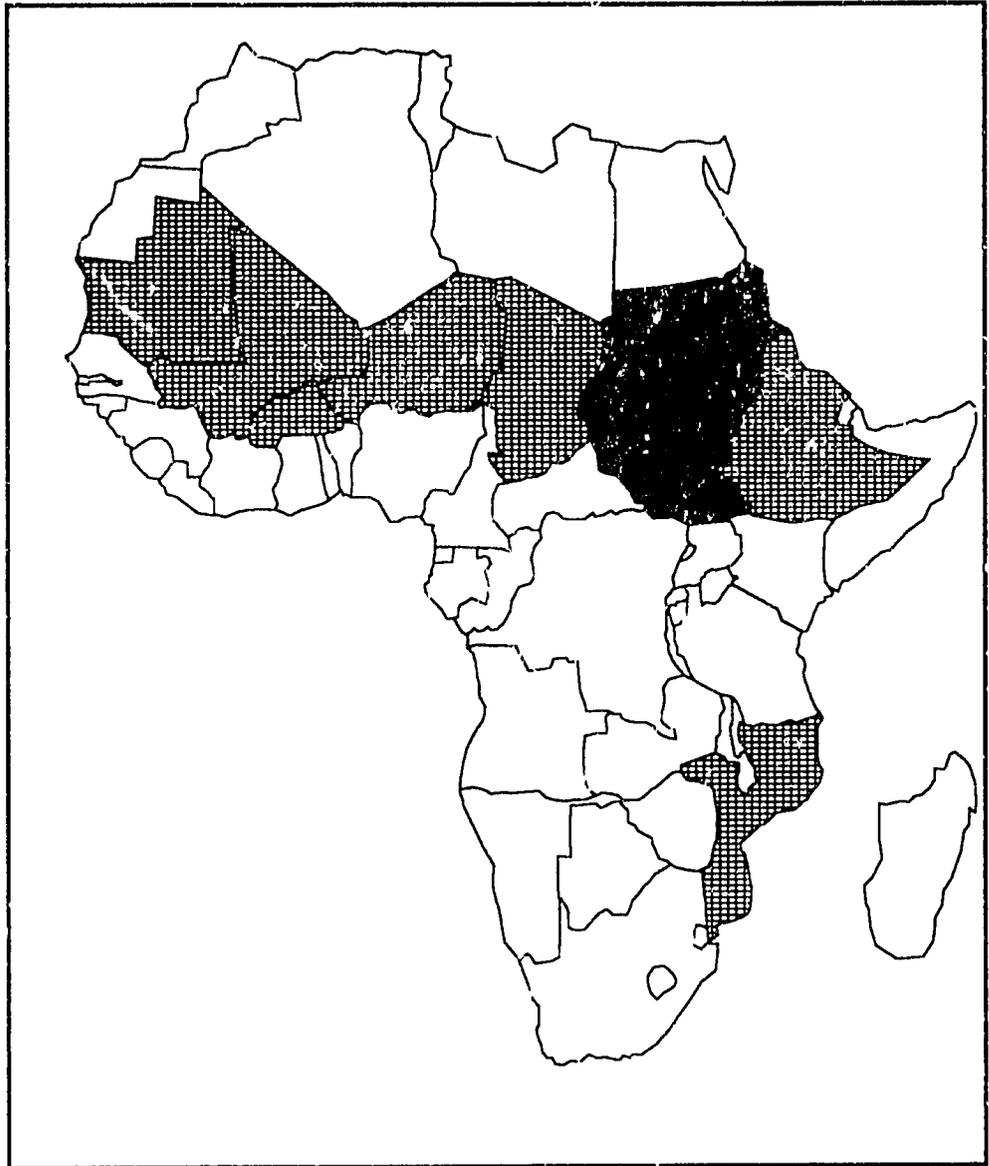


Report Number 8  
January 1987

# FEWS Country Report SUDAN



Africa Bureau  
U.S. Agency  
for International  
Development

# Summary Map



# SUDAN

## The Problems With Surplus

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Prepared for the  
Africa Bureau of the  
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International Development

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## **INTRODUCTION**

This is the eighth of a series of monthly reports issued by the Famine Early Warning System (FEWS) on Sudan. It is designed to provide decisionmakers with current information and analysis on existing and potential nutrition emergency situations. Each situation identified is described in terms of geographical extent and the number of people involved, or at-risk, and the proximate causes insofar as they have been discerned.

Use of the term "at-risk" to identify vulnerable populations is problematical since no generally agreed upon definition exists. Yet it is necessary to identify or "target" populations in-need or "at-risk" in order to determine appropriate forms and levels of intervention. Thus for the present, until a better usage can be found, FEWS reports will employ the term "at-risk" to mean...

...those persons lacking sufficient food, or resources to acquire sufficient food, to avert a nutritional crisis, i.e., a progressive deterioration in their health or nutritional condition below the status quo and who, as a result, require specific intervention to avoid a life-threatening situation.

Perhaps of most importance to decisionmakers, the process underlying the deteriorating situation is highlighted by the FEWS effort, hopefully with enough specificity and forewarning to permit alternative intervention strategies to be examined and implemented. Food assistance strategies are key to famine avoidance. However, other types of intervention can be of major importance both in the short-term and in the long-run, including medical, transport, storage, economic development policy change, etc.

Where possible, food needs estimates are included in the FEWS reports. It is important to understand, however, that no direct relation exists between numbers of persons at-risk and the quantity of food assistance needed. This is because famines are the culmination of slow-onset disaster processes which can be complex in the extreme.

The food needs of individual populations at-risk depend upon when in the disaster process identification is made and the extent of its cumulative impact on the individuals concerned. Further, the amount of food assistance required, whether from internal or external sources, depends upon a host of considerations. Thus the food needs estimates presented periodically in FEWS reports should not be interpreted to mean food aid needs, e.g., as under PL480 or other donor programs.

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FEWS is operated by AID's Office of Technical Resources in the Bureau for Africa in cooperation with numerous USG and other organizations.

## **SUMMARY**

The global grain glut is expected to lead to a decline in world prices which will severely curtail the ability of the Sudanese to export their surplus grain sorghum. The agricultural surplus could strain Sudanese resources and could lead to a devaluation of the Sudanese pound to be competitive on the world market. The record production will probably lead to a further decline in domestic prices. Detailed analysis of the May-June Childhood Nutrition Survey by the Sudan Emergency and Recovery Information and Surveillance System (SERISS), shows that childhood undernutrition is widespread throughout northern Sudan. While inter-provincial variation in childhood malnutrition is significant, the overwhelmingly important variable is the specific urban, rural, or nomadic council in which the child lives. Analysis of 19 social, economic, demographic, and child specific variables showed that altogether they explained only 20% of the variation in childhood malnutrition. Concern, within Sudan, over a locust emergency next summer could become justified if swarms successfully escape from their winter and spring breeding areas to the central grasslands of Sudan.

### **Issues**

- The expected worldwide decline in grain prices will limit the ability of the Government of Sudan (GOS) to export its sorghum stocks and could lead to a decline in domestic prices that will limit incentives to farmers to plant sorghum next year.
- The overvalued Sudanese pound limits the export market for its cash crops (gum arabic, sesame, groundnuts) without massive government subsidies. Sudan requires foreign exchange for imports, including wheat and other foodstuffs for its urban population, and to support prices on domestic production.

### **Key January Indicators**

- The third in a series of SERISS childhood nutrition surveys will begin at the end of January and should provide invaluable baseline data on post-harvest childhood nutrition in northern Sudan.
- Preliminary results from the second SERISS childhood nutrition survey (that took place in September/October) might become available in January, providing data on pre-harvest childhood nutritional status.

## **CROP PRODUCTION**

Estimates of record cereal production, reported in the December FEWS report (gross production of 4,451,000 MT based on November's preliminary estimates by the Ministry of Agriculture (MOA)) is supported by a Food and Agricul-

ture Organization (FAO) estimate of 4,370,000 MT. It is also coincident with an FAO estimate of record world cereal production. The estimated increases in crop production for 1986 are attributed, by the MOA, to improved crop protection measures and a more even distribution of rainfall than in 1985.

World grain prices are expected to decline as large numbers of exporters (including many small, usually food deficit, countries) fight for a share of the market. Sudan's surplus sorghum, over-priced due to an over-valued Sudanese pound, will not be in a competitive position without export subsidies. Domestic prices, already low in much of the country, should decrease further thus providing disincentives for farmers in 1987. Newspapers in the Sudan, however, report that 1,250,000 MT of sorghum will be exported this year. Of this, 300,000 MT are to go to Holland, 500,000 MT to Iran and 435,000 MT to Saudi Arabia.

Table 1: Cereal Production by Region and Province in Sorghum Equivalents Based on Ministry of Agriculture Preliminary Estimates.

| Province/Region | Estimated<br>1987 Pop | Cereal<br>Reqd.<br>(000)MT | Sorghum Caloric Equivalents |       |                   |          | Per Capita          |
|-----------------|-----------------------|----------------------------|-----------------------------|-------|-------------------|----------|---------------------|
|                 |                       |                            | Production                  |       | Surplus/(Deficit) |          | Surplus/<br>Deficit |
|                 |                       |                            | Gross                       | Net   | (000)MT           | % Of Req | KGS                 |
| Central Region  | 4,585,190             | 669                        | 1,946                       | 1,553 | 912               | 136      | 199                 |
| Kassala         | 1,736,797             | 254                        | 1,222                       | 984   | 734               | 290      | 423                 |
| Khartoum        | 2,179,281             | 318                        | 29                          | 23    | (295)             | (93)     | (135)               |
| Nile            | 696,375               | 102                        | 26                          | 20    | (81)              | (79)     | (116)               |
| Northern        | 459,828               | 67                         | 56                          | 40    | (19)              | (28)     | (41)                |
| Northern Darfur | 1,691,499             | 247                        | 109                         | 88    | (159)             | (64)     | (94)                |
| North Kordufan  | 1,888,561             | 276                        | 271                         | 219   | (57)              | (21)     | (30)                |
| Red Sea         | 824,453               | 120                        | 19                          | 15    | (105)             | (87)     | (127)               |
| Southern Darfur | 2,061,539             | 301                        | 287                         | 232   | (69)              | (23)     | (34)                |
| South Kordufan  | 1,441,261             | 210                        | 296                         | 238   | 28                | 13       | 19                  |
| SUBTOTAL        |                       |                            |                             |       |                   |          |                     |
| Northern Sudan  | 17,564,784            | 2,564                      | 4,261                       | 3,413 | 890               | 35       | 51                  |
| Southern Region | 5,675,835             | 517                        | 190                         | 149   | (366)             | (71)     | (64)                |
| TOTAL           | 23,240,619            | 3081                       | 4,451                       | 3,562 | 524               | 17       | 23                  |

Sources: MOA, Division of Agricultural Statistics Preliminary Production Report, November 6, 1986. GOS historical production figures on wheat, maize, and rice. 1983 GOS census results, extrapolated to 1987. GOS consumption requirements by region (146 kg/person/year in the north, 91 kg/person/year in the Southern Region). Crop specific seed, post-harvest loss factors, and caloric values calculated by ABT Associates. NOAA based production estimates from FEWS Report #6.

Regional and provincial food deficits, as shown in Table I, are very sensitive to population estimates, but these can vary widely. In Northern Darfur Province, for example, the FEWS/Sudan population estimate of almost 1,700,000 people is 36% higher than the figure used by Save The Children (SCF (UK)). On the other hand, MOA and SCF (UK) production estimates for Northern Darfur are very close. In another case, estimates of people displaced, from the Southern Region to northern Sudan, range up to 1,000,000. Such a shift in population would lead to a change in the food deficit calculations for the southern Region, as well as for the destinations of the displaced people.

The MOA estimates for crop production in northern Sudan show that the areas under sorghum, millet and wheat have decreased by 5%, 13% and 1%, respectively, since 1985. The reduction in area under sorghum was largely in irrigated areas, and under millet, in the rainfed mechanized areas of the Central and Eastern Regions. In 1986 less irrigated land is said to have been planted with wheat in Northern Region than in 1985. In spite of the reduction in areas under sorghum and millet, production of sorghum is expected to increase by 2% to 3,250,000 MT and millet, by 33% to 551,000 MT. Estimates used for wheat production were made based on historical records; it has been suggested that production could fall by as much as 30%.

Wheat imports are flexible in the sense that any deficit in national wheat production will be compensated for with imports. Wheat is the staple food in urban areas, Khartoum in particular. Given that 70% of the population in Khartoum Province is urban and 70% of wheat imports reach the Khartoum market, data suggesting that Khartoum has a large grain deficit (based on sorghum and millet requirements) must be treated with extreme care.

In southern Sudan, production of sorghum has been estimated by the MOA to have fallen by 39% to 152,000 MT and millet by 47% to 7,000 MT. This decrease is explained by the reduced area under cultivation. These estimates, however, probably understate production due to limited access to rural areas because of the security situation.

The decrease in the area under production of sorghum and millet in northern Sudan has been offset by a 40% increase in the area under groundnuts. This increase has been in the irrigated areas of Central and Eastern Regions and the traditional rainfed areas of Kordufan. Farmers switched to groundnuts and, to a lesser extent, sesame, because of low sorghum prices following 1985's record sorghum

production. Groundnut production is expected to reach 443,000 MT, which is an 80% increase over production in 1985. The area of sesame production increased by 7% compared with 1985, largely in the rainfed mechanized areas of Central and Eastern Regions, and production is expected to reach 295,000 MT, which is 144% of the 1985 level. The implications of an increase in groundnut and sesame production for nutritional status should not be over-looked; both crops are important as cooking oil. Thus, any increase in production could result in an increase in the availability of edible oil, a decrease in price and an increasing food energy intake by people.

#### **AGRICULTURAL PRICES**

Sorghum prices are presently low through most of northern Sudan. In Gedaref, a 90 kg sack sells for 20 Sudanese Pounds, while in Kordufan the price is 30 Pounds per sack. Prices are around 50 Pounds per sack in Darfur Region and in Northern Darfur Province they are said to have reached 60 Pounds per sack. One reason suggested for these latter high prices is that merchants are transporting grain to Southern Sudan, where the price is considerably higher. Save The Children suggests that high prices in Northern Darfur are due to uncertainty over the extent to which pests will affect the harvest.

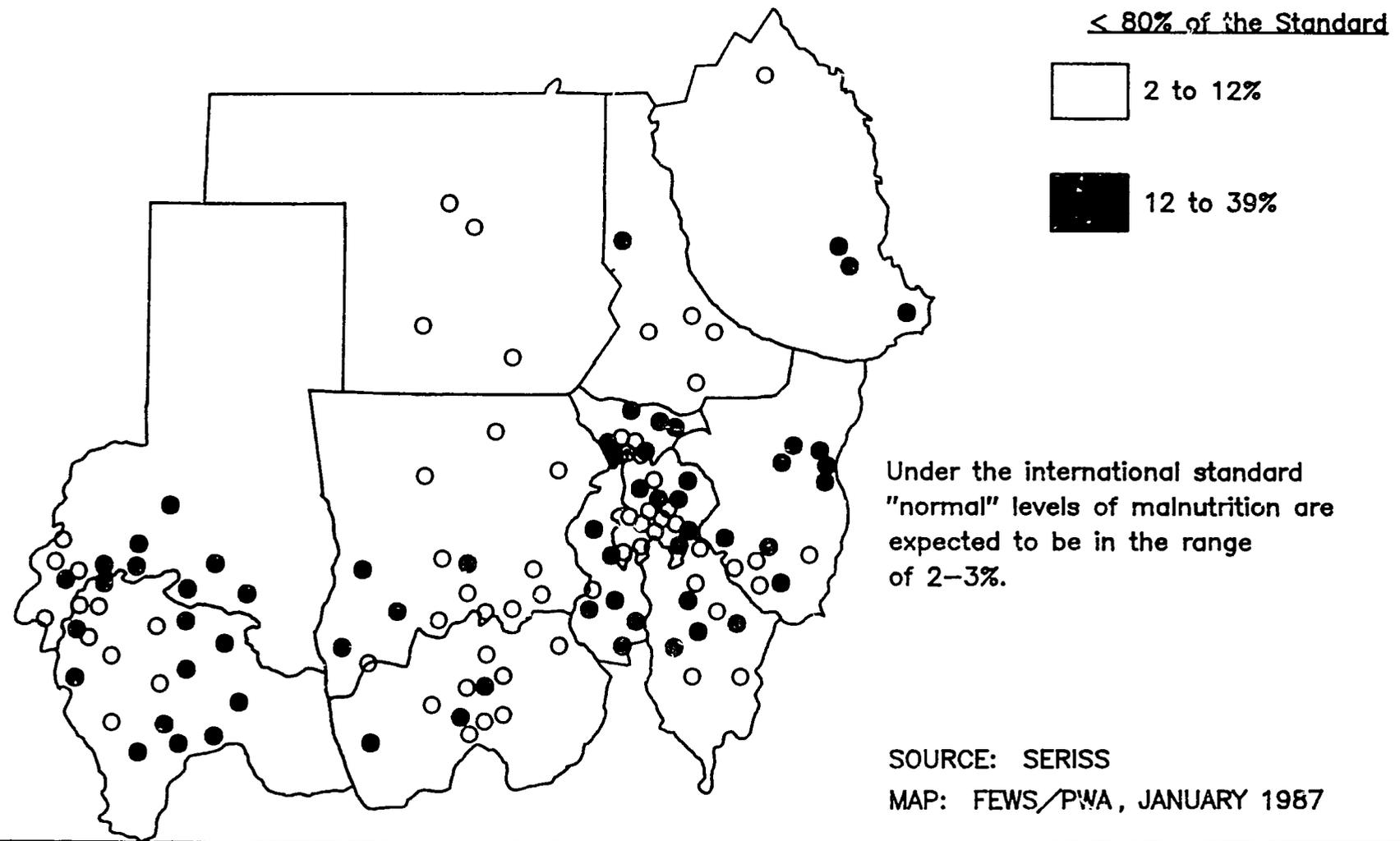
#### **HEALTH AND NUTRITION**

Data from the first round of the Sudan Emergency and Recovery Information and Surveillance System (SERISS) surveys, carried out in May/June 1986, showed that childhood undernutrition, as measured by a standard weight for height measure, was widespread throughout northern Sudan. Indeed, the most important finding was that the intra-provincial variation in the average weight/height measure overrides the inter-provincial differences. This indicates that there are pockets of undernutrition throughout northern Sudan and the situation in any one province cannot be termed better or worse than in another province (See Map 2). The average nutritional score (Z wt/ht) of children studied was approximately one standard deviation below the international standard reference level, although the distribution was normal. Twenty percent of the variance was explained by 19 social, economic, demographic and child specific variables, of which the greatest contributor was age of the child.

Thirty-five percent of the nomadic, 50% of the rural and 57% of the urban households studied were calculated to have less than 300 gm of grain available per person per day. The high proportion of urban households having less than 300 gm/person/day, reflects the fact that these households have access to a greater variety of food than

# SUDAN: Malnutrition Levels in Sample Rural Villages

May-June SERISS Survey Results of the Percent of Malnourished Children. Median = 12%



rural and nomadic people, and so grain is of less importance in the urban diet.

Fewer children in urban areas were reported to be suffering from either diarrhea, vomiting, measles, respiratory tract infections, fevers or night blindness than children in either rural or nomadic areas. Children suffering from these conditions were generally less than 33 months old. Water source was associated with morbidity patterns. More children suffered from diarrhea or vomiting in areas where hand-drawn well water and river/canal/wadi water was used, than where tap water was available.

The over-all mortality rate among children under two in northern Sudan was found to be 111 per 1000. Relatively high levels were found in Kassala, Blue Nile and White Nile Provinces (Table 2), which are all areas of surplus agricultural production. These provinces, along with Gezira Province, received less food aid between 1984-1986 than other provinces in northern Sudan. Work is currently in progress to determine whether there was any relationship between total food aid distributed and the mortality rates among children under two.

**Table 2: Relative Mortality Rates in Children Under Two by Province**

| <u>Low</u><br><u>&lt;100/1000</u>                         | <u>Medium</u><br><u>100-120/1000</u> | <u>High</u><br><u>&gt;120/1000</u> |
|-----------------------------------------------------------|--------------------------------------|------------------------------------|
| N. Kordufan<br>S. Kordufan<br>Nile<br>Red Sea<br>Khartoum | Gezira<br>N. Darfur<br>S. Darfur     | Kassala<br>Blue Nile<br>White Nile |

One of the more interesting results of the survey was that households representing 64% of the population, reported receiving food aid in the twelve months preceding the survey (Table 3). In the three months prior to the survey, which was the first quarter of 1986, households representing 21.5% of the population reported receiving food aid. Extrapolated to the total population of the northern part of Sudan, these figures represent 10,500,000 people and 3,410,000 people, respectively. This latter figure corresponds well to the total of 3,112,000 estimated by FEWS to be at-risk in June, 1986. The distribution of food aid recipients in the survey,

however, differs significantly from the distribution of at-risk people estimated by FEWS in June.

**Table 3: Estimated Number of People Receiving Food Aid in the 12 Months and 3 Months Prior to the May/June SERISS Nutrition Survey, Based on Proportion of Urban, Rural and Nomadic Households Reporting Receipts of Food Aid.**

| <u>Province</u> | <u>1986 Estimated Population</u> | <u>Estimated Food Aid Recipients 4/85-3/86</u> |               | <u>Estimated Food Aid Recipients 1/86-3/86</u> |               |
|-----------------|----------------------------------|------------------------------------------------|---------------|------------------------------------------------|---------------|
|                 |                                  | <u>Number</u>                                  | <u>%</u>      | <u>Number</u>                                  | <u>%</u>      |
| Khartoum        | 2,103,702                        | 200,191                                        | 9.52X         | 26,584                                         | 1.26X         |
| Northern Nile   | 443,881                          | 20,668                                         | 4.66X         | 13,746                                         | 3.10X         |
| Nile            | 672,224                          | 254,782                                        | 37.90X        | 177,840                                        | 26.46X        |
| Red Sea         | 795,861                          | 289,603                                        | 36.39X        | 146,211                                        | 18.37X        |
| Kassala         | 1,676,564                        | 1,525,329                                      | 90.98X        | 224,998                                        | 13.42X        |
| Blue Nile       | 1,162,214                        | 919,051                                        | 79.08X        | 77,336                                         | 6.65X         |
| Gezira          | 2,226,146                        | 1,345,758                                      | 60.45X        | 122,941                                        | 5.52X         |
| White Nile      | 1,037,813                        | 754,807                                        | 72.73X        | 43,212                                         | 4.16X         |
| N. Kordufan     | 1,823,065                        | 1,714,622                                      | 94.05X        | 1,405,530                                      | 77.10X        |
| S. Kordufan     | 1,444,450                        | 775,649                                        | 53.70X        | 10,439                                         | 0.72X         |
| N. Darfur       | 1,241,000                        | 1,090,686                                      | 87.89X        | 704,910                                        | 56.80X        |
| S. Darfur       | 1,990,044                        | 1,681,173                                      | 84.48X        | 462,996                                        | 23.27X        |
| <u>Total</u>    | <u>16,616,964</u>                | <u>10,572,320</u>                              | <u>63.62X</u> | <u>3,416,744</u>                               | <u>20.56X</u> |

The estimate that 3,400,000 people received food aid in the first quarter of 1986, immediately following a record harvest of cereal grains, implies that they did not have access to that production and that more than that number would require food aid later in the year (assuming that those who require food aid and those who receive food aid are one and the same). In the beginning of 1987, following another record harvest, there has been no essential change in the economy, or in the distribution of agricultural production, that would suggest fewer people should be fed.

## SOUTHERN SUDAN

The Sudan Emergency Operation's (UNOEOS) Technical Coordination Committee estimated in December that 1,174,000 people are at-risk in Southern Sudan, requiring 71,250 MT of food aid over the next six months. They have estimated 300,000 of these people as displaced and destitute, requiring full rations. While not including people in at least some areas of East Equatoria, Jongoli or Boheriat Provinces, this estimate does include those people in areas accessible to relief efforts. Donors and relief organizations are using this estimate to target their activities.

**Table 4: People At-Risk and Cereal Requirements (Metric Tons) in Southern Sudan.**

| <u>Region</u>  | <u>Population At-Risk</u> | <u>Cereal Requirement</u> |
|----------------|---------------------------|---------------------------|
| Bahr El Ghazel | 690,000                   | 38,350                    |
| Upper Nile     | 172,000                   | 9,900                     |
| Equatoria      | 312,000                   | 23,000                    |
| <u>Total</u>   | <u>1,174,000</u>          | <u>71,250</u>             |

The number of displaced people in the Narus camp, in southeastern Eastern Equatoria Province, has declined to about 5,000 from an estimated high of 30,000. The health conditions in the camp are reported as good. This is an abrupt turnaround from reports at the end of last summer which described the situation as "as bad as the worst situation in Ethiopia during the height of the drought".

A figure of 1,000,000 people is current, in Sudan, as an estimate of the number of urban displaced people and migrants from southern Sudan into northern Sudan. An accurate enumeration is not likely.

Food aid shipments overland via Uganda and Zaire are continuing at greater cost in time and money than originally anticipated. Food aid stocks in Juba are at low levels, even in the face of successful recent deliveries.

## **REFUGEES**

Recent nutrition surveys in 19 camps in Eastern Sudan show childhood malnutrition levels among Ethiopian refugees to be relatively low. Among children less than five years of age, only 6.4% of the reception camp children and 7.2% of the settlement camp children were found to be acutely malnourished (<80% weight/height standard). This is lower than the level of malnourishment found among the surrounding Sudanese population.

The results of the survey showed a range of from 1.6% to 7.2% of refugee children acutely malnourished in reception centers and from 2.1% to 14.3% in settlements. Supplementary feeding centers enrolled 58% of these malnourished children in reception centers and 45% in settlements. Many healthy children also attended supplementary feeding centers.

The highest incidence of malnutrition was found among children aged 12-23 months. This high level was attributed to poor weaning and infant feeding practices, amenable to change through education.

There are currently a total of 277,000 Ethiopian refugees living in 9 reception centers, 16 agricultural settlements, 8 rural (wage earning) settlements and 2 semi-urban (wage earning) centers (according to a recent GOS Commissioner for Refugees, UNHCR and WFP assessment mission report). Generally, the twenty-six rural settlements offer limited opportunities to their inhabitants. The mission found that the drought, food aid and counterproductive development strategies also limited the ability of refugees to adapt to life in Sudan.

In all the rural settlements, wage earning is an essential survival strategy. The limited land allocated to farmers in the agricultural settlements can, at best, only provide farmers with their own cereal subsistence needs. Wage earning limits the amount of time farmers can spend on their own crops during the most important periods in the agricultural calendar.

For many rural refugees, livestock ownership is important for subsistence and for wealth generation. Pastoralism is the traditional economic strategy of most refugees. Livestock herds have been built from the sale of food aid, wage earnings and farm production sales.

The assessment mission recommended that food aid distribution to refugees be drastically curtailed in 1987. Exceptions would be made for supplementary feeding programs and refugees in reception centers, as well as those moved to settlements since 1984. A new school feeding program has been recommended to improve attendance and improve nutritional levels among school age children. This would provide a ration of 620 calories and 20 gms of protein per day to each child.

## **PESTS AND DISEASES**

Crop pests continue to be of concern within Sudan. Desert locusts, in particular, are being monitored with some apprehension. In areas of Northern Kordufan and Northern Darfur, however, other pests such as American stalkborer and rodents have caused meaningful damage and, along with millet smut, are reported to have deprived some villages of a harvest.

Warnings of a locust emergency next summer are continuing within Sudan. The reappearance of Desert locusts in the highly productive central grasslands is described as likely, as is the return of swarms to those areas from the Red Sea coast and the Arabian Peninsula.

In historical perspective, however, it is too early to issue warnings of a dire locust season this year. It could be severe if there is a particular convergence of meteorological events in both the central grasslands and the Arabian Peninsula. The reappearance of Desert locusts in the central grasslands of Sudan is certain, as they appear there every year.

The question for forecasters is whether those returning locusts will reproduce in numbers that imply a worse pest year than the one just past. This depends in large part on the timing and distribution of rainfall next summer. The year just past cannot be characterized as one of high locust activity. Even a worse year, if fueled only by the reproduction of returning solitary phase locusts, should not reach plague levels or cause other than local damage to crops. Outbreaks at less than a plague level are cause for action, but not of special concern for this year's total crop.

If swarms in Arabia and on the Red Sea coast successfully breed and reproduce during the winter and spring breeding seasons, and if they give rise to breeding swarms, and if those breeding swarms are blown back into Sudan in the early summer, then conditions would be right for a possible plague year in Sudan. But, even in the absence of human intervention, it is by no means certain that this will occur, although our understanding of why plagues end is limited. It appears related to the vagaries of rainfall and the actions of predators. With the ongoing monitoring of locusts by the Sudanese and Arabian authorities, and the provision of adequate resources for combating them, there is no reason to expect major swarms are likely to return from winter and spring breeding areas to the central grasslands of Sudan. Desert locust breeding in the central grasslands, during last summer and fall, is not directly relevant to this year's problem. Unhatched eggs will have died before the next rains arrive. Eggs laid in dry soil will not hatch and the maximum incubation period (which is reached only in cool areas) is 90 days. The extent and form of migration from winter and spring breeding areas will determine the degree of the locust threat this summer.

In Sudan, control measures were taken, with over 230,000 liters of fenethrothion deployed along with other pesticides. By the end of November, a total of 370,000 hectares (1,430 sq. miles) had been sprayed, with 90% of that by aircraft (270 hours). This was a major undertaking and was necessary for a total multi-year control

effort, even if it was not all directly connected to the results of last year's harvest in the productive regions.

Reports of small Desert locust swarms traversing agricultural areas during late November and December--on their way toward winter breeding areas--were of limited threat to last year's harvest. Reports of damage are minimal and concentrate on cotton. It is important to control these swarms to limit the breeding stock in the winter breeding areas, and thus limit the potential geometric increase in locust numbers that a good winter breeding season could produce. (A tenfold increase per generation could be expected under plague conditions).

These reports of small swarms and/or concentrations of locusts during November and December are normal. Dispersed insects are concentrated by a reduction in available food and breeding areas, hormonal clues and prevailing winds. Their migration to winter breeding areas would occur in any case, but their concentration provides an opportunity for control. Current control efforts are focused on the Red Sea coast, specifically the Tokar delta, where numerous small swarms and concentrations have been reported.