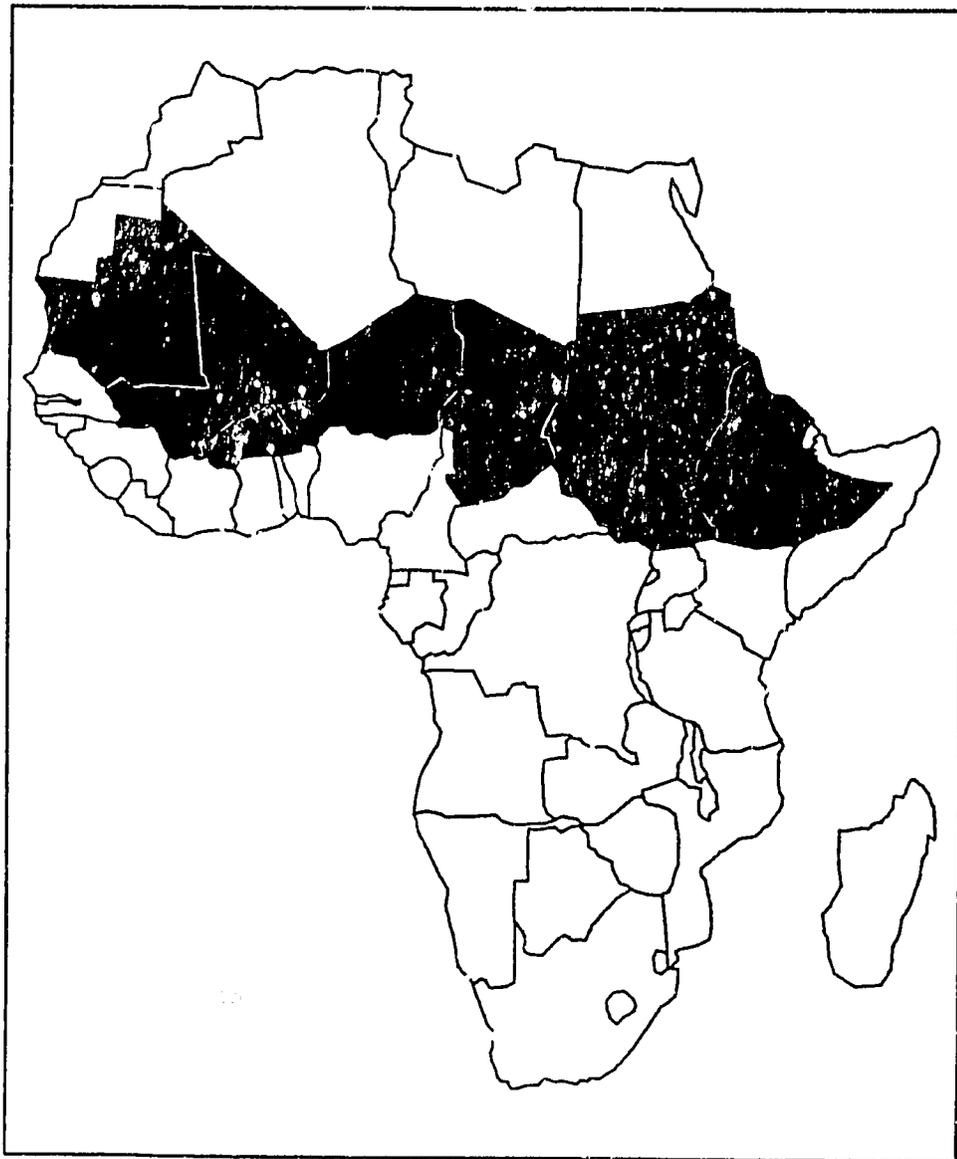


**Field Reports**

**BURKINA, CHAD, ETHIOPIA, MALI,  
MAURITANIA, NIGER, SUDAN**

**FAMINE EARLY WARNING SYSTEM**



# **FAMINE EARLY WARNING SYSTEM**

The Famine Early Warning System (FEWS) is an Agency-wide effort coordinated by the Africa Bureau of the U.S. Agency for International Development (AID). Its mission is to assemble, analyze and report on the complex conditions which may lead to famine in any one of the following drought-prone countries in Africa:

- Burkina
- Chad
- Ethiopia
- Mali
- Mauritania
- Niger
- Sudan

FEWS reflects the Africa Bureau's commitment to providing reliable and timely information to decision-makers within the Agency, and among the broader donor community, so that they can take appropriate actions to avert a famine.

This report is a compilation of monthly reports from the FEWS Field Representatives resident in each of FEWS countries, with the exception of Ethiopia. The work of the FEWS Field Representatives is coordinated by Tulane University's School of Public Health and Tropical Medicine. Their monthly reports are compiled for USAID's Africa Bureau by Price, Williams & Associates, Inc.

**NOTE:** This publication is a working document and should not be construed as an official pronouncement of the U. S. Agency for International Development.

# Field Reports

## BURKINA, CHAD, ETHIOPIA, MALI MAURITANIA, NIGER, SUDAN

March 1989

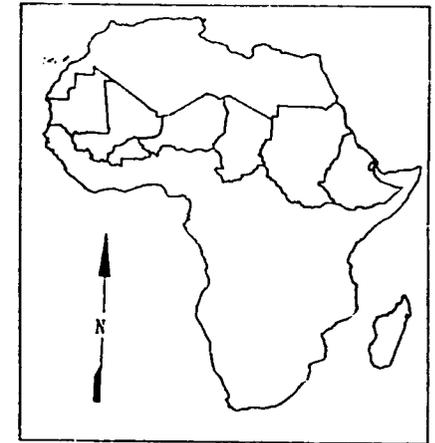
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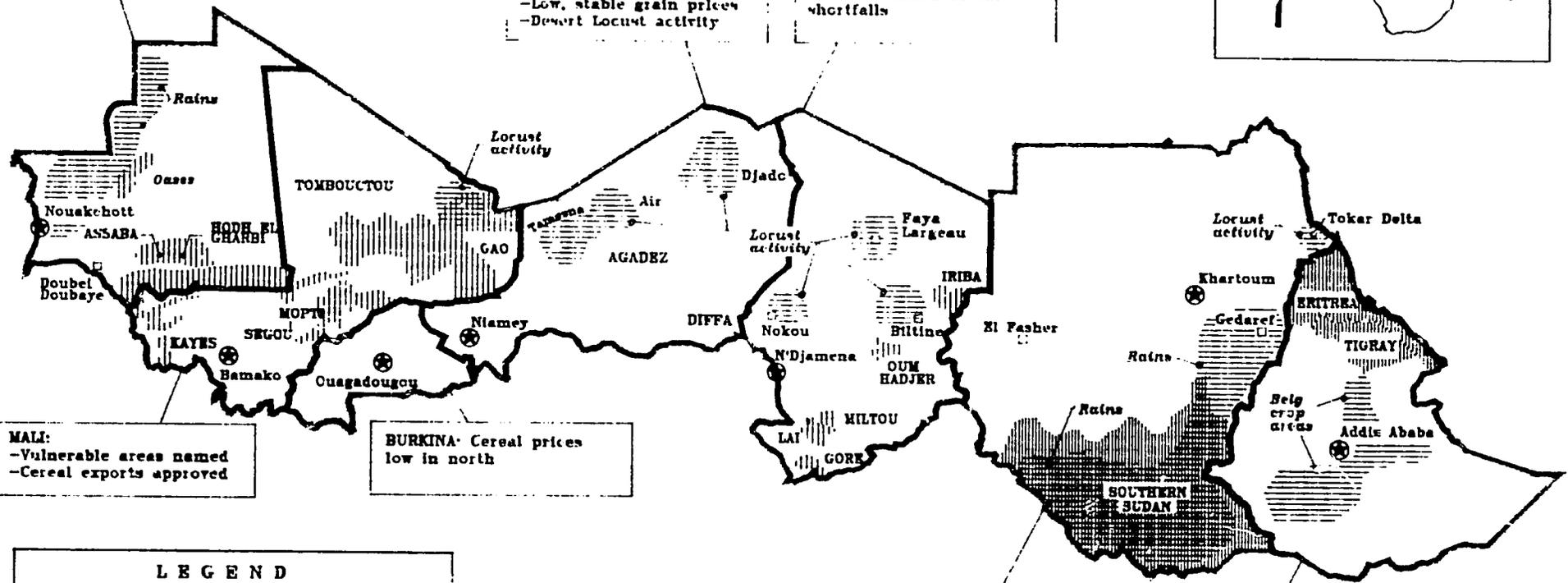
# Summary



**MAURITANIA:**  
 -Harvest meets 45% of needs  
 -Southeast needs commerce and food aid to meet needs  
 -Winter rains may provide locust habitat

**Niger:**  
 -Low, stable grain prices  
 -Desert Locust activity

**CHAD:** Localized cereal shortfalls



**MALI:**  
 -Vulnerable areas named  
 -Cereal exports approved

**BURKINA:** Cereal prices low in north

**SUDAN:**  
 -Rains begin in Southern Sudan  
 -Government food stocks low

**ETHIOPIA:**  
 -Conflict rising in Tigray  
 -Belg rains begin

**LEGEND**

	Area at-risk		Capital city
	Vulnerable area		Town
	Highlighted area/event		

0 100 200 400 600 Miles  
 0 200 400 600 Kilometers

## Regional Summary

The return of "normal" rains in the Sahel during 1988 produced record agricultural harvests and excellent pastures for 1989. In general, food security in all seven countries monitored by FEWS is better than it has been for many years. In the few places where severe food shortage and near famine conditions exist (southern Sudan and, to a lesser degree, northern Ethiopia), the predominant cause is armed conflict. Significant donor responses to these areas are underway and will ameliorate, but not resolve, very poor conditions. Elsewhere, close monitoring of available data (cereal and livestock prices, refined harvest estimates, stock inventories, food distribution reports, etc.) continues to indicate a relatively abundant food supply. The regional threat of Desert Locusts remains, with residual populations being reported all across the Sahel and light rains being reported in potential Saharan breeding areas.

- In *Burkina*, FEWS reports no significant change from the food situation described last month. As of March, cereal prices in local markets of the northernmost provinces remain at the same low levels (40-70 FCFA/kg) they were in December, according to the *Système d'Alerte Précoce*.
- In *Chad*, further assessment of recent consumption patterns, flood and pest damage, market prices, nutrition levels, and other indicators in areas previously reported as possibly requiring assistance has helped to identify areas of most immediate need.
- In *Ethiopia*, an increase in warfare in Tigray threatens further disruption of emergency assistance activities. Sudanese refugees continue to flow into western Ethiopia.
- In *Mali*, the government has authorized the export of grain in order to support cereal prices.
- In *Mauritania*, food needs for 1988/89 now appear covered by the excellent 1988 harvest, donated assistance, and commercial imports of food.
- In *Niger*, low market prices for cereals and the government's buying campaign to replenish state-held stocks through local purchases reflect the apparently abundant food supply.
- In *Sudan*, the multi-lateral effort to move food into famine-wracked southern Sudan is starting just as the first rains have begun. Elsewhere, an abundant sorghum harvest is replenishing on-farm stocks and straining the resources of the labor-short mechanized sector.

## Cereal Stocks Sufficient

### Summary

The food supply situation has, for the most part, evolved favorably. There are no serious problems in Chad's Sahelian zone (a central tier of eight prefectures). Localized problems in the Sudanian zone (the five southern-most prefectures) are being monitored. The Government of Chad (GOC) Donor Food Aid Action Committee (FAAC) has sent food aid to two cantons in Tandjilé Prefecture (in the Sudanian zone) for emergency feeding. Food aid and regulatory stock on-hand and in the pipeline will be sufficient to meet any further emergency feeding needs that might arise before the 1989 harvest. Blankets are being distributed to flood victims in the Chari River Basin. Refugees continue to trickle back to Chad from neighboring Nigeria, Cameroon and Sudan. Cereal prices remain lower than in 1988, reflecting a general abundance of cereals in the markets.

### Populations At Risk

The February FEWS Report identified five zones where localized harvest shortfalls might necessitate food aid (see Summary Map). Further assessment has determined that only one of these zones (Lai Sub-prefecture, Tandjilé Prefecture), requires immediate assistance. The remaining four have sufficient resources to see the population through until at least May. The food supply situation for these zones is summarized below:

- *Lai Sub-Prefecture, Tandjilé Prefecture:* Cereal crops in three cantons suffered severe damage from flooding and stem borers. The population was forced to resort to foraging for wild roots much sooner after harvest than usual. The GOC/Donor FAAC has sent 144 metric tons (MT) of Japanese rice provided by the United Nations World Food Program (WFP) to Tchaguine and Soumraye cantons. Other funds allowed the Tandjilé Prefect to procure 10 MT, equal to 100 bags of local rice, which have also been distributed in the two cantons. The League of Red Cross Societies (LICROSS), after having visited the zone, indicated that a third canton might require assistance during the lean period. Additional assessments of this zone have been programmed.
- *Iriba Sub-prefecture, Biltine Prefecture:* The EEC-funded Système d'Alerte Précoce (SAP) conducted an in-depth analysis of the socio-economic and nutrition situation in Iriba in November. The SAP's findings indicated that the population in one canton would likely require assistance at some time during the lean period and that three other cantons faced similar food-supply problems. The population in Iriba is comprised largely of herders, who have had to resort to agriculture following the loss of livestock during the 1984/85 drought. The 1988 cereals harvest in the most stressed canton surveyed was severely damaged by Desert Locusts. Food aid has been pre-positioned in nearby Abéché and will be sent to these four cantons prior to the rains if the situation deteriorates.

- *Bouso Sub-prefecture, Chari Baguirmi Prefecture:* Heavy infestation of stem borers registered in Miltou Canton at the start of the 1988 cropping cycle destroyed the crop. Reseeding did not occur, because of food supply problems that weakened the labor force and a lack of seed. Torrential rains also caused crop damage. SAP's December socio-economic survey of the zone found that several families had already left this canton. Of the families surveyed in Miltou, however, few indicated that they intended to leave. Rates of childhood malnutrition are extremely low and seven out of twelve village chiefs interviewed indicated that water supply, not food shortage, was the most serious problem. Although food aid is not currently required, SAP recommends pre-positioning food aid in Miltou Canton prior to the rains.
- *Oum-Hadjer Sub-prefecture, Batha Prefecture:* Crop damage caused by stem borers had put several cantons at risk, but a SAP socio-economic/nutrition survey completed at the end of February shows that the situation looks quite good. In the five cantons surveyed (Mesmedjé, Massalat, Kouka, Missirie Rouge and Missirie Noire), 97 of the families interviewed were eating cereals that had been harvested in 1988, as opposed to buying them on the market or subsisting on other foodstuffs. Also, the nutrition surveyors found only 1.4 percent of the children to be moderately malnourished (below 80 percent of the standard weight for a given height). Recommendations have not yet been made for this zone.
- *Goré Sub-Prefecture, Logone Oriental Prefecture:* Located close to the Central African Republic (CAR), this area has been subject to considerable cross-border movement of local populations. An assessment was carried out in one of the three cantons in Goré that were designated as at-risk by local authorities. During this assessment, it was discovered that many of the villagers, recent returnees struggling in their resettlement efforts, had experienced severe crop damage in 1988 due to stem borers. Many maintained fields on the other side of the border in CAR, however, where the stem borer was kept under control. Another assessment is programmed for April. It is likely that some food aid will be distributed in this area during the lean period.

## Disaster Relief

Disaster relief commodities, provided primarily by LICROSS and Germany (FRG), continue to be distributed to victims of August/September floods and more recent brush fires. The most recent distributions took place in Medogo Canton, Batha Prefecture, where 650 blankets were delivered to two villages destroyed by fires. With the recent arrival of 30,000 blankets and 30,000 mosquito nets provided with FRG funding, the Ministry for Food Security and Disaster Victims (MSAPS) is establishing a distribution plan to benefit disaster victims in 10 of Chad's 14 prefectures.

## Food Stocks

As of February 28, there were 13,585 MT of food aid in storage, of which approximately 6,240 MT were for disaster relief, while the remainder were for on-going WFP projects. WFP also has 2,500 MT of emergency food aid in the pipeline, of which 2,020 MT are soya-fortified sorghum grits (SFSG). In addition to food aid, there were 12,600 MT of cereals in National Cereals Office (ONC) warehouses, serving as its regulatory stock. Given the highly localized nature of 1989 food supply problems and the small number of persons requiring assistance, these resources will be sufficient to meet feeding requirements through the 1989 harvest. However, given the renewed threat of severe crop damage from locusts during the upcoming cropping cycle (June-September 1989), it is vital that security stocks be in place to meet possible feeding requirements after the 1989 harvest.

## Cereals Prices

Prices are still considerably lower in the Sahelian zone, somewhat lower in the Sudanian zone, and slightly lower in N'Djamena. Grain prices, which usually begin to rise in January, are holding stable, perhaps because of the very good recessional sorghum harvest. Meanwhile, the stockpiling of grain is clearly visible in the N'Djamena millet market as traders continue to unload grain which has been

bought in Chari-Baguirmi, Guéra, Salamat and Mayo-Kebbi prefectures. In sum, supply continues to exceed demand throughout most of the country, resulting in low prices.

## Pests

The numerous locust sightings reported in January continued into February with a total of 458 hectares (ha) treated during 1989 by teams from the Chadian Crop Protection Service. The sightings included solitary and immature gregarious Desert Locusts around Faya Largeau (in Borkou-Ennedi-Tibesti Prefecture), Nokou (in Kanem Prefecture), and Biltine (in Biltine Prefecture). Locust activity has not been officially monitored since mid-February, as prospection teams were withdrawn for lack of operating funds. Unofficial reports of Tree Locusts in the Sahelian zone have been transmitted by local authorities, but do not pose a threat to crops. The situation is believed to be generally calm.

## Population Movements

In addition to the normal internal movement of people along transhumance routes and the seasonal migration of sedentary farmers looking for work in towns, there continues to be a steady return of Chadians from neighboring countries. Below is a repatriation summary for the past nine months:

Month	Repatriation from Sudan to the East	Repatriation From Nigeria, Cameroon, etc., via N'Djamena
May	2,408	231
June	7,282	221
July	n/a	248
August	762	332
September	1,062	502
October	1,290	286
November	154	330
December	1,820	179
January 1989	1,144	366
<b>Total Returnees</b>	<b>15,922</b>	<b>2,695</b>

## Rising Conflict

### Summary

Increasing conflict in Tigray again threatens the food security of this and surrounding regions. The belg rains, especially important in Wello and Shewa regions, have returned to normal after a slow start. New Sudanese refugees continue to arrive in the West. The rainy season will make the creation of a 3 month stockpile of food difficult there.

### Tigray Conflict

The intense conflict of the past month in Tigray is beginning to be felt in the number of displaced people arriving in southern Eritrea and northern Wello at feeding centers. The World Food Program reports that these displaced people do not appear to be returning home after receiving food, perhaps an indication of the level of conflict in their places of origin. The substantial carryover of emergency food aid stocks from 1988 will make sufficient food supplies available to meet any emerging level of need in that area.

### Secondary Rainy Season

The NOAA/USDA Joint Agriculture-Weather Facility (JAWF) reports that the secondary, belg, rains have returned to normal after approximately 3-4 weeks of dryness lasting from mid-February through the end of the first week in March. Little impact on the belg crop is expected from this early dryness.

### Refugees

New Sudanese refugee arrivals in the West during February averaged approximately 100 a day throughout February. In early March the arrivals increased to approximately 450 a day. The effort to build a 3-month stockpile of emergency food supplies near the Sudanese camps will be increasingly difficult as the rains continue.

## Mali to Export Grain

### Summary

Mali's food security situation remains stable, even in the zones the *Système d'Alerte Précoce* (SAP) determined at-risk. The markets are well supplied with grain at prices that remain below last year's levels. Grain prices in producer markets have held their level and a decision by the Malian government to allow the export of 100,000 MT of grain should help sustain them. A move by the *Programme de Restructuration du Marché Céréalière* (PRMC) to provide 100 million FCFA credit to consumer cooperatives for grain purchases in Gao and Tombouctou regions will maintain the buying power of those groups.

### Market Prices and Supply

Markets in all regions of Mali continue to have adequate supplies of cereals, and prices are maintaining steady levels in general. In Kayes, local grain is still available on the market, but in smaller quantities than in January. In the regions of surplus production (Ségou, Mopti, Sikasso, Koulikoro) markets have abundant cereals. In Koulikoro and Ségou some markets are experiencing problems of oversupply. In the Tombouctou region, local cereals are still available on the market, but these are also being supplemented with grain from both the Ségou and Mopti Regions. In the Gao Region, markets are well supplied; however, there has been a reduction in the quantity of grain offered for sale in the cercles of Ansongo and Bourem.

In SAP areas, millet prices for February vary between 33 and 85 FCFA/kg. Regional averages vary between 40 and 73 FCFA/kg and have not changed significantly from their January levels. At the cercle level, prices have fallen in Banamba, Niono, Djenné, Gourma Rharous, Bourem and Ménaka. Prices have risen in Kayes, Kolokani, Nara, Bankass, Youvarou, Tombouctou, and Ansongo. They have remained stable in the other markets covered by the SAP.

In other areas, the SIM (*Système d'Information des Marchés*) reports producer prices of sorghum are falling in Kadiolo, Kita, and Ségou, but remaining stable or rising in all other producer markets. Sorghum and millet prices vary between 35 and 59 FCFA/kg. Kita remains the market with the highest producer grain prices while Tominié has the lowest.

### Populations At-Risk

On March 15, the Ministry of Territorial Affairs (MTDA) published its official list of zones it considers to be grain deficient and at risk for 1988-89. For the time being, no food distributions, decisions or other actions have been made in conjunction with the announcement of the deficit zones.

The MDTA-named arrondissements are as follows (see Summary Map for general locations):

#### **Kayes Region**

Kayes Cercle: Diamou, Samé, Lontou, Ségala, Aourou  
Yélianané Cercle: Maréna  
Nioro Cercle: Gavinane, Touroungoumbé, Nioro, Gogui  
Bafoulabé Cercle: Bamaflé, Koundian, Diellan  
Kéniéba Cercle: Faraba

#### **Ségou Region**

San Cercle: Téné, San Central (Not SAP Area)  
Niono Cercle: Nampala  
Macina Cercle: Macina Central (Not SAP Area)  
Tominian Cercle: Timissa, Koula (Not SAP Area)

#### **Mopti Region**

Bandiagara Cercle: All Arrondissements  
Mopti Cercle: Mopti, Dialloubé Konna, Korientze, Soufouroulaye, Soye  
Koro Cercle: Diankabou, Toroli  
Douentza Cercle: All Arrondissements

#### **Tombouctou Region**

Diré Cercle: Saréyamou.  
Niafunké Cercle: Soumpi, Léré, Niafunké  
Gourma-Rharous Cercle: Rharous Central  
Tombouctou Cercle: All Arrondissements

#### **Gao Region**

Ansongo Cercle: Tessit, Talataye  
Bourem Cercle: All Arrondissements  
Gao Cercle: All Arrondissements  
Kidal Cercle: All Arrondissements  
Ménaka Cercle: Inékar, Tidarméné

### **Cereal Exports**

In response to the large grain surplus that Mali has after the 1988-89 harvest, the GOM authorized grain exports of 100,000 MT. This has been done in an effort to maintain producer prices in areas of surplus production.

At the beginning of March, the PRMC approved a 100 million FCFA credit program for consumer groups in deficit regions of Gao and Tombouctou. Details are still being finalized, but once the program has been put in place, loans will be available for consumer groups to buy and store grain. This program should bolster the buying power of these consumer groups and encourage the movement of grain from surplus regions to deficit regions.

### **Food Distributions**

The SAP recommends that food distributions begin in April in the arrondissements at risk in Gao Region (N'Tillit, Talataye, Almoustarat, Bamba, Téméra, Inékar and Tidarméné) and for the displaced

populations in Ségou Region. No actions have yet been taken by the GOM to set into motion these distributions. However, the stocks are in place in the national security stock warehouses. In its March Bulletin, the SAP will reevaluate the zones it has classified as "under surveillance" to determine if these zones risk facing food shortages before the 1989 harvest.

### National Security Stocks

OPAM continues its buying campaign to replenish the security stock. Security stock quantities and locations are found in Table 2.

Bamako	9,978
Kayes	3,382
Kita	0
Koutiala	816
Ségou	523
Mopti	9,781
Tombouctou	3,437
Gao	4,955
<b>Total Stocks</b>	<b>37,465</b>

### Grasshoppers and Locusts

In its February Bulletin, the SAP reported sightings of locusts in Kidal in the Adrar des Iforas. This report has not been verified by the national crop protection service, but field personnel are on the alert in the area. In the February Food Security Report for Mali, figures on the results of the 1988 *Oedaleus senegalensis* (OSE) egg pod survey were communicated. A comparison of 1988's figures with those of 1987 shows that the maximum density of OSE egg pods in 1988 is generally higher in all the sectors concerned except Diankabou. Densities of OSE egg pods per square meter are significantly higher in all sectors. These results indicate that the grasshopper threat which was already substantial in 1988, may be even more important in 1989.

Pasture and water conditions continue to be favorable throughout Mali; however, in Ségou Region a large brush fire in Niono Cercle, in the PRODESO zone, destroyed 40,000 hectares of pasture land. This loss of pasture land forces pastoralists to exploit pasture in the surrounding areas, adding extra demands to those areas.

# MAURITANIA

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## Cereal Deficit is Slight

### Summary

The food security situation appears to be good in Mauritania, given the 154,000 MT net harvest expected to be completed this month. Mauritania will meet over 45% of its domestic cereal requirement in 1988-89 from its own production. Commercial stocks and donated food aid will make up the gap. FEWS/Mauritania and Food for Peace/USAID estimate that only a 1,000 MT cereal shortfall exists, according to the most recent food needs assessment of early March. The key this year will be to effectively program food aid and to identify pockets of food shortage attributed to the incidence of grasshopper and locust crop damage, the flooding of last September which caused some dams and dikes to break in the interior, and the vulnerable groups which exist in areas along the southeastern border of Mauritania, in the urban areas, and along the upper flood plain of the Senegal River Valley. Some oasis areas also have been hard hit by locust attacks in 1988/89. The total population in vulnerable areas is 264,000 people. The assessment is at best partial, however, and overstates the actual vulnerable populations in these areas of the country.

### Agricultural Production

In January, the Bureau of Agricultural Statistics issued the preliminary 1988/89 agricultural production estimates, based on the second of three annual surveys. The Bureau estimates a gross cereal production of 201,993 MT with a resulting net production of 159,000 MT. This estimate is just 2,000 MT less than the estimate given in their first report, in November, of 204,000 MT. Even with substantial crop losses due to locusts in some rainfed agricultural areas, agricultural production still remains high enough to provide Mauritania 45% of its cereal needs. In recent years, domestic cereal production has usually supplied 30-35% of needs.

### Vulnerability to Locust and Grasshopper Losses

The Bureau of Agricultural Statistics estimates that national rainfed agriculture losses due to grasshopper and locust damage were 17% for sorghum and 29% for millet. The most disconcerting losses for sorghum were recorded in Hodh ech Chargui Region (22%), which depends predominantly on rainfed agriculture. Millet in Hodh el Gharbi was also attacked, leading to losses of 37%. These loss estimates do not take into account crops harvested early. In a worst-case scenario, some 135,000 people could be vulnerable should locusts have completely wiped out their rainfed crops. About 244,000 people derive their livelihoods almost exclusively from cultivation, many of whom may have suffered partial damage from grasshoppers and locusts in 1988.

Guidimaka, Assaba, Hodh el Gharbi and Hodh ech Chargui regions are the prime rainfed agriculture areas. Informal reports from the Assaba Region indicate that the harvest is very good in 1988/89. Grasshopper and locust losses for recessional agriculture have not yet been officially estimated by the

Bureau of Agriculture Statistics. For the purpose of the Food Needs Assessment, a conservative estimate of 15% crop losses due to all pests was used.

## Food Security

The Food Security Commission (CSA) and the food aid donor community continue to refine the national food needs assessment for 1989. Through February, FEWS/Mauritania and the Division of Food for Peace/USAID had pegged the cereal deficit at 6,000 MT, after recalculating locust and pest losses for recessional agriculture. In early March, the Italian government announced that it would be giving 5,000 MT of rice to the CSA in 1989, reducing the projected national cereal deficit to only 1,000 MT. In terms of deficits in individual cereal types, the largest gap exists in the availability of wheat. Donors have calculated the wheat deficit at some 43,000 MT.

The Bureau of Agricultural Statistics estimated 1988/89 agricultural production by region. FEWS/Mauritania makes an early cereal balance based on assumptions of the regional production of river recessional agriculture. In terms of regional cereal deficits in the agricultural regions, Assaba Region registers a 21,305 MT deficit, which represents 77.3% of its global cereal need. Hodh el Gharbi Region is also largely deficient, falling short of annual consumption needs by 13,021 MT (51.5% of food needs). This analysis points to the need for cereal imports into the region through the private sector and the Food Security Commission (CSA), but does not necessarily point to a vulnerable zone.

Both Hodh el Gharbi and Assaba regions are prime livestock rangeland areas where the local population practices a mixture of herding and farming. It should be noted, however, that eastern Assaba received below average rainfall in 1988, and that a number of dikes and dams broke under the localized, heavy rains of last September. As this is the first year that the Bureau of Agricultural Statistics has published regional production estimates, there is no basis for comparing regional deficits with those in years past.

## Vulnerable Areas

In December, FEWS/Mauritania listed 212,709 people as being vulnerable to food shortage in 1988/89. This figure has been raised slightly given the information from the Bureau of Agricultural Statistics (see

Area/Population Identified	Reason for Vulnerability	Estimated Population
Touareg Population (in the southeastern-most corner of Mauritania)	Chronic	1,500
Oasis Areas	Locusts/Grasshoppers	126,300
Rainfed Agricultural Areas	Locusts/Grasshoppers	135,000
Areas of Assaba and Hodh el Gharbi regions	September Flooding	n/a
Doubel Doubaye (Gorgol Region)	Identified as Food Short by Univ. of Arizona	1,000
<b>Total</b>		<b>264,000</b>

Summary Map). These are preliminary estimates, and reflect the population within affected areas rather than the actual population affected. The estimates therefore overstate the actual at-risk population in Mauritania.

### **Grasshopper/Locust Control**

Rains fell in northern Mauritania during the months of January and February, leading some to speculate that conditions have become favorable for locust activity in the regions of Adrar and Tiris Zemmour. As the rains have fallen relatively late in comparison to last year, however, experts do not believe that locusts will reach the high population levels in the north which they did in 1988. USAID, FAO, and the Mauritanian Crop Protection Service report the situation to be calm as of late February. Locusts are expected to return to Mauritania in March and April.

## Favorable Food Situation

### Summary

Following the generous harvest from the 1988 growing season, the food security position of Niger remains strong in 1989. On a global basis, food production, stocks and projected imports are more than sufficient to cover national needs until the next harvest in October of 1989. As is normal given the ecology of this Sahelian country, two of the seven departments (Agadez and Diffa) are deficit in the basic cereals, millet and sorghum. Neither government officials, international agencies, nor donors are alarmed because these are pastoral zones which trade labor, vegetables and livestock products to meet their food needs. No emergency food aid has been requested for the upcoming year.

### Cereal Markets

After a dramatic decline following the harvest in October 1988, cereal prices stabilized in November, December and January. During the month of February, millet prices rose an average of 6 percent nationwide while sorghum prices rose only 2 percent. Two departments showed more striking gains; in Maradi, millet prices rose almost 17 percent, and in Diffa they rose more than 22 percent. In Agadez, prices actually fell 7 percent. In all cases, February prices are as low, if not lower, than those witnessed at anytime during the last 4 years. While this raises questions about farmer incomes, it does suggest that food supplies will be sufficient. There is evidence to suggest that imports of millet from neighboring Nigeria have declined dramatically in recent months as local millet saturated the markets.

### Livestock Markets

In the past, the pastoral sector of the Nigerien economy has often been menaced by famine. Owing to the abundant rains, pasture and water resources are considered adequate to nourish the herds this year. Animals are reportedly returning to Niger from neighboring countries. The scant price data that exist do not demonstrate a clear trend.

### Population Movement

With assistance from the United Nations Development Program (UNDP), over 5,000 Nigerien nomads have been resettled from camps in Algeria during 1987 and 1988. Another 7000 are to be settled during 1989. The vast majority are returning to Tchín-Tabaraden arrondissement, in the pastoral zone, their home of origin.

### Government Cereal Stocks

At the end of January, there were roughly 30,000 metric tons of cereal stocks held in government owned warehouses around the country. With donor assistance, the government cereals marketing

board, OPVN, has launched a buying campaign to replenish this stock to the target level of 80,000 metric tons. The cereals will be purchased within Nigerien boundaries.

### **Environmental Conditions**

In the last month, there have been no new explorations of the locust situation in the Agadez zone (northern Niger, bordering with Algeria and Libya). There remain significant areas of concentration in the Tamesna, northeastern Air Mountains and the Djado Plateau. There is evidence of a northward movement of Algerian locusts into Tunisia and Morocco, which implies a heightened need for vigilance in the region. USAID is maintaining locust-fighting activities into the next growing season.

The Niger River reached a record flow in August (records maintained since 1928) due to heavy rains around Tera and near the Burkina border. The current flow of the Niger River is on par with that of 1987-88, a relatively dry year.

## Government Stocks Low

### Summary

Food grain production has been exceptionally good throughout the country this year with a corresponding increase in present food availability. However, a shortage of wage laborers continues to suppress the amount of sorghum harvested in the mechanized farming sector. As of the end of February, the Ministry of Agriculture estimated that only about 35 percent of the total production of sorghum in the mechanized areas has been harvested. In addition, the Sudanese government has made no effort to purchase grain for food security stocks while it has committed 2.1 million MT for export through the issuance of commercial licenses. At present, there are only about 260,000 MT of government held food stocks, but these too are destined for export. The implications of an absence of national food stocks are great. First, it means Sudan may be greatly endangering its medium to long term food security. Second, it means that there may not be enough food available in country if a larger scale relief program should start for Southern Sudan. Although the situation is unclear in the mechanized sector, it has been reported that traditional, rainfed-agriculture farmers have harvested record amounts, and that much of their surplus will be stored for future use. War in southern Sudan continues to cause much starvation and displacement.

### Agricultural Production

The Ministry of Agriculture (MOA) has estimated that production of sorghum, Sudan's major crop, will be some six million MT in 1988. This compares to a total domestic production of sorghum in 1987 of 1.86 million MT and an average of about 2.5 million MT over the past five years. Total domestic consumption is estimated to be about 2.8 million MT. However, because labor continues to be unavailable, the amount harvested in 1988-1989 will not meet full production potential. At a time in the agricultural season when most of the sorghum harvest should be completed, the MOA is reporting that only 35 percent of the mechanized area production has been harvested. This sector normally provides about seventy percent of Sudan's total domestic production of sorghum. It is from this sector that reserve stocks are usually purchased to avoid future food insecurity. On the other hand, the Agricultural Planning Unit (APU) in El Fasher, Northern Darfur, reports that the harvest in the traditional rainfed sector in that area has been completed. According to the APU, many communities have organized communal work parties to relieve the labor constraint. APU also reports that most of the surplus grain produced in Northern Darfur is destined for on-farm stocks.

### National Food Stocks

National food stocks remain virtually unchanged since August 1988. The Agricultural Bank of Sudan (ABS), which is responsible for the purchase of surplus sorghum for food reserves, reports that there were approximately 600,000 MT of reserve food stocks held in ABS storage. It has been reported by various assessment teams that the grain silos in Gedaref, where large amounts of reserve sorghum

stocks are normally held, are empty. At present, there are no plans to buy sorghum this year to replenish national stocks.

## **Pests**

Ground control of desert locusts continues along the Red Sea coasts with a few first and second instar hoppers sighted in the Tokar Delta. The Plant Protection Department (PPD) reports that total crop loss from locusts in 1988 was approximately two percent of total production. However, there were some isolated areas of greater destruction in the west, and along the Nile.

## **Prices**

Sorghum and millet prices continue relatively low and stable. Livestock prices have continued to increase steadily. Both of these price movement patterns support a view of an abundant food supply in areas outside of southern Sudan.

## **Southern Sudan**

The situation in the south continues to be critical as the beginning of the rainy season approaches. Although donors and international agencies are ready to start large-scale emergency assistance, no plans have been made to conduct a thorough assessment of needs in the most affected zones. The status of the populations that live outside of the major towns is virtually unknown, but it is believed that they face the greatest risk of death by starvation. JAWF (the NOAA/USDA Joint Agriculture Weather Facility) reports that rains have already begun in Southern Sudan. According to estimates made from METEOSAT imagery, at least 25 millimeters of rain fell in Southern Sudan during the week of March 19, including the vicinities of Wau, Rumbek, and Juba. Rains of similar magnitude were also seen in eastern Sudan, in the vicinity of Gedaref. While this could be a false start to the rainy season, these early rains will impede transport of emergency stocks to relief points in the south. Transport to these areas will become progressively more difficult as the rainy season advances.

## Key Terms

**At Risk** - FEWS Reports employ the term "at risk" to describe those populations or areas either currently or in the near future expected to be 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.

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.

**ITCZ** - The Intertropical Convergence Zone (ITCZ) is where the high pressure system originating in equatorial regions of the Atlantic (the St. Helena's High) collides with the Azores High descending from the north. The ITCZ tends to move northward during the spring and summer in response to normal global weather patterns. The position of the ITCZ normally defines the northern limits of possible precipitation in the Sahel; rainfall generally occurs 100 to 300 kilometers south of the ITCZ.

**NDVI** - Normalized Difference Vegetation Index (NDVI) images are created at the laboratory of the National Aeronautic and Space Administration (NASA) Global Inventory Modeling and Monitoring System (GIMMS). These images are derived from Global Area Coverage (GAC) imagery (of approximately 4 km resolution) received from the Advanced Very High Resolution Radiometer (AVHRR) sensors on board the National Oceanic and Atmospheric Administration (NOAA) Polar Orbiting series of satellites. The polar orbiter satellites remotely sense the entire Earth and its atmosphere once each day and once each night, collecting data in 5 spectral bands. Bands 1 and 2 sense reflected red and infra-red wavelengths respectively, and the remaining 3 bands sense emitted radiation in 3 different spectral bands. The NDVI images are created by calculating

$$(\text{infrared} - \text{red}) / (\text{infrared} + \text{red})$$

for each pixel from the daytime satellite passes. Since chlorophyll reflects more in the infrared band than in the red band, higher NDVI values indicate the presence of more chlorophyll and, by inference, more live vegetation. A composite of daily NDVI images is created for each 10-day period, using the highest NDVI value for each pixel during that period. This technique minimizes the effects of clouds and other forms of atmospheric interference that tend to reduce NDVI values. NDVI is often referred to as a measure of "greenness" or "vegetative vigor." The NDVI images are used to monitor the response of vegetation to weather conditions.