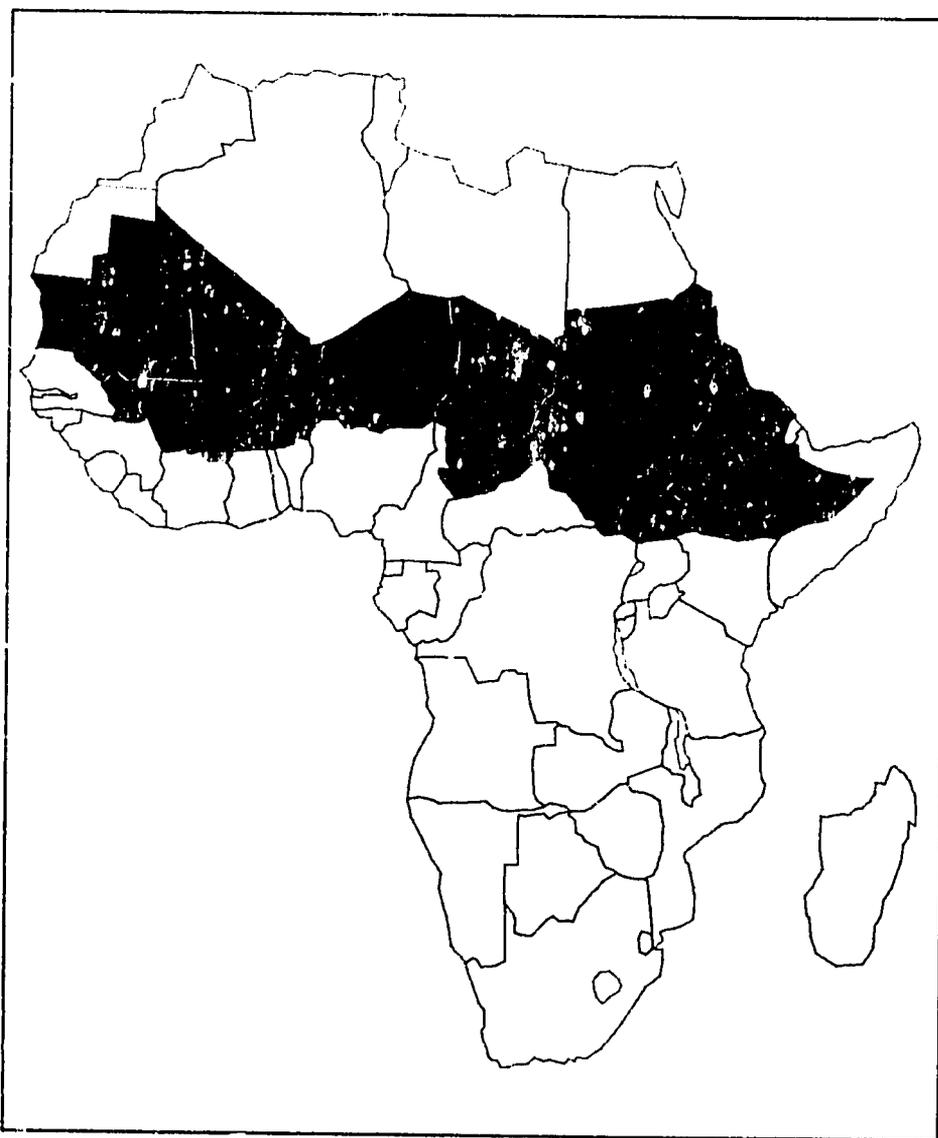


Field Reports

**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.

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February 1989

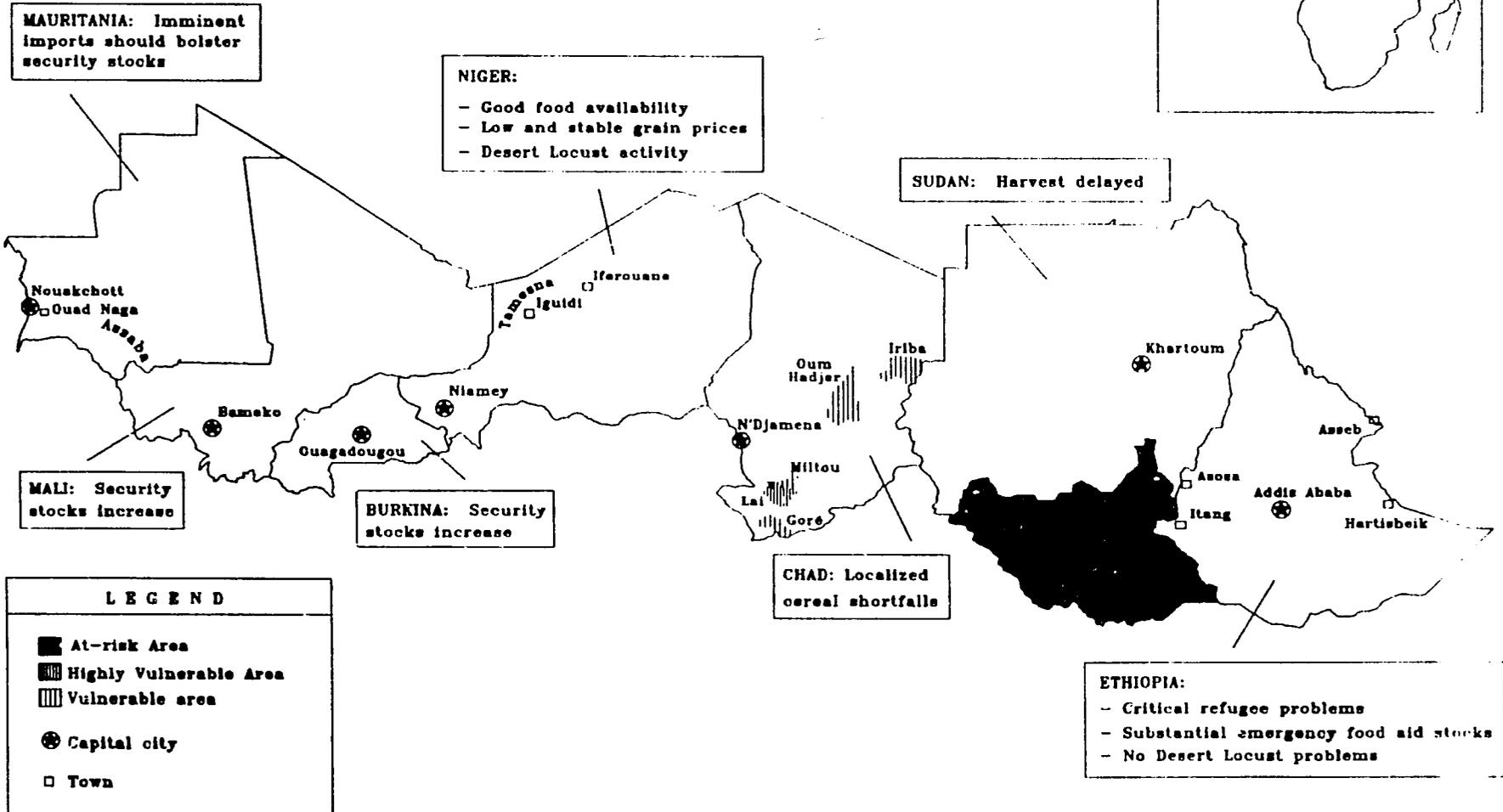
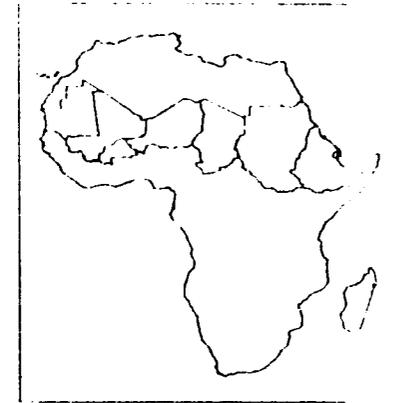
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Summary



FEWS FIELD REPORTS

Regional Summary

The effects of last year's excellent rains and agricultural production continue to be felt in all seven countries monitored by FEWS. Food security has improved everywhere. A common theme of lower grain prices and increased stocks is a welcome change from the previous picture of an ever decreasing supply in an ever degrading environment.

- In *Burkina*, a record agricultural year should lead to an increase in food security stocks because of low prices and little emergency demand.
- In *Chad*, the 1988/89 harvest was excellent, although there have been localized shortfalls.
- In *Ethiopia*, an excellent main harvest last year, especially in areas previously hard hit by drought, mitigates a situation where warfare, geographic inaccessibility, and long-standing poverty still make some populations vulnerable to food shortage. Refugees, especially those from Somalia, are vulnerable due to the logistics of transporting emergency food to their border camps.
- The excellent harvest last year in *Mali* provides optimism for that country's immediate food security. Food security stocks have already been replenished in Gao and Tombouctou Regions.
- *Mauritania's* relatively good 1988/89 agricultural production, along with expected commercial imports and already pledged food aid, should meet its food needs. Locust and grasshopper damage to crops, while significant, does not threaten the country's relative food security.
- *Niger* produced a record grain harvest in 1988. Even in areas of the most chronic food shortages, low cereal prices and abundant pastures will contribute to a lessening of normal food stress.
- *Sudan* enjoyed record cereal production last year, but harvesting has been delayed because of a limited supply of labor. Starvation and destitution continue in the South because of the war.

BURKINA

OFNACER Stocks Increase

Summary

All indicators continue to confirm 1988 as an excellent year for agricultural production in Burkina. High yields combined with large areas planted produced a record harvest. Official stocks, both for security and stabilization, should increase with low prices and limited demand.

Agricultural Production

The Ministry of Agriculture has released its September 30, 1988 report on the 1988-89 agricultural campaign. While total cereal production is still estimated at 2,100,563 metric tons (MT), the newly released report provides detailed estimates of the acreage planted in each of five cereals by province. The national totals are as follows:

Sorghum	1,251,714 hectares
Millet	1,262,711 hectares
Corn	201,947 hectares
Rice	22,717 hectares
Fonio	18,761 hectares

Neither these areas nor estimated yields were at record levels in 1988. Nevertheless, 1988 saw a record harvest due to the combination of these large areas along with widespread high yields.

Stocks

A recent report from the National Cereal Control Board (OFNACER) indicates that, during its 1987/88 cereal buying campaign, it was only able to purchase 2,365 MT of cereals out of a goal of 30,000 tons, because of that year's overall cereal deficit. OFNACER subsequently imported approximately 30,000 tons (4,833 MT of maize from France, 10,241 MT of red sorghum from Argentina, and 14,979 MT of millet from Zimbabwe) in order to make up for the shortfall in official grain stocks.

As of January 19, 1989, OFNACER had 20,733 MT of security stocks and 9,632 MT of stabilization stocks. In view of the substantial 1988/89 cereal production surplus, OFNACER hopes to buy an additional 42,000 tons from producers. OFNACER was able to buy only 220 tons in the first month of the campaign, however, at its initial buying price of 45 FCFA/kg. Heavy rains apparently caused major crop losses in traditionally surplus zones of the south (Sissili, Poni, Comoe). Cereals are reported more plentiful in Kossi, Mouhoun, northern Kenedougou, Houet, Bougouriba, Bulkiemde, Passore,

and Yatenga. Although cereal prices were as low as 35 to 45 FCFA/kg in October and November, by mid-January OFNACER estimated them to be in the range of 45 to 55 FCFA/kg in western provinces, 50 to 60 FCFA/kg in eastern provinces, and up to 80 FCFA/kg in Comoe. Consequently, OFNACER has focused its buying operations on more promising areas and has increased its price to producers to 60 FCFA/kg. Demand for OFNACER grain is likely to be low in 1989, due to record production, so that reaching planned purchasing goals is not critical to the food supply in Burkina this year.

The recently released *Système d'Alerte Précoce (SAP) December 1988* report on Burkina's Sahel region showed that the food supply situation in Seno, Soum, and Oudalan is satisfactory. Cereal production in Seno and Soum is expected to last until the next harvest. Oudalan will need to import approximately half of its cereal needs, a consequence of insufficient rains and/or flooding. Oudalan does not, in general have adequate cereal production and is primarily dependent on livestock production. Last year's harvest, OFNACER stocks, and normal trade should prevent any significant food shortages. The departments of Gorom and Markoye were most affected.

Cereals are plentiful in local markets in Burkina's Sahelian zone. Sales by OFNACER have fallen from over 2,000 MT per month in May and June to 40, 26, and 60 MT per month in October, November, and December respectively. Cereal market prices are reported to have dropped between 72 and 50 percent from August and September levels. At the end of December millet prices were said to range from 40 to 50 FCFA/kg in Seno and Soum, and 45 to 70 FCFA/kg in Oudalan. Animal prices are satisfactory, with many buyers and few sellers. Seasonal migration to Cote d'Ivoire and gold mining sites is underway, but at lower levels than last year. All indicators combine to paint a picture of relatively good food availability in Burkina this year.

Food Stress Found in Small Areas

Summary

While the overall 1988/89 harvest is excellent, there have been localized shortfalls. In particular, the populations of Tchaguine and Soumraye cantons in Lai Sub-prefecture, Tandjile Prefecture, will require food aid soon. Recent nutrition surveys, carried out in four areas (see below), found no malnutrition above the threshold for action set by the Ministry of Health.

Rainfall and Agricultural Production

The most recent rainfall data indicate that only three of the regularly reporting rain stations showed lower rainfall levels for 1988 than the long-term average, and that the deficit was minimal:

- Oum Hadjer, Batha Prefecture at 96% of the 30 year average.
- Bebedjia, Logone Oriental Prefecture at 99% of 30 year average.
- Sarh, Moyen-Chari Prefecture at 95% of 30 year average.

Such statistics are outstandingly better than has been seen in recent years. Agricultural production is correspondingly expected to be vastly improved.

There has been no new official estimate of cereal production since the mission's cable reporting on crop production and food needs assessment for the 1988/89 agricultural season. That cable provided two record breaking estimates: 791,536 metric tons (MT) and 824,888 MT. The two estimates are based on different yield figures applied to the same area cultivated. Both estimates use recessionary production figures from 1987/88 as a stop gap until the current recessionary harvest has been quantified. Reports that the area planted in recessionary crops is greatly increased over recent years, especially in the Sahelian zone, indicate that Chad's 1988/89 cereal production will likely be larger than the above estimates.

Pests

While Desert locusts were spotted in December entering eastern Chad from Sudan, no crop damage has been reported. Migratory locust swarms were also reported during December (in Salamat and Moyen-Chari prefectures), but again no significant crop damage was seen.

During January, locust damage to date palms was reported in Borkou Sub-prefecture of Borkou-Ennedi-Tibesti Prefecture. Locust damage to over 130 ha of cropland was reported from the Nokou area (in western Kanem Prefecture). In response to these infestations, 375 hectares (ha) out of 475 ha infested were treated in the month of January, 1989.

Populations At-Risk

Unverified reports indicate that actual production in the south is substantially less than the preliminary estimates. Areas at risk of deficit production include Tchaguine and Soumraye cantons of Tandjile Prefecture. Populations there are reported to be foraging for wild roots, nuts, and leaves following crop failure from flooding and stem borers. An estimated 200 deaths were reported in these areas during the 1988 harvest season (between September and December) due to food poisoning from incorrectly prepared famine foods. The people in these cantons will likely need food distributions within a very short time. In Kimré Canton, Lai Sub-prefecture, Tandjile Prefecture, over 100 cases of food poisoning caused by improper cooking of wild roots were reported in during the earlier August to September lean period. The subsequent cereal harvest in Kimré Canton, however, is expected to be sufficient to feed the population for a few months.

Localized harvest shortfalls that have been identified will not affect large numbers of people and can be handled with current food aid pledges (4,000 MT of Japanese rice and 2,500 MT handled by the WFP). The most urgent areas include:

- Iriba Sub-prefecture, Biltine Prefecture, approximately 3,750 people affected;
- Miltou Canton, Bouso Sub-prefecture, Chari-Baguirmi Prefecture, approximately 11,900 people affected;
- Oum Hadjer Sub-prefecture, Batha Prefecture;
- Lai Sub-prefecture, Tandjile Prefecture, about 12,000 people affected in Tchaguine and Soumraye cantons; and
- Goré Sub-prefecture, Logone Oriental Prefecture.

Blankets and tents were distributed by LICROSS in the south due to damage caused by the heavy rains of August and September:

- 1,000 blankets and 3 tents in Yamodo Canton of Goré Sub-prefecture in Logone Oriental Prefecture;
- 2 tents in Goré Town;
- 1,000 blankets in north rural Doba Sub-prefecture of Logone Oriental Prefecture;
- 1,000 blankets in Krim Krim Canton, Moundou Sub-prefecture, Logone Occidental Prefecture;
- 1,500 blankets in Beinamar Sub-prefecture of Logone Occidental Prefecture; and
- 1,500 blankets in Kelo, Tandjile Prefecture.

Another population that often requires assistance are recently returned refugees. A report from Sudan stated that, as of the end of January, there were 24,000 Chadian refugees in three camps in western Sudan, and another 50-500,000 Chadians suspected to be outside the camps.

Nutrition

All nutrition surveys performed by the Système d'Alerte Précoce during in-depth investigations of potentially vulnerable areas found malnutrition levels below the threshold for action by Ministry of Health (10% of the study population found to be severely malnourished, which is defined as weighing less than 80% of the standard weight for their height). The results of the surveys were:

- Biltine Prefecture, Iriba Sub-prefecture, South Kobé Canton -- 7.1% of the children were severely malnourished;

- Biltine Prefecture, Arada Sub-prefecture, 4.1% severely malnourished;
- Chari-Baguirmi Prefecture, Bousso Sub-prefecture, Ba-Illi Canton -- 1.9% severely malnourished;
- Chari Baguirmi Prefecture, Bousso Sub-prefecture, Miltou Canton -- 4.6% of the children measured were severely malnourished.

Prices

Cereals prices are as high in southern urban centers of the Sudanian zone as in N'Djamena (6,000-6,500 FCFA/100kg). Millet prices in the Sahelian zone are considerably lower than last year at this time (75 - 125 FCFA/coro in 88 versus 250 FCFA/coro in 87 -- a corò is a local measure that ranges in size from one to 2.5 kilograms), reinforcing the assessment that the 1988/89 Sahelian zone harvest has been outstanding.

ETHIOPIA

Conditions Relatively Favorable

Summary

After an excellent main harvest, especially in areas hard hit by drought last year, food availability is relatively good in most areas. Nevertheless, warfare, geographic inaccessibility, and long-standing poverty still render some populations vulnerable to food shortage. Emergency food aid is available in larger than normal quantities. The condition of refugees, especially in the East, is worrisome due to continuing problems in the relief effort itself. Desert Locust problems are minimal, although they pose, as usual, a future threat. Early reports concerning the secondary rainy season indicate a normal start and then a recent period of relative dryness.

1989 Rains

The secondary *belg* rainy season began in most areas on time in early February. Latest reports indicate that rains during the second half of February were not, however, plentiful. Planting may have occurred with the rains that did fall. There is no reason for concern unless rains do not pick up in early March.

1989 Food Needs Assessment

The USAID/Addis Ababa food needs assessment concludes that food availabilities are much improved over last year. Areas of substantial unmet food needs include "areas isolated by conflict or geography or to groups too poor to purchase food. This year's deficit of 770,000 MT (reduced to 270,900 MT if carryover stocks and regular food aid are included) is largely structural in nature." It is important to note that this assessment assumes a contribution of 400,000 MT from the *belg* season that is just beginning. Should rains be insufficient in *belg* areas during the next three months, the deficit noted above might require reexamination.

Emergency Food Aid

The World Food Program reports that, after repayments are made to the food security reserve, a total of 416,000 MT of emergency food aid will be available for distributions in 1989. Of this amount, 1988 carryover stocks total 329,000 MT (154,000 held by the Relief and Rehabilitation Committee and 175,000 by non-governmental organizations). An additional 87,000 MT will be available in 1989 from 1988 pledges arriving this year.

An unexpected heavy rain fell over Asseb port during February 3 to 6. The 33 millimeters of rain received may have damaged emergency food stocks in the port. A report is expected soon on the amount of food affected and what steps may be taken for recovery of the food. In general, the offtake of food from all three ports (Massawa, Asseb, Djibouti) is lower than required.

Refugees

The emergency relief program assisting Somali refugees in the East continues to be plagued by insufficient food stocks, poor water supply, and logistic and administrative problems. The WFP reports that food stocks at Hartisheik camp are "problematical, and over distribution of food during first half of February will result in insufficient food stocks being available for next 10 day distribution." Nutritional surveys of children below the age of five show a general decline in the Aware area. There is a critical need to pre-position food in the area prior to the start of the rainy season. The first rains may come as early as March. Arrangements have been made by the United Nations High Commission on Refugees to purchase water from private sources in the Aware area to provide to refugee camps during the remainder of the dry season. A transfer of refugees from the H^oshin camp to the new Hartisheik camp was scheduled for February 13, 1989. Reports of inadequate food stocks in refugee camps just over the border in Borama, Somalia may complicate the situation on the Ethiopian side. Unmet food needs for Somali refugees total 20,000 MT of cereals, as well as other assorted food stuffs.

In the West, approximately 200 refugees are arriving from Sudan each day (as of early February). The condition of new arrivals is not as critical as it was during much of 1988; only 5 % need therapeutic feeding. Food deliveries to the camps are improving. The Itang, Dimma, and Asosa camps now have a stock of one month of food supplies over what is required for the month of February. Over 9,000 MT of food were delivered to the camps during January. Unmet food needs for the Sudanese refugees for the remainder of 1989 total 47,000 MT of cereals as well as other assorted food stuffs.

Desert Locusts

Despite continuing sporadic reports of Desert Locust swarm activity in northern Ethiopia, the situation appears relatively calm at the moment. Aerial surveys of the Red Sea coast, the area around Asmera, and the Ogaden have continued without success in locating the reported swarms. The Desert Locust Control Organization posits that the next threat may come from the direction of Saudi Arabia during the period from May to July.

Favorable Outlook

Summary

The food security outlook for Mali continues to be favorable. Food security stocks have been replenished in Gao and Tombouctou Regions. Food prices are generally stable in areas often vulnerable to food emergencies.

Agriculture

Recessional agricultural activities continue in the regions of Gao and Tombouctou. The area under production is estimated to be far greater than last year's total. Pasture and water conditions for livestock continue favorable, although brush fires in Koulikoro Region continue to pose threat to pasture. Animal herds are now concentrated around permanent water sources. No disease outbreaks have been reported. The Pan African animal vaccination program was launched in January.

Pests

There were no reports of locust or grasshopper activity during January and February. The Crop Protection Service published a report of its 1988 egg pod survey for Senegalese Grasshoppers, which has relevance for the potential infestation in this upcoming agricultural season. Absolute densities of 0 to 40 egg pods per square were found. Parasite damage was found in 40.3 % of the egg and viable eggs per egg pod were estimated at 6 to 24. Under good ecological conditions these densities could translate into larval bands of 23.4 larva per square meter. Egg pods of other species were also encountered.

Système d'Alerte Précoce

In the area under the general purview of the Système d'Alerte Précoce (SAP), prices are general stable with a rising trend. Prices still are much lower than the same time last year everywhere in the area except in Nara Cercle where prices are higher. These findings reflect the relatively good availability of grain this year compared to last.

SAP reports that security stocks have been replenished in Gao and Tombouctou. OPAM continues to replenish stocks in other areas. Definitive recommendations for possible distributions in potential areas at risk will be made next month by SAP.

Food Aid

The World Food Program has planned food for work (grain only) projects across Mali.

Region	Tonnage
Gao	667
Kayes	390
Bamako	940
Mopti	667
Segou	667
Tombouctou	794

World Vision has programmed an additional 2000 tons for Gao, Ansongo, and Menaka Cercles while Care has programmed 500 tons for Dire Cercle.

Health

There have been no exceptional disease outbreaks recently in Mali. A new effort to increase vaccination coverage in Bamako seems to be generating some public response. Bamako had the lowest vaccination coverage in Mali.

MAURITANIA

Locust Damage Not Ruinous

Summary

Mauritania's 1988/89 agricultural production should be sufficient for any 1988/89 cereal needs not already covered by expected commercial imports and pledged food aid, in spite of substantial locust and grasshopper damage to crops. The government and the donor community are discussing the creation of a 15,000 metric ton (MT) public security stock of cereals to provide a buffer should the 1989/90 harvest be poor. A further 7,000 MT of cereals must be imported to make that stock a reality.

Agricultural Production

The Government of the Islamic Republic of Mauritania's (GIRM) Bureau of Agricultural Statistics (SSA) published results of the second agricultural assessment, which took place in January. That report shows the estimate gross production to be at 201,993 MT, with an ensuing net of 158,957 MT.

Table 1: Mauritania, January 1989 Production Assessment (MT)

Grain	Gross	Net
Sorghum	136,009	115,607
Millet	10,868	9,237
Rice	50,949	30,569
Corn	4,167	3,542
Totals	201,993	158,957

Source: GIRM/MRD/SSA

These figures take into account the damage of grasshoppers and locusts to rainfed agricultural crops, but do not include such losses in recessional agriculture. Recessional crop losses to grasshopper and locusts should not exceed 15%. Such a loss would decrease gross 1988/89 production to 197,292 MT, dropping net production to 154,961 MT.

Pests

The UN Food and Agriculture Organization (FAO) Early Warning technician, working with FEWS/Mauritania, USAID/Food for Peace, SSA, and the UN World Food Program (WFP), calculated potential locust losses to be 41,627 MT out of a pre-locust and grasshopper production of 238,920 MT. Locust and grasshopper losses were reported by region for rainfed agriculture:

Table 2: Mauritania, Rainfed Crops Lost to Grasshoppers and Locusts (MT)

Region	Sorghum	Millet
Hodh ech Chargui	22	17
Hodh el Gharbi	4	37
Assaba	6	34
Gorgol	21	19
Brakna	33	45
Trarza	.	.
Guidimaka	.	.

Source: FEWS/Mauritania; USAID/FFP; WFP; GIRM/MRD/SSA; FAO Early Warning Program

In terms of hectares (ha) lost, SSA concludes the following for rainfed agriculture:

Table 3: Mauritania, Grasshopper/Locust Influence on Rainfed Harvest

	Sorghum			Millet		
	area crops destroyed (ha)	area crops abandoned (ha)	area harvested early (ha)	area crops destroyed (ha)	area crops abandoned (ha)	area harvested early (ha)
Assaba	295	442	821	1	785	1,458
Guidimaka	949	.	.	720	608	952
Brakna	1,674	.	1,315	641	503	.
Gorgol	1,459	3,374	.	502	.	0
Hodh ech Chargui	9,666	2,510	15,418	1,357	389	2,390
Hodh el Gharbi	510	.	3,866	1,106	.	0
Trarza	0
Totals	14,553	6,326	21,420	4,327	2,285	4,800

Source: FEWS/Mauritania; USAID/FFP; WFP; GIRM/MRD/SSA; FAO Early Warning Program

Food Security

The SSA assessment for 1988/89 is that the harvest is still promising. Mauritania's food security picture for 1988/89 is therefore also still promising. Mauritania should be able to meet its cereal needs, given an estimated 154,000 MT harvest, planned commercial imports, and the already pledged food aid for the year. Should the public security stock of 15,000 MT of cereals now under discussion be approved, the cereal balance deficit would become approximately 7,000 MT.

Food security stocks (especially wheat stocks) have been low at the CSA. Only some 5,000 MT were available at the CSA as of January. That will soon change, however, as 11,000 MT of wheat are scheduled to arrive at the CSA during February. In addition, there are some 18,000 MT of US sorghum in stock at the CSA for use in food-for-work programs, of which 9,000 MT could be transferred to free distributions if required.

Nutrition

World Vision recently conducted a nutritional survey in Assaba Region, but the results are not yet available. UNICEF worked in the area of Ouad Naga Town, Trarza Region, and Doulos (a US private voluntary organization) should soon have statistics for the last trimester of 1988 by the end of the month for its feeding centers in Nouakchott.

Prices

In January, the government changed official cereal prices following the announcement of the new Mauritania price policy last fall. The CSA will buy millet, sorghum, and maize at 22 oughiya per kilogram (UM/kg). SONIMEX will market CSA rice, having bought it from CSA at 35 UM/kg. SONIMEX will be able to buy processed rice directly from the private sector at 30 UM/kg. The government has also announced consumer prices as follows: 32 UM/kg for local and imported rice, 21.5 UM/kg for CSA wheat sold in Nouakchott, and 20.5 UM/kg for CSA wheat sold in the interior.

Locust Activity a Cause for Concern

Summary

All indicators of food accessibility suggest an abundant food supply situation across most of the country. Even in the north and east, in areas of the most chronic food shortages (Tchirozerine, Arlit, N'Guigmi, Maine-Soroa, Tchín-Tabaraden) the low cereal prices and abundant pastures are contributing to less than normal food stress. Desert Locust activity in the north is still a factor of concern for next rainy season.

Cereal Price Trends

Millet prices collected in December 1988 and January 1989 by the Office des Produits Vegetaux du Niger (OPVN) show a constant national average price of 50 FCFA/kg and 49 FCFA/kg respectively. FEWS data for the same periods last year showed rising millet prices of 61 FCFA/kg and 72 FCFA/kg. Price stability at these low levels supports a conclusion that the food supply is currently not a problem in most areas.

Departmental cereal prices during the same period showed little movement. Prices remained constant in Dosso (59 FCFA/kg) and Tillabery (43 FCFA/kg), and decreased slightly in Diffa (4.4%), Tahoua (3.7%), Maradi (5.5%), and Zinder (8.5%). Prices remained constant in all areas of Agadez except in the Air Mountain market of Iferouane, where they increased by 12.5% (see Desert Locust section below).

Niamey market cereal prices collected by the Direction des Statistiques Agricoles at the Ministry of Agriculture also confirm the current trend of general price stability. Average millet price on Niamey markets was 53 FCFA/kg between January 1 and 24. A very slight fall was noted by the end of this period (about 3.7%). The same also applies to sorghum. Rice has kept a fairly stable price.

Cereal Needs

Final 1988/89 agricultural production figures indicate the expected production deficits in the non-agricultural arrondissements: Bilma (-100% of cereal needs), Arlit (-99%), Tchirozerine (-91%), and N'Guigmi (-79%). Agricultural, or semi-agricultural, arrondissements that did not meet their cereal needs (based on the Government of Niger annual cereal requirement figures of 200 and 250 kg for pastoral, rural sedentary, and urban populations) include Tillabery (-8%), Ouallam (-17%), Birni N'Gaoure (-1%), Tchín-Tabaraden (-29%), Bouza (-2%), Keita (-11%), Gouré (-14%), and Maine Soroa (-28%). These results are, nevertheless, quite good ones compared to average years.

Desert Locusts

USAID/Niamey reports continued locust activity in the north of the country. Small areas within the far northwest (Tamesna, Iguidi) and north-central (especially the Air Mountains) desert regions are providing a breeding habitat for the pests. Control operations are difficult due to the broken terrain in both regions. Only one survey/treatment team is available for the Air Mountains and treatment is underway in Iferouane. Mating and egg-laying are occurring in the Tamesna, particularly southwest of In Abangarhit in Iguidi. Control operations there by a Crop Protection Service survey/ground treatment team are underway. The closure of OCLALAV operations has reduced the number of survey/control teams from 5 to 2.

According to Charles Kelly of the USAID/Drought Relief Unit, the presence of locusts in the north constitutes a potential threat to southern agricultural zones. Looking ahead, he believes that locust movement towards the south in the early rainy season is possible. Government of Niger plans for locust control from 1989 to 1991 are being considered by the Government-Donor Coordination Group, and may be ready for submission to donors during February.

Off-Season Crops

There is yet little information available as to 1988/89 off-season agricultural production. Initial indications from government sources are that this year's off-season agricultural campaign will be far better than last year's. Press reports estimate 80,000 MT off-season production for 1988/89, the same amount that was foreseen last year. In Maradi, Tillabery, Tahoua, and Dosso departements some crops have already been harvested.

Niger River in Niamey

AGRHYMET's situation report released on January 20, 1989 indicates that the crest of the Niger River was higher, yet the river began receding one week earlier, in 1989 (hydrologic year from July 1, 1988 to June 30 1989) than last year. At the current rate of flow, and without any releases of water from the Markala Dam in Mali, the river will dry up in Niamey in early June. Should the rains be late in June, water shortages for crop irrigation and for Niamey drinking water would again become a problem.

Harvest Delayed by Labor Shortage

Summary

Sudan has enjoyed unusually bountiful production this year and for this reason cereal deficits throughout the country are minimal. Even Northern Darfur and Northern Kordofan provinces enjoyed exceptionally good harvests of millet. In these areas it is anticipated that farmers will have stored on-farm stocks, equivalent to two years of consumption, from harvest surpluses. Although production has been very good in the bread-basket of Sudan (i.e., from Gedaref in Kassala Province to Damazin in Blue Nile Province), the actual harvesting of the sorghum is limited by an insufficient supply of labor. Although harvesting continues, it is currently well below its potential. The locust problem has subsided with limited activity in Red Sea Province. Lower than normal rainfall is believed to have led to the abatement of the locust threat. Grain prices have continued to decrease, while livestock prices have continued to increase. Starvation and destitution continue in the south because of the war. Some food has gotten in but only to a few major towns, and then in insufficient quantities.

Agriculture Production

The Ministry of Agriculture (MOA) estimates cereal production to have reached almost 6 million metric tons (MT). The actual harvest, however, may be substantially less due to the unavailability of labor. A recent survey of the Gedaref area by the British Overseas Development Authority (ODA) found that the harvest progress varied from 50% completed at the most southerly point (Sim Sim) to only 25% in Gedaref. Local officials believe, however, that most of the harvest will be completed before the rains come again. Some observers attribute the lack of labor to decreased migration of western Sudanese. It may also be that there is only a labor shortage relative to this year's great expansion of acreage (while the labor supply remained static), which decreased the ratio of labor to land. It could also be that there was little incentive to migrate for seasonal work as rainfall was good throughout Sudan, including the west. There is some evidence that seasonal labor migration is relatively less important than it was in the past, having been replaced by the permanent migration of people and families from the west to labor demanding areas of the east.

Meanwhile, in the west, the food security situation looks favorable. The Agriculture Planning Unit (APU) in El Fasher, North Darfur Province, reports that its pre-harvest survey showed that grain production in the province was expected to exceed the population's consumption requirements, although there is uneven distribution. Pockets of deficit include Malha and Mareiga in northern Mellit area council. Malha and Mareiga are areas usually considered too far north for agriculture but where pastoralism dominates. Cereal deficits there are not in themselves cause for alarm. Production in North Darfur Province is expected to be about 438,320 MT, which exceeds local needs by about 212,000 MT. Production in South Darfur is expected to be well above consumption requirements for 1989.

A recent field survey conducted by USAID and FEWS confirmed these findings from the west. A subsequent field visit to Kordofan revealed that the harvest was good there as well. The mechanized sector there has also been constrained by a lack of labor as well as increased transportation costs. Nonetheless, the production of both cash and food crops was excellent.

Rainfall and Pests

Rainfall has been inadequate in much of the Red Sea area. This has positive and negative impacts. On the one hand, locusts have had difficulty breeding successfully because of the lack of moisture. On the other hand, farmers in much of Red Sea Province will not enjoy the bumper harvests that other Sudanese farmers experienced in 1988. In general, the locust threat has all but subsided. Experts predict that there will not be massive invasions of swarms into the central grasslands of Sudan for the summer breeding season. Generally, crop damage due to locusts was minimal in 1988, although there were some localized areas of heavy loss.

Prices

Data from the MOA Statistics and Economics Department suggest that food grain market prices have decreased in all reporting markets. In Gedaref, the price of sorghum dropped to Ls (Sudanese pounds) 75 per sack while the estimated cost of production is about Ls65. Meanwhile, the price of millet has dropped to about Ls140 per sack in El Obeid. Livestock prices throughout the country have increased steadily. This widespread decrease in grain prices probably reflects widespread grain availability. The gradual increase in the price of livestock could reflect both its relative value vis-a-vis grain and the economic health of pastoralists, allowing them to withhold cattle from the market in favor of rebuilding their herds.

The Southern Region

The situation in Southern Sudan continues to be critical. Many people there are starving to death or becoming destitute because of the continued civil war. Some food has arrived through convoys and airlifts, but the quantities are grossly inadequate. In addition, food has been delivered only to large towns. A high proportion of the people living in the countryside do not have access to adequate amounts of food. Still, great efforts are being made by the international donor community to deliver relief supplies to the south. Many believe that adequate relief will only come when the Government of Sudan and the Sudanese People's Liberation Army (SPLA) agree on peace or a cease fire.

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.