

THE GOVERNMENT OF MALAYSIA
THE STATE OF SARAWAK

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MIRI-BINTULU

REGIONAL PLANNING STUDY

SUPPORTING REPORT

No. 2

AGRICULTURE PART I THE PLANING OF AGRICULTURAL DEVELOPMENT

—1974—

HUNTING TECHNICAL
SERVICES LTD. LONDON

HOFF AND OVERGAARD
COPENHAGEN

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PART V	THE DEVELOPMENT OF INLAND FISHERIES AND LIVESTOCK (Describes the present situation and potentials for fisheries and livestock in the Study Area. A detailed programme for the development of a beef ranch is included)	

CHAPTER 1

THE FACTORS AFFECTING THE PLANNING OF AGRICULTURAL DEVELOPMENT

1.1 INTRODUCTION

The Terms of Reference for this Study require that, in drawing up the development plans, consideration must be given to political aims and sociological needs as well as economic and technical factors. Thus, while the economic viability of the plans remains a constant objective, equal importance must be given to the well-being and aspirations of the people for whom the development is being planned. Certain development approaches which have a high social benefit may have to be advocated even though they result in a lower economic rate of growth than would be achieved by some other less socially orientated method.

1.2 POLITICAL AND SOCIOLOGICAL FACTORS

These two factors are treated together because often there are both political and social motives in Government's aims.

1.2.1 Stated Government Policies

The Malaysian 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 1.1 indicates the general goals of this New Development Strategy.

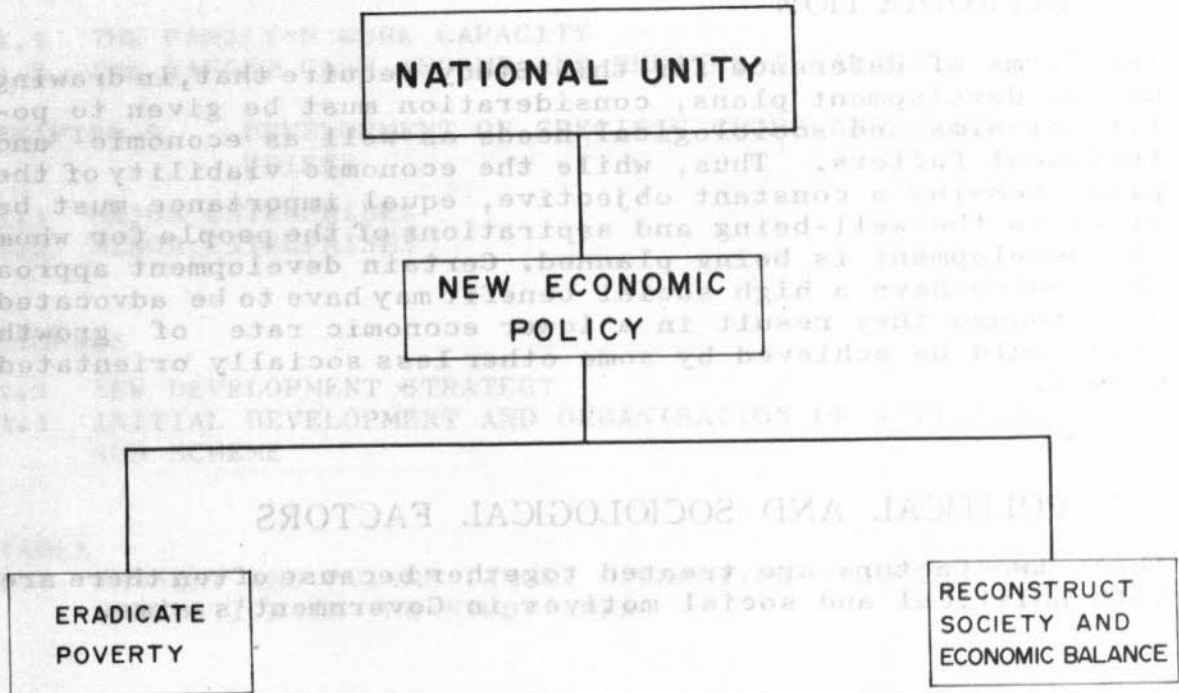
The two main components of the objective of National Unity are social integration and a more equitable distribution of income and opportunities. The two-pronged New Economic Policy is the most important measure to achieve these goals. The first prong in this policy is to reduce and eventually eradicate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

FACTORS AFFECTING THE PLANNING OF NEW DEVELOPMENT STRATEGY

FIGURE 1.1



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 crops and 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 production activities by implementing agricultural development and forestry projects, providing modern fishing techniques, encouraging industries and commerce and improving services.

Generally Sarawak identifies itself with the rest of Malaysia and therefore also with its goals and strategies. These have already influenced rural and agricultural planning in Sarawak, for instance The Sarawak Development Plan (1964-68), published in 1963, states a number of objectives, of which several are still 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;

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;

To provide more adequately for rural utilities."

A further political and social aim which exerts a considerable influence on development plans is outlined in the Terms of Reference for this Study. It is stated that: "The population of Sarawak, which is concentrated in the First, Second and western part of the Third Division, is increasing at a rapid rate, to the extent that land resources within and around the more intensively settled areas are proving insufficient to meet the traditional subsistence agriculture needs of the indigenous peoples or the permanent agricultural land requirements of the immigrant groups. Furthermore, opportunities in other sectors of the economy cannot fully satisfy the rising aspirations of both these groups within these areas. On the other hand, conditions in other parts of Sarawak, particularly in the Fourth Division, are favourable to settlement and development by people from outside the Division, and the State Government has accordingly identified an extensive region of predominantly unencumbered land with considerable agricultural and forestry potentials as suitable for priority development during the coming decades, primarily to meet the employment needs of a large proportion of the population from the more congested areas." The Region identified by Government has become the Study Area for this Regional Planning Study. The aims that Government has for the Region necessitate that:

- a) the majority of the land selected for intensive planned development in the next twenty years should be unencumbered State Land. (Unencumbered in this context means that the land is not legally occupied or owned under Government-issued title or Native Customary Law);
- b) a State-wide labour recruitment organisation is set-up, designed to recruit potential migrants primarily, though not exclusively, from other parts of Sarawak.

However, if development in the Study Area is to play a significant part in alleviating congestion in other parts of Sarawak then considerable industrial and service sector developments must take place in addition to agricultural schemes.

This fact is shown in Table 1.1, which is compiled from Supporting Report 5 where the present and expected future populations in the Study Area are fully discussed. It is clear that the recruitment organisation must provide for industrial and service employment as well as for agriculture.

TABLE 1.1 PRESENT AND FUTURE TARGET OCCUPATION STRUCTURE OF POPULATION IN THE STUDY AREA

Sector	1970		1980		1990	
	Number persons employed	Per cent of total	Number persons employed	Per cent of total	Number persons employed	Per cent of total
Agriculture	21 000	54	32 000	53	50 000	50
Forestry	4 000	10	5 500	9	6 000	6
Manufacturing	4 500	12	6 500	14	21 000	21
Services	9 500	24	14 000	23	23 000	23
Total employed	39 000	100	60 000	100	100 000	100
Unemployed	6 000		6 000		7 000	
Total labour force	45 000		66 000		107 000	

1.2.2 Current Government Action in Agriculture

An acceleration of agricultural development was provided for by Government in early 1972 by the establishment of the Sarawak Land Development Board. In accordance with Government policy it was charged with the following tasks:-

- to open-up undeveloped land for agricultural use and settlement, with oil palm and rubber as the main crops;
- to settle selected persons on land thus developed by providing economic holdings of the main crops;
- to provide credit facilities, management and supervisory services to settlers;
- to facilitate the processing and marketing of settlers' produce through the establishment of modern processing and marketing facilities; and
- to develop settler groups into viable social and economic communities.

It is obvious, therefore, that during the next decade, and possibly even longer, SLDB will play a most important part in the implementation of the agricultural plans, influencing immensely the pattern of development in both the short term and the long term.

The SLDB, since its inception, has done much development in the Study Area, and by the end of 1973 it will have planted between 18 000 and 21 000 acres of oil palm in that part of the Region known as the Lambir-Subis Development Area. However, all this development is based on the establishment of public estates with a firm central management and on monoculture of oil palms. Although thought is being given by SLDB to participation by the labourers/settlers in the profits of the public estates, there is no present intention of demarcating physical land holdings for each participant. Nor are there any other direct provisions for the establishment of small-holders.

It appears that the financial rules and physical development targets, under which SLDB is presently working, necessitate a strong commercial approach to its undertakings. For this reason SLDB has adopted an estate-type agriculture with a management system designed to ensure a disciplined labour force under close supervision. There is a minimum allocation of SLDB effort to social objectives outside the estates. To enable SLDB to adopt a better balance between the commercial and social aspects of development, may necessitate alteration of the financial rules and some slowing down of the rate of present physical development.

1.2.3 Social Requirements of Potential Migrants

There is no doubt that a large proportion of the people willing to participate in agricultural development, whether recruited locally or from other parts of Sarawak, will come from communities presently practising shifting cultivation. This has important implications on the planning. The majority of the migrants will have attitudes and expectations not presently associated with SLDB-type developments. For example they will:-

- be unused and unprepared for the social environment created in a development area; therefore emphasis will have to be given to organised re-orientation training and social welfare among the migrants to ensure that they receive help in adapting to the new conditions;
- consider the planting of a patch of rice as a social and cultural necessity, while others will consider it traditionally desirable; the development plans must provide for this;
- have a minimal knowledge of the cultivation techniques for the most important crops and enterprises suitable for development. It will be necessary to ensure that no newly arrived person or family will have to undertake any farming without either close supervision or intensive guidance and assistance from specially trained and organised personnel;
- expect to have the prospect of establishing a personal relationship with an identifiable holding of land. The development plans must include provisions for the creation of viable small-holders and independent farmers.

To attract and retain persons to new development areas will require the rapid establishment of a reasonable level of amenities. Sociological studies among the existing settlers, and among peoples who are likely to be settlers in the future, have shown that the amenities considered most important are:-

- security of persons and property, requiring the concentration of houses into reasonably close grouped units;
- easy access to health and schooling services;
- facilities for worship and religious ceremonies;
- opportunities for a diversification of employment especially for dependents of migrant families;
- facilities for recreation.

To satisfy these requirements and achieve Government's aim of improving the rural environment will mean creating sufficiently large communities within a reasonably limited area to justify establishing the desirable services. This will require a certain degree of urbanisation which, moreover, should be attained as rapidly as possible.

The development areas are at present jungle with a few very minor towns and villages scattered around the periphery. For many years the majority of the population in the development areas will be the SLDB labourers/settlers. Clearly these people must be housed in groups large enough to form villages. However, it is essential, for successful development in the area as a whole, to create larger towns each sufficient to warrant the establishment of services of a higher order than can be justified in villages. (See Supporting Report 5)

The foregoing all refers to development on State Land where planned, intensive development will take place. Although this will cover a rapidly expanding area, for many years the acreage will be considerably smaller than that covered by existing agriculture in the Region. Much of the latter is traditional shifting hill rice cultivation or low intensity swamp rice farming. It is evident that a peaceful coexistence between the existing population and people from other Divisions settled onto State Land in the Study Area would be prejudiced if comparable assistance is withheld from the population in the legally occupied areas. However, the physical problems associated with agricultural extension work in these areas - their huge acreages, the poor communications, long distances and the remoteness of some of the lands - together with technical and social difficulties will necessitate the concentration of effort initially in specific areas which have special advantages for agricultural development. Of particular importance will be roads to provide access, and proximity of the areas to some adjacent nucleus development which can act as a catalyst.

A strategy for initiating the improvement of farming in Native Customary Land could be the concentration of effort onto a relatively narrow strip of land on both sides of a road. This could be undertaken either as an expansion from existing or planned development on State Land, or as an independent development following a road into an area of Native Customary Land currently remote from market centres and/or development schemes.

13 TECHNICAL FACTORS

There are two main groups of factors involved here; those affecting the environment (land and climate) and those affecting management of agricultural enterprises. These factors are sometimes so inter-related that they are discussed together.

1.3.1 Land Capability

Surveys for selection of land for agricultural development have been undertaken at three different levels. These surveys are fully discussed in Supporting Report 1. Very briefly they were:-

- i) a desk study; a stereoscopic aerial photo analysis of the entire Study Area, supplemented with available relevant physical resource data, and resulting in a broad zonation of land possibly suitable and land unsuitable for agricultural development.
- ii) based on the findings of the desk study, an area was selected for soil studies at a broad transect level. In the selection of land for this purpose, priority was given to presently unoccupied land and land that is now, or can be easily, connected by road to either Miri or Bintulu. These studies resulted in the demarcation of blocks of land totalling about 590 000 acres in which there is a high proportion of land suitable for agricultural development.
- iii) based on the results of the Broad Transect Soil Survey and other relevant information, an area of roughly 100 000 acres was selected for soil survey at a semi-detailed level. Priority was given to presently unoccupied land which already had, or easily could have, good road connections to Miri or Bintulu. Further selection criteria were that forest exploitation on the land was completed or in progress, and that the location of the area enabled its development to be easily associated with development already undertaken. These semi-detailed surveys resulted in the selection of about 62 000 acres of land suitable for agriculture on which development could take place in the period 1974 to 1980. For these areas the land use capability is sufficiently well established to enable detailed cropping and settlement patterns to be recommended.

Only a small proportion of the land found suitable for agriculture is useable for arable farming of annual crops. The majority is quite steeply undulating with an average slope of between 12 and 25 degrees. The erosion hazard with the soils, gradient and climate of the area dictates that agricultural development should be based on perennial or semi-perennial crops. This restriction in choice of enterprise for large scale development is further constrained by economic and market limitations as well as by lack of agronomic research evidence. The screening of all possible crops is explained in Part IV of this Supporting Report, where the conclusion is reached that the choice of crops for immediate large scale development is effectively limited to oil palm and rubber, with fair prospects for a wider range of activities on a restricted scale. Important among these are cocoa, beef cattle, rice, pepper, vegetables, fruits, coffee, some essential oil crops, pigs, poultry and the pond culture of fish.

This assessment means that initially the majority of farming in the Study Area, whether as estates, large holdings or small-holdings must rely on oil palm and/or rubber as the main income earners, with the other possibilities generally undertaken as supplementary enterprises.

The husbandry requirements of all these supplementary enterprises - except beef cattle and cocoa - are such that, generally, they must be small-holder undertakings and occupy only small areas of land. Moreover, they should be concentrated around the homesteads for close supervision or, as in the case of rice, on particularly suitable sites.

Besides the topography of the terrain the land investigation studies showed that soil type and soil depth are important in the planning of development. It was found that land capability changes rapidly from one place to another, and there are few really large stretches of uniform land: rather there is a haphazard occurrence of irregularly shaped blocks of land with different capabilities. Agronomically the ideal farming pattern would be to develop each individual block to the enterprise for which it is best suited, but this would lead to a patchwork cropping pattern which has, in a broader context, both advantages and disadvantages. For estate-type agriculture the interspersing of blocks of secondary crops among areas of main crop would increase transport costs and possibly increase management problems. However, in both estate-type and small-holder farming such interspersing contributes towards a fundamental aim of the agricultural development - that of diversification. It is therefore necessary to devise a cropping pattern that takes account of land capability, management and economics.

1.3.2 Long-Term Enterprises

The heavy reliance on oil palm and rubber (and to some extent cocoa) as the major recommendable enterprises has a considerable influence on the planning and implementation of development. All three crops have relatively long establishment periods before economic returns are attained: they involve high initial investment and protracted repayment. Moreover, with permanent tree crops proper planting, maintenance and management are of fundamental and lasting importance.

To these considerations must be added the need for large scale processing plants (essential for oil palm but desirable also for rubber and cocoa) involving heavy investments in machinery and buildings, which in turn, depend on regular supplies of raw material for economic operation. These considerations assert the need for a concentration of crops, not only into fairly large blocks but also within reasonable transport distance of processing facilities.

Planning must take particular account of the need to bridge the gap between crop planting and economic returns. Large companies, or governments can be relied upon to finance continued good husbandry, and the outlay can be recovered when the crops come into production. But the majority of small-holders will have little or no capital reserves, and some form of financial assistance will be needed for them initially. This could be either in the form of loans or as subsidies or grants. Alternatively, the crops could be established under estate-type conditions, employing the potential small-holders as labour. When the crops came into production the developed land could be handed over to the small-holders under a variety of conditions, including provision for the repayment of development capital invested on their behalf.

Whatever system is adopted it will be essential that high standards are maintained during the establishment and critical early years of perennial crops, that farmers and their families are adequately trained and fully employed, and that their indebtedness is kept to a reasonable minimum.

14 ECONOMIC FACTORS

14.1 The Outlook on Prices for Agricultural Commodities

There are two particular aspects of agricultural commodity prices that affect agricultural planning; short term fluctuations and longer term trends. Short term fluctuations and cycles characterise the prices of several important commodities considered for production in the area and are subject to varying conditions of supply and demand in the market. These fluctuations will have repercussions at various levels in the

economy. These effects are outlined below.

Producers' incomes are directly affected, and at times they may not cover production costs. This would be especially damaging and discouraging to small-holders. There are no price or income stabilisation schemes in Sarawak or Malaysia at present. It may be advisable to introduce them, or to adopt a system of land rent or charges which could be adjusted to offset the main commodity price fluctuations. This aspect is fully discussed in Supporting Report 9.

Supplies of produce to traders, processors and consumers vary in response to price changes, giving rise to difficulties in planning production schedules, storage, staffing and the like. Under-utilised plant and staff lead to increased operating costs and lower profits. Plans must ensure not only that the capacity of processing facilities is matched with expected production, but also that sufficient areas are always under reliable management to ensure efficient operation of those facilities.

High prices and unstable supply situations may have serious effects on the long term demand for a commodity because they cause users or consumers to seek alternative materials or technical substitutes. A fundamental aim of the development plans must be to create an assured supply of goods, produced, processed and marketed as efficiently as possible under the prevailing technical, political and social conditions.

Declining price trends; a series of long term projections of world production and consumption patterns indicates that during the next decade supplies of oil palm, rubber and cocoa are likely to outstrip demand. This, coupled with increasing competition from technical substitutes and synthetic materials, will probably lead to a gradual decline in their prices. Sarawak, as a relatively small producer, is unlikely to exert any influence over this trend.

For these reasons the development plans must attempt to ensure that farmer's incomes are based on at least two, preferably more, enterprises. A considerable effort must be made to diversify agriculture and to maintain efficient, stable production even when produce prices fall. Some financial system devised to insulate individual farmers from conditions which they cannot influence, would assist appreciably in this direction.

1.4.2 The Level of Economic Returns Achieved by Agricultural Activities

Financial returns are lower in Sarawak than in other areas due to several factors, particularly the following:-

a) high transport and handling costs of agricultural production inputs and products.

Adverse shipping rates and unfavourable port facilities particularly affect the cost of fertilisers, machinery, equipment etc., thus increasing the cost of production and, at the same time, reducing the profit margin on products exported. This is especially so for those products with a low bulk-to-value ratio such as palm oil, palm kernels and palletised rubber.

b) high investment and operating costs, in addition to transport costs.

Mainly caused by:-

- high import duties on vehicles and plant;
- labour wage rates which are above those in other Malaysian States, combined with a relatively lower level of labour skills and hence productivity;
- management staff salaries are substantially higher than in other Malaysian States both in the public and private sectors;
- road costs are high due to terrain difficulties and scarcity of construction materials;
- high costs of crop establishment and maintenance due to the need for considerable soil conservation measures on much of the land. Despite careful selection of the less steep land for agricultural development, it will be necessary to make platforms for oil palm and terraces for rubber in terrain conditions which will generally prevent mechanisation.

To mitigate these adverse factors calls for a carefully designed and more extensive road network, vastly improved port facilities and particularly, efficient agricultural production. In this context economies of scale are important, especially in the processing and transportation of oil palm and rubber. At the processing level, units for these crops should be as large as is reasonably possible. However, large processing units require large capital investment and, for efficient operation, must have reliable supplies of raw materials, which in turn depend on effective control of production operations. Historically these requirements have led to the adoption of large scale operations run on estate lines, using centralised management for oil palm and, only to a slightly less extent, for rubber and cocoa.

In the development areas the best solution, in terms of technical efficiency, production control and return on investment would be one in which the whole area supplying a factory or mill was under estate-type management. However, this, as already explained, is not regarded as politically or socially acceptable. Small-holders and independent farmers must be included in the development plans, but their possible lower efficiency must not be allowed to jeopardise adequate factory through-put. A solution would be to arrange that the bulk of

the raw materials would be produced by estates while a lesser proportion would be grown by small-holder and independent farmers.

1.4.3 Economy of Small-Holdings

The main problem of small-holdings of various types, from an economic view point, is that they tend to be consumption orientated. Crop production has to compete for available cash resources with the needs of everyday life and with the purchase of consumer goods required to satisfy the family's expectations of a reasonable living standard. The main input is often "unpaid" family labour, and the people tend to relate their input effort to the cash return expected from selling the crop produced. In Sarawak that input of labour only appears worthwhile to the farmer when the return is upwards of \$5 per day. Returns of this order cannot be guaranteed because of price fluctuations for the main crop products; especially if loan repayment and contribution to capital investment costs are rigidly fixed. These facts again point to the need to introduce a financial system, a land rent system for example, whereby the income earned by the average farmer can be adjusted, to some extent at least, in accordance with price fluctuations.

CHAPTER 2

PRINCIPLES FOR AGRICULTURAL DEVELOPMENT

2.1 CONCENTRATION AND INTEGRATION OF EFFORT

Until quite recent years the rivers have been the only important means of access to the interior, and most of the settlement and cultivation have been close to the rivers and streams navigable by longboat. This has resulted in dispersed, low intensity development and a thinly spread agricultural extension service.

By contrast the proposed strategy for development in the Study Area is to concentrate effort in relatively limited areas to create viable agricultural undertakings which, together with the necessary infrastructure, will form a basis from which further development can take place.

This policy envisages a huge input of capital, people and know-how under a planned sequence of operations which will cover not only agricultural development with its processing and marketing facilities, but also the construction of roads, towns and villages and the provision of services for health education, administration and recreation.

Although the area under this form of intensive development will steadily increase each year in the future there will be, for many years, far greater areas which are not included in, or directly affected by it. For these areas it is recommended that the existing level of extension services should be continued, but efforts should be made to relieve and avoid repetition of problems which have sometimes occurred in the past, such as:

- market and transport problems created by starting production enterprises in areas too remote and on too small a scale;
- inappropriate land use planning resulting in the best land in an area being used for a low return crop.

The minimum aim in these remaining areas would be:-

- to maintain the land in a condition suitable for a more intensive development when the time is ripe;
- to produce sufficient food (rice, fruit, vegetables; meat, eggs, fish, etc) for the farmers themselves and other people living in those areas.

Other preliminary developments could take place. Of particular importance in this respect would be a collection, processing and marketing organisation for the numerous, small, scattered

plantations of rubber. The construction of factories at Marudi and Bintulu, to process sundried rubber sheets, bucket-lump or poly-bag coagulum, and an organised collection and transport system are possibilities worth further investigation.

22 THE IMPORTANCE OF GOOD ACCESS

Probably the most important single requirement for development in the Study Area is the construction of good roads to give easy access and for the efficient evacuation of produce.

The existence of the Miri-Bintulu road automatically focuses attention first on to the areas through which it passes, and fortunately, there is much potentially good agricultural land adjacent to the road. This land and that served by existing feeder roads extending from this main artery, are recommended for priority development.

23 IDENTIFICATION AND DEMARCATION OF BOUNDARIES BETWEEN STATE LAND AND LEGALLY OCCUPIED LAND

In order to undertake development in an orderly, planned fashion it is necessary to know before starting the exact boundaries between State Land and legally occupied land because different development strategies are required in each.

The fact that illegal occupation of land has occurred, and continues in the Study Area, makes it necessary that identification and demarcation on the ground of the boundaries between the two land categories is accepted by Government as an integral part of the development effort. It is recommended that special survey teams are set-up by the Land and Survey Department to carry out this work. Initially it should be concentrated in those areas where shifting cultivation impinges on land selected for priority development. But before any survey parties move into these areas it will be necessary for Administrative Officers to explain to the people concerned exactly what is happening. It is important to ensure that the people understand that they will be able to participate in, and benefit from, the development that Government intends for the nearby unoccupied area and that any extension of illegal cultivation into the unoccupied area will not be tolerated under any circumstances. No survey or demarcation work should commence until these preliminary explanations have been completed, but the teams should move in immediately afterwards. The follow-up work should be undertaken in two distinct phases:

PHASE I adjudication to determine a dividing line between legally and illegally occupied land. This step should be the

responsibility of the Divisional and District Administrative Officers. Every effort should be made to decide upon the boundary without taking the matter to court. Recommendations that would help to achieve rapid, amicable solutions are:-

- a) that the accepted boundary should be the limit of the clearings as shown on the 1:250 000 scale series No.22 Land Use maps. These were compiled from 1963-1968 aerial photographs. This should be acceptable to the cultivators because by law, as laid down in the Amendment to the Land Classification Ordinance 1955, they would only have Customary Rights over land cleared before April 1955. Thus by accepting the situation as shown on these maps they would be treated generously. For Government the situation could be acceptable because these maps would then show the extent of legally occupied land.
- b) assurance from Government that the people concerned, i.e. those actually cultivating illegally, will be given priority consideration, if they wish it, to join the development scheme on the nearby State Land; and that planned improvement of agriculture will be supported by Government in their legally occupied land.

PHASE II survey and permanent demarcation of agreed boundaries. In carrying out this work no attempt should be made to identify or demarcate individual holdings in the legally occupied area. The work should be undertaken only on a longhouse or village basis.

Great accuracy in this work is not initially required. It is considered sufficient if a preliminary demarcation is done by chain and compass. A team could consist of an experienced chainman with enough labourers to complete about 1 000 chains a month. Records giving prismatic compass bearings and distances along the trace would need to be kept and semi-permanent marks (bilian posts) erected. Later a more accurate survey could be done and permanent boundary marks established. This would require theodolite work and teams led by Senior Surveyors.

24 PRIOR EXPLOITATION OF FORESTS

An obvious recommendation is that before agricultural development starts on any land the marketable timber must first have been removed from it under an organised exploitation scheme. It is particularly important that the maximum early revenue be derived from timber to offset the initial cost of establishing long term crops with delayed economic returns.

In some parts of the Study Area forest exploitation has been completed and in other parts licenced logging is still continuing. In all such cases the full utilisation of residual timber, that will otherwise be wastefully burnt, should be

planned. All logged and/or licensed forest land found suitable for agriculture and conveniently situated is given high priority for development to agriculture and the licencees should be immediately warned to complete their logging operations before the date on which the area is required for agriculture (see Supporting Report 3, Part I). There are other, far larger areas of potentially suitable agricultural land still under virgin forest. These are mostly areas controlled by the Sarawak Forest Industries Development Authority whose exploitation plans must be coordinated with the agricultural development plans so as to ensure that land is released by the date it is due to be cleared for agriculture.

It is recommended that the Government should consider the possibility of allocating some of the land under its control to agriculture. This would be done by the Government, which would then allocate the land to the appropriate authority for development. The Government should also consider the possibility of allocating some of the land under its control to agriculture. This would be done by the Government, which would then allocate the land to the appropriate authority for development. The Government should also consider the possibility of allocating some of the land under its control to agriculture. This would be done by the Government, which would then allocate the land to the appropriate authority for development.

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CHAPTER 3

THE AGENCIES FOR IMPLEMENTATION OF THE AGRICULTURAL PLAN

The State and Divisional machinery for planning and implementing the overall development plan is discussed in Part II of this Supporting Report. In this Chapter the principles and recommendations are given for the implementation of the agricultural plan which is also described in Part II.

The basic agricultural aim should be to combine efficient primary land development with the ultimate objective - progressively achieved - of meeting the understandable wish of many farmers to identify themselves with a piece of land and to manage it.

For private companies and individuals already able and wishing to undertake the full economic responsibility of farming, land should be made available from the outset. But for the majority of people who must achieve their goals by degrees the experience and efficiency of the Sarawak Land Development Board (SLDB) should be used to develop the land for small-holdings and for public nucleus estates round which small-holders and others can be helped to manage their own affairs.

The economic success and efficient operation of the small-holder farmers will be a vital component of the whole plan, and it will be essential that the Department of Agriculture provides all the various services that these farmers would need.

It is recommended that the agricultural plan is implemented mainly by two agencies, the SLDB and the Agricultural Development Unit (ADU) which is an organisation proposed to be created within the Department of Agriculture specifically to support and guide farmers in the development areas in the management of land which will not be directly under the control of SLDB. The creation and functioning of the ADU is described in Part IV.

3.1 THE ROLE OF THE SLDB

SLDB's role should be somewhat wider than at present. Its responsibilities should extend beyond the opening and operating of public estates into a closer involvement with overall development. SLDB should be responsible for the initial development of all land allocated to it, regardless of whether the developed land is ultimately destined for small-holders or public estates. Its efficiency and experience qualify it for doing so. In addition its responsibilities should include the construction of village houses, participation in

the initiation of larger urban centres and giving some assistance in the improvement of agriculture in legally occupied land. To enable SLDB to undertake this wider, more socially oriented role it is recommended that the present financial rules, which appear to demand maximum economic return from all of its operations, are modified and that, in future, work undertaken by SLDB is considered as being in two phases:-

PHASE I the development of new land. This would include the clearing and the preparation of land, and the planting and care of all permanent crops - whether for public estates or small-holders - up to a specified stage, (to first bearing, for example). It would also include the establishment of, processing and marketing facilities for the crops planted. During this phase SLDB should be thought of as a contractor carrying out a job for which it would be paid by Government. Government should consider these development costs from a social as well as from an economic point of view because they are necessary to create new jobs and farming opportunities under up-to-date technological and managerial conditions and because there is no better way of achieving the same objective.

PHASE II the management of the developed land; i.e. land on which the permanent crops are beyond the stage of first bearing. In this phase the objective of the operator, whoever it is, should be to obtain maximum economic returns. The recommendation is that SLDB should manage as a public estate, sufficient areas to form a substantial nucleus.

SLDB should be thought of as the "spear-head" organisation moving systematically through the Study Area developing the land in such a way that subsequently it can be managed under different settlement patterns.

The arguments, summarised below, supporting this two-phased economic approach are explained more fully in Supporting Report 9.

In the development of new land the approach of a private investor and of a Government could differ considerably. The former would estimate investment and operational costs and compare them with the estimated financial returns over the life-time of the investment. Only if the expected returns were economically favourable would the project be undertaken. A Government, on the other hand, would consider economic, social and political as well as financial aspects. Indeed the Malaysian New Development strategy puts greater importance on political and social objectives than on economic growth, and activities which cannot, at the best present estimates of costs and prices, be expected to give as high an economic return as would have been possible if only economic criteria had been considered.

Besides this widening of SLDB's role the annual development target, in terms of new areas cleared, should be geared to the requirements of the State as a whole. It is known that the Government intends SLDB to undertake large-scale development in other Divisions of Sarawak. Therefore SLDB's effort in the Fourth Division must be reduced compared with recent previous years. The Terms of Reference for this Study give a guideline on the rate of development that Government would accept in the Study Area; namely 50 000 acres in the first 5 years and a further 200 000 acres in the following 15 years. These aims appear reasonable and the recommendations are that the annual targets for SLDB with respect to development in the Study Area should, starting in 1974/75, be about 5 000 to 6 000 acres and increase gradually over time to about 10 000 acres.

The following is the recommended development system and specific roles of SLDB.

3.1.1 The Development of State Land and the Initiation of Villages and Larger Service Centres

The opening-up and planting of specified areas of State Land should be undertaken by SLDB working it all at first as an estate as at present. Similarly the current practice of housing SLDB labour in villages of about 400 workers (i.e. roughly 200 families) working about 4 000 acres of crop land should continue. However, in order to ensure the rapid establishment of one or two larger centres the principle of concentrating a greater number of SLDB labourers/settlers into the selected sites is recommended.

In Peninsular Malaysia the Federal Land Development Authority (FELDA) has adopted the principle of concentration of labourers/settlers in larger centres and has found that an important criterion governing the size of the area economically workable from such centres is a maximum vehicle travel time of half an hour for conveying labourers to and from work. This corresponds to a maximum distance of about 6.5 miles from the centre. It is recommended that the same planning criterion should be used in the Study Area and that the planning and construction of these towns should be in close cooperation with the town planning authorities.

The land developed and worked from these larger centres should form public estates remaining under SLDB management and should be the nucleus around which village, road based, private and block alienation types of development take place. The land developed around the villages should be destined for later transfer to small-holder management.

All the land should be developed to a reasonably diversified cropping pattern determined by considerations of proper land use as well as economic, marketing and management factors. At present the major enterprises should be limited to oil palms, rubber and, to a lesser extent, cocoa. Beef cattle rearing and/or fattening, and possibly other enterprises, could be added later when technical and economic aspects have been worked out.

Rice growing has always been an important agricultural enterprise in Sarawak as has been previously explained; in fact the growing of a patch of rice is of great social and cultural importance to a large proportion of the present rural people of Sarawak. Recently (1974) Government's official policy has been stated as attempting to make Sarawak an exporter of rice. Because of this policy and because the majority of SLDB labourer/settlers will come from rural communities, it is recommended that in the village areas one acre of swamp rice land should be allocated to each family that wants it. This land should be, whenever possible, a block of valley land close to the village or service centre and especially selected during planning for development to this purpose.

All the crops should be planted in blocks, the approximate minimum acreage of which should be:-

200 acres for oil palm and rubber;

100 acres for cocoa;

50 acres for rice.

There need be no defined maximum acreage of the blocks except in so far as it is necessary in principle to avoid the monoculture of any one crop within an area operated from a village or urban centre.

This general development pattern should apply to all land developed by SLDB because the ultimate aim should be the transfer of management of all developed land to the farmers working it. Thus the management of these areas initially planned as public estates is expected to change in future but the most appropriate type of management which will eventually emerge cannot yet be foreseen. It will depend on political aims, social requirements and the success, socially and agriculturally, of small-holder management. Thus these estate lands could eventually be divided into small-holdings, or the management could, as an intermediate or permanent measure, change to some form of group participation in which the workers would become the joint owners of the estate. The diversified cropping pattern will add flexibility to the choices available, and increased economic security will be provided for future small-holders by spreading the risks between more than one major enterprise.

On the public estates the management problems of SLDB will undoubtedly be greater than around the villages. Control over the labour will be lessened to some extent in the urban environment of the larger centres. Development and running costs will also be greater because of the need to transport the labourers to and from their places of work. But the concentration of people will ensure a rapid development of a centre sufficiently large to warrant the provision of administrative, medical and educational services of a much higher standard than could be provided in a system of small villages and should be conducive to a more stable labour force. The provision of these public services and utilities should not be undertaken by SLDB, but should be the responsibility of the appropriate departments of government. (See Supporting Report 5)

3.1.2 The Selection of Potential Small-Holders and the Creation of Conditions Suitable for their Establishment

It is recommended in Supporting Report 4 that throughout Sarawak the recruitment of people for all types of planned development should be undertaken on a state-wide basis by a special Section of the Department of Labour. From the mass of people so recruited, selection of suitable candidates for participation in SLDB development should be by the Settler Development Division of SLDB itself. All recruits selected should be considered potential small-holder farmers but all should first be expected to work for a time (about nine months) as labourers, preferably but not necessarily, on the public estates. This would be a probation period during which the people would establish, to themselves and the authorities, their suitability as future small-holders. Having successfully completed the probation period those wishing to become small-holders would be transferred to live and work in a village area destined for sub-division into small-holdings. In this respect an important role of the public estates would be the screening of small-holder farmers.

Thus it is proposed that the majority of small-holders should be selected from the SLDB labour force. The amount and quality of work contributed by individuals and families during the probation period should be a major criterion in selection.

The policy of selecting small-holders from within the public estate labour force can be criticised on the grounds of efficiency in that it would cause a continual change in that force. But it should be regarded as part of SLDB's wider role in assisting socio-economic progress. Moreover, sociological studies indicate that a constant change will take place in any case. In fact the provision of both short-term and long-term employment opportunities in the rural development system

would be highly desirable because, within the Sarawak communities seeking employment, there are many people, particularly the younger ones, who want short term employment. (Supporting Report 4)

Nevertheless this method of selection and establishment of small-holders on State Land should not be the only one. Other procedures recommended are:-

- through the Block Alienation schemes;
- priority allocation of land to young people who have successfully completed a training course at the Farm Institutes run by the Agricultural Department;
- providing for individuals able to finance land development themselves.

The transfer of potential small-holders from the public estate to the villages should take place as soon as the houses in the village are completed after initial land clearing. During the establishment stage of the permanent crops all work should be organised on estate lines and all families should be obliged to participate.

The villages should be planned at a low housing density whereby the families would live on a homestead plot of about one acre around a small central bazaar and service centre (see Supporting Report 5). On the acre plots the families should be encouraged to undertake small-scale enterprises for which they would receive advice and assistance from the ADU. Such enterprises could be the growing of pepper, fruit, vegetables, spices, essential oils, the pond culture of fish or the raising of pigs and poultry. These enterprises would provide rewarding occupation for the family near home. To achieve this aim it is essential that the villages are sited on good agricultural land. The land capability classes considered suitable for selection as village sites are: I, IIe, IIIe, IVe, Ve. (See Supporting Report 1)

Thus all potential small-holder families, once they are moved to a village area could have an almost immediate allocation of two acres of land; a homestead plot and a rice plot. Nevertheless the main cash income for the families would have to come from paid estate-type work in the oil palm, rubber and cocoa areas until these crops reached sufficient maturity for sub-division of the lands into viable small-holdings.

The transfer of this land should be a phased process which could change as experience is gained and as political aims and social requirements alter. The conclusion from an analysis of the present situation is that transfer of management should

aim at the identification of plots of land with individual small-holder farmers. This, it is suggested, should be done through an intermediate stage similar to that presently practised for oil palms by FELDA in Peninsular Malaysia, in which a group of potential settlers are allocated a block of oil palms to be worked on a group basis. For the Study Area it is suggested that blocks of oil palms, rubber and cocoa are allocated to groups of potential small-holders to work on this basis. This stage could occur before the trees come into bearing, but management would still be under SLDB along estate-type lines. If and when the running of these blocks is proved successful the next stage could be the sub-division of blocks and their allocation as individual holdings. At this stage the SLDB responsibility would stop and the management would pass to the small-holders, advised and supported by the ADU.

The aim of the allocation should be to allot at least two plots, each of a different crop, to each family, and all plots should be within reasonable walking distance of the homestead, a maximum distance of about 1.5 miles.

The best time for allocating plots to small-holders can only be determined by experience and events at the actual time, but for the present the following sequence is recommended:-

- a) the homestead plot; allocated together with the houses as they become habitable; probably during year 2 after commencement of land clearing; SLDB responsibility on this land would cease after clearing the village area and erecting the houses;
- b) the swamp rice plot; during year 2 after commencement of clearing, SLDB responsibility should end after the land has been sufficiently cleared, drained and levelled for rice production;
- c) oil palm and cocoa plots; at the beginning of good bearing, about the fourth year after planting; probably the fifth year after commencement of clearing;
- d) rubber plot; when ready for tapping, about the seventh year after planting; probably the eighth year after commencement of clearing.

This phasing would mean that for the first four years after commencement of clearing SLDB would be able to rely upon a large input of labour from each family and to manage the area around the village as an estate. In order to simplify the process of transferring management responsibility from SLDB to small-holders, and to avoid involving SLDB in the management of any part of small-holdings, it is recommended that during the fifth year after commencement of clearing responsibility for management of the whole crop area around the village is handed over to ADU.

FIGURE 3.1

INITIAL DEVELOPMENT AND ORGANISATION OF A VILLAGE SUB SCHEME

	YEAR								
	0	1	2	3	4	5	6	7	8
IDENTIFICATION AND DEMARCATION	LAND AND SURVEY/AD								
LAND CLEARING	S L D B								
HOUSE CONSTRUCTION		S L D B							
GUIDANCE AND SUPPORT FOR HOMESTEADS AND RICE PLOTS			AGRICULTURAL DEVELOPMENT UNIT (A D U)						
PLANTING AND MAINTENANCE OF CROPS: OIL PALM		S L D B							
COCOA		S L D B							
RUBBER		S L D B							
BLOCK ALLOCATION TO GROUPS OF SETTLERS				S L D B		RUBBER (A D U)			
DIVISION INTO SMALL HOLDINGS						OIL PALM / COCOA AND RUBBER (A D U)			

NOTE: SLDB management ceases at the end of year 4

The development phasing of a village and its surrounding area is illustrated in Figure 3.1.

3.1.3 Establishment and Operation of Processing and Marketing Facilities

This function is already being undertaken by SLDB with regard to oil palm and rubber, but it should be extended, at the appropriate time, to include cocoa and possibly other enterprises. The facilities should be designed to serve the total acreages of the enterprises in the development areas but sufficient acreage of each crop, except rice, should remain under direct SLDB control to ensure efficient operation of the processing facilities established. SLDB control should cease first in the areas planned for small-holdings and later in the public estates when reliable production is achieved from the small-holder areas.

3.1.4 Assistance in Agricultural Improvement Schemes in Legally Occupied Land

The nature of SLDB assistance would be:-

- use of heavy equipment in the making of access roads, clearing land, etc.
- supply of oil palm, rubber and cocoa seedlings from central nurseries;
- providing the processing and market facilities for produce.

3.2 THE ROLE OF THE ADU

The purpose of the ADU is to operate in the intensive development areas supplementing and following-up the work started by SLDB. The ADU would support and guide the small-holders who take over land developed by SLDB and would assist other independent farmers. An important aim of ADU would be to encourage self-reliance among the small-holders and small-scale private farmers by assisting them to form Farmers' Organisations to take over responsibility for supplying credit and other farming inputs and to arrange crop transport.

There would be four distinct groups of farmers with whom the ADU would deal, these are:

- (i) small-holder farmers managing land development by SLDB;
- (ii) small-holder farmers arising from Block Alienations;
- (iii) small-holder farmers on legally occupied land (Native Customary Land);
- (iv) small-scale, independently established farmers.

The principles for handling each group of farmers are different. These are discussed below.

3.2.1 Small-Holder Farmers Managing Land Developed by SLDB

As soon as any land is allocated to individual farmers they should be supported, advised and guided in the management of their holdings by the staff of the ADU. Close liaison between the ADU and the executive staff of SLDB will be necessary, especially in the early years when there will be some competition for farmers' time between rice/homestead plots and estate crops.

The oil palm, rubber and cocoa land destined for allocation to small-holders will have been planned as an integral part of the overall development and will have been worked as an

estate up to the time of its allocation. It will therefore retain its orientation to the overall plan after allocation, and the recipients of the land, having previously been the estate workers, will have learned the techniques and discipline necessary to work the land successfully. There should be little difficulty in maintaining high standards of crop husbandry, provided the participants are correctly selected and provided there are sufficient, well-trained, ADU staff available.

The terms under which crop land, houses and homestead plots would be allocated should be carefully defined but easily understood. The main principles involved should be:-

- a) that the small-holder is given security of tenure on the crop land and the house for as long as he wishes provided that:
 - he complies with certain rules designed to ensure the land and crops are not misused;
 - he continues to pay a sum specified by Government (see Supporting Report 9).
- b) Government should have the power to take the property back and re-allocate it if the above provisions are not fulfilled.
- c) Inheritance of the property should be permitted but sale should be carefully controlled.
- d) The allocation of land and houses should be recorded with the Land Registry.

3.2.2 Small-Holder Farmers Arising from Block Alienations

The system of Block Alienation is used at present by the State Government to settle groups of people on State Land who, for one reason or another, have to be moved from their present location. At present the groups are usually those who have illegally occupied land elsewhere. In future there will probably also be people who wish to move as groups from areas which can no longer support them. Therefore, this settlement system, whereby a block of land is allocated to a group of people, should be continued and it is proposed that the ADU should be responsible for handling it. However, much help will be required from SLDB. The procedure proposed is that when the need arises to settle a group of people in this way, a block of land, conveniently situated within an area planned for development by SLDB, is selected for eventual allocation to the group. The size of the block should be sufficient to provide each family in the group with a small-holding of about 16 acres (see Chapter 4). The previously explained procedure for selecting people individually from among the SLDB estate workers would not apply in these instances.

However, before moving any of the group it would be important to discuss their resettlement thoroughly with them and to make arrangements to move them by carefully planned stages.

First, a party of men, like the migrant labour parties who travel under temporary leaders for a period, should work with SLDB during the stages of land clearing and cover crop establishment. They should work as ordinary estate labour workers and need not necessarily work on the land to be allocated to the group. But, on the selected land, sites would have been chosen for a separate village and for growing rice and vegetables. After cover crop establishment responsibility for supervision of further development would be handed to the ADU and the pioneer party would start working exclusively within the allocated area. By stages, as houses are built and rice and vegetables plots are established, other members of the group would move in, and the main crops planted. During the crop establishment and maintenance period the members of the group would be paid for their work by Government through the ADU. The planting pattern should follow the diversified block system of the rest of the development area. Undoubtedly there will be variations between groups in the detailed procedures for settlement and land allocation within groups, but the overall planning should remain basically the same.

3.2.3 Small-Holder Farmers on Legally Occupied Land

It is recommended that the legally occupied areas, which are adjacent or close to State Land development schemes, should be included in them. In most cases the keys to the successful improvement of farming in such areas will be the road network and the agricultural and social infrastructures on planned State Land. Access roads, either existing or planned, passing from schemes on State Land into legally occupied areas, will provide the opportunity for the people there to participate in new farming activities and take advantage of the facilities provided. Thus it is recommended that development in legally occupied areas should initially be either as narrow bands along the roads connecting the acres with development on State Land, or as a compact area development if the location of the land is particularly favourable in relation to State Land development. The ADU should be responsible for organising and supervising this work.

The vast majority of the people in these legally occupied areas will be shifting hill rice cultivators and the land will normally be held in usufruct by an individual or by a family household. Not all cultivators in an area will necessarily have land close to the road and therefore not everyone will be able to participate in intensive development adjacent to the roads unless negotiations for a redistribution of land rights are successfully concluded before development starts.

This fact should be carefully explained to the people by Administrative Officers during the negotiations establishing the boundary between legally and illegally occupied land. In principle any redistribution of land rights among the people should be worked out between themselves. The Administrative Officers and later the ADU staff should assist implementation of any land reallocation but should take no active part in the negotiations.

Some persons may be unwilling to participate in the improvement scheme because the main aim of most shifting cultivators is to grow hill rice. Although the ultimate objective should be to eliminate this practice in its present form, diversion away from it will not, at first, generally have prior claim on the farmers' time and efforts. Any undue or arbitrary haste in attempting to introduce new forms of agriculture could meet with strong opposition. A possible way of dealing with this problem is the taungya system of establishing permanent crops. In this system, which originated in Burma, the establishment of a permanent crop (forest trees in Burma) is achieved by planting it together with an annual crop on land cleared by the farmer for that crop. The traditional cultivation of hill rice could easily be adapted to incorporate the planting of oil palms, rubber or trees. However, danger of erosion and the need to ensure early vigorous growth in the permanent crop dictate that, in most cases, only one crop of rice should be taken before a leguminous cover crop is planted. Oil palm should be planted only on suitable land within a strip about 200 yards wide on either side of the road to facilitate crop collection.

Other objectives considered essential for the success of these road based improvement schemes in legally occupied land are:-

- to improve the farming and living conditions for only those people having rights, customary or titled, to that land. In future years the improvement should be gradually extended into surrounding suitable land by constructing a network of feeder roads. This further assistance by Government may well secure the agreement of the local people to the organised settlement of migrants on surplus suitable land.
- the alignment of roads to pass close to existing longhouses or villages which are suitably located for future enlargement into rural service centres. Also the roads should be so aligned as to pass through land with agricultural potential. Some relocation of longhouses and villages as well as redistribution of land must be anticipated;
- to introduce simultaneously a complete range of development and amenity inputs, thus combining services and facilities provided by various institutions and Government Departments;
- to encourage and support farming only in specified, suitable areas reasonably close to the roads;
- to encourage a range of crops, but limited in any one area to a few selected ones which suit the particular conditions and circumstances of the area. The main enterprises should

be the same as those undertaken on nearby State Land development where processing and/or marketing facilities would be provided;

- to encourage and support wet rice production on suitable flat valley land. In areas without, or short of, such land, Government should if necessary guarantee that rice supplies will be made available as food relief;
- to provide a credit system, as opposed to subsidies as the method of providing goods and services to farmers for agricultural undertakings. Only those few enterprises particularly selected for a given area should be eligible for credit. Nevertheless farming efficiency cannot be expected to be as good as that on the more closely supervised SLDB schemes, and lower yields must be expected for oil palm, rubber and cocoa.

3.24 Independently Established Farmers

It is proposed to set aside blocks of land of moderate size for privately financed, commercial development. The location of the blocks should be such that their development will be an integral part of the overall plan. Sub-division of the blocks into individual holdings must await an assessment of the response to a Government announcement that the land will be available for private development. However, it is expected that the following types of holdings will be asked for:-

- a) small-holdings, of 15 to 20 acres in extent, that would be operated only by family labour.
- b) larger holdings, of about 20 to 50 acres, that would be operated by the family assisted by hired seasonal labour.
- c) holdings of sufficient size to require a large input of hired labour. In this category farms could vary from 50 to several hundred acres, while private estates could vary from several hundred to several thousand acres.

During allocation of land care will be needed to ensure that a holding does not consist of only flat valley land, because in such cases the range of possible farming enterprises could be severely limited. On most undulating land, assessed as suitable for agriculture, a reasonably wide range of enterprises could be undertaken. Particular care should be taken over allocation of land to farm types (a) and (b), and in some locations it may be necessary to allot two blocks of land to one farmer.

A vital criterion in the acceptance of an applicant for land in any of the above categories would be evidence of enterprise and sufficient capital, or credit-worthiness, to finance the development.

CHAPTER 4

FACTORS AFFECTING THE SIZE OF SMALL-HOLDINGS ON SLDB DEVELOPED LAND

Four main considerations apply;

- a) a family's work capacity, which will determine the actual size of holding that a family can handle;
- b) the labour input requirements of the preferred cropping pattern;
- c) the net target income, which will determine the minimum size of holding that any family should have. It is proposed that a minimum target income of \$2 500 net per year is aimed at; this includes any income earned from the homestead and rice plots;
- d) loan repayment capacity generated by the crops established on the land.

These conditions are discussed below.

4.1 THE FAMILY'S WORK CAPACITY

Flexibility in the total acreage of individual small-holdings is essential because, not only will the families of small-holders be of different sizes and therefore of different work capacities, but also their capacity will change over time. The recommendation to accommodate this is that, in addition to the homestead and rice plots, each small-holder should be allocated a plot, or plots, of the major crops so that the total labour requirement of the holding matches the estimated labour output of the family. For each crop the plot that can be allocated should be of a minimum acreage, called for convenience a module. A small-holder may be allocated one or more modules.

The size of the modules for different crops should be based on an estimate of the minimum acreage that will provide sufficient work, for most cultural operations, to justify the small-holder making a journey to a module. The approximate sizes commended are, oil palm and rubber about five acres, cocoa about four acres.

When sub-division of a block of a major crop is taking place a small-holder, depending on the family's work capacity and personal wishes, should be allocated one or more modules of one or more crops according to what is available in the vicinity of the village. In this way a balance can be struck between the work capacity of the family and the total size of

the holding. Modules would be indivisible, but when the family work capacity changes it should be offered the opportunity for acquiring or disposing of modules. It is expected that within a small-holder community a balance will be maintained between total available labour and total available acreage of major crops.

4.2 THE CASH TARGET INCOME AND REPAYMENT CAPACITY

Considerations of present and possible future income standards for average urban workers suggest that the minimum cash income target for rural families should be approximately \$2 500 per year, which should include any income earned from the homestead and rice plots. This determines the minimum total size of the holding. Production from a holding should be able to:-

- repay total development costs within a specified period (20 years is a reasonable period);
- pay interest on the outstanding amounts owing at a defined rate. (Seven per cent per annum is suggested)

The annual amounts available to cover these payments should be considered as the gross value of the production less:-

- the costs of inputs such as fertilizers, weed and pest control, processing etc.; and
- a replanting levy calculated to create over the production life of the tree crops, a fund to meet replanting costs, and
- the minimum target income of \$2 500.

The actual crops making up each holding will be determined by the cropping pattern in the area within approximately 1.5 miles of the village.

Given below are the types of holding which have been found suitable for an average family of two manpower units.

	(a) acres	(b) acres	(c) acres	(d) acres	(e) acres
Homestead	1	1	1	1	1
Rice	1	1	1	1	1
Oil Palm	9	10	11	10	9
Rubber	6	5	4	0	0
Cocoa	0	0	0	4	5
Totals	17	17	17	16	16

Farm budgets and income analysis for these farm types are prevented in Supporting Report 2 Part II. The conclusion is that in all cases the small-holdings generate the necessary repayment capacity for financial viability within the assumptions and constraints indicated above.

In Supporting Report 9 a system is described whereby the allocation of all State Land, whether to SLDB, small-holders or to independent farmers, could be on a leasehold basis. The lease-holders would be considered as tenant farmers and the State as the land owner. A Rent payable to Government could be charged for the use of the land. There could be two basic levels of Rent:

- (a) for land developed by Government, that is by SLDB;
- (b) for land developed by private persons or companies using their own capital.

The former would be the greater and Government would have the power to vary the Rent upwards or downwards for land under the major crops or enterprises. The variations would be made in accordance with world prices for those commodities with the object of stabilizing the incomes from holdings enterprise at a reasonable economic level, already stated as about \$2 500 per year per family. Tenant farmers would have the right to work the land allocated to them for as long as they wished or for so long as they are able to pay the Rent which would be adjusted to the potential earnings of an "average" farmer caring for the crops in the recommended manner. Thus a reasonable standard of husbandry would be obligatory. The farmers would have the right to pass on the management of the holding to their descendants. It will be a Government Political decision whether free-hold or lease-hold titles should be given.

(a) Rubber
The object should be to establish plantations of high yielding rubber trees on sufficient localized concentrations to warrant organizing centralized collection, processing and marketing facilities. The actual facilities to be established will depend on the market circumstances when the plantations reach bearing age. The production could be towards 100-150 tonnes of processed natural rubber or the export of smoked rubber sheets, likewise, production at the farm level could be limited around the sale of fresh latex, and dried sheets or granules (either unprocessed or banded).

CHAPTER 5

DEVELOPMENT OF SPECIFIC CROPS AND ENTERPRISES

Detailed proposals of the methods for handling individual crops and enterprises within the overall development plans are described in Part IV. Below are the most important opportunities.

5.1 MAJOR ENTERPRISES

In this category are, oil palms, rubber, cocoa and beef cattle. For all these enterprises centralised processing and organised marketing should be undertaken.

(a) Oil Palm

This would be the most important agricultural enterprise. Its development would be based on processing mills with a capacity and 60 tons per hour of fresh fruit bunches. Mills of these capacities are expected to handle planted areas of roughly 30 000 acres. The cultural and fertiliser application techniques as practised in Peninsular Malaysia and Sabah would be followed (modified as found necessary for Sarawak Conditions) and imported hybrid Dura X Pecifera seed would be used.

During the early years of bearing artificial pollination would be normal practice. The collection and use of fresh pollen would be the usual practice but periods of short supply could be expected especially in the road based schemes and on small-scale private estates where relatively small acreages might be planted. As an insurance for these occasions it is recommended that SLDB should hold supplies of dried, ready-for-use pollen, which could be sold to the ADU for distribution to, and application by, the small-holders.

(b) Rubber

The object should be to establish plantations of high yielding rubber trees in sufficient localised concentration to warrant organising centralised collection, processing and marketing facilities. The actual facilities to be established will depend on the market circumstances when the plantations reach tapping age. The production could be towards factory-processed palletised crumb rubber or the export of smoked ribbed sheets. Likewise, production at the farm level could be organised around the sale of fresh latex, sun dried sheets or coagulum (either polybag or bucket lump).

(c) Cocoa

It is recommended that cocoa planting should at first be restricted to reasonably large blocks in order to facilitate management and the control of damage from squirrels and rats. Only the most suitable sites for cocoa should be chosen, and each block should not be less than 100 acres in SLDB developed areas and 20 acres in legally occupied land. Proved hybrid varieties should be planted.

(d) Beef Cattle

The climate of the Study Area is favourable for year round growth of forage and much of the terrain suitable for beef cattle rearing. However, because local research and knowledge of cattle rearing and pasture management expertise are limited, beef cattle development should be restricted initially to the establishment of a breeding ranch using an imported herd of about 2 300 Brahman - cross in-calf heifers together with the necessary pure-bred Brahman bulls for repeat breeding. The objective would be to create the foundation of a future stratified beef industry in Sarawak. The National Livestock Corporation should be responsible for this undertaking (possibly with assistance from a commercially orientated expatriate organisation such as CDC) and for the setting-up of marketing and processing facilities. The herd will be managed in accordance with recognised commercial standards of animal husbandry, but cannot be expected to make high direct monetary profit. The benefits would become apparent when the offspring are distributed to future producers and breeders.

The Sarawak Department of Agriculture plans to support this development by the establishment of a Livestock Production and Animal Husbandry Training Centre adjacent to the proposed ranch. Besides solving practical husbandry problems encountered on the ranch the Station should undertake work dealing with:

- (a) the rearing and fattening of steers from the ranch on nearby estates, farms and small-holdings;
- (b) training of Government staff and farmers in practical animal husbandry;
- (c) encouragement of water buffalo rearing in areas unsuitable for beef cattle.

5.2 MINOR ENTERPRISES

In this category are the raising of pigs and poultry, the pond culture of fish, and the growing of rice, pepper, fruit, vegetables etc. Generally, but not always, the processing and marketing of produce from these enterprises should be left to

the producers themselves. This recommendation is made because it is considered socially necessary and desirable for each family to have some private means with which to secure personal loans with private merchants. The necessity for continuing this present widespread credit system is stressed by the Sociologists following their investigations in the Study Area. (See Supporting Report 4)

(a) Pigs and Poultry

These two enterprises will develop sufficiently under private enterprise to supply local demand. Support from Government is recommended to continue as at present.

(b) Pond Culture of Fish

There are considerable possibilities for the expansion of Chinese carp production and the creation of a Taiwan turtle raising industry. It is recommended that assistance from Government for both these enterprises is mainly concentrated reasonably close to the major population centres.

(c) Rice

In the Study Area most of the land suitable for development to rice production is in irregularly shaped, relatively narrow, long valleys. It is recommended that only swamp rice growing should be encouraged and supported in the development areas, except in legally occupied land where hill rice cultivation could be used to establish oil palm or rubber plantations.

In the development areas flat valley land should be selected close to the future villages and towns for development to swamp rice production, sufficient to allocate about one acre of such land to each participating family. On small areas (up to 300 acres) the clearing, draining and levelling should be undertaken by SLDB as part of the overall land development process. For the development of larger contiguous blocks of suitable rice land the Government's present practice should be followed whereby such work is undertaken by the Drainage and Irrigation Department.

In both cases the works should aim at creating rice areas on which land flooding can be controlled and preparation for planting can be done mechanically. Double cropping of rice, which requires irrigation, should not generally be an immediate objective although it might later be an important development. But the possibility of off-season cropping of other short term crops should not be overlooked. Progress along these proposed lines is expected to make the developed areas at least self-sufficient in rice, thus helping to achieve the Government's intention, recently announced, of making Sarawak a net exporter of rice.

(d) Pepper

This is not considered a major enterprise for the development areas, but is seen as an important subsidiary crop for small-holder farmers. Small patches of up to half an acre in size should be encouraged in the homestead plots within the villages. Centralised processing for the production of white pepper should be considered at convenient places. If this is arranged then the marketing too must be organised, but generally the drying and marketing of black pepper should be left to the producers themselves.

(e) Fruit and Vegetables

Production of these should be encouraged on the homestead plots. However, in most villages there will be little scope for sale of the produce because almost everybody will have planted the same crops. In these areas therefore fruit and vegetables should be considered as subsistence crops but close to Miri, Bintulu and other large population centres, there will be a large consumer demand and market gardening should be encouraged as commercial enterprises.

(f) Other Minor Crops

Considered in this group are such crops as lemon grass, citronella grass, patchouli, turmeric, ginger, annatto, nutmegs, cloves, chillies etc. These crops are unsuitable for large scale production because of the fluctuating and uncertain markets for high labour requirements, particularly for the annual crops. Nevertheless they are suitable for homestead plots and, even on a small scale, they could provide a valuable addition to a small-holders income. For all of them the processing required is very simple, but to make marketing worthwhile a concentration of the crop is needed. It is therefore recommended that one, or at the most two, of these crops be concentrated in selected villages. For example: ginger in one village, turmeric in another, lemon grass in yet another and perhaps annatto in all three. Each householder should grow only a small patch of the appropriate crop, but in the village as a whole there would be sufficient production to warrant organising of central processing and marketing facilities.

