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OPERATION LIFELINE SUDAN
Southern Sector

A Critical Review of the Management and Impact of
Seeds and Tools Programmes
in Southern Sudan

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CONTENTS

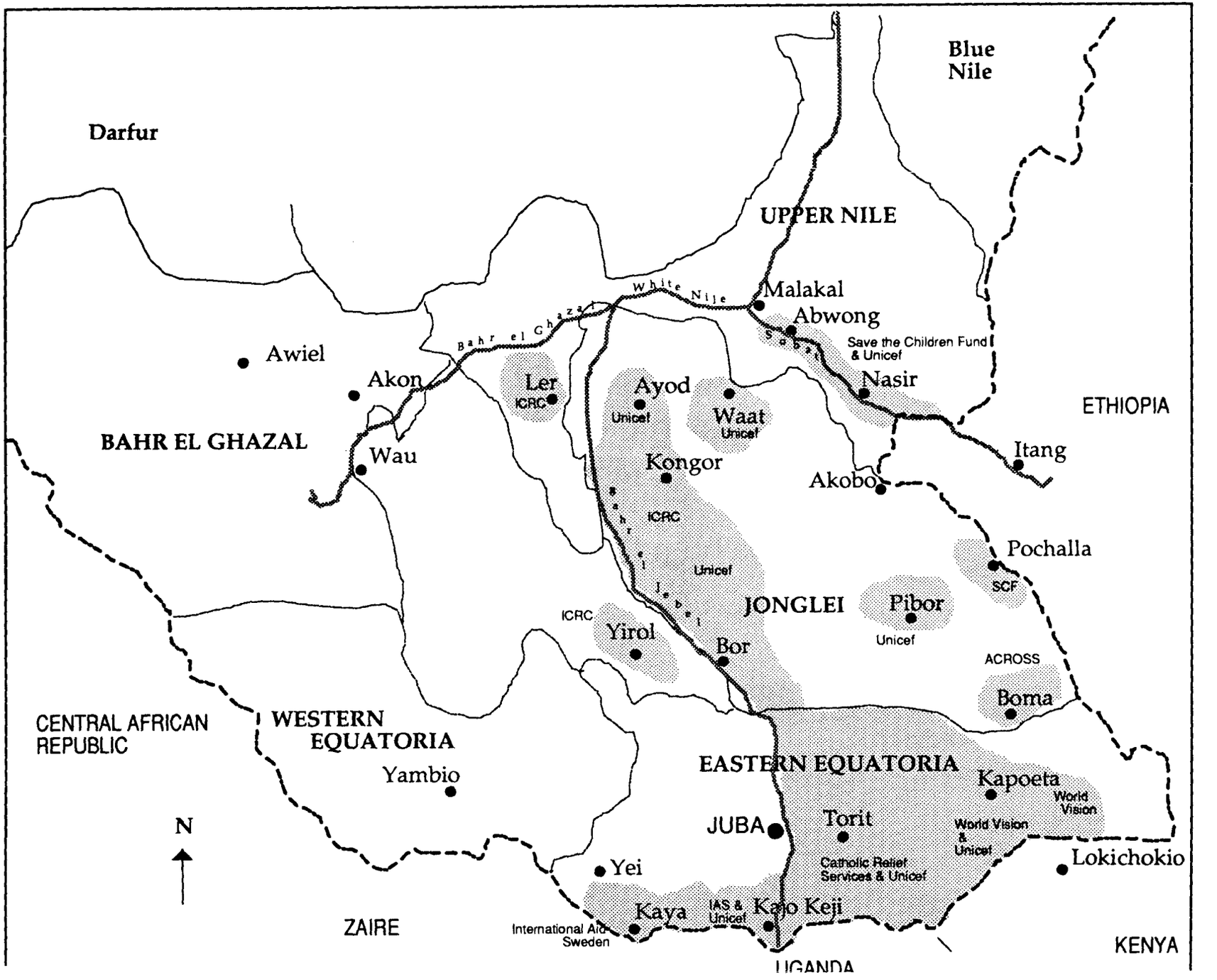
SECTION 1.

SUMMARY & CONCLUSIONS

lap 1

SOUTHERN SUDAN

SEEDS & TOOLS PROGRAMMES 1990



Areas Supplied With Agricultural Inputs

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

The 1990 agricultural support programmes in SPLA-administered southern Sudan consisted of provision of seeds and tools to farmers in a number of areas (Map 1). Unicef, Catholic Relief Services, World Vision, Save the Children Fund (UK), International Aid Sweden and Oxfam America combined to supply some 1,800 MT field crop seed, 7 MT vegetable seed and 390,000 handtools at a cost of around US$ 2.5 million. An ICRC programme was also undertaken, details of which are not covered in this report. Seeds provided included staple grains such as Serena sorghum and Katumani maize, pulses, oilseeds and vegetables. Tools were mainly hoes and mallodas (push hoes), along with pangas (machetes), axes and sickles. These inputs were designed to assist in promotion of food security and self-reliance in all the areas accessible to the NGO'S and UN in SPLA-administered southern Sudan.

This report is the result of a comprehensive survey and review of the 1990 seeds and tools provision programmes. This survey was initiated in July 1990 and planned and undertaken in agreement with and in participation with all NGOs involved with agricultural programming in southern Sudan. [1]

Details of other food production support programmes such as the provision of fishing equipment or cattle vaccination are not included in this report. Fishing and livestock are other very important food sources and will be the subject of separate reports.

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[1]Figures are quoted with full authorisation of the relevant agencies: Catholic Relief Services, World Vision, Save the Children Fund, International Aid Sweden, Oxfam America, Across and ICRC.

1.2 PROGRAMME IMPACT

The impact of the programmes in promoting food production was significant. Overall the inputs resulted in food production estimated at 57,000 MT, nearly forty times the initial quantities provided, even though in some areas rains were poor and production relatively low. In the most marginal areas, the seed may have produced less, but was critical as it formed a greater proportion of the total seed available in these locations than in the higher production zones. In all areas it was made clear to us that support to indigenous production, where possible, was greatly prefered to receiving free handouts except in cases of urgent food need; we found that people were prepared to walk great distances to collect seeds and tools.

The table opposite gives a very broad illustration of the estimated food impact of the programmes in selected areas. The cost of providing the seed is set against the cost of shipping in the food that the seed is estimated to have produced. So, for example, the 180 MT seed that was distributed in Bor is expected to have produced around 5,400 MT food of various types, the cost of which would have been some US$ 2,7 million. The seed itself cost only US$ 230,000 to provide. The last column of the table gives the estimate of what proportion of the area's crops was produced from relief seed inputs: in the case of Bor it is set at 23%.

TABLE 1

IMPACT OF SEEDS AND TOOLS PROGRAMMES ON FOOD PRODUCTION IN SELECTED AREAS

ALL AGENCIES

Area	Seed Rate/ feddan	Yield kg/ feddan	Seed Input MT	Prod-uction MT §	Seed Cost* $	Equivalent Food Cost* $	Percentage of Total Food Production
TORIT	15 kg	450	820	24,600	1,066,000	12,300,000	34%
BOR	16 kg	450	184	5,520	239,000	2,760,000	23%
KAJO KEJI	12 kg	900	207	15,911	269,100	7,955,500	14%
AYOD †	12 kg	180	14	252	18,200	126,000	2%
NASIR †	11 kg	90	70	594	91,000	297,000	4%
KAPOETA †	9 kg	180	45	942	58,500	471,000	8%
CHUKUDUM †	13 kg	180	60	850	78,000	1,105,000	10%
PIBOR	10 kg	180	14	252	18,200	126,000	26%
ALL	20	300	1,414	48,921	1,837,900	25,140,500	14%
					1	: 14	

§ Estimated production from relief seed input, taking into account 1990 climatic constraints.

* Seed cost including transport and personnel $ 1,300/MT
Food cost including transport and personnel $ 500/MT

† Areas affected by drought

Feddan = 0.42 Hectares

The table does not include Kaya, Boma, Pochalla or Waat as these areas were not visited by the agricultural teams. These locations represent and additional 170 MT seed with a possible production of 8,000 MT, bringing the total estimated production from relief seed inputs by all agencies to around 57,000 MT. The table shows very clearly the margin in cost terms between providing seed and providing food and it is clear that a wide margin is only produced if climatic conditions are conducive to adequate crop growth. It should also be noted that a cost analysis does not include the undoubted benefits of the increase in self-reliance promoted by seed provision.

1.3 BENEFICIARIES AND RECEIPTS

The impact was considerable although the amounts received by each farmer were relatively small. The programme assisted by providing around 12% of the seed planted in the areas covered by the programme and an impressive 53% of the handtools. Survey results indicate that perhaps 73% of farm families received

at least some seed or tools or both. Average receipt found was 5kg seed and 2 handtools per farm family, however there was a considerable range in both quantities received and in farm family size. Those in the more inaccessible areas received much less than their counterparts in locations such as Torit. Whilst we aimed at providing some 90,000 farm families with an average of 15 kg seed and 3 tools, the survey indicates that some 180,000 farm families benefited from a smaller amount. (Table 1)

TABLE 2

AVERAGE SEEDS & TOOLS (BOTH LOCAL AND RELIEF) PER FARM FAMILY SURVEYED

Location	n	Relief Seed Kg	Local** Seed Kg	Relief Tools #	Local** Tools #	% Receiving Seed %	% Receiving Tools %
Torit	88	13	48	2	2	78	80
Bor	82	3	43	2.5	5	81	82
Kajo Keji	32	1	57	1.5	2	81	62
Ayod	60	3*	40	2	3	98	60
Nasir	57	6*	21	3	2	79	56
Pibor	56	2	0 (!)	3	0	98	93
Kapoeta	50	4	29	2	2	48	48
Chukudum	80	4	45	1	2	29	39
All	505	5	36	2	2	73	66

*Farm family size perhaps three times greater than that in other areas.

** Local seed are those available to the farm family from their previous harvest or acquired through barter or kinship networks. Local tools are those owned or acquired by the family prior to relief distribution.

1.4 CONCLUSIONS

The impact of the seed and tools programmes has been significant despite the poor harvests in some areas. Table 2 above shows a multiplication factor of 40 times the amount of seed planted to food reaped. In terms of cost this means that instead of spending 25 million dollars on food, some 2 million dollars was spent on seed. In addition we must consider the considerable benefit of assisting, notably through the provision of handtools, in the efforts of the farmers of southern Sudan to produce their own food.

With regard to potential seed supply, it is expected that adequate quantities of seed will be available next year in all survey areas except Sobat, northern and eastern Ayod and Waat. Although not included within this report, it is worth mentioning that Bentiu District, northern Upper Nile and possibly other areas currently inaccessible will suffer a deficit in seeds next year.

A more widespread deficit will continue to be in the supply of suitable tools. Support to blacksmiths should be given attention, but would probably not result in a large increase in supply due to shortages of workable metal.

The planning of an agricultural programme for 1991 should concentrate on preservation of what small amounts of local seeds are available in each area, on ensuring food supplies to deficit zones to prevent seed being eaten and on provision of tools. Emphasis must be placed on the worst-hit areas, at least in terms of early interventions to avoid logistical problems, but the important role of the southern districts in producing potential surpluses should not be overlooked. Southern districts should receive support in seed preservation and tool manufacture.

Basic conclusions from this survey suggest that the following points should be noted in planning of future interventions:

1. There remains a major deficit of agricultural tools in SPLA/M-administered southern Sudan.

2. The potential for local seed preservation is great and should be given priority consideration.

3. We should continue to work closely with traditional authorities, whilst also investigating the traditional systems of kinship and exchange. This is a means of ensuring people's participation and feedback in assessment and implementation of programmes in southern Sudan.

4. The role of women in food production should be given further emphasis in programme research and implementation.

5. Any future projects should design simple universal ledger-type record keeping systems and ensure these are kept at all appropriate levels.

6. Future projects would benefit considerably from having specific personnel assigned to specific jobs, both from the SRRA and counterpart agency.

7. Serious consideration should be given to the northern districts (Upper Nile, Bahr el Ghazal, northern Jonglei).

2. OVERALL FINDINGS

2.1 METHODOLOGY

The survey took place between July and August 1990 and covered 7 of the 12 areas provided with seeds and tools. Over 500 farmers in 82 villages were interviewed along with their chiefs and those responsible for distribution. Individuals were asked for details of receipts and for their opinion of the programme. Input arrival and distribution records were studied and personnel involved in all aspects of the programme were asked to comment.

2.2 LOGISTICS

The logistics of delivering nearly 1,600 MT of seeds and tools to twelve main locations and then to around 200 primary centres was complex. Most of the deliveries were done during the rains, due to the late start and slow early stages of the programme. The bulk of the inputs were transported by road convoy, but some critical amounts were ferried by aircraft to otherwise inaccessible locations. Once in main centres, deliveries to primary and secondary centres were made by trucks and cars, boats and canoes and in many instances on the heads of bearers.

One of the criticisms that some of the Unicef staff make of their own operation was that the northern districts were not given immediate priority first: they were the most difficult to reach, the need for an airlift was clear at an early stage - perhaps inputs could have been speeded up and full allocations received if given greater priority. There does appear to be a bias by all the agencies to the southern districts, resulting from ease of access, potential for successful programmes and historical factors. Only two agencies were actually involved with the SRRA in providing agricultural inputs to the geographical areas north of Torit District: Save the Children Fund and Unicef. SCF managed to send in inputs to Pochalla and Nasir between February and March, but Unicef only managed early delivery of seeds and tools to Bor and Pibor. Most of the Unicef supplies to Nasir, Waat and Ayod did not arrive till June or July due to late arrival of the aircraft to transport them after attempts to get through by road failed. The fact that rains were late in these northern areas and that the seed therefore came at the critical moment when many farmers had run out of their own seed (which had been planted earlier and had already failed) does not really mitigate against the lack of attention received by these areas. Little assistance was provided for local distribution or for record keeping in the northern districts, a failure that contributed towards the weaker programme in these zones. Torit was given priority by Unicef due to the early start of the rains, its high potential productivity and the ease of logistics from Kenya. However Kajo Keji and Chukudum also start their cultivation seasons early and are high potential zones and these two locations received Unicef inputs only in July. As predicted, productivity in the southern Districts was overall considerably higher than in the northern areas.

2.3 DISTRIBUTION

SRRA and collaborating agencies were involved in deciding which chief got what, and in Torit were involved in decisions even at village level, but elsewhere and otherwise the traditional system of chieftaincy was the mechanism employed. Some of the agencies listed a target number of beneficiaries (ie a proportion of the population) who would receive a certain amount of agricultural inputs, for example Unicef chose to target 32% of the families within those districts covered by its programme (55,000 farm families). In practice the chiefs were not instructed of this aim and anyway it appears that it would not have suited their approach which was as egalitarian as possible.

Chiefs took into account family size and needs, thus giving us an extraordinary range of receipts, but in general they tried to give to as many families as possible. The chiefs assisted around 75% of families with amounts smaller than those planned by the donor agencies. This system of equality is reflected in almost every activity of the peoples of southern Sudan.

Chiefs appear to represent their people well and direct contact with them in programme planning and implementation is very effective. Only a very few of the men and women interviewed complained of unfairness despite the remarkable range of receipts found even within single villages. This is partly due to the levelling process found in most societies in southern Sudan:

The survey found little evidence that those most in "need" were those who received the most inputs, rather they received and so did their more well-off counterparts. This is a common system throughout Sudan. In southern Sudan, the resulting products are then made available to the poorer by the richer through traditional kinship networks. In addition there is amongst most of the tribes a "Levelling" process whereby surplus food and seed is shared out amongst less favoured sections of a tribe, often shortly before planting time.

It is recognised that women play an important role in agricultural production and survey results indicate that they were not overlooked in seed and tool distribution. However, the extent of their involvement in decision making is poorly understood and is recognised as an area for further investigation.

2.4 RECORD KEEPING

The programmes did not stress record keeping at field level and this was perhaps one of the primary flaws in the activities. The complexities of record keeping in these programmes was perhaps underestimated. However, evidence collected through the monitoring survey points to a fair although disorganised distribution without significant loss, however actually tracking particular items right down to beneficiary level has not been easy.

Record keeping was undertaken in most areas to some degree or another - ledgers were compiled, delivery notes filled and signed, but the records are generally incomplete and often do not match one another. Record keeping was perhaps a harder job than it is given credit for: boxes of tools are considered to have 24 pieces and recorded as such until they are opened, then they are found to have quantities ranging from 20 to 30, adjustment of records is then difficult after the boxes have left the store - the chief therefore receives 20 and the record says 24. More often than not the chief claimed to have received MORE than the records say was sent, this leads us to believe that it is not that distribution is in error but merely the records of it.

The one area amongst those visited whose record keeping appears to have been exemplary was Kajo Keji, the knowledge of why and how to track the agricultural inputs was comprehensive, probably due to the long history of development programming in the area. A recommendation of this report will be that Kajo Keji staff be employed in training their counterparts in other, less favoured areas.

Unicef and SRRA had jointly produced a format for distribution monitoring: Forms 1 & 2 (Appendix 1). Form 1 was designed to be filled in by a village head, listing the names of each family receiving, family size and items received. Form 2 was then to be compiled by SRRA from Form 1: a summary of what was distributed village by village. In practice very few of the village headmen or more senior chiefs were able to read and write English and those that could were not given adequate instructions in how to fill the forms. All the Form 1's and 2's reviewed by the monitoring team appear to have been filled by officials at the main centres and tend to be an ideal rather than reality. We did not find many farmers whose receipts conformed to what Form 1 said - again they had usually received more than was recorded.

2.5 TIMING

Most of the respondents said that the items were late. Only those who received inputs in April said that they were on time. However in almost all cases there was still time to plant. In Kajo Keji where the bulk of the seeds and tools arrived in July, the farmers stated that they were in time for the second planting. In Nasir and Ayod, seeds arrived in June and July and although this would normally be very late, this year there had been a late start to the rains, much local seed had been planted and lost and the relief seed arrived at a good moment to supplement dwindling supplies. Even the amounts provided by Oxfam America to Chukudum may be in time for the third planting there. Some of the seeds that arrived late at Kapoeta villages (World Vision/SRRA) will probably have to be stored until next year. Tools did not arrive in time for land clearance in most areas, but were extensively utilised for tilling and weeding.

2.6 QUALITY AND CONDITION OF INPUTS

Almost all farmers were please with the quality and condition of the items they received. Only a few (some 2%) said that the seed was damaged, weevil infested or mixed with grass seed. A number of people mentioned that the hoes and pangas were not as strong as their local types and a small proportion were already cracked on receipt. Since the tools played and will play such a great role in agriculture of southern Sudan, it is particularly important that they should have been of adequate quality and generally speaking they were.

2.7 SUITABILITY OF TYPES PROVIDED

Most respondents were pleased with the different types of seed and tools that they received - a few found the tool type wrong for their needs. In Torit, where there is a great multiplicity of tool types there were some comments on suitability and in Mongalla (Bor) where some push hoes (mallodas) were given to Mundari Area - the farmers referred to them as being useful for children. Generally people were unwilling to criticise the inputs, perhaps fearing that they might compromise future beneficence. When quizzed as to whether they would have preferred that money should have been spent on staples rather than vegetables, few said they would prefer staples: "everything that was brought was wonderful and appropriate!" One person in Pibor mentioned that vegetable seed was unnecessary.

With regard to vegetables, although few were critical, the teams observed that the failure rate was high, mostly due to drought and lack of knowledge as to how to grow vegetables. For future programmes it would probably be more effective to provide only the most common horticultural seeds, okra and pumpkin.

The only mistakes of any magnitude were sending maize to Ayod and millet to northern Bor. Ayod farmers grow primarily sorghum; the maize sent there (about 50% of cereals sent) was not doing very well. In parts of Bor, millet failed to produce grain - this is probably related to soil type and perhaps to time of planting.

Other inputs were particularly appreciated: many people were pleased to receive cowpeas, pigeonpeas, sorghum, maize and vegetables, such that if asked we would be hard put to say which items should or should not be provided another time. We cannot unfortunately use the information gathered on local seed supplies to indicate the most appropriate seed types for each area as the seed we found may have been what was available rather than the ideal choice of each farmer. When asked, the farmers were not ready to shorten the list of types of seed that they would most prefer

2.8 SUITABILITY OF VARIETIES PROVIDED

The two main varieties provided were Katumani maize and Serena sorghum (now christened "YOOEN" in many locations). We are aware of the potential dangers of introduction of new varieties, untested in the environments of southern Sudan (although farmers in Torit and Kajo Keji were familiar with both Serena and Katumani). However it appears that the farmers interviewed were aware of the value of their traditional varieties and the role of each in overcoming particular environmental hazards. The proportion of exotic seed to indigenous seed was small: we may therefore assume that rather than a take-over, an addition to the genetic base has taken place. Mixing of the small amounts provided with local varieties did occur and will result in some changes, whether beneficial or not cannot be judged at this stage.

Generally farmers were unable to say much on the performance of the new inputs when compared with their own local varieties as the plants had not been in the ground long enough. Few complaints were received about germination rates except where the seeds had been damaged and in Kajo Keji where Katumani was clearly unsuitable. A number (notably those who had been assisted in 1989) said that serena stored less well than local sorghum and tasted bitter. Most said that all the items provided performed excellently, whilst a few noted the better flood and drought resistance of their local varieties. Equally many were delighted at the prospect of short maturity. On the other hand, those in Torit who had suffered particularly intense bird damage ascribe it to the early maturing crops being the only food available for birds, thereby attracting them from far and wide.

2.9 LOCAL SEED AND TOOL SUPPLIES

Local seed supplies available to survey respondents were in greater quantities than expected. What sacrifices had been made to acquire or keep local seed is not known. However, very few (7% or the sample) were found who did not have something from last year or who were unable to barter. An average of 39 kg of various types of seed was recorded, ranging from 0 to 150 kg. (Table 1)

30% of those interviewed had no tools of their own and those that were seen were often old and very worn. We found an average of 1.9 per household, ie, since 30% had none, those that did have often had more than two. Two tools for a family of between 4 and 7 adults requiring a range of at least five tool types is hardly adequate. Our tool inputs may therefore have been more valuable than our seed inputs: relief tools averaged 1.5 per family and although not given to all families, were available to them through borrowing. Tools provided represented over 50% of the tools used in cultivation in 1990. There remains a clear absence of tools in southern Sudan and continued efforts to ensure their supply should be pursued.

All respondents had something, virtually all had some seed, and a fair proportion had tools, the rest borrowing from relatives or neighbours.

2.10 SUFFICIENCY OF RELIEF INPUTS

Nearly 100% of those interviewed said the seeds and tools provided were insufficient. However, significant amounts of local seed of a number of varieities and types were available, especially in Torit, Bor and Kajo Keji. It would appear that in these areas the programme impact was to save people the trouble of buying or bartering for additional needs.

In areas such as Ayod and Nasir, local seed supplies appeared quite good considering the difficult times the populations have suffered in recent years, but overall were inadequate. Would they have planted more if more had been available? In the northern locations yes, as so much had been lost in the first two or three plantings that the third planting was probably limited not by labour constraint or time, but by seed availability. Therefore the seed provided by relief organisations, although small in quantity and, due to climatic constraints, poor in productivity, may be said to have been more important as it was a major proportion of the available seed.

It is clear that tools are in very short supply. More tools would, without doubt have been greatly welcomed in all areas - ideally a family would have at least two different tools per person ie. 8 - 14 implements. Whilst the projects only provided an average of two tools per family to add to the two that were already owned by the average household and thus leaving a still significant deficit, the impact was significant and generally appreciated by respondents.

2.11 LOSSES

Although record keeping was shaky, evidence from the farmers and their chiefs leads us to believe that losses were very slight. A small proportion of the seed was spoiled during transport (perhaps 1 MT, less than 1%). Use by the civil administration of a certain amount for the workers in each administrative centre was not fully recorded in all cases, but was perhaps not more than 5% of the district total and appeared a well justified distribution decision.

2.12 STATE OF THE CROPS

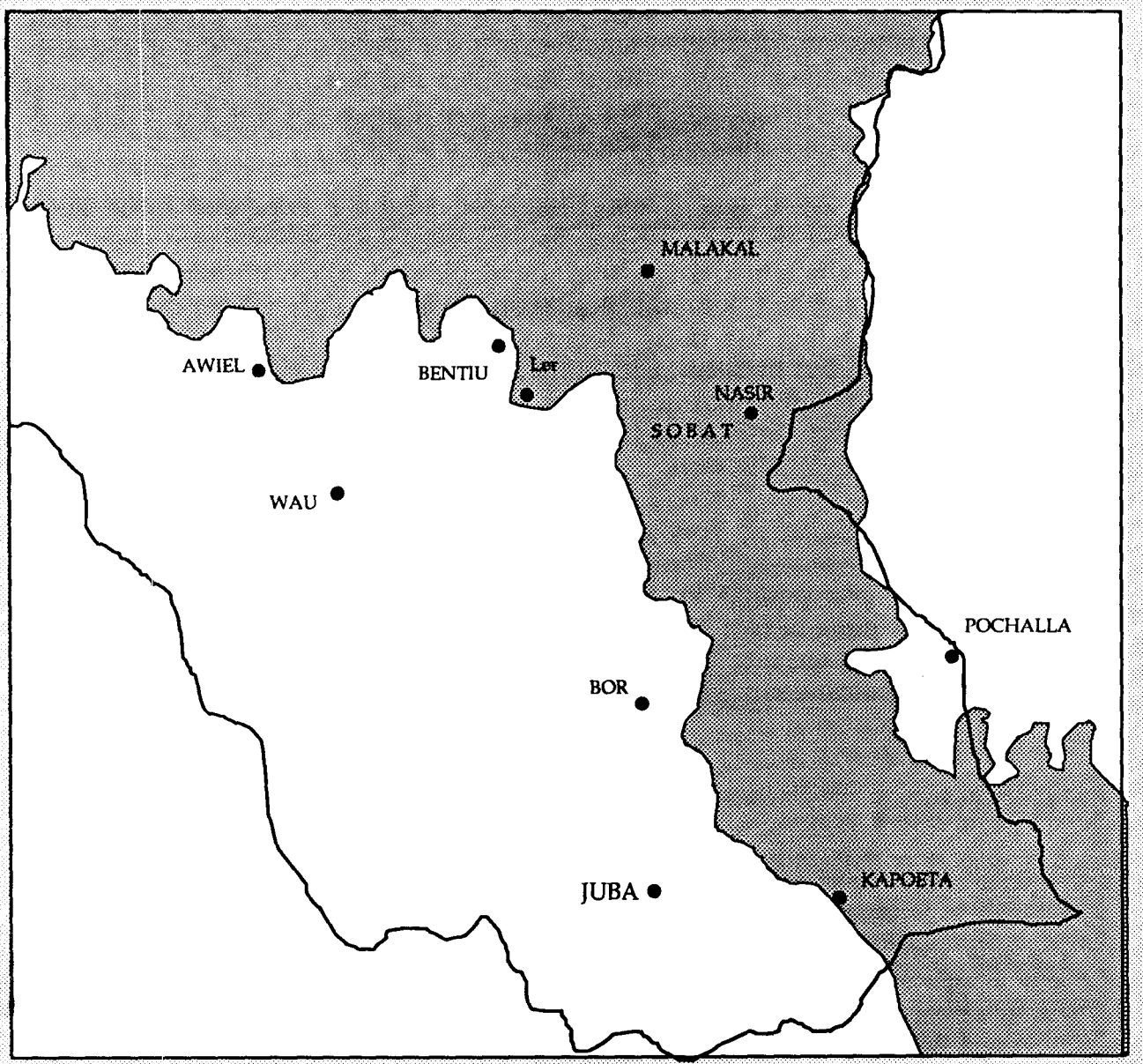
With regard to potential harvest, southern Sudan can be divided broadly into two main areas, those that faired relatively well and those that suffered from early drought. Torit, Bor Kajo Keji and Yei Districts all received fairly well

Map 2

SOUTHERN SUDAN

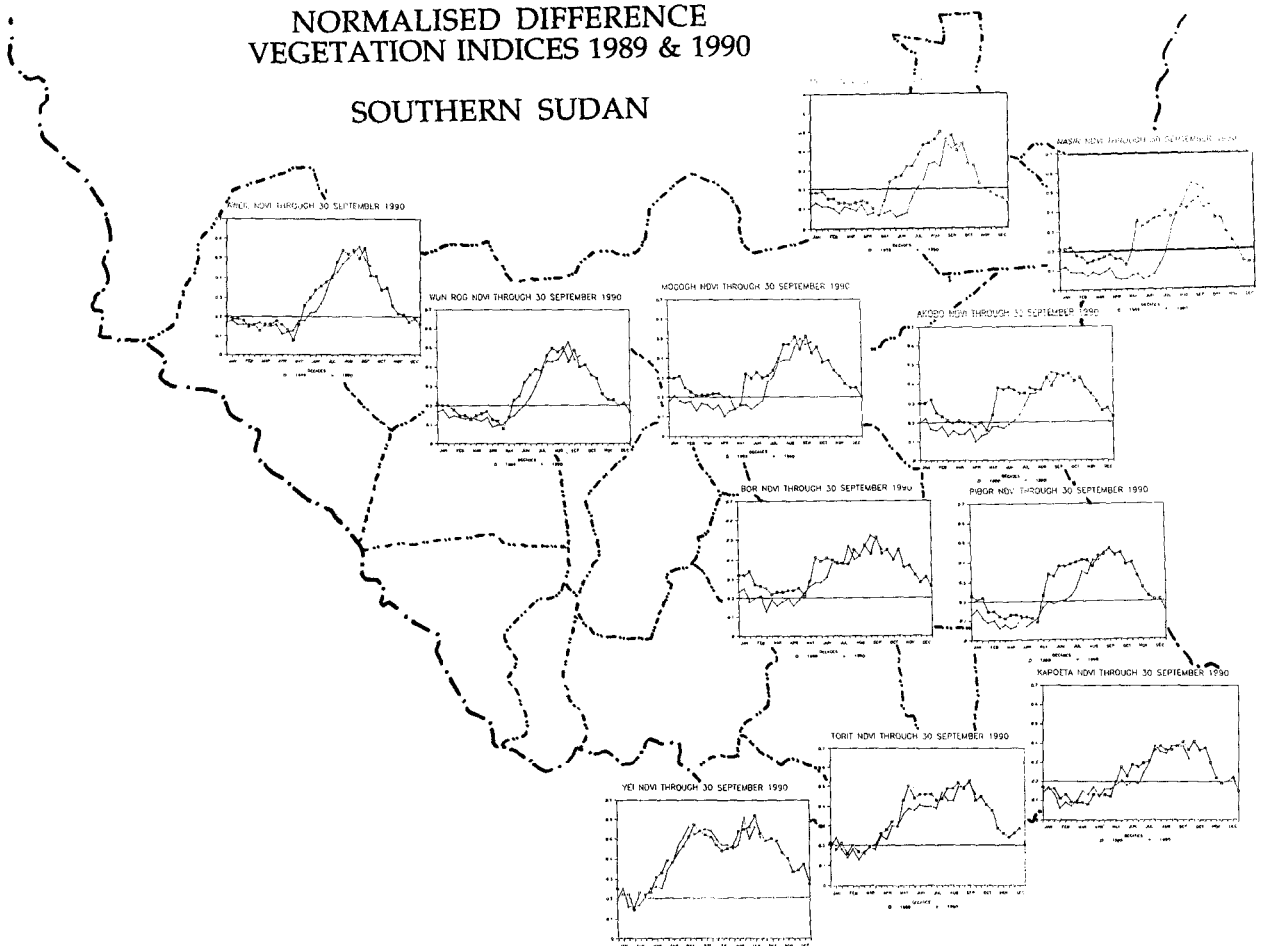
NORMALISED DIFFERENCE VEGETATION INDEX

1 - 10 JULY, 1990



**Area where N.D.V.I. values less than 0.2,
ie. Soil moisture conditions inadequate for vegetation growth:
Areas of subsequent poor harvests**

Source: Regional Remote Sensing Centre, Nairobi



Normalised Difference Vegetation Index (NDVI) is created from data sensed by the Advanced Very High Resolution radiometer (AVHRR) on the NOAA polar orbiting series of satellites. Light bands red and infra-red are sensed daily, composited every ten days and a ratio formed (0 - 1.0). Calibration work in East Africa has led to the establishment of a threshold of NDVI = 0.2, below which soil moisture is inadequate or too great to support green vegetation for a protracted period.

distributed rains this season and harvests are expected to be fair to good. Within these zones there are some patches of poor growth resulting from local climatic fluctuations and pests. Other areas of southern Sudan not covered by OLS but having good rainfall regimes in 1990 include almost the whole of the West Bank up to northern Bahr el Ghazal (see Map 2).

TABLE 3

TOTAL ESTIMATED PRODUCTION OF AREAS SURVEYED

n	Location	Sacks*/ Feddan	Feddan/ Household	Sacks/ Household	Total Households	Production (MT)
88	Torit	5	4	20	40,000	72,000
32	Kajo Keji	10	4.6	46	19,400	91,000
82	Bor	5	1.9	9.5	27,500	23,512
50	Kapoeta	2	3.8	8	18,000	12,600
80	Chukudum	2	3.9	8	18,500	12,950
57	Nasir	1	2.8	2.8	20,600	5,191
60	Ayod	1	2.2	2.2	8,000	1,584
56	Pibor	2	0.8	0.8	13,000	972
505	TOTAL				156,000	219,809

* Sack = 90 kg

Analysis of satellite data and field visits to some locations confirm that northern Bahr el Ghazal, Upper Nile and northern Jonglei suffered from an almost complete absence of early rains (April - June). Rains came to northern Bahr el Ghazal in late June and the season then appears to have been fair. Ayod seems also to have recovered from the early drought. The main problem in these two zones is the loss of large amounts of seed in failed plantings. The Sobat Basin, Waat, Akobo, Bentiu and northern Upper Nile are probably the areas where harvests are likely to be the poorest overall. In Nasir the survey teams observed that the late rains were closely followed by flood as the annual rise in the rivers and flow of rainwater saturated the fields of young crops. This phenomenon has also been reported in parts of Kongor and northern Bor Districts. Included here is a recent statement from the SRRA regarding overall crop performance in southern Sudan, the conclusions contained in this statement are generally supported by the findings of this agricultural survey:

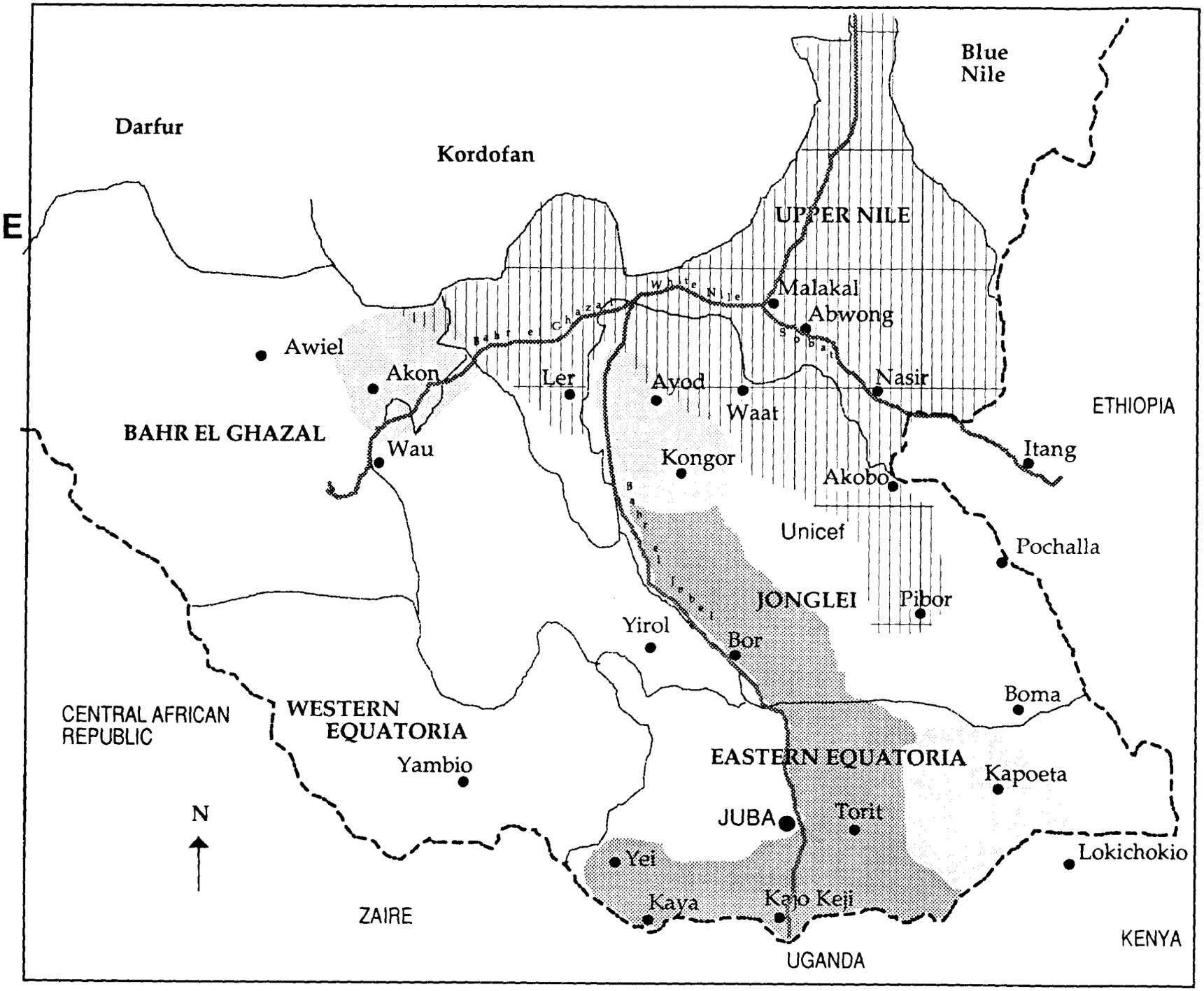
"GENERAL CROP PERFORMANCE IN SRRA-ACCESSIBLE SOUTHERN SUDAN

[The seed and tool] relief supplies, added to farmers' own efforts to provide for themselves through networks of kinship, harvest saved from last year and some barter trade, have made a considerable impact on the life of the resident and displaced populations. Some areas have received relatively good rains, notably

lap 3

SOUTHERN SUDAN

STATE OF THE CROPS IN AREAS SURVEYED 1990



Areas of Good Harvest

Areas of Fair/ Poor Harvest

Areas of Poor Harvest

Source: SRRA

around Torit, Bor and Kajo Kaji and productivity is quite good. However, the weather has been unkind to the majority of areas, many of which suffered early crop failure due to lack of rains and prevalence of bird damage. The late start of the rains and consequent vegetation growth is confirmed by satellite data and field reports from SRRA and OLS personnel.

An ICRC team visiting Ler in July this year reported clear evidence of crop failure. The UN/SRRA delegation that visited Akon in August this year reported signs of crop failure and crop stunting due to late rains. In his message to Dr Garang dated 3 August 1990, Mr Michael Priestley stated that it is clear that there is already considerable hunger stress in northern Bahr el Ghazal and both western and eastern Upper Nile which require special relief measures immediately. It is evident that the late rains have resulted in a series of failed plantings in many areas resulting in the loss of early crops during the hunger period and in a generally poor prospect for the 1990 harvest. It is also clear that Sudan as a whole is witnessing a severe drought resulting in crop failure in many parts of the country.

Signs of crop failure in many parts of south and north Sudan are already clear. Today many livestock owners in north Sudan have started to sell their cattle. Prices of grain in Khartoum are extremely high, costing some LS 2,500 a bag (US$ 555 at the official rate).

If we compare the situation in the south to that of the north, the situation in the south may seem less serious, but it is possibly more acute due to the absence of governmental apparatus, the long-term effects of the ongoing civil war including the displacement of populations and disruption of production since 1983. This, compounded together with the lack of transport infrastructure will necessitate continued OLS Programmes in 1991.

Many field reports have confirmed that the 1990 drought may be worse than that of the mid-eighties in the south. Many people will be threatened by starvation, particularly those who have been forced back to Bahr el Ghazal and Upper Nile from Khartoum at a time when the area cannot support them.

A field visit to Nasir area, accomplished by Unicef field staff in October 1990, confirmed clear evidence of serious food shortage in Nasir and in both Northern and Western Upper Nile due to crop failure. Groups of displaced hungry people are reported to be passing through Nasir from those affected areas on their way to Western Ethiopia."[2]

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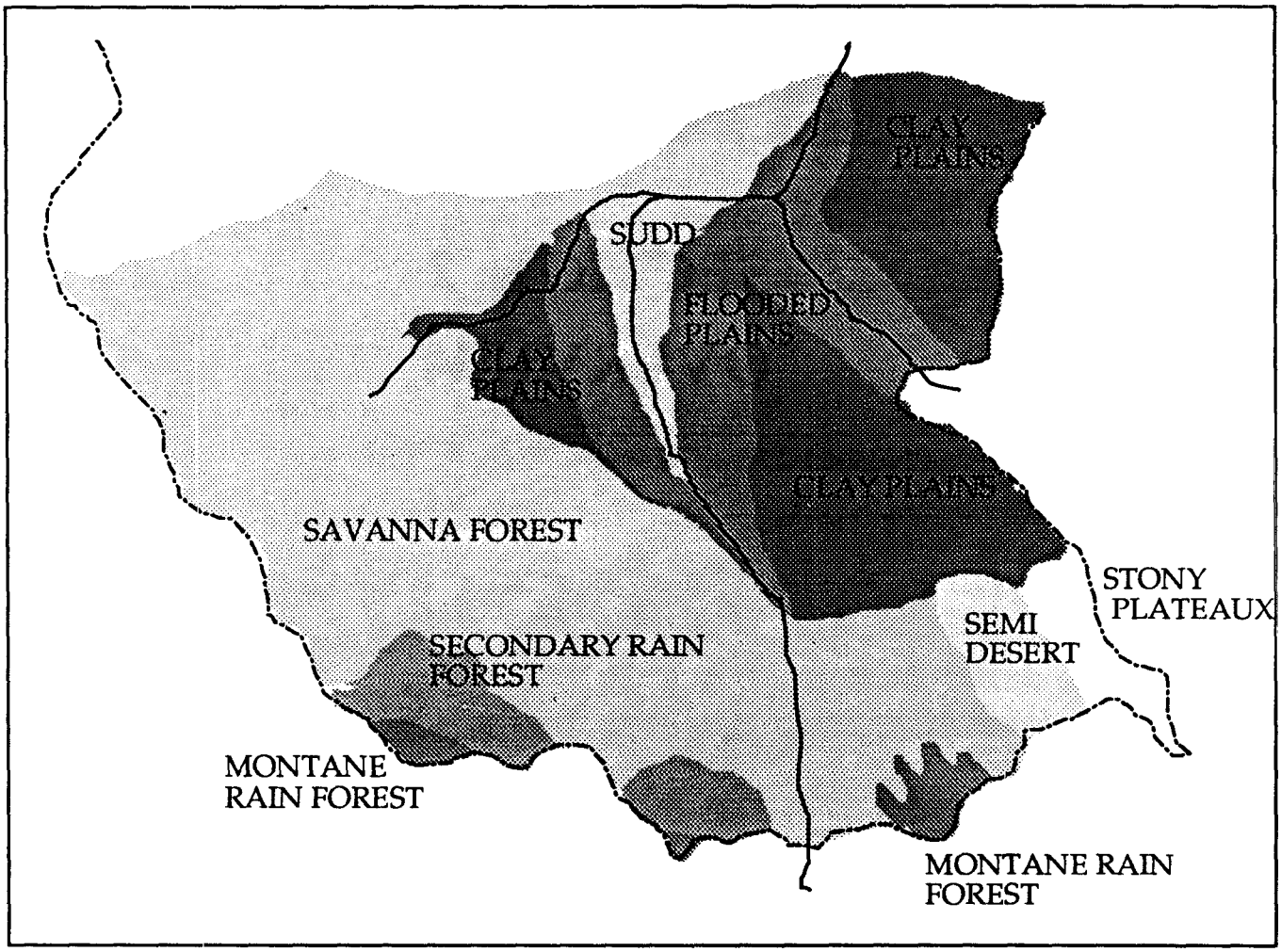
[2]SRRA Agricultural Department, Kapoeta

SECTION 2:
OVERVIEW

Map 4

SOUTHERN SUDAN

ECOLOGICAL ZONES



A. BACKGROUND

1. CLIMATE

Rainfall in southern Sudan varies from a maximum of some 1,300mm in the very south (parts of Torit, Kajo Keji and Yei) to around 400mm in the semi-arid area east of Kapoeta. Average rainfall in the Imatong mountains is 2,200mm, in Nasir around 700mm. There is a single definite dry season in most areas other than the very south were there is a double equatorial rainfall peak. Generally the rains start around April/May becoming later as one travels north and end in October, continuing longer as one travels south - the rain regime is linked with the annual north-south passage of the inter-tropical convergence zone.

> *"The rainfall in any one year or any one month is most capricious and unreliable: extreme variability of rainfall distribution is one of the main features of the area."* [3]

2. HYDROLOGY & ECOLOGY

Most of the flow from the highlands in and surrounding Southern Sudan runs off after storms, so the flow of the draining streams is very erratic. The rivers emerge onto plains so flat that often their channels are lost and water mingles with the accumulations of direct rainfall on the plain and covers great areas, sometimes moving slowly across country or standing until evaporated in the dry season. Referring to the Jonglei area, Johnson says:

> *"The occurrence of flood is less dependent on local rainfall than on rainfall in other parts of northeast Africa. The plains draw on water from the Ethiopian highlands, East African lakes and eastern Equatorian mountains. The flat topography and impermeable soils of the plans prevent the region from storing much of this water in the dry season. Water availability depends instead on the configuration of the annual flood filtered through the permanent swamps of the Bahr el Jebel (Nile)...*[4]"

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[3] "Natural Resources and Development Potential in the Southern Provinces of the Sudan – A Preliminary Report by the Southern Development Investigation Team 1954, Government of Sudan.

[4] The Ecology of Survival - Case Studies from Northeast African History, Johnson D. H. and Anderson D. M. (eds), Lester Crook Academic Publishing, 1988.

In 1990 rains were very slow to start in the northern parts of the zone in question. The Normalised Difference Vegetation Index (NDVI) data recorded by NOAA[5] satellites confirms ground observations of the extension of the drought belt that is currently hitting northern Ethiopia and northern Sudan down into Upper Nile and Bahr el Ghazal. NDVI for Akobo, Nasir and Malakal is particularly dramatic, the vegetation response during the early part of the rains being far below the five year average and in Nasir increasing at a very rapid rate indicating flood.

It is possible to see from the cumulative vegetation indices that the northernmost areas of southern Sudan (Melut) are suffering a drought on a scale similar to that experienced in 1984. Further south cumulative biomass figures indicate a good year although starting late.

The soils of southern Sudan fall into two major groups: the soils of the alluvial clay plains and the soils of the lateritic zone. On the plains the alluvial soils are deep and erosion is uncommon. Despite their inherent fertility, the soils are alternately waterlogged and impermeable and waterless and unworkable. The sandy soils that occur in isolated patches on the plains are less fertile but are intensively cultivated due to their better drainage and ease of tillage. In the laterite zones where rainfall is also higher and more reliable, the topography is undulating, soils are lighter and characterised by free drainage. The nutrient status of these soils is inferior to that of the alluvial clays and nutrients once accumulated under natural vegetation are quickly lost to erosion and exhaustion when land is cleared and cultivated (Map 4)

3. ECONOMY

The economic base of southern Sudan is livestock and crop production. Other important activities used to include fishing and marketing of dried fish, small scale service industries such as blacksmithery and paid labour. Prior to the outbreak of the civil war the economy was held together by a network of merchants, with their shops and transport infrastructure. The merchants were the fulcrum of the cash economy in the south, providing a market for livestock and produce, whilst making available household items for sale. This network has all but disappeared, to be replaced by a system based on barter and the renewed importance of kinship exchange networks. Today, in the absence of other sources of income, even urban populations in SPLA/M administered areas rely largely on their own agricultural production.

As a result of the collapse of the transport infrastructure, movement of surpluses across large distances or from one tribal group to another is no longer guaranteed. It has therefore become increasingly important that each area or kinship group manages to be self-sufficient in food production.

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[5]National Oceanographic and Atomspheric Administration, USA

4. AGRICULTURE

Whilst large scale food production in southern Sudan has come to standstill as a result of the ongoing civil war, subsistence cultivation continues to play the key role along with livestock husbandry in providing almost the sole means of living.

Many people had been displaced by insecurity, drought and flood, others are still on the move and this, in addition to the vagaries of the climate in recent years has disrupted agricultural activities. Even now, in many relatively stable areas, lack of hand tools is a major contributor to poor agricultural production; in the past a large proportion of the required agricultural tools were imported from northern Sudan by Arab traders, a practice that has today totally ceased. Blacksmiths used to contribute to production of handtools, but today lack of metals and lack of distribution networks for those tools that are now manufactured have combined to limit the spread of their wares.

Another constraint seems to be labour availability. Although this has always been a constraint in a system which depends entirely on hand labour, this situation has been exacerbated by the war and remains a problem today. More than anything else, it is labour along with tool supply that limits the amount of land cleared, the amount planted, the amount weeded and the amount protected from birds. The important role played by women in traditional cultivation has been augmented by current circumstances.

It has been noted that the soils used for cultivation are generally low in most plant nutrients. "It is likely that most the long-established crops of the region are adapted to grow in soils of low nutrient status; recently introduced crops are likely to suffer unless fertilised."[6]It is also very important to understand that losses of a certain proportion of every year's crop are expected in the absence of modern agricultural inputs, machinery and techniques: "The farmer in Jonglei area protects himself to some extent from damage by pests by growing a range of crops, and by planting a mixture of varieties of some of them. In spite of this, crop losses are large." [7]

In the past, one of the major constraints to productivity in grains was Striga hermonthica, a parasitic weed that feeds from the roots of sorghum and millet plants and also has a reservoir amongst wild relatives. The survey teams did not see any significant infestations of Striga during our visits to fields in 1990. The absence of the parasite, which can lead to losses of more than 50% may have been caused by the floods of 1988 or may simply be that due to insecurity in recent

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[6]The Jonglei Canal, Impact and Opportunity, Howell P., Lock M. & Cobb S., Cambridge University Press, 1988.

[7] Ibid

years, farmers have not recultivated the same plots as they were wont to do in the past.

5. POPULATION

In order to assess the impact of the programmes and attempt to extrapolate from survey results, knowledge of population figures is essential. Unfortunately in southern Sudan we are working with limited and somewhat questionable information.

According to the 1983 census, the population of the entire southern region was set at 5,273,930 with a growth rate of 2.5%. Thus today, all other things being equal, the region would have a population of 6.2 million. However a number of factors have combined to reduce this number, notably insecurity and harsh environmental conditions. Many are said to have perished as a result of war and famine, the number is not known. In addition large numbers of people have been displaced from the south to northern Sudan and to refugee camps in Ethiopia, Uganda and Zaire. It is estimated that there are some 500,000 people in Ethiopia and some 1.5 million in northern Sudan, mostly around Khartoum. At the same time, as a result of the relative stability enjoyed by large parts of the south during 1989 and 1990, some people are returning to the area, some coming from Uganda, others returning from Khartoum. The situation in Khartoum is becoming increasingly untenable for many, the economy is in serious decline and southerners are not popular in that city. The process of return has been encouraged the the Government and it was reported that some 50,000 people had returned to Bahr el Ghazal and Western Upper Nile by May of this year. [8]

Thus we can assume that any growth that took place has been nullified by outmigration, albeit temporary. Therefore for the purposes of programme planning, implementation and monitoring the 1983 Census has been utilised, though it is accepted that this might be unreliable. In terms of the areas covered by this report, the census lists population as follows:

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[8] Investigation into Rural Production Capability, UN/SRRA, June 1990

TABLE 4

POPULATION OF PROGRAMME AREAS ACCORDING TO 1983 CENSUS

Area	Population	Families
Kapoeta	188,523	17,813
Chukudum	58,550	7,573
Torit	243,866	43,900
Kajo Keji	96,063	15,233
(Yei)	244,533	40,017
Bor	176,334	25,350
Pibor/Boma	81,264	11,959
Pochalla	28,717	4,198
Waat	109,010	16,492
Akobo	83,424	11,921
Ayod/Fangak	144,527	20,972
Nasir/Abwong	206,067	28,133
Total	1,666,878	243,561

B. THE 1990 SEEDS AND TOOLS PROGRAMMES

1. PROGRAMME DEVELOPMENT

After the harvest in 1989 it was perceived that although food production had been greater than during the previous disastrous year, continued support was needed by the farmers of southern Sudan for food production. Whilst some seed was known to be available, it was not known to what extent kinship ties and barter would provide to all those in need of them and all the types required. It was also clear that tools were in very short supply and mostly very old and worn. SRRA therefore decided, that in addition to provision of emergency food supplies to those in need, a wide reaching programme would be implemented aiming at providing seeds and tools to all areas of SRRA-accessible southern Sudan.

A number of agencies worked together with SRRA in provision of seeds and tools, namely: Unicef, Catholic Relief Services (CRS) World Vision (WV), Save the Children UK (SCF UK), International Aid Sweden (IAS), International Committee of the Red Cross (ICRC) Oxfam US and ACROSS. Complementing one another, these programmes covered to one extent or another most of the cultivating areas of southern Sudan (See Map 1).

This report covers the activities and impact of the Unicef, CRS, IAS and World Vision programmes and part of that implemented by SCF UK. The programme supported by ACROSS was not covered, nor was that of ICRC. The programme of Oxfam US is also not documented here, due to its late start in August 1990.

It is not intended to provide full details of programmes other than that of Unicef/SRRA but rather the results of field survey and brief information on distribution modalities of these other programmes. We hope that the information herein will be helpful to those agencies and complement their own reports on the subject.

2. AIMS AND OBJECTIVES

The primary aim of the seeds and tools programmes was to improve food security. Secondary aims included increased self-reliance amongst the population of southern Sudan and increased capacity amongst the personnel of the SRRA Agricultural Department.

In order to achieve these aims, the programmes planned for the provision of a variety of field crop and horticultural seeds accompanied by hand tools to a targeted number of farm families in all areas.

i) Unicef planned to provide some 10kg of field crop seed of various types and varieties, 100g horticultural seed and 3 handtools to 55,000 farm families in Bor, Kajo Keji, Torit, Nasir, Ayod, Akobo, Pibor, Abwong and Waat Districts.

ii) CRS planned to provide 30kg seed of various types and varieties and 2 handtools to 15,000 farm families in the Acholi and Madi areas of Torit District.

iii) World Vision planned to provide around 6 kg seed and 3 handtools to some 10,000 farm families in Kapoeta District.

iv) SCF UK planned to provide as much as possible and allow local authorities to decide on target beneficiaries.

v) IAS planned to provide to all families in Kajo Keji and Kaya at least one handtool and 1kg seed.

vi) ACROSS planned to provide all families (some 6,250) in Boma/ Kasangor with around 10kg field crop seed, 700g vegetable seed and 6 hand tools.

TABLE 5

TOTAL SEED & TOOLS INPUTS BY AGENCY

Donor	Total Tools '000	Field Crops MT	Vegetable Seed MT
Unicef	187	713	6
CRS	48	596	0
WVI	28	63	1
OXFAM US	6	20	0.3
SCF UK	5	85	0
ACROSS	36	69	0.5
ICRC	25	284	
IAS	54	54	0
TOTAL	389	1,883	7.8

3. PLANNING

A meeting hosted by the Operation Lifeline Agriculture Sub-Committee in Kapoeta in August 1989 agreed on the need for and basic modalities of a seed and tools programme.

Provision of the items was to be by road or air and the programmes were implemented by SRRA and the relevant agency.

The items were to be packed in quantities that would make distribution easy, such as 10kg bags for maize. The items were to be labelled with the name of the organisation supplying the goods.

A further meeting was held in January 1990 when the various agencies pledged or intimated what they were able to provide and on what criteria they would like to see their inputs utilised.

4 IMPLEMENTATION

The combined agencies supplied some 1,800 MT field crop seed, 8 MT of vegetable seed and 390,000 handtools at a cost of some US$ 2.5 million.

Items arrived in Sudan between December 1989 and August 1990, much coming overland from Kenya, Tanzania, Malawi and the bulk arriving in May and June of 1990. Some horticultural items were brought in by air from Holland. Almost all inputs were distributed immediately to primary centres (area council level or executive chiefs), to secondary centres (main villages or sub-chiefs) and to farmers. Distribution was done by truck, Toyota pickup, by small boat, by canoe and on foot.

TABLE 6

AGRICULTURAL INPUTS BY LOCATION				
Location	Seed MT	Tools '000	Agencies	Population '000 families
Torit	820	116	CRS/Unicef	44
Kajo Keji	207	53	IAS/Unicef	15
Bor	184	46	Unicef	25
Kapoeta/ Chukudum	106	39	WorldVision/ Unicef	25
Nasir/Akobo	70	8	SCF/Unicef	40
Boma	69	36	ACROSS	2
Pochalla	55	3	SCF (UK)	4
Kaya	30	30	IAS	40
Waat	16	3	Unicef	16
Pibor	14	17	Unicef	10
Ayod	12	7	Unicef	21
Total	1,582	359		228

4.1 UNICEF PROGRAMME

4.1.1 Planning:

A project proposal was submitted to donors in October 1989. In late December, USAID committed US $1.2 million and later the Government of Australia provided an additional 500,000. (Details of actual expenditure are available in the Unicef financial report).

Unicef went ahead in early December and ordered some 70 MT seed and 30,000 hoes in anticipation of the programme. These arrived in early January and a plan was compiled by SRRA/Unicef for delivery of these to Torit District. Torit District and later Kajo Keji District were chosen as the major focal points for the Unicef programme, due to their potential productivity.

Once full commitment had been received, SRRA and Unicef started work on a distribution plan in January 1990 based on the provision of some 700 MT seed and 200,000 hand tools. The initial plan covered some 238 MT seed of all types and 81,000 tools. Unfortunately the full plan, put together by Unicef and SRRA together, was not completed until the end of March. Thus although some seeds and tools had been procured in December and others were ordered in January

and February, the bulk of the items were not ordered until March and therefore did not arrive at the UN base at Lokichokio in northern Kenya until April and May.

Planning was an activity that took place at intervals - actions were initiated on the basis of partial plans and continuously modified due to circumstances. Given the late commitment of funds, late completion of distribution plans, the unpredictable logistics, and the presence of only a small number of staff who had to cover several complex logistical and monitoring activities at once, this is hardly surprising. The only MASTER PLAN was the finalisation of the distribution plan from the field in March; this was not accompanied by a logistics plan with time deadlines, because by then it was too late. Day to day decisions based on availability of transport and state of the roads were the only mode of management possible.

4.1.2 Logistics:

Only once the final distribution plan was complete could tenders be put out for transportation of the bulk of the supplies from Lokichokio to the eight centres in southern Sudan. This proved a complex and time consuming activity: there are a number of contractors willing to travel to Bor and Torit as the roads are good, but to find those both willing and truly able to cover the long distances along swampy and rutted roads to locations such as Waat or Pibor was less easy. Contractors are not able to find insurance for running trucks into a war zone such as southern Sudan and therefore the vehicles used are usually the oldest and least road-worthy. In order to travel such routes trucks have to carry half loads, otherwise they risk bogging down or breaking down.

Torit had received almost its full allocation by the end of March. Torit was given priority not only because of its potential productivity and its proximity to Loki, but also because the rains come earliest to this area. In addition, Torit was the base for the Unicef Agricultural Co-ordinator and therefore the area for which the distribution plan was made first. Unicef notes that Kajo Keji, though a high potential area and Chukudum/Kimatong though within very easy reach of Lokichokio and both areas with early starts to their agricultural seasons were the last to receive items.

A plan was put together in March for convoys to Bor, Pibor and Ayod/Waat. A convoy went to Pibor in early April delivering some 7 MT seed and 9,000 tools. This was followed by a convoy to Ayod and Waat carrying 20 MT seed and 6,500 tools. After this, few contractors would try and none managed to get through the difficult road conditions that developed as a result of rains. These same rains that closed the roads also encouraged many to plant. However the rains were ironically inadequate to sustain the crops but adequate to keep the roads closed.

From end of April it was clear that if the northern locations of Ayod/Waat/Nasir were to be assisted then a major airlift effort would have to take place. At that time it was expected that a second Twin Otter, flown by Air Serv, would be arriving soon to assist the first Twin Otter in transporting seeds and tools. The Twin Otter was flying to 17 locations transporting not only agricultural supplies

but all the high value goods and personnel for OLS programmes such as vaccines, essential drugs and cold chain equipment. The second plane did not arrive until May and by June it began to shuttle between Bor and Nasir and Bor and Ayod with loads of around 1 MT. With two flights a day for two months, the Twin Otters managed to deliver some 50 MT seeds and 13,000 tools to these two locations. By the end of July it was considered too late to continue and much of the remaining seeds and tools were distributed in Bor district (some 40 MT seed and 18,000 tools). 6 MT seed and 9,000 tools remain in store in Bor.

4.1.3 Distribution:

Once the items arrived in each centre, a variety of means was employed to deliver them to primary centres and onward. In Torit, Bor and Kajo Keji, items were delivered to Primary and even Secondary centres by Unicef-contracted trucks. In other areas a variety of means were employed: in some cases SRRA provided a truck and Unicef provided fuel, in Nasir, the allocation for Abwong was delivered in small boats, each journey carrying 1 MT and taking a day to get there and a day back. In Pibor, Nasir and Ayod, chiefs delegated able-bodied individuals to walk to collect allocations for their area, some walked 30 kilometers or more. When permission had been withdrawn for flights to Ayod, the chiefs were asked if their people would walk as far as Kongor to collect their seeds and tools. Although a six day journey the chiefs said that the people would. Fortunately the granting of flight clearance for Ayod obviated the necessity of such a long walk.

TABLE 7

TOTAL UNICEF SEED & TOOL INPUTS TO EIGHT AREAS OF SOUTHERN SUDAN

Area	Seeds (MT)	Tools (Pcs)
Torit	224.137	68,000
Kajo Keji	182.890	29,303
Bor	183.630	46,152
Nasir	40.347	5,160
Chukudum	40.223	6,160
Waat	16.000	3,252
Pibor	14.034	17,121
Kapoeta		4,650
Ayod	11.746	6,926
Total	713.167	186,724

4.2. CATHOLIC RELIEF SERVICE, WORLD VISION, SAVE THE CHILDREN FUND, INTERNATIONAL AID SWEDEN, OXFAM US, ACROSS PROGRAMMES

Full details of the planning, logistics and distribution activities of the voluntary agencies will not be included here except where they are relevant to survey results.

4.2.1 **CRS** planned a programme that aimed to provide every farm family in Acholi and Madi areas of Torit with a full package of agricultural inputs. They were very successful in this regard.

TABLE 8

TOTAL CRS SEED & TOOL INPUTS TO TORIT DISTRICT	
Seed (MT)	Tools (Pcs)
596	48,481

4.2.2 **World Vision** started its programme early, but due to difficulties with SRRA transport in Kapoeta District, distribution was a lengthy process, being largely undertaken by the World Vision pickup. Therefore at the time of the survey in August, not every village visited had received their full allocation.

TABLE 9

TOTAL WORLD VISION INPUTS TO KAPOETA & CHUKUDUM DISTRICTS	
Seeds*	Tools
64,075 kgs	28,180 pcs

* NB. 1.075 MT seed carried over from 1989

4.2.3 **Save the Children Fund UK** took an overland convoy to Pochalla in February 1990, carrying 85 MT seed (sorghum, beans and maize), 5,550 tools, some blacksmith tools for local handtool manufacture and 2.3 MT of fishing line. They also took with them two of the WFP-donated wooden boats and outboard engines. The story may be exaggerated, but it is told that whilst crossing a swampy area near Pochalla, the convoy had to unload some of the bags of seed and boxes of tools, ship them across by boat and bring the trucks through empty to avoid getting stuck. In April,

SRRA Pochalla loaded 30 MT of sorghum seed, 2,275 tools, blacksmith tools, fishing equipment, and one boat and engine on trucks loaned to SRRA and moved the items to Nasir utilising fuel provided by Unicef. This must be credited as a remarkable and praiseworthy achievement. This report covers only the Nasir distribution.

TABLE 10

TOTAL SCF UK SEEDS & TOOLS TO POCHALLA AND NASIR		
Area	Seed (MT)	Tools (Pcs)
Pochalla	55	2,275
Nasir	30	2,275
Total	85	5,550

4.2.4 **Oxfam US** planned and committed funds to an early intervention in the agricultural sector in Chukudum District. However bureaucratic difficulties meant that the project did not get off the ground until July/August. Due to a reported failure of the first crop in the district, World Vision and Unicef reacted in June by sending in some 60 MT (38 MT Unicef 22 MT World Vision).

4.2.5 **International Aid Sweden** provided agricultural inputs to Kajo Keji and Kaya Districts via Uganda. A total of 40 MT seed and 43,000 tools were delivered in April 1990 which were added to 14 MT seed and 13,000 tools that had arrived in december 1989. This report only covers the impact of the Kajo Keji distribution as we did not manage to survey Kaya.

TABLE 11

TOTAL IAS SEEDS & TOOLS TO KAJO KEJI AND KAYA		
Area	Seed (MT)	Tools (Pcs)
Kajo Keji	24*	24,000*
Kaya	30	30,000
Total	54	54,000

* Including 14 MT seed and 13,000 tools carried over from December 1990

5. DISTRIBUTION SYSTEMS

SRRA and Unicef remain convinced that the most effective method of distribution and targeting of relief inputs within geographical areas is through the traditional leadership.

Thus we defined our role as ensuring delivery to the chiefs, assisting them to deliver onward to sub-chiefs and farmers where possible, but not interfering with their distribution decisions.

Administration amongst the pastoralists of rural southern Sudan revolves around the tribe. Each tribe is led by a Paramount Chief and divided into sections controlled by Court Presidents and Executive Chiefs, these sections are then sub-divided into groupings overseen by Sub-Chiefs. Within the responsibility of each subchief are a number of villages led by village headmen. The important factor regarding this structure is that chiefs can be voted out or bypassed if they are not considered by their people to be representing them well. In the sedentary areas of Torit and Kajo Keji the systems are similar, but with certain differences. They also have more of a tradition of modern governmental administration. For example in Eastern Torit, whilst there are chiefs and sub-chiefs, the decision makers within each village are young men called Munyimajis.

Our experience in the field was that chiefs, headmen and even farmers met to decide on who got what. Generally speaking, the SRRA would issue to the chiefs on the basis of relative populations, the chiefs to the sub-chiefs and the sub-chiefs to village headmen, usually equally and regardless of population sizes, the village headmen to family heads according to need or family size or importance or accessibility or a combination of all these.

The decisions at each level must be understood in the context of the arrival of the relief items. Most areas received inputs in batches: for example Ayod and Nasir received a few tonnes a week, seed and tools arrived in Bor on a number of different road convoys. Thus the SRRA Secretary or Agricultural Officer along with counterpart agency personnel had to divide up what was present, without necessarily knowing what and when more would arrive. In some cases the Paramount and Executive Chiefs (or Court Presidents) were called to make the division to primary areas, in others the SRRA made this decision entirely themselves. The Chiefs or Primary centres therefore also received inputs in batches and the same can be said for each level down to the farmer.

5.1 Some Examples of Variation in Distribution Systems

If each chief received equally but one had a larger population to administer than another, average receipts of relief items could be expected to vary from area to area. If each sub chief and headman received equally, then we can expect variations between one village and another. Why, though, did we find quite significant variations between the receipts of one farmer and another?

i) If a village headman is issued with 20 hoes and 50kg of various seeds which he then has to divide amongst 72 families what does he do? A meeting is called and after much debate the hoes are issued to 20 deserving family heads. The remaining 52 families representatives then line up and are issued with a cupful (about 1 kg) of maize until that runs out. Then the headman starts to hand out the green gram and so on. A week later 20 kilos of cowpeas arrive as do ten more families returning from their dry

season grazing grounds. The elders discuss the matter and decide to distribute the 20 kg of cowpeas to the ten families just arrived. And so on. It is therefore not so surprising that the survey teams found one farmer with a hoe and 5 kg maize seed, another with 50 grams of sorghum seed and another with 2kg each of cowpeas, groundnuts, sorghum and millet.

ii) In retrospect it seems that the survey results were confused by "family size" ie how many groups the farmer responding to the questionnaire took responsibility for. In a time when we might expect a number of women headed households, the men having gone to war, a male respondent might be answering for himself and his wife as well as a number of other females and their offspring currently staying within or near his compound. It was noted that those women interviewed seemed to receive less than men. Perhaps this is because they represent the smallest unit of organisation 'the family" whereas the men often include "the extended family".

iii) There was some degree of favouritism noted by the survey teams. Persons of importance seemed to be likely to receive more than others, this could be partly due to their having a large number of families (mothers with children) to account for. Persons who were in the village during all distributions were likely to have received more than persons who were not.

iv) In Eastern Torit, distribution decisions were made by the Munyimaji, an interesting system differing from others in that the Munyimaji are young men between the ages of 25 and 45. Distribution by Munyimaji was often influenced by who could use each item best.

v) Some chiefs argued that the beneficiaries would produce seeds from their input, so gave as many families as possible a small amount of each seed and distributed the tools in a way to allow access by all. Despite the amount per family being small there will be beneficial impact for a greater number of people than if a targeted number had received 15kg and 3 tools. The small extent of each field planted with relief seeds helped to guarantee careful husbandry.

vi) Even in CRS areas where at first all farmers were receiving the requisite planned amount, the system was modified by the local chiefs and SRRA personnel to allow for an influx of people from Uganda.

vii) In Kapoeta, SRRA were involved in organised farming, the results of which have been significant. Chiefs around Kapoeta worked with SRRA to organise clearance of some 800 feddan of land and each section of Kapoeta town organised its own planting, weeding and harvesting.

viii) In Torit town, the women's group were assisted in growing vegetables, the produce of which was purchased by the Diocese of Torit for hospital feeding.

ix) The Paramount Chief of the Lotuka in Chukudum utilised handpump water runoff to plant a communal garden whose produce was provided to the school. Schools were also assisted in many of the other areas, notably Bor where virtually every school has a small garden.

6. THE SURVEY

21 people were involved in the collection of data for the seeds and tools monitoring survey, 17 SRRA, 3 Unicef and one CRS (Diocese of Torit). Seven locations were visited, chosen for their representative nature as well as their accessibility. The survey took two months to enumerate in the field and a further two to analyse and write up.

Within each location the survey teams worked with local SRRA to divide the area into strata - usually based on administrative and therefore distribution criteria. Then villages within these strata were listed and picked at random from a hat. Within each village, enumerators tried to walk in random directions and pick random farmers. This was achieved with various degrees of success.

In total 505 farmers and 70 officials were interviewed. Questions to officials referred to receipts, time of arrival, condition of items and modalities of distribution. Farmers, both men and women, were asked what relief inputs they had received, what they thought of their timing, type, variety, amount etc, what local inputs they had been able to obtain and what area they had under cultivation. (Questionnaires, Annex 1)

TABLE 12

NUMBERS OF HOUSEHOLDS SURVEYED BY LOCATION

Location	Population Households	Number of Villages	Villages Surveyed	Households Surveyed
TORIT	40,000	80	20	88
BOR	27,500	55	18	82
AYOD	8,000	16	6	60
NASIR	20,600	41	6	57
KAPOETA	17,500	35	6	50
CHUKUDUM	7,500	15	8	80
PIBOR	11,500	23	4	56
KAJO KEJI	16,000	32	15	32
ALL	148,600	297	83	505

Data has been analysed in a very simple and straightforward manner, utilising only averages and percentages and observing trends and anomalies. No attempt

has been made to make any other statistical analysis of the data as it is not comprehensive enough to support this.

6.1 Survey Constraints

The sample that was covered must be viewed with a certain degree of caution. The sample size of 508 farmers, although around 7% of the families within each of the villages visited, was inadequate to reflect the great variety of distribution decisions based on the wide range of inputs and quantities of these provided to any one location. A number of constraints were encountered and a number of mistakes made; elaboration of both will be a primary source of lessons for future undertakings of this nature.

i) There was certainly a transport bias in enumeration, as there had been in the original distribution of the inputs. For example, in Pibor, lack of any form of transport and flooded paths led the team to do all the interviews inside Pibor town itself, in Ayod all transport was once again on foot and therefor villages no further than 10km from Ayod could be covered.

ii) The enumerators were required to write in English, something that not all were entirely happy with. In some areas translation was required from the local language to Arabic, often the translators were those who had organised the distribution therefore introducing a bias.

iii) Some enumerators failed to understand the purpose of certain questions and others failed to probe anomalous answers. Others probed in certain directions and not others.

iv) Difficulties arose in establishing units of measurement. Most of the respondents received their seed in cups or bowls: the variation amongst respondents as well as amongst enumerators as to the contents of such vessels was quite large.

v) In some cases, notably Nasir, the status of the respondent and who he/she was answering for was a source of confusion. It seems that a number of village headmen were interviewed as family heads. The same confusion applies to the definition of "family" or "household". In most cases it seems to be defined as a mother and her children, thus a group of mothers: two sisters, three co-wives and one cousin might be approached from outside as a single "extended family", but actually represent 6 actual families. This was found particularly in Nasir and was instrumental in increasing the apparent amount received per farmer interviewed in Nasir area.

6.2 Lessons Learned During the Survey

The primary lesson from all this is the training of enumerators is essential: this survey itself constituted an effective initial training activity. Secondly the supervision: the programme included a supervisory team as well as a team leader for each group. Unfortunately many of the supervisory team members and team leaders were redeployed after a short while to cover other important

agricultural office activities. Other lessons include recognition of likely responses in the field and planning for them, asking about family size, arranging outside translators etc. It may be beneficial to consider having boxes to tick instead of asking for written answers to questions - this would work well if the enumerators are well acquainted with the purpose of each question and with the system and its drawbacks. All in all, however, except by enlarging the sample, not much more can be done to ensure effective and statistically significant results.

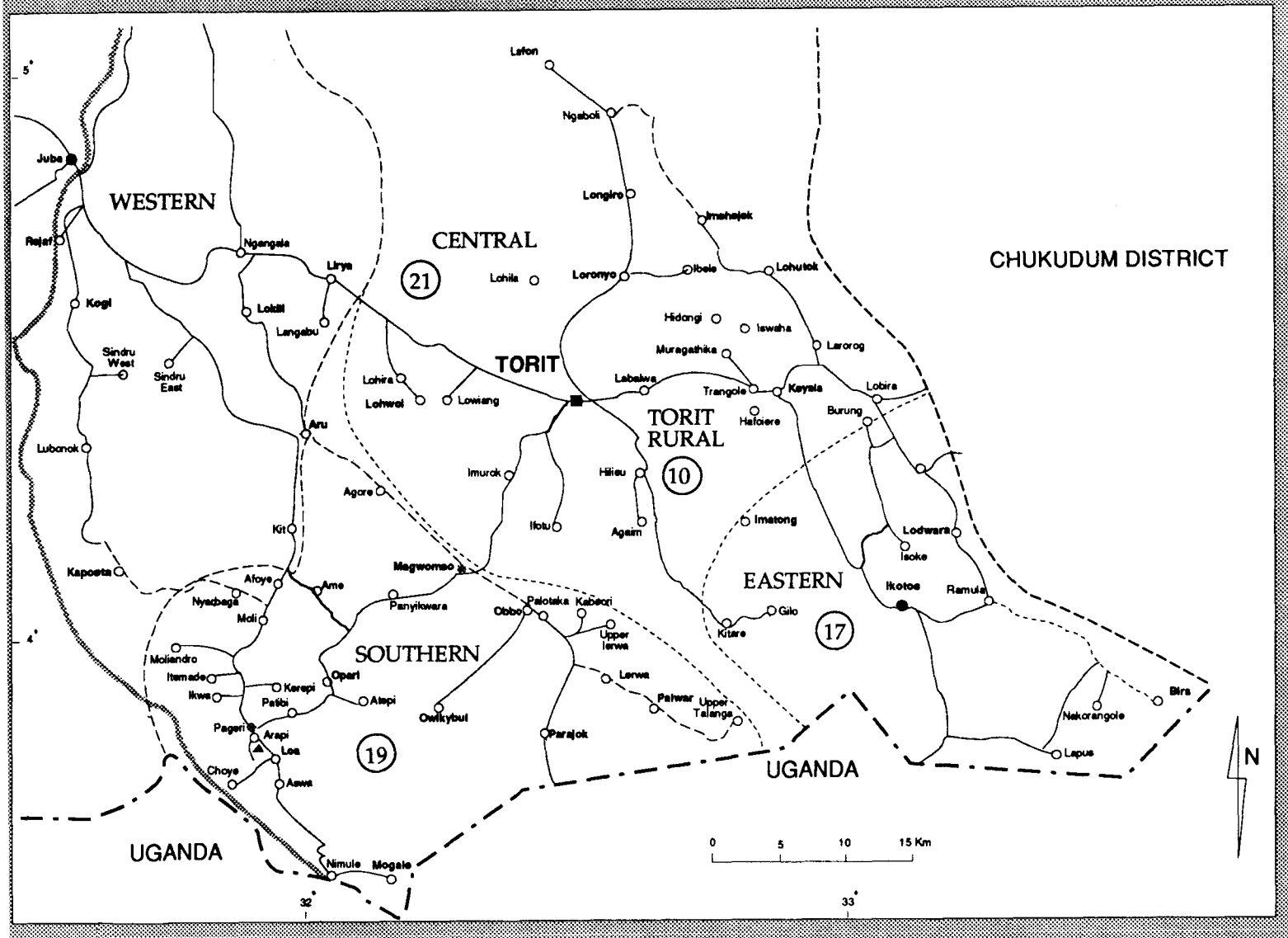
One point of view that the SRRA survey team members have developed which is significant (or perhaps worrying) for all Lifeline activities is that relief is something to depend upon: "the farmers need to be given many more free inputs, because they are good farmers and they deserve it".

The SRRA agriculturalists in the survey teams developed a considerable understanding of agriculture in their own and in areas other than those from which they came. They were made acutely aware of the role of record keeping in tracking and reporting on a project and of all aspects of the management of a seed and tool distribution project. They also learned how careful a surveyor has to be to ensure useful data.

SECTION 3.
AREA REPORTS

Map 5

TORIT


WESTERN
CENTRAL
TORIT
TORIT RURAL
EASTERN
SOUTHERN
CHUKUDUM DISTRICT
UGANDA
UGANDA
21
10
17
19
20
Number of Farmers Surveyed
International Boundary
Area Boundary
Road
Area Council Hq
Rural Council Hq
'A' Court Villages
Villages
Juba
Rejaf
Kegi
Sindru West
Sindru East
Lubonok
Kapoeta
Ngangala
Liriya
Lokili
Langabu
Aru
Kit
Afoye
Nyadega
Moli
Ame
Magwomae
Panyikwara
Moliandro
Itemade
Ikwa
Kerepi
Patibi
Opari
Atapi
Pageri
Arapi
Lea
Choye
Aswa
Owiikybul
Nimule
Mogale
Lafon
Ngaboli
Longiro
Imehejek
Lohila
Loromye
Ibele
Lohutok
Hidongi
Iswaha
Muragathike
Larorog
Labelwa
Trangole
Keyala
Lobira
Burung
Haloiere
Lohiria
Lohwat
Lowiang
Imurok
Ifotu
Agam
Hilieu
Agore
Imatong
Lodwara
Isoke
Ikotos
Ramula
Gilo
Kitare
Obbo
Palotaka
Kabeori
Upper Terwa
Lerwa
Pahwar
Upper Talanga
Parajok
Nakorangole
Lapus
Biira
0 5 10 15 Km
N
5°
4°
32°
33°

A. TORIT AREA

1. BACKGROUND

Torit area is divided into five main administrative areas. The area is relatively densely populated and is home to some eight major tribal groups. According to the 1983 Sudan population census, Torit has a total population of approximately 240,000. This is about 40,000 households with an average of 6 persons per household, a family size that was confirmed during the monitoring exercise. Although current estimates vary from time to time and from one report to another, this figure was used for the distribution plan and is considered appropriate for current purposes.

TABLE 13

POPULATION OF TORIT DISTRICT

Location	Families	Population	Families surveyed
Torit Rural	2,770	16,620	10
Central	8,741	52,446	21
Eastern	9,670	58,020	18
Southern	15,316	91,896	19
Western	3,000	18,000	20
Total	39,446	236,982	88

(Source: SRRA Torit)

The rainfall pattern in the area is bimodal. The first rains which normally cover the whole area come at the beginning of March with subsequent rains in May, June and July. In July most areas start to plant second crops up to the end of September. April, early May and late June are often dry periods. Rainfall is highest in Palotaka and Madi (1150mm per year) decreasing towards the east. (Hunting Technical Services, 1986). There are areas where rainfall is supplemented by runoff at the base of mountain slopes and areas of rainshadow on the lee slopes of the same ranges. The majority of the population live in the ecological zone characterised by relatively fertile red/brown sandy soils and at the foot of montane slopes. (See Map 4) The most fertile area is that of Acholi which also is said to have the most reliable rainfall.

The population are primarily sedentary cultivators, keeping comparatively few livestock. Major crops include sorghum, maize, greengram, bulrush millet, groundnut, cowpea, sesame and some beans, finger millet, tubers and root crops. The area has always been one of the most productive on the East bank and in 1986 it was estimated that Acholi and Madi areas produced a surplus of between 3,000 and 5,000 MT each year and that this was sold within the district or to Kapoeta. (Hunting Technical Services, 1986). Between the early seventies and

1983, Norwegian Church Aid played a major role in agricultural development in the area, training extensionists and promoting simple farm improvements such as ox-ploughing. This had a great impact on agriculture and resulted in an innovative farming population and well-trained agricultural personnel. In 1989 crops were reasonable in many areas, but poor in others prompting the targeting of seeds and tools to the area. In that year rains were particularly patchy in eastern Torit in Ikotos (Lafus) and Lafon.

2. SURVEY ACTIVITIES

A total of 20 villages were surveyed, an average of four in each of the five major areas of Torit. These were chosen by random sampling from 33 distribution centres and their satellites within strata defined by the five area boundaries. All areas were surveyed regardless of the agency who supplied the inputs. At least one official and ten farmers were to be surveyed in each distribution centre, five from the centre itself and five from a satellite village, making a total of 100 farmers. In effect, only 87 farm families were interviewed as, despite strict adherence to the sampling procedure irrespective of distance, the random sample was violated following security problems in Pageri and to heavy rains in another location. The sample represented some 30% of the distribution centres within the district and some 7% of their farm families. The teams were at times unable to travel far from the road to farmers in the furthest fields and also noted that they often visited homes when farmers had gone out to work for Katal (group agricultural work) leaving villages deserted.

Fourteen of those responsible for receiving and distributing inputs at primary and secondary levels (officials both SRRA and traditional) were interviewed. Map 5 shows the distribution and survey areas.

3. THE TORIT SEEDS & TOOLS PROGRAMMES

Two main agencies have been involved, alongside SRRA, in the seeds and tools programme in Torit District, namely Unicef and Catholic Relief Services (CRS)/Diocese of Torit. CRS concentrated in the southern area, particularly Parajok and Magwi, while Unicef covered nearly all the other areas. There have, however, been no hard lines on coverage and the agencies complemented or supplemented the efforts of each other such that CRS seeds have also been available in Unicef supported areas and vice versa.

TABLE 14

AGRICULTURAL INPUTS TO TORIT		
AGENCY	SEEDS (MT)	TOOLS (PCS)
CRS	596	48,481
UNICEF	224	68,000
TOTAL	820	116,481

3.1 Arrivals

3.1.1 Unicef Inputs

The first consignment of Unicef supplied seeds and tools arrived in the main store at Torit on 1/2/90 and comprised 25 MT seeds and 27,000 pieces of tools. The second Unicef consignment arrived towards the end of April delivering a total of 198 MT of seeds and 20,000 mallodas (push hoes). A final consignment brought 21,000 tools and 1 MT seed, thus bringing the total consignment to 224 MT seed and 68,000 tools.

TABLE 15

UNICEF CONSIGNMENTS TO TORIT				
Item	Con. I	Con II	Con III	Total
		Kg		
Sorghum	9,025	100,400	0	109,425
Katumani*	5,990	25,800	0	31,790
Composite*	0	1,000	0	1,000
G.Gram	3,250	10,000	0	13,250
Sesame	1,150	0	0	1,150
C. Peas	3,138	0	210	3,168
P.Peas	2,000	15,000	0	17,000
Beans	0	15,200	0	15,200
B. Millet	0	21,500	1,000	22,500
Groundnuts	0	8,125	0	8,125
Vegetables	254	1,225	50	1,529
Total Seed	24,807	198,250	1,260	224,137
		Pcs		
Hoes	15,000	0	5,000	20,000
Sickles	1,874	0	0	1,874
Mallodas	4,000	20,000	13,500	37,500
Pangas	6,000	0	2,578	8,578
Axes	0	0	48	48
Total Tools	26,874	20,000	21,126	68,000

* maize

TABLE 16

CRS CONSIGNMENTS TO TORIT	
Item	Kg
Maize	236,000
Sorghum	238,000
Cowpeas	112,000
Groundnut	10,000
Total	596,000
	Pcs
Hoes	16,964
Pangas	14,553
Mallodas	11,224
R/E Hoes	5,740
Total	48,481

3.2 Record Keeping

When seeds/tools arrived at the main stores the SRRA registered receipt in a stock ledger and signed waybills. The SRRA agricultural officer and Unicef/CRS personnel made up distribution plans following which delivery notes were compiled, store issues recorded. The survey team checked and verified these steps and were satisfied that these procedures had been followed. However omissions or errors in certain records do present a slightly confusing prospect.

Recording at the level of primary and secondary centres included receipt of inputs by the SRRA field agricultural staff or SRRA secretary (where there was no agricultural staff) or by the chief or sub-chief. The contents of delivery notes were recorded in exercise books or pieces of paper as there were no ledgers or, more often, information was kept in the head where there was no paper at all.

Forms 1 and 2 were sent out to all locations, but the results seem to bear little relation either to ledgers for receipts or to the reported amounts received by each surveyed farmer. This is because although the names of each farmer were filled for the first allocation, a different form was then used for subsequent allocations, thus a total received by any one farmer is on a number of forms, some of which were mislaid or never filled.

3.3 Distribution Planning & Implementation

Planning of distribution of inputs from main store to primary/secondary centres was done based on:

i) Estimated number of farming population

ii) Suitability and potentiality of the crop to each area

iii) Degree of emergency needs of the area.

These were put on a weighted scale, input by input, centre by centre. The main store distribution plans were done by the SRRA Agricultural Officer with Unicef, CRS and the SRRA Secretary. These plans were used for all consignments.

After a detailed distribution plan had been made up and local transport organised, distribution started in the first week of March and was completed by late May/early June.

After items arrived and were received at the primary centres, the Agricultural Field Officer sent information to all chiefs or sub-chiefs or traditional administrative groups (Monyimaji in Latuko and Lokuro) informing them about the arrival of inputs and distribution. The basis for distribution at the village level was reported as equal division of items (eg. one cup per family representative). People stood in line and collected their share. If they failed to received anything they were then the first on the list for the next consignment. This helps to explain the variation in receipts, as each consignment differed in size from the next.

One village, (Labalwa) distributed according to who would most benefit: women received mallodas (for weeding as this is the women's role amongst the Lotuka), young men received hoes for soil preparation and planting and old men received axes and pangas for land clearance. This system was unique to this particular village, but made sense bearing in mind the existing division of labour.

In all the centres visited there was general approbation of the way inputs were distributed. Female heads of households were found to have been treated on an equal footing to men.

TABLE 17

DISTRIBUTION TO PRIMARY CENTRES

1. SEED

Item	Torit*	Central	Eastern	Southern	Western**	Total
			Kgs			
Unicef:						
Serena	16,175	37,850	39,105	575	15,475	109,180
Katumani	2,390	7,435	10,740	9,500	2,250	32,315
Composite	20	240	250	490	0	1,000
B. Millet	1,700	4,210	12,800	4,000	1,100	23,810#
Cowpea	875	146	1,091	630	579	3,321
PigeonPeas	1,450	1,950	3,335	5,350	5,800	17,885
Beans	150	5,675	5,250	3,400	725	15,200
Greengram	2,150	3,250	5,050	2,250	1,500	14,200
Groundnut	1,925	3,000	2,125	150	2,000	9,200
Sesame	450	-	400	100	75	1,025
Vegetables	131	341	375	541	158	1,546
Subtotal	27,416	64,097	80,531	26,986	29,662	228,682
CRS:						
Maize				196,700		196,700
Sorghum	2,500	3,600	15,000	247,000	8,200	277,300
Cowpeas	740	1,720	2,300	105,970	1,270	112,000
Groundnut				10,000		10,000
Subtotal	3,240	5,320	17,300	559,670	9,470	596,000
GRAND TOTAL	30,656	69,417	97,831	586,656	39,132	824,682
Popul.	2,770	8,740	9,670	15,316	3,000	39,466
Potential average/ff	10.8	7.6	13.8	13.3	12.9	11.3
Actual average/ff	13.9	14.8	1.1	27.5	8.0	13.1

* Includes special Units: Civil Administration, Schools, Hospital etc.

** Includes Tibari Displaced Settlement

Includes 1,350 kg provided by World Vision in 1989 and carried over.

2. TOOLS

Item	Torit	Central	Eastern	Southern	Western	Stock	Total
				Pcs			
Unicef:							
Hoe	4,125	5,735	4,574	-	1,100	3,611	
Malloda	2,688	6,614	8,351	4,000	4,090	11,550	
Panga	2,103	1,859	1,888	-	1,130	1,238	
Axe	-	-	-	48	-	-	
Sickle	558	691	575	-	203	-	
Subtotal	9,474	14,899	15,388	4,048	6,523	15,399	65,731
CRS:							
Hoes				16,964			16,964
Pangas				14,553			14,553
Mallodas				11,224			11,224
R/E Hoes				5,740			5,740
Subtotal				48,481			48,481
GRAND TOTAL	9,474	14,899	15,388	52,529	6,523	15,399	114,212

4. RECEIPTS

4.1 Percentage of Farm Families Benefiting from Seed & Tool Inputs

Overall 78% of the sample received seeds and 80% received tools. This percentage varied from one area to another, ranging from as few as 67% receiving seed (Central) to as many as 100% (Torit Rural and Southern). Apart from sampling error induced by an inadequate number of samples, the variation may be put down to the inaccuracy of population figures for each area and to the different distribution policies of chiefs and other authorities.

TABLE 18

PERCENTAGE OF RESPONDENTS RECEIVING RELIEF INPUTS						
Item	Torit	Central	Eastern	Southern	Western*	All
			%			
Serena	100	61	87	100	95	
Maize	80	67	27	100	38	
B. Millet	90	0	47	0	28	
Cowpeas	90	61	67	53	81	
PigeonPeas	50	11	7	26	71	
Beans	10	22	20	21	22	
Greengram	80	27	47	0	90	
Groundnut	10	11	0	0	29	
Sesame	0	0	0	0	0	
Vegetables	50	39	53	32	52	
Seed	100	67	87	100	95	78
Hoe	90	94	55	100	65	
Panga/Axe	60	44	28	85	60	
Sickle	40	0	0	0	5	
Malloda	70	88	39	100	40	
Tools	90	94	55	100	65	80
n	10	16	18	20	20	83

4.2 Average Quantities Received per Household

In all Torit District, an average of 13 Kgs of seed and 1.8 hand tools were received by each farm family. Why did Eastern Torit receive so little? Sampling error may have influenced the quantities recorded above, but it is clear from reference to each questionnaire that the inhabitants of Eastern area generally received less than their counterparts in other areas. It is possible that the population of the area was underestimated when original distribution plans were being drawn up. In contrast, farmers in Southern Torit received comparatively large amounts; all families in this area were targeted by CRS to receive 30 kg, the amount was reduced due to an influx of people from outside the area. Overall the survey average of 13kg reflects well the receipts for Torit District as a whole.

TABLE 19

AVERAGE FARM FAMILY RECEIPTS BY TYPE AND AREA						
Item	Torit	Central	Eastern	Southern	Western	ALL
			Kgs			
Serena	5.15	2.94	0.69	11.75	1.9	
Maize	1.9	5.05	0.17	12.5	1.23	
B. Millet	0.95	0	0.22	0	0.7	
Cowpeas	1.35	0.31	0.22	2.4	0.76	
PigeonPeas	2.7	0.05	0.03	0.45	0.75	
Beans	0.2	3.44	0.07	0.35	0	
Greengram	1.2	0.08	0.13	0	1.58	
Groundnut	0.25	2.78	0	0	1.11	
Sesame	0	0	0	0	0	
Vegetables	0.22	0.22	0.01	0.02	0.07	
Total	13.92	14.87	1.54	27.47	8.1	13.35
			Pcs			
Malloda	1.2	0.61	0.26	1.05	0.4	
Hoe	1.1	0.77	0.6	0.12	0.6	
Panga	0.6	0.33	0.3	0.85	0.5	
Axe	0	0	0	0	0	
Sickle	0.8	0	0	0	0	
Total	3.7	1.71	1.16	2.02	1.5	1.8
n	10	21	17	19	20	87

5. TIMING OF INPUTS

Few complaints were received regarding the timing of inputs although some farmers said that it would have been useful if the tools had arrived in time for early field clearance.

6. CONDITION AND QUALITY OF INPUTS

Generally those interviewed stated that the items were received in good condition and were of fair quality. However, a fair number of respondents noted that the hoes and pangas were not strong and expected them to wear out quickly. Some in western Torit reported that groundnuts were rotted when they received them, having been spoilt in transit by rain. A number of farmers from eastern Torit reported that the sorghum seed was contaminated by a weed known as Sudan Grass (a relative of sorghum which produces no edible grain). Hoe handles were brought initially and these were found to be too short. After this, it

was decided that handles, being expensive to transport relative to their value, should no longer be provided and the people made their own handles according to their wishes.

7. SUITABILITY OF TYPES AND VARIETIES

Most respondents were pleased with what they received. Many noted that short maturity was a desirable aspect and that the bulrush millet was performing well in conditions of drought. At the same time, however, bird damage, possibly partly exacerbated by the early maturing nature of the serena and katumani was significant. The birds were able to feast on serena at a time when other crops had not yet produced grain.

People were pleased with serena sorghum bulrush millet, green gram and pigeonpea.

Although few complained about the type of tool received, it was clear that, given the wide variety of tools used in Torit District, that the tools provided were not always quite what the people were used to.

The farmers of Torit are very experienced with various varieties of a number of crops. there is no danger that serena or Katumani will displace their own crops, both varieties are already present in local stocks and the new inputs will add to the supply of these. It is considered very unlikely that the farmers will throw aside their own varieties for the types provided as many were quick to point out the qualities of their own types. However, as the small quantities provided were small, most farmers mixed the exotic seed with their own local varieties. We can therefore expect cross-pollination and resulting genetic changes; whether these will be beneficial or not remains in question.

8. LOCAL SEED & TOOLS AND SUFFICIENCY OF RELIEF INPUTS

89% of the sample had their own or had acquired seeds locally. Amounts reported were high, averaging 48 kg per farm family. Tool were more scarce, only 63 % reporting having their own or buying them and having an average of 1.7 per ff. The worst off for local supplies were those of Torit Rural, thus justifying their relatively high relief receipts. In Chahari (Eastern Torit) where only small amounts of relief seeds were received, farmers had planted large fields from their own savings. So, although 84% of the sample said that the relief supplies were insufficient, we may infer that total seed supplies for the area were sufficient.

TABLE 20

LOCAL SEED & TOOLS PER FARM FAMILY BY AREA AND TYPE						
Item	Torit	Central	Eastern	Western	Southern	All
			Kg			
Sorghum	2.6	16.28	16.53	38.0	12.00	
Maize	2.4	5.8	0.83	0.78	3.03	
Cowpeas	0.5	0.18	1.75	3.07	1.53	
Pigeonpeas	0.1	0	0.22	3.5	0.68	
Greengram	0.5	0	0.31	3.47	0.11	
Millet	1.6	1.15	6.64	4.1	5.42	
Groundnut	18.6	6.48	6.53	33.2	9.2	
Beans	0	0.2	0	0	1.18	
Sesame	1.1	0.7	3.36	8.3	2.03	
Vegetables	0.04	0.03*	0.03	0.1	0.02*	
Total	27.44	30.82	36.09	96.6	35.2	47.67
			Pcs			
Hoe	0.3	0.6	0.4	0.1	0.7	
Panga/Axe	0.4	0.6	0.8	0.7	0.5	
Sickle	0	0.1	0.1	0.04	0.3	
Malloda	0.3	0.8	0.8	0.6	0.2	
Total	1.0	2.1	2.1	1.4	1.6	1.7

* Large quantities of cassava and sweet potato also mentioned

TABLE 21

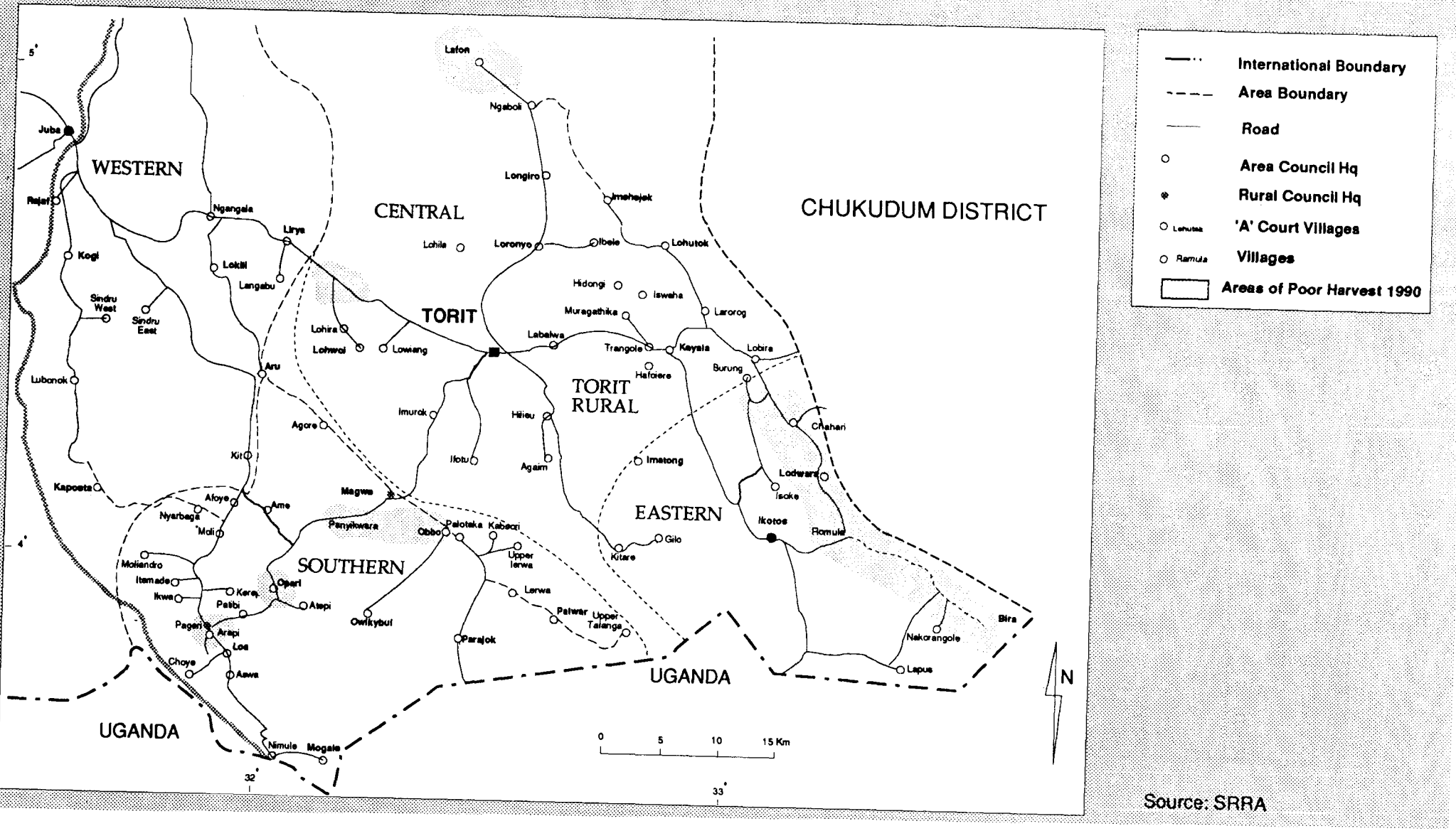
LOCAL SEED, TOTAL SEED & FEDDAN PLANTED PER HOUSEHOLD					
Area	Feddan per household	Relief seed Kg	Local seed Kg	Total seed Kg	Apparent seed rate Kg/Feddan
Torit	4.45	13.92	27.44	41.36	9.3
Central	4.15	14.87	30.82	45.69	11.0
Eastern	3.2	1.54	36.17	41.07	12.8
Western	4.4	8.1	94.44	102.54	23.3
Southern	3.84	27.47	35.20	62.67	16.3
All	4.03	13.35	47.67	61.02	15.1

The table above shows the apparent seed rate, that is the amount of seed used to plant the reported acreage. Total seed reported is the full amount utilised by the farmer to plant fields in 1990, the acreage reported was that which was under crop in July 1990, the time of the survey. Therefore the apparent seed rate

Map 6

TORIT

STATE OF THE CROPS



International Boundary
Area Boundary
Road
Area Council Hq
Rural Council Hq
'A' Court Villages
Villages
Areas of Poor Harvest 1990

Source: SRRA

includes all the seed put into any one feddan, regardless of whether it failed or not. The higher the apparent seed rate, the more likely it is that some of the seed inputs to those fields did not survive and had to be replanted. In Torit District the usual seed rate for grains has been set at 7.5 kg per feddan, in addition we must add the quantity of intercropped pulses such as cowpeas and beans, which average perhaps 3 or 4 kilos. A total of 10 - 12 kilos per feddan is therefore to be expected. The rate found during the survey was 15 kg, thus indicating that some 3 - 5 kg had been replanted on any one feddan.

9. STATE OF THE CROPS

In 1990 the average farm was found to be 4 feddan and the yields, though patchy due to poor rains and bird damage estimated at some 5 sacks per feddan.

February, early March, the whole of May and the later part of July were generally dry in most parts of Torit, especially the lower lands. Compared to rains in 1989, the 1990 rains seem to have been slightly lower and less well distributed. In the high lands at Talanga, Katire, Isoke and Parajok relatively good rains were reported. Areas such as Eastern Torit, southern Bari and Lafon had rains until the end of April followed by two months of drought. Small amounts of rain then fell in July.

Those areas that did receive good rain suffered from bird damage (Quelia quelia) and some crops were entirely abandoned as a result. Protection against birds is usually the task of children set on platforms in the middle of fields. Farmers also complained of infestation by Stainer Bugs. It should be remembered that a certain amount of pest damage and difficulties is to be expected in a system which does not utilise pesticides, fertilisers, herbicides or mechanical cultivation methods.

Good harvests were observed in Talanga Parajok, Katire, Imatong, Isoke hills, east and West Lopit, Torit and Kayota. Poor results are predicted for north and eastern Torit, southern Bari, Pageri, West Acholi, Magwi and Obbo. In Lafon, farmers were so disenchanted with their rain maker that the Monyimaji banished him and a new one is in the process of being appointed.

Tibari displaced camp, supplied with tools and sorghum, had managed to grow an impressive crop, however amounts of seed provided were aimed at 5,000 people, Tibari is now reported by SRRA to support some 15,000.

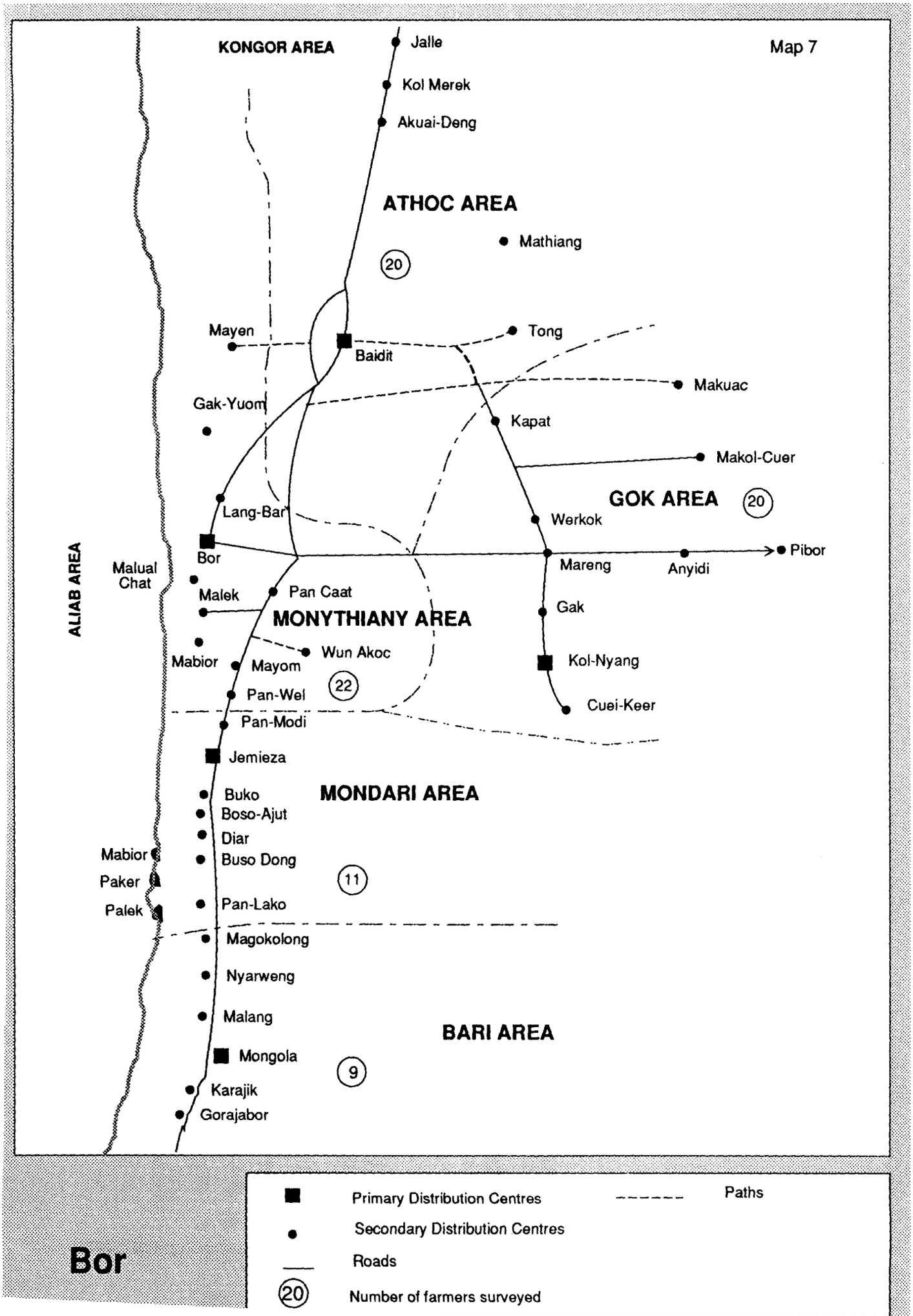
Average estimated yields for Torit (based on observation) could be very tentatively set at 5 sacks per feddan (450 kg) for crops and all plantings together. An optimum yield would be 5 sacks per feddan for each of two cultivations, ie a total of 10 sacks per feddan. The 1990 survey gives an average farm size of 4.0 feddan which would thus give each family an average of 20 sacks (1.8 MT). A total tonnage for the district could therefore be set at 72,000 MT by multiplying the average produce per family by the number of farm families (40,000). Of this, perhaps 24,600 MT or 34% was produced from the inputs provided by CRS and

Unicef. (If the 820 MT provided was planted at a rate of 15 kg/feddan then total feddans planted with relief seed was 54,667, production (54,667 fed x 450 kg) would have been 24,600 MT which is 34% of 72,000 MT).

10. CONCLUSION

The Torit seed distribution was well organised, timely and generally satisfactory. The only major anomaly appears to be that the farmers of eastern area received so much less than those of other areas. Can we draw a conclusion from the two different approaches taken by Unicef and CRS? CRS chose to concentrate their efforts into one part of the District, thereby ensuring that most of the population benefited and received a fair input, Unicef attempted, with a smaller quantity of inputs to cover all the other areas. People managed to supplement relief seeds and tools with locally acquired items, thus CRS may have allowed many farmers to save income by providing them with almost all their seed requirements, but did not provide that which was completely unavailable.

Certainly comparing Torit with other areas it appears that a far greater proportion of the seeds planted and tools used were relief inputs. Whether the need in Torit was greater than that in other areas is another question. Whatever the original need and sacrifices made by those who had to acquire their own agricultural inputs, it is clear that in terms of production, Torit district certainly managed one of the largest margins from its inputs (1kg seed to 30kg food produced).


Map 7
KONGOR AREA
Jalle
Kol Merek
Akuai-Deng
ATHOC AREA
Mathiang
20
Mayen
Baidit
Tong
Makuac
Gak-Yuom
Kapat
Makol-Cuer
GOK AREA
20
Lang-Bar
Werkok
ALIAB AREA
Bor
Pibor
Malual Chat
Mareng
Anyidi
Malek
Pan Caat
Gak
MONYTHIANY AREA
Mabior
Mayom
Wun Akoc
Kol-Nyang
22
Pan-Wel
Cuei-Keer
Pan-Modi
Jemieza
Buko
MONDARI AREA
Boso-Ajut
Diar
Mabior
Buso Dong
Paker
11
Palek
Pan-Lako
Magokolong
Nyarweng
Malang
BARI AREA
Mongola
9
Karajik
Gorajabor
Bor
Primary Distribution Centres
Paths
Secondary Distribution Centres
Roads
20
Number of farmers surveyed

B. BOR

1. BACKGROUND[9]

Bor District is divided into five areas and has an estimated population of 165,000 (27,000 families) Dinka, Mundari and Bari whose permanent settlements are concentrated along the sandy ridges that run parallel to east bank of the Nile (Bahr el Jebel). The five areas reflect the different tribal sections in the area which in turn are partly identified by ecology. Thus Monythang is the area close to the Bahr el Jebel where fishing is a primary activity, Mundari is the area inhabited by the Mundari who migrate each year to and from the west bank of the river.

TABLE 22

POPULATION OF BOR DISTRICT (1983 CENSUS)

Location	Total Households	Households surveyed
Gok	5,833	20
Athoc	4,167	20
Monythang	7,500	22
Mundari	7,833	11
Bari	2,167	9
Total	27,500	82

Cattle rearing is the primary activity of the Dinka, the Mundari and Bari and dictates the movements from permanent wet season settlements to temporary dry season cattle camps in the toic, the seasonally flooded plains. The pastoralists also keep significant numbers of sheep and goats, keeping these close to the permanent settlements all year as a major source of milk and meat.

Two crops of sorghum are usually planted, the first in April-May on the sandy soils above the waterlogged clays and the second, a smaller crop, in late September on the lower lying land as the floods recede. Maize, groundnuts, sesame, cowpeas, tobacco and a number of vegetables are also grown.

Other food sources are fishing, hunting and gathering wild foods. In addition, trade has once more become important for acquiring foodstuffs, seeds and small household items. Family obligations are important in the distribution of food from deficit to surplus areas.

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[9] For further detailed information, see Investigation into Rural Production Capability, UN/SRRA, June 1990

During 1988 the northern part of the district was affected by severe flooding during which crops were lost and many cattle succumbed to disease. The southern part of the District suffered from insecurity. 1989 was a good season and crops in almost all areas did well except those around Jalle where there was once again flooding.

2. SURVEY ACTIVITIES

Bor District has some 55 main villages within the five traditional administrative areas, from which 82 farmers were interviewed in 10 main villages and 8 satellite villages. Thus the survey covered a sample of all the primary areas, 18% of the villages and 2% of the farm families in the sampled villages. 11 officials were also interviewed. The villages were picked at random from within each of the five areas, and farmers within each village also picked at random by team members walking in different directions from the centre of the village. Sampling error is expected to be less than in those areas where transport was a constraint. However, in some locations it was clear that the time of day influenced those who could be found for interview, some farmers leaving the village for their "far" farms at an early hour and not returning until sunset. The results show a higher average per farm family for tools and a lower average for seeds than was expected, this is probably due to the inadequate size of the sample.

3. THE BOR SEED & TOOL PROGRAMME

3.1 Arrivals

Unicef provided a total of 173 MT seed and 46,000 tools to Bor District as a supplement to those available in the area. The items were almost all delivered by road between May and June 1990 except for a final 10 MT for Mongalla which, due to transport delay, arrived there in August.

TABLE 23

UNICEF AGRICULTURAL INPUTS TO BOR		
Item	Pledged MT	Actual* MT
Sorghum	49.30	
Katumani	21.13	
Composite	1.74	
Millet	18.00	
Cowpea	1.70	
Pigeonpea	13.65	
Greengram	10.88	
Sesame	1.00	
Beans	4.44	
Groundnuts	12.00	
Vegetables	0.90	
Total Seed	134.79	183.63
	Pcs	Pcs
Hoe	4,548	7,658
Panga	9,016	14,785
Malloda	17,230	20,135
Sickle	1,550	653
Axe	5,184	2,921
Total Tools	37,528	46,152

*This includes 40 MT seed and 18,000 tools that were redirected from Ayod, Pibor and Nasir.

3.2 Distribution Planning & Implementation

On arrival of the relief seeds and tools at Bor town, a UN/SRRA committee discussed and formulated a distribution plan on the basis of population distribution, projected needs and suitability of each crop and handtool to each area. The committee at Bor were aware of what had been pledged to the area and indeed received the full allocation plus additional items that were destined for places such as Ayod and Nasir, so their distribution planning was considerably easier than that of their counterparts in Ayod and Nasir. However the items did arrive piecemeal over a number of months (weeks?) which made distribution difficult.

A weighting was given to each area according to a) need and b) type of item required. Mundari and Bari areas are wooded and therefore received pangas and axes, Athoc (pronounced atoich) is grassland and was therefore given priority in

sickles for grass cutting and mallodas for tilling the heavy black cotton soil, rather than hoes. Mundari and Bari received fewer tools as local tools were known to be in greatest supply and the emphasis was placed on hoes for turning the lighter soil. At the same time Mundari and Bari areas received most of the groundnuts due to the suitability of the sandy soils. Athoc area received the highest proportion or sorghum as the crop is most widely grown there. Within each area each main village was assigned an equal amount as no detailed population figures were available. Thus farmers in larger villages received less than those in smaller villages.

Most of the items were delivered from Bor to the 55 main villages by Unicef-contracted trucks. Smaller amounts were distributed by SRRA themselves with UN-provided diesel. Some items remain in the store in Bor and it is possible that some also remain in store at the primary centres as, for example, items were noted in Mongalla store in October 1990.

TABLE 24

DISTRIBUTION TO PRIMARY AREAS							
Item	Gok	Athoc	M.thang	Mdri/Bri	Sp*	Stock	Total
			Kg				
Sorghum	11,400	15,850	7,125	26,900	350	150	61,625
Katumani	7,000	1,940	1,390	6,930	350	180	17,610
Composite	220	470	260	990	0		1,940
Millet	5,400	4,350	3,150	5,450	250		18,600
Cowpeas	130	40	220	600	225	100	1,215
Pigeonpeas	1,425	1,200	850	5,800	250	4,000	9,525
Beans	1,000	865	665	1,100	225	300	3,855
Greengram	2,565	2,315	1,365	2,270	225	700	8,740
Sesame	110	150	220	350	0		830
Groundnuts	1,625	600	1,625	6,800	125	675	10,775
Vegetables	110	189	216	435	25	202	985
Total	30,995	27,969	17,085	57,625	2,025	6,307	135,699**
			Pcs				
Hoe	0	0	2,660	4,848	0	150	7,508
Mallodas	8,000	5,795	200	1,200	0	4,400	15,735
Pangas	1,930	2,050	1,900	4,805	0	4,100	10,685
Axes	409	27	1,073	1,412	0		2,921
Sickles	198	272	176	7	0		653
Total	10,537	8,324	6,009	12,272	0	8,650	37,502**
Population (families):	7,500	5,833	4,166	10,000			27,500
Seeds:							
Planned average	4.1	4.8	4.1	5.7			6.6
Survey average	7.7	2.4	3.3	3.3			4.1
Tools:							
Planned average	1.4	1.4	1.4	1.2			1.6
Survey average	2.5	1.6	2.7	3.1			2.4

*Special = Schools, hospitals, leprosy colony and Civil Administration

** NOTE The above tables represent only a part of the items distributed. The delivery notes were left in Bor at the time of the bombing, one person who was

present in Bor was asked to bring the notes and did so, but left some behind and it has not yet been possible to bring the remaining ones to Nairobi. The details included in the delivery notes were initially added up in Bor by Unicef and came to a total of 183.63 MT seed and 46,162 tools.

3.3 Record Keeping

Records in Bor were quite well kept, it is therefore unfortunate for the purposes of this report that records are unavailable due to insecurity. Receipts were entered into store ledgers as well as on waybills. Every dispatch that left the stores was recorded in the store ledgers and on delivery notes in triplicate, those despatched on UN trucks were also accompanied by waybills. The Court Presidents or Chiefs signed for receipt of each delivery and kept a copy of the delivery note. At the village level most chiefs and sub-chiefs did not use Form 1 for registering beneficiaries, although these were issued to them, rather they used the traditional method of dividing to sub-chiefs according to their population who divided amongst headmen who divided amongst heads of families.

4. RECEIPTS

4.1 Percent of Population Benefiting

The survey findings indicate that 89 % of farm families received seed and 90% tools. It is not always clear why some did not receive when there was enough for at least every family to have one handtool. One respondent in Bari area said he had returned late from the Toic on the far side of the Nile to find all the inputs distributed. The five who did not receive in Gok could not explain why they had been overlooked except by saying that the items were insufficient. It may be that the respondents were not pressed enough to give explanations and a brother or wife got the allocation for the family. It must be remembered that each village received tools and seeds in a number of small batches over three months which no doubt helped to confuse the issue. It is clear from the that the criteria for distribution include family size, the importance of that family, the presence of a family representative in the village at the moment of distribution etc. There were many cases of "first come first served" referred to. As in other locations no complaints were received about the distribution system.

TABLE 25

PERCENT OF RESPONDENTS BENEFITING FROM INPUTS					
Item	Gok	Athoc	Munthang	Mundari/Bari	All
			%		
Serena	60	81	86	95	81
Maize	45	86	52	80	66
Millet	35	24	52	75	46
Cowpea	35	57	57	50	50
Pigeonpea	15	24	38	40	29
Greengram	40	48	62	80	57
Groundnut	45	24	33	85	46
Sesame	10	24	33	40	27
Vegetable	35	48	52	85	59
Seed	60	86	86	95	81
Hoe	20	9	62	90	45
Malloda	75	76	38	55	62
Panga	20	52	71	80	56
Axe	15	14	81	80	48
Sickle	25	5	81	0	28
Tools	75	76	81	90	62
n	20	20	22	20	82

4.2 Average Receipts

The average amount received per family surveyed was 3.4 kg seeds and 2.5 tools. An extrapolation of these figures results in more tools and less seeds being reported as received than were to be expected from totals provided and current estimates of population. Sampling error is expected to be the cause of this, due to an inadequate number of samples, inability to ensure standard measures of amounts received and misunderstanding of difference between extended family and a family unit etc. We can also assume some inequity between one village and the next due to lack of knowledge of the real populations of each village and area. In Mundari and Bari items were delivered to the two main centres of Mongalla and Gemmeiza and from there distributed by the Civil Administrator who in turn organised distribution through local chiefs.

TABLE 26

AVERAGE FARM FAMILY RECEIPTS OF RELIEF SEED AND TOOLS					
Item	Gok	Athoc	Munthang	Mundari/Bari	All
			Kg		
Serena	0.63	0.77	0.97	0.76	
Maize	0.94	0.54	0.52	1.28	
Millet	0.53	0.22	0.36	0.23	
Cowpea	0.35	0.08	0.32	0.11	
Pigeonpea	0.35	0.08	0.6	0.11	
Greengram	0.44	0.36	0.25	0.28	
Groundnut	0	0.21	0.1	0.14	
Sesame	0.1	0.05	0.1	0.1	
Vegetables	0.1	0.2	0.1	0.2	
Seed	3.77	2.67	3.51	3.81	3.43
			Pcs		
Hoe	0.55	0.1	0.72	0.9	
Malloda	0.95	0.76	0.27	0.55	
Panga	0.3	0.57	0.86	0.75	
Axe	0.15	0.1	0.86	0.8	
Sickle	0.6	0.05	0.13	0	
Tools	2.6	1.7	2.8	2.95	2.5

The range of receipts is 0 - 8.5 kg seed and 0 to 6 tools. One cause of this was the timing of arrivals. If a farmer received in the first distribution, then he or she did not receive in the subsequent ones. Since each distribution was of a different amount, amounts received per farmer varied greatly. For example in Mundari and Bari, the first consignment received was small, and all those who received from it reported amounts of seed averaging 1.4kg, whilst those who received from a later consignment in June received an average of 4.5 kg.

5. TIMING OF INPUTS

Respondents received supplies between April and June, the bulk arriving in May/June. Those that received in April and May said that the seeds arrived in good time, some of those that received in June said they were late. Most had no comment to make on the matter, indicating that they were satisfied with the timing. One chief in Kapat (Gok) mentioned that the groundnuts and cowpeas had come too late as they tend to be planted earliest, but that the rest of the seeds arrived on time. The rest noted that even the items that arrived in June were timely because the rains had started so late this year.

6. CONDITION AND QUALITY OF INPUTS

Most farmers and chiefs said that both the quality and condition of the items were good, however some commented on particular items. One chief noted that one sack of groundnuts was in poor condition, another that a few of the hoes were cracked. A farmer in Malek said that the Unicef-provided tools were stronger than his own. The SRRA agricultural officer noted that 500 kg of seed (sorghum, cowpeas, pumpkin and onion) had been lost due to water damage en route between Loki and Bor. One person in Kapat said his allocation was weevil infested. A farmer in Makol Cuir mentioned that germination of a number of types was poor due to damage to the seeds. Others reported germination of between 75% and 100%.

7. SUITABILITY OF TYPES AND VARIETIES PROVIDED

Many of the farmers in Mundari and Bari reported that the malloda was not what they needed and that they would have preferred hoes; they said that the relief malloda was too small for their requirements, but was good for weeding. In Cuie Keer the chief noted that the people needed assistance in the provision of groundnuts and vegetable seed. Several noted that they would have to wait for floods to recede before they could plant the green gram.

Most respondents were unable to comment on any differences between local and relief varieties of seed as they had only recently planted. Others said that the performance of both in drought, flood and pest attacks was very similar. Many said that they were very pleased with the germination and performance of the seeds and many were pleased by the short maturing nature of Katumani maize and Serena sorghum. In Malek it was reported by three farmers that groundnuts showed poor germination and that millet, although germinating and growing well, did not set grain. One farmer in Mongalla thought the relief seeds (all of them) more resistant to drought than local varieties. Many were pleased that the grains would be short maturing. Three mentioned that serena tasted bitter, whereas local varieties of sorghum were sweet. Another mentioned that he liked the taste of UN maize. Two said that serena does not store as well as local sorghum.

Generally, whilst not criticising the relief items to much in order to ensure that more were provided in the future, people had a good understanding of how well their own varieties were adapted to the local growing conditions. Bor District can boast a very large number of local varieties, particularly of sorghum where the survey teams came across more than 15 different types.

8. SUFFICIENCY AND LOCAL SUPPLIES

All respondents stated that the supplies were not enough. There was, however, significant amounts of local seed and tools available to the farmers either from last year's harvest or from the local market or relatives. 92% of those interviewed in Bor had local seed and 77% local tools and all 82 respondents had at least some seeds and tools either relief or local. The average quantity of local seeds per farm family was 43.4 kg as shown in the table below:

TABLE 27

LOCAL SEEDS AND TOOLS PER HOUSEHOLD		
Location	Seed Kg	Tools Pcs
Munythang	45.9	2.5
Gok	30.8	3.2
Athoc	23.4	3.7
Mundari/Bari	73.3	11.1
All	43.4	5.0

Much (31%) of the local seed in Mundari, Bari and Munythang areas had been bought from the Aliab area on the west bank of the river Nile the rest was the farmers own from 1989. In Athoc the majority of farmers had supplies from last year but 35% had bought from Gok area and from Kongor to the north.

Local seed included many varieties of sorghum as well as maize, groundnuts, sesame, okra, cowpea and green gram. Local tools included mallodas, axes, pangas, torias and slashers.

The average area under crop in July was 1.9 feddan.

TABLE 28

TOTAL SEED AVAILABLE AND AREA PLANTED					
Location	Feddan 1990	Relief seed Kg	Local seed Kg	Total seed Kg	Apparent seed rate Kg/feddan
Munythang	2.5	3.3	45.9	49.2	19.7
Gok	2.4	7.7	30.8	38.5	16.0
Athoc	1.98	2.4	23.4	25.8	13.0
Mundari/Bari	0.75	3.3	73.3	76.6	****
All	1.9	4.1	43.4	47.5	16.5*

**** As many had not yet planted due to lack of rains in Mongalla area apparent seed rate appears very high.

* This figure is based on Munythang, Gok and Athoc areas.

9. STATE OF THE CROPS

Overall the crop status observed by the survey team and others is fair to good.

The harvest projection for Gok area is above average in general even though some lower lands were affected by waterlogging resulting from late rains.

Athoc area suffered from particularly severe bird infestation. Crop damage is estimated at more than 60% and sometimes as much as 80%, a figure considerably greater than that usually expected which is around 20-25%. Areas worst hit are those nearest to the Bahr el Jebel and woodlands. This is the same area that suffered flood in 1989.

Munythang area suffered from early drought which affected the Katumani maize, but sorghum recovered and has produced fair yields, despite more bird damage. Sesame did well as did vegetables grown along the river.

Mundari showed a very good first groundnut harvest and a promising second one. Only small quantities of sorghum was seen by the survey teams, partly because it is planted "in the forest". Rains were more erratic in Mundari than in Gok.

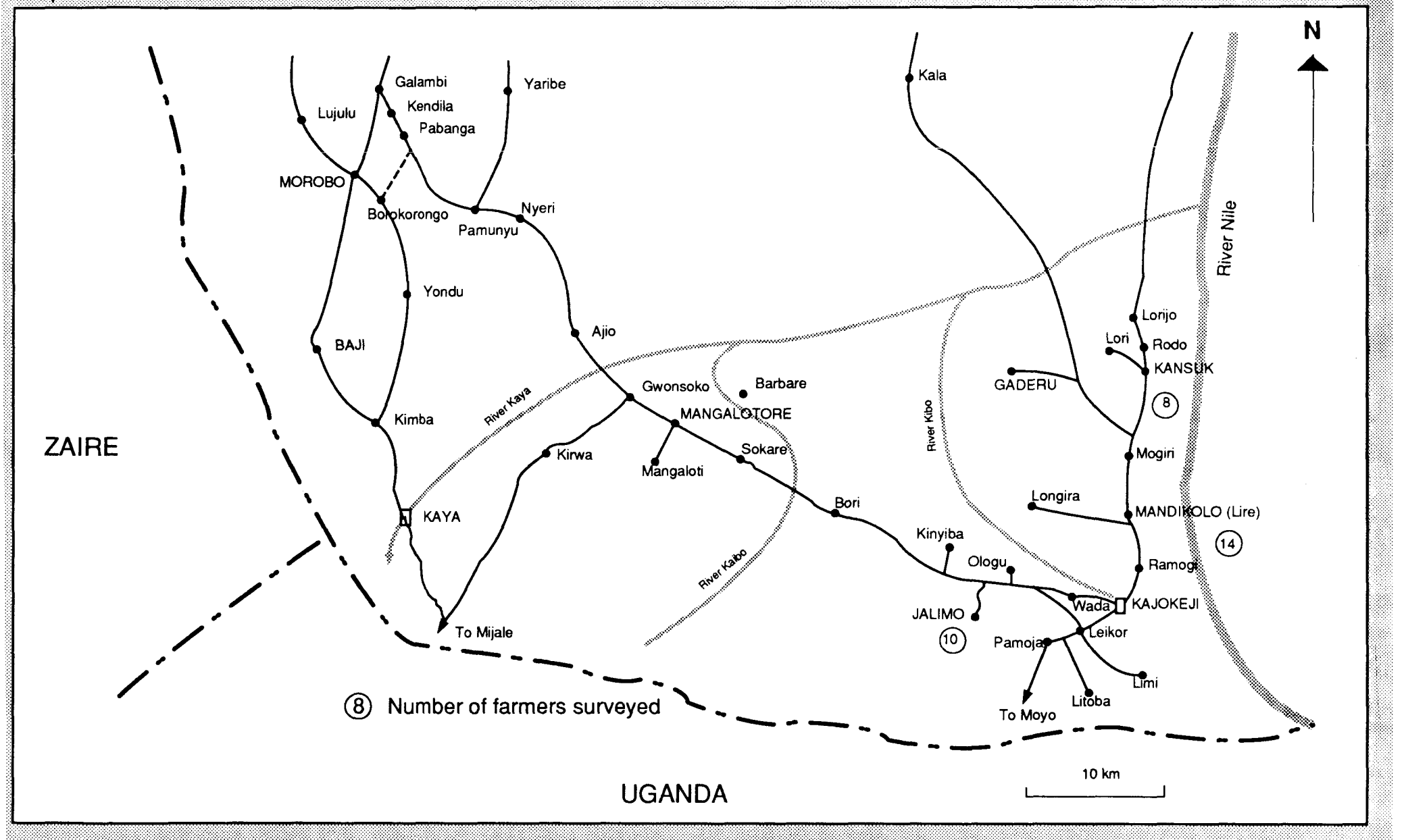
A number of farmers interviewed in Bari had been unable to plant as there had been no rains between June and July and they had received seed inputs late and had arrived from the Toic across the river late. Again grains were in short supply, but pulses and legumes were doing well.

Average estimated yields for Bor could be very tentatively set at 5 sacks per feddan (450 kg) for all crops and all plantings together. With an average farm size of 1.9 feddan that would give each family an average of 9.5 sacks (855 Kg). A total tonnage for the district could therefore be set at 23,512 MT by multiplying the average produce per family by the number of farm families (27,500). Of this, perhaps 5,520 MT or 23% was produced from the inputs provided by Unicef. (If the 184 MT provided was planted at a rate of 16 kg/feddan then total feddans planted with relief seed was 11,500, production (11,500 fed x 450 kg) would have been 5,175 MT which is 22% of 72,000 MT). An optimum for the area might be set at 10 sacks per feddan, that is 5 sacks for each of two cultivations.

10. CONCLUSION

The Bor programme was relatively well documented and well organised. The only area that was not directly supervised by the SRRA Agricultural Office and Unicef was Mundari and Bari where some small losses of seed may have occurred. The relief seed constitutes 9% of the planted seed. At a projected average of 5 sacks per feddan, or 9 sacks per farm family we can tentatively suggest a production of 22,000 MT for the District of which 2,000 MT were the result of Unicef seeds.

Map 8



KAJOKEJI

C. KAJO KEJI

1. BACKGROUND

Kajo Keji district, historically the breadbasket for Juba, is home to an estimated 97,000 people of various tribes (19,400 farm families). Yei river district (Kaya) has a census population of 244,533 or around 40,000 households. The rainfall in the district is the highest in southern Sudan and the soils relatively fertile. The topography of the area is characterised by hills. The people are cultivators, growing maize, sorghum, cassava, groundnuts, sesame pigeon peas, green gram beans cowpeas and a number of vegetables. Honey collection is another important activity. Until recently, life in the area had been relatively normal. Rural development programmes had been initiated after the first civil war in 1972 and had resulted in a range of social and economic infrastructure including farmers co-operatives, clinics and waterpoints. Hostilities in the area in late 1989 and in 1990 led to many people fleeing their homes and farms. It was therefore considered a priority area for seeds and tools in 1990.

2. SURVEY ACTIVITIES

32 farmers and 4 officials were interviewed in 15 villages, within three of the five main areas of Kajo Keji. 46% of the villages were covered and 0.3% of the population of these villages. Constraints to adequate sampling were mainly related to transport - the teams found difficulty in utilising the 3 SRRA cars available at Kajo Keji.

3. THE KAJO KEJI SEEDS & TOOLS PROGRAMMES

3.1 Arrivals

Seeds and tools were provided through SRRA by two agencies: International Aid Sweden and Unicef. IAS provided 24 MT seed and 26,000 tools which arrived by road from Uganda in December 1989 and April 1990 (2,000 of the hoes were delivered in August 1990). Following this, Unicef provided 181 MT seed and 29,000 tools, again by road through Uganda, arriving late June. The sagas of the Unicef convoy which took about three weeks to get through Uganda are the subject of a separate logistics report.

IAS also provided 30 MT seed and 13,000 tools to Kaya in Yei River District

TABLE 29

IAS & UNICEF AGRICULTURAL INPUTS TO KAJO KEJI			
Donor	Item	Quantity Pledged MT	Quantity Received MT
IAS	Maize	13.00	13.0
	Beans	11.00	11.0
Unicef	Sorghum	75.00	75.00
	Katumani	39.58	39.96
	Composite	0.70	1.00
	Cowpea	1.50	1.50
	Pigeonpea	13.00	13.00
	Millet	15.40	15.40
	Greengram	12.13	12.18
	Beans	13.94	14.00
	Groundnut	10.00	10.00
	Vegetables	0.64	0.85
Total	Seeds	205.88	206.89 (101%)
	Pcs	Pcs	
IAS	Hoe	19,000	18,943
	Panga	3,000	3,008
	Axe	2,000	1,996
Unicef	Hoe	15,000	15,000
	Panga	13,024	13,024
	Axe	4,000	1,200
Total	Tools	56,024	53,171 (93%)

3.2 Distribution Planning & Implementation

Distribution of the IAS seeds and tools was arranged and implemented by the SRRA Agriculture Office in Kajo Keji. The items were allocated to five main "A" Court Centres (including Kajo Keji itself) where the local SRRA Agric. Field Office further divided the items amongst the local leaders of the area, who were responsible for providing to farmers. The items were mostly sent out in early May and delivered by SRRA truck or collected on foot by the people of each centre. Farmers then collected their allocations on foot from the A court centres. Each farmer was registered and then issued with a standard amount of each item. When one item came to an end, those who did not receive were first on the list for the next item, thus we end up with a variation in receipt.

The major part of the distribution of Unicef items to primary centres, did not take place till July, one month after they had arrived at Kajo Keji. This was due to an apparent lack of transport and waiting for the Unicef-contracted trucks, which were held up for three weeks in Uganda trying to reach KK. Unicef had delivered 24 drums of diesel on 7 July and SRRA had used 10 of the drums to deliver 65 MT by SRRA lorry and landcruiser to primary centres between mid and end of July. Another 7 barrels had been issued for other purposes and the remaining 7 used by Unicef to distribute the remaining 146 MT seeds and tools.

By the time the survey team arrived on 29 July the majority of the items had only just been delivered to the primary centres and some still remained in Kajo Keji, so no distribution to farmers had taken place.

TABLE 30

DISTRIBUTION OF UNICEF ITEMS TO PRIMARY CENTRES

Item	Kajo Keji	Jalimo	Lire	Mangalatore	Kansuk	Reserve	All
				Kg			
Sorghum	15,500	19,400	17,700	11,000	6,800	1,750	72,150
Katumani	8,310	10,360	8,120	5,900	3,600	3,670	40,000
Composite	240	200	140	100	100	195	975
Millet	3,300	2,650	3,100	3,900	1,500	700	15,150
Cowpea	325	400	300	200	200	30	1,455
Pigeonpea	3,400	3,400	2,700	1,900	1,200	750	13,350
Greengram	3,000	3,200	3,750	1,800	1,100	1,450	14,300
Beans	3,300	3,600	2,820	2,100	1,300	200	13,320
Groundnut	2,100	2,600	2,020	1,500	900	755	9,875
Vegetables	173	201	182	124	82	0	717
Total	39,648	46,011	40,832	28,524	16,782	9,500	181,292
				Pcs			
Panga	2,803	3,358	2,634	1,911	1,187	1,230	13,123
Axe	293	309	243	176	109	50	1,180
Hoe	3,333	4,167	3,333	2,500	1,667	0	15,000
Total	6,429	7,834	6,210	4,587	2,963	1,280	29,303

3.2 Record Keeping

SRRA officials kept exact records of receipts and despatches although paper was limited. Generally the understanding of the role and system of basic record keeping was very strong and to be commended. One official noted the difficulty of recording tool figures when boxes supposedly containing 24 pieces were found to contain between 9 and 12 pieces. Others noted the lack of space on Forms 1 and 2 and that the serial numbers did not allow for carbon copies.

4. RECEIPTS

4.1 Percentage of Households Benefiting

The survey picked up on IAS inputs only as the Unicef items were still at the primary centres. Thus receipts are for maize and beans only. 87% of the survey sample received seed and 84% tools. the few who did not receive had not been present at the time of distribution or another member of their family had been a beneficiary.

TABLE 31

PERCENT OF FARM FAMILIES BENEFITING FROM RELIEF INPUTS

Item	Lire	Kansuk	Jalimo	All
		%		
Maize	85	100	80	87%
Beans	71	88	80	78%
Seed	85	100	80	87%
Panga	0	75	40	15%
Axe	0	50	20	19%
Hoe	92	88	70	84%
Tools	92	88	70	84%
n	14	8	10	32

4.2 Average Receipts Per Household

Respondents reported receiving an average of 1.2 kg seed and 1.65 tools. This reflects the items delivered by IAS as none of the Unicef commodities had yet arrived with the farmers. Receipts were fairly uniform ranging from 1/4 to 1 kilo and mostly being 1/2 kilo of maize and bean seed. One person reported receiving 10kg and also to having considerable amounts of local seed - we can assume he is a farmer of some importance with a large extended family. The sample was not large enough to give an fully accurate picture and was also biased by access. Due to the fact that most of the items were distributed at once and to the fact that only a few different types of input were provided there was less variation in what each farmer received than in other areas. We can assume that almost everyone in the district received around 1.2 kg seed and one or two tools.

TABLE 32

AVERAGE RECEIPTS PER HOUSEHOLD SURVEYED				
Item	Lire	Kansuk	Jalimo	All
		Kg		
Maize	0.5	0.4	0.8	0.6
Bean	0.3	0.4	0.8	0.6
Total	0.8	0.8	1.6	1.2
		Pcs		
Panga	0	0.75	0.4	0.31
Axe	0	0.5	0.2	0.19
Hoe	1.1	1.0	0.7	0.95
Total	1.1	2.25	1.3	1.5

We can extrapolate to include the Unicef seed and tools and predict that each farmer received approximately 9 kg seed and 1 -2 hand tools, giving a total receipt per farmer in 1990 of 3 tools and 10 kg seed.

5. TIMING OF INPUTS

81% of the respondents said that the items were late and this was referring to the Swedish input. The Unicef inputs were obviously very late. People noted that although the first season is better for planting beans and maize than the second which starts in August, the IAS and Unicef seeds were in time for the second planting.

6. QUALITY AND CONDITION

12% of the sample said that seeds and/or tools were in poor condition when they arrived and 22% said the quality was not very good, the rest were pleased with both quality and condition. Officials noted that a number of bags had been damaged en route. One official said that the beans had not been certified seed and that they could have brought in diseases. Most of the 22% above were noting that the hoes and pangas were easily bent and broken.

7. SUITABILITY OF TYPES AND VARIETIES

The farmers of Kajo Keji have a great depth of knowledge regarding various varieties and their performances and as such were more critical of the relief inputs than their counterparts in other areas. Almost everyone was pleased with

the types of seed and tool received - only one person said the hoes were the wrong shape. Many requested vegetable seed and groundnuts (it is pleasing to think that a few days after the interview the farmer would have received vegetable and groundnut seeds).

A large number of people said that Katumani maize was not appropriate for Kajo Keji and had performed badly. Some said that it was less drought and pest resistant than local varieties. It was said that TZB or Western Yellow maize are the preferred varieties for the area. Beans were reported as doing very well.

8. LOCAL SEED AND TOOLS AND SUFFICIENCY OF RELIEF ITEMS

All respondents had local seed and 72% had their own tools, about half of these were carried over from previous years and the other half had been bought in the markets of Kajo Keji district or northern Uganda. The average amount of local seed per family was found to be 57 kg with 1.9 tools. Average area planted with both relief and local supplies was found to be 5 feddan.

TABLE 33

LOCAL SEED AND TOOLS PER FARM FAMILY SURVEYED

Item	Lire	Kansuk	Jalimo	All
		Kg		
Sorghum	4.8	6.9	5.5	
Katumani	7.5	10.4	6.9	
Millet	0.8	4.6	1.5	
Cowpea	3.8	3.5	1.5	
Pigeonpea	1.7	1.1	2.7	
Greengram	1.3	0.3	0	
Beans	3.2	1.3	1.0	
Groundnut	21.7	59.3	16.19	
Vegetables	0.13	0.01	0.02	
Total	50.53	91.89	39.91	57.42
		Pcs		
Panga	0.2	0.3	0.5	
Axe	0.2	0.6	0.4	
Hoe	0.7	1.0	1.4	
Malloda	0	0	0.2	
Sickle	0.1	0	0.1	
Rake	0.1	0	0	
Total	1.3	1.9	2.7	1.9

TABLE 34

TOTAL SEED AVAILABLE AND AREA PLANTED PER FARM FAMILY					
Location	Feddan 1990	Relief seed Kg	Local seed Kg	Total seed Kg	Apparent seed rate Kg/Feddan
Lire	5.9	0.8	50.5	51.3	8.7
Kansuk	6.8	0.9	91.9	92.84	13.7
Jalimo	2.8	1.6	39.5	41.1	14.7
All	5.0	1.2	57.4	58.6	11.72

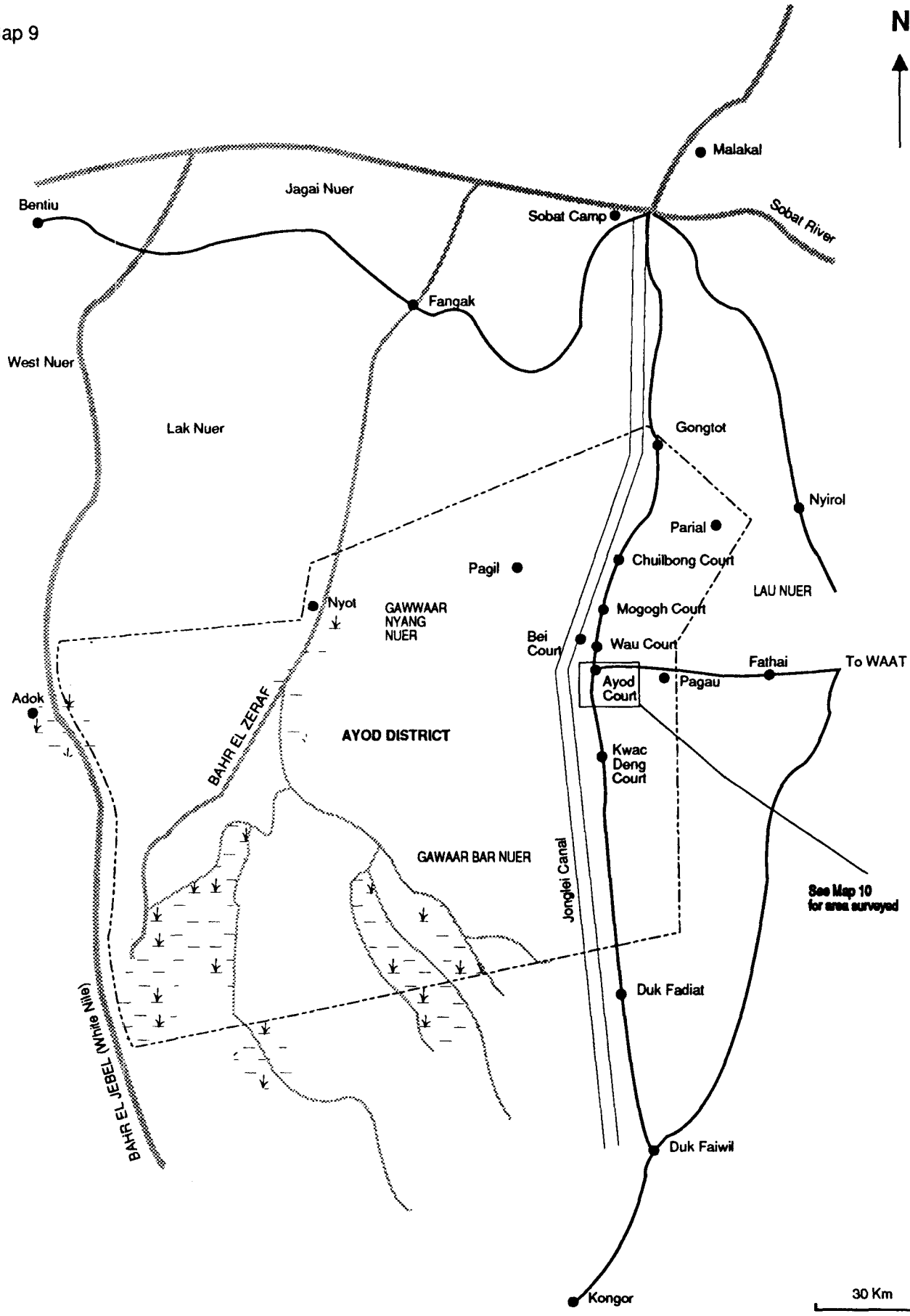
9. STATE OF THE CROPS

Despite insecurity which may have interfered with the production of some farmers, the people managed to plant a reasonable area. Rains have been good this year and estimated yields for Kajo Keji could be very tentatively set at 10 sacks per feddan for all the plantings so far and all crops (900 kg). An optimum yield would be 5 sacks per feddan for each of these plantings, ie, 15 sacks per feddan. With an average farm size in 1990 of 4.6 feddan that would give each family 46 sacks (4 MT). A total tonnage for the district for the plantings to date could therefore be set at 77,600 MT of which perhaps 1,843 MT or 2% was probably produced from the inputs provided by International Aid Sweden. (If the 24 MT provided was planted at a rate of 12 kg/feddan then total feddans planted with relief seed was 2,047 multiplied by 900 kg, production would have been 1,834 MT which is 2% of 77,600 MT). In addition, it is expected that if rains continue well, the 183 MT provided by Unicef will reap a further large tonnage which can be estimated in the same manner at 14,077 MT from 15,640 feddan, constituting an additional 15% of the total harvest. The crop that was planted in July will also, of course, include local crops, possibly in similar proportions as those of the last crop. It is possible therefore that local supplies will add another large tonnage to the total production. We therefore have a minimum harvest projection of at least 91,000 MT not including any further local crops planted in June.

10. CONCLUSION

Kajo Keji has efficient local authorities and a farmining population well acquainted with agricultural development. The potential for the area is high and the impact of 1990 seed and tool inputs significant. Future activities in the agricultural sector would probably be best directed towards tool production and appropriate technology interventions.

Map 9


N
Malakal
Jagai Nuer
Bentiu
Sobat Camp
Sobat River
Fangak
West Nuer
Lak Nuer
Gongtot
Nyirol
Parial
Pagil
Chuilbong Court
LAU NUER
Nyot
GAWWAAR
NYANG
NUER
Mogogh Court
Bei
Court
Wau Court
Fathai
To WAAT
Ayod
Court
Pagau
Adok
BAHR EL ZERAF
AYOD DISTRICT
Kwac
Deng
Court
GAWAAR BAR NUER
Jonglei Canal
See Map 10
for area surveyed
Duk Fadiat
BAHR EL JEBEL (White Nile)
Duk Faiwil
Kongor
30 Km

AYOD