

# Evaluation Report 2.81

Norwegian church aid  
— Sudan programme —



NORWEGIAN CHURCH AID

- SUDAN PROGRAMME -

EVALUATION REPORT

NORWEGIAN AGENCY FOR INTERNATIONAL DEVELOPMENT

EVALUATION REPORT NO. 2, 1981



NORWEGIAN CHURCH AID/SUDAN PROGRAMME

EVALUATION REPORT

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## SUMMARY OF MAIN ARGUMENT

- On balance the way the NCA/SP has used the Funds made available from NORAD has contributed to relieve important bottlenecks for development of Eastern Equatoria.
- These improvements are, however, not sufficient to bring about self-sustained development in Eastern Equatoria.
- Improvement of the existing farming systems with increased crop commercialisation is necessary in order to make use of the NCA constructed infrastructure and provide a development momentum which can generate funds to its maintenance and further expansion.
- Transformation of a society based on subsistence production to a society oriented towards the market is a process which is complex and longterm, which is not subject to control in the same way as construction of physical infrastructures, and which has incremental consequences and not spectacular results like roads, buildings etc.
- It is thus not likely that the investments undertaken so far will be made efficient use of, nor adequately maintained without a comprehensive effort towards transformation of the agricultural sector.
- The means of the Sudan Government to undertake such effort is extremely limited.
- Because of the efforts of the NCA Programme, people in the Southern Region look at Eastern Equatoria as a specially favoured Province, and there is consequently strong pressure on political leaders to direct available funds from other sources to other areas. Unless NCA make a continued effort in the rural sector in Eastern Equatoria it is thus unlikely that such an effort will be undertaken at all.
- A basic issue which has to be confronted when decision about continuation of the NCA/SP is taken, is whether to continue the present multisector approach dominated by relatively independent organisation and delivery of specific concrete facilities, or whether to put the emphasis on the more difficult task of "delivery" of "rural development" and integrate the various inputs in relation to judgements about their importance in relieving constraints for such development.

- A strategy based on an integrated rural development approach implies reorientation of priorities towards increased emphasis on agriculture.
- The Mission favours this strategy and recommends that its first phase should consist of a comprehensive landuse survey covering the natural resource basis, the existing production systems, and the relevant market conditions. This should increase the chances of undertaking relevant activities on the Rural Development Centers as well as establishment of other viable activities, like mechanised schemes and agro-industries.
- Since the secondary consequences of programmes directed towards rural development may not only be undesirable but are also essentially unpredictable, a simple socio-economic monitoring component ought to be built into the programme, in order to provide information feedback allowing the programme to take appropriate action at an early stage.
- Monitoring can however only be of use if the programme is organised in such a way that information feedback matters to the performance of programme personnel, and that it has the flexibility to adapt to information on changing circumstances.
- Another prerequisite for success of such an approach is continuity of institution building around peoples' participation in planning, decision making and implementation. Given the cultural gap between the programme personnel and the majority of the population a continuous exploration of possibilities for development of such institutional links is a sine qua non for grassroot mobilisation.



## 1. INTRODUCTION

### 1.1. The Evaluation Mission

This is the report of a mission appointed by NORAD to evaluate the development activities undertaken by the Norwegian Church Aid in the Southern Sudan. The Agreement between the Norwegian Church Aid/Sudan Programme (NCA/SP) and NORAD started in January 1975 for an initial four year period. It was subsequently revised in December 1978 for a further four years, expiring at the end of 1982.

The evaluation mission carried out its work between 20 January and 10 February 1981: that is six years after the initial agreement and in mid-term of the second agreement.

The tasks of the mission (as included in NORAD's Terms of Reference) are set out in Appendix I. In addition to providing a general assessment of the activities and achievements of the Programme to date, and a specific assessment of major programme components, NORAD asked the mission to review existing plans for the continuation of the Programme and to indicate its view on possible changes in priorities in the future direction of the Programme.

The work of the mission was undertaken by four people. (A fifth person appointed by NORAD, Farah Hassan Adam of the Faculty of Agriculture, University of Khartoum, was unable to join the mission.) The mission team consisted of

Gunnar Haaland (Department of Social Anthropology, University of Bergen: team leader),

John Howell (Agricultural Administration Unit, Overseas Development Institute, London),

Eivind Vollset (Vegkontoret, Møre og Romsdal)

Arne Sunde (Helsedirektoratets Kontinentalsokkelkontor, Stavanger).

In the course of its work the team visited most parts of the Programme area in Kapoeta and Torit Districts where there were NCA/SP activities.

The team also interviewed Southern Regional Government officials at various levels, Programme staff, expatriate advisors, Ministers, M.P.s, Chiefs, and a wide range of people living and working in the Programme area. There was an exceptionally high degree of support given to the mission by NCA staff and officials of the Regional Government. Any deficiencies in information in this Report or any inadequacies of judgement cannot be attributed to lack of co-operation from either Government or NCA. On the contrary, their advice and candour have been invaluable to the Mission.

## 1.2. Structure of the Report

There are four main objectives of this report:

- (i) to assess - in broad terms - the contribution of NCA/SP to the development of the Programme Area, particularly in the context of the Programme's stated objectives of an 'integrated' approach to rural development;
- (ii) to evaluate the performance of particular Programme components and to examine the priorities for a continuation of each of these components, their contribution to the Programme as a whole, and any changes in the direction of such components,
- (iii) to examine specific issues raised by NORAD concerning the relationship between the Regional Government and NCA/SP, the training of staff and localisation of posts, and the role of women in the Programme; and to consider specific issues raised by Southern Regional government officials concerning the geographical spread of the Programme and the organisation of agricultural research;
- (iv) to consider alternative development priorities for the future of the Programme and to assess their likely resource requirements and implications for the organisation of the Programme.

The following section examines the issues raised in evaluating the overall contribution of NCA/SP to development and criteria against which future priorities should be measured. It also discusses in

more detail some of the issues raised in (ii) above. Section 3 examines Development Prospects in Eastern Equatoria, particularly the environment and human adaptations to it, constraints to development, the structure of administration and government policies and priorities. Section 4 consists of a series of short evaluation reports on different projects within the NCA/SP (see Objective iii). Section 5 presents the views of the mission on the general achievements of the Programme (see Objective i), on specific issues raised for the mission (see Objective iii), and on future development alternatives (see Objective iv) and their implications.

## 2. EVALUATION ISSUES

### 2.1. Objectives and Achievements

The conditions under which the Programme started are an important consideration in identifying objectives and assessing achievements. The civil war had been particularly destructive in Eastern Equatoria and even after the settlement of the conflict, the stability of the area was not easily assured. There were, therefore, a number of short-term priorities which gave the Programme an emergency relief character rather than a long-term development planning character. In particular NCA/SP objectives included the rehabilitation of roads, bridges, and buildings and the relief of hunger in food deficit areas. Furthermore, the provision of water supply facilities and the contribution to health care were, in part, a response to the need to build confidence in the settlement and thereby establish conditions for political stability.

In the event, these have not been temporary concerns. In the Programme period there have been serious crop failures leading to demands for emergency food relief; the closure of the Ugandan border meant that rehabilitation of the trunk road to Kenya required priority attention. As a consequence, the Programme tends to have a dual perspective. On the one hand its specific "objectives" are based on relatively short-term considerations (eg. sinking wells in villages deficient in water, repairing school-buildings in places of high demand). On the other hand, it has rural development objectives which are much longer-term in nature (eg. "self-sufficiency in food crops, adequate supply of diet-improving crops, a surplus of agricultural produce for marketing" (Programme Report no. 10).

There is no conflict between these short-term objectives and longer-term development objectives. Virtually every activity which has been undertaken can, in some way, be said to contribute to the long-term objective of improving the production, incomes and living standards of people in the area. The important question however is whether particular objectives in different sectors add up to coherent strategy for meeting the (admittedly broad) over-riding objective of sustained development based on increased rural production. And a secondary question is whether the particular objectives (and thus priorities) represent an effective utilization

of resources given the wide range of measures that need to be undertaken to improve living standards.

## 2.2. 'Localisation'

The relationship between NCA/SP and (a) the Regional Government, (b) Sudanese staff, and (c) local people is an important area of enquiry for the mission. From the outset the Programme was envisaged as providing the basic services and investment which Government itself would undertake if it had the resources. In some respects, NCA/SP has acted as a substitute for the Regional Government in Torit and Kapoeta. The mission saw four main issues requiring discussion. Firstly, there is the issue of ensuring consistency between NCA/SP activities and Government priorities and resources, particularly the extent to which the level of services and investment undertaken by NCA/SP can be sustained in the long term. The second issue concerns the process whereby NCA/SP can be administratively integrated into the daily functioning of government where the special conditions of the Programme organisation (swift access to foreign currency, financial and personnel autonomy etc.) will not longer apply. A third issue concerns the ways that NCA/SP has responded to these administrative problems by the training of Sudanese staff and by the localisation of posts within the Programme.

Fourthly, there is the issue of 'participation' of which much is made in the 'basic principles' of the Agreement. Participation is the process whereby local people become increasingly involved in the planning and execution of these programmes which effect their livelihoods. It is a large issue for the mission to consider and it goes beyond the particular work of NCA/SP. Nonetheless, the mission has attempted to discuss the ways that the Programme has encouraged procedures and institutions for the greater involvement of local people in maintaining services and generally running their own affairs.

## 2.3. Priorities

In undertaking an evaluation of past performance of NCA/SP, the mission has attempted to identify further priorities for the Programme. There are several factors to be taken into account, and they can be categorised broadly into 'resource' factors and 'needs' factors. The mission has not dealt

in detail with financial resources, making no assumptions about the level of future NCA/NORAD/Sudan Government investment in the area. But the mission has considered the implications, within the present levels of expenditure, of intensifying efforts (in Agriculture for example) and of maintaining the existing level of infrastructural investment (in further road-building for example and in rural water supply).

The Mission has also investigated NCA itself as a resource, considering the sorts of activities where NCA is a more efficient than any other agency (government, voluntary or foreign) and where it does not have any comparative advantage over others.

The Mission has spent considerable time on attempting to identify needs. In this context we consider ability to maintain an adequate intake of food throughout the individuals' lifetime to be one basic need. The other basic need is ability to cope with diseases.

#### 2.3.1 Food Supplies

Natural conditions like droughts and erratic distribution of rainfall, and plant and animal diseases periodically incur great reductions in agricultural and pastoral production. Traditional social institutions of mutual support give the individual households a certain resilience in tackling such contingencies when they are short term. However, when several disasters occur at the same time (like the drought and east coast fever in Didinga area), or over longer periods, the existing systems of production and distribution are grossly inadequate to maintain a sufficient supply of agricultural and pastoral products for the producers' own consumption and to the urban markets. Hunger is endemic to Eastern Equatoria. Reliable quantitative experiences with which NORAD could compare the food needs of Eastern Equatoria with the needs in other parts of the world do not exist, but the continuous food relief operations can be seen as manifestations of the gap between food produced and food required in the region.

#### 2.3.2. Health Conditions

The health conditions of a population reflect several conditions: (a) the ability of the regional production system to supply goods required to maintain an adequate diet (quantity and quality) for its population;

(b) the population's knowledge about how to practice preventive health care; (c) the population's ability to practice preventive health care, e.g. access to clean water facilities and the financial and organizational means to maintain such facilities; and (d) the types of diseases the population is exposed to and the facilities for treatment of such diseases.

Although quantitative expressions of the health situation are inadequate, our evidence clearly indicates great shortcomings with reference for all these conditions.

### 2.3.3. Rural Development

Food supply and health care are not only basic needs, they are also important conditions for self-sustaining development. The Mission accepts the broad goal (shared by the Sudan Government, NORAD and NCA) of attempting to improve the living standards of all people in the area through increasing smallholder crop and livestock production and the promotion of rural commerce and industry. The question is what particular interventions are necessary to promote these objectives. For example, obviously education is important to rural development but what sort of education (adult literacy, primary schools?) should have priority and what is the relative priority of education against for example feeder roads or crop research? These are almost impossible questions to answer with any certainty, but in development planning some sorts of judgements have to be made.

'Integrated rural development' - a term frequently used in the NCA/SP - is not simply undertaking several activities simultaneously. As the Mission sees it, integrated rural development is based on identification of the important constraints determining the nature of rural production systems, and on implementation of measures directed towards remaining constraints in a way which allows the rural economy to move in a direction consistent with specific development objectives (i.e. food self-sufficiency, marketed surpluses etc.). In a region like Eastern Equatoria the great variety of rural production systems requires a programme which is flexible enough to adapt its inputs to local variations in constraints and opportunities. Furthermore, a programme aiming at transforming societies based on subsistence oriented production to societies based on market oriented production,

has to realize that the complexity of the processes which are set in motion by change of some constraints are likely to produce unintended and often undesirable consequences. Consequently, the adequacy of the Programme's organization is significantly dependent on its capacity to identify new bottlenecks emerging as others are relieved, and also on its flexibility to direct efforts towards these bottlenecks.

To what extent a rural development programme is integrated thus depends on the nature of its interaction with the environment. The question of how adequately the NCA/SP has deployed its resources will therefore not only be discussed with reference to the achievements of separate projects, and their inter-relationship with each other, but also in relation to relevant features in the Programme's environment. (See Section 3.)

#### 2.3.4. Regional Needs

A further issue, which several government ministers and officials raised with the team, were the needs of other areas beyond Torit and Kapoeta. The team was unable to investigate these demands fully but it has attempted to find out if, in fact, Kapoeta and Torit are unusually favoured areas in term of investment. It has also considered the sorts of activities that NCA/SP could undertake outside the present Programme area without impairing the efficiency of the present operations and without undermining the prospects for consolidating the investment already undertaken.

#### 2.4. Summary

This section has indicated the main issues that have occupied the minds of the evaluation team. They are:

- (a) the performance and achievement of specific NCA/SP objectives set against the longer-term objectives of the Programme;
- (b) the progress made towards the ultimate transfer of responsibility for NCA/SP development activities to the people and Government of the area;
- (c) the requirements for the meeting of the basic needs and the sustained



development of the economy of the area and the contribution that NCA/SP is best able to make towards it.

The team's findings on these issues are presented in section 5.

### 3. DEVELOPMENT IN EASTERN EQUATORIA

In order to attempt an answer to the questions the Mission was confronted with, it is necessary to place the NCA/SP in the context of the environment it operates within. This environment has several dimensions:

- the natural resource basis in the programme area
- the existing human adaptations to these resources
- the market system connecting local production to outside supply and demand forces
- the regional and national politico-administrative system with its policies and resources.

Basically the NCA/SP aims at achieving a change in its environment of existing human adaptations. These adaptations have evolved over a long historical process of innovation and borrowing, and it is reasonable to assume that they have developed a certain adequacy in terms of coping with contingencies caused by difficult natural conditions (erratic rainfall, plant-, animal-, and human diseases etc.) in one of the most isolated areas in Africa. Shortcomings in these adaptations are, however, evident in the death-toll when natural disturbances of larger scale occur. As local populations are drawn into the politico-economic framework of the wider region and nation these inadequacies are further accentuated. When evaluating the overall achievements of the NCA/SP the Mission will pay attention to the effects it has had in changing conditions which have improved local human adaptations.

#### 3.1. Physical Environment

Sufficient data on the natural environment is still lacking. However, the limited information available shows that Eastern Equatoria is not a homogeneous region. The influence of various environmental factors produces here a complicated mosaic of ecosystems. Map 1 indicates the main subdivisions within the programme area.

##### 3.1.1. Flood region

This subdivision covers the northern part of the programme area. The lack of slope (rarely exceeding 10 cm/km), the heavy impermeable soils,

a relatively high rainfall (800-1000 mm) and a drainage system which is insufficient to carry large accumulations of water, means that large parts of this area are exposed to flooding and waterlogging during rainy seasons. This has meant limited agricultural utilisation of the area, although the clays and heavy loams which cover the major part probably constitute the most fertile soils in the Sudan. The annual discharge of the northward flowing rivers (Kinyetti, Koss, Kidepo, Singaita and Lokalyam) and from Kurun draining the Ethiopian escarpment has been estimated to 1.5 milliards. Except for Lokalyam and Kurun which are drained by the River Kengen to Pibor, the other rivers fan out onto the plain and all trace of their channels is soon lost. On Map 4 names of rivers and other geographical features are shown.

### 3.1.2. Central hills

This subdivision is located in the western part of the programme area along the Nile. Rainfall around 1000 mm and the undulating topography have exposed the area to erosion resulting in shallow lateritic and skeletal soils. The soils of this area are generally acid, and with the exception of a few eroded soils contain little organic material. Their fertility is limited by shallow depth, low water holding capacity and low nutrient status.

### 3.1.3. The Green Belt

This consists of an area around the Acholi Mountain. Rainfall is heavy (1,350 - 1,600 mm) and extends over 8 to 9 months. The soils are laterite and can from an agricultural point of view be classified into shallow and deep soils. The higher rainfall is reflected in a higher organic matter content in these soils. The fertility of these soils depends on their depth and on the extent of erosion of the surface layer, in which soil nutrients accumulate under fallow. These deeper and better developed soils are of great importance agriculturally.

### 3.1.4. South Eastern Hills and Mountains

This covers the rest of the programme area. It is an extremely heterogeneous area and falls into the following subdivisions:

High altitude areas (above 1500 mm)

Mean annual rainfall ranges from 1100 mm in the Didinga mountains to

2200 mm in Imatongs with rainy seasons from 7 to 9 months. Soils are very variable, but may be classed as deep loams and shallow skeletal soils.

#### Lower mountain slopes and hills

Mean annual rainfall is between 750 and 1200 mm. The soils are either skeletal or formed on the detritus material of lower slopes. Depth is probably the most important factor in determining their fertility, but their nutrient status is generally poor. Vegetation is much affected by cultivation and grazing practices and erosion has in some places reached an advanced stage.

#### South Eastern plain

The mean annual rainfall is below 700 mm. Very little is known about the soils. Vegetation consists of thorny scrubs and open grassland composed of short perennial grasses and some taller perennials.

The various ecological subdivisions which are briefly sketched here obviously pose different limitations and opportunities for human adaptations. A natural constraint of great importance for human adaptations crosscut this classification. This is the distribution of tse-tse flies. Map 2 gives a rough indication of its wet season distribution.

### 3.2. Human Adaptation

If the natural environment exhibits a complex pattern so does the system of human adaptations which have evolved in the programme area. It does in fact constitute a mosaic of different ethnic groups, with different origins, different languages, different rules and values regulating interpersonal behaviour, and different techniques of exploiting natural resources.

To a certain extent the geographical distribution of the different ethnic groups correlates with the ecological subdivisions. These subdivisions constitute different constraints and opportunities for human adaptation and the different groups have consequently developed different organisational techniques of coping with these constraints. The main groups are distributed on the subdivisions as follows:

Lokoro (Pari)	-	Floodplain
Madi	-	Central Hills
Acholi	-	The Green Belt
Latuka	-	Lower Mountain Slopes and Hills
Lakoya	-	" " " " "
Loluba	-	" " " " "
Bari	-	" " " " "
Didinga	-	" " " " "
Boya	-	" " and South Eastern Plain
Topotha	-	South Eastern Plain and Flood Plain

Among these groups the Topotha are primarily pastoralists, the Acholi and Madi are cultivators, while the others may be described as agro-pastoralists with cultivation as the dominant activity. These groups may be divided in two main categories according to the pervasiveness of traditional institutions regulating rights and obligations among their members. The institutional forms of different groups have emerged as techniques in adaptation to different natural conditions in a situation of limited governmental control and limited trade. Given communal agricultural land and free pasture the most important form of wealth which can be accumulated is livestock. Consequently there has been strong competition for areas suitable for animal husbandry. These areas are, however, also most exposed to droughts. Groups practising a specialised pastoralism or an agro-pastoral economy have developed forms of organisation primarily based on age grades and descent groups. For the individual household these institutions imply support and insurance both against the risks imposed by nature and risks imposed by competing groups. Groups relying completely on agriculture (Acholi & Madi) are generally in areas of higher rainfall unsuitable for animal husbandry. They are less exposed both to the risks of natural contingencies and risks from competing groups. Consequently there has not been the same pressure to develop complex institutions of the type found in the first category. In a situation with increasing governmental control and increased opportunities for trade, individual household among the pure agricultural groups are thus less constrained by reciprocal commitments to fellow members in their economic management. The Acholi and the Madi have therefore responded much more rapidly to new economic and technological opportunities. A strategy for improving the existing human adaptations thus has to be different for the different groups.

Since the NCA/SP Programme aims at involving the rural population not by imposing "development" from above but responding with support to problems they are confronting, the chances of success are largely increased if this response is based on understanding of the existing social organisation, and of awareness of the fact that people attach strong values and sentiments to the rules and regulations underlying this organisation. (For further detail, see Appendix 2. Human Adaptation.)

### 3.3. Trade and Markets

There is very little local specialisation and division of labour among the local groups in Eastern Equatoria. Consequently the scale of trading has been very limited. The growth of administrative centres (especially Torit and Kapoeta) has created some demand for agricultural and pastoral products as well as for imported goods. The farmers' demand for imported goods has been limited and mainly consists of salt, sugar and textiles. Consistent with the basically subsistence oriented local economy the market system in Eastern Equatoria is also poorly developed. The majority of the traders originate from a few small villages in Northern Sudan; Keli near Shendi on the Western bank of the main Nile and Um Dom on the Blue Nile. Two trading pioneers (one from Keli and one from Um Dom) arrived in Eastern Equatoria sometime around 1920-30 and started small-scale petty trading, selling imported goods like beads and buying agricultural and pastoral products. The profit made was channelled into expansion of the enterprises; trading in a greater variety of products and covering larger market areas.

Such expansion had to tackle a variety of constraints:

- the great distance and difficult means of transport separating sources of supply and demand;
- the multitude of small and scattered households the traders have to absorb supply from and deliver goods to;
- the limited buying power of households are expended on small quantities of a wide variety of different goods;
- limited information about the market situation requiring a significant bargaining time in order to negotiate transactions;
- seasonality of supply and demand.

Expansion of trading enterprise within these constraints required a division of functions between a larger number of employees. The critical problem in such expansion is control of the employees performance. The favoured solution among the Jellaba is to bring in relatives or neighbours from their home areas over whom they can exercise extra commercial sanctions. Such agents were usually hired on a share basis, with one share of the profit to capital (i.e. the trader), and one share to labour (i.e. the employee or agent). These shares could be 50-50, but frequently a larger share goes to capital. Such a system implied incentives to good performance of the agent, it also gave the trader some control over his agent; if the agent performed according to the trader's satisfaction, the trader might delegate more trading capital to his agent and thus increase the scale of his operations and thereby his profit.

However, the goal of the agent is to establish himself as an independent trader. Consequently there has been a long process whereby successful agents have broken off from the trading patron and established independent enterprises. At the same time as there is an influx of new personnel as juniors in the trading enterprises, there is also a small outflow of successful traders who invest their capital in the north, who transfer responsibility of their southern enterprises to their sons, or sell them. Today most of the larger shops in Torit are owned by merchants living in Keli and Um Dom, and are run by their representatives.

A critical problem for these enterprises is supply of market goods. Transport from factories or from the import port is long and requires several reloadings. Delays in this transport is not only critical because capital does not work during this time, but the risk of deterioration of the quality of the goods is also important. For any trading enterprise operating in the south, it is thus essential that there is somebody who looks after the goods at various stages in the transport. Frequently this is done on an informal basis, the trader having friends or relatives engaged in trade or other activities in different places along the transport network. These people make sure that the goods are passed on rapidly. Often this is done on an expectation of reciprocal services. The important thing is that these very important services may carry very small economic costs. This is another aspect which makes it very difficult for a formal enterprise to compete.

On the lowest level in the retailing sector in the South one finds the village traders. They are usually natives from the region and buy their goods from the Jellaba traders. Some of them rely on supply of market goods from specific traders and some are even granted credit.

Given the constraints confronting trading enterprises the Jellaba system represents a remarkably efficient adaptation; within the family there is a systematic training of the children for skills required in marketing and socialization to a strong motivation for such activities, and through the scattered distribution of relatives in similar trading enterprises they can draw on assistance in the critical task of getting goods to pass bottlenecks in the transport system with hardly any monetary costs. The profit of the trader obviously depends on the quantity of goods he manages to sell and the profit margin per unit. Given the periodic shortages following from bottlenecks in the transport system or from general supply shortages in the Sudan economy it is also fairly obvious that traders will increase the profit margin per unit as soon as they get information about such shortages. Since the quantities they can transact within a time period are fairly fixed, it would be irrational to sell them out quickly for a low price. Instead of blaming such periodic price raises on the merchants, it should rather be blamed on the external conditions creating shortages.

### 3.4. Government and Administration

#### 3.4.1. Regional Government

The Southern Sudan Regional Government has twelve ministerial portfolios: Regional Administration; Police and Prisons; Agriculture and Natural Resources; Finance and Planning; Education; Communications; Industry and Mining; Housing; Health; Public Service; Co-operatives and Rural Development; Information; and Wildlife and Tourism. Much of the day-to-day work of the ministries now formally comes under the administrative authority of the six Province Councils with the former provincial level officers (of Health, Agriculture etc.) now designated Assistant Commissioners. In practice the regional ministries are still the main influence, particularly as they are largely responsible for any new expenditures, transfers, technical direction etc.



The term 'districts' is still widely used for the tier below the province, but in terms of administrative authority, the lower tier is in fact the rural (or town) council area which in turn administers several chiefs' and sub-chiefs' court areas. Local taxes are collected through the chiefs and this revenue is added to the small amounts warranted to the councils for administration, public health, road repairs, market administration, rest houses, wateryards etc. The councils within Kapoeta and Torit 'districts' are Torit, Chukudum, Ikotos, Magwi, and Kapoeta. Torit, with Assistant Commissioner rank, is the most important council; followed by Kapoeta (Local Government Inspector), Chukudum (Asst. L.G.I.) and Ikotos and Magwi (Executive Officers).

For NCA/SP the issue of transferring responsibilities to local governments involves both regional ministries and local councils. Road and well repairs are local council matters, but health, agriculture and co-operatives are primarily matters for the regional-level ministries.

#### 3.4.2. Local Councils

Province administration do not yet have any planning officers, so the province budget is simply an amalgam of ministry budgets. Salaries come from the province budget, so do vehicle repairs etc. There is no system of district administration, but the various sector ministries have their staff, in formal terms, seconded to the province and working at various sub-province centres. The main ones are M.T.D. (Transport), Health, Education, Agriculture, Animal Production, Housing, Rural Water. M.T.D. and Rural Water have general responsibility - in theory at least - for overseeing the work of the rural councils who have a statutory obligation to maintain roads and wells. The councils require a grant-in-aid from the Province Council and also receive taxes from residents through collection by the chiefs and sub-chiefs. They also have other minor sources of revenue from commercial vehicles and markets.

The Councils in Eastern Equatoria are very weak, in fact, with virtually all expenditure covering the salaries of the small numbers of book-keepers, cashiers, market clerks, drivers, messengers, foremen of works etc. in General Administration and the even smaller numbers in Public Health and Native Administration.

### 3.4.3. Ministry of Agriculture and Natural Resources

The Ministry has five 'departments': Agriculture, Animal Resources, Forestry, Planning, and the PDU (Project Development Unit). The PDU is largely funded from external sources (IBRD/IFAD/ODA) and is the largest component of the Regional Smallholder Agricultural Development Programme (RSADP). It works largely in Yei and Yambio Districts and is planning to operate in Gogrial and Tonj also. The Ministry has asked NCA/SP if they could take over the work of the PDU experimental officers in Kapoeta and Torit. This is discussed in Section 5.

### 3.4.4. Health Services

The overall responsibility of health care delivery at all levels rests with the National Ministry of Health in Khartoum. That Ministry is responsible for formulating the national policies on health care, within the framework of the national development plan.

The Regional Ministry of Health in Juba is responsible for implementation at regional level. This Ministry is headed by the Regional Minister of Health, assisted professionally by the Regional Director of Health Services.

The administration of the Regional Ministry has recently been rearranged by appointment of Directors heading distinct sections of the Ministry. Also directly under the Director General are the Assistant Commissioners of Health at Provincial level, of which there are 5, being responsible for all health services in the Provinces, but advised and directed by the Regional Director.

Due to the recent reorganisation of the administrative set up of the Ministry of Health, no official organisational chart exists, but the structure is discussed in Appendix 4 which describes the different levels of health administration at the province and below.

### 3.4.5. Manpower

Trained manpower, especially in the technical and professional areas, remains a major constraint to development. The Six-Year Development Plan 1978-83 was cut by around 75% in 1980 and the budgets for various

training centres were seriously curtailed. Well over 50% of the posts in administrative, professional, sub-professional, technical, and clerical grades remain unfilled. Training centres which have been established suffer from shortages of trainers and in-service training has not been widely established in the ministries. UN agencies are now putting considerable emphasis upon manpower development, as are various voluntary agencies. But the growth of the public sector is such that for many years it seems that the region will be deficient in skilled manpower, particularly in the fields of agriculture and health.

#### 3.4.6. Education

The system of formal education<sup>1)</sup> in Southern Sudan place a dominant emphasis on promotion - lower levels serving to filter through the pupils who can continue to the higher levels. Primary schools are divided into three categories: "Government", "Government Aided" and "Self Help" schools. "Government schools" have their finances handled through the Ministry of Education through the provincial councils, the "Government aided" schools are self-help schools having at least one teacher paid by the government, and the "Self Help" schools are controlled by local parents councils (or private individuals or bodies) independent of government financial aid. About 45% of the schools in Eastern Equatoria are Government schools and they offer about 65% of student places. It is rather difficult to estimate how large percentage of the 7-12 year age group are attending Government schools (the non-Government schools do not have the full six grades). On the basis of the census from 1973, a figure of 35% enrollment has been calculated, but this is probably over-estimated if it is true that the census numbers fall short of the actual population. The proportion of male to female students is approximately 2:1 (except Kapoeta District and Juban Town where the percentages of female students are 14:2 and 43:6 respectively). 55% of the teachers in Government schools are trained while the percentage for non-Government schools is 22%.

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1) Based on information from Education Statistics 1978-79. Regional Ministry of Education & Guidance, Southern Sudan.

After completing six years of primary education, the next level is Junior Secondary Schools where the students may study for a minimum of three years. In Eastern Equatoria there are 22 Junior Secondary Schools (7 in Juba Town, 6 in Torit, 4 in Yei, 3 in Juba Rural, 1 in Kajo Kaji and 1 in Kapoeta). These schools can cater for 3,000 places in J.S.1 out of a total number of about 5000 of P.6 leavers. The proportion of male to female students is about 3:1. Only 41% of the teachers are trained to teach at all.

Senior Secondary School is the last level in the educational system. These schools are controlled from the Regional Headquarters in Juba. There are two categories of senior secondary schools: Senior Academic and Senior Technical. The study period in Academic schools is three years and in Technical schools four years. There are four senior secondary schools in Eastern Equatoria (Loka Boys and Juba Girls are Academic, and Juba Commercial and Torit Boys are Technical). The first year intake for the schools in 1978/79 was 840 out of 6,937 school-leavers from J.S.3. The percentage of female students is 29%. About 71% of the trained staff is considered trained teachers.

The whole organisation of the system prompts the student to move up through the system to the top. The curriculum on various levels is a preparation to the next higher level and except for the Technical Secondary Schools the different levels are not considered terminal. Education is thus seen as the road which takes the successful pupil from the traditional agricultural sector to the modern non-agricultural sector. The schooling system does thus have very limited effects on improvements of the existing agricultural systems. Pupils who leave the school system at lower levels have learned little which is relevant for improved performance of agricultural tasks, and the activities of those who move to the top of the educational system have so far had little feedback serving to relieve constraints facing the farmers. At the same time as education so far has had few positive effects on rural production it is a rather costly undertaking. For the fiscal year 1980-81 education (Primary & Junior Secondary) takes about 42% of the total budget for Eastern Equatoria.

### 3.5. Regional Development Expenditure

There are three main sources of expenditure in the Region. Firstly, there is the recurrent budget which covers the cost of established services, of which salaries are a major part. In FY 1980-81, the Region's budget was NOK 420 m (of which NOK 280 m comes from the central government and NOK 140 m from the Region's revenues). This appears to be evenly distributed, although Regional Ministry expenditure in Juba is inevitably very high. A major school and clinic building programme in one area increases recurrent costs substantially, but this has not happened in Kapoeta and Torit districts. Furthermore, the use of NCA/SP to pay its local employees has reduced the need for the Regional Government to meet costs of unclassified staff in the area.

Secondly, there are the regional and provincial development budgets which are formulated against a Three-Year Socio-Economic Plan (1980-83). As a matter of policy, E. Equatoria Province has received only NOK 5 m from the provincial development plan out of total budget for the six provinces of almost NOK 50 m. Under the regional three-year budget of NOK 120 m, E. Equatoria receives a relatively large share (NOK 11 m) considering that NOK 75 m is allocated to regional headquarters. The figure of NOK 11 m is swollen partly by the Jebel Lado Durra Scheme and the Katire Sawmills, but around NOK 3 m is allocated for Health and NOK 1.5 m for Education.

Thirdly, there is external assistance. In FY 1979-80 the total external assistance expenditure was NOK 175 m. Most of this was in grants. UNDP and other UN agencies contributed around NOK 40 m. Bilateral assistance (W. Germany, U.S.A., U.K., Netherlands, Kuwait) was around NOK 30 m. Non-governmental agencies contributed around NOK 50 m. In addition, soft loans came from an IBRD consortium - NOK 175 m over four years for the Southern Region Agricultural Development Project - and from EDF (which disbursed around NOK 3 m on the Upper Talanga Tea Project in 1980).

### 3.6. Investment in Eastern Equatoria

Apart from NCA/SP, the only significant expenditure from this total figure in Kapoeta and Torit was in Upper Talanga where EDF are funding a four-year project to establish (initially) 120 ha. of planted tea and in the Imatong Forestry Project where ODA is spending around NOK 15 m over four years. UNDP expenditure is confined to a small contribution to road improvement and some local horticultural and sheep-rearing investments. Non-NCA voluntary agency activities are not widespread in the two districts. At a rough estimate, it seems that around NOK 35 m may have been invested from external sources in Kapoeta and Torit in 1979-80 which is not a disproportionate amount of the total NOK 175 m when

- a) the high potential of the area is forestry and tree crops and
- b) the strategic importance to the Region as a whole of the Juba - Kenya road are taken into account.

Leaving aside the Upper Talanga and Imatong Projects which are currently of a small enclave nature, NCA/SP is the major external development agency working throughout the two districts. In 1980, NCA/SP expenditure in the two districts was around NOK 15 m (a figure which excluded the Printing Press project in Juba and part of the Programme's overhead costs). The recurrent budget expenditure of the two districts is difficult to calculate. The 1980-81 budget for E. Equatoria Province (which includes Juba) as a whole was around NOK 40 m and it is unlikely that more than NOK 5 m was spent in Kapoeta and Torit Districts. Apart from the Province budget there are also budgets for the various regional ministries (now much reduced after provincial decentralisation) and, within the NCA/SP, there are around 20 officers and assistants seconded - and paid - by their Ministries. This non-province expenditure could amount to NOK 3 m at the most. In addition there are the development budget commitments mentioned above.

The picture that emerges is that NCA/SP is by far the most active agency of 'government' (in both expenditure terms and in its range of activities), in the two districts. However, it is misleading to suggest (as several people meeting the Mission have done) that the return of some basic services and the rebuilding of infrastructure in the two districts are entirely due to NCA/SP and that "nothing would have happened" without the Programme. The impact of NCA/SP has been widely felt and an early withdrawal would cause considerable hardship in the two districts. On

the other hand, the Regional Government has continued to commit resources to the area and NCA/SP commitments have released government resources for services and investment elsewhere in the Region.

### 3.7. The Role of the Women

Given the ethnic heterogeneity of the province it is difficult to generalise in this field. In all groups, division of labour is primarily based on sex. Within the households women are in charge of activities connected with food preparation, collection of firewood, water, grinding flour and cooking. They are also heavily involved in cultivation of subsistence crops especially in weeding and harvesting, while men are more involved in bush clearing and in activities involving livestock like herding or ploughing. Men also seem to be more involved in the cash sector.

In terms of authority relations between men and women it is even more difficult to generalise. Affiliation to clans and lineages is invariably transferred in the male line, and inheritance of movable property like livestock is also mainly transferred through men. Positions of power in both traditional and modern political structures are also predominantly occupied by men.

The rules which regulate the relations between the sexes have evolved in a context where the survival of the local communities have been dependent on the men's ability to militarily defend the local group. Childrearing and food production are thus sectors of activity assigned to women. On ceremonial occasions the women's duties in this field are strongly emphasised, especially among the cattlekeeping groups. On the background of the ideology of male and female tasks it is therefore not surprising that there are fewer female students enrolled in the formal school system than male students. In many ways it is surprising that there is such a high percentage of girls in the schools. The reason for this is probably that the political power position of men in the traditional system only to a very limited extent is related to ideological emphasis on male dominance dependent on restrictive control of women's movement outside the domestic sphere. It may also be mentioned in this connection that female circumcision is traditionally not practiced among the groups in Eastern Equatoria. There may, however, be a certain increase of this practice in urban areas among people who see this as an idiom identifying them with Central Sudanese identity.

## 4. NCA/SP ACTIVITIES

### 4.1. Summary of Activities

For purposes of comparison, the programme can be divided into five main activities:

- (a) Rural Development: that is those activities designed to improve over a period of time the production and incomes of rural people through the provision of agricultural inputs and services, consumer goods and farm implements. Under this category comes the Agriculture (4.2.), Cooperatives (4.3.) and Village Polytechnic (4.4) projects.
  - (b) Rural Infrastructure: that is engineering activities designed to construct or reconstruct the basic facilities in the area. These are Water Supply (4.5), Roads (4.6) and Buildings (4.7).
  - (c) Health (4.8)
  - (d) Administration and Supply
  - (e) The Printing Press (4.9)
- (Training (4.10) is an activity which in its various forms is part of all these activities)

The following table (Fig. 4.1) indicates the distribution of expenditure from 1976 to 1982. Over the period 38% of expenditure is on Infrastructure, 30% on Administration, 19% on Rural Development, 7% on the Press and 6% on Health.

Several points should be made. The proportion spent on Administration and Supply rises from 24% in 1977 to an estimated 35% in 1982. The growing cost of Administration and Supply reflects the decline in gross expenditure - overhead costs are very difficult to reduce even when real reductions are made (i.e. from 1979 onwards).

Infrastructure work has not declined as much as the figures indicate as the buildings and carpentry sections have become increasingly involved in contract building for Government and other agencies, so there is a revenue account to offset.



Figure 4.1: NCA/SP Expenditure (NOK millions) 1976-1982

	1976	1977	1978	1979	1980(Est.)	1981	1982	Total	TOTAL
<b>1. RURAL DEVELOPMENT ACTIVITIES</b>									
Agriculture	1.59	3.21	2.51	4.42	2.91	3.11	3.03	20.78	} 29.69
Co-operatives	0.39	1.06	0.88	1.58	0.59	1.26	0.89	6.65	
Village Polytechnics	-	-	-	0.50	0.55	0.62	0.59	2.26	
<b>2. RURAL INFRASTRUCTURE</b>									
Roads	2.84	3.24	3.07	6.09	3.90	2.73	2.68	24.55	} 60.33
Buildings	4.51	3.80	4.42	0.55	1.00	1.26	1.06	16.60	
Water	0.63	1.30	1.46	3.06	2.05	2.28	1.66	12.44	
Workshops	1.21	1.90	2.22	0.29	-	0.59	0.53	6.74	
<b>3. HEALTH</b>	1.34	0.82	0.75	2.05	1.78	1.29	1.32	-	9.35
<b>4. ADMINISTRATION AND SUPPLY</b>									
Administration	1.58	1.60	1.54	2.60	2.45	2.06	2.06	13.89	} 47.57
Logistics	2.85	3.33	3.39	3.63	3.42	3.25	3.24	23.11	
Hilieu Centre	1.68	0.80	0.28	2.88	2.65	1.22	1.26	10.57	
<b>5. PRINTING PRESS</b>	4.72	2.26	0.69	0.97	0.58	0.64	0.53	-	10.39

The following sections indicate the ways that programme changes after 1982 are likely to alter the present pattern of expenditure. Any extension of the roads and water projects will involve substantial re-equipping and cost. An Education Project would mean a new claim on resources, but projects like the Printing Press would be reduced substantially in the next period.

#### 4.2. Agriculture: Rural Development Centres

According to the agreement between the NCA and the Sudan Government, the Agricultural Project is to concentrate on:

1. Crop experiments (observations and trials)
2. Seed multiplication (bulking)
3. Animal power (oxen for ploughing, transport and oil milling)
4. Extension activities
5. Production of tools and equipment which will suit the local farmer (village polytechnics)

To achieve these objectives the main tool is planned to be the six Rural Development Centres (RDCs).

##### 4.2.1. RDC Organisation

The Supervisors of the RDC are appointed by the NCA and responsible to NCA/SP Coordinators (for Agriculture and Co-operatives) (see Fig. 4.2). Within each RDC, the Supervisors are responsible for agricultural and co-operative staff seconded from their respective ministries. These include a farm manager, an extension assistant (with up to four overseers), a home economist, and a divisional co-operative officer (with up to five field agents). In all the RDCs there is also a experimentation officer technically responsible not to NCA but to the Ministry's senior agronomist. The Ministry has asked if this work could be taken over in the six RDCs. The Farm Managers are diploma-holders, like the PDU experiment officers, and they have junior staff responsible for specialist areas such as horticultural crops, livestock or animal power, plus field recorders. For no apparent reason, NCA/SP tops up Ministry salaries by 10% for seconded staff working within the Ministry's World Bank-assisted Project Development Unit (PDU).

#### 4.2.2. RDC Activities

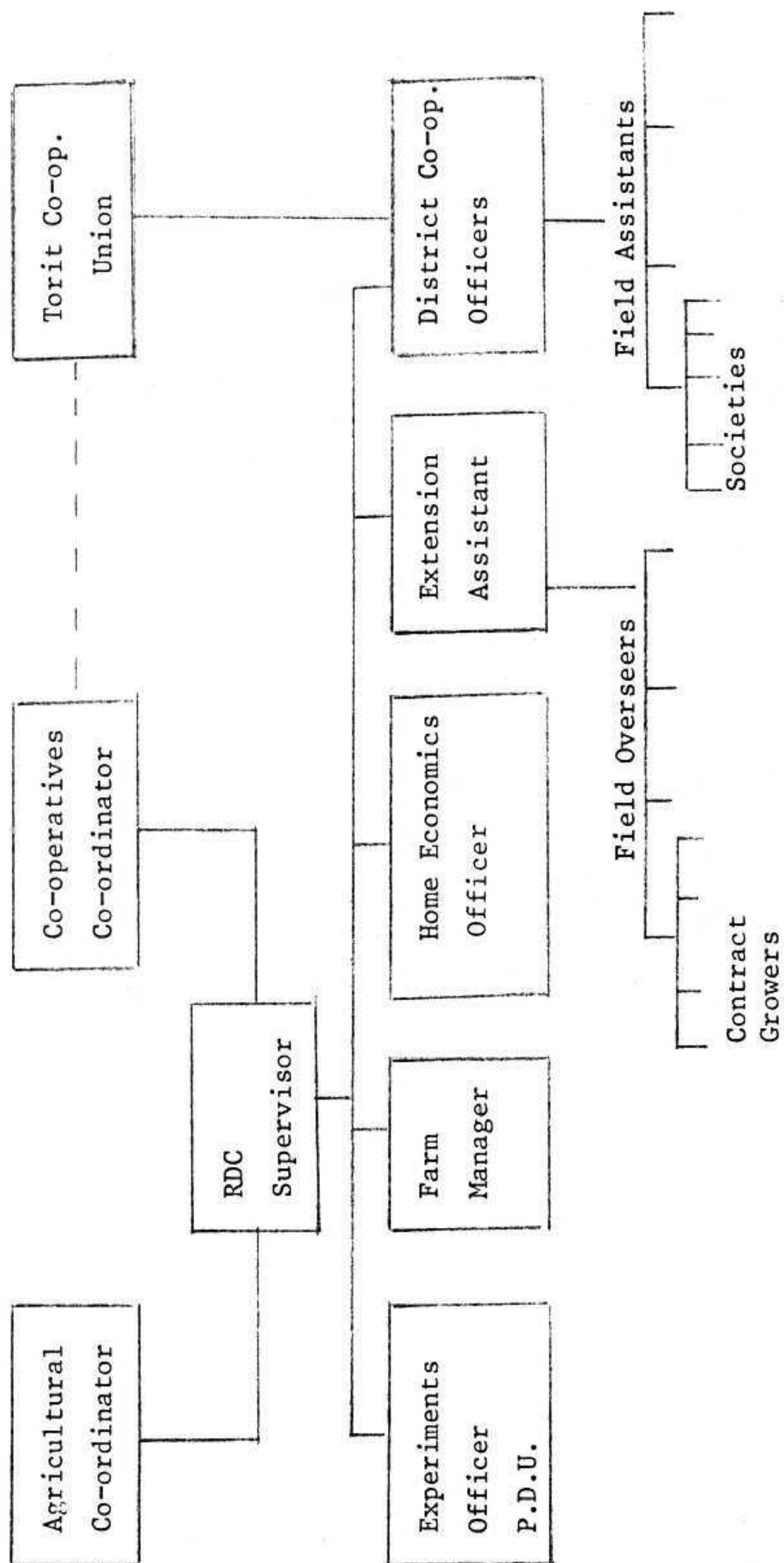
Research: At present the activities on the RDC farms seem rather haphazard. It is thus extremely difficult to draw any lesson from crop yield records. Attention has been given to yields per feddan, but this is not very important under conditions of abundant land. The important concern for the farmer is his return to labour in alternative cropping systems and the risks these patterns expose him to. If there are no records of labour inputs in various phases of the cultivation cycle the yield records are unhelpful. Similarly, if no monitoring (however primitive) of crop failures are undertaken there is very little basis for judging how a more specialized cropping pattern compare with a more diversified pattern. The concern for the farmer is not yields per unit of land, but yields per unit of labour. Demonstration of how nicely a field can be cultivated and what yields can be harvested from such fields may not be relevant for the farmer.

Trials: The record on trials has been poor. Some of the most ambitious (fish ponds, donkey training) have failed totally. Others have seemed successful (e.g. ox-training) but the adoption rate of farmers has been very low. Crop trials are in a muddled state because there are two separate sets of activities: PDU 'trials' and NCA 'observations'. The distinction is meaningless but it has meant that at least one case planted observation plots were far too large for their purpose as trials, possibly confusing the scale of seed multiplication with observation.

Seed Multiplication: NCA/SP is now wisely moving away from direct production, using a system of contract growers (see Co-operatives section). Elite seeds only will be grown at RDCs. The growers return the seed quantities given to them, and the surplus is bought and collected from the growers. It is mainly durra, maize, beans and ground-nuts.

Extension: Apart from some cases of work with women's groups (on horticulture) and with schools (on farming education) there is no agricultural extension programme in the sense of a system of extending knowledge to farmers on a regular basis and of responding to farmer's requests for advice. (In the Ministry, the extension function includes providing inputs but this is a co-operative activity within NCA/SP). Most of the extension staff (field overseers) are engaged in supervising contract

Figure 4.2: Rural Development Centre Organization



growers. (There are around 100 in Chukudum supervised by 5 overseers).

The four sub-centres of Hilieu RDC are primarily concerned with extension, although they are confined to demonstrating ox-ploughing and training oxen. The demonstration fields in some of the centres reflect an extremely low level of crop husbandry and NCA asked its associated Communication Development Project to investigate the reasons for this signally dismal performance. Its findings on the lack of supervision and training and its helpful discussion of the problem of initiating field level workers<sup>1)</sup> show two things: (1) the enormity of the problem in establishing an effective agricultural extension service and (2) the utility of continuous investigation into what is being tried out. NCAs agricultural staff are now in a position to rectify the mistakes made in the first years of the oxcentres and it is to be hoped that performance will improve.

Farmer Training: Although centres and dormitories have been established for training these have not yet been used for farmer training on any scale. They should not be used, anyway, until it is clear what sort of knowledge can be transferred to farmers that is within their resources to use and does not incur significant risks or costs.

#### 4.2.3. Location and Purpose of RDCs

The RDC programme must be seen against the background of a virtual absence of government agricultural activities in large areas of the two districts. The RDCs therefore must provide the basis for all government's agricultural activities. These are (a) research - on crops, animals, farm power, land use etc. (b) data collection - on climate, production etc. (c) agricultural extension - including farmer training and nutrition programmes (d) the provision of farm inputs - including seed, tools, improved stock (e) the collection, storage, and marketing of crops (f) the organization of farmer groups, especially co-operatives (g) the promotion of farm processing activities. In addition, the circumstances of Eastern Equatoria also necessitate a food grain reserve programme for alleviation of distress.

It is against these criteria that the location of RDCs and the purpose of their activities should be examined. Obviously RDCs should adapt their research programmes to the particular constraints and opportunities which

1) "Torit RDC Oxcentres". CDP, August, 1980. (4 pp)

have been identified in each area, and they should specialize to some extent. But ultimately the success of the RDCs depends upon whether they can simultaneously conduct trials and field investigations, link such work closely to input supply and extension activities, and make the centres places where individual farmers will come to acquire services, farm inputs and skills and where farmers' organisations (such as co-operatives) will come for assistance in their buying and selling operations.

This is looking a long way ahead. Extension services do not exist as yet; co-operative produce marketing has hardly begun: and farmers generally do not see research centres as having much relevance to their own farming concerns. It is on the input supply side that most progress has been made, especially seed and farm tools, with more limited progress in the field of trained animals for farm power. Nonetheless, RDCs will be an expensive investment of financial resources if they do not eventually serve as focus for a range of related agricultural activities which support increased production and commercialisation of agriculture.

Three of the centres are well-situated in this respect. Chukudum (Didinga area), Palotaka (Acholi area) and Loa (Arapi) (Madi area) each represent distinctive agro-ecological environments; they are close to centres of potential marketing activity so that farmers and their organisations will find them useful; and they have an established catchment areas (in terms of common language, and land use and settlement patterns) for extension activities. Torit (Hilieu) and Kapoeta seem less well chosen. However, Hilieu is a natural site for a research station attached to a residential training college and for this reason the present plans for eventual handover (to a Forestry College) are probably appropriate. This does suggest however that another RDC could eventually be established for the particular social and environmental conditions and market potential of the Latuka area which is not well-served by Hilieu.

Kapoeta RDC (Topotha area) is similarly open to question in terms of its long-term appropriateness as an agro-service centre as it is some way from Kapoeta and its market and services. It is a crop research station largely and it is difficult to imagine it becoming a centre for services and marketing for the livestock sector. But there is a large amount of enquiry to be undertaken on the Topotha before any such centre is established and meanwhile Kapoeta could continue with a modest crop trial and seed

bulking programme.

Lafon RDC (Lokoro area) is a special case. It could develop rather rapidly into an agro-service centre specialized in mechanised dura production (tractor-hire services, input supply, marketing etc.) with a large estate of its own to manage as well as the existing smallholder tenant scheme, whereby Lafon RDC prepares the land and provides seed for 80 two feddan plots which are allocated to farmers on a seasonal basis. Recovery of cost is through the RDC offering marketing facilities, but this is working poorly as there are alternative marketing outlets. There is considerable underutilized capacity at Lafon at present and suggestions are made in Sect. 5 for a new approach to what is rather misleadingly called a 'Mechanised Farming Co-operative'.

The general approach to RDC development, therefore, is that they should increasingly become centres which offer services (in various forms) to farmers which the farmers themselves are prepared to use and demand. 'Services' covers a wide range of possible activities: tractor-hire, vaccination, advice to school production units, on-farm ox-training etc. But to reach the position whereby RDCs can provide such services requires (a) a much greater investment in research and (b) a much greater sensitivity to the demands of local farmers. These issues are discussed further in Section 5.

### 4.3. Cooperatives

#### 4.3.1. The Co-operative Movement

The cooperative movement in Eastern Equatoria is largely concerned with commodity distribution. It distributes consumer goods, mainly from outside the area (soap, sugar, dura, milk powder, raincoats, t-shirts, etc.) to groups which are unreliably served by the private sector. It distributes farm inputs (notably seeds and tools) which it buys from both outside the area and from within the area through its close involvement with production at the RDCs and its supervised contract growers. It has also distributed (in 1980 especially) food to areas of serious deficit through its supervision of a food-for-work programme. This was not confined to member societies.

The other activities of the cooperative movement are on a much more modest scale. They consist of (a) food processing (mainly grinding mills) and (b) agricultural produce marketing. These three main activities are discussed below.

The mechanism for these activities in the Torit Cooperative Union (T.C.U.). The T.C.U. consists of a union of 39 registered primary societies with a further 63 'pre-cooperative' primary societies awaiting consideration by the Registrar. A number of the societies are based on government employees (e.g. Civil Hospital) but there has been considerable growth in membership among ordinary villagers as the following table illustrates.

T.C.U. Societies 1977-1980

Registered societies	Pre-cooperatives	Total	
-	45	45	1977
17	26	43	1978
31	31	62	1979
39	63	102	1980

Registered societies pay an entrance fee of £s 25 and contribute the minimum share capital of £s 75. Six hold savings deposits of between £s 500 and £s 3,500 with the Union. Pre-cooperatives receive goods from the TCU but they must first have a deposit (normally around £s 100).

In 1979-1980 period, the T.C.U. had a net profit of £s 19,000 on a turnover of almost £s 400,000. The 'trade expenses', however, were put at around £s 40,000, a figure which does not reflect the very high transport costs incurred in distribution and the payment of salaries to staff working for the Union.

The T.C.U. has a staff of 27 persons: secretary/manager, nine cooperative officers, eight field assistants, one accountant, four store-keepers, and four grinding mill managers. There is also an expatriate coordinator who has a strong advisory role, and some of the RDC expatriate supervisors spend half of their time on cooperative affairs.

#### 4.3.2. The Role NCA/SP

NCA/SP plays a major role in the T.C.U. Twenty-two of the T.C.U. staff



are employed by the Project (the other five are seconded by the Ministry of Cooperatives to the Union and the Project). NCA/SP has built stores for several of the primary societies; it heavily subsidises transport costs; and it has an outstanding loan of fs 50,000 with T.C.U.

There is no question that without NCA/SP support, the T.C.U. would not have achieved the present level of performance. Similarly, any premature withdrawal of NCA support in management, finance and logistics, would seriously damage the future prospects of TCU as a distribution and trading organisation.

This conclusion does not mean that NCA/SP has therefore failed to create a visible self-managing cooperative movement. On the contrary, its emphasis on building up the business side of cooperatives within those fields of activities which are seen to be in the interests of individual members in a crucial first step in the building of cooperatives. Given the appalling record of failure in externally-initiated cooperative organization elsewhere in developing countries, the NCA/SP initiative must be considered a major (if interim) success.

#### 4.3.3. Activities

On the distribution side, it is the Union which fixes prices and allocates commodities to societies. These are supervised by field assistants who take orders from societies and demand cash payment for delivery. Many of the societies use houses of individual members as stores. There have been cases of embezzlement and fraud but action has been taken. As there are no figures available on the total trade in the area, it is impossible to calculate the market share of T.C.U. But in some smaller villages it is clearly very high and the Union is evidently providing a major service to its members.

In drought-stricken areas, non-members have also benefitted considerably from T.C.U. distribution of food supplies in return for the collection of piles of stones for road building programmes. T.C.U. is not primarily a disaster relief organisation but - with major NCA/SP support - it has performed this function remarkably well.

For farmer members, sales of farm implements through the cooperatives has shown a steady increase. Ox-ploughs have ceased to sell as it appears

that oxenisation has not been widely adapted and the re-sale of ploughs (to Uganda) has been curtailed by low demand. Other implements are selling well, however, as the following table indicates.

Sale of implements 1979-80

Type	1979		1980	
	Sales	Price (£s)	Sales	Price (£s)
Ox ploughs	94	23,250	19	42,500
Hoes	3873	2,000	8144	3,300
Grass slashers	987	0,750	1599	2,200
Pangas	2615	1,400	5055	2,350
Sickles	2190	0,750	1368	1,200
Axes	993	2,700	2579	3,250
Rakes	171	0,400	500	1,100
Hand grinding mills	6	25,000	17	25,000

Seeds sales have also improved, despite sharp price increases. Of course it is easy not to establish whether some of the seed is consumed rather than planted, but there is no firm evidence that seed sales are a disguised form of food subsidies. The following table indicates the general rise in sales.

Sale of Seeds 1979-80

Type	1979		1980	
	Sales	Unit Prices (£s)	Sales	Unit Prices (£s)
Serena Sorghum	2,340 kg	0,100	10,518 kg	0,350
Nyeting Sorghum	0 "		2,871 "	0,350
Katumani maize	630 "	0,100	7,902 "	0,350
Western yellow maize	1,890 "	0,100	1,011 "	0,350
Finger millet	0 "		481 "	0,350
G. nuts, Makuli red	4,000 "		1,024 "	
G. nuts, Manipinta	2,000 "		259 "	
Vegetable seed, 100g	199 pcs	2,000	1,026 pcs	1,350
Vegetable seed, packet	211 "	0,750	892 "	0,750

T.C.U. is also engaged in processing. It has six mills operating, all of them with NCA/SP providing support and fuel supplies. In 1981, NCA/SP will also be providing a crusher and boiler for brown sugar production under the control of a manager serving cooperative societies in Palotaka. These activities - like the distribution activities - are manifestly important to members and it is to be hoped that in due course the members themselves will accept that the real costs of running the enterprises are worth bearing without external financial assistance, either from the Ministry of Cooperatives or NCA/SP.

Produce marketing is a less promising area of cooperative activity at present. The level of production in the area is still very low and marketed supplies are small. The private sector works fairly efficiently although the buying process appears to favour the merchant rather than the farmer. The cooperative societies are buying very little as the following table indicates.

Marketed Produce 1979-1980

Type	1979 (kg)	1980 (kg)
Durra	15,400	5,245
Cassava	13,230	5,580
Potatoes	13,760	62,400

(no information available on price)

Irish potatoes (from Nagishot and Gilo) have shown a dramatic increase but there has been a shortage of demand and if the price is adjusted downwards in 1981 there could be a significant decline in production.

One other area of expansion in marketing activities is the mechanized dura scheme at Lafon but here the cooperative marketing channel is partly a means of recovering costs of tractor-hire and seed and as there are alternative channels (plus local consumption alternatives e.g. beer-making) it is unlikely to be a very successful venture.

Figure 4.3: R.D.C: (Agricultural Project) Staff 1980  
(Co-operative Project staff excluded)

	Loa Arapi	Kapoeta	Palutaka	Hilieu (Torit)	Lafon	Chukudum	Total
Supervisors	1	1	1	1	1	1	5
Farm Managers	1	1	1	1	1	1	6
Extension Assistants	1	-	1	1	-	1	4
Agricultural Overseers	4	-	3	1	1	5	14
General Management	4	3	6	4	4	7	28
Home Economics staff	3	-	1	2	-	-	6
Animal Power	14	3	8	15	4	9	53
Horticulture	3	-	1	4	-	2	10
Stockmen	4	2	4	3	2	4	19
Oil Mill	2	-	2	3	-	-	7
Labourers	25	30	63	36	15	29	199
Total	62	40	91	70	28	59	

#### 4.3.4. The Future

Cooperatives are closely bound to the future of RDCs as service centres for input supply, extension and marketing, and NCA/SP should continue to invest resources in the T.C.U. even though there is bound to be a feeling that greater 'self-reliance' is required. There is no question that members should begin to bear more of the real cost of commodities and services but external management remains essential for the foreseeable future.

The contribution of the present coordinator has been most impressive. The practicality of his approach to cooperatives provides important lessons for the rest of the region where modest success has been achieved only in areas of high-value crops where marketing societies have been established.

#### 4.4. Village Polytechnics

Given the low level of technological development in the rural sector, given the limited sophistication in capital management among the farmers, and given their limited financial means, introduction of low cost "intermediate" technology may, in the immediate future, provide a stimuli to improvements in the farming system. The aim of the Village Polytechnic Workshop is to design and test such technology and if found feasible extend the construction skill or deliver the products.

At present the Village Polytechnic Workshop employs the following staff categories: 1 Supervisor, 1 Foreman, 4 Carpenters, 2 Blacksmiths and 1 Porter.

An impression of the achievements of the Village Polytechnics can be gained by the following list of items sold up to February, 1981:

<u>Item</u>	<u>Amount sold</u>	<u>Price</u>	<u>Purchaser</u>
Water filter pots	50	£ 2.50	Individuals
" " "	5	2.50	RDCs
Blacksmith bellows	5	8.00	RDCs
" "	2	8.00	Individuals
Tin cooking stoves	45	1.50	Individuals

<u>Item</u>	<u>Amount sold</u>	<u>Price</u>	<u>Purchaser</u>
Wheelbarrows	68	£ 7.00	Engineering
"	7	7.00	Individuals
Ground nut shellers	10	17.00	RDCs
" "	1	17.00	Individuals
Maize shellers	10	10.00	RDCs
" "	2	10.00	Individuals
Bicycle trailers	8	25.00	Individuals
Ox carts	6	30.00	RDCs
" "	2	30.00	Individuals
Winnowers	6	36.00	RDCs

The following items are made in small quantity for the RDCs: Solar heater (1), Hand carts (2), Water wheel (1), Bio gas model (1), Mud stove (1), Barrel stove (1), Irrigation shallow well pumps (4), Drinking pumps (1), Blacksmith tools like plough spare parts, hoes, axes, barrows etc.

The fact that items produced have found a market indicates a certain level of achievement. However, in order to further improve the performance of this project it may be advisable that for a period more attention is directed towards identification of technological constraints the rural households are confronting in their daily activities and on the basis of this focus the development of new prototypes.

#### 4.5. Water Supply

On the East Bank, the general situation is that of a great lack of water. Only a few rivers have water throughout the year. Due to low ground water level only few hand dug wells exist. As a part of struggle for life, water has to be carried from far away. In very many places, this task takes several hours, in some places even days.

Also the quality of the water is rather poor in most of the places. Against this background, the need for the Water Project is obvious. The principle aim of the water project is to provide clean water in the various communities. This means drilling and installations of hand pumps. Very important in this connection is also to establish a satisfactory maintenance system to secure the pumps being working more than a short time after installation.

4.5.1. Drilling

The drilling is carried out according to priority lists drawn up in co-operation with the Rural Councils, chiefs and Regional Ministry of Co-operatives and Rural Development, based on requests from local chiefs, Rural Councils, Directorate of Rural Water Development, other aid organisations and also other NCA/SP projects. Up to the end of 1980, 441 boreholes have been drilled, out of which 295 were successful and 146 were dry. The following table gives a summary of the work carried out each year and approximate expenses including the cost of expatriate personnel:

Year	Boreholes	Successful boreholes	Approximate Expenses 1000 NOK
1975	6	6	1,330
1976	35	24	585
1977	59	51	1,155
1978	81	53	1,360
1979	117	77	2,840
1980	143	84	1,995
<b>Total</b>	<b>441</b>	<b>295</b>	<b>9,265</b>

The following table shows the distribution of boreholes up to 1st November 1980:

Area	Boreholes	Successful Wells	Estimated population in Area
Southern Bari	12	7	35,000
Madi	39	32	41,000
Acholi	53	32	23,000
Torit Rural Council	163	115	87,000
Ikotos Rural Council	9	7	27,000
Didinga-Boya	52	20	70,000
Kapoeta	61	41	150,000
<b>Total</b>	<b>389</b>	<b>254</b>	

From the table above is seen that the number of persons for each well

with water is varying from 720 in the Acholi area to at least 5,000 in the Southern Bari and Kapoeta areas. If one pump is supposed to give potable water for 500-600 persons there is a need for a threefold expansion in drilling, which means at least 600 more boreholes giving water (approximately 1000 more to be drilled). Using the expenses already spent for drilling 441 holes the remaining work is estimated to require approximately 20 million N. kroner.

The main problems in connection with performing the water drilling is the break down of vehicles upon which the drilling rigs and compressors are mounted. They are just used for moving between the different sites which makes a short annual run. Nevertheless, these trucks give many problems and are out of order a great part of time.

Due to a low capacity of the mechanical workshop, the repairs are very time-consuming. Also the quality of the work performed is unsatisfactory. Often the same repair has to be done several times before a satisfactory result is obtained. As an example from last year, the repair of an oil leakage on one of the compressors took 3 months. If the workshop was equipped with moveable service units led by experienced mechanics, a lot of time could be saved, and the operation time of the machinery would be increased considerably,

The following table illustrates the situation in 1980:

Rig	Effective working days		Repairs of mechanical workshop		Own Repairs		Travel and Miscellaneous	
	Days	%	Days	%	Days	%	Days	%
Aquadrill I	100	35	140	48	15	5	35	12
Aquadrill II	180	62	65	22	10	4	35	12

#### 4.5.2. Maintenance of pumps

All well-drilling will be in vain if the pumps are not working. Therefore, it is of greatest importance to establish a proper maintenance system. This issue should be given the highest priority.

The biggest problem of pump maintenance seems to be that of transportation. Therefore the maintenance units should be as lightly equipped



as possible to enable the people to carry them by hand within the different areas.

Within each area is needed one trained repair man assisted by the inhabitants from the area to carry the repair equipment from pump to pump. This system is tested in some places and seems to function fairly well. To make the work easier, each two or three villages should have their own stand for hoisting the pipes of the pumps. In this way the problem of transportation should be reduced to a minimum. At present, two maintenance units are existing and six more men are under training and seem ready to be placed in other areas.

It is supposed that each trained maintenance unit should manage to maintain about 30 pumps when the size of the area is not too big. For areas with more scattered pump installations, the number of pumps should be correspondingly reduced.

In addition to these small repair units, there is a need for Regional Maintenance Teams, more heavily equipped to take care of difficult cases which the local units do not manage. The Regional maintenance teams should be equipped with cars to make them more movable.

The maintenance units mentioned previously are now working for the Rural Council and paid by them. They are running from pump to pump according to requests from the people when the pumps are out of function. According to the Water Project Coordinator, the assumption can be made that in average  $2/3$  of installed pumps are working and  $1/3$  are under repair or waiting for repair. This indicates that the number of maintenance unit should be increased considerably. To maintain the pumps already installed gives work for at least 6-7 more maintenance units. An important task should therefore be to train people for this job. This is now to a certain extent done by a Regional Repair Crew. Also the people using the pumps should be given some instructions on how to use the pumps. Probably that would reduce the needs for repair.

The councils themselves are in a better position than NCA/SP to determine methods of maintenance. In towns, there are small water charges to cover the cost of a wateryard clerk who regulates use of the pump at certain

times. In some areas, chiefs may be able to help to organise maintenance (e.g. by holding tools for use by villagers), but these are difficult issues of community organisation which are not easily addressed by external agencies.

#### 4.5.3. The Future

In 1980, 143 boreholes were drilled by 2 aquadrill rigs and one rig only for soil drilling (Dando). By these units alone it may take some more 5-6 years if 1000 more boreholes have to be drilled in Eastern Equatoria. If the working area should be larger and extended, it is absolutely necessary to buy one or two more drilling rigs (see Fig. 4.4).

Each aquadrill will be an investment of about 1,2 million Nkr. including compressors and lorry to carry the equipment. Running cost for each rig will reach an amount of approximately 1.0 million Nkr. yearly including one expatriate mechanic. Today there are all together 3 trained drillers who have got 3 years of education at a "Drilling School" in Khartoum. These men are able to run the rigs in a quite satisfactory way when supported with necessary spare parts, fuel, and repair service, etc. But they are hardly able to formulate their own working programme and organise the necessary supporting system.

#### 4.6. Roads

The Road Project was set up primarily to improve the feeder roads in the Programme area. It was hoped that the Government would cover the improvement of the main roads. After a survey in the Programme area, a priority list was set up. This list comprised 580 km. Later on also the main road Juba-Torit-Kapoeta was included in the programme. At the end of 1980, a 290 km of the listed roads had been reconditioned/constructed completely anew. Out of this length 46 km is executed on the main road Juba-Torit-Kapoeta. This was done in 1979 due to the situation in Uganda which meant that all supplies had to be transported directly between Kenya and Sudan. This work occupied the road team nearly half a year, consequently the planned work on feeder roads was considerably delayed.

At the end of 1980, approximately 50% of original programme has been built. Nothing suggests that the work has been carried out in an ineffective or inadequate way when the extremely difficult conditions are taken under consideration, but the work plans have been far too ambitious.

Instead of upgrading and light conditioning work, it has been necessary to carry out new constructions or thorough reconstructions. This solution has probably been wise as it has reduced the demand for maintenance. Other difficulties have been serious delays in deliveries of equipment and spare parts.

The capacity of the workshop has also been a bottleneck and delayed the work considerably from time to time. Thus the operation time for heavy machinery and vehicles is very low. The heavy machinery have an operation time of 47.3% of the time, while the lorries (tippers) have an operation time of 48.5% during 1980. So the time at the workshop is more than half.

#### 4.6.1. Organisation

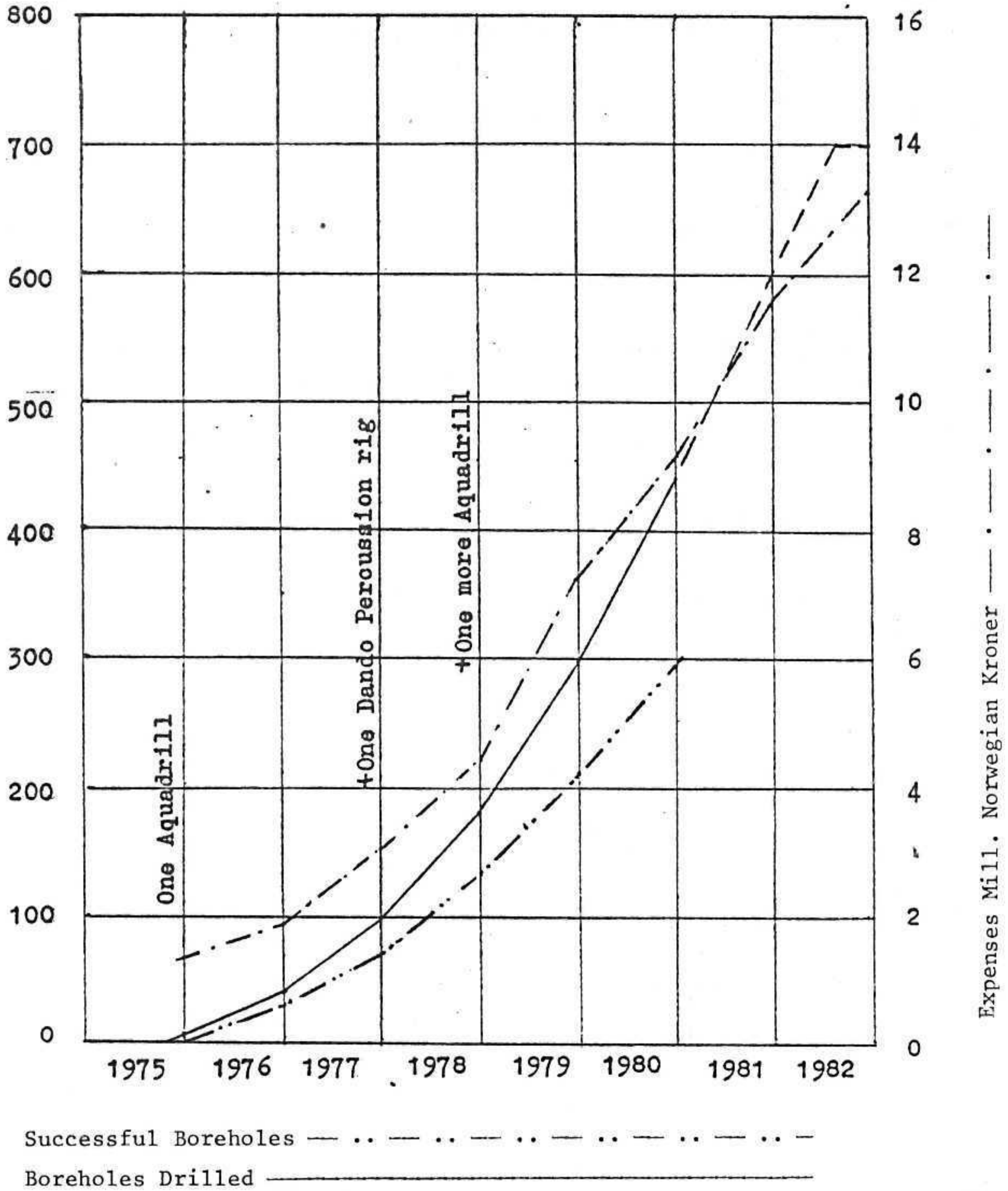
The road construction team has the last year (1980) been set up with the following machinery:

8	lorries (tippers)
1	tractor with tower grader
1	Brøyt x2B excavator
1	Brøyt x20 excavator
1	Bulldozer Cat. D4
1	Bulldozer Cat. D6
1	Grader Volvo
1	Grader Champion
1	Wheel-loader Volvo
1	Vibro roller
1	Low-loader

The estimated cost of the above mentioned machinery is 5,200.000 NOK.

This team occupies approximately 40 labourers of different kinds.

Fig. 4.4: Boreholes and Costs 1975-82



The bridge and culvert team has at its disposal:

- 1 Tractor excavator
- 2 Lorries
- 4 Tractor with trailers
- 3 Concrete Mixers

The original value of these machinery is approximately 1.250.000 NOK.

This team is divided in 4 working groups and occupies in average 80 - 90 labourers.

Since March 1980 a Maintenance Team has been working in Torit District. It has:

- 1 Tractor with tower grader  
Value 250.000 NOK.

For supervision is bought together 5 landrovers,  
Value 500.000 NOK.

#### 4.6.2. Costs

The total value of machinery lorries, landrovers and other equipment for executing the work programme is estimated to be, 7.200.000 NOK.

Assuming a writing off time of 5 years and 12% interest we get,

$$\text{Yearly writing off } \frac{7.200.000}{5} = 1.080.000 \text{ NOK.}$$

$$\text{Interest: } \frac{7.200.000 \cdot 12}{2.100} = 430.000 \text{ NOK.}$$

$$\text{Yearly princial and interest cost} = \underline{1.510.000 \text{ NOK.}}$$

(Capital)

According to the account for 1980 the following expenditures for executing the road work programme are:

Tools and equipment, etc.	1.015.000 NOK
Running cost, as fuel	
Maintenance, local salaries, and transport, etc.	2.285.000 NOK
Expatriate Personnel	400.000 NOK
Overhead, offices, Adm., etc.	<u>450.000 NOK</u>
T O T A L	4.150.000 NOK
Principle and interest cost	<u>1.510.000 NOK</u>
Total Road Expenditures	<u>5.660.000 NOK</u>

According to the Engineering Coordinator, approximately 1.000.000 NOK has been used by the Maintenance Team. During 1980, there is reconstructed 40 km roads and 20 km is reconditioned which is equal to 10 km reconstruction. We, therefore, can say that together 50 km was reconstructed.

$$\text{Cost/km} = \frac{4.660.000}{50} = 95.000 \text{ NOK.}$$

In 1980, 1.000.000 NOK have been spent for road maintenance and 150 km road have been maintained.

$$\frac{1.000.000}{150} = \underline{7000 \text{ m/Km}}$$

However, this cost is not representative as an average yearly cost as this maintenance has been executed on newly reconstructed stretches. Twice this amount should be a more realistic figure.

$$\underline{15.000 \text{ NOK/km/year}}$$

As mentioned previously only 290 km of the roads are reconstructed at the end of 1980. Thus 290 km remains according to the work programme. To estimate the realistic cost of this work is difficult, but if choosing the same km-cost as used in 1980, it still will amount to  $95.000 \cdot 290 = \underline{28.000.000 \text{ NOK}}$ . On the budget for 1981 - 1982 is foreseen approximately, 5.000.000 NOK.

Necessary after 1982 is thus 23.000.000 NOK.

For each four-year period, yearly = 6.000.000 NOK.

If more extensive and proper maintenance work also shall be executed during the same period, it probably will be necessary with yearly grants

of at least 4.000.000 NOK.

#### 4.6.3. Quality and Maintenance

When this programme started in 1974, all the roads in the programme area were in an extremely bad condition. Bridges were blown up, long stretches were washed away. Many roads were not passable at all during the rainy season and hardly at all in the dry season.

Now, when 50% of the programme is complete the roads reconstructed are fairly good, but it has to be stressed that these reconstructed roads have not been built as permanent roads according to certain specification or standards. They are built more like service roads to be easily passable at rather slow speed.

The choice of standard seems to be reasonable, as the cost would have been at least 10 times higher if more permanent roads had been built.

It was necessary also as soon as possible to establish a passable road system in order to get connections for execution of the other building activities under the programme. Further, it seems quite clear that the present traffic load on the feeder roads in the programme area does not justify roads of high quality. Although traffic statistics are insufficient for these roads, it is quite clear that the most of these roads are passed daily only by a few cars and trucks, even the main road through Juba-Torit-Kapoeta has a low traffic load.

According to the Police Post in Torit, the main road is passed by 30 - 40 heavy trucks daily. The number of smaller cars was not recorded, but this is hardly any higher. Until the Juba-Torit-Kenya road is reconstructed the traffic load on the feeder roads in the area will probably not increase substantially. (See Appendix 3.)

At an early stage of the NCA/SP programme, it became quite clear that it would be necessary to make an effort to organize maintenance for the roads built by the project. Unless some proper regular maintenance was organized there certainly would be bad deterioration of the road after few years.

Since NCA/SP started the road programme, several attempts have been done

to get the Rural Councils or other local authorities to take care of the road maintenance, but so far almost without success.

An organization at two levels was proposed. At village level, basic groups should each have a road section as its responsibility. These groups were planned to be labour-intensive and equipped with tools for manual work.

At district level, other units, equipped with tractors and tow-graders, etc., were planned to carry out major maintenance that would be necessary every two or three years.

However, nothing happened. To avoid complete deterioration of the roads reconstructed during the years 1974 - 1980, a road maintenance team was established by the Road Section of NCA/SP in March 1980. One unit equipped with tractor with trailer and tow-grader, and another unit backed by men on bicycles using handtools for filling pot-holes, cleaning culverts, slashing grass and cutting bushes, have done quite extensive maintenance work during the time since they started. But it is clear that the maintenance has to be given a much higher attention and priority the coming years.

The maintenance team established by NCA/SP in March 1980 is able to execute road maintenance in quite a suitable way. For the future, maintenance unit have to be established for in average each 150 km of road. These units may consist of 2 - 3 working groups.

- 1) A mechanized group equipped with tractor with trailer and tow-grader. This group has to go in front for grading up the road surface, supply gravel with tractor-trailer and handloading.
- 2) A labour intensive group for repair of scattered damages where grader is inappropriate: clearing off culverts and ditches, etc.
- 3) A group on bicycles taking care of road signs, road shoulder indicators at culvert wings, etc., by painting and any other necessary maintenance.

#### 4.6.4. The Future

It was necessary to execute road improvements in the past in order to be able to carry out the other parts of the programme, especially to provide



connections to the different building sites. But as the scheduled buildings for schools, health project and agricultural project now more or less are brought to its end, it is time to raise the question if NCA/SP should continue with road construction on its own.

As the traffic load on the feeder road is very low and will increase little in the coming years, there are considerable doubts in the Mission's view about the need for a continued building of feeder roads or whether this can be justified in cost terms. As it also seems impossible in the near future to hand the responsibility for road maintenance to the local authorities, it increases the doubt about road reconstruction work for the time being. Probably it will be easier to hand over the maintenance at a later stage of economic development when the people really are able to see their own need for roads. In any case, a solution for the maintenance for the roads reconstructed within end of existing programme has to be found very soon.

If the maintenance responsibility will not be taken over by the Sudanese authorities, NCA/SP has to fulfil this important task for the years coming. If not the constructed roads will decline to their former situation very soon.

At the end of this four-year period in 1982, probably approximately 350 km of roads will be rebuilt. To maintain these roads it will be necessary for an yearly amount of at least 2 - 3 million NOK for maintenance depending on the maintenance level chosen.

#### 4.7. Buildings

When the NCA-Programme started in 1974 schools and health centres in the area were more or less destroyed after the civil war. Education and health services were in almost all places non-existent. There was a general need for a complete rebuilding of both housing facilities and services. A work plan was prepared containing a list of works to be executed as well for repair, rebuilding and new buildings for schools, health centres, workshops and an administrative centre at Hilieu.

The building section has since then been working according to this priority list, and all those works were finished by end of October, 1980. In

addition to priority list it was decided in 1980 to build a new primary school centre at Borewajak, the village close to the NCA/SP centre at Hilieu. The main reason for this decision was that a great part of the employees at the centre settled down with their families in that village. The demand for a primary school was then obvious.

Although the original programme has now been brought to its end there is still a great demand. But it should now be possible to pause for some time in the building programme. Up to the end of 1980 11 school centres have been built with together 44 school buildings, 40 staff houses, and 10 flats together 12,890 m<sup>2</sup>. Cost 9,307.000 NOK. In addition:

3 hospitals	(together	860 m <sup>2</sup> )
8 dispensaries	( "	1300 " )
17 P.H.C.U.s	( "	1320 " )
22 staff houses	( "	2330 " )

have been built. Total cost 4.958.000 NOK

Five RDCs of various buildings (together 3500 m<sup>2</sup>) have been built at a cost of 2.800.000 NOK; and

Hilieu Administrative Centre has been constructed

30 staff houses (4.500 m<sup>2</sup>), plus

20 various buildings (4.300 " )

with a total cost of 7.240.000 NOK.

Altogether 31.000 m<sup>2</sup> has been built at at cost of 24.305.000 NOK. That means NOK 785/m<sup>2</sup> on average. In addition the overhead cost is estimated to NOK 3.597.000. Total costs then will be NOK 27.902.000 for 31.000 m<sup>2</sup>. That means NOK 900/m<sup>2</sup> on average.

The quality of the various houses is fairly good. Taken into consideration the unskilled labourers, the result can be characterized as very good.

As the building section now has finished all the buildings on the NCA-Programme the question is what to be done the coming years. Even though there will not be more funds available from NCA as the original building programme has been completed, it should be appropriate to continue the building section for some more years. The aim will be to assist the

Regional Government and others as contractor for construction of buildings etc. which are of importance for developing the area. At present no private contractors are available for these tasks. But if the building section continues its work with teaching and training of local employees in building trade with special emphasis on recruitment and education of key personal, it should be possible to get people able to start as contractors after some time. The building section should also continue with investigations on local building material resources in order to reduce imported materials. The established brick and culverts fabrics should gradually be transformed to self-supporting units run by Sudanese personnel.

#### 4.8. Health

##### 4.8.1. Activities

The health project of the Norwegian Church Aid is part of the integrated rural development programme and limited in its activities to Eastern Equatoria Province, comprising the two districts of Torit and Kapoeta.

The project as such as started in 1974 and the original objectives of the project were threefold:

- a) Construction of primary health care facilities and assistance in providing these facilities with furniture and equipment.
- b) To provide a medical team to render health care to the programme personnel
- c) Assist the Government in its medical programme for the area.

Following the completion of construction activities the objectives of the project has been changed following better coverage as far as physical infrastructure is concerned.

The main emphasis since 1979 has been on implementation, and the expansion of other activities under NCA has allowed nurses to be posted to more outside stations for supervision of the programme. At the same time medical care of local programme personnel has been taken over by local health facilities allowing expatriate personnel previously tied up to such activities to spend more time on supervision and programme activities within the framework of Government health policies. The medical team attached to the project is only left with the expatriate personnel and it seems important

that the project has a medical officer, as the local health service is not well equipped to cater for the project's expatriate personnel. The medical officer spends about five hours a week on expatriate personnel attached to NCA.

The main activities of the health project is within rural health work, and since 1978 this has basically been in support of the Government's Primary Health Care Programme. The objectives of the project within 79-82 programme period are as follows:

- a) Supervision of local health staff including inservice training and the arranging of seminars. Main focus on preventive health care with special emphasis on the major disease problems of the area, such as tuberculosis, malaria, trachoma, gastro-enteritis.
- b) Health education particularly directed at improving hygiene and nutrition. The attention is on personal hygiene, clean water, and building of pit latrines. There is cooperation with the agricultural projects and the cooperatives in the field on nutrition.
- c) MCH work with antenatal and under five clinics.
- d) Vaccination campaign in accordance with the Expanded Programme of Immunisation formulated by the Regional Ministry of Health.
- e) Establishing and maintaining necessary regular supplies of drugs and equipment to the area by offering transport and supplies when required.
- f) Supply of pit latrine floors in order to motivate people to dig latrines.
- g) Provision of items such as pots, plastic containers and water filters for people in cooperation with NCA/SP Village Polytechnics.

The following staff is presently attached to the project:

- a) One Medical Officer who is the project coordinator.
- b) Five nurses on expatriate contracts stationed at Chukudum, Palotaka, Loa, Lafon and Kapoeta.
- c) Two nurses (wives of expatriate personnel) on local contract engaged in work at the NCA centre and supervision of nearby health facilities.
- d) One laboratory assistant (local) trained within the project and stationed at the centre.
- e) One expatriate nurse (wife of Eritrean project officer) engaged in the development of nutritional extension programme.

Fig. 4.5. shows the capital and recurrent expenditure on the health project for 1980-1982.

The 1980 health project capital expenditure is final expenditure on health infrastructure building project which was completed in 1979. Of the total expenditure for the period 7.1% is spent on the health project. Within the health project NOK 350.000 or 8% is spent on drugs and dressings. Within this expenditure about 10.000 NOK is spent on expatriate personnel most of which is for purchase of gammaglobulin, the rest is for supplies to the health facilities under NCA supervision. This expenditure should ideally have been zero, but this is tied up to the hopeless situation concerning the supply of drugs which is mentioned later. The same applies to surcharge of vaccines for the vaccination programme. The cost of transport including customs duties and maintenance of vehicles is also fairly high, maintenance being the major cost item, transport in total accounting for 13.5% of the total expenditure. 46.5% of the total expenditure is for costs incurred by the expatriate personnel on the project. Apart from seminars for local staff there is no training or counterpart component to the project.

The construction of health facilities were completed towards the end of 1979. A total of 8 dispensaries, 17 Primary Health Care units and 22 staff houses were constructed, all work done by the Engineering Section of NCA.

The health building activities are summarized below.

Buildings	No.	m <sup>2</sup>	Sum m <sup>2</sup>	Cost NOK	Cost NOK /m <sup>2</sup>	Remarks
<u>Health Building</u>						
Hospital units	3	varying	860	946,999	1100	Paid by Regional Government
Dispensaries	8	161	1300	975,000	750	
P.H.C. Us	17	77	1320	1,056,000	800	
Staff houses	22	106	2330	1,981,000	850	

The hospital units are maternity wings at 3 district hospitals done on a contractual basis for the Government.

Figure 4.5: Health project expenditure (capital and recurrent) 1980-82

HEALTH	1980	1981	1982	Total
<u>Buildings</u>				
Various buildings	<u>450,000</u>			<u>450,000</u>
<u>Equipment</u>				
Housing equipment	<u>25,000</u>	<u>15,000</u>	<u>5,000</u>	<u>45,000</u>
<u>Running Costs</u>				
Fuel	50,000	50,000	50,000	150,000
Maintenance of vehicles	125,000	150,000	125,000	400,000
Miscellaneous	20,000	20,000	20,000	60,000
Business trips	5,000	5,000	5,000	15,000
Local salaries	100,000	100,000	100,000	300,000
Medicines/dressings	50,000	150,000	150,000	350,000
Vaccination Programme	20,000	20,000	20,000	60,000
Latrine-making Programme	10,000	20,000	20,000	50,000
Training (Seminars)	10,000	10,000	10,000	30,000
Transport	<u>15,000</u>	<u>15,000</u>	<u>15,000</u>	<u>45,000</u>
	<u>405,000</u>	<u>540,000</u>	<u>515,000</u>	<u>1,460,000</u>
<u>Expatriate personnel</u>				
Salaries	550,000	450,000	450,000	1,450,000
Folketrygden	140,000	110,000	110,000	360,000
Travels	30,000	40,000	100,000	170,000
Miscellaneous	<u>20,000</u>	<u>20,000</u>	<u>20,000</u>	<u>60,000</u>
	<u>740,000</u>	<u>620,000</u>	<u>680,000</u>	<u>2,040,000</u>
Contingency	<u>160,000</u>	<u>120,000</u>	<u>120,000</u>	<u>400,000</u>
Total	<u>1,780,000</u>	<u>1,295,000</u>	<u>1,320,000</u>	<u>4,395,000</u>

The average cost for the different structures are:

PHC units	NOK	62.000 or 1320 per m <sup>2</sup>
Dispensaries	NOK	121.000 or 1300 per m <sup>2</sup>
houses	NOK	90.000 or 2330 per m <sup>2</sup>

The cost per m<sup>2</sup> of the staff houses seems high; however, it is to some extent influenced by the relatively high standard of the supervisor's house. The design of the health facilities has been determined by the Government Building Department with small structural modifications done by the NCA engineering department.

#### 4.8.2. Impact

The complete lack of statistical data including baseline figures for the area of NCA operation makes it almost impossible to indicate any possible direct effects on the health status of the population of the area. There are no morbidity or mortality statistics over time, which could indicate decreased incidence of certain diseases, either from the Regional Ministry or from NCA itself. The only statistics collected by NCA is the number of vaccinations performed which only gives an indication of work done but does not give coverage as the target population is unknown. And there are not morbidity statistics on the diseases for which vaccination has been carried out.

As already stated, the target population is unknown and accordingly the coverage cannot be estimated. We have been unable to find in the documents available any specific vaccination targets for the area. The vaccinations are carried out as specific campaigns at certain period of the year. This together with the fact that the record keeping system is very deficient probably accounts for the poor total coverage of individual vaccination schedules. The dramatic fall from e.g. DPT 1st dose to the third dose is a consequence of above. The same is true for polio. The result is poor protection of the target group.

Such campaigns as done by NCA, and indeed by most organisations and agencies involved, are poor substitutes for a tie-up to fixed facilities, particularly for those immunisations requiring more than one dose. It should be considered whether efforts at present should not be concentrated on only one disease, e.g. tuberculosis through BCG vaccination,

rather than spreading resources on several campaigns where results are dubious due to lack of coverage, until a proper cold chain has been established.

However, tuberculosis being a major disease problem in Southern Sudan needs a specific eradication programme culturally formulated and directed comprising standardization of treatment, securing stable drug supply, BCG vaccination with clearly defined targets, health education, and statistics. The target groups need clear definition on a census basis and morbidity and mortality statistics concerning the disease must be greatly improved.

The medical team from NCA is mainly or almost exclusively involved with preventive work. The medical officer when visiting outside stations does not see patients. This was done previously but stopped as it was found to be useless bearing in mind the poor quality/limited possibilities as far as the district hospitals are concerned.

According to directives from the Regional Ministry no expatriate officers are to see curative patients that have not been seen first, or that cannot be managed, by local staff. This apparently is in order to undermine the ability/authority of local staff. However, to see patients referred from local staff is acceptable. And even if the referral possibilities are limited and likewise the treatment possibilities due to the chronic shortage of drugs, one feels that the NCA doctor should use at least part of his time to see referred patients. We feel that this may be important in two respects, most importantly as in-service training for local staff and secondly we believe that the impact of preventive public health efforts may be strengthened if the medical officer also does some curative work. Furthermore, the ultimate aim must be to render a comprehensive service at all primary health care facilities on a multi-purpose basis. And as such preventive and curative services go hand in hand, one being complementary to the other.

It is obvious that NCA health team has been working under extremely difficult conditions at least up to 1978, but this still holds to a large extent. Before completion of the building programme the lack of physical infrastructure was an obvious obstacle which also prevented posting of project staff. This was coupled with a low morale among local staff which included and still does, cases of corruption amounting to sale of drugs to get money due to non-payment of salaries. Absenteeism is a continuous problem - during one visit we found one nurse who had been away from the dispensary for three weeks under the pretext of collecting his salary from Torit. Even if such



cases are reported no disciplinary action seems to result. Apart from disrupting the service such incidences left unattended are bound to have a detrimental effect on the whole service.

From 1978/79 onwards the effectiveness of the NCA operations seems to have improved although serious constraints still exist. Better planning of work has been possible and objectives have been more clearly defined. However, as no statistics exist it is impossible to state whether the activities of NCA have led to more people seeking medical aid, how this has effected the flow of patients between primary and secondary facilities, or if there is any real decrease in morbidity for certain diseases, e.g. the infectious diseases for which vaccination is given. The effect of NCA is probably more easily measured in those cases where the team has intervened in particular crisis situations.

In the first half of 1980 a large epidemic of gastro-enteritis broke out on the East Bank. The project staff at that time gave active support to local teams from Torit and Kapoeta hospitals in managing sick patients and the emphasis was on rehydration treatment using UNICEF supplied packets. Observations by the project leader indicates that they managed to lower the case fatality rates among children from 100-80% to 10-15%. An important secondary effect was the understanding of the local health staff of the importance of rehydration in the treatment of diarrhoeal disease instead of the previous sole treatment of administration of antibiotics.

During the severe drought in Kapoeta district during 1980 the health project in cooperation with other projects of NCA supplied food and supervised the feeding of several hundred children who were severely under-nourished and would probably otherwise have died from starvation.

To a country like Southern Sudan the presence of NCA health project's ability to intervene in times of acute crisis or during epidemics is important (even if this is not a primary objective of their presence) because there exists no infrastructure which could respond quickly and adequately in such cases.

#### 4.8.3. Evaluation

It was not until 1978/79 that the health project found its footing. From

then on there is a change from a policy of substituting for government to supporting government services. The basis for this change has largely been the expansion of physical infrastructure enabling the posting of supervisors to more rural areas obtaining a better coverage for implementation and follow up.

After 17 years of civil war the establishment of government control and administrative services have clearly been a fundamental problem for which a solution has not been found. Strengthening of the administrative set up and solving a chronic logistic problem is a wide-spread need throughout government. This is acutely felt within the health sector. Supervision and advice from government at different administrative levels is severely lacking, but paramount in order to:

- a) strengthen the staff morale, the laxity of which is widely seen as a serious impediment towards effective implementation of an adequate health care delivery system,
- b) avoid that the variety of voluntary organisations involved in the health field run their own shows directed by own objectives rather than by the government and ultimately the peoples priorities.

Government support is equally weak, and in particular, the supply of drugs and equipment. The whole supply situation needs a thorough analysis, which can only be done properly by an independent outside consultant. A health service lacking all most essential drugs and with no organised delivery system can hope for nothing more than to pay lip service to the medical needs of the people. Any immunisation programme without reliable and adequate supply of vaccines can only do more harm than good, and probably worst of all destroy the confidence between people and health workers necessary for such programmes to succeed.

Of particular concern is also the state of the hospitals acting as referral centres for the primary health care facilities, and the level and quality of the services they are able to render. Of the two hospitals the Mission visited in Torit and Kapoeta, both seemed to need a complete reconstruction with strengthening of staff at all levels, and the installation of equipment adequate and appropriate for the type and level of service to be rendered. Greater priority must also be given to the

posting of qualified professional staff to rural hospitals.

It is also paramount to strengthen the Central Statistics built in the Ministry of Health and to considerably improve the reporting system. A meaningful and regular feed back from the central unit to the peripheral reporting stations must be inherent in such upgrading. Such an upgrading needs the assistance of qualified medical statisticians, computer access and considerable education of and cooperation with the peripheral health workers.

The formulation of specific programmes relevant to the prevailing health situation as found in Southern Sudan with specific objectives and targets also seems important for the future developments of the health services of the area. This should include Specific Disease programmes, but must be preceded by a thorough analysis of the present situation, evaluation of future needs and be followed by a firm political commitment regarding financial support. This is obviously a vast undertaking that will require considerable financial and manpower resources, but one that is imperative for the future development of a health service so largely dependent upon external assistance. The programmes and policy papers existing presently were found to be more an expression of wishful thinking partly reproduced from WHO guidelines than a realistic assessment of development potentials for Southern Sudan. The programme on Primary Health Care is a typical example, a policy programme that everybody feels is long overdue for a realistic revision.

In short there are several areas of the organisation built up and programme activities of the health services which are in urgent need of upgrading, revision and strengthening, all of which are outside the present scope of NCA involvement, but if not done will have serious implications for the expected and real achievement of the NCA/SP inputs in the area.

#### 4.8.4. Recommendations

The NCA/SP health project expenditure 1980 - 1982 is NOK 4.395 million or 7.1% of total NCA expenditure for the period. 46.5% of the expenditure is on expatriate personnel, transport accounting for an additional 13.5%, drugs and dressing accounting for a further 8%. Thus nearly 70% of the total

budget is relatively fixed expenditures, leaving only about 30% for actual programme activities. However within the 1980 budget needs NOK 450.000 as a carry over on building expenditure.

Counting on a total expenditure after 1983 as during the years 80 - 82, and further assuming that health will get an equivalent share of total expenditure, the emphasis must be on programme implementation, possibly more directed at specific disease problems. Should, however, the expenditure on health be cut, then this is likely to severely cut back the project's ability to achieve but a few of its set objectives as the fixed expenditure is unlikely to fall unless serious reductions in expatriate personnel is done, which again will have the same negative results at present on project achievements.

Against this background it is obvious that there can be no serious expansion of programme activities with the possible exception of a limited expansion in nutrition and a greater emphasis on basic research as mentioned below.

One is aware of a proposal to start a programme for the handicapped. Whatever the demand for such a project we are unable to recommend such expansion for a variety of reasons, the most important being financial. Further no prevalence study on different types of handicap exists, and we are unaware of the role of family structure in caring for the handicapped. There is no government commitments or directive to further the extreme difficulty in recruiting qualified personnel with experience in this type of work in developing countries.

Our further recommendations for the future of the health project can be summarized as follows, assuming continued support to the programme after 1982 of the same magnitude as for 1980 - 82. We further agree that to seriously cut the project at this stage would be counterproductive and an expansion would be unwise in view of poor government support. This applies to expansion both financial and geographical.

1. The physical infrastructure component of the project was concluded towards the end of 1979, and the Mission sees no pressing needs at present for continuation of this part of the project. Under present

circumstances with shortage of drugs, staff and appropriate equipment, and further judged by present criteria and on a comparative basis against other provinces, the coverage is fairly good.

2. Future emphasis must be on implementation. One expects a revision of the Primary Health Care programme to bring it more in line with realistic objectives in Southern Sudan, and it seems appropriate for the NCA/SP health project to be guided by the expected revised principles of PHC.
3. The project personnel should aim at a closer link up between curative and preventive health care, one being complementary to the other. The inservice training component in this approach is important.
4. More emphasis must be placed on comprehensive clinics and immunisation programmes should be linked to fixed facilities rather than sporadic campaigns. This would improve the rather poor total coverage as judged from past vaccination campaigns.

Paramount to such an approach is the establishment to fixed facilities of a proper call chain and adequate supply of vaccines. The solution to this problem is long overdue, but a closer cooperation between the voluntary organisations in support of UNICEF's efforts will probably bring about a more rapid solution. It is anticipated that UNICEF will supply fridges and one further anticipates that NCA may have to supply paraffin within their area of operation. This is however a small expenditure in relation to expected return.

5. MCH activities must be given greater support at all facilities.
6. Greater effort is needed on the part of the supervisors for CHW to visit the villages. The main emphasis should be to motivate people to use the health facilities.
7. It is desirable with a closer link up between the agricultural and health component of the NCA project, with particular emphasis on nutrition and nutritional education.

Consideration should be given to the posting of a nutritionist to the programme.

Closer link up at dispensary level with the agricultural extension workers in establishing "dispensary demonstration gardens" coupled with simple nutrition education could be established with available resources.

8. The complete lack of population data and data on disease prevalence is a serious set back in the area of project operation. The project leader has started a population survey in some areas, and this is a commendable effort. However it needs to be followed by further research on specific diseases in order to provide basic data necessary for planning and evaluation purposes. It is not anticipated that the project itself has the necessary resources to do such research, it has to be done by short time consultants or by establishing contact with epidemiological research institutions in Norway. A long-term cooperation between such an institution and the NCA health project could lead to a stimulating exchange of ideas on the future directions and emphasis of the project.

It is clear from what has been said earlier that the ability of the project to emphasize the areas mentioned above is largely dependant upon developments within the administrative and logistic set up of the health services, over which the project has no or very little influence. However the initiative taken in bringing the various voluntary organisations closer together and establishing a closer and tighter link up with responsible government departments is of crucial importance and should be given every possible support. It should further be clear that if the Mission was evaluating an activity directly supported by NORAD and based on a bilateral development agreement at government level the priorities for future assistance would be different.

#### 4.9. The Printing Press

The Printing Press in Juba has been built and established as a running concern by NCA/SP. It now produces a weekly newspaper (around 6,000 copies), a monthly magazine and undertakes a range of printing work for government and non-government organizations. There has been a major capital investment therefore and a continuingly heavy technical assistance cost (around NOK 0.5) which consists of three seconded NCA staff in senior management and technical positions.

The Press is obviously separate from the Eastern Equatoria development programme and therefore has to be examined separately. The question to be asked does not concern the success of the project as a technical exercise or the relative importance of the project in terms of NORAD and Regional Government priorities. The issue is whether NCA/SP should, after 1982, hand over the Press to the Regional Government (who may then need to recruit senior technical staff); whether NCA/SP should continue to provide support for the Press as long as it is required; or whether NCA/SP should now project a hand-over date sometime after 1982 on the assumption that current manpower training plans are completed. The Mission favours the third option, which is also the preference of NCA/SP. This involves a termination of direct management responsibility in September 1983 with a one-year period of advisory work and a final withdrawal in March 1985. This timetable is tied to the return of Sudanese staff on training, and the Mission's view is that it should be kept to regardless of any reverses on the training front. By 1985 NCA/SP support for the Press will have extended considerably beyond the anticipated period.

#### 4.10. Training

There are formal training and education components in the various project budgets of NCA/SP. These are not large, consisting of funds for short courses and seminars, within the Agriculture Project especially. These include study tours outside the Programme area and in some cases to Khartoum and Nairobi. Staff seconded to NCA from the Regional Government are eligible for scholarships from non-NORAD sources and several are studying overseas at present.

NCA/SP is working closely with the Cooperative College of Kenya in training by correspondence and will use the planned Training Centre in Juba when it materializes (with DANIDA support).

When the road project started it was difficult to find trained operators and drivers and other skilled personnel in the Programme area. Therefore, the road project has to a great extent been obliged to train its own personnel of all categories. In general, people are trained through their work. This has given quite good results, but of course there have been some accidents because of careless or wrong handling of machinery. But it is now reported that the standard of the personnel has been steadily improving.

However, another question is whether enough has been done in order to recruit and train local people for higher level positions within the project. There is obvious need for such personnel also in the government itself. This fact should probably indicate a greater effort to train personnel for the road authorities.

It would be possible, of course, to greatly expand the training components of every project, but as the great majority of staff eligible for professional and technical training are on secondment from the Regional Government (and can be transferred at any time) there is no guarantee that such training would lead to localisation of posts held by expatriates.

The issues of training and localisation cannot be seen solely in the NCA/SP context and they are discussed more broadly in the following section.



## 5. ISSUES FOR THE FUTURE

This section is largely concerned with presenting arguments for an intensification of efforts to remove constraints to agriculture and rural development in Eastern Equatoria and with examining the implications of such an intensification for NCA and NORAD. But before addressing such strategic matters, the Mission wishes to consider the overall record of NCA/SP and some of the criticisms that have been levelled at NCA/SP - by members of the Mission, the Regional Government, NORAD, people of the area, and - not least - by NCA/SP itself.

### 5.1. The General Record

It is tempting for the outside observer to think in terms of a 'relief' stage of NCA activities in the year after the settlement of the civil war, followed by a 'development' stage when the more urgent tasks of relief and rehabilitation were completed and NCA could turn its attention to longer term task of creating the conditions for improved incomes, production and living standards for the people of the area.

This is, in fact, an unhelpful distinction to make. For many years to come, there will be a 'relief' problem in Eastern Equatoria: there will be outbreaks of disease, local grain harvest failures, collapsing bridges etc. Alleviation of distress will remain an essential component of 'development'. NCA may sometimes appear to spend an inordinate amount of effort and money on the relief and rehabilitation aspects of development at the expense of investigating the reason for the very low levels of productivity of land and labour which contribute to the need for such relief.

But in the view of the Mission the work of NCA/SP to date has been beneficial to a large number of people in the Programme area and without NCA/SP support the area would not have reached the present position of infrastructure and services where it is possible to consider realistically the option for long-term development from which all people in the area have a chance of benefitting.

On balance, therefore, the Mission feels that the funds made available to NCA/SP from NORAD have been well spent, and that there is a firm basis for considering positively the prospects for future funding.

On the basis of considerations about the state of the Sudan economy as a whole it is highly improbable that sufficient resources can be generated internally in the immediate future (next 10 years) to enable the Government to have any significant impact in terms of relieving constraints which are limiting the population's ability to satisfy their basic needs.

Other parts of the Southern Region are apparently even worse off than the Eastern Equatoria in terms of satisfaction of basic needs. There is a strong pressure on the Regional Government to distribute its resources thinly on the basis of different provinces' claims for a just distribution. Partly because of the NCA/SP achievements Eastern Equatoria is considered to be a specially favoured province, it is thus very unlikely that the level of support to the region will be kept up if the NCA/SP comes to an end in 1982.

Although NCA/SP has completed substantial physical infrastructural development, the structure of the existing production systems in Eastern Equatoria are such that it is unlikely that these facilities in themselves will serve to stimulate the production increase required to satisfy basic food needs. Thus the strategic importance of roads as a means to stimulate increased production through improved access to markets vary significantly with the production systems of the producers having access to them. As we have tried to show in the chapter on Human Adaptations, several of the production systems found in the region are such that it is unlikely that the roads will generate a rapid increase in the flow of products between different localities. Only when a certain level of dependence on access to wider markets has developed is it likely that a sufficient local commitment to road maintenance will enable Rural Councils to maintain this work efficiently. Correspondingly only when this dependence is manifested in a sufficient traffic load on the roads is it possible to have a government income from lorry taxes which can serve as a significant maintenance fund.

Discontinuation of the NCA/SP is thus likely to lead to deterioration at the infrastructural investments. In such a case the chances are that five years from now the judgment would be that the present achievements served more as symbols of aid than as factors in development. If it is a concern for NORAD that efficient use is made of investments already undertaken, it should continue to provide support to the NCA/SP. The problem is what strategy should be chosen in order to make efficient use of the established infrastructure (see 5.3).

## 5.2. Criticisms

There are five main areas where criticism of NCA/SP has been expressed:

- (a) insufficient attention to the administrative and policy implications of NCA/SP activities, particularly in relation to the eventual hand-over of functions to Government;
- (b) too much emphasis upon Torit and Kapoeta districts at the expense of other equally - or more - deprived areas;
- (c) insufficient emphasis upon the particular disadvantages of women in rural society and in public employment;
- (d) insufficient emphasis upon training of Sudanese staff and upon the localisation of posts;
- (e) insufficient emphasis upon finding ways of involving local people in development decisions and in implementing development activities.

### 5.2.1. Policy and Administration

In terms of overall policy and determination of priorities, NCA/SP and the Regional Government are working within the structure of the Agreement and the Mission found no reason to believe that this was anything but satisfactory for both parties. It is in particular components of the Programme that the criticism needs to be examined more carefully.

In infrastructure (roads, water, buildings), it is broadly accurate to say that NCA/SP has substituted for government in Torit and Kapoeta districts and thus has allowed Government to deploy its very scarce resources elsewhere. The demands for a continuation of NCA/SP infrastructural work remains; especially on school and hospital building but also on local maintenance. But the road network in Kapoeta and Torit has now been largely restored and even completion of the originally planned feeder road programme may not be justified in terms of its slow impact on commercialization and in terms of the Government's limited resources to cover the recurrent costs. On buildings, NCA/SP is increasingly undertaking work at cost for the various Government Ministries against approved expenditure.

The main difficulty, therefore, concerns maintenance: of roads and wells especially. Both of these functions are the statutory responsibility of local government councils. The evidence of 4.5.2. and 5.6.3. indicates that NCA/SP is, in fact, sensitive to the need to strengthen procedures of maintenance but this must involve substantial financial and technical support to councils.

In the health sector, NCA has - since around 1979 - been able to work within a Ministry Health Programme and NCA/SP is now in effect simply providing a technical assistance input with the Regional Ministry.

In the agricultural and co-operatives sector, questions of government priorities and the role of NCA/SP are similarly straightforward, although the future of the agricultural project does involve a closer liaison with government agricultural plans as these are likely to be subject to slight shifts in emphasis. There are two main objectives of regional agricultural policy: regional food-sufficiency, and the promotion of higher income generating 'cash' crops such as tea, coffee, tobacco etc. This involves three main thrusts: (1) towards direct production and nucleus estate schemes (e.g. for durra under mechanised farming, estates for tea, sugar, rice, state ranches; (2) towards encouragement of progressive farmer cash cropping (e.g. special tobacco, coffee, cotton extension services and marketing facilities); and (3) towards supporting small producers by removing constraints in the production systems of the great mass of subsistence-level farmers and stock-keepers working in

unfavourable climatic and physical environments far removed from government services and as yet unconnected to any regular system of input supply and produce evacuation.

These three thrusts are not mutually exclusive but clearly they compete for the same scarce financial and manpower resources. The Ministry of Agriculture is now moving towards procedures for co-ordinating the policies and priorities of agencies within the sector and the implications for NCA/SP have been discussed.

Within the Ministry, a Planning Unit has been given particular responsibility for conducting a series of base-line agro-economic surveys in selected districts (covering production, consumption, exchange (i.e. local barter markets) use of land and labour in advance of preparing district development plans which identify major constraints to increased production and potentials for improvements in crops, farm technologies, marketing etc. This approach involves three main disciplinary skills: farm management, rural sociology and land use planning.

The Unit is encouraging similar work in those districts where voluntary agencies, such as NCA, are operating. The Unit is likely to be able to offer professional support on a fairly moderate scale but its most important role is that of a clearing house for ideas and findings between the various agencies and Government. The intention is to formalise this role through a Regional Small Farmer Development Committee meeting possibly every three - six months. In addition to participating in this new approach, NCA/SP has also been asked to take over the research functions currently undertaken at the RDC by Ministry staff, and the Mission feels that this should be done.

The formation of the Unit is a particularly important initiative for NCA/SP as it provides a regional context for its work and it also ensures some form of Ministry responsibility for the success of RDC. This is important because there has, until now, been a question of whether the cost of RDC (especially if expanded further) could be justified in terms of the eventual takeover by Government when they serve such dispersed and marginal producers. There are roughly 10,000 farm families served by each RDC and it is unlikely that they are able or willing to increase dramatically, within a short term, their agricultural production given the uncertain climatic environment and weak market prospects.

There are some administrative issues for the RDCs (e.g. concerning the relative responsibilities of Ministries of Agriculture and Co-operatives and the professional standing of the post of RDC Supervisor within the Ministry) that eventually will have to be considered by NCA and the Regional Government. But these are not in the least pressing and the present working arrangements appear to be satisfactory.

In the co-operatives' sector, NCA/SP continues to work within the framework set down by Government and the relative successes of the Programme have been viewed as important indicators of the opportunities and difficulties which lie ahead for the co-operative movement and for the role of Government in promoting it.

To summarise: the mission found no evidence to suggest that NCA/SP could do more than it is doing at present to integrate its activities into the existing programmes and institutions of the regional and local government system.

#### 5.2.2. Geographical Emphasis

The evidence of 3.5 and 3.6 suggests that Torit and Kapoeta do not, in fact, receive an inequitably high proportion of total public investment in the Southern Sudan and the contribution of NCA/SP does not distort the pattern of regional expenditure and investment towards two favoured districts.

It is erroneous to believe that the ordinary villages in Eastern Equatoria are substantially better off at present than citizens of the regions elsewhere. This does not mean, however, that NCA/SP should not extend its activities elsewhere. Continued investment in water supply, school-building, health centres etc. might well mean that Torit and Kapoeta become pockets of relative affluence in terms of services. This is already the general belief according to the Mission's meetings with government officials in Juba. There are pressures for expansion

(particularly for water supply to the west and north of the Programme area) and NCA will be assessing the technical and economic feasibility of such work in due course ( It is, in fact, already drilling in Southern Bari ). All the Mission can record is its view that with its existing resources and programme it would not have been possible for NCA/SP to have operated with any degree of effectiveness outside the East Bank area and that any major new initiative, within the present level of resources, would have harmful consequences for the investment and services currently being provided to Torit and Kapoeta. There are specific issues involved for well-drilling and road-building as decisions on new investment in equipment will be influenced by decisions on expansion. These are discussed below.

### 5.2.3. The Position of Women

Programmes directed towards transformation of traditional agricultural societies will almost certainly have effects which for some population categories can be seen as negative. Since men in most such societies, are the category which is most active in the public sector development, activities are usually directed towards them. Consequently, there is a risk that women may lose out in the transformation process. This is an extremely difficult field and it is important to set out what sectors of life a programme can legitimately interfere in.

One sector which immediately can be identified as within the responsibility of an integrated rural development programme is technology. On the basis of the existing division of labour within different communities it should be possible to direct attention to technological innovations which would reduce the time women have to commit to various tasks. The water-drilling project is an obvious example of such improvements. Some of the prototypes developed in the village Polytechnic project may likewise serve to free female time from time-consuming tasks. A task which consumes a most important part of a woman's time is flour grinding. Small diesel driven flour-mills (or maybe larger mills driven by hydro-electric power if power plants in Katire or Nimule are established) would definitely allow women more time to other activities. The managerial aspects of such mills should, however, be carefully thought through before an eventual expansion is undertaken in this field.

Home economics is also an activity which falls within the scope of an integrated rural development programme. The Mission was favourably impressed by the home economics programme in Loa and would recommend strengthening of home economics in other parts of the area as qualified Sudanese staff is available. Initially this might require increased support (e.g. scholarships) for training of home-economists.

Concerning rules regulating male-female relations this cannot be the task of an integrated rural development programme for the obvious reason that such a programme has no legislative authority. Neither should it be the task of the NCA/SP to get involved in campaigns against the practice of activities, e.g. female circumcision, associated with female identity among specific categories of people. If support for such campaigns is considered important, it should be channeled through Sudanese institutions. However, although the Programme has no authority to change the rules of social life, it should try to design its development inputs in such a way that the chance of negative effects on women are minimised. Since such effects are impossible to completely anticipate, a certain amount of simple socio-economic monitoring should be considered, especially if the future Programme activities are oriented more towards real integrated rural development.

Since the programme has had very little impact on the transformation of the rural society, no negative effects of its activities on the position of women can be expected so far. In fact, given the conditions in Eastern Equatoria and given the resources of NCA/SP, the Mission is of the opinion that it would have been unjust and unrealistic to expect more of the Programme than the technological achievements they have made to improve the women's life.

#### 5.2.4. Training and Localisation

The Mission considers that the present expatriate staff are important to the success of NCA/SP and that there is no prospect at present of Sudanese staff being available to replace them on any significant scale. The more relevant issue is whether NCA/SP has done enough to train Sudanese staff for this eventuality. Training has been discussed in 4.10 and it is evident that NCA/SP has not invested heavily in staff development. There are at least three reasons for this decision:



(a) it is very expensive to train professional and technical staff given the paucity of training facilities within the Southern Region; (b) training (or manpower development) is primarily a government matter, with needs and priorities to be determined regionally rather than project-by-project; and (c) training is an area where other sources of technical assistance are already available.

There are many projects similar to NCA/SP where 'training' has its own budget for which a Training Officer is responsible. In such projects, 'training' involves organizing scholarships, short releases and in-service courses, as well as generally monitoring the manpower requirements of localisation policies. On balance, the Mission feels that the advantages of having such a post - with earmarked funds - are not outweighed by the costs involved. Training should remain the responsibility of particular components of the Programme, where - as far as the Mission could tell - individuals were attempting to pass on advice and skills to local staff in their different ways.

'Localisation' is a slightly different matter as it involves recruitment as well as training. Many Programme posts are, in fact, filled by staff on 'secondment' from Government so the main area of NCA recruitment where localisation is an issue concerns fairly senior-level posts currently filled by expatriates. It is impossible for the Mission to take a firm view on the potential availability of Sudanese staff for expatriate-held posts. The three Printing Press posts have been discussed in 4.10; the six Health posts are patently necessary; and the fourteen posts in engineering and buildings are related to the particular requirements of this phase of the project. This leaves the 'administrative' posts (seven in all) and the 'agricultural' posts (eight in all). On the face of it, it should be possible to make appointments over the next few years to more administrative posts without impairing the efficient running of the Programme. Two administrative posts are already held by Sudanese (Liaison Officer and Personnel Officer). In agriculture, it may be possible, over a similar period, to ask the Ministry to second one or more of the present establishment to the post of RDC Supervisor.

Such appointments would be important for the character of the Programme. The Mission was disappointed with the virtual invisibility of Sudanese staff at Hilieu Centre and feels that some effort should be made to reduce the social distance that exists between Programme staff and the Southern Sudanese among whom they work.

#### 5.2.5. Participation

In 'Basic Principles', participation has been emphasized both as an end and as a means of development. What this means in concrete activities and how to evaluate the Programme's performance in relation to this is difficult to specify. As the Mission sees it, participation must relate to people's opportunity to and interest in taking part in decisions which have consequences for their future livelihood. From this point of view the important issues to look at are the institutional frameworks within which people can exercise influence over decisions, and how NCA/SP relate to these institutions.

In all the groups of Eastern Equatoria decision-making in agricultural and pastoral production is regulated within various form of family structures. Supposedly one of the meanings of participation implied in BP is that development should be based on the responses of the existing family farm units. The significant question to ask from the perspective of this interpretation is not how many families have received relief and health care, or how many have bicycled on the feeder roads, but rather what has NCA/SP delivered (information and concrete resources) which have stimulated family farms to adopt improved cultivation practices (in terms of marketable surplus, nutritional value for own consumption, or risk insurance). In the Mission's judgment little has been achieved of participation in this field. However, given the nature of the existing production systems, the limited information available on them and the relatively small resources devoted to the agricultural project, one should not expect great achievements in the short period the programme has been in operation.

Another meaning of participation relates to people's influence on decision relating to programme activities. This is again an extremely difficult area where there are no ready-made solutions. Some attempts have been made to make programme resources available to support local commitments

to invest labour in construction of communal facilities, e.g. school building. Such attempts are laudable and one ought to look into the possibility of establishing institutional mechanisms whereby such local initiatives can be better articulated and coordinated. There is also a need for such institutions in order to avoid project activities which may directly alienate local interests. Apparently in Lafon the selection of the building site as well as the farm site was taken without proper consultation with rightholders involved, in this case mainly the village of Pugeru, and consequently a certain amount of bad feelings about NCA has developed in this village. If cooperatives get established as a viable and widespread organization they might serve to improve some aspects of participation at this level.

### 5.3. Priorities

#### 5.3.1. Programme Approaches

The mission has considered two contrasting strategies: a multi-sector demand-led strategy, and an integrated rural development strategy. Both strategies have clear advantages and disadvantages and although the Mission has got its opinion on what strategy is preferable, we strongly emphasize that other considerations are important, particularly NCA's comparative advantages in implementation of alternative strategies.

##### (a) Multi-sector demand-led strategy

This basically implies a programme composed of separate projects organized to tackle specific tasks typically of a technical nature. The demand for these tasks as it is articulated in Eastern Equatoria should then be the guiding line for the scale of different projects. From interviews with local people the Mission got rather consistent responses reflecting the rural population's conception of what tasks should be given priority within the NCA/SP. The listing was almost invariably as follows:

1. health facilities and water drilling;
2. school buildings;
3. roads;
4. agricultural projects;
5. cooperative projects.

this priority list obviously reflects people's experience of the benefits they have derived from such projects. Although politicians' priorities may be based on additional considerations the opinion in their constituencies are obviously important. This approach would most likely lead to a strategy concentrating on establishment of physical infrastructures.

Related to this one might think about support to the educational system. There has also been strong requests from the Regional Government for increased support in this sector. Although the Mission clearly appreciate that education is a 'good' in itself and thus deserves support, it will also emphasize that in a poor region with scarce resources one has to think about returns to investment in education in order to justify further NCA/SP involvement in this sector. The Mission has doubts about the contribution of the present educational system to improvement of sector which in the foreseeable future will be the basis of the economy, namely agriculture.

This multi-sector approach could also lead to expanding activities of specific projects into other areas since no questions of integrated strategy is involved. From an aid agency's point of view there are great advantages in this approach:

- it responds to expressed priorities in the region;
- the tasks involved can be attacked separately and in the management of the project, there is control of the process from when the inputs are brought in until the 'goods' are delivered (except for the two last components on the list);
- administration of the programme is thus relatively simple;
- the achievements of the programme are easily demonstrated.

The disadvantages of this approach primarily follow from the assumption that since such infrastructures are necessary elements in the functioning of economically advanced market-organized societies, their introduction in subsistence based societies will be sufficient to set in motion a process of self-sustained economic growth and social change.

There are several problems with this assumption:

- the period required from the time the infrastructures are constructed and the time when productivity has reached the level where the economy can meet the recurrent costs of these investments are rarely specified and if specified, it is usually on very unrealistic assumptions about the nature of the socio-economic transformation involved. Consequently donor agencies are frequently faced with the following dilemma: if their commitment stops at the establishment of the infrastructures their investments will not be maintained, and if they want to prevent waste of resources contributed they may be stuck with the programme into an indefinite future;
- the assumption may not hold in the sense that elements which are of vital importance in some economies may not be the same as those which are most strategic in terms of achieving rapid transformation of other economies. Resources may thus be wasted in unwise phasing of development inputs. The barely-used Lafon road is possibly an example of this.

(b) Integrated rural development strategy

This approach is focussed on the constraints which maintain a low level of income among rural producers, and integrates inputs with reference to judgments about their importance in relieving these constraints. From this approach one would start by looking at farmers' inputs in production and their terms of trade:

- land, its quantity and quality;
- technology, its efficiency and costs;
- labour, man hours put into production over the seasons;
- relative prices.

The basic question which has to be asked is what conditions can a programme change in order to improve the farmer's income and production. If the perspective is followed through, the following considerations would serve as guidelines for choice of inputs:

- inputs in the health sector which focus on control or treatment of diseases with a disabling effect on labour input;
- provision of clean water which is of fundamental importance for its health implications and thereby on labour input;
- a research component involving crop trials and cultivation methods in order to design and test an extension message which represents an improvement to existing practices and which can be adapted to the farmers' resources (financial, as well as the labour available in the household);
- an extension component delivering such well-tested messages to the farmers;
- a village polytechnic (rural technology) component to find simple technological solutions which the farmers have the means to adopt;
- a cooperative component which in addition to delivery of technological inputs for production, can also provide the local communities with a supply of a wide range of consumer goods which serve as incentive to increased labour input in order to increase the market surplus required in order to buy these goods.

The above considerations imply that the RDC would play a key role in the programme. Provided the activities on the RDC are well-oriented it is from them that one might expect a break-through in terms of developing techniques and crops which represent a real improvement in terms of risk insurance, dietary value, and market value. Improvement in rural production may eventually carry the recurrent costs of improvements in other sectors, while improvement in other sectors do not by themselves improve rural production. If this strategy is chosen the RDCs should be greatly strengthened. Initially the research component has to be greatly improved in order to avoid irrelevant trials and in order to collect data from the trials which make it possible to draw any conclusion with regard to the relative advantages of different crops cultivation methods.

### 5.3.2. Putting Agriculture First

An integrated rural development strategy therefore involves a high priority for strengthening the Agricultural Project of NCA/SP and particularly the RDCs.

#### Research

The Mission feels that a substantial strengthening of the research work of the NCA/SP is necessary in agriculture. Above all, each RDC must have a clearer idea of its research programme and how this fits in the prospects for extension work, input supply, and eventually marketing. Much closer attention to the needs and potential of small farmers is required and this can only be done if more information is available.

One practical meaning of 'research strengthening' could be the establishment of (say) five additional expatriate posts in agronomy, animal husbandry, soils and water conservation, farm management and marketing economics. The Mission does not, however, feel that this would make a significant impact given the size of the area and diversity of the environment and the inevitable demands of routine administration and supervision on senior staff. A preferred alternative would be to commission a team to undertake an area-wide land use survey and prepare a series of development plans for each agro-climatic region based on the RDCs. Given the heterogeneity of the region both in terms of natural environments and human adaptation and given the limited information of these features it is essential to have a better information base in order to reduce the risks of irrelevant activities. This survey should include the following features:

- soil, water and pasture survey;
- establishment of a wide system of rain gauges in order to get information on drought risks (this is a fairly simple operation and competent ecologists with experience from this type of work in semi-arid Africa should be consulted);
- survey of labour requirements in various phases of the agricultural cycle in existing systems of production;
- survey of existing varieties of different crops;
- survey of markets where cash crops feasible in Eastern Equatoria can compete;
- potential for establishment of agro industries.

On the basis of information from such a survey the research on the RDC has a better chance of directing its attention to relevant tasks. For example, one area of necessary research is soil and water conservation, with particular emphasis upon possible improvements in methods of tillage and water harvesting (i.e. preventing rapid run-off of rainfall) within peasant farming system where the technological aspects of land use are so closely bound to the use of farm labour and the ways that risks are spread.

A serious problem in such research is the continuity of personnel. Tropical agricultural research is not an easy task and knowledge about the state of the research is not something that can be easily handed over to a successor, like a road engineer can hand over to his successor. It is, therefore, advisable that a research institute takes on responsibility for this activity and supplies the staff.

#### Production

Given the periodic food shortages in Eastern Equatoria and given the potential for mechanized agriculture on the floodplain north of Lapit, the NCA/SP should consider the possibility of taking over large scale mechanized sorghum farming over unused land in this area, in the order of 1500 feddan. This would require lease permission from Government. In addition, negotiations should be undertaken with the groups of Lafon considering this area as their communal property and possibly a compensation should be paid also to these groups for the period of the lease, e.g. 10 years. Before mechanization is taken up a land use plan for this area should be completed and sanctioned by Government. This plan should include a zoning of land taking into consideration the interests of protection of wildlife, the needs for dry season pasture of the livestock of surrounding groups and the needs for future agricultural expansion among the smallholders of the area. In order to protect the interests of the smallholders it is essential that this zoning takes place before mechanization starts.

Mechanized agriculture under the conditions of the floodplain requires seasonal supply of labour for specific tasks, like weeding and harvesting. This should be done on piece work basis and cultivators should be recruited locally. The Land use survey would provide information relevant for



phasing production on the schemes in such a way that the labour requiring tasks there did not coincide with labour peaks in the farmers' cultivation system. This would be necessary in order to plan production in relation to seasonal wage labour supply.

The sorghum harvest from the scheme could provide an insurance against periodic food shortages. A possible way of organizing this could be through construction of silos in strategic locations, like Torit and Kapoeta. Sales from the silos could be organized through the cooperatives. One way of doing this would be to tie sales to products the farmers had marketed through their cooperatives, i.e. by selling crops or livestock through their cooperative, farmers would get receipts which gave them a claim to buy from the silos quantities of sorghum related to the amounts of crops they had marketed.

If the price level for sale to cooperative members was kept below a certain maximum level, the farmers would have a security which would allow them greater freedom in taking risks with regard to committing more of their production to the market. The movement of subsistence farmers into commercial farming almost invariably implies exposure to greater risks. Unless small farmers have funds to fall back upon, they are naturally very reluctant to take on such risks. The links between mechanized food production schemes, local storage and cheap sales from storage related to cash crop marketed through cooperatives, would not only give cooperatives a comparative advantage vis-a-vis merchants, it would also involve a degree of insurance. It could thus serve to stimulate a diversification of regional production in relation to the comparative advantages of different localities.

Localisation of the mechanised schemes is a long-term prospect, but one should immediately explore and plan for the possibility that e.g. Torit Cooperative Union in the future might hire managers to the scheme. This should, however, not be done until the cooperatives are solidly established as the critical link in a diversified regional production system.

Finally, the mechanised scheme should have the capacity to hire out a certain amount of mechanised services for soil preparation to smallholders in surrounding areas (primarily Lafon and Lapit) at cost price.

### Pastoralism

In the pastoral areas the Mission does not suggest any large-scale NCA/SP inputs in the immediate future. The Land Use Survey should provide information on the optimal zoning of land for agriculture and pastoral production, on allocation of exclusive pasture rights to individual groups, and on possible mechanisms which could serve to coordinate individual husbanders' investment strategies in such a way that stocking rates did not exceed carrying capacity. If a plan based on such information is accepted by Government and by the pastoral groups involved, and if Government can establish effective police control in the area, then NCA/SP should consider involvement. If these conditions are not satisfied, the request for water and veterinary services would most likely lead to undesirable consequences in the term of desertification if they were met.

### Programme organisation, participation, monitoring and extension

If an integrated rural development strategy is followed, the programme should be based on the assumption that new bottlenecks will emerge as others are relieved, and that there is a constant danger that efforts directed towards constraints in one sector are undermined by processes in other sectors. Consequently, integrated Rural Development requires a Programme with the organisational capacity to redeploy its resources as new constraints emerge or as undesirable secondary ramifications of programme activities are discovered. A good example of the need for such flexibility can be seen in the ox plowing programme. Among the Acholi farmers there was a clearly expressed interest in ox ploughing. However, the risk of losses caused by trypanosomiasis and other diseases is an effective constraint holding back any further expansion of this activity. The obvious question to be addressed in this situation is to compare the costs of support to an efficient veterinary service with expected benefits in terms of more efficient soil preparation. Clearly such organisational capacity have budgetary and administrative implications which ought to be clarified.

The programme's ability to adapt efficiently to the needs of the population in a changing environment is significantly dependent on the adequacy of the channels of communication between the programme and the people. This is not

only a question of finding media whereby the "enlightened" can influence the "ignorant", but just as much a question of establishing institutionalised fora where the people can articulate their interests vis-a-vis the programme. Given the socio-cultural heterogeneity of the region, establishment of such fora will necessarily differ in relation to different groups, and one should expect a period of trial and error before a feasible solution is found. It should, however, be one of the tasks of the landuse survey to provide relevant information for such institution building.

However, the information needs of the programme are not sufficiently cared for by establishment of such communication links. As has been stressed repeatedly in this report, a programme of the scope we are dealing with here must expect that its activities may have far reaching repercussions which not all may be desirable, e.g. with reference to how different population categories are able to make use of the new opportunities. It is quite clear that not all groups in Eastern Equatoria are equally prepared for participation in more market oriented production, and it is consequently a possibility that some may be losers in the new "game". If economic losers tend to correlate with ethnic identity one would expect undesirable consequences for political stability. One might likewise expect undesirable consequences if the losers correlated with sex identity. On the basis of such considerations the Mission suggest that a small socio-economic monitoring component ought to be built into the programme.

A final issue of organisation the Mission wants to draw attention to relates to extension efficiency. A critical problem in all extension work is the efficiency of the extension workers, how to make them committed to spread the message. The poor performance in many projects is partly due to the fact that the message is very inadequately developed. There is also the question of the extension workers' motivation. It is extremely difficult to maintain devotion to the task only because of an idea of a moral duty to help one's people. The usual complaint of extension workers is lack of transport; without cars they don't see much reason to spend their time walking or bicycling, especially when there are no tangible rewards attached to it. This last point is very important and a kind of reward system should be tried, whereby extension workers accumulate bonuses according to the number of times they have been contacted by farmers.

To work this requires several conditions:

- there should be several extension workers on the RDC's and the farmers should be allowed to select the one they want advice from;
- provided that the research side of the RDC's have developed real improvements for the farmers, the farmers should pay a small fee for learning these improvements.

Under such conditions the extension workers should be in a position where their rewards were dependent on their ability to convince farmers about the importance of what they were doing. This would stimulate their attention to what was going on in the agricultural research, as well as to contact farmers and talk to them in an understandable language, instead of demonstrating their educational status by using incomprehensive terms from their syllabus.

### 5.3.3. Cost Implications

Putting Agriculture first, within the context of an integrated rural development strategy, would mean a fairly substantial re-allocation of resources. Assuming that the present level of expenditure is maintained, this would also mean a substantial reduction in some parts of the Programme. And, as a corollary, if major parts of the Programme are not reduced, then there cannot be a sufficient investment in Agriculture. For example, if road construction continues at the present level, it will take around 5-6 years to complete the 1974 priority list (of 580 km) at around NOK 4 million per year. In addition, there would be replacement costs of around NOK 6 million in 1982 (including 1 bulldozer D6, 2 wheel-loaders, 1 grader and 4 lorry-tippers) for such a programme. Even if no more road construction is undertaken, the cost of maintaining existing reconstructed road (assuming it is borne by NCA/SP) will be NOK 2-3 million per year. The borehole drilling programme similarly involves new capital investment if it is to be continued. Two aquadrills (plus compressor and lorry) would cost around NOK 2.5 million and running costs would be at least NOK 2 million per year. A Land Use Survey of the kind suggested could take a year and cost in the region of NOK 4 million and it would obviously only be worth the cost if it identified further investment opportunities for small-scale agricultural improvement.

There appear to be two main alternatives for NCA/SP after 1982 within current expenditure levels.

- (a) Emphasis upon agriculture, cooperatives and RDC; roads, buildings and water put on a care-and-maintenance basis;
- (b) Continued infrastructural development, e.g. roads, water in neighbouring areas, school-buildings with small programme of trials and seed multiplication.

In both alternatives there would be room for a limited health programme, for humanitarian as much as developmental reasons, but there does not seem to the Mission to be a strong case for finding a middle way. NCA/SP has performed fairly well to date in striking a balance between short-term technical assistance priorities, demands for physical infrastructure, and longer-term development initiatives. But in the view of the Mission, it must now consider whether it is willing to invest substantially in agricultural development within a longer perspective of how the people of Eastern Equatoria can benefit from external assistance. If such a view is accepted, a reduced effort in those activities which are technically and administratively easier to execute can only be avoided if there is a substantial increase in the financial resources made available to NCA/SP.

#### Disadvantages of Integrated Rural Development Strategy

This strategy has several disadvantages:

- it is much more difficult to administrate;
- it requires adequate and rapid information feedback from the effects of programme activities to programme authorities;
- the results are incremental and not easy to demonstrate between the visits of evaluation teams;
- the process is not controlled in the same way as a technical process;
- expertise which is both competent to solve their specific tasks, and have some kind of understanding of what a rural transformation involves is in extremely short supply.

## APPENDIX 1: TERMS OF REFERENCE

Tasks of the Evaluation Team1. General objectives

The evaluation team shall undertake a general assessment of the activities and achievements of the Programme from its beginning in the light of the "Basic Principles" (1974), other objectives laid down as well as the political, economic and social situation in the Programme area.

Further, the evaluation team shall review existing plans for the continuation of the Programme. Desirable changes of such plans shall be indicated, in view of the general assessment (preceding paragraph) as well as present and expected future budgetary constraints.

2. Organisational and administrative aspects

Bearing in mind that the Programme is to be integrated into the activities of the Sudanese authorities at some stage, the team shall

1. review the adequacy and complementarity of the present activities as an integrated rural development programme, with regard both to local needs and wishes and the activities of Sudanese authorities and other organisations;
2. assess the adequacy of the Programme's organisational and administrative procedures;
3. consider the relationship between the Programme and the activities of the Sudanese authorities and, if necessary, indicate changes to improve on coordination and facilitate local takeover.

3. Training and education

In view of the need to facilitate Sudanese takeover, the team shall

1. assess the achievements of the Programme's job training activities and, if necessary, suggest changes;
2. consider the need for education and training of Sudanese personnel; moreover the team shall
3. give attention to the Programme's recruitment, training and

education of women.

#### 4. Engineering project

With reference to i.a. the existing and potential economic situation, the level of Government spending, the local transportation needs and the technological and managerial level, the team shall

1. assess planning and work procedures as well as achievements of the road construction programme, and consider plans for its continuation;
2. consider the organisational set-up and choice of technology for a maintenance organisation and feeder roads in the Programme area;
3. in addition the team shall assess the adequacy and progress of the building project.

#### 5. Agricultural project

The team shall

1. assess the project's present and potential future effects on agricultural development;
2. assess the adequacy of the agricultural activities at the Rural Development Centers (RDCs) and consider any plans for new RDCs or sub-centres, in view of the project's capacity and of ecological, social and other problems critical for agricultural development. If necessary, suggest changes;
3. consider the relationship between RDC agricultural staff and local farmers and, if necessary, indicate organisational or other changes that may improve contact;
4. assess the Programme's attention to the involvement of women.

#### 6. Cooperative project

Departing from the social and economic situation and the aims of the cooperative movement, the team shall assess cooperative activities in the Programme area and the project's role in the development of these activities.

## 7. Health project

The team shall

1. assess the project's activities and achievements in rural health work, and, if necessary, suggest changes;
2. consider specifically the project's activities in preventive health care.

## 8. Research

The team may point out subjects related to the Programme on which research could be fruitful.



## APPENDIX 2: HUMAN ADAPTATIONS

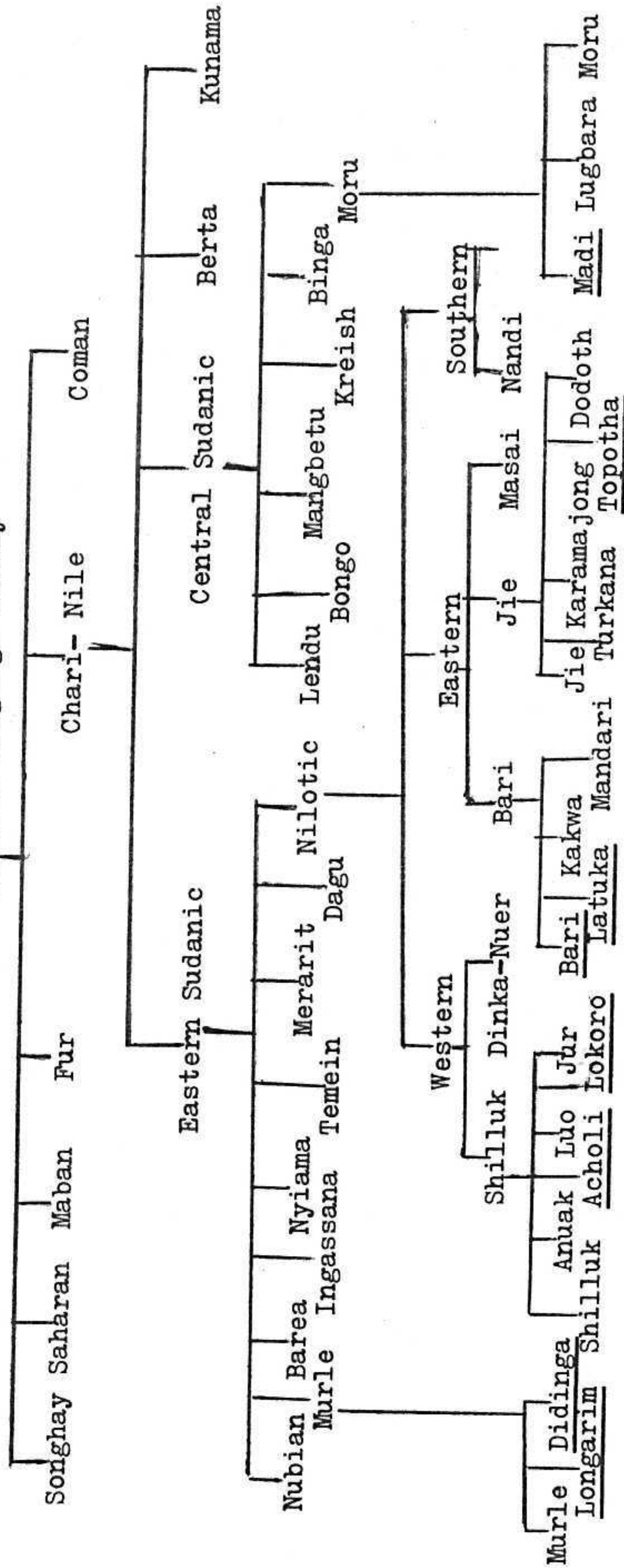
In the language family chart the main groups in the programme area are underlined and their position in relation to other main groups within the large Nilo-Saharan language family is indicated (newer linguistic research has demonstrated that the term Nilo-Hamitic does not refer to any meaningful linguistic unit, and it is thus not used here). The data available on the social organization of the groups is rather scanty. The following is primarily based on information from the socio-economic survey.

I shall briefly try to outline how specific features of the social organization of various groups serve as techniques whereby different populations maintain an adaptation to their environment.

### 2.2.1. The Topotha

The Topotha inhabit the south-eastern plains and base their adaptation primarily on animal husbandry, supplemented by some sorghum cultivations. No reliable data on human and livestock numbers exist, but the human population is probably in the order of 120,000 and cattle population around 200,000. Transhumant migrations from the banks of Singaita and Lokalyam (where they have the more permanent villages, cultivate sorghum and keep their animals in the rainy season) to the floodplain and towards Ethiopia and Kenya (see Map 2 for main directions of dry season migration) are of fundamental importance in their adaptation. These ill drained areas are not favourable for animal husbandry in the rainy season. In the dry season they do, however, provide good grazing from "sweet" perennials which stay green until the end of the year and which are palatable when dry. The quality of the water in these areas is, however, exceptionally poor. The most severe limitation on livestock numbers is probably shortage of good dry season water supplies on the plains. However, the stocking rate which is built up in this adaptation is apparently above the carrying capacity of pasture on the more well-drained soils near the home areas where they spend the rains. These more sandy soils are vulnerable to overgrazing and erosion was reported before the disturbances (Harrison's grazing report, 1953). Pressure on pasture has probably increased further since then as a consequence of expansion in sorghum cultivation.

Nilo-Saharan language family



If this argument holds (it is consistent with available evidence, the evidence is, however, far from satisfactory) it has clear implications for planning of expansion of water facilities in dry season areas, i.e. it should not be done unless coordinated with a comprehensive landuse plan. Although the rationality of migratory movements are easy to understand, it may be more difficult to understand the adaptive rationality of the Topo<sup>o</sup>tha institutions of kinship and marriage, clan and lineage, generation and age sets, sections and chiefship, and ritual meat feasts. However, it is reasonable to expect that they must have had some kind of survival value in order to be maintained in the harsh environment of the Eastern plains. The key to understanding of this survival value lies in the way these institutions have served to provide security for a large number of people.

Security for life and property has never been guaranteed by effective Government in this part of Sudan, it depended on locally mobilized support. The basic issue in security is cattle, they are the basis for livelihood as well as a means to acquire wives and gain influence. Cattle are wealth which by proper management have substantial growth potential. Moreover, it is a form of wealth which can be easily lost. Periodic draughts and epidemic diseases are factors which constantly threaten the viability of individual households. Just as important as natural contingencies is the danger of raiding from competing groups. In the absence of efficient police apparatus which guarantees the security of the individual husbander, his chance of survival is significantly dependent on the numerical strength of the groups supporting him. The institutions of clan, age, generation, kinship, and section create a network of crosscutting loyalties; people who are separated within the framework of one of them, are united within the framework of others. Consequently they serve as mechanisms integrating a large population as one political unit. The fact that centralized chiefly rule hardly plays any role in creation of this unity indicates the strength of these institutions. Their importance may be understood against the following conditions:

- Pastoral capital has a high growth potential (animals breed animals).
- Pastoral products provide the basis for a healthy diet.
- A healthy diet stimulates human population growth.

- Pasture carrying capacity within any given area limits the number of animals, and thereby the human population which the area can support.
- Population growth within pastoral groups thus favour evolution of institutions which a) serve to eliminate surplus personell from the pastoral area, or b) allows for expansion of the population over a larger area.

In East Africa the selection pressures have favoured evolution of institutions which are adaptive in political mobilization of personell for expansion of territorium. If political support is one aspect of these institutions, the other interconnected aspect is the economic support and risk sharing they imply. Although animals can be said to be "owned" by individual management units, any owner is likely to be indebted to and have claims on somebody else's animals. Such debts have been established in marriage transactions, in transactions of animals for influence and prestige on ritual meat feasts, or through obligations to support community members in need. In a way a significant aspect of Topotha community may be described as a system of outstanding cattle debts. This system of lending and borrowing serve to increase the chance of survival of individual households when their economic viability is threatened. Although much more need to be investigated of the Topotha social organization our present knowledge is sufficient to state that it represents a highly efficient adaptive technique to harsh natural conditions and competing pastoral groups in an environment characterized by poorly developed marketing system as well as administrative control. The institutions which can be seen as efficient in maintaining the Topothas adaptation to their environment as a group have, however, significant implications for the individual management units' freedom of allocation of their resources. The following example will illustrate these implications.

Although the nuclear family or the extended family (in case the father is alive when the sons marry) can be identified as management units, their livestock management is significantly constrained by relationships between such units.

The following are some typical examples.

(a) Bridewealth is in the order of 40-60 cattle. However, at the establishment of marriage only a fraction of this is paid. The rest is delivered at irregular intervals and always after repeated request from the "creditors". These "creditors" thus evaluate the "debtor's" ability to repay and they take a keen interest in the way he husbands his cattle. If he consumes them at home or sells them in the market this reduces their chances of repayment. Such activity is therefore sanctioned by public isolation, exclusion from ceremonial occasions when meat is consumed, lack of support in case of raiding, harassment.

(b) Ceremonial slaughter. Such slaughter involves oxen and it is an important prerequisite for acquisition of rank. However, the one who performs the slaughter does not take the ox from his own herd but selects it from somebody else. This, however, implies that he becomes a "debtor" to the owner of the ox and he has to repay it later with a heifer. This is again a type of delayed exchange and repayment is only done after repeated "begging". The "creditors" in these types of transactions of course also take a keen interest in the "debtor's" cattle disposals. The sanctions on allocations which affects the "creditor's" interests are similar to those mentioned under (a).

The effect of such institutions is that a significant aspect of the Topotha social organization can be characterized as a system of delayed cattle exchanges. The effect of this on off-take from the herds is that cattle are hardly used for home consumption at all, and the number which is marketed is limited to what is required for tax purposes or for purchase of grain in case of a bad harvest. In Topotha society, then, everybody has a keen interest in other people's herds and also a keen interest in preventing others from knowing their own herd-size. The longer a person can delay his own debts and the sooner he can "cash" in other people's debts to him, the greater chance he has to be a successful Topotha. This system of sanctions works as a constraint on increase in the commercial off-take.

This analysis has certain implications for planning:

- Unless Governmental control increases, better marketing facilities is unlikely to produce significantly higher commercial off-take.
- Increased population growth within a limited pasture area and, consequently, increased dependence on cereal diet is probably the single most important factor which may stimulate higher commercial off-take.
- Increased commercial off-take is likely to lead to reduction in importance of communal consumption of meat.
- Increased commercial off-take will primarily affect the male animals and will consequently have little effect on relieving pressure on pastures.
- Pressure on pasture is expected to stimulate increase in cultivation.
- Increase in Governmental control and increase in commercial off-take is likely to weaken the institutions which so far have provided a basis for social control and economic support within Topatha community.
- The poverty structure in Topatha is thus likely to change dramatically with commercialization and there will be need for capacity to introduce ad-hoc relief means in a transition period.

#### 2.2.2. Latuka - Lango - Lapit

The people of this group live in the lower mountain slopes and hills of South Eastern Hills and Mountains. There are indications that these groups were formerly pastoralists. Whether they have been pushed out of the Eastern Plains by the Topatha or weather increase in tsetse flies in their present area is the cause of the present reduced livestock importance is uncertain. Today tsetse occurs in some of the stream valleys, especially during the wet season. Rainy season movements up the hill slopes or down the valleys to fly free areas is practised as a technique of coping with the tsetse threat. The seasonal movements are local, generally towards water in dry season and away from tsetse in rainy season. Although cultivation is the dominant subsistence activity today, livestock is still important as objects of investments and security when the badly distributed rainfall of these areas causes local crop failures.

The settlement pattern of Latuka communities is characterized by relatively large compact villages based on a complex social organization. Like the Topatha the Latuka are organized on the basis of several principles (clan membership, age, rain maker authority, etc.) which serve to integrate the population in a network of crosscutting loyalties.

It is reasonable to assume that this type of organization has evolved as a response to the problem of maintaining order internally in a rather large community and maintaining security vis-a-vis competing groups. The settlement problem which is an attribute of the Latuka social organization has probably also certain implications for cultivation pattern. Most importantly it seems to produce a zoning of crops around the villages; in the sense that it is a concern to have the more labour requiring crops like sorghum closer to the village. Given the large size of the villages there is thus a certain competition for land for sorghum cultivation around the villages leading to a rather high land use factor  $\left(\frac{\text{years cultivated}}{\text{years fallow}}\right)$  in the order of  $\frac{1}{2}$  has been indicated. This does not allow for much bush regeneration, and with limited systematic use of manure, one would expect localized over-cultivation. One would also expect that population concentration and concern for sorghum might serve as a constraint on cassava cultivation. This is a crop which can easily be stolen. When grown at a distance it is difficult to protect, while grown nearby it would significantly increase the time required to walk to the sorghum fields. This argument on cultivation pattern is based on the impressionistic observations and interviews, and ought to be investigated further. If it holds, one would expect variation within Latuka communities with reference to variation in settlement pattern and with reference to over-cultivation. If it does not hold, the data which falsifies it will at least draw attention to which other factors are relevant in the Latukas' agricultural management, and these factors are in this case unlikely to be the frequently stated ignorance and laziness of the Latuka.

### 2.2.3. Didinga and Boya

The Didinga and Boya (probably about 30-40,000) inhabit the hill ranges between the Latuka and Topotha. This area is part of Lower Mountain Slopes and hills or Southeastern Hills and mountain region. The Didinga and Boya are closely related to each other, but rather distantly related to the surrounding groups (see linguistic chart). Like their neighbours the Topotha, they are strongly devoted to cattle - they have their favourite oxen, they have the ritual meat feast, they use cattle in marriage transactions, and especially the Boya use the blood and milk diet. Like Topotha and Latuka they are also integrated around a complex network of loyalties derived from clan and age identity. Apparently the political strength created by this social organization has not been strong enough to hold the ground against the Topotha on the open plains and the distribution of Didinga and Boya has largely been confined to the hills.

This has given certain advantages in terms of defense but has been less favourable in terms of animal husbandry especially for the Didinga. While the Boya have been better able to maintain their position in a predominantly pastoral niche and thus directly compete with the Topotha, the Didinga have developed an intricate system of agricultural production and the relationship to the Topotha has to some extent taken on a more symbiotic character in the form of exchange of livestock and agricultural products. Since the Boya seem to have developed an adaptation similar to what has been described for Topotha, the following presentation is confined to the Didinga.

The Didinga are settled in rather small hamlets on the mountain slopes of Didinga mountains. In order to understand the agro-pastoral production system of the Didinga it is important to be aware of the fact that individual household can base their adaptation on exploitation of three ecological zones; mountain plateau, hill slopes and valley bottoms and plains.

For traditional animal husbandry the important distinction was the plateau where the castrated oxen and non-lactating cows were kept, and the settlement areas on the slopes where lactating cows, calves and bulls were kept. There seems to be little indication of environmental deterioration caused by overstocking. There does also seem to be a trend towards increased seasonal exploitation of pastures in the Kidepo plains. Presence of tsetse does, however, imply a severe constraint on animal husbandry in this area. Although livestock is of critical importance as an insurance in case of crop failure, cultivation is by far the most important subsistence activity. Cultivation took place on all three zones; the plateau, the hill slopes and valley bottoms. The main crops were sorghum, bullrush millet and finger millet. Driberg mentions that the Didinga terminologically distinguish about thirty species of slow maturing sorghum and almost twenty varieties of quick maturing sorghum. The slow maturing and the quick maturing varieties have different environmental requirements. The following table (after A. Sandnes) is a simplified representation of some topographical and seasonal aspects of cultivation of different crops.



	Wet season	Dry season
High mountain ca 1600-1900 m	Maize Finger millet	Early sorghum Maize
Middle and low mountain area ca 1000-1600 m	Early sorghum Late sorghum Bullrush millet Finger millet Maize	

In an environment characterized by great variations in distribution of rainfall from year to year and from locality to locality, this distribution of cultivation of different crops in different zones in different season is another technique developed by the Didinga in order to cope with the contingencies of nature. The most important cash crop in the Didinga area is the local snuff tobacco, which is extensively traded to the surrounding groups. In addition new crops like cassava and ground nuts have been introduced in the cultivation system. A large part of the Didinga fled to Uganda during the disturbances and after the Addis Abeba agreement there seems to have been a tendency to resettlement lower in the valleys. Although this may have certain advantages in terms of access to soils more easy to cultivate and closer to Kidepo pastures, one would expect this to imply a certain loss in terms of ability to utilize the higher zones and thereby reduced risk insurance.

#### 2.2.4. The Lokoro (Pari) of Lafon

The Lokoro number about 20,000 and live in one continuous settlement around Jebel Lafon. In some ways the Lokoro are similar to what has been described for the Latuka. Crop production differs, however, with respect to the main sorghum crop which is grown on the fertile clay soils of the flood plains surrounding Jebel Lafon. The fields are cultivated for a considerable number of years before it is necessary to rest them. Several sorghum varieties are distinguished. The grain is of good quality and gives two crops, the first harvest in August and the second in December. Animal husbandry is also of certain importance. During the dry season from December to June they keep the animals near the swamps of the Kinyetti river where water and green grass is available. In the rainy season

the cattle do not thrive in this muddy area and they are moved back to the higher area around Jebel Lafon. They are, however, here in direct competition with cultivation and this acts as a severe constraint on herd build-up. Hunting (January-March) and especially fishing (peak season is beginning of dry season) are also of considerable importance in Lokoro economy. Like the Latuka, social integration among the Lokoro is primarily based on clan membership and age sets. An important feature in clan organization is that the clans are land administrating units, thus land in the village and land radiating out on the flood plain from the clan centers around the Jebel Lafon is considered as corporate property of individual clans. As member of a clan a person has thus a right to cultivate clan land. The close association between clan and land is expressed in ancestor cults and earth cults. Every clan has got a leader and a meeting place where matters concerning clan members are discussed. In the five villages at Lafon there are 24 clans. Matters concerning the whole tribe are discussed in the meeting place of the senior clan in Wiatwo village, and this meeting is open to all Lokoro people. The head of the senior clan of Wiatwo is also the rainmaker of Lafon. As rainmaker he receives respects, labour services, contributions in kind like grain and livestock from other clans. As groups with separate corporate interests clans will necessarily tend to oppose each other. This build-in tendency to opposition is among the Lokoro counteracted by loyalties defined by membership in age sets. These age sets embrace the whole population. Each set consists of people who are born within a 3-4 year period. The sets have got individual names and the members remain in their set throughout their lives. In their life cycle the set passes through three age grades: 'youngster', 'warriors', and 'retired'. One set in the warrior grade will at any time be considered the senior set - and as such they will constitute a group who exercise most influence in Lokoro society. The period a set stays in power is about 10 years and this implies that several sets are skipped when power is transferred from one set to another. The sets also have their leader and their meeting place. A main task of the ruling set is to police the society, settle disputes, fine wrongdoers, and organize defense and raiding.

#### 2.2.5. The Acholi

The Acholi are historically closely related to the Lokoro, but differ significantly from them in terms of social organization. They inhabit the part of the green belt region of the East Bank. Good grazing is available but animal husbandry is severely restricted because of the presence of the tse-tse flies. The farming system is primarily based on shifting cultivation; the fields being cultivated from five to six years and then left for seven to eight years. The most important crops are millet, slow maturing sorghum varieties and early maturing sorghum varieties. Cassava is usually planted in the final year of the cultivation cycle. Maize is also of increasing importance. Sesame is extensively grown as a cashcrop. Both cotton and coffee are promising cash crops which the Acholi have been familiar with for about fifty years.

Acholi settlements are characterized by small scattered hamlets. Although there are indications that the Acholi earlier had a more strongly developed clan and age set organization these organizational principles seem to be of far less importance than the case is in the other societies discussed. This may be due to several factors; the insignificant importance of livestock in the tse-tse infected area and the low pressure on agricultural land must have implied that rights in concrete objects which needed protection and which would serve as an incentive to conquest were limited. Consequently there would not be the same pressure for development of the complex institutions which served to produce close political integration of large population segments. The experience during the disturbances probably weakened the tribal organization even further. Individual Acholi households are thus not tied in the same closeknit net of reciprocal commitments as we have seen for the other groups. It thus leaves the individuals greater freedom in their allocation of time and resources.

An important aspect of present day Acholi society is that the traditional African beer-work party has been developed to a highly formalized organization for pooling of labour and cooperation in critical phases in the cultivation cycle. The fewer constraints on individual economic management and the more single purpose character of Acholi forms of cooperative behavior makes it easier for them to adapt the new opportunities in the economic environment.

### 2.2.6. The Madi

The Madi probably number about 40,000 and inhabit a belt of the Central Hills along the east bank of the Nile. Although very distantly related to the Acholi in terms of culture history the adaptation they have established to their environment is essentially similar to what has been described for the Acholi. Like the Acholi individual households have shown a greater interest and ability to get involved in commercial farming. A very interesting development in Madi agriculture has been the expansion of tobacco cultivation. Tobacco cultivation is an operation which requires relatively great skill and care as well as substantial commitment of the farmers' time and financial resources. The Mission did not have sufficient time to look into the way the Haggard Company has managed to mobilize farmers for this kind of production, but lessons of general relevance for extension work could probably be learnt by further investigations of the tobacco company.

An impression of the relationship between the farmers and the tobacco company is provided by a quotation from a preliminary report by Simon Monoja to NCA in 1976:

"Tobacco was introduced in 1952 by the Haggard Company. By 1960 it had overtaken cotton as the major cash crop. After the agreement cultivation was revived by the company last year, and 6,064 kg. of cured tobacco were brought by the company from about 40 small holders, worth £s. 2,151, 700 m/ms at the following prices for each of the grades:

Grade One	at	550m/ms	per	Kg.
" Two	"	450m/ms	"	"
" Three	"	350m/ms	"	"
" Four	"	250m/ms	"	"
" Five	"	150m/ms	"	"

The average income received by each farmer was Ls.54. These were farmers who have barns of their own and cure their own tobacco by flue-curing method. It is said that the company plans to have about 700 barn owning farmers in Madi. The number of those who will sell air-cured tobacco or fresh leaves is not specified but it is assumed that in the future when enough seedlings are available any interested farmer can grow tobacco.

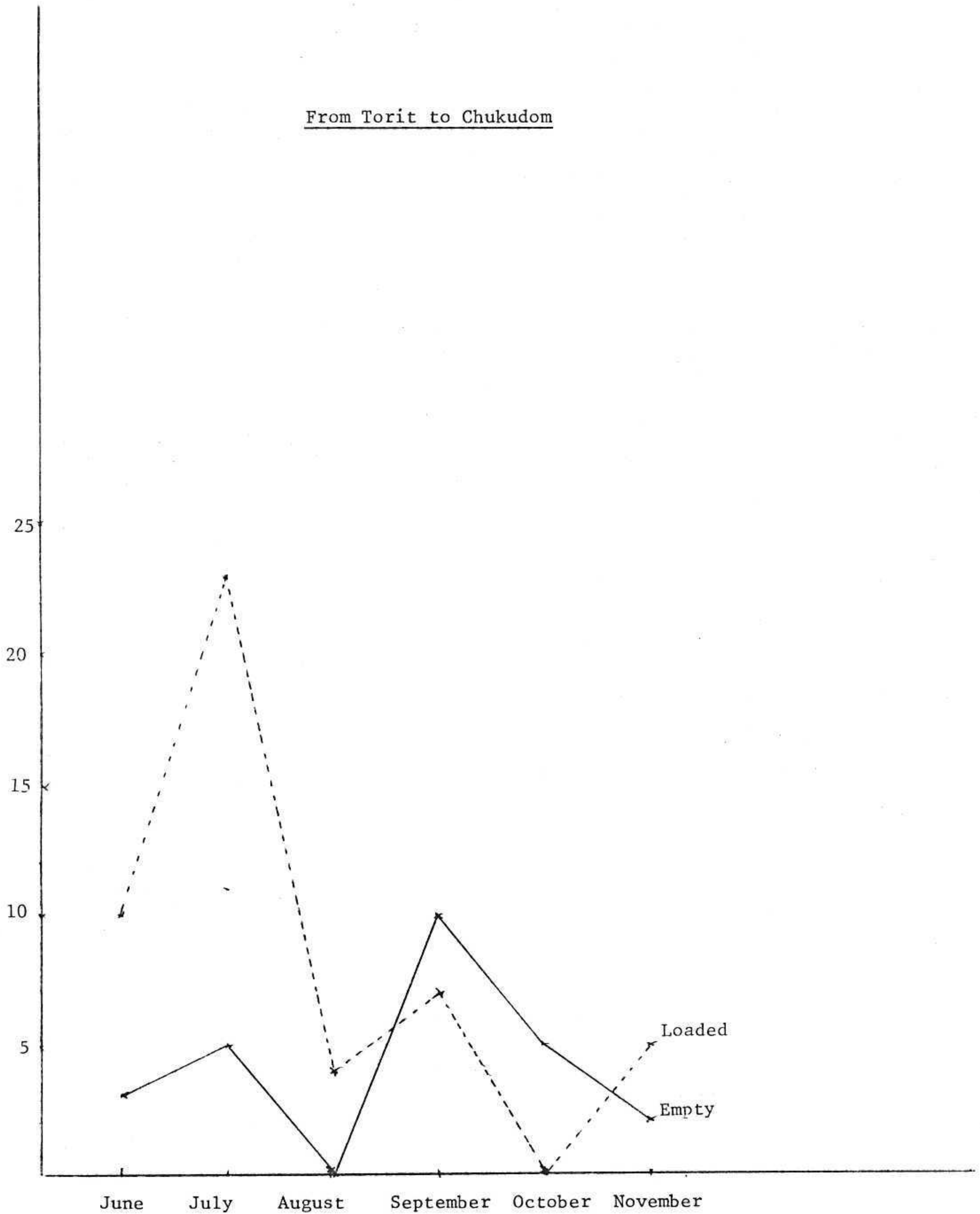
This year the number of barn owning farmers has increased by about 80 over that of last year bringing the number for this year to about 120. For each farmer who wishes to build a barn he applies to the company for a permit and if approved, he is given a loan of Ls. 30 to meet the building cost payable after the first successful harvest and sale. In addition he is supplied

with fertilizers chargable at 9 pt. per kg. and also payable after the sale of the crop. Each barn owner is required to saw his own seeds supplied by the company in his seed-bed. But after transplanting at least one fed. from his seed-bed if hos own seedlings are finished and he wants to plant more, he can be supplied seedlings by the company chargable at Ls 6 for each fed. planted. It is said that the company plans to give the responsibility of seedling growing entirely to barn owning farmers so that after planting their own fields, they can sell any surplus seedlings to other non-barn owning farmers."

#### 2.2.7.

Other groups like Lokoya, Loluba and Bari have not been discussed here, because NCA activities have only in limited extent been directed towards these.

## APPENDIX 3: TRAFFIC LOADS ON NCA FEEDER ROADS\*



\* Based on records from Torit Police Post.  
Only commercial lorry traffic is included.

From Chukudom to Torit

25

20

15

10

5

June

July

August

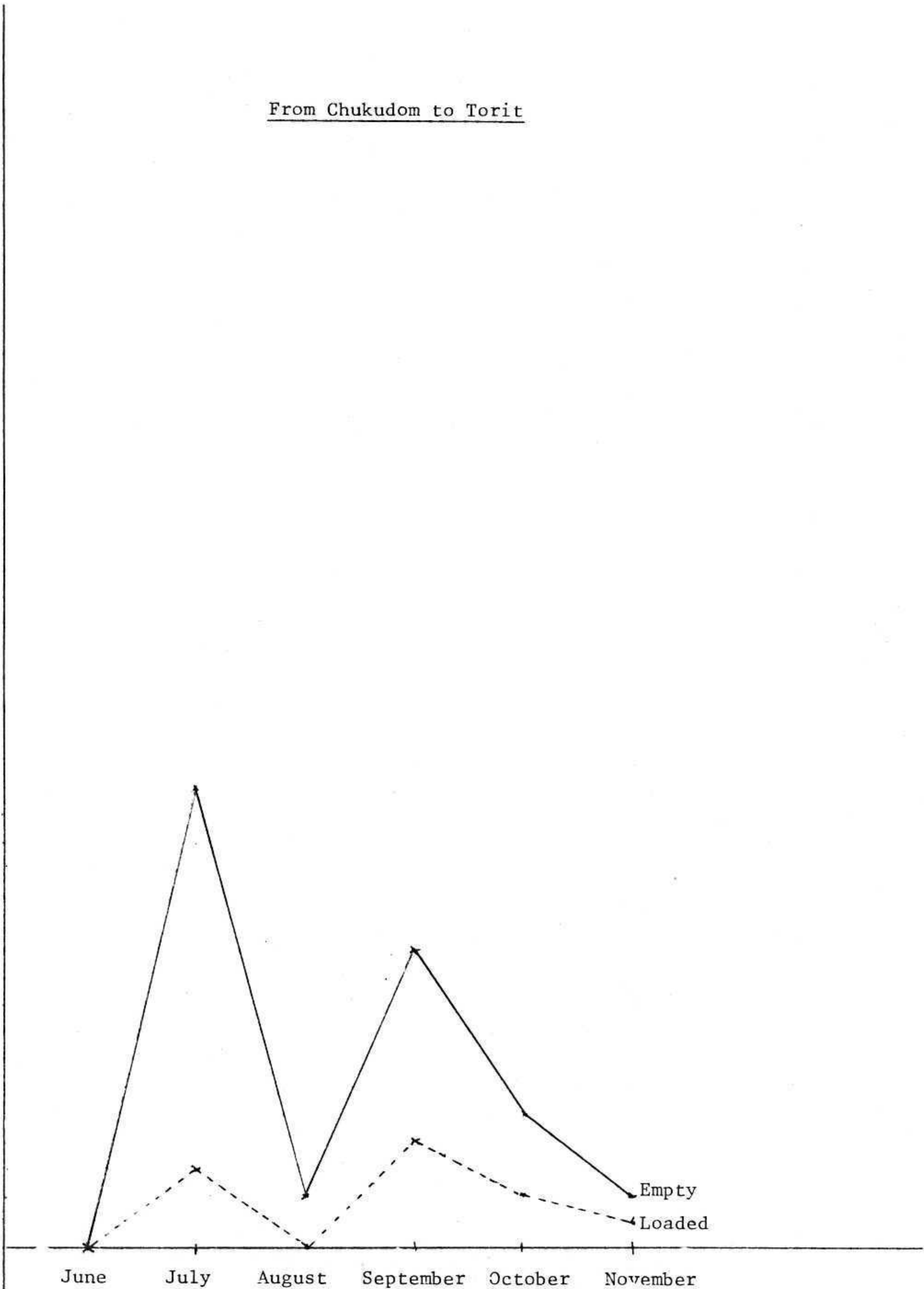
September

October

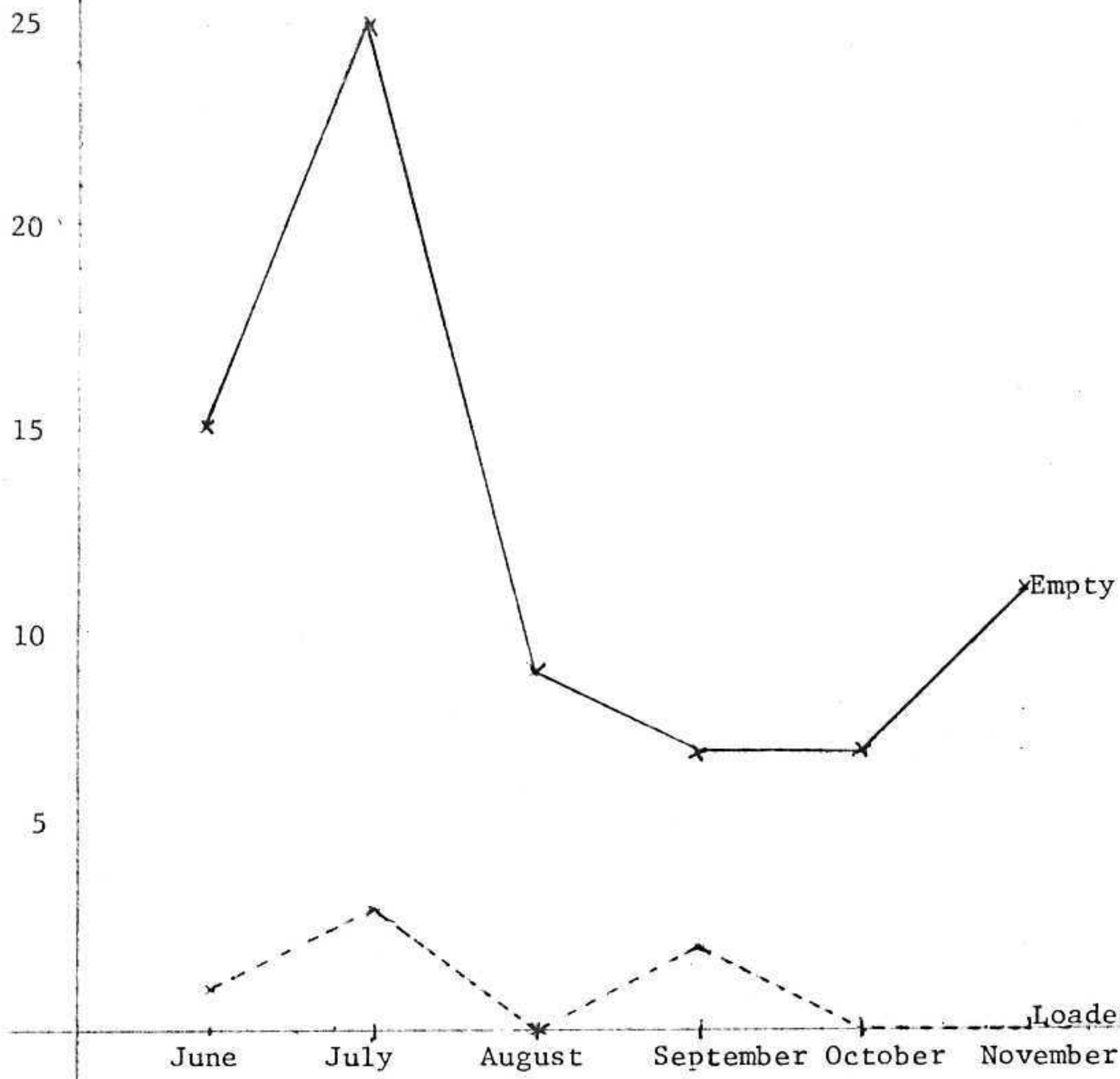
November

Empty

Loaded

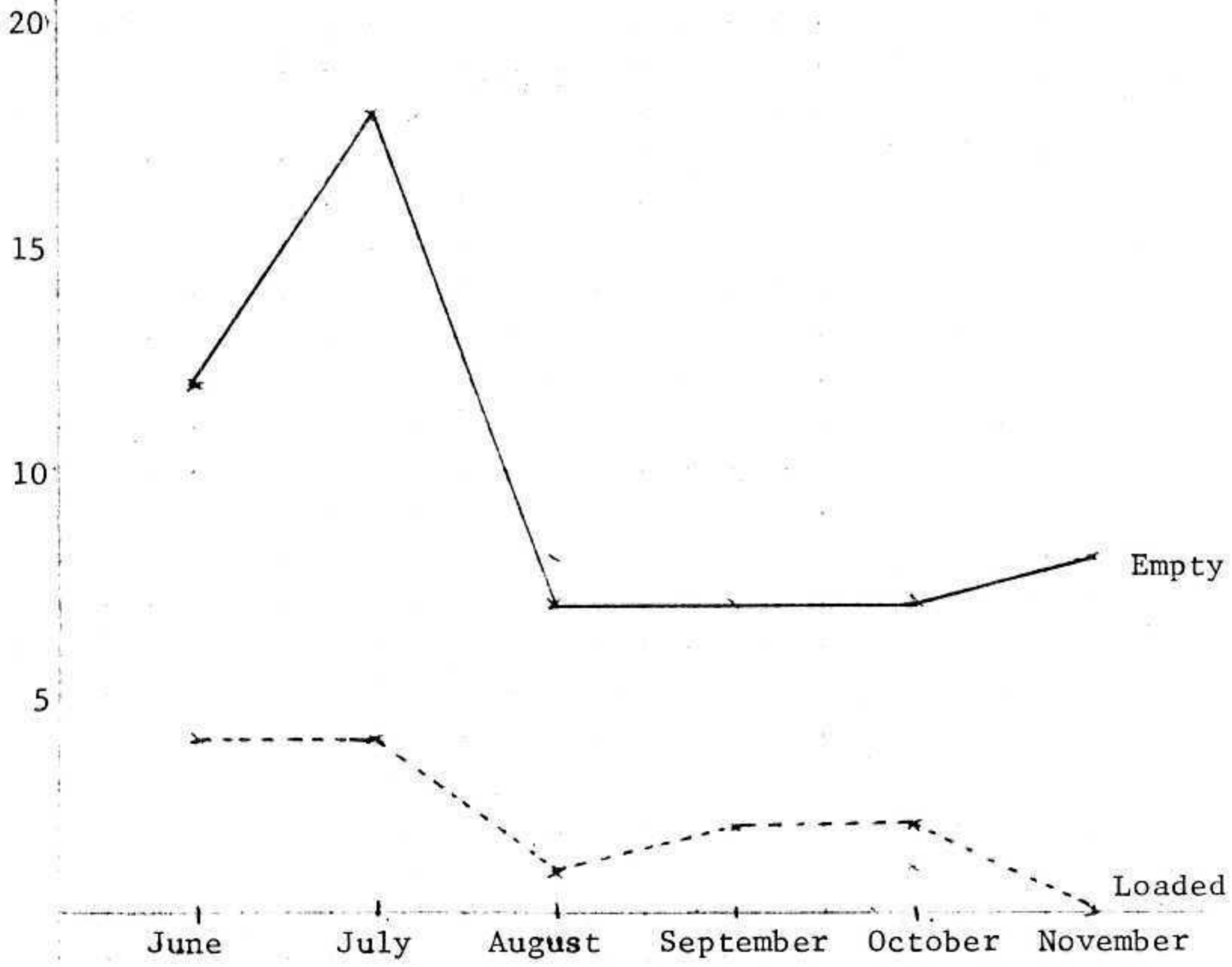


From Loronyo to Torit

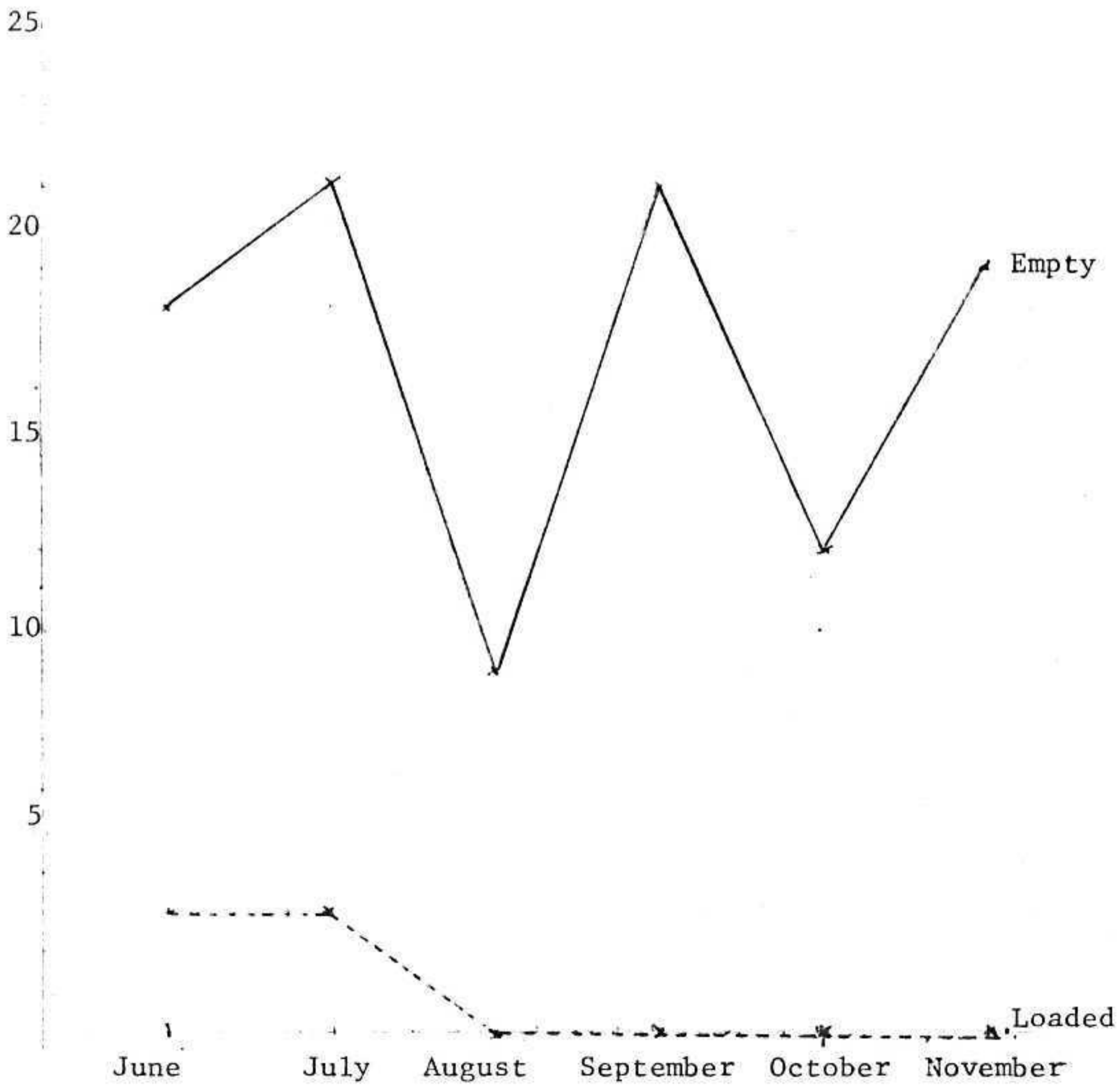




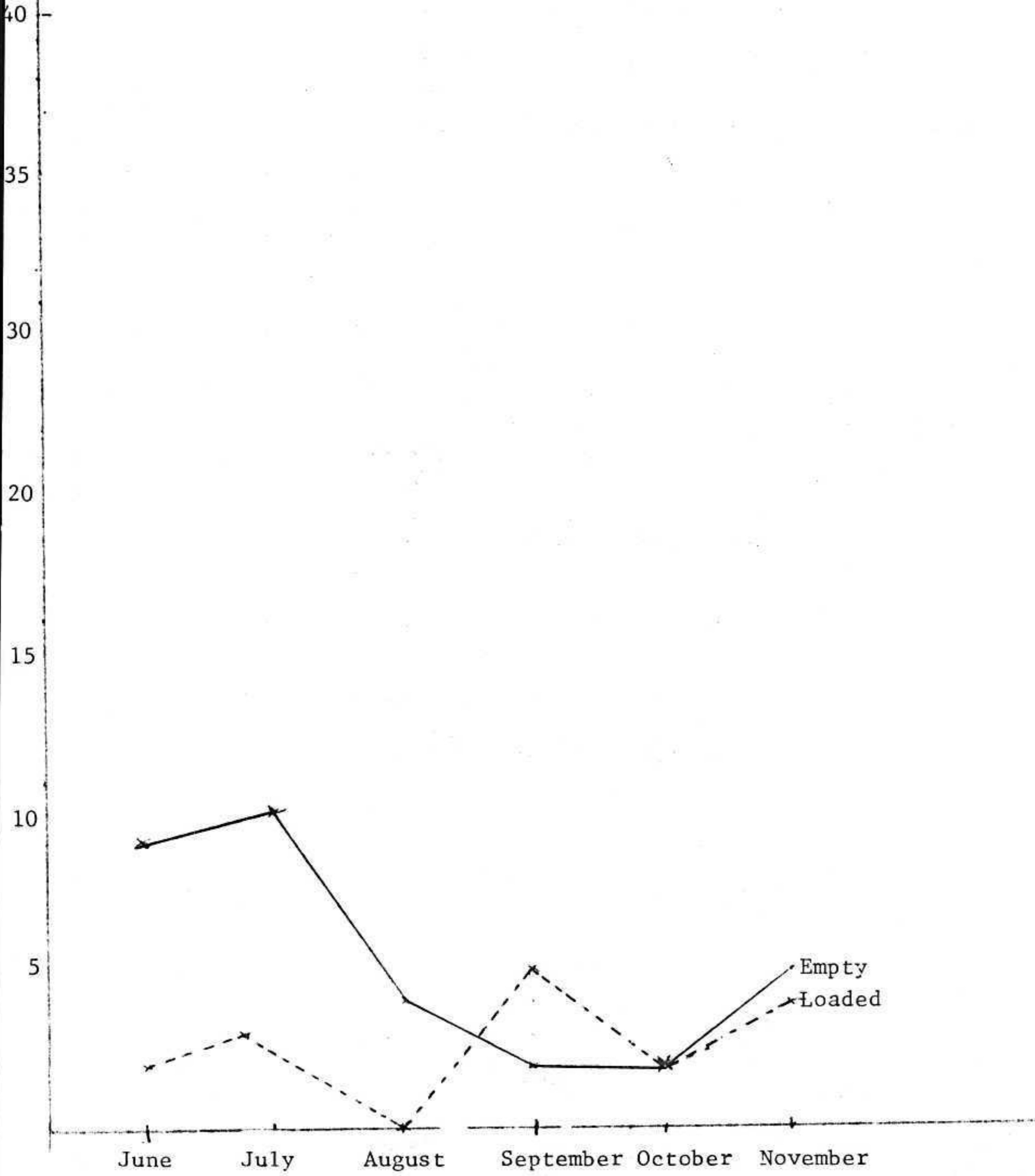
From Torit to Lafon

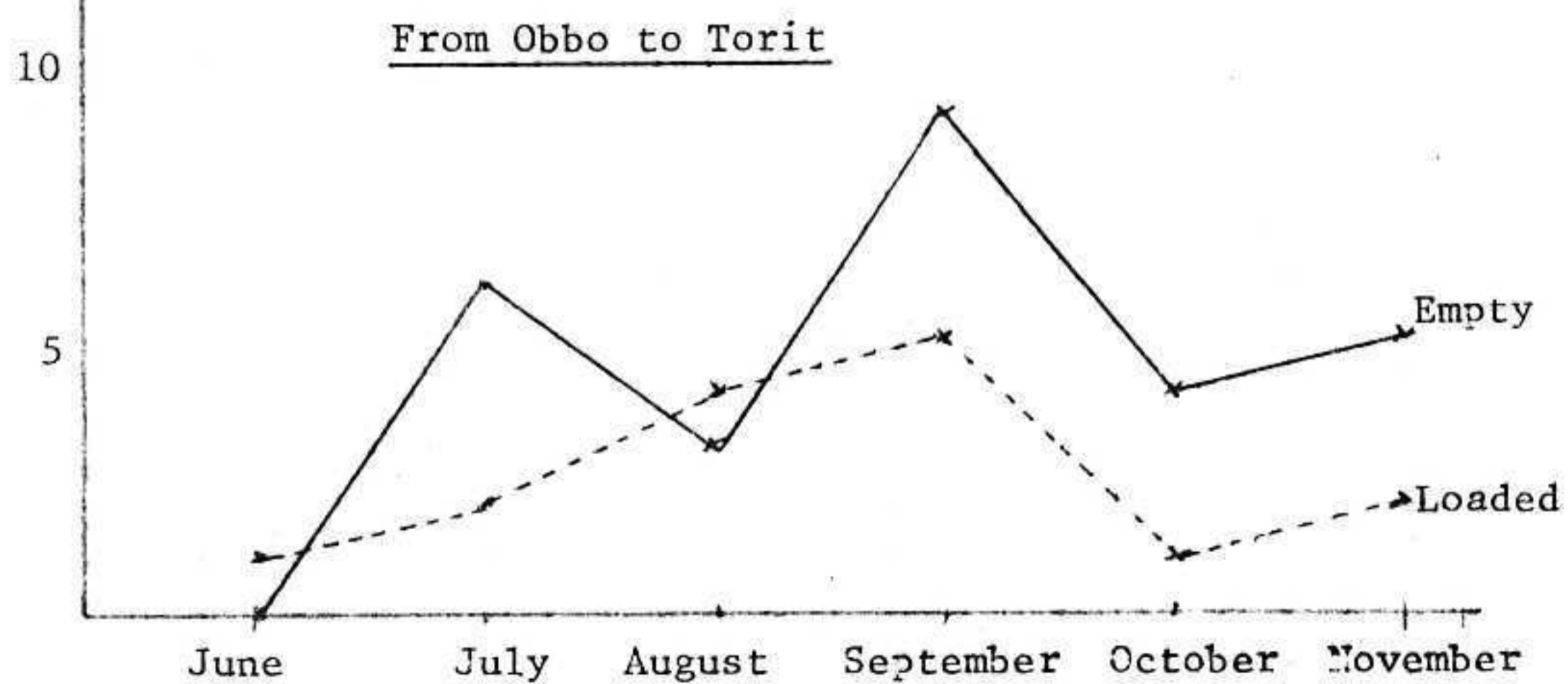
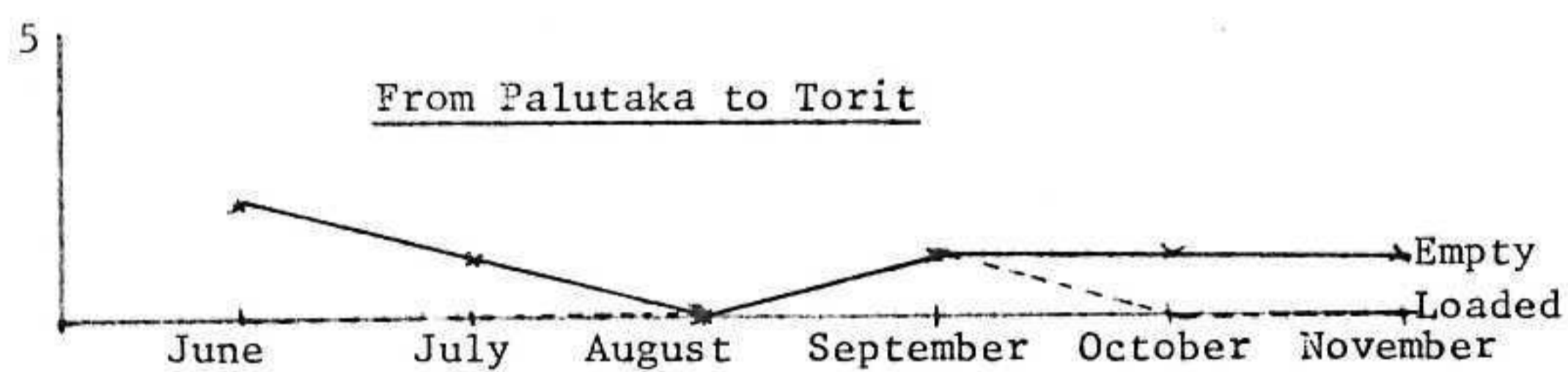
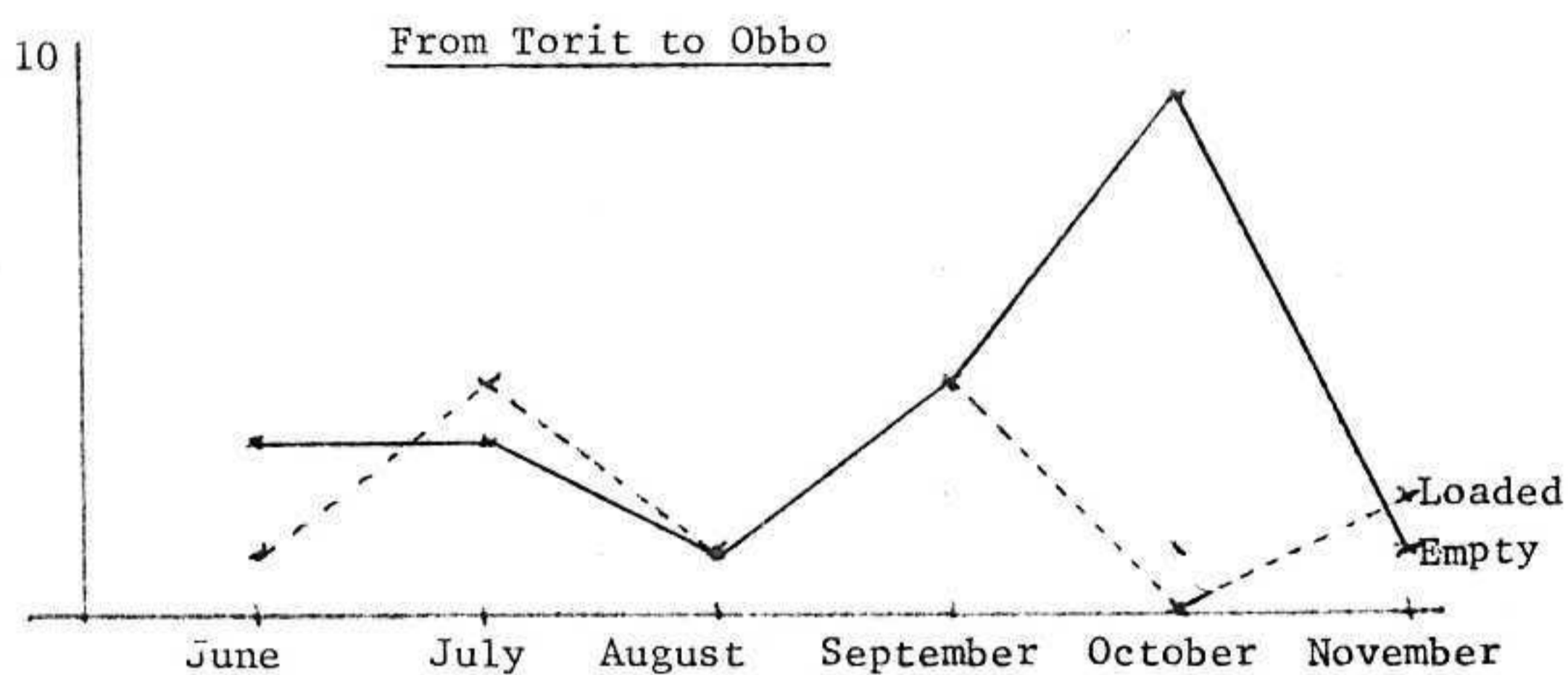
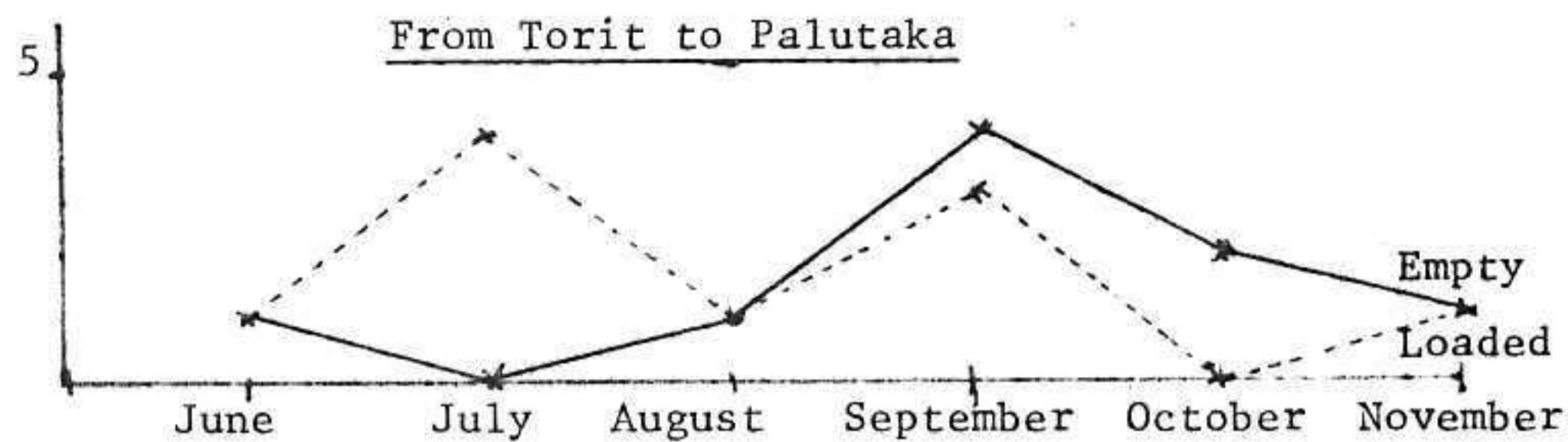


From Torit to Loronyo



From Lafon to Torit





## APPENDIX 4: HEALTH SERVICE ADMINISTRATION

The health facilities are arranged basically on four levels as follows:

1. Each primary health care unit is supposed to serve a population of 4000 people within a radius of 16 km. Some of these units are previous dressing stations, which were mainly curative in its functions. They were staffed by a nurse, but as Community Health Workers (CHW) are being trained these are posted to these facilities which then by nature of the change in staff is being called PHCU. The nurses are being withdrawn to the hospitals and health centres. Some PHCU are newly constructed. In the past an impressive number of dressing stations were built by the Community through self-help projects particularly in Equatoria province. Many of these were built without government consultation and as a result suffered lack of staff and many were non-functioning. The main function of the PHCU is preventive in nature.

2. The next facility is the dispensary.

This is according to present plans a 4 room structure with a covered waiting area, staff houses and pit latrines.

The dispensary is to serve a population of about 20,000 and serving as referral centre for 4-5 surrounding PHCUs. The staff, and mainly the Medical Assistant, is to supervise the work of the PHCU. Medical Assistants who are trained for curative work are to be given inservice training in order to prepare them for their supervisory role. These inservice training courses are to be arranged by Government, but up to now all have been arranged by voluntary organisations like NCA, AMREF and others.

The staff of dispensary is as follows:

- 1 Medical Assistant
- 1 Enrolled Nurse
- 1 Village Midwife
- 1 Sanitary Overseer
- 1 Laboratory Assistant

Only a few of the dispensaries have the full complement of staff, the sanitary overseers and laboratory assistants in particular being in shortage.

The functions are to provide basic health care, both curative and preventive including immunisations and MCH. They are also to treat patients referred from the PHCU. In practice, however, they are curatively orientated, none of those we saw during the Mission's visit had any refrigeration facilities for storage of vaccines, MCH did not seem to have a high priority, and in preventive care and public health only simple advice could be offered. Many of the staff had not visited the village for months. There is clearly a wide gap between programme expectations and reality. The supervision of the PHCU was done by expatriate personnel from NCA, not by the medical assistants at the dispensary.

None of the dispensaries had vehicles and this in itself tend to exclude active supervision. The staff was supposed to use bicycles, but the only staff we saw using these were some of the community health workers.

3. The next level of health care is the health centres. These are of two types, A and B.

The former has up to twenty beds but the latter had no bed facilities and offers curative and preventive services on outpatient basis only. Only 4 type B health centres are in operation in Southern Sudan.

It has not been possible to find a plan for localisation of the health centres and the reasons for such localisation in relation to other health facilities. Likewise there seems to be no definite staffing projections.

Rural hospitals are next in the hierarchy of health facilities. These include the type A Health Centres (2) and those hospitals with 40 or more beds, which are placed outside the district town. There are 2 type A health centres and 4 rural hospitals, i.e. a total of 6 rural hospitals in the Southern Region.

4. The next level of care is the district hospitals which are centres for hospital care and District Health Administration. They are to serve as referral hospitals for other rural health facilities and there are 17 such hospitals in Southern Sudan.

In Juba, there is a Provincial hospital, which also serves as a teaching hospital for Juba University Medical School. This medical training institution is new, and the first lot of 20 medical students are now in their third year.

An upgrading programme for the hospital in Juba is underway, and a new children's ward which is also to house the obstetric and gynecological sections of the hospital is about to be completed.

Southern Sudan has today 28 functioning hospitals with a total bed capacity of 2595, giving 0.54 hospital beds per 1000 of the population. Apart from the obvious lack of actual hospital beds, the hospitals are hopelessly inadequate in several respects, and do not function as adequate referral centres for the outside facilities. The main reasons are the following:

- a) Inadequate staffing, especially doctors and trained nursing staff.
- b) The physical condition of many of the hospital buildings are very poor, and the functional layout such that no effective administration is possible.
- c) Severe lack of vital equipment - and what is present is hopelessly outdated and worn out.
- d) Supporting services like X-ray, laboratory services, blood transfusion services, are totally inadequate if present at all, and severely lacking trained staff.
- e) Supply of drugs is erratic and very poorly organized. The hospitals we visited had only a few simple drugs in store, and were lacking all essential drugs.
- f) The staff morale was low, due to the difficult conditions under which they were working.

The distribution of hospitals throughout the Southern Sudan is geographically uneven. A major investment, financially, administratively and logistically is needed in order to bring the hospitals to an acceptable level and to secure a true referral chain from the peripheral units.

The professional supervision and administration of the provincial medical services is carried out by the following medical personnel:

- a) The Assistant Commissioner of health is in overall charge of all health services at provincial level, being directly responsible to the Director General. He is assisted by the Province Public Health Officer and the Province Medical Assistant, and is supposed to visit all health facilities in the province at least once yearly.

The Ass. Commissioner is a member of the Province Executive Council and acts as professional adviser to the Commissioner for the province (Presidential appointment) who again is assisted in administrative matters by the Chief Executive Officer.

- b) At district level the Medical Officer in charge of the district hospital, is responsible for the hospital, and for supervision of the outside facilities in his added capacity of Medical Inspector for the district.

He is also in overall charge of all Public Health services in the district being directed by the Assistant Commissioner. He should pay supervisory visits to these stations twice yearly, during which time he will distribute drugs etc. The visits should be made on a fixed time schedule, and the Public Health Officer and District Medical Assistant should accompany him during the visits.

- c) District Medical Assistant, who is resident in the district headquarters town, is responsible for the supervision of work carried out in the Health Centres, Dispensaries and PHC Units in the district. He is to report to the Medical Inspector on matters or problems related to personnel, equipment, instruments and buildings. His visits should be on a three monthly basis.
- d) Medical Assistant, will be in charge of the five PHC Units in his area through technical supervision once every two months, for one day on a fixed schedule. He will also carry administrative supervision on the village midwives and other Public Health personnel on behalf of the Sanitary Overseer.



The capacity of above supervisory personnel to carry out their work seems to be limited.

This is mainly due to the chronic lack of transport and petrol, and also in part to rapid change-over of personnel.

It is also probable that the medical officer in charge of a district hospital, but at the same time being Medical Inspector of the district, may become too occupied with hospital work, excluding the possibility of outside activity. Of the two hospitals in the Equatoria Province, Torit had only one medical officer, while Kapoeta had no doctor at present. In the area of NCA activities no visit had been made from the Provincial Health Administration during the past 3 years.

## APPENDIX 5: HEALTH IN THE SOUTHERN SUDAN

The last population census in Sudan was carried out in 1973, but the report has not yet been made official. However, some data has been made available, but it is likely that the data may be unreliable for several reasons, the most important being that the census was carried out at a time when a lot of people were still returning from refuge in other countries.

According to the census figures the population of Sudan rose from 10.26 million in 1956 to 14.9 million in 1973. This corresponds to an average growth rate of approximately 2.2%.

In two provinces of Southern Sudan, Equatoria and Upper Nile the population is recorded to have declined considerably from 1956 to 1973. For Southern Sudan as a whole there is only a small increase, representing an annual growth of around 0.4%. The present population (1973) is estimated at 4.7 million. The population density for Sudan as a whole was estimated at 6 per square kilometer in 1973.

The age and sex distribution of the population based on the 1973 census figures can only be considered as approximate. The 1973 census recorded 2.9% to be under the age of 1 year, and 44.5% under the age of 15. A further 44.9% were between 15 and 45, and only 10.5% 45 or older.

There are in total 3.3% more males than females in the Southern region, but females outnumber males in the 14-45 age group.

The crude birth rate is given as 49/1000 and the corresponding death rate as 24/1000. For planning purposes the government has used a crude rate of natural increase estimated to be 2.5%.

The infant mortality rate is estimated to be between 135 and 145/1000, for planning purposes a rate of 135 is officially used. However, given the uncertainty of the baseline figures this should be judged with care, it is likely that this rate may be somewhat higher.

The predominant diseases are those of tropical area with Malaria, Trypanosomiasis, Leishmaniasis and Bilharzia being present in endemic form. The main cause of death in the Southern Region is said to be malaria, infantile gastroenteritis, measles, respiratory diseases, tetanus and diarrhoea diseases. There is also reason to believe that infectious hepatitis is prevalent. No reliable statistics are available, but talking to health workers, it seems that jaundice is often cause of death.

From above, it is evident that apart from the tropical diseases and the infectious diseases of childhood, many of the other main causes of mortality are the direct consequence of an unhealthy environment and lack of understanding of personal hygiene. Lack of clean and potable water is predominant in this respect in many areas of the region.

The sectoral chapter on Health and Social Services on the NDP 1977/78 - 82/83 for Southern Sudan lists a variety of general problems and programmes but formulates no specific objectives and sets no targets for achieving change. Neither does it indicate any policy directives towards improvement in various sectors of health care delivery. As such this document offers little guidance to the development of the health services in the Southern region and it most certainly does not allow any critical assessment of progress or lack of such in different sectors.

However, based on the National Development Plan a document entitled National Health Programme 1977/78 - 83/84 has been produced covering the whole country. In this specific programmes and policy objectives have been identified, priorities given and the cost implications both recurrent and capital calculated. But bearing in mind the variations of resources and different problems in programme implementation between North and South one feels that this document can be little more than a guideline in formulating a health care policy for Southern Sudan. Furthermore, it is not verified that the priority programmes listed for the NDP plan period necessarily coincides with health priorities of the Southern region. One would have liked to have seen a health care policy programme with clear development objectives based on the constraints and potentialities of the Southern region.

The National Health Programme has identified some national health problems and listed them in order of descending priority. For each problem a specific detailed programme including cost estimates have been worked out. The main health problems listed are the following:

- a) Malaria "nationwide"
- b) Malaria man made
- c) Wider coverage by primary health care
- d) Bilharzia
- e) Public's lack of health information
- f) Communicable diseases, especially those preventable by immunization
- g) Need for safe and adequate water supplies
- h) Environmental sanitation
- i) Protein-calorie malnutrition
- j) Gastro-enteritis
- k) Tuberculosis

These programmes are directed at specific diseases, nothing is said about strengthening other aspects of the health services organization or implementation of health education, drug supply, hospital improvements, medical statistics or the transport problems facing all levels.

## APPENDIX 6: MORBIDITY AND MORTALITY STATISTICS

The Medical Statistics Unit in the Ministry of Health in Juba is working under severe constraints, the major ones being trained manpower and computer access. The reporting from outside units are erratic and unreliable, and on whatever reports are received there is no feedback to the reporting units.

Due to above there is presently no reliable data on which to plan or access the health care delivery system.

The last annual statistical report from the Ministry was published for the year 1978. During that year only 58% of all hospitals submitted reports for more than 8 months of the year, only a few submitted regularly throughout the year. As for the other units the report gives no indications as to the coverage.

Tables 1, 2 and 3 give some morbidity and mortality figures extracted from the 1978 Annual Statistical Report. The tables give an indication of the major disease problems in Southern Sudan as reported by the health facilities and reflected in the Statistical Annual Report.

**Malaria, pulmonary tuberculosis, diarrhoeal diseases, other diseases of the digestive system and eye diseases are the most important courses of morbidity. It is likely that there are serious under-reporting of some of these conditions. The Ministry of Health believes that the true prevalence of malaria maybe 4-5 times the reported figure. It is unlikely that the picture is very different with the other groups.**

Looking at mortality, the major causes of deaths are malaria, diarrhoea, tetanus and pulmonary tuberculosis. In terms of morbidity, tuberculosis is second only in importance to malaria, and from the figures given the case fatality is 6.9%.

The disease pattern is similar to what one finds in other developing countries, the infective diseases being the major causes of morbidity and mortality, with traffic accidents and other forms of violence increasing in importance.

The tables also reflect the poor quality of the medical statistical reporting system. The tables as found in the Statistical Annual Report for 1978 contain several mistakes and inconsistencies. Apart from trying to obtain more accurate reports from the peripheral units, one of the major tasks as mentioned above, must be to strengthen the Central Statistical Unit. It will be impossible to undertake sensible planning exercises or to assess the present and future health care delivery system if it is to be based on material so obviously insufficient.

Table 1: Selected hospital morbidity figures by age, sex and diagnosis 1978.  
(Source: Statistical Annual Report 1978, Regional Ministry of Health)

	Under 1 yr.		1 -		4		5 -		14		15 -		24		25 -		44		45 - over		Total	Grand Total	% of Total
	M		F		M		F		M		F		M		F		M		F				
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F			
Malaria	3428	3888	5208	4784	6664	10786	7580	7030	7688	6655	3853	3453	34421	36596	71017	10.6							
Pulmonary Tuberculosis	3716	4016	5594	5240	3323	3838	4122	3589	4385	3566	2232	1731	23372	21980	45352	6.7							
Tuberculosis - other forms	30	44	66	124	223	327	466	449	383	276	285	81	1453	1301	2754	0.4							
Enteritis & other Diarrh. Dis.	2048	1831	2275	2641	1932	1805	2359	2129	2447	1736	1282	999	12343	11041	23384	3.5							
Basiliary & amoebic dys.	128	190	381	557	742	750	1134	1088	1290	913	811	666	4486	4164	8650	1.2							
Other diseases of digestive system	979	1160	1452	1703	2117	1618	1791	1647	1880	1828	1110	1024	9279	8980	18259	2.7							
Bronchitis, ephysema & asthma	614	685	755	828	1016	1037	1265	1430	1765	1289	1153	603	6568	5872	12440	1.8							
Gonococcal infections	-	-	2	24	41	85	349	298	311	286	129	111	832	804	1636	0.2							
Schistoiniasis (Bilharziasis)	10	57	179	222	324	316	452	453	507	667	298	310	1770	2025	3795	0.5							
Ancylostomiasis	56	66	37	451	536	586	654	771	758	728	560	657	2601	3259	5860	0.8							
Whooping cough	68	77	153	170	184	252	289	267	296	281	328	326	1318	1372	2691	0.4							
Diseases of the teeth	94	98	31	25	47	66	164	193	306	318	114	194	756	894	1650	0.2							
Filariasis	1	5	52	112	229	210	346	396	151	396	254	166	1233	1285	2518	0.3							
Chronic rheumatic heart diseases	66	107	223	267	816	1056	1800	1813	2402	2114	1623	1281	6957	6638	13595	2.0							
Motor vehicle traffic accidents	9	16	114	148	377	248	411	313	360	321	184	148	1453	1194	2647	0.3							
Hypertensive diseases	-	-	-	-	5	6	7	16	61	47	38	11	111	80	191	0.02							
Other ill defined unknown causes of morbidity	1495	1814	1750	1211	2032	1880	2502	2320	2052	2180	1700	1654	1531	11059	22059	3.3							
Skin diseases & subcutaneous tissners	681	641	959	1189	1657	1510	2302	2052	1797	1741	1245	894	8641	8027	16668	2.4							
Diseases of the eye	946	1180	1277	2339	1585	1544	1622	1700	1542	1209	1023	143	7995	9115	17110	2.6							
Ear & mostoid process	150	161	394	489	750	718	885	779	851	701	534	448	358	3296	6880	1.0							
Other dis. of resp. Preumionia	232	340	382	459	876	678	1253	1666	1926	1552	1379	770	6048	5465	11513	1.7							

Table 2: Major Causes of Death 1978.

Diseases	D E A T H S		T O T A L
	Male	Female	
Malaria	134	126	260
Diarrhoea	55	24	79
Tetanus	50	20	70
Pulmonary Tuberculosis	24	33	57
Gastro enteritis	35	21	56
Anaemia	13	27	40
B. Pneumonia	19	12	31
Bronhitis	18	13	31
Amoebic Dysentery	6	24	30
Infective Hepatitis	22	8	30
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T O T A L	376	308	684

Source: Statistical Annual Report 1978.  
Regional Ministry of Health



Table 3: Communicable diseases, morbidity and mortality, 1978.

Disease	No. of cases reported	Deaths	Case fatality %
Malaria	51357	250	0,4%
Whooping cough	1596	1	
Gastroenteritis	920	31	3,3%
Bilharzia	822	1	
Infective hepatitis	741	32	4,3%
Measles	660	16	2,4%
Chickenpox	398	0	
Mumps	346	0	
Tuberculosis	274	19	6,9%
Onchocerciasis.	202	0	

Sourcer: Statistical Annual Report 1978.  
Regional Ministry of Health.

APPENDIX 7: HEALTH MANPOWER

There is a great shortage of various types of health personnel in the entire region. At present there is about one doctor for every 100,000 population. Almost all doctors apart from those working with voluntary agencies are trained in Khartoum, apart from a few trained in Egypt, where there is a limited quota for candidates from the Southern Region. A new medical school has been started at the university of Juba, the first 20 candidates are now in their 3rd year. One constraint in trying to increase the number of medical students is the lack of qualified candidates from secondary schools.

Medical Assistants are trained in two schools in Juba and Wau, the school in Juba is also training laboratory assistants and theatre attendants. There are about 350 medical assistants in the Southern Region or one to approximately 10,000 people. The medical assistants who are mainly curatively orientated are to be given inservice training courses to enable them to supervise the primary health care units. There are two main levels of trained nurses and midwives. The lower level is that of certified/enrolled nurses and midwives, the training being provided in 12 of the district hospitals. However, one constraint seems to be qualified tutors. Training of midwives takes place at three provincial hospitals in Juba, Wau and Malakal. The higher level of nurse training leads to the status of Nursing Sisters. This training is provided at the higher Nursing College in Khartoum, and there are only 10 nursing sisters serving in the Southern Region out of which 9 are in Juba. Most of them are engaged in teaching or in administrative positions. Special mention needs to be made of the Community Health Worker, which is a new category of health staff, introduced with the launching of the Primary Health Care programme for Southern Sudan in 1976. There are the basic "grass root level" health workers, intended to be posted to the Primary Health Care Units and being supervised by the medical assistants from the dispensary.

The CHW's are selected for training by the community itself, sent on a 9 months' training course of which 6 months is theoretical training and 3 months practical, and then posted back to the community from which they were selected. Seven training centres for CHW are to be built within the plan period (1974/74 - 1983/84) and it is hoped to train approximately 700 people.

The CHW are presently paid by the Provincial Government, but they are supposed to be paid by the community which they are serving after 1984. None of the CHW we met could see the communities being able to meet this requirement.

Sudan also trains what are known as village midwives at about 20 training schools evenly spread throughout the country. This training started by persuading the traditional birth attendants to undergo a formal training course. The schools now offer a nine months' course tailored to the standard of an intelligent illiterate rural woman. The candidates are subjected to a careful selection process before admission. There are at present about 200 trained village midwives in Southern Sudan, and this service is regarded as complementary to primary health care programme.

Traditional birth attendants also exist, this profession to a large extent being a hereditary one. Some of these are given medical training by those responsible for supervision of the primary facilities. It was our impression from our visits that this was a theoretical consideration without practical implications.

The sanitary overseers are responsible for the environmental health programmes for rural settlements and are usually based on the dispensary.

The supervisory staff comprises the following categories of staff:

a) Health Visitors

A Public Health Nurse responsible for MCH work under the direction of the District Medical Inspector, and she is based at Health Centre level.

b) Public Health Officers

These work at district level and supervise at environmental health programmes.

c) Medical Officers

Besides hospital work these are responsible for overall supervision health services in the district.

- d) Regional Medical Assistants  
Responsible for supervision of dressing stations, PHEU and dispensaries.
- e) Regional Senior Public Health Inspectors  
These are responsible for supervision of all environmental health programmes in town or rural districts.
- f) Medical Inspector  
Operates from a more carefully located district hospital and is in charge of all curative and preventive health administration.
- g) Provincial Medical Assistant  
Responsible for overall supervision of dressing stations, dispensaries and health centres in the provinces.
- h) Province Senior Public Health Inspector  
In overall charge of environmental health services of a province.
- i) Commissioner for Health  
Answerable to the Commissioner of the Province as his adviser, and to the Director of the Regional Ministry of Health and Social Welfare. In overall charge of the administration of all curative and preventive services of the Provinces.

APPENDIX 8: OTHER VOLUNTARY ORGANIZATIONS IN HEALTH

Several other voluntary organizations and multinational agencies are involved in health work in Southern Sudan, some of these in the Eastern Equatoria Province, while most of the multinational agencies are supporting ongoing activities of these organizations. The work of these organizations and agencies are briefly described below.

Save the Children Fund

This is a voluntary organization stationed in Torit where they have been working since the end of the civil war in 1972. They have rather limited funds and were previously mostly engaged in running mobile services. From 1979 their activities have been limited to supervision of health facilities in Torit, apart from assistance at the pediatric ward of Torit hospital. They have on the staff one medical officer and three nurses.

Voluntary Service Group is a Christian organization which supervises the Primary Health Care complexes in the Lapit area. They have no medical officer but three well-trained nurses.

International Union for Child Welfare has been working in the Acholi area, but will finish this work towards mid-1981.

German Leprosy Relief Foundation is supervising the leprosy work throughout Southern Sudan, but this work is mainly concentrated on the Western bank where other German medical groups are also working.

Several UN agencies are represented in the area with offices in Juba. UNICEF has been established in Juba since 1974 and the total assistance for 1979/80 is valued at around US\$ 4.2 million. Besides support for the water project in Bahr El Ghazal province the relief assistance is mainly created with the support of the Primary Health Care programme mainly for supplies and equipment. UNICEF is supplying almost all vaccines used by voluntary organization and by Government, but the supplies do not include polio and measles due to lack of proper refrigeration facilities both in Juba and at the rural health facilities. The World Food Programme is involved in the supply of food mainly for malnourished children, but also in school feeding on a small scale.

WHO is little involved in ground work, but has supplied advisers at various levels of the health services organizations and also to other ministries. WHO has also been instrumental in drawing up the Primary Health Care Programme. This programme was supposed to be revised but this work is still shelved.

AMREF (African Medical and Research Foundation) is attached to the Director of the PHC programme, being mainly active in the field of training, firstly of tutors, secondly in reorientation courses for IHCW and Public Health Nurses. Financial support comes from US Aid and amounted to US\$ 3.2 million for the years 1978-83.

They have also done some survey work through their Survey and Evaluation Officer in the Ministry and they have looked at the problems of medical supplies.

Some efforts have been made recently by the voluntary organizations themselves to get together in trying to coordinate the work of these organizations in order to avoid duplications and in order for multinational agencies to define their objectives in the light of experiences gained by those engaged in field work. Instrumental in this effort have been UNICEF and NCA. However, not all organizations and agencies are participating and one is doubtful as to the full benefit unless an initiative is taken by the Ministry to establish a coordinating body. It is not only a question of coordination, it is also a question of individual resources including abilities to recruit appropriate expertise. UNDP ought to be an important agency in this coordinating work. No doubt the various organizations involved in health work in Sudan need better guidance and coordination. The obvious danger, if this is not done, is that most of them will be left working in a vacuum. And furthermore, by Government not being more actively involved the danger is always present that these organizations are working as substitutes for Government effort rather than support. And the organizations may develop structures and programme solutions which may not be transferable to government set-up when time comes for a take-over.

APPENDIX 9Disease of Livestock in East BankIntroduction

East Bank of Eastern Equatoria is an endemic areas for many infections and contagious diseases afflicting livestock development; these include Rinder-Pest, C.B.P.P., Hoemorrhagge Septicoemia, Trypanosomiasis, Tick-borne disease, the recently recorded east coast fever in Chukudum.

The control measures of these diseases depend mainly on annual vaccination campaign with the exception of Trypanosomiasis and Tick-borne diseases.

No vaccination campaign has been carried out in Torit Districts for the last two years.

Incidence

Most of the disease outbreaks occur in the rainy season from May to November.

Disease outbreak in Torit RDC

Last year in July/August three diseases broke out at quarantine stable (C.B.P.P., Foot Rot and Trypanosomiasis) with a mortality rate of 21.9%.

The outbreak occurred among 210 bulls purchased from Kimatong stable, 1980. The morbidity rate was 56.5%, so drastic measures were taken and all the bulls were got rid of.

C.B.P.P. and Trypanosomiasis also broke out at the RDC farm when 25 herds of cattle (apparently healthy bulls) from the quarantine stable were introduced to the RDC Farm.

Two types were found (T. congolense and T. virus). Mass treatment with Novidiun has been effective.

Ticks and tick-borne diseases

The incidence of tick infection is very high especially in Lafon where cases of anoplosmosis are very common. In Chukudum Ticks of genus Repiciphallus Appendiculatus the vector of east coast fever is recorded.

Report by Dr Ibrahim Julla, January, 1981

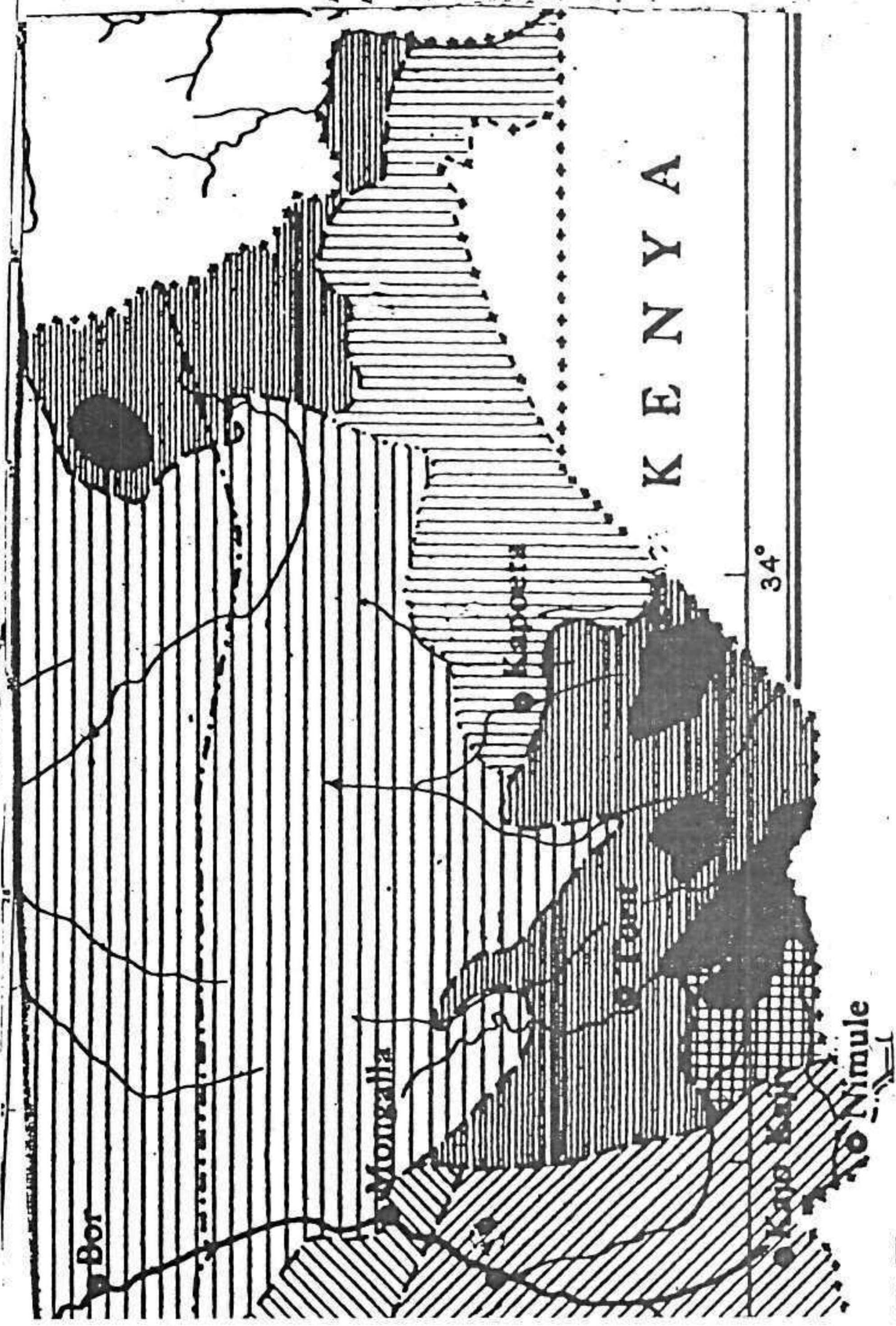
Table showing morbidity and mortality rate of cattle at Torit RDC, 1980

RDC	No of bulls	Place & date of purchase	No of dead bulls	No of sick bulls	No of apparently healthy bulls	Morbidity rate	Mortality rate	Cause of death	Remarks
Torit quarantine stable	210	Kimatong, June, 1980	46	139	25	56.66%	21.9%	1) C.B.P.P. 2) Foot-rot 3) Trypanosomiasis	Drastic measures were taken and all the sick animals were got rid of.
Torit RDC Farm	22	Lafon 1978/79	5	1	16	4.5%	22.7%	1) C.B.P.P. 2) Trypanosomiasis 3) Babesiosis	Mass treatment with Novidiun has been effective to tryps.

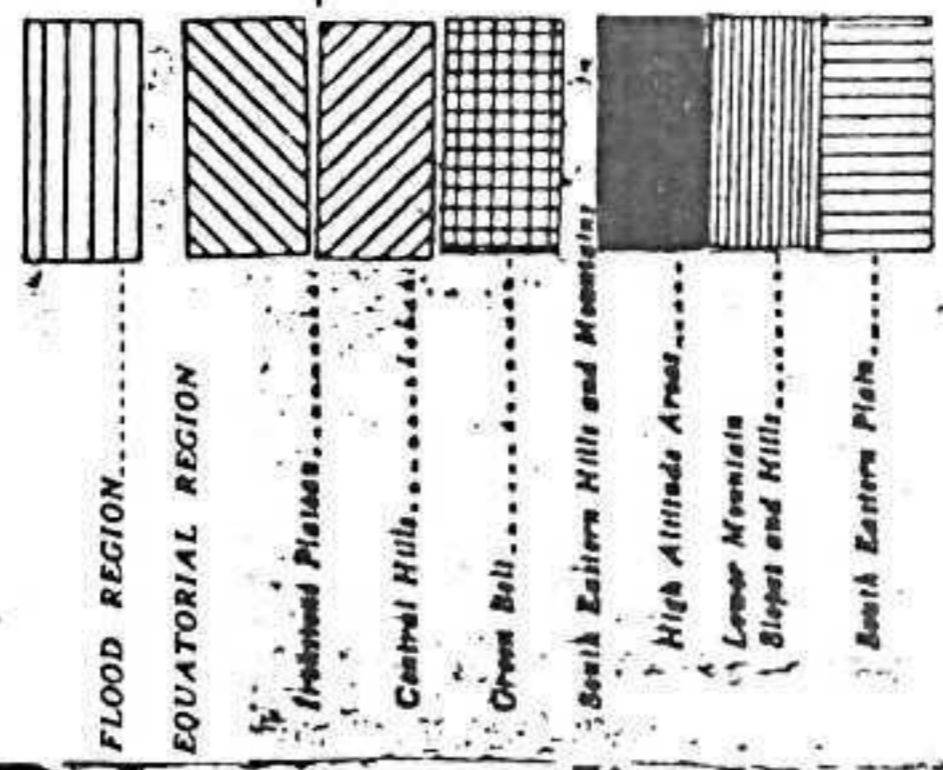


Map 1

Eastern Equatoria  
Ecological Subdivisions

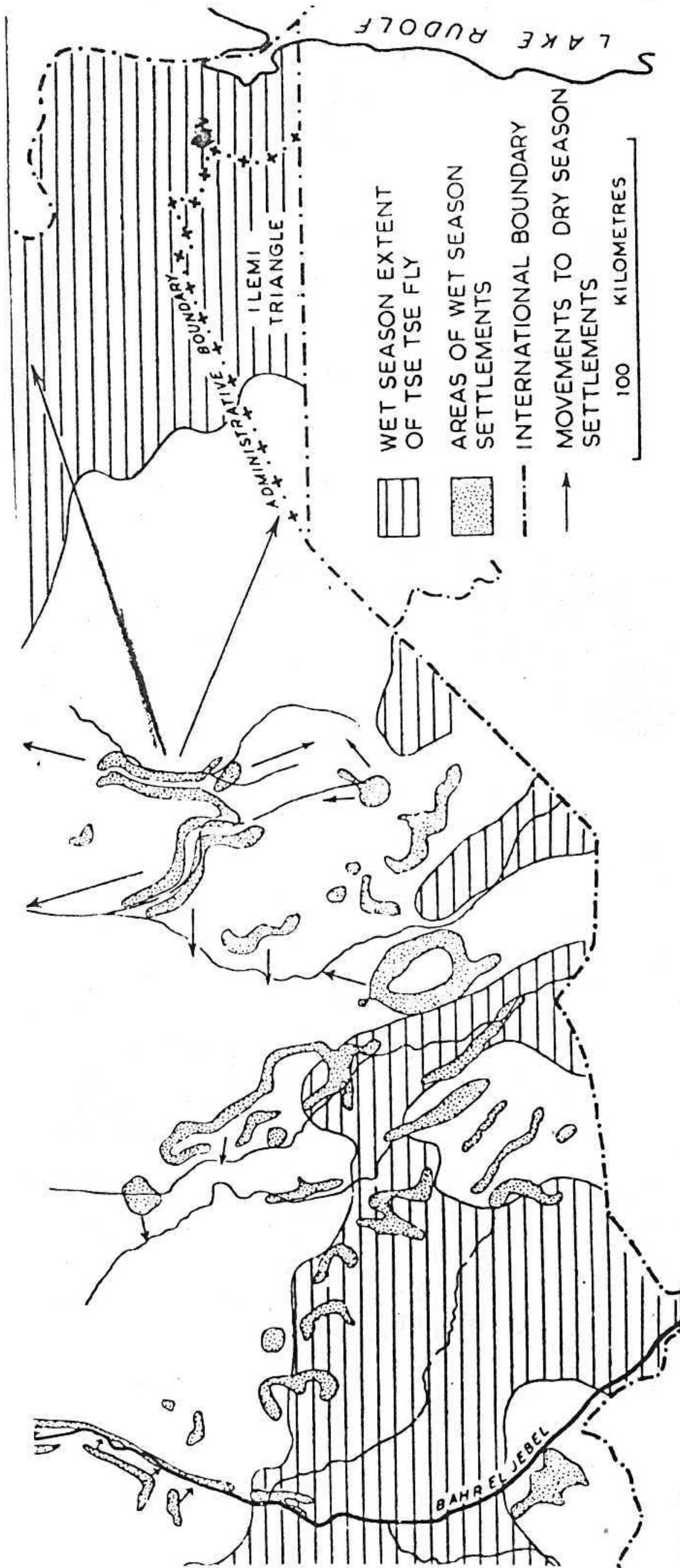


LEGEND



Map based on "A Preliminary Report by the Southern Development Investigation Team" 1954

Migratory Pastoral Movements and tse-tse distribution

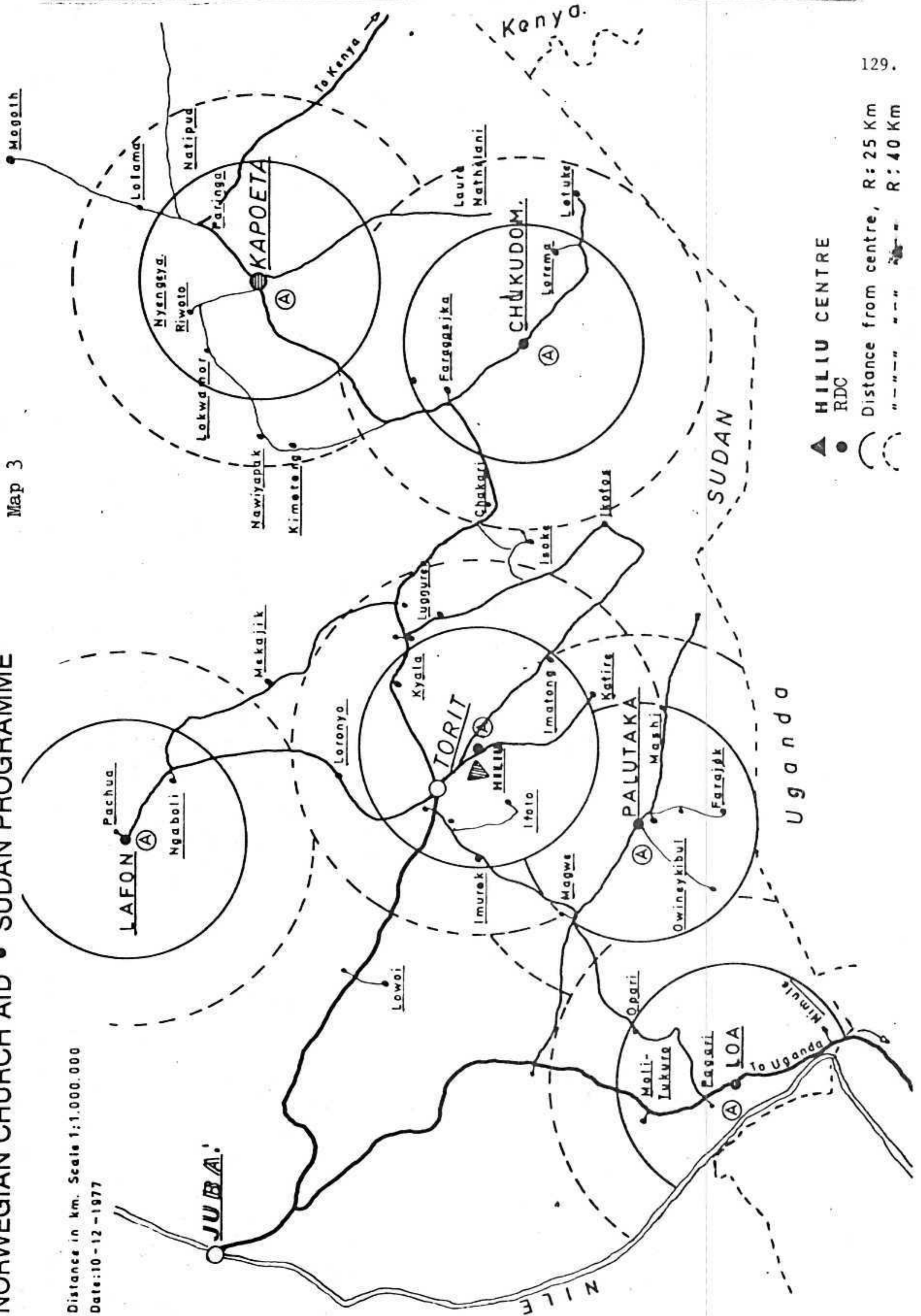


Map based on "A Preliminary Report by the Southern Development Investigation Team" 1954

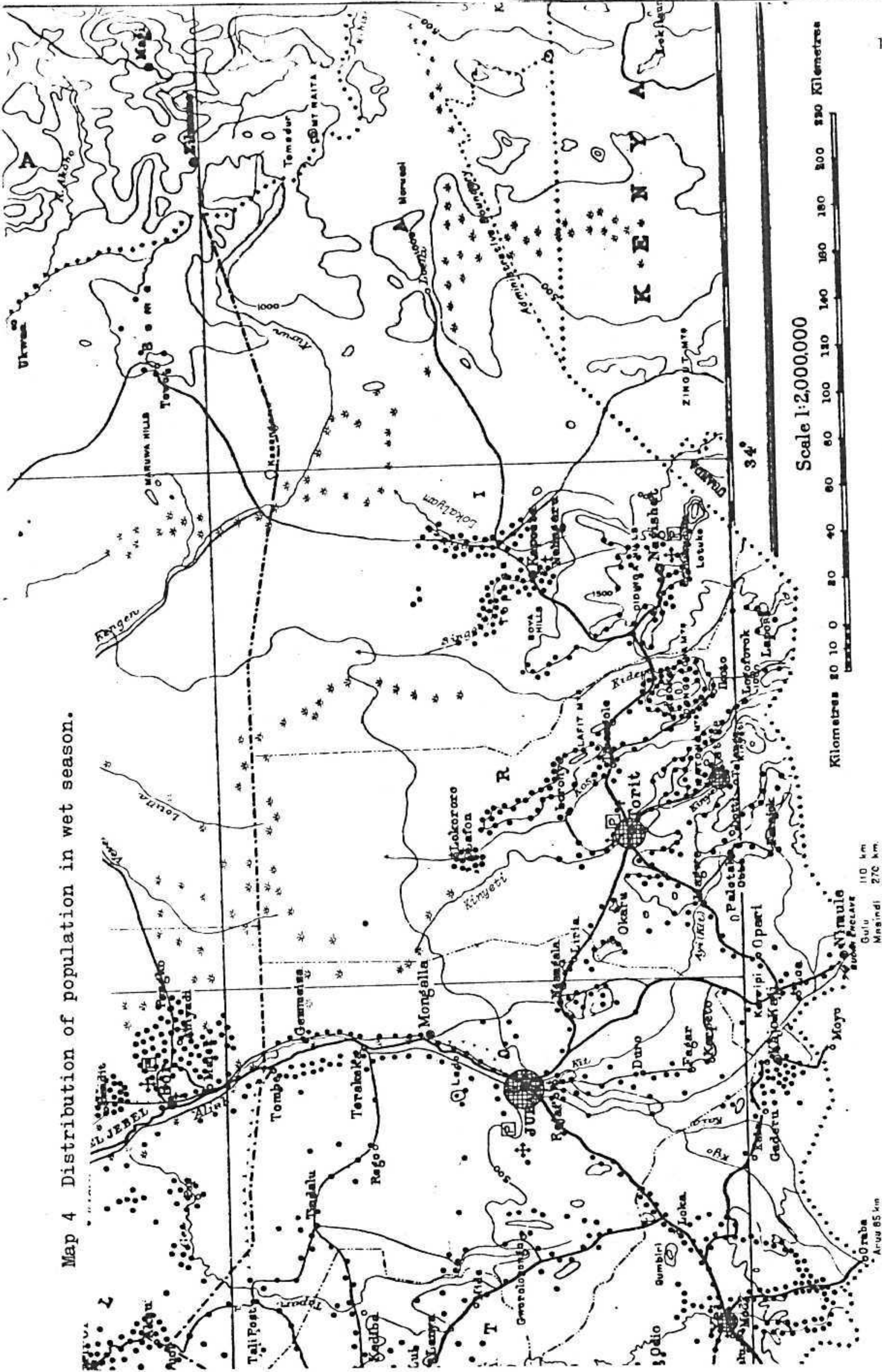
# NORWEGIAN CHURCH AID • SUDAN PROGRAMME

Map 3

Distance in km. Scale 1:1.000.000  
Date: 10-12-1977



- ▲ HILIU CENTRE
- RDC
- Distance from centre, R: 25 Km
- Distance from centre, R: 40 Km



Map 4 Distribution of population in wet season.

110 km  
Gulu  
270 km  
Mairi  
510 km  
Kampala

Map based on "A Preliminary Report by the Southern Development Investigation Team 1954

