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Special Report—FEWS Sahel Vulnerability Assessment (Insert)

Southern Africa

Slowdown of Rainfall and High Temperatures Increase Risk of Crop Stress

The heavy rains experienced across much of southern Africa during January tapered off significantly over much of the area in February. The drier weather, in combination with unusually high temperatures, has caused stress to crops in much of the region during the past month. Figure 1 shows the estimated average levels of moisture deficit experienced during each of the past 3 months.

Prospects for the upcoming harvest are generally below normal in the south and west, but they improve toward the north and east. Yields are expected to be fair to poor in southern Zimbabwe and South Africa and in southern Zambia, while the area planted to crops is also down significantly in Zimbabwe and South Africa. Planted area is in the normal range and yield prospects are generally good in northern and eastern Zambia, in northern Zimbabwe, in Malawi, and in northern and central Mozambique. However, some parts of these areas have had too much rain and some crops are at risk of waterlogging. Flooding has occurred in some areas, including parts of central Mozambique.

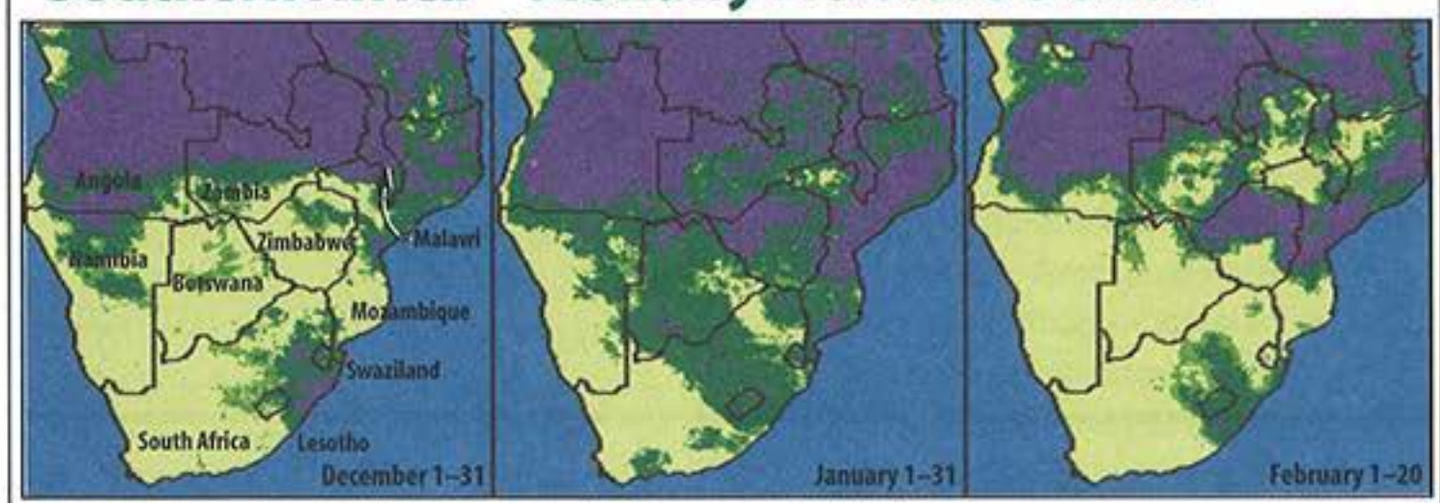
Zimbabwe

Most of Zimbabwe received heavy rainfall during late January, bringing cumulative rainfall totals close to average for more than half of the country. The agronomic significance of the January rainfall will depend on its timing with respect to planting and other agricultural activities. As area planted is some 20 percent below average, yields would have to be exceptional for production to reach average levels. The beginning of February has brought drier weather to much of the country, which could reduce yields.

In the center and north, crops planted before the December dry spell are in advanced stages of development and generally appear to be in good condition. Indications of nitrogen deficiency, including yellowing leaves, have been observed in some areas of the north, where the rainfall in January was particularly heavy. Crops planted in response to the heavy rains in late December and early January would require a longer rainy season—extending into April—to be productive.

Most of the southeast received 60 percent or less of the average cumulative rainfall through the end of January. Much of Matabeleland South Province and the southern portions of Midlands and Masvingo Provinces have been consistently dry throughout the season. These areas and parts of Matabeleland North Province received most of their rainfall during January, and they would require several more weeks of good rainfall in order to have a reasonable harvest.

Southern Africa—Monthly Moisture Deficit



Ratio of Moisture Supply Versus Demand

- Moisture Deficit
- Little Moisture Deficit
- Adequate Moisture
- High Moisture

Source: FEWS
FEWS, February 1998

Figure 1

Inside:

In the aftermath of the unrest that followed price increases, maize meal remains scarce in retail outlets in some areas. On instructions from the Government, the Grain Marketing Board has released about 200,000 MT of maize from the Strategic Grain Reserve for sale at prices below prevailing market levels. This measure has driven retail prices down somewhat, but such an intervention is likely to dampen private-sector interest in maize marketing.

Zambia

Most of Zambia received normal to above-normal rainfall during January. The center of the country—including the major grain-producing regions of Central, Eastern, and Southern Provinces—received normal rainfall. Northern areas generally received above-normal rainfall, and some areas—including Mansa District in Luapula Province; Mbala, Kasama, and Mpika Districts in Northern Province; Mumbwa District in Central Province; Choma District in Eastern Province; and Solwezi District in North-Western Province—had too much rain: crops were washed away in some areas, and the wet conditions delayed such activities as weeding. Nutrient leaching and waterlogging may also reduce yields in these areas.

Below-normal rainfall continued in parts of Western and Southern Provinces, and it is likely to result in reduced yields in several areas. In the southernmost portions of Southern Province, some crops were wilted following a 3-week dry spell earlier in the season and were replanted in late December and early January. Field reports, however, indicate that crops in most parts of these Provinces are in fair to good condition.

Prices for agricultural commodities normally peak shortly before the harvest, in February or March. The wholesale price of maize continued to rise in January as the end of the marketing year approached, and prices of other staple food commodities, including beans and groundnuts, increased at both the wholesale and the retail levels. The price of maize meal also increased, but the recent arrival on the market of cheaper imported mealie meal should stabilize prices. Maize meal prices are most important in the urban centers, because residents of rural areas and the smaller towns tend to rely more on purchases of maize grain (which they take to local hammermills) than on industrially processed meal.

Mozambique

Most of Mozambique received above-average rainfall during January, and crops are reported to be in good condition across most of the country. Parts of Cabo Delgado, Nampula, Niassa, Tete, and Zambezia Provinces and coastal areas of Inhambane and Maputo Provinces may have received too much rain. The southwest, which had generally been dry, received significant amounts of rainfall in late December. Should the rains continue to fall regularly in February and March, this year's national production is likely to be close to last year's.

Crops in the south are generally further along in their development than those in the north. In late January, many plantings in the southern coastal areas were approaching maturity, while those in the center of the country were mostly in the grain formation stage. In the north, where planting generally began in mid-December and was essentially completed by late January, plants were still in the vegetative state and appeared to be doing well.

Significant variations also exist within the different regions, due to differences in local rainfall patterns. In inland areas of the south, most current plantings were made in mid-December, after the first two plantings had failed due to inadequate and irregular rains; these crops were still in the vegetative stage at the end of January.

Following the usual seasonal trend, the quantities of grain marketed in the most important grain markets have decreased and prices have increased. During a recent field visit to the southern Province of Inhambane, FEWS learned that traders were not stocking much maize, due to lack of demand at current high prices. Local consumers preferred to purchase cassava meal and rice, which were lower cost alternatives. A similar pattern was reported in the northern Province of Nampula.

Malawi

Heavier-than-normal rainfall continued in Malawi through January, and pasture conditions are good. Crops are generally more advanced in the south and mostly in the vegetative stages in the center and north. Although the heavy rains have caused some nutrient leaching and rotting of cassava in flooded areas, rainfall must continue through March for good yields in the center and north of the country.

Early assessments by the Government of Malawi indicate an increase in this season's maize production by 27 percent over last year, to 1.7 million MT. Production of other staples—rice, sorghum, and millet—is also expected to increase. The area planted to cassava and sweet potatoes is up, probably in response to warnings of a potential El Niño-related drought. Production of cassava and sweet potatoes is also expected to increase—by 13 and 33 percent, respectively, over last year, to 800,000 MT and 1.1 million MT.

The demand for maize is at its seasonal high at this time of year, as households deplete their own stocks and rely on the market for food. Prices are rising very quickly: the national average at the end of January, MK6.82 (US$0.30) per kilogram, had risen 37 percent since December. The Agricultural Development and Marketing Corporation (ADMARC) is selling maize at MK3.90 (US$0.17) per kilogram, but supplies are limited. Transportation delays are hampering the arrival of additional maize that ADMARC has purchased from Mozambique, causing substantial hardship for the many low-income consumers who depend on the subsidized prices. ADMARC has introduced rationing across the country as a control measure to discourage traders from buying maize in bulk for resale at a higher price.

Eastern Africa and the Horn

Kenya

Kenya's unusually heavy rains stopped in mid-January, and more moderate rains resumed in early February. The brief rainless period allowed crucial supply routes to dry enough to restore partial accessibility to the pastoral districts of Isiolo and Marsabit (Eastern Province), Wajir and Mandera (North Eastern Province), and Samburu (Rift Valley Province). The districts of Garissa (North Eastern Province) and Tana River (Coast Province), however, remain largely inaccessible.

Although pasture, browse, and water availability were uncharacteristically abundant in January, the condition of livestock continued to decline due to an upsurge in diseases promoted by the very wet conditions. Severe access problems have made it difficult for NGO's working in pastoral districts to estimate livestock mortality rates, but extremely high rates have been reported in Garissa, Isiolo, Marsabit, Samburu, Tana River, and Wajir Districts. The Drought Preparedness and Intervention Project and Oxfam-United Kingdom report that pastoralists in some areas have lost up to half of their sheep and goats due to a combination of contagious caprine pleuropneumonia, enterotoxemia, and foot rot. In the southern agropastoral district of Kajiado, an outbreak of bluetongue has resulted in the loss of an estimated 30 percent of wool sheep, which constitute a major portion of household income. Losses of cattle have been lower than those of other livestock, but an outbreak of East Coast fever in Marsabit District in mid-January resulted in some cattle deaths. Reduced livestock prices due to lack of access to markets have caused pastoralists' terms of trade to decline (figure 2).

Kenya—Meat-to-Cereal Ratio in Samburu District

Source: Drought Preparedness Intervention and Recovery Project
FEWS, February 1998

Figure 2

During the 1997/98 short-rains season, about 460,000 ha has been planted to maize—a substantial increase over the 1992–95 short-rains average of about 350,000 ha. The most notable

increases in area planted have occurred in Central, Eastern, and Rift Valley Provinces. Leaching and waterlogging caused by the recent heavy rains should result in reduced yields, but preliminary Ministry of Agriculture Province-level estimates totaling 387,000 MT of maize do not reflect this. Total national maize output for the 1997/98 production year is estimated to be 2.2 million MT—15 percent below the average for 1991/92 through 1995/96. Meeting the consequent 590,000-MT maize production shortfall should be well within the capacity of the commercial sector.

The impact of this second consecutive deficit production year on food access for Kenyans will depend on world prices for maize (especially white maize), which are already rising. January maize prices in the principal markets of Nairobi, Mombasa, Kisumu, and Eldoret remained 63 to 73 percent higher than the 1993–97 January average. Bean prices have also remained high, even during the current harvest, due to low local production. These high prices have reduced purchasing ability and produced significant food stress, particularly among deficit producers in the lakeshore and pastoral areas.

WFP plans to conclude the first phase of its extended Emergency Operation Program for flood-stricken areas at the end of February. So far, WFP has airlifted approximately 2,000 MT of flood relief supplies to Mandera, Wajir, Tana River, Garissa, and Isiolo Districts. The second phase of the extended program, which is contingent upon funding, would run from March through May, targeting an estimated 539,000 persons with 4,800 MT of food supplies. FAO plans to procure seeds worth US$200,000 for donation to the flood-affected districts. The U.S. Government has contributed about US$2.2 million to the flood relief operation, and it expects to provide two C–130 aircraft for use in the flood-affected areas. Australia, Belgium, The Netherlands, Spain, the United Kingdom, France, Germany, Italy, Japan, the European Union, UNICEF, WHO, and UNDP have collectively contributed about US$6.6 million to the relief operation.

Greater Horn of Africa Climate Outlook

The following paragraphs summarize the statement and the press release issued by the Greater Horn of Africa Climate Outlook Forum at the end of its February meeting.

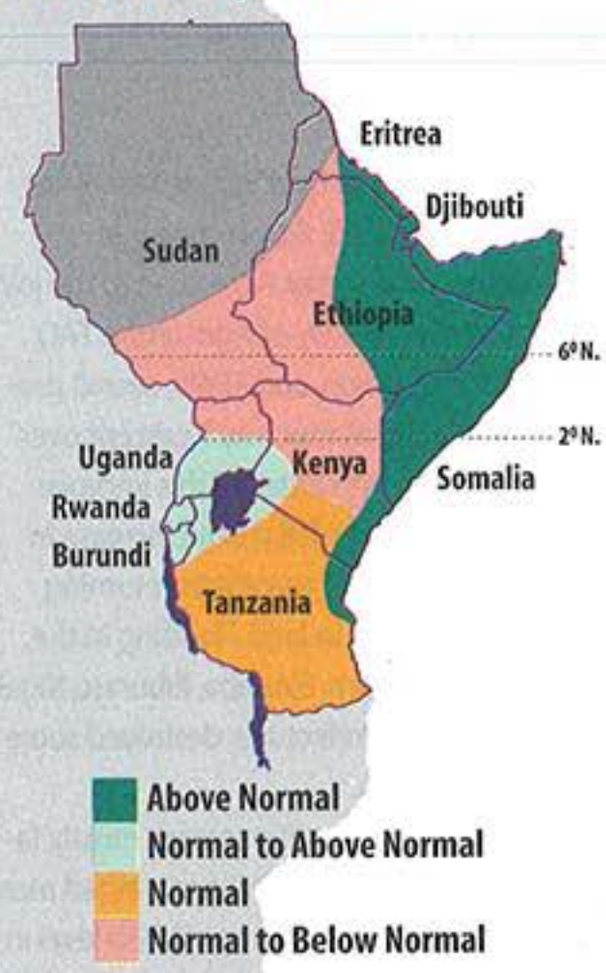
National, regional, and international climate and food security experts met in Nairobi, Kenya, February 9 to 13, to develop a Greater Horn of Africa climate outlook for March through May 1998. Among the principal factors that the experts took into account were the major El Niño event of 1997–98, very warm sea surface temperatures in the western Indian Ocean, and warmer-than-normal sea surface temperatures in the tropical Atlantic.

March through May constitutes an important rainfall season over much of the Greater Horn of Africa south of about 6° N. and in northeastern Ethiopia and eastern Eritrea.

Much of the eastern Greater Horn and the Lake Victoria basin is likely to have normal to above-normal total precipitation from March through May (figure 3). The indicators for above-normal rainfall are strongest over coastal parts of northern Tanzania, Kenya, and southern Somalia and over northeastern Ethiopia. Normal to above-normal rains are also expected over the eastern half of Ethiopia; Somalia, Djibouti, and the highlands of Eritrea; Uganda south of 2° N.; and Rwanda, Burundi, western Tanzania, and western Kenya. Near-normal rains are expected over the rest of Tanzania and over southern Kenya.

Near- to below-normal conditions are expected further south and in the central inland areas. Although southern Sudan, western Ethiopia and Eritrea, north-central Kenya, and northern Uganda are more likely to experience below-normal rainfall, risks of widespread dry conditions are low. Over most of Sudan, the rainy season does not start until after the forecast period, and normal conditions are expected.

Expected Rainfall Patterns in the Greater Horn, March–May 1998



Source: Greater Horn of Africa Climate Outlook Forum FEWS, February 1998

Figure 3

The relationship of sea surface temperature variability in the Pacific and Indian Oceans with rainfall is generally weaker from March through May than it is for October through December. It is therefore more difficult to predict the March–May rains. This climate outlook is relevant only as a general estimate of prospects for the season over relatively large areas; local and month-to-month variations may occur.

Tanzania

Above-average rainfall continued during January in Tanzania's northern, central, and coastal areas, and the *vuli* (short rains) harvest continued in the bimodal areas of the north. Farmers around Lake Victoria anticipate a good maize and sorghum harvest, but bean yields have been significantly reduced. The good harvest is facilitating recovery among households who suffered drought-induced losses in the preceding seasons. In Arusha, Kilimanjaro, and Tanga Regions, the abnormally heavy rains have caused some production losses, particularly in low-lying areas, where the area planted was reduced. However, a January FAO–WFP assessment mission concluded that good *vuli* yields in the highlands should compensate for these losses. The *vuli* season is of secondary importance in these lowland areas where the harvest outlook is poor, and households could still achieve average annual production if the *masika* (long rains) season, which begins in March, has favorable rains.

In the unimodal central and southern areas at the end of January, the *masika* cassava crop was at the vegetative stage while sorghum and maize ranged from knee high to flowering. The flooding may result in some yield reductions, but if the weather conditions during the remainder of the season are favorable, an above-average harvest is still possible. A FEWS assessment of damage to field crops caused by rodents and armyworms along the southern coast found losses of about 10 percent from expected yields.

The FAO–WFP assessment mission reported greater variability in harvest prospects for cash crops, estimating cotton and tobacco crops in the central and Lake Victoria areas as total losses. In contrast, the team reported that the cashew crop, which is an important source of income in the coastal areas, should be good. Many rice fields remain underwater; about half of the fields in the main rice-growing areas have not been cultivated.

The heavy rains have severely disrupted road and rail systems, inhibiting flows of both commercial and relief food. Consequently, prices remain at least 50 percent above average in food deficit areas, particularly at the village level. Of the total 68,000 MT of relief food scheduled for distribution before the next harvest under the WFP Emergency Operations Program, 12,134 MT has been delivered to the Regions, according to a WFP report issued on February 20, and 8,165 MT of maize and

600 MT of pulses have been successfully distributed. Despite the delayed distributions, there are no widespread reports of households' resorting to extreme coping mechanisms, such as the sale of productive assets. Commercial millers plan no additional maize imports in the next few months, and domestic supplies from the ongoing *vuli* harvest are meeting current demand.

Rwanda

Preliminary estimates of Rwanda's season A harvest show the continued, slow recovery of Rwanda's agricultural sector. According to the joint assessment by the Ministry of Agriculture, FAO, WFP, the European Union, and FEWS, overall production increased by as much as 9 percent over last year's season A. The causes of this improvement were generous rainfall and an increase in area cultivated of up to 7 percent as returning refugees gained access to land. Flooding in the low-lying areas of Butare, Byumba, Kibungo, Kigali Rurale, and Umutara Prefectures destroyed some crops, especially beans.

Although growing conditions were mostly favorable, season A food production remained more than 15 percent below the prewar (1990) level in absolute terms and 26 percent below that level in per capita terms. The assessment team estimates Rwanda's food deficit for January through June at 80,000 to 90,000 MT—significantly below the FAO–WFP estimate of 124,000 MT for the previous 6 months. As has been the usual pattern in recent years, WFP will provide food to meet about half the deficit, leaving the commercial sector to meet the remaining requirements.

Farmers are preparing their lands in anticipation of the start of season B between late February and early March and waiting for the unseasonable rains to stop before sowing. The Ministry of Agriculture still plans to distribute free planting materials to the one-third of Rwanda's farmers whom it considers needy. However, donors have committed only 20 percent of the US$10.8 million requested; distribution will begin at the end of February.

Vulnerability to food insecurity remains high due to a combination of factors that restrict households' access to staple foods. In addition to the national food deficit and insecurity in the northwest, these factors include the limited availability of planting materials, continued high market prices, and flooding in East Africa, which has destroyed roads and bridges and thus blocked both commercial and humanitarian deliveries of food commodities (see box on p. 5).

Uganda

Uganda's second-season harvest is complete. Flooding, waterlogging, and high humidity from the abnormally heavy rains that have fallen since November have decreased cereal and pulse yields. Beans are particularly vulnerable to excess moisture, and some farmers in the east and west lost their entire crops. Harvested maize also suffered extensive damage from the persistently high humidity.

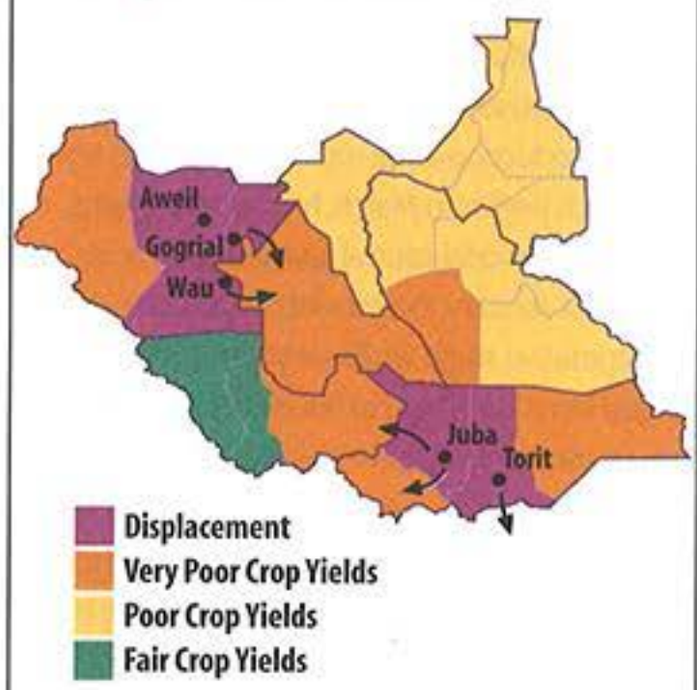
Staple foods are readily available in all major markets across the country. During the recent harvest, prices for maize and beans declined slightly, nearing their levels of a year ago.

Although rations have been cut due to transportation problems in the region (see box on p. 5), WFP continues emergency food aid operations to areas in the north and west that have been disrupted by civil unrest. In response to recent fluctuations in numbers of internally displaced persons (swelling in the north and shrinking in the west), the Government of Uganda, WFP, and donors plan to reassess the numbers of people needing humanitarian assistance. To reduce dependence on food aid, the Government assisted and protected internally displaced persons while they cultivated crops on 120 ha adjacent to the Amuru camp in Gulu District during the recently concluded season. Donors are currently considering Government requests for support in extending this effort to areas adjacent to other such camps in the north.

Southern Sudan

Light rains continued over parts of southern Sudan during January, improving pasture conditions during what is normally the dry season. As households shift to dry-season coping patterns, they are more strained than in recent years due to this year's poor harvest, the cumulative stress on livelihood systems, and escalating civil insecurity.

Southern Sudan—Displacement and Crop Performance



Source: FEWS/Sudan FEWS, February 1998

Figure 4

Various crop assessments by WFP, NGO's, and local authorities corroborate a serious reduction in cereal production across southern Sudan. The recent FAO assessment estimates that this year's cereal production is 45 percent below last year's. Localized surpluses exist, mainly in Western Equatoria Region, but the inadequate market linkages in southern Sudan prevent northern Bahr-el-Ghazal Region and Lakes and Jonglei Regions from benefiting from the cereal surpluses elsewhere in the region. NGO's report that food prices have increased; in some markets, rice and groundnuts have reached prices nearly double their normal levels. The scale of the harvest losses in Eastern Equatoria and Lakes Regions and in northern Bahr-el-Ghazal Region will require relief distributions beyond previously planned amounts until the next major harvest, between June and August.

Approximately 100,000 displaced persons are fleeing intense fighting in Wau, Aweil, and Gogrial Counties in Bahr-el-Ghazal Region (figure 4). Citing security concerns, the Government of Sudan has imposed flight bans in Bahr-el-Ghazal Region and in parts of Equatoria (Maridi and Yei Counties, Mundri, and Ikotos) and Jonglei (Panyagor and Yomciir) Regions. Operation Lifeline Sudan is seeking clearance for flights to Mapel and Acumcum in Bahr-el-Ghazal Region, where people are suffering from a lack of food, water, medicine, and shelter. In addition, NGO's have made contingency plans in anticipation of civil insecurity in Torit and Juba Counties of Equatoria Region. As many as 250,000 persons in those counties could escape into adjacent areas (which have had a poor season), increasing their need for relief food.

Ethiopia

Many areas of Ethiopia received above-normal rainfall in January. Although these rains were unseasonable, they were generally welcome and they have improved pastures and increased water availability, which is normally low at this time of year. Off-season crops planted during the unusual rains of October and November benefited from the abundant moisture, and it is likely that they will attain maturity and good yields. The January rains also aided farmers in land preparation for the upcoming *belg* (secondary) season and encouraged the early planting of *belg* crops in the higher altitude areas (above 2,500 m) of North Shewa and South Wello Zones, where crops are usually planted in February and harvested in May and June.

Recent field reports from the Disaster Prevention and Preparedness Commission confirm these positive effects, and DPPC believes that food aid needs in many areas may decrease somewhat. The commission has scheduled postharvest assessments for mid- to late February in areas of Tigray, Amhara, and Oromiya Regions where the food security situation

Floods Hamper Food Aid Deliveries in Eastern Africa

The torrential rainfall across eastern Africa during the final months of 1997 and the start of 1998 has crippled the region's transportation network. Food aid into Tanzania, Uganda, Rwanda, and Burundi is transported inland from the coast by rail, mainly through Mombasa and Dar es Salaam. The rains have washed out bridges and roads. Even relief food that has been positioned in country is not reaching intended recipients.

At different times over the past 3 months, rains have disrupted the train routes from both Mombasa and Dar es Salaam. The Mombasa line from Kenya into Uganda has been repaired, but it is operating at reduced capacity. The rail line in Tanzania suffered extensive damage to both bridges and tracks, and Tanzanian authorities estimate that repairs will take 4 to 6 months. WFP is exploiting alternative routes for bulk food delivery, but with limited success: the rains have also reduced alternative routes' capacity. With over half of Tanzania's railcars stranded at Dar es Salaam, the Tanzanian Harbours Authority has agreed to waive storage charges for some of the food aid commodities accumulating at the port.

Donors and WFP have responded quickly, and crews have begun repairing key roads, rail lines, and bridges. The World Bank is providing long-term credit for repairs and infrastructural improvements: US$19 million in Tanzania and US$30 million in Uganda. Restoring the transportation infrastructure will cost more than US$30 million in Tanzania alone. In the meantime, WFP is drawing on stocks that it had positioned before the flooding, and it is combining transportation by rail, road, barges, tractors, animals, and human labor to move food as fast as possible to the interior. To further improve capacity, WFP has provided the Kenya Railway Corporation with funds to put more trains on the Mombasa-Kampala line, both by repairing old locomotives and by leasing locomotives from South Africa. National governments are also assisting. The Uganda Railway Corporation has sent freight cars to Tanzania to help speed the shipment of food stocks.

Despite these efforts, only about half of the programmed food aid was delivered to the Great Lakes region in January, and WFP plans to provide half rations until the Tanzania rail link is reestablished. Only a fraction of the relief targeted to Tanzanian households affected by drought in 1997 has been distributed, and WFP may be forced to cut rations to refugees in western Tanzania by half unless deliveries improve in the next few weeks. Until these transportation bottlenecks are cleared, WFP and other relief organizations face hard choices in prioritizing needs and targeting available food aid.

has changed or where it had been unclear during previous assessments.

Ethiopia has little experience with large-scale commercial importation of cereals, but private companies and parastatals are showing increasing interest in commercial imports of wheat, partly due to the poor quality of local wheat from the new harvest and the commodity's current low price on the international market. One private company has already purchased nearly 27,000 MT of wheat on the international market. A group of Government-owned flour mills and a consortium of private companies have also launched tenders for 46,000 and 25,000 MT of wheat, respectively. The European Union has launched a cereal availability survey in collaboration with the Grain Market Research Project to determine whether the European Union and other donors should purchase grain locally, import it from abroad, or do both.

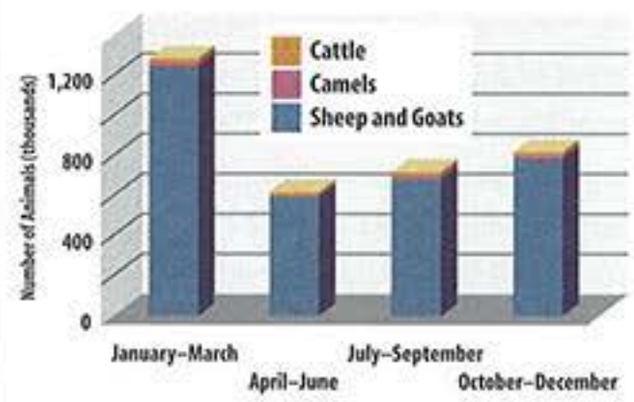
Somalia

Concerns that livestock from Somalia may carry the Rift Valley fever virus have prompted Saudi Arabia and neighboring countries to ban imports of livestock and fresh meat from Somalia. This ban occurs during the annual peak of overseas demand for livestock: January through March. During this period last year, 1.3 million head of livestock (37 percent of the annual volume) were exported from Berbera and Bosasso (figure 5). The current ban, if prolonged, could have devastating consequences in trade-dependent northern Somalia, including enormous loss of revenue to exporters, collapse of herder income, loss of foreign exchange to local authorities, and a sharp reduction in food imports because livestock traders usually use the proceeds from livestock sales to import foodstuffs. Prices of imported food are likely to shoot up as supplies dwindle, hurting all consumers. Moreover, the presence of these livestock, especially when concentrated in export collection areas, will place continued pressure on grazing and water resources during the dry season. Authorities in Somaliland and Somalia are urgently asking Saudi Arabia and other importing countries to rescind their bans.

Floodwaters continue to recede in southern Somalia, and many displaced people have been able to return home. However, the general health situation continues to be grave. Incidences of malaria, diarrhea, and upper respiratory infections have increased in flood-stricken areas, although a recent outbreak of hemorrhagic fever among people and livestock is subsiding. UN agencies are rushing additional drugs to areas where new cholera cases have been reported, and they are continuing to chlorinate wells and to dig pit latrines to reduce the spread of cholera.

Food aid is jump-starting the economy in flood-stricken areas. However, food security in Bay and Bakool Regions is worsening due to renewed outbreaks of warfare, which have disrupted farming, scattered people, and depressed incomes and economic activity. These Regions' food aid needs are considerable, but delivery to this conflict zone remains difficult.

Northern Somalia—Livestock Exports by Quarter, 1997



Source: Somalia Food Security Assessment Unit
Figure 5 FEWS, February 1998

On February 10, WFP issued an appeal for $17 million for food and for air operations through July in order to provide assistance to flood-affected Somalis and Kenyans. Without these funds, WFP will have to halt its huge emergency deliveries of food aid to locations that are accessible only by air. The food pipeline is also worrisome, because current availabilities will last only through March. WFP urgently needs new pledges to repay food aid stocks from which it has borrowed in the region. As of late February, the United States had contributed US$4 million and two other donors were considering contributions worth US$2 million.

Sahel

The 1997/98 harvest was mixed throughout the Sahel; some areas face serious food shortages and others have registered record production. To determine the significance of the mixed harvest and assist decisionmakers in identifying areas likely to have the greatest need for outside assistance, FEWS has conducted current vulnerability assessments, which are summarized in this month's *FEWS Special Report* (insert). The food security situation following the 1997/98 harvest is mixed across the Sahel, both among and within countries, and thus the responses initiated by governments vary according to local conditions.

Food security is worsening in several areas of **Mauritania,** especially along the Senegal River in Brakna and Gorgol Wilayas and in southern Hodh Ech Chargui and Assaba Wilayas. Following an analysis of the national cereal balance in late December, the Government of Mauritania had made a request for over 50,000 MT of assistance, but half of this amount was intended to support livestock and was rejected by the donors. Individual donors have since been approached, but there has not been another formal request for assistance to address needs in vulnerable areas. WFP organized a meeting of donors, NGO's, and technical services in mid-February to assess the situation, reexamine the national cereal balance, and recommend actions. The group decided to send teams to the field in late February to identify the most needy populations, and some NGO's are proceeding with interventions in their project areas. Pastoral conditions remain good, but prices of cereals are very high for this time of year, which will make access to food difficult for some farmers and herders.

Despite above-average cereal production at the national level in **Niger,** food security is deteriorating in Agadez and Diffa Departments and parts of Tillabéry, Tahoua, and Zinder Departments. The Government of Niger has asked donors for 151,000 MT of food aid: 10,000 MT for free food distribution, 62,000 MT for food-for-work activities, and, 49,000 MT for subsidized sales and to replenish existing cereal banks or create new ones. As of mid-February, donors had confirmed pledges of nearly 40,000 MT, half of which had already arrived in the country and was in various stages of storage and distribution. The rest should arrive by May. There is still a large gap between the request and the response, but the Government and donors are meeting biweekly to focus on the situation in the most vulnerable areas, confirm food aid pledges and distribution plans, and highlight needs for further action.

Across central and northern **Burkina Faso,** cereal production was well below average. The Government of Burkina and its nongovernmental partners have pledged 20,000 MT to assist the vulnerable populations in areas suffering significant production shortfalls. Almost all of the planned assistance will involve restocking existing cereal banks or the expansion of existing development activities, and all cereal purchases will be made within the country, if possible. Cereals from the banks will be sold to affected populations at subsidized prices, which will be determined by village-level committees. A consortium of NGO's is planning free distributions of 1,500 MT of food to the most vulnerable populations in the these zones.

Although food security in **Chad** is better than average and better than after the 1996/97 season, there are still vulnerable populations in isolated areas across the Sahelian zone (especially in parts of Batha, Ouaddaï, Biltine, and Kanem Prefectures). The Food Aid and Catastrophe Management Action Committee (CASAGC)—which comprises various ministries of the Chadian Government, the European Union-funded early warning system (SAP), FEWS, and other organizations—will meet in late February and early March to decide on the final food aid needs and distribution plans. SAP's preliminary estimate of food aid requirements for the highly vulnerable Sahelian population is 2,300 MT, which national security stocks should cover. The National Cereals Office (ONC) has begun purchasing 10,000 MT for the national security stock; as of mid-January, about 1,500 MT of cereal was secured in its warehouses. ONC also has funds available from last year's food aid sale that can be used to cover food aid transport and loading costs.

Good growing conditions across much of **Mali** during the 1997/98 growing season resulted in a cereal surplus at the national level. Aside from a few areas in Mopti, Tombouctou, and Gao Regions, most Malians should be able to meet their food needs in 1998 without outside assistance. The Early Warning System (SAP) will recommend the distribution of 2,500 MT of emergency assistance from the national security stocks for Tombouctou Region if necessary, and WFP is providing an additional 5,000 MT for Mopti and Gao Regions to cover food needs until the next harvest. Mali's national security stocks as of January were at 19,000 MT, and transfers are under way from stocks in the surplus zones (Ségou Region) to deficit zones (Tombouctou and Gao Regions). The Agricultural Products Office of Mali (OPAM), which manages the national security stocks, will rebuild them to the authorized level of 35,000 MT by the end of March, using locally purchased cereals. Due to the good harvest, the price of millet in February was 10 to 15 percent lower than it had been at the same time during the preceding 2 years. This reduction in prices will help in fulfilling the cereal purchasing requirements for the national security stocks and emergency assistance.

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FEWS Special Report

1998 FEWS Sahel Vulnerability Assessment

February 26, 1998
SR 98-2

Good rainfall and river levels this year (1997/98) provided favorable growing conditions for rain-fed, irrigated, and recessional crops across much of the Sahel. In Chad, Mali, and Niger, cereal production this year was at or above the 1992/93–1996/97 average, and in all countries, rice production was 30 to 80 percent above average.

Production of cotton—an important cash crop in Burkina Faso, Chad, and Mali—also showed a strong increase as farmers continued to expand area planted in response to the high cotton prices that have followed the 1994 devaluation of the CFA franc.

As is often the case, the rains this year were not uniform, especially in the north of this arid region. In parts of each country, the rains were poorly distributed and failed to support adequate crop and pasture development. In Burkina Faso and Mauritania, production losses were large enough to reduce national cereal production levels to 7 and 14 percent below average, respectively. Burkina Faso, Mauritania, and Niger are meeting part of their production deficits by importing cereals from Mali. However, reduced cereal availability in Senegal is exacerbating the production shortfall in Mauritania, and high prices in Nigeria are hindering cereal flows into Niger. Civil insecurity is also interfering with internal cereal flows in Niger.

Accustomed to erratic production, local populations in many of the areas with production shortfalls will rely on assets or alternative sources of income to meet their food needs. Some, however, have little margin to absorb these losses due to successive years of poor production, limited access to alternative income sources, and high cereal prices, which are eroding purchasing power. Just over 4 million Sahelians (10 percent of the population) are food insecure in 1998: approximately 1.7 million are highly food insecure, and approximately 2.4 million are moderately food insecure (figure 1).

Mauritania

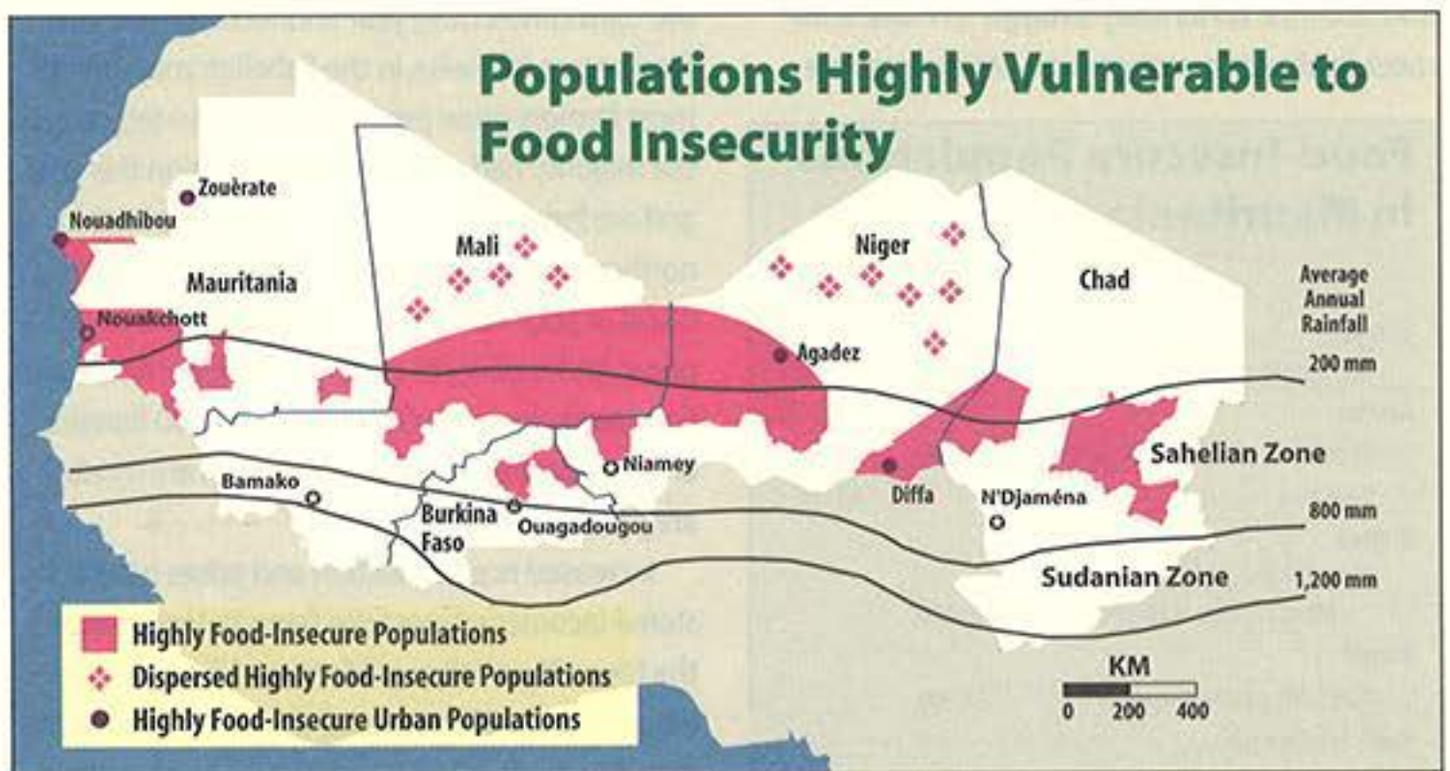
For the second consecutive year, production of millet and sorghum in Mauritania was well below average in most of the zones where *dieri* (rain fed), *walo* (river recessional), and *bas-fonds* (lowland) crops are grown. Production of irrigated rice, in contrast, was 50 percent above average (figure 2). Nationwide, production of all cereals was 14 percent below average. Poor production of cereals in Senegal this year will limit flows into Mauritania's Senegal River Valley Wilayas. In Assaba, Hodh Ech Chargui, and Hodh El Gharbi Wilayas, cereals from Mali are easing supply shortfalls, but many households lack resources to purchase available cereals.

FEWS analysis of vulnerability by socioeconomic group has identified 422,000 farmers, agropastoralists, pastoralists, fishing households, and urban residents as highly food insecure and 179,800 as moderately food insecure (figure 3).

Farmers in Mauritania exploit one or more of five agricultural production systems: *dieri, walo, bas-fonds,* controlled recessional, and irrigated. Farmers' opportunities to combine production systems and thereby to reduce the risk associated with any one system are determined by proximity to suitable land and water sources. The failure of two or more production systems in any one year can spell disaster for farmers who lack significant alternative income sources.

This year, for farmers practicing either pure *dieri* or *bas-fonds* production or a combination of the two, inadequate rainfall and pest damage reduced production in all Wilayas except in northern Hodh El Gharbi. Following a disastrous harvest last year, these farmers are ill equipped to deal with this year's loss, and consequently 95,000 farmers in Assaba, Gorgol, and Hodh Ech Chargui Wilayas are highly food insecure and another 50,000 in central and southern Hodh El Gharbi and Hodh Ech Chargui Wilayas are moderately food insecure.

Farmers in the Senegal River Valley practice the most diversified combination of production activities. This year, only irrigated crops produced well. *Dieri* and *bas-fonds* production suffered from inadequate rainfall, and *walo* yields suffered because fields were not flooded long enough to ensure adequate residual moisture. With reserves depleted after last year's poor harvest, 146,000 farmers in Brakna and Gorgol Wilayas are highly food insecure.



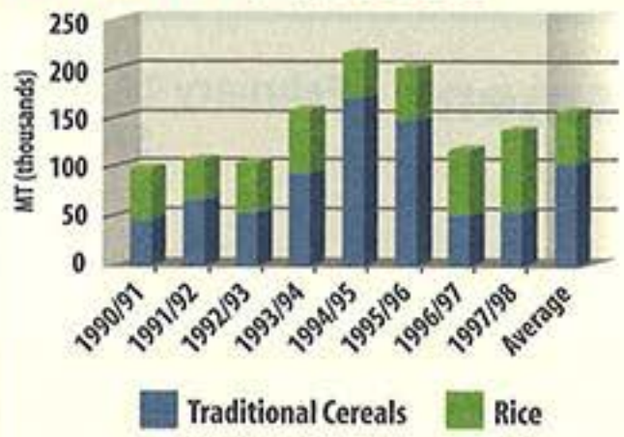
Food-Insecure Sahelians

	Highly Food Insecure		Moderately Food Insecure		
Country	Population Affected	Percentage of National Population	Population Affected	Percentage of National Population	Total National Population
Mauritania	422,000	17	179,800	7	2,489,000
Mali	211,000	2	735,000	8	9,436,000
Burkina Faso	256,000	2	396,000	4	10,840,000
Niger	681,000	7	606,000	6	9,539,000
Chad	93,800	1	522,000	7	7,066,000
Total	1,663,800	4	2,438,800	6	39,370,000

Source: FEWS
FEWS, February 1998

Figure 1

Mauritania—Gross Cereal Production



Sources: Ministry of Rural Development and Environment, FEWS/Mauritania
FEWS, February 1998

Figure 2

Late-season rains in September and October replenished water sources and regenerated pastures, improving pastoral conditions across much of the pastoral zone. Livestock-to-cereal terms of trade are poor because cereal prices are very high, but the good condition of animals and increased milk production partially compensate. Consequently, most pastoralists and agropastoralists are food secure. In Brakna and Trarza Wilayas, however, where pasture conditions are very poor and traditional cereal production was below average for the second consecutive year, 46,000 sedentary pastoralists and agropastoralists are highly food insecure and another 112,000 in Assaba Wilaya and southern Hodh El Gharbi Wilaya are moderately food insecure.

The urban poor of Nouadhibou, Nouakchott, and Zouèrate continually struggle to make ends meet. In all urban centers, high cereal prices are eroding purchasing power. Approximately 135,000 urban residents, including traditional fishermen, are highly food insecure, and another 17,800 are moderately food insecure.

Food-Insecure Populations in Mauritania

Wilaya / Moughataa	Population: Highly Food Insecure	Population: Moderately Food Insecure
Assaba		
Barkèol, Boumdeïd, Guèrou, Kiffa	63,000	
Kankossa		48,000
Brakna		
Aleg, Bababé, Boghé, Magta Lahjar, M'Bagne	136,000	
Gorgol		
Kaëdi, Maghama, Monguel	62,000	
Hodh Ech Chargui		
Bassikounou		5,000
Nema	23,000	
Hodh El Gharbi		
Aïoun, Kobenni, Tintane		109,000
Trarza		
Boutilimit, Ouad Naga	3,000	
Urban Centers		
Nouadhibou	10,000	17,000
Nouakchott	124,000	800
Zouèrate	1,000	
Total	422,000	179,800

Source: FEWS/Mauritania
FEWS, February 1998

Figure 3

Mali

In Mali, national cereal production this year is 9 percent above average. All Regions except Kayes produced average or above-average cereal harvests (figure 4), and the decrease in Kayes Region was due in part to increased area being planted to cotton in Kita Circle. Increased local availability of cereals in structurally deficit zones along with larger-than-average surpluses in Sikasso and Ségou Regions should ensure adequate cereal availability across Mali. Continued peace in the north should facilitate the normal commercial flow of cereals. Cereal prices at the end of 1997 were at almost half their levels during the same period in 1996, making cereals much more accessible.

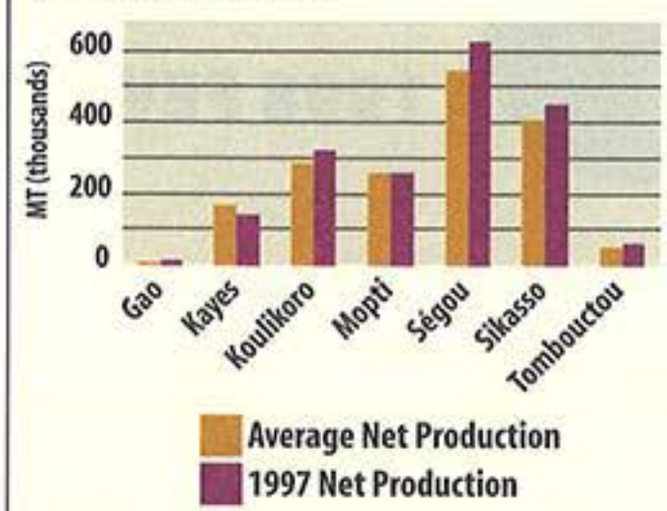
FEWS analysis of vulnerability by socioeconomic group indicates that the majority of rural residents are food secure. However, 213,000 farmers and pastoralists are highly food insecure, and another 735,000 are moderately food insecure (figure 5).

Malian farmers exploit two main agricultural production systems: rain-fed cereal and cash crop production and irrigated and recessional rice production. In the Sudanian zone, rain-fed cereal and cotton production levels were above average for the third consecutive year and most farmers are food secure. Likewise, in the Sahelian zone, where most farmers grow predominantly rain-fed cereals, the majority had good cereal production this year and are food secure. However, cereal harvests in northern Mopti Region were below average because of poor rainfall and pest damage. Low cereal prices and traditional coping strategies should partially compensate for losses, but 263,000 farmers and agropastoralists in Mopti Region are moderately food insecure.

Increased rice production and prices have bolstered incomes of most rice farmers. However, in the Niger River Valley of Mopti and Tombouctou Regions, up to 80 percent of this year's flooded rice crop was washed away or eaten by birds, leaving 150,000 rice farmers who depend exclusively on rice production for most of their annual income highly vulnerable. Another 324,000 farmers and agropastoralists who practice rain-fed and recessional production in addition to irrigated rice production are moderately food insecure.

This is the second consecutive year of good pasture conditions. Reduced civil insecurity in the north in 1997 has allowed pastoralists to exploit available pasture and has enabled private traders to supply markets with cereals from southern Mali.

Mali—Regional Cereal Production



Sources: National Directorate of Agriculture, National Directorate of Statistics and Information, CILSS/FAO
FEWS, February 1998

Figure 4

However, some pastoralists lost large parts of their herds during the past 5 years of civil insecurity, and they require outside assistance to help them rebuild their herds and develop farming and gardening enterprises. Consequently, in Gao, Kidal, and Tombouctou Regions, 63,000 pastoralists are highly food insecure and 148,000 are moderately food insecure.

Fishing is the principal income source of approximately 5 percent of Malians in Koulikoro, Mopti, Ségou, and Tombouctou Regions. With fish catches projected to be average and fish prices

Food-Insecure Populations in Mali

Region / Circle	Population: Highly Food Insecure	Population: Moderately Food Insecure
Gao		
Ansongo	8,000	12,000
Bourem	3,000	9,000
Gao	11,000	27,000
Ménaka	7,000	19,000
Kidal		
Abeïbara	4,000	11,000
Kidal	2,000	5,000
Tessalit	2,000	5,000
Tin-Essako	1,000	3,000
Mopti		
Bandiagara		58,000
Djenné		98,000
Douentza		51,000
Mopti		136,000
Ténenkou	28,000	75,000
Youvarou	15,000	43,000
Tombouctou		
Diré	4,000	18,000
Goundam	72,000	84,000
Gourma-Rharous	4,000	22,000
Niafunké	38,000	46,000
Tombouctou	14,000	13,000
Total	213,000	735,000

Source: FEWS/Mali
FEWS, February 1998

Figure 5

high following the 1994 devaluation of the CFA franc, fishing households are food secure.

This year's harvest-period (October to January) millet prices in urban markets were 31 percent lower than during the same period in 1996/97. Urban households are experiencing an effective increase in their purchasing power and are food secure.

Burkina Faso

Uneven growing conditions this year produced mixed harvest outcomes in Burkina Faso. The east, south, and southwest had good production, with larger-than-average surpluses in most cases, while the center and north had larger-than-average deficits. Overall, Burkina has a 150,000-MT cereal production deficit, compared with an average surplus of 100,000 MT. National average millet prices during the harvest period were 50 percent higher than the 1994/95–1995/96 harvest period average, reflecting reduced availability. An excellent cereal harvest in Mali is helping to mitigate the supply shortfall.

FEWS analysis of vulnerability by socio-economic group has identified 256,000 farmers as highly food insecure and another 396,000 farmers and pastoralists as moderately food insecure (figure 6).

Farmers in Burkina practice mainly rain-fed crop production. The diversity of crops grown varies with the agroclimatic zone. In the Sudanian zone, farmers grow cereals, pulses, tubers, and cash crops, such as cotton and peanuts, whereas in the northern half of the Sahelian zone, they produce mainly millet. Most farmers diversify their incomes through noncrop activities, including livestock raising, artisanal production, and seasonal migration either to the closest urban center or to neighboring countries, such as Côte d'Ivoire.

Food-Insecure Populations in Burkina Faso

Province	Population: Highly Food Insecure	Population: Moderately Food Insecure
Bam	32,000	
Bazega		36,000
Boulkiemdé		28,000
Ganzourgou		41,000
Kadiogo		12,000
Kouritenga		54,000
Namentenga		6,000
Oubritenga		66,000
Oudalan		17,000
Passoré		31,000
Sanguié		18,000
Sanmatenga	131,000	
Séno	93,000	10,000
Soum		58,000
Yatenga		15,000
Zoundweogo		4,000
Total	256,000	396,000

Source: FEWS/Burkina Faso

Figure 6 FEWS, February 1998

In the north-central Provinces of Bam, Oudalan, Sanmatenga, Séno, and Soum , cereal production this year was 25 to 72 percent below average. This is the third consecutive year of poor production for Bam, Séno, and Soum Provinces and the second for Oudalan and Sanmatenga Provinces. In Oudalan and Soum Provinces, the production shortfalls will be mitigated to some extent by access to abundant and affordable cereals coming from Mali; 75,000 farmers in these Provinces are moderately food insecure. In Bam, Sanmatenga, and Séno Provinces, which are farther from supply sources, farmers will not be able to compensate for this year's lost production, and 256,000 are highly food insecure.

In other Provinces in central and northern Burkina that experienced significant production shortfalls, farmers should have adequate savings or access to alternative income sources that will allow them to compensate partially for production losses. However, they will rely heavily on market purchases, and high cereal prices will strain household budgets. Consequently, 311,000 farmers in these Provinces are moderately food insecure.

Pastoralists make up 60 to 75 percent of the populations of the three northern Provinces of Oudalan, Séno, and Soum and are present in much smaller numbers in the Provinces just to the south. Pasture conditions across most of this zone are good this year, and most pastoralists are food secure. In Séno Province, however, the exceptionally poor cereal harvest increased cereal prices and eroded pastoralists' purchasing power, leaving 10,000 moderately food insecure.

FEWS Vulnerability Assessments

FEWS assesses the vulnerability of various socio-economic groups by evaluating the degree of shock associated with the current harvest and interpreting this determination in light of the following factors:

- Past harvest shocks and other income shocks
- Degree of dependence of each group on agricultural production for meeting food needs
- Levels and diversity of other income sources
- Market availability of cereals
- Coping strategies to deal with income shocks

FEWS classifies populations by degree of food insecurity:

- **Extremely food-insecure populations** have depleted their asset base to such a degree that without immediate outside assistance, they will face famine. Appropriate interventions include emergency food distributions and long-term rehabilitation programs.
- **Highly food-insecure populations** cannot meet their food needs during the current year without reducing consumption or drawing down assets to such a degree that they compromise their future food security. Appropriate interventions include nutritional support for vulnerable groups, food for work, income and asset support, and market interventions.
- **Moderately food-insecure populations** can meet their food needs in the current year, but only by drawing down savings or relying heavily on secondary income activities. Should market access or income from secondary activities be compromised, these populations might become highly food insecure in the current year. No interventions are necessary, but positioning of cereals would facilitate market interventions if conditions deteriorate.
- **Food-secure populations** can meet their food needs in the current year without altering normal income activities or depleting savings.

Niger

This year's cereal production in Niger was slightly above average, but population growth continues to outpace production. The national production deficit this year was 151,000 MT—double the average. Cereal production was uneven at the Department level, with larger-than-average surpluses in Maradi and Zinder Departments offset by deficits in the normally surplus Departments of Dosso and Tillabéry and in the normally deficit Departments of Agadez, Diffa, and Tahoua. Nigeria is normally an important source of cereals for Niger, but high cereal prices in Nigeria this year are limiting cereal flow to Niger. In contrast, traders are transporting cereals from Mali to Tillabéry Department, improving cereal availability in that Department.

FEWS analysis of vulnerability by socio-economic group reveals that 681,000 Nigeriens are highly food insecure and another 606,000 are moderately food insecure (figure 7).

The majority of farmers and agropastoralists are food secure in 1998, either because they had average to above-average production (Maradi Department and southern parts of Zinder and Tahoua Departments) or because they can offset below-average cereal production with alternative sources of income (Dosso Department).

However, in Diffa Department, Tchintabaraden Arrondissement (Tahoua Department), southern Agadez Department, and Ouallam Arrondissement (Tillabéry Department), both cereal production and pasture conditions are poor. Even wild foods, which contribute significantly to consumption in times of poor harvests, are scarce this year. In many places, this was the third consecutive year of poor cereal and pasture production, leaving households with depleted assets and limited purchasing power. Although this year's production in Tanout

Food-Insecure Populations in Niger

Department / Arrondissemet	Population: Highly Food Insecure	Population: Moderately Food Insecure
Agadez		
Agadez City	27,000	
Arlit	69,000	
Bilma	6,000	
Tchirozerine	100,000	
Diffa		
Diffa	53,000	
Diffa City	7,000	
Maïné Soroa	87,000	
N'Guigmi	25,000	
Tahoua		
Tchintabaraden, Abalak	85,000	
Tillabery		
Filingué		275,000
Ouallam	156,000	
Say		34,000
Téra		232,000
Zinder		
Gouré		65,000
Tanout	66,000	
Total	681,000	606,000

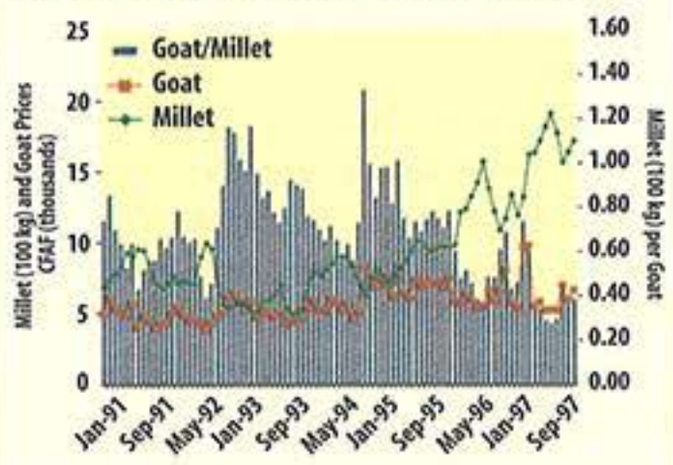
Sources: FEWS/Niger; Ministry of Rural Development, Hydrology, and Environment; National Early Warning System

Figure 7 FEWS, February 1998

Arrondissement (Zinder Department) was slightly above average, the two previous harvests were very poor. With cereal prices at unusually high levels, low goat-to-millet terms of trade (figure 8), and limited alternative income sources, 563,000 farmers and agropastoralists in Tillabéry, Tahoua, Zinder, Diffa, and Agadez Departments are highly food insecure.

Crop production and livestock conditions have also been poor in Filingué, Kollo, Say, and Téra Arrondissements (Tillabéry Department) and in Gouré Arrondissement (Zinder Department), but farmers in these areas can draw on alternative income sources—including remittances from family members in Niamey and coastal West Africa, off-season gardening and irrigated production, and cash-crop production—to compensate at least partially for losses of rain-fed cereal production. Approximately 566,000 farmers and agropastoralists in these arrondissements are moderately food insecure.

Niger—Goat-to-Millet Terms of Trade in Diffa



Sources: Niger Market Information System, Ministry of Rural Development, Hydrology, and Environment

Figure 8 FEWS, February 1998

This year, civil insecurity in the pastoral zones of Agadez, Diffa, Tahoua, and Tillabéry Departments has disrupted cereal flows, hindered herd movements, and halted tourism and development projects. In addition, pasture conditions and water availability are poor across much of the pastoral zone. With livestock-to-cereal terms of trade the lowest since 1991, 83,000 pastoralists are highly food insecure and another 40,000 are moderately food insecure.

In urban areas, stagnant wages and salaries, arrears in the payment of civil servants' salaries, high unemployment, and high cereal prices have made food access difficult. In Agadez and Diffa Departments, insecurity and particularly poor cereal production have compounded the already difficult situation, and 35,000 urban residents are highly food insecure.

Chad

Preliminary production estimates by Chad's Ministry of Agriculture put this year's gross cereal production at 993,320 MT—10 percent higher than average. Estimated rice production registered a 47-percent increase over last year's level and an impressive 80-percent increase over average. Maize production also increased significantly, with the increase coming almost exclusively from the polders of Lake Chad in Lac Prefecture. A shortened growing season and pest damage reduced millet production in the northern parts of Batha, Biltine, Guéra, Kanem, and Ouaddaï Prefectures, with complete crop failure in some areas. Given increased national cereal availability and postharvest cereal prices that are significantly lower than last year's, normal commercial flows from surplus to deficit areas should be adequate to meet most needs.

FEWS analysis of vulnerability by socioeconomic group indicates that the majority of Chadians are food secure in 1998. However, 93,800 farmers are highly food-insecure and another 522,000 are moderately food insecure (figure 9).

This year's growing season was uneven across the Sahelian zone. Rainfall replenished pastures and surface water sources, but the season ended too soon for late-planted crops in the northern parts of the zone (northern Batha, Biltine, Guéra, Kanem, and Ouaddaï Prefectures) to reach maturity. In Abéché Rural Subprefecture, where farmers rely heavily on off-season market gardening of garlic and onions, production of these crops will also be greatly reduced because water table levels this

Food-Insecure Populations in Chad

Prefecture / Subprefecture	Population: Highly Food Insecure	Population: Moderately Food Insecure
Batha		
Djedaa	11,000	11,000
Oum-Hadjer	29,000	63,000
Biltine		
Arada	800	
Guéra		
Mangalmé		22,000
Kanem		
Mao		148,000
Moussoro		60,000
Nokou	34,000	27,000
Ouaddaï		
Abéché Rural		137,000
Am-Dam	19,000	54,000
Total	93,800	522,000

Source: FEWS/Chad

Figure 9 FEWS, February 1998

year are too low to irrigate the crops. Localized cereal production shortfalls will be offset to some extent by increased national cereal production. However, given the cumulative effect of two or three poor seasons in the affected parts of the Sahelian Prefectures, 93,800 farmers are highly food insecure and another 522,000 are moderately food insecure.

In the Sudanian zone, farmers responded to a 20-percent increase in cotton prices in 1997 by increasing area planted to cotton, and production increased 40 percent over last year. With cereal and tuber production at average levels, farmers across the Sudanian zone are food secure.

In the floodplains of Mayo-Kébbi, Salamat, and Tandjilé Prefectures, the polders (depressions between sand dunes) of Lake Chad in Lac Prefecture, and the Lake Fitri area of Batha Prefecture, farmers practice a combination of rain-fed and recessional agriculture. Production of rain-fed crops was well below average, but recessional sorghum and rice production were well above average, making recessional farmers food secure.

Rainfall during this growing season provided favorable pasture and water conditions in most pastoral zones, and problems with livestock diseases were minimal. Cereal prices in 1997 fell following the above-average harvest, and terms of trade shifted to pastoralists' favor. Consequently, pastoralists are food secure.

As many as 300,000 Chadians depend on fishing for a large share of their income. Fish catches are highly correlated with water levels, and water levels in rivers, lakes, and ponds this year are high enough that fish production should be average. Cereal harvests were also good, and fish-to-cereal terms of trade are favorable for fishing households, leaving them food secure.