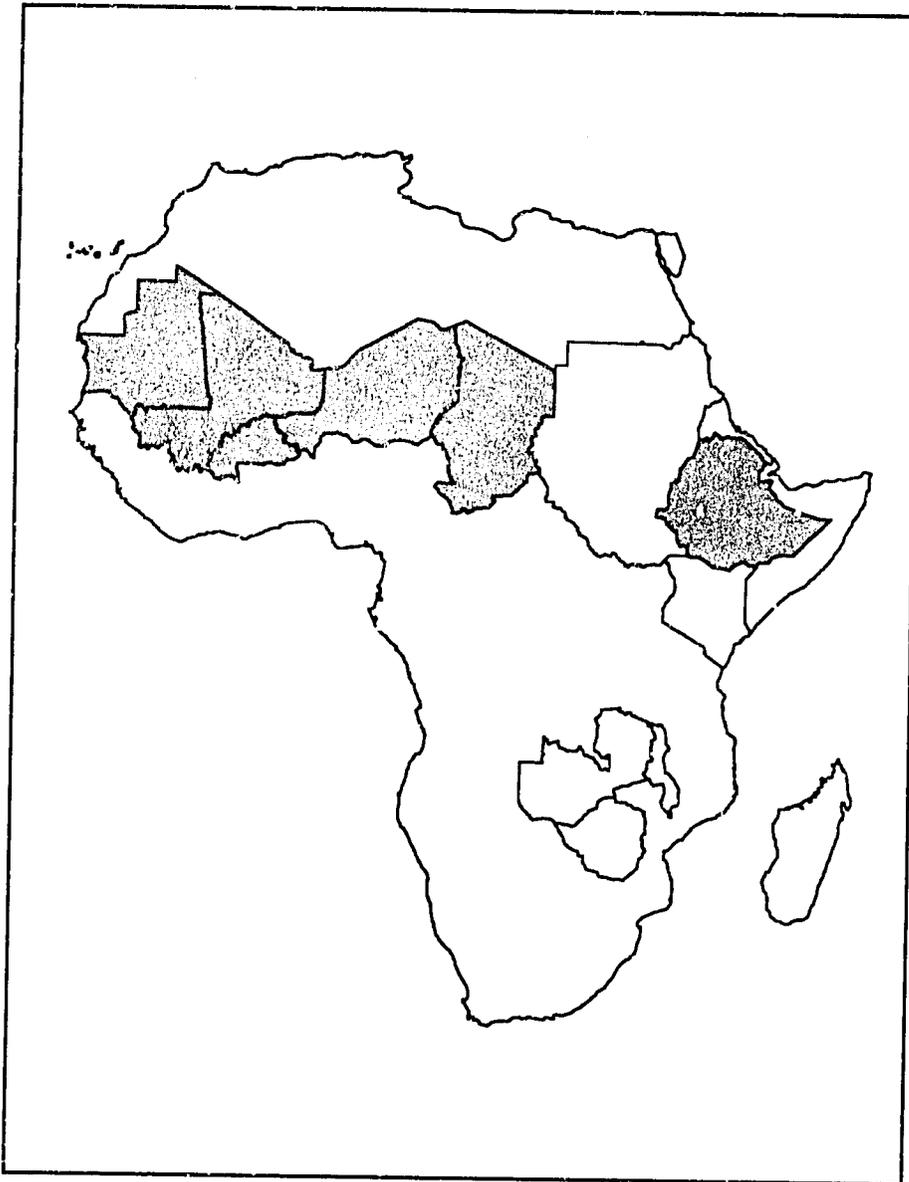


Preharvest Assessment



Contains reports on:

Mauritania

Mali

Burkina

Niger

Chad

Ethiopia

Preharvest Assessment

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Executive Summary

MAURITANIA

Better than average rains have been recorded in much of the south and east of Mauritania resulting in good pasture conditions and improved prospects for *dieri* (rainfed) and *bas-fonds* (lowland) agriculture in many areas. Citizens in Gorgol, Brakna, and the two Hodhs say they expect harvests this year to be better than those of the last few years. Infestations of Desert Locusts in Tagant, Assaba, and northern Brakna *wilayas* (regions), and grasshoppers in Trarza and Gorgol pose a serious threat to pasture and crop lands.

MALI

The late start to the agricultural season has been compensated for by adequate and timely rainfall in July and August, resulting in satisfactory harvest prospects across most of Mali. Good harvest prospects depend on additional heavy rain before the end of September. In Mopti and Ségou, a serious blister beetle infestation and a growing population of grain-eating birds must be controlled for harvest prospects to remain positive. Reduced security problems and civil strife in the northern parts of Kayes, Koulikoro, Ségou, and Mopti regions, and in Tombouctou, Gao, and Kidal regions, resulted in improved food security for local populations.

BURKINA

National cereal production will be above average and emergency food aid will not be necessary during 1994. A cereal production surplus estimated at 375,000 MT (20 percent of the 1.86 million ton consumption requirement) will assure that large quantities of inexpensive cereal will be available nationally. Small areas of crop failure will require targeted assistance by the Government of Burkina.

NIGER

Projections indicate national cereal production may meet national consumption requirements, but a majority of departments and as many as 11 agricultural arrondissements could suffer from severe production deficits. Poor pasture prospects and ongoing civil strife will negatively affect food security in several agropastoral and pastoral areas. Over 1.1 million people could be moderately or highly vulnerable, and require emergency food assistance in 1994.

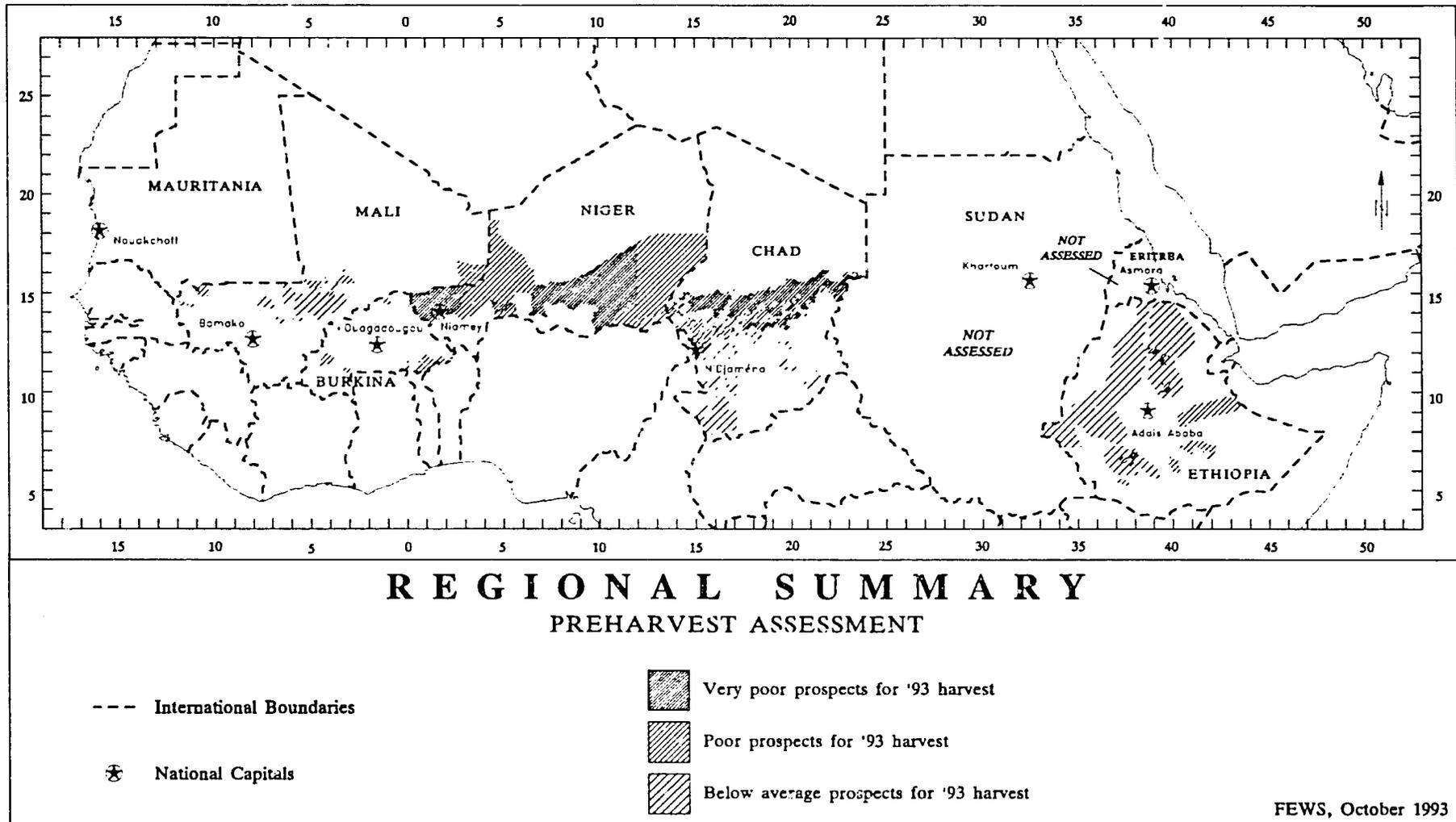
CHAD

Mediocre harvest prospects in the Sahelian zone are the result of irregular climatic conditions and crop pest attacks. Following two good harvests market cereal supply is good and prices remain low, indicating adequate commercial and farm stocks. Local stocks will cover some production shortfalls but food assistance, using locally purchased grains, will be required in some Sahelian regions during 1994.

ETHIOPIA

Ethiopia's harvest depends on the season's last few weeks of rain (mid-September—mid-October). Based on a comparison of trends over the previous three years an average harvest is projected. There are significant regional variations and some food-stressed areas. Ethiopia is burdened with a chronic food deficit and will still need targeted program food aid. No major emergency food aid needs are foreseen for 1994.

Map 1. Regional Summary: Preharvest Assessment



FEWS REGION

Decent Harvest Expected in Most Areas

From Mauritania to Chad, the early start to the 1993 rainy season in southern (Sudanian) areas was followed by a dry spell in June that translated into a late start-of-season in more northern (Sahelian) areas. The rains resumed in July and have continued into September. The outcome of this pattern should be average and above-average harvests in Burkina, southern Mali, and southern Chad. However, there is also concern whether rains will last long enough to allow for a decent harvest in Niger, Sahelian Chad, and Sahelian Mali.

Even with longer rains, people in the north of Sahelian Chad and Niger are expecting poor harvests (see Map 1). Satellite-derived vegetation imagery (NDVI—see Key Terms) suggests that patterns seen in eastern Chad extend into western Sudan (Northern Darfur and Northern Kordofan).

While the start of rains was late in Mauritania, the rains have been heavy enough for officials there to expect a decent harvest. Conditions in Mauritania are usually harsh—in a good year, local production generally meets about one-third of the annual food cereal needs (the expected situation for 1993/94).

As in the Sahel, the strength of the main (*meher*) season harvest in Ethiopia depends on the continuation of rains through

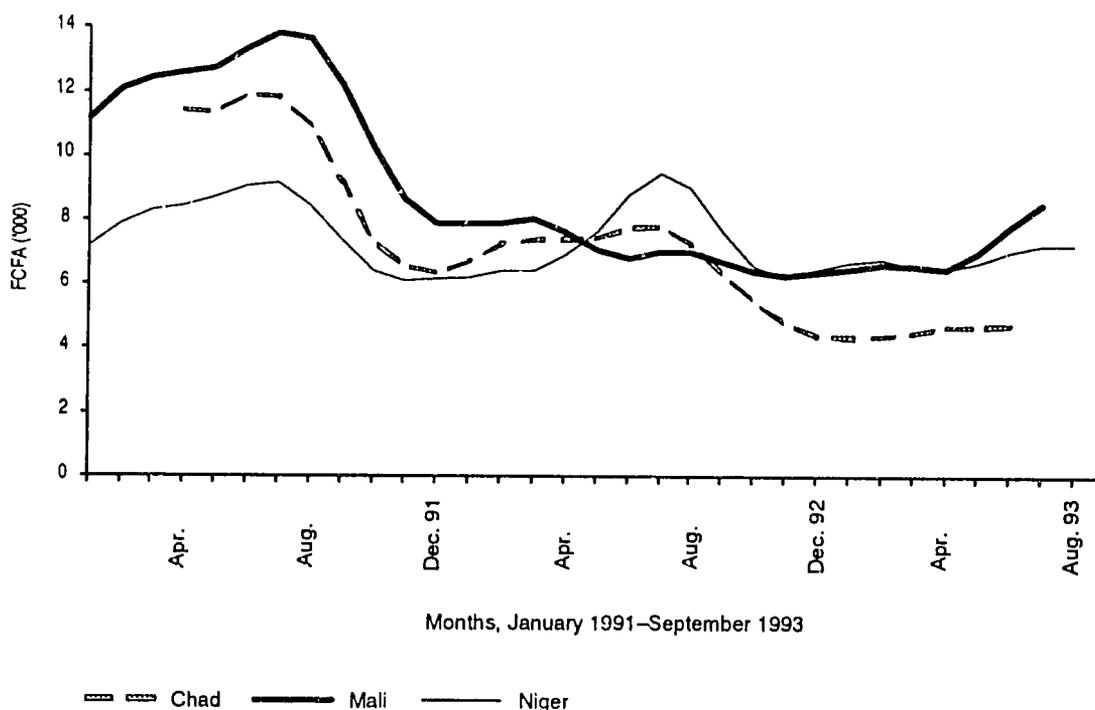
the end of September (there are two growing seasons per year in Ethiopia). If the rains continue, the main harvest should be about average, with regional variations—1993 has seen drought in the east and excessive precipitation in the west. The earlier, secondary (*belg*) season produced an average harvest and contained areas of crop failure and reduced planting.

Another important feature of the 1993/4 season is potential losses from crop pest attacks. In February and March, well before the start of the growing season, severe outbreaks of Desert and African Migratory locusts in the Horn and the Arabian Peninsula, prompted substantial control efforts in affected areas except for northern Somalia.

Locust swarms escaped to western Sudan in May and June and from there into the mountainous desert areas of Chad, Niger, and Mali but appear not to have spread further in the Sahel.

The more recent outbreak of Desert Locusts in Mauritania may yet effect the harvest outcome, given its timing—locusts (and grasshoppers) prefer green, growing grass. As long as grasslands remain green, these pests tend to stay away from crops. Once the rainy season ends and grasses begin to dry, locusts and grasshoppers, if present, could attack the crops, which gen-

Figure 1. FEWS Region: Chad, Mali, Niger, millet prices January 1991–August 1993



Sources: Chad/SAP and SIM, Mali/SIM, Niger/OPVN/SIM

erally stay green longer than the pasture lands.

Other crop pests are reported in unusually large numbers in Ethiopia, Chad, and Mali and are currently damaging crops. Among the pests cited in one or another of these countries are grasshoppers, armyworms, stem borers, caterpillars, blister beetles and grain-eating birds. These pests are always present in the Sahel and Horn. Whether the amount of damage done by pests this year has a greater than usual affect on the harvest outcome remains to be seen, and depends in part on whether national crop protection services are able to mount adequate control efforts.

Cereal Prices

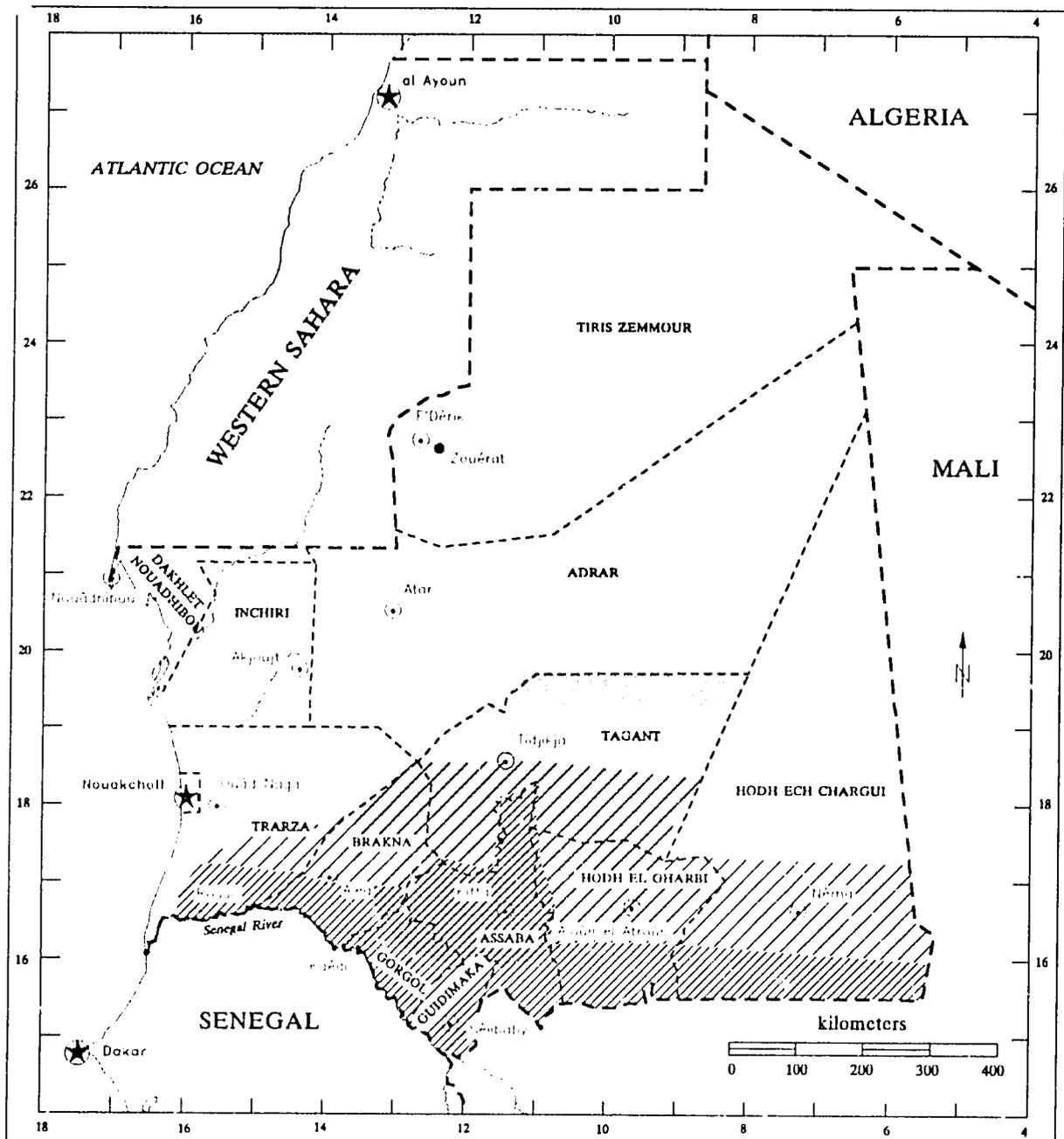
Chad, Niger and Mali, which all use French West African Francs (FCFA) as their currency, show different patterns in cereal prices (see Figure 1). In Chad, the overall lower prices of 1993 compared to the previous two years are due to the presence of on-hand stocks following two excellent harvests (1991/92 and 1992/93). This year's potentially mediocre harvest will probably not effect prices until the 1994 rainy season.

In Niger, unlike Mali and Chad, 1992 millet prices were higher than they were in 1991. Current prices are lower than in either 1991 or 1992. As in Chad, 1993 prices may be remaining low in Niger because of stocks held over from the past two years. Active trade across Niger's almost 1,000 mile border with Nigeria is a confounding factor in this picture, especially given recent changes in the exchange rate between FCFA and the Nigerian naira.

In Mali, the trend in millet prices was similar to that of Chad for 1991 and 1992, but, unlike Niger or Chad, 1993 millet prices rose above 1992 levels. The subsequent trend for 1993 is puzzling, given Mali's 1992/93 harvest was above average and its 1993/94 harvest is also expected to be above average. At the same time, the pattern seen in 1992 is unusual. Sahelian cereal prices usually rise during the rainy season and then fall just before and after harvest—there appears to have been no such peak in Mali in 1992. Factors other than domestic cereal production and available stocks possibly had a much stronger influence over the past two years than is usual.

- 5 -

Map 2. Mauritania: Preharvest Assessment Summary



MAURITANIA

PREHARVEST ASSESSMENT SUMMARY

- International Boundary
- Wilaya Boundary
- ★ National Capital
- ⊙ Wilaya Capital
- Cities and Towns
- Intermittent Drainage
- Good pasture conditions
- Average pasture conditions
- Area of Desert Locust infestation

Source: FEWS/Mauritania
FEWS, October 1993

MAURITANIA

Agricultural Zone Receives Above-average Rainfall—Desert Locusts and Grasshoppers Pose Crop Threat

Based on a report released by US Embassy/Mauritania on September 16, 1993

SUMMARY

With few exceptions, rainfall has been above-average in most of the south and east of Mauritania. Many farmers planted very late, having grown accustomed to the past few years of very poor rainfall, but feel this year's harvest will exceed the 1992 harvest. Ministry of Rural Development (MRD) personnel say they expect better irrigated crop yields, due in part to the earlier availability of agricultural loans this year (at the beginning of August), allowing for earlier season start-up. NDVI satellite imagery (see Key Terms) indicates vegetative growth in much of the south and east of the country is more advanced than last year and the ten year average; field visits confirm these conclusions.

In Tagant and Assaba, there is a "generalized" infestation of Desert Locusts (see Map 2). Infestations are also reported in northern Brakna, Gorgol and Hodh el Gharbi. There are infestations of grasshoppers in Guidimaka and Trarza. The MRD has prospecting and treatment teams in the field but report shortages of personnel and materials, especially pesticides.

areas of the wilaya (Monguel and M'Bout). Very few farmers have been forced to replant, an indication that rainfall amounts have been adequate and well spaced. Maghama has registered 398mm of rain thus far, compared to 137 mm during the same period last year. Millet and sorghum plants are in the tillering stage and are heading-out in Maghama and M'Bout moughataas (departments). Rice transplanting has begun.

In Assaba, the regional MRD delegate in Kiffa reported pasture and crop conditions were better this year than in 1988 (considered a good year). Unfortunately, abundant rainfall and vegetation are favorable conditions for locusts. Infestations in the wilaya threaten crops. Sorghum plants are in the height growth stage but are not yet heading. The cowpea crop is at the advanced growth—flowering stage.

Rainfall has been variable in Guidimaka. Selibaby, capital of the wilaya, has already registered over 435 mm of rain in 20 days of rainfall. Farmers in Selibaby Moughataa describe ponds which have risen to overflowing for the first time in 20–25 years. In the southern part of the moughataa (Gouraye and Ghabou), rains have been below average including a 16 day break in precipitation during the second half of August.

In Hodh ech Chargui, precipitation has been below average in Nema Moughataa. The Regional Director of Agriculture reported that area sown increased throughout the wilaya this year. There were long periods without rain in the wilaya in August (from 19 to 30 days) that will affect millet yields (millet makes up around 70 percent of approximately 60,000 hectares of agricultural land). Since the beginning of September, rains have been more regular.

In Hodh el Gharbi, rainfall in the southwest areas of Tintane and Touil have been below average, but above average in Kobenni.

FACTORS AFFECTING FOOD AVAILABILITY

Agricultural conditions

Currently, no crop production data is available from the Department of Agricultural Statistics. Initial harvest forecasts are expected in November. The MRD's agricultural production objective is 127,000 MT.

Rainfed agriculture (*dieri*)

Rainfall through the first dekad (ten-day period) of September has been adequate for crop development in much of the principal agricultural areas of the country (in central and southern Gorgol, in parts of Guidimaka, southern Assaba and in parts of the two Hodhs) raising expectations of an improved rainfed harvest.

In Brakna rains began very late. Although precipitation has been steady since mid-August, *dieri* yields will likely be adversely affected barring an extraordinary extension of the rainy season into October.

In Gorgol, a regional agricultural official reported that precipitation levels have exceeded last year's in the main *dieri*

Irrigated agriculture

The Trarza regional MRD delegate described the infestation of grasshoppers in the wilaya as being the worst he has seen in twenty-five years and posing a serious threat to the region's irrigated rice crop. 20,000 hectares of pasture land are infested and irrigated fields are threatened. The Government of the Islamic Republic of Mauritania (GIRM) has invested over 550 million ouguiyas (US\$ 4.5 million) in agricultural loans for the estimated 11-12 thousand hectares under cultivation. Again, loans were made available to farmers more promptly this year, allowing for earlier start-up. Yields for rice and traditional cereal crops should be greater than last year barring losses from pests.

Flood recessional agriculture (*walo*)

Farmers in Brakna and Gorgol complain that river levels have not permitted a start to the *walo* season. The local MRD delegate in Rosso said members of the OMVS (l'Organisation pour la mise en valeur du fleuve Sénégal) are planning 21 days of water releases from the Manantali Dam in Mali, before the end of November. There will be four days at 2,500 m³ per second, followed by 17 days at 1,600 m³ per second.

Optimally, flooding of *walo* lands takes place in August, allowing soils to store sufficient quantities of water as well as permitting the deposit of a silt layer. After the releases, *walo* prospects could improve.

Depression agriculture (*bas-fonds*)

Many ponds and dams are full of water in Brakna, Gorgol, Guidimaka, and the two Hodhs. Rainfall has been steady since the beginning of August in the southern Brakna *moughataas* of Boghe, Bababe, and M'Bagne, increasing the potential for a good *bas-fonds* crop. In Hodh ech Chargui, rains have been below average in Nema Moughataa, suggesting that *bas-fonds* harvests will be affected in that area.

Décrue SONADER

According to SONADER (a large agricultural parastatal), 5,500 hectares have been cultivated at R'Kiz. No information was available for Achram (see Map 3).

Pastoral conditions

Field trips to Brakna, Gorgol, Assaba, Hodh el Gharbi and Hodh ech Chargui confirmed satellite imagery (NDVI) which suggested good biomass development in much of the south and east of the country. The exceptions to this trend were the north-east part of Boutilimit Moughataa in Trarza, Magta-Lahjar Moughataa and western Bababe in Brakna, northwestern Assaba, the northern part of Aïoun Moughataa, Hodh el Gharbi and Nema Moughataa in Hodh ech Chargui.

Good pasture conditions elsewhere have permitted pastoralists to begin returning north, relieving grazing pressure on pastures in southern *wilayas*, and especially around the Senegal River Valley.

Table 1. Mauritania: Agricultural production estimates for 1993/94 ('000 MT)

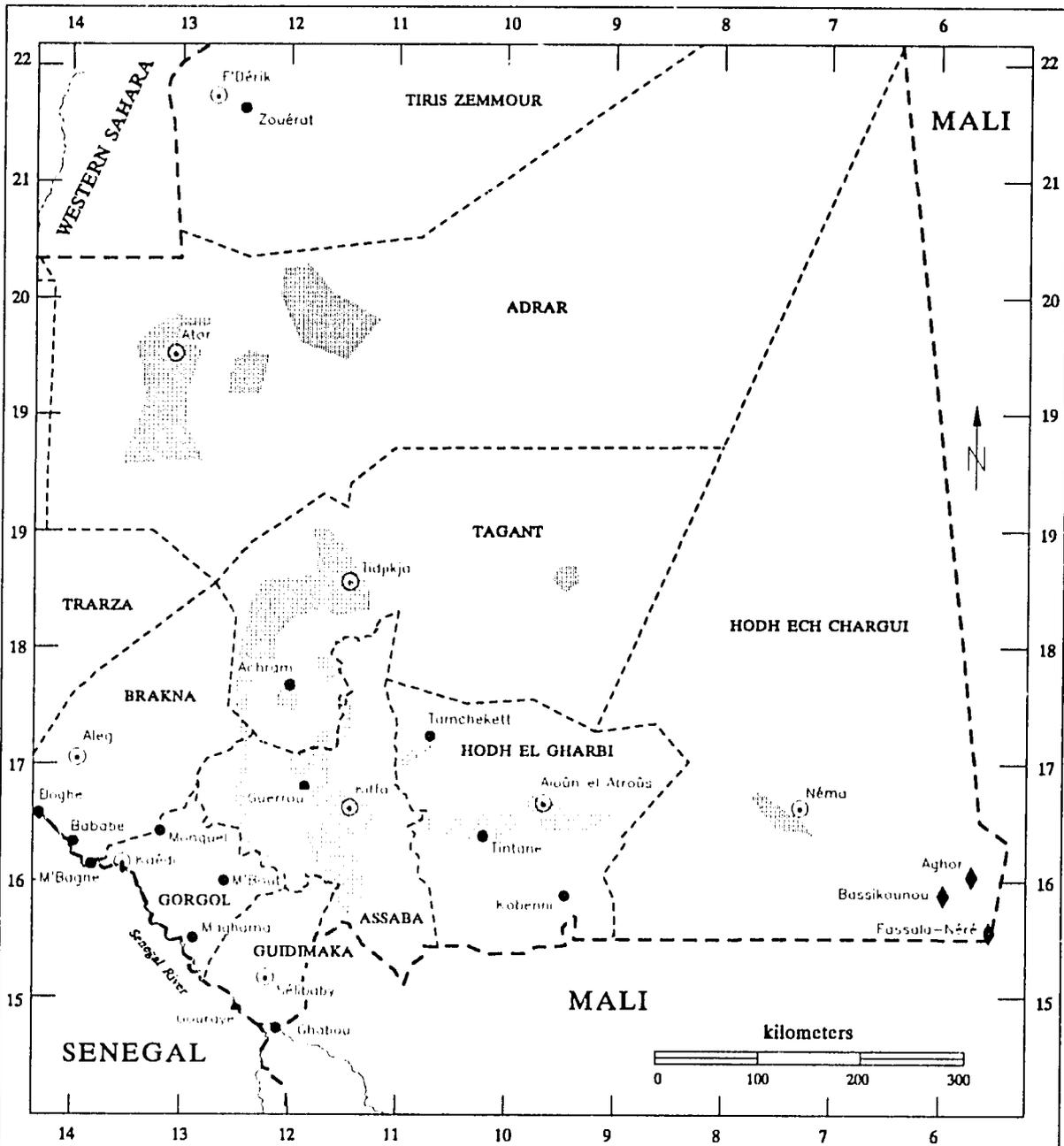
Wilaya	Dieri	Walo	Bas-fonds	Décrue SONADER	Traditional Irrigation SONADER	Rice Irrigation SONADER*	Total gross production by Wilaya	Total net production by Wilaya
Hodh ech Chargui	15,993	0	5,870	0	0	0	21,863	18,584
Hodh el Gharbi	6,624	0	12,828	0	0	0	19,452	16,534
Assaba	2,229	0	312	0	0	0	2,541	2,160
Gorgol	6,487	6,442	721	0	1,305	2,351	17,306	14,122
Brakna	2,232	1,034	18,861	0	466	1,092	23,685	19,859
Trarza	0	1,680	0	5,610	0	36,000	43,290	27,797
Guidimaka	8,890	0	13	0	166	381	9,450	7,937
Tagant	0	0	0	4,342	0	0	4,342	3,691
Total (Gross)	42,455	9,156	38,605	9,952	1,937	39,824	141,929	
Total (Net)	36,087	7,783	32,814	8,459	1,646	23,894		110,684

Notes: * Private Irrigation (rice) estimates were supplied by the MDR Trarza delegate, and account for 27,150 MT of the total.

1. Dieri, *walo*, and traditional irrigation areas normally yield coarse grains i.e., maize, sorghum, and wheat.
2. Décrue SONADER = Flood recessional farming away from the Senegal River, with financial assistance from the agricultural parastatal SONADER.
3. Estimates for *dieri* were produced by AGRHYMET based on a consideration of this year's rains, their spacing, and planting dates in comparison to past years.
4. Estimates for *walo* harvests were made by adjusting the *walo* harvest of last year—due to the late flooding of the Senegal river last years totals have been reduced by 20 percent.
5. Estimates for *bas-fonds* harvests were based on a comparison of 1988 (a good year) rainfall to 1993 levels. Totals were adjusted up (Hodh ech Chargui) or down (Brakna) where 1993 rainfall varied significantly from 1988 levels.
6. Estimates for SONADER irrigated production were provided by SONADER.

Sources: FEWS/Mauritania, SONADER, AGRHYMET (Regional Center for Training and Applied Agrometeorology and Hydrology Operations), Mauritanian Department of Agricultural Statistics.

Map 3. Mauritania: Reference Map



MAURITANIA

REFERENCE MAP

- International Boundary
- Wilaya Boundary
- ★ National Capital
- ⊙ Wilaya Capital
- Cities and Towns
- - - - Intermittent Drainage
- [Stippled Area] Area containing oases (date palms)
- ◆ Refugee camp



FEWS, October 1993

Table 2. Mauritania: Provisional 1993/94 cereal production by wilaya ('000 MT)

Wilaya	1994 population	Cereal needs	Net production	Balance	Percent of needs met
Hodh ech Chargui	220,113	36,319	18,583	-17,735	51
Hodh el Gharbi	171,918	28,366	16,534	-11,832	58
Assaba	186,297	30,739	2,160	-28,579	7
Gorgol	201,129	33,186	14,122	-19,064	43
Brakna	220,299	36,349	19,859	-16,490	55
Trarza	274,764	45,336	27,797	-17,539	61
Guidimaka	131,372	21,676	7,937	-13,739	37
Tagant	77,877	12,850	3,691	-9,159	29
Adrar	72,361	11,940	0	-11,940	0
Inchiri	16,273	2,685	0	-2,685	0
Nouadhibou	71,610	11,816	0	-11,816	0
Tiris Zemmour	40,268	6,644	0	-6,644	0
Nouakchott	462,879	76,375	0	-76,375	0
Total	2,147,160	354,281	110,684	-243,597	31
Refugees	42,000	6,930	0	-6,930	0

Note: Population figures were extrapolated from 1987 census data.

Pests

The first Desert Locust sightings were reported in mid-July in Tagant. Current MRD reports describe infestations in Tagant and Assaba as being "generalized" with pockets of activity around Magta-Lahjar in Brakna, Tamchekett in Hodh el Gharbi, and northern Monguel in Gorgol (see Maps 2-3 for locations).

During a September 11 field trip, several large swarms were sighted between Guerrou and Achram (in Tagant and Assaba), flying from the north and heading south. In Hodh ech Chargui, non-swarving locusts have been sighted along the Malian border.

Locust infestations are thought to be of local origin. AGRHYMET reports that winds are not yet favorable for carrying locusts in Mali and Niger into Mauritania. At least 27,000 hectares have been treated with larvicide and insecticide. MRD representatives reported that shortages of materials and insufficient personnel hinder prospecting and treatment operations. Due to these limitations, the extent of the locust problem is not yet understood.

Aerial spraying is scheduled to begin September 15. The FAO is supplying a helicopter for control operations. Two additional airplanes for spraying are scheduled to arrive September 27. MRD personnel have expressed fears that there would not be adequate liquid pesticide available for use in aerial and ground spraying. Available pesticide stocks will run out by September 30.

The preoccupation with the Desert Locust control efforts has obscured to some extent the threat posed by infestations of grasshoppers which have been reported in Kankossa Moughataa in Assaba, in Djiguenni Moughataa in Hodh ech Chargui, and in Bousteila in Timbedra Moughataa. MRD reports from Trarza say

that 20,000 hectares, mainly pasture land in Boucreiva, Lexciba, Glewiti, and Oum el Khairat, are infested with grasshoppers.

Food stocks and food flows

Any household stocks of note have been exhausted. As of August 9, 26,308 MT of cereal (food aid) had arrived in Mauritania and an additional 49,998 MT were expected or pledged. Of the 76,296 MT total, 40,950 MT are to be sold and the remainder (35,346 MT) will be distributed without charge. The Food Security Commission (CSA) reports total national stocks of 3,839 MT, of which nearly 50 percent have been declared spoiled. Total commercial imports for 1992/1993 are estimated to be 133,443 MT. Data on commercial imports and food aid for 1993/94 are not yet available.

FACTORS AFFECTING FOOD ACCESS

Projected food consumption needs

Although it is still very early to predict harvest totals with any precision an, estimation of the country's production deficit is presented in Table 2. The estimated net global cereal production for 1993/94 is 110,684 MT. The total cereal needs, calculated by multiplying 165 kg per person per annum by the total population, is equal to 361,211 MT. This leaves a production deficit of 250,527 MT.

Economic data

Cereal prices in Nouakchott remain high and prices of meat and fish have been rising over the past several months. In most of the interior, only imported cereals are available in the markets (wheat and rice).

After four consecutive years of poor harvests, vulnerability is high in the countryside and the cities. The devaluation of the ouguiya by 42 percent in December 1992, has decreased the purchasing power of the Mauritanian population, though the majority of food and common household items are imported.

VULNERABILITY UPDATE

The *guetna* (date harvest) which took place in July and August provided some relief to vulnerable populations in the Adrar and Tagant. The 1993 *guetna* was below average in many areas of Adrar and Tagant (see Map 3 for oasis locations). Even an extraordinary harvest of dates would not relieve the high vulnerability and malnutrition levels which exist in those *wilayas*.

The populations of the Tagant and Adrar remain highly vulnerable. Pasture quality improvements will allow animals to return to the *wilaya* in greater numbers and should make the population only moderately vulnerable.

The highly vulnerable condition of agropastoralists and pastoralists in parts of the *wilayas* of Trarza, Brakna, Gorgol and Assaba should improve as pasture conditions improve. Good *dieri*, *bas-fonds*, *walo* and irrigated crop harvest are essential to alter present conditions. There continue to be food shortages in many of these areas as the hungry season continues.

The agricultural director of Gorgol and the *hakem* (chief administrative officer) of Maghama emphasized that populations of Monguel and Maghama *moughataas* are in a very

“precarious” situation regarding food availability. The *hakem* has said that only 50 of 200 MT of grain promised for distribution in Maghama has been delivered by the CSA. In Monguel as well, the local agricultural director reported only receiving 50 of a promised 200 MT of grain.

The condition of nomadic pastoralists should improve as pasture lands continue to develop. Many will return to the north with their animals. As they move with their animals, stress on pastures in the southern *wilayas*, where heavy concentrations of livestock have grazed for the past six months, will decrease.

The estimated 42,000 Malian refugees in camps in the extreme southeast corner of the country are said to have adequate supplies of food. Some refugees are reported to have begun to return to Mali. At the conclusion of the rainy season, more are likely to follow.

As the concentration of animals gradually decreases along the Senegal River, trampling of crops should decrease and harvest prospects will be enhanced. Food, especially grains, are still scarce, leaving a significant number of people highly vulnerable.

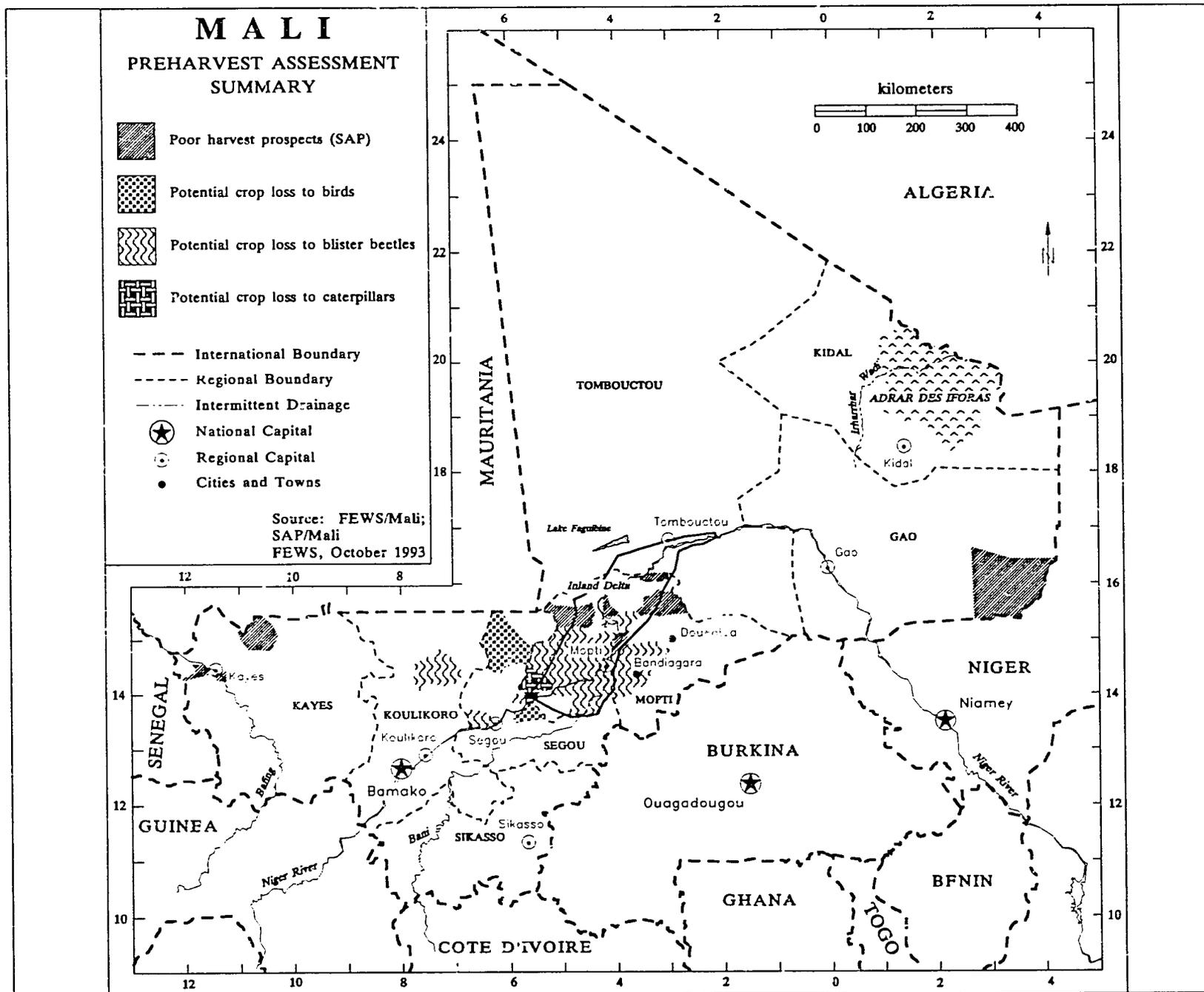
CONCLUSION

Despite relatively good rains across much of the agricultural area of the country, estimated production of only 111,000 MT, leaves a production deficit of over 250,000 MT (before commercial imports and food aid).

The actual harvest predictions will vary depending on:

- whether or not Desert Locusts and grasshoppers reach the major farming areas;
- continuation of rains through the end of September; and
- adequate Senegal River flood levels—allowing a successful *walo* crop.

Map 4. Mali: Preharvest Assessment Summary



MALI

1993/94 Harvest Outlook is Satisfactory Despite Late Start of Season

Based on a report released by USAID/Mali on September 17, 1993

SUMMARY

The late start of the agricultural season has been compensated for by adequate and timely rainfall in July and August. This has resulted in good harvest prospects across Mali, providing the rains continue through the end of September. Farmers and the Crop Protection Service also need to control the serious blister beetle infestation in Mopti Region, and increasing grain-eating bird populations in Ségou Region (see Map 4). Since September 2, conditions in most zones of Mopti and Ségou regions have been dry; precipitation over the next ten-day period is vital for the current outlook to remain positive.

Available numeric and qualitative estimates of area planted in cereal crops at the end of August indicate an increase over the same time last year. All zones except those in the south also show area planted is greater than in 1991, an excellent agricultural season.

In the northern parts of Kayes, Koulikoro, Ségou, and Mopti regions, and in Tombouctou, Gao, and Kidal regions, reduced civil strife and insecurity have allowed merchants, farmers and herders to return to productive activities. Relief agencies are also now able to help returning refugees.

FACTORS AFFECTING FOOD AVAILABILITY

Agricultural conditions

Rainfall

The 1993 rainy season got off to a late start in many agricultural zones in Mali. This late start, especially in Sikasso Region (see Table 3), set the planting calendar back. In many areas where planting is normally completed by the end of July, farmers continued to plant into August. At the end of August, cumulative rainfall was at least 80 percent of normal at all reporting stations except Kayes and Tessalit.

In general, rainfall in July and August was adequately timed and spatially well distributed. This resulted in satisfactory crop conditions throughout most agricultural zones. The two exceptions are Kayes Cercle (Kayes Region), where it is anticipated that the reduced area planted will result in a production shortfall, and in localized areas of Macina and Niono cercles (Ségou Region), where millet and sorghum production may also be reduced because rainfall was not adequate in August.

Based on its network of rainfall stations and field reports, the Malian Early Warning System (SAP) has identified several

Table 3. Mali: Cumulative rainfall: June, July, August, September
(Percent of the 1961-1990 average)

Station	June 30	July 31	August 31	September 10
Bamako-Sénéou	136	87	91	95
Bamako-ville	100	92	87	80
Bougouni	58	82	89	85
Gao	54	78	106	109
Katibougou	73	70	88	83
Kayes	36	34	56	63
Kidal	29	141	93	118
Kita	50	—	100	96
Koutiala	61	68	83	79
Menaka	86	152	114	110
Mopti	16	65	81	76
Nara	—	62	88	99
Nioro	127	118	114	119
San	82	98	93	87
Ségou	115	87	100	94
Sikasso	68	94	91	94
Tessalit	—	10	51	76
Tombouctou	182	195	146	147

Notes: 1. Dekad = 10 day period.

2. Cumulative averages from the first dekad of May through the end of each month (1st dekad only in September).

Source: Malian Meteorological Service

cercles and arrondissements as having a poor agricultural season to date (see Map 4).

Rainfall through mid-September in Mopti, Ségou, and Sikasso regions has been very poor and erratic. Good harvest prospects in the Mopti and Ségou regions depend on the resumption of rainfall in late September. Reported production estimates for Mopti and Ségou are valid only if precipitation continues through the end of September.

Vegetation index

Start-of-season analysis of NDVI (see Key Terms) corroborates the rainfall data, showing that in almost all agricultural zones planting was one to two dekads (10-20 days) behind average. The zones showing the greatest delay were the southwestern zones Kita and southern Koulikoro; Kayes Cercle, where the season was two dekads behind the 10-year average; and southern Sikasso, where the season start was up to 4 dekads behind the average (see Figure 2).

NDVI analyses confirm the satisfactory recovery in most agricultural zones following July and August rainfall. The third dekad of August NDVI values show average or above-average conditions for most areas. Notable exceptions exist in the *cercles* of Macina, Niono (Ségou Region), Tenenkou (Mopti Region), the southern parts of the *cercles* of Bafoulabe and Kita (Kayes Region), and in the far western areas of Menaka Cercle (Gao Region).

Pests

Until the end of August, reports of pest infestations and damage to crops were very limited. In early September the Crop Protection service in Mopti reported a generalized blister beetle infestation. In Ségou and Koulikoro regions (Farako, Macina, Niono, Mourdiah, Nara, Banamba, Kolokani) there have also been reports of limited blister beetle infestations. Dry conditions through the first dekad of September brought insects from areas of natural vegetation into farmers' fields, just as the plants were heading and very susceptible to attack.

In some fields in Mopti Region, densities were reported at 1 to 5 insects per millet/sorghum pocket, which is very high. Farmers and crop protection personnel are treating infested fields. Crop losses will depend on the effectiveness of control efforts.

Another concern is the swelling population of grain eating birds in Ségou Region. Farmers and crop protection personnel have inadequate supplies and equipment to deal with this problem because donor support for bird control efforts has dwindled. If the bird populations are not brought under control there could be serious losses of rice, millet, and sorghum crops.

Grasshopper damage to crops is expected to be minimal this year and the extent of the locust threat is not yet determined.

Crop protection reconnaissance teams (funded by USAID Title III counterpart funds) have been in the field since early September. Their September 1-13 report confirmed low densities of mature locusts and larvae at various locations in traditional locust breeding grounds in northern Mali, and very high densities (100 to 200 insects or larvae per square meter) in the Irharrhar Wadi in the western Adrar des Iforas. Ecological conditions continue to favor locust reproduction.

Cereal Production Estimates

The maize crop has reached maturity. Higher river levels should contribute to irrigated rice crop production. Rainfall dependent crops including millet, sorghum, and rainfed rice tracts all require additional rain to reach maturity. Tentative

production estimates (based on Rural Development (ODR) and Regional Agricultural Service (DRA) area-planted reports) are based on the continuation of rains through September and effective control of pest infestations and attacks are shown in Table 4.

Historically, ODR/DRA reports account for 75 percent of actual production. The calculated production figure of 1,544,172 MT has been adjusted by a factor of 1.33 to reflect total estimated cereal production. Estimates of area planted (see Table 4) could not be obtained for all rural development offices and regional agricultural offices for the same reference period. Instead, data for either July 31, August 21, or August 31, are presented. In general, the end-of-July data (ODI Kaarta, Koulikoro DRA, CMDT, Mopti DRA), for areas and total production will be adjusted upward, thus increasing the total production figures for Mali.

The National Agriculture Direction's (DNA) qualitative estimates put this year's area planted as being higher than in both 1991 and 1992. This would translate into a national cereal production figure of at least last year's 2,153,000 MT.

No area-planted data are available for the regions of Tombouctou and Gao. The production estimates above (see Table 4) are based on historic averages of cereal production for these regions.

At the different rice parastatals, this year's total area planted was already greater than last year as of August 31. At Operation Riz Mopti (ORM) and Office du Niger (ON), planting and transplanting continued into September indicating that areas planted will be even greater than currently estimated. (Please note: in Table 4, ORM and ORS production figures for 1993 include rice, millet, sorghum, and maize, whereas those for 1992 are only for rice).

Figure 2. Mali: NDVI—1993 Start-of-season (month)

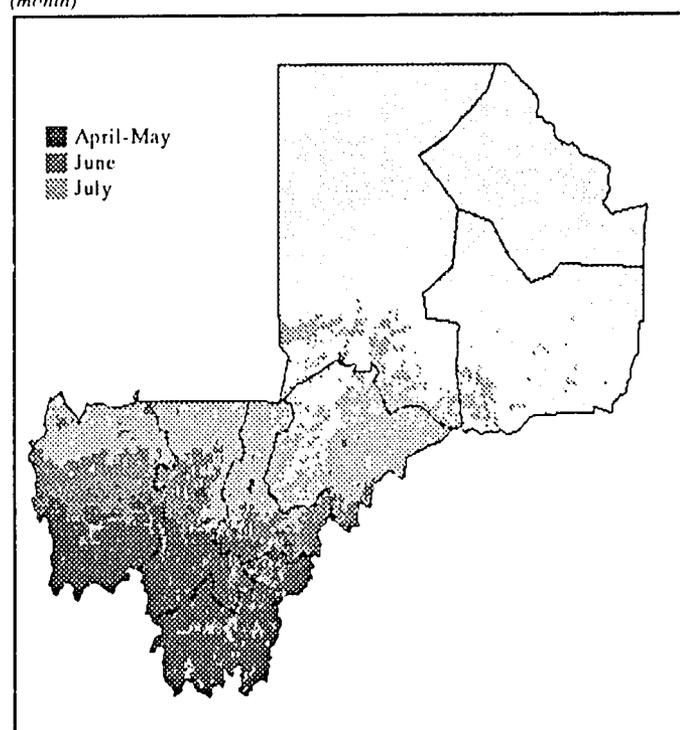


Table 4. Mali: 1993/94 Preharvest estimated cereal production

ODR/DRA Area	1993 Area planted (ha)	1992 Area planted (ha)	1993 Area planted (percent)	1993/94 Production estimate ('000 MT)
Kayes DRA* (Regional Agricultural Service)	30,533	16,136	189.2	31,889
ODIMO	132,23	124,43	106.3	126,847
ODI Kaarta*	73,375	53,865	136.2	59,907
Koulikoro DRA*	42,458	51,439	82.5	41,716
OHVN (Office haute vallee Niger)	142,73	139,62	102.2	139,071
Ségou DRA	223,29	292,31	76.4	148,015
CMDT*	454,64	454,64	92.8	475,432
ORS (Ségou Region rice parastatal)	61,288	14,109	434.4	41,518
ON (Ségou Region rice parastatal) **	35,799	22,007	162.7	143,196
Mopti* DRA	363,75	359,52	101.2	272,023
ORM (Mopti Region rice parastatal)	26,863	19,509	137.7	15,373
Tombouctou DRA				40,942
Gao DRA				8,244
Total reported	1,554,1	1,547,6	100.4	1,544,172
Total adjusted				2,058,896

Notes: * Locations where area-planted estimates were made through July 31, 1993.

** Locations where area-planted estimates were made through August 21, 1993.

1. All other estimates are based on area planted through August 31, 1993.

2. 1992/93 comparisons are based on area-planted estimates made on the same reference date.

3. Total production estimates are based on average yields for each cereal for the 1985-1991 period and were calculated by summing area-planted times yields for rice, millet, sorghum, and maize.

Source: Regional Direction of Agriculture (DRA) and Rural Development Zone (ODR) reports.

Pastoral and fishing conditions

Once the rains finally began this year, pasture conditions improved and have remained satisfactory during the season. Increased security in traditional pastoral zones has meant that herders in the Niger Delta were able to graze their herds in traditional rainy season areas, relieving the pressure on Delta pastures.

Favorable river levels bode well for fishing communities in the Delta area. Problems with decreasing catches continue because of overfishing.

Food stocks and flows

Information on the level of commercial and household stocks is generally not available. Levels of government security stocks are shown in Table 5. At this point, localized production shortfalls can be met by in-country stocks.

FACTORS AFFECTING ACCESS TO FOOD

Projected food consumption needs

Projected food consumption needs are calculated based on mid-1993 population figures and a national per capita cereal consumption figure of 212 kg per person. It should be noted that this figure of 212 kg per person is much higher than the 185 kg per person figure used in *FEWS 1992/93 Preharvest Assessment*. The 212 kg per person figure is derived from the national statistical service's 1988-89 consumption and expenditure study.

As shown in Table 6, total cereal consumption for 1993/94 will be around 1.9 million MT. Estimated cereal production should cover national consumption needs. At this time, it is impossible to identify regional production shortfalls.

Economic data

Consumer prices for millet as reported by the Malian Market Information System (SIM) remained relatively low through the preharvest period this year. They began their seasonal climb in May, rising from just over 50 FCFA/kg to nearly 100 FCFA/kg in August. Prices remained well below their 1991 levels but in general rose above 1992 levels.

1991 can be taken as a reference period of high prices and 1992 as one of low prices (see Figure 3). Producer millet prices rose in June and July before farmers were confident of the progress of the rainy season, but by the end of July, with the onset of the rains, producers unloaded increasing quantities of stocks on rural markets and prices began to fall in August (not seen in the urban areas).

The reduction of civil unrest in the north allowed a much freer flow of cereal from Mopti Region to Tombouctou and Gao. Northern traders bought stocks from villagers in several small irrigation projects in Mopti, where villagers had not been able to find a market for their stocks for two years. Terms of trade between grain and goats through the preharvest season have generally favored agriculturalists. Good pasture conditions should improve terms for pastoralists.

In contrast, cotton planting began so late that farmers in the cotton producing zones only achieved 89 percent of last year's area planted. In addition, late planted cotton is not likely to result in yields as high as those attained last year. Reduced cotton production will adversely affect farmers' buying power.

Table 5. Mali: National security stock as of September 6, 1993 ('000 MT)

Location	Millet	Sorghum	Total
Bamako	4,896	3,322	8,218
Kayes	2,812	990	3,802
Kita	0	1,837	1,837
Koutiala	708	2,524	3,250
Ségou	15,624	2,604	18,228
Mopti	6,727	3,172	9,899
Tombouctou	2,262	3,074	5,336
Gao	2,445	2,351	4,796
Total	35,474	19,892	55,336

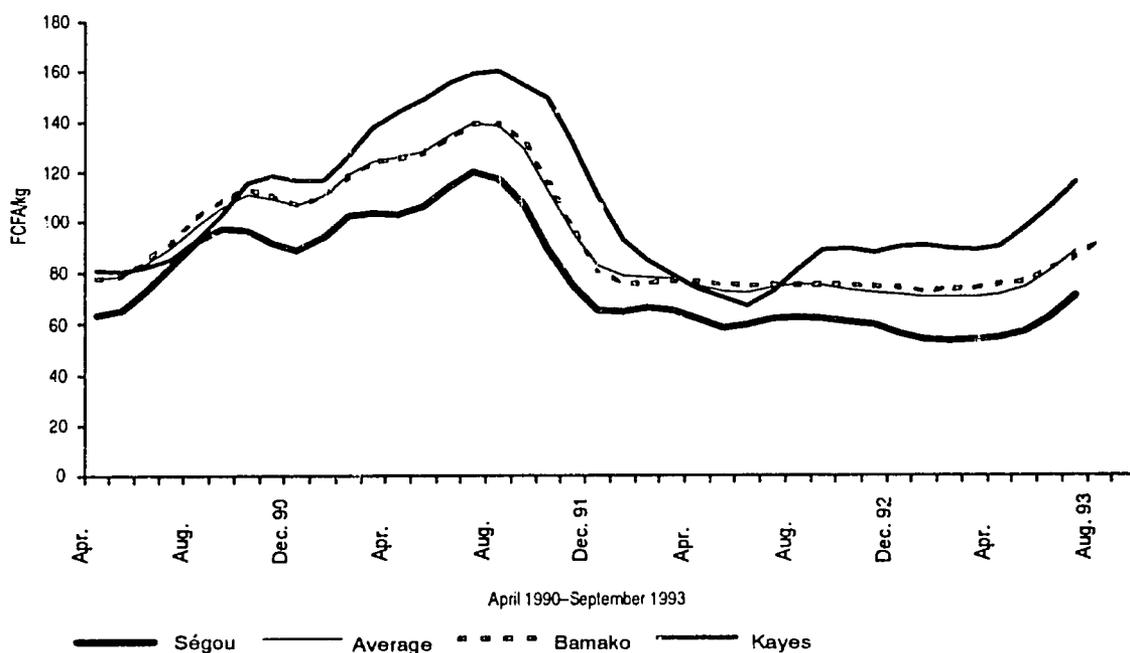
Source: Malian Agricultural Products Office (OPAM).

Table 6. Mali: 1993 Estimated cereal consumption ('000 MT)

Region	Mid-1993 population	1993 Est. total cereal consumption
Kayes	1,204,361	255,325
Koulikoro	1,392,346	295,177
Sikasso	1,464,858	310,550
Ségou	1,521,997	322,663
Mopti	1,415,849	300,130
Tombouctou	657,088	139,303
Gao	419,039	88,836
Bamako	859,396	182,912
Total	8,934,934	1,894,206

Note: Calculation of the 1993 cereal consumption is based on population figures derived from DNSI Census data from 1976 and 1987; and based on a national per capita consumption figure of 212 kg per person.

Figure 3. Mali: Regional capital millet prices



Source: SIM.

VULNERABILITY UPDATE

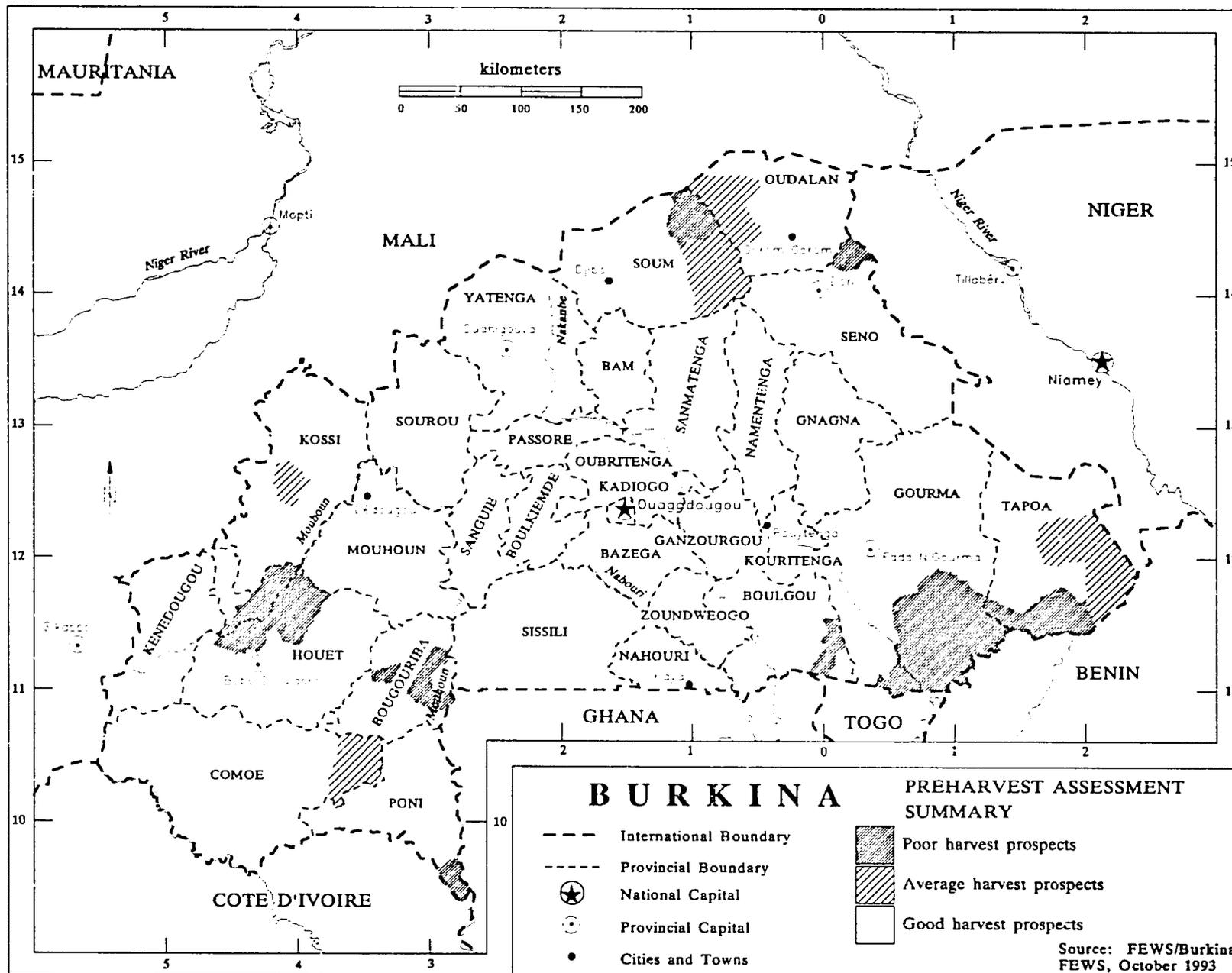
The reduction of civil unrest in northern parts of Kayes, Koulikoro, Ségou, and Mopti regions, and in the Tombouctou, Gao, and Kidal regions, has resulted in improved food security for populations there. Food distributions in Kayes, Tombouctou, and Gao/Kidal regions helped reduce vulnerability of populations identified as at-risk by the SAP. In the *cercles* of Bandiagara and Douentza (Mopti Region), food distributions are incomplete and people have experienced a very difficult preharvest season. Rains have been plentiful in both these areas, which should reduce overall vulnerability levels.

CONCLUSIONS

Mali's prospective food security status is very good based upon FEWS/Mali analysis of agricultural and economic indicators.

Estimated 1993/94 cereal production should cover domestic consumption needs (see Table 6). This is contingent on the resumption of rainfall in Mopti and Ségou regions, where there was a prolonged dry spell in September, and the control of locust, bird, and blister beetle infestations. There are adequate food security stocks to meet localized production shortfalls.

Map 5. Burkina: Preharvest Assessment Summary



18

Burkina

Third Consecutive Year of Above-average Production

Based on a report released by USAID/Burkina on September 22, 1993

SUMMARY

The 1993 growing season began earlier than usual. Cumulative rainfall has been average throughout most of Burkina. Crops in the eastern provinces suffered from drought periods in June and July which will reduce production in those areas.

North of Ouagadougou cereal crops are in very good condition and the harvest outlook is excellent. FEWS/Burkina estimates a national cereal production surplus for 1993/94 of approximately 375,000 MT. This surplus should provide citizens with continued low prices and easy access to staple cereal.

If early estimates are accurate there will still be pockets of below-average production in the eastern provinces of Gourma, Tapoa, and Gnagna for the third consecutive year. This will further degrade the food security situation for groups identified as highly vulnerable in the 1993 FEWS Vulnerability Assessment. Affected groups will not be able to rebuild household economic resources lost over the last two to three years of below-average production. More people could become highly vulnerable.

FACTORS AFFECTING FOOD AVAILABILITY

Cereal crop production

Cereal production is the primary source of food and household income in Burkina. General qualitative indicators of annual cereal production include rainfall distribution (over time and space) and the progression of NDVI values during the growing season.

Rainfall was sufficient for good cereal production over southern Burkina in June and July. In August, low rainfall in southern and eastern Burkina caused some crop stress. Cumulative rainfall levels from April–August 1993 is about average at most reporting stations.

The NDVI progression can identify the times and places of moisture stress. Decreases in NDVI values during the vegetative and flowering period of crops (July–August) over an area, suggest moisture stress—reducing cereal production potential. There is a good correlation between total NDVI for the six dekads (10-day periods) of July and August and net cereal production.

Estimates of annual cereal production potential by region generally follow the NDVI total difference from average. The NDVI progression was very irregular over southeastern Burkina early in the season. This reduced total NDVI values to less than average especially in southern Tapoa and southern Gourma.

Using NDVI data, FEWS/Burkina estimates national net (85 percent of gross) cereal production for 1993/94 at 2.23 million MT (see Table 7). This will create a national cereal production surplus of 375,000 MT. Losses due to pest infestations in September or an early end of the rainy season will reduce this estimate.

Pastoral conditions

Pasture quality is not a constraint to livestock production in 1993. Pastures developed early and are in excellent condition throughout the country. The early development of pasture land greatly reduced the vulnerability of agropastoralists in the economically stressed areas of Gnagna and Oudalan.

Food stocks and flows

An initial assessment of existing stocks and imports for 1993/94, shows that there will be no significant changes in programmed food aid, or commercial imports. The greater than average cereal production expected in 1993/94 will be available to replenish on-farm stocks.

FACTORS AFFECTING ACCESS TO FOOD

Cereal balance

Food access is a function of household income. Since most income for the poorest groups in Burkina comes from cereal production, FEWS assesses food access by using the cereal balance and its difference from average, for the past few years. This is an indicator of where people are using a larger percentage of their household resources for purchasing food that they might normally produce themselves.

Only the provinces of Boulkiémdé, Tapoa and Kadiogo are below average for the past three years. Kadiogo is the capital and each year there is a smaller percentage of cereal producers in the area. Tapoa and Boulkiémdé may need Government of Burkina (GOB) food aid.

Projected food aid needs

If the cereal production estimates in Table 7 are accurate, Burkina will not need emergency food aid in 1993/94. The government will need to target food aid or other income support to those areas where cereal production has been below average for several consecutive years (Tapoa, Boulkiémdé). This

Table 7. Burkina: FEWS preharvest estimated cereal production and balance for 1993/94 ('000 MT)

Province	June 1994 population ('000)	Need	FEWS estimated net production	FEWS estimated balance
Bam	178	34	45	12
Bazèga	372	71	109	38
Bougouriba	253	48	70	22
Boulgou	493	94	100	6
Boulkiémdé	406	77	72	-5
Comoe	318	60	86	26
Ganzourgou	236	45	74	29
Gnagna	291	55	82	26
Gourma	374	71	114	43
Houet	786	149	171	21
Kadiogo	766	146	20	-126
KénéDougou	171	32	54	21
Kossi	414	79	149	70
Kouritenga	240	46	50	5
Mouhoun	359	68	95	27
Nahouri	128	24	20	-5
Namentenga	221	42	61	19
Oubritenga	338	64	85	21
Oudalan	131	25	17	-8
Passoré	238	45	62	16
Poni	270	51	66	15
Sanguié	241	46	56	10
Sanmatenga	421	80	85	5
Séno	283	54	77	24
Sissili	321	61	74	13
Soum	231	44	45	1
Sourou	333	63	86	23
Tapoa	202	38	41	2
Yatenga	570	108	115	7
Zoundwéogo	184	35	53	18
Total	9,768	1,856	2,232	375

Notes: 1. Provincial population projections for June of 1994 are exponential extrapolations of 1985 census figures (Institut national de la statistique et de la démographie) at province-specific growth rates. 2. Need is assumed to be 190 kilograms per person per year. 3. Net equals 85 percent of gross for most cereal. These are CILSS (Comité Inter-états de Lutte contre la Sécheresse dans le Sahel) conventions. 4. FEWS-estimated net production is a function of the difference from average of total NDVI during July and August expressed as the normalized anomaly index. This index value was used to adjust the standard deviation of 1984-92 average per capita production for each

will reduce the likelihood that vulnerable groups will have to sell off household assets to purchase cereal.

More smallholder agriculturalists in Tapoa will become highly vulnerable due to several consecutive years of below-average production in these provinces.

Price information

Price data from the OFNACER (Office national des céréales) market information system show nominal millet prices for the period Jan–Aug, 1993 are below average for most of the country. However, in southern Burkina, cereal prices have risen more sharply since June than elsewhere. This increase is due to less than optimum growing conditions in the southwest. Local farmers have been holding on to their stocks to see what the final result of the growing season will be.

Depressed market prices have made it easier for smallholder agriculturalists in cereal-deficit areas to purchase cereal. Low prices, however, contribute to the poverty of those groups trying to rebuild household resources lost during the poor production year of 1990. It is likely that cereal prices will drop further in November in response to this year's production.

For livestock producers the number of sacks of millet that can be purchased with income from the sale of one goat (terms of trade) is a good indicator of purchasing power (see Figure 4). Goat prices, which had declined throughout 1992, are beginning to recover.

VULNERABILITY UPDATE

The 1993 FEWS Vulnerability Assessment reported that 454,000 smallholder agriculturalists and agropastoralists were highly vulnerable. Most of these people are in the provinces of Boulgou, Sanmatenga, Boulkiémdé, Gnagna, Sissili, Nahouri and Tapoa. Citizens in these provinces have suffered from at least two consecutive years of below-average cereal production.

Most of these provinces will have above-average 1993/94 cereal production. Above-average cereal production will reduce the level of vulnerability of these groups from highly vulnerable to moderately vulnerable.

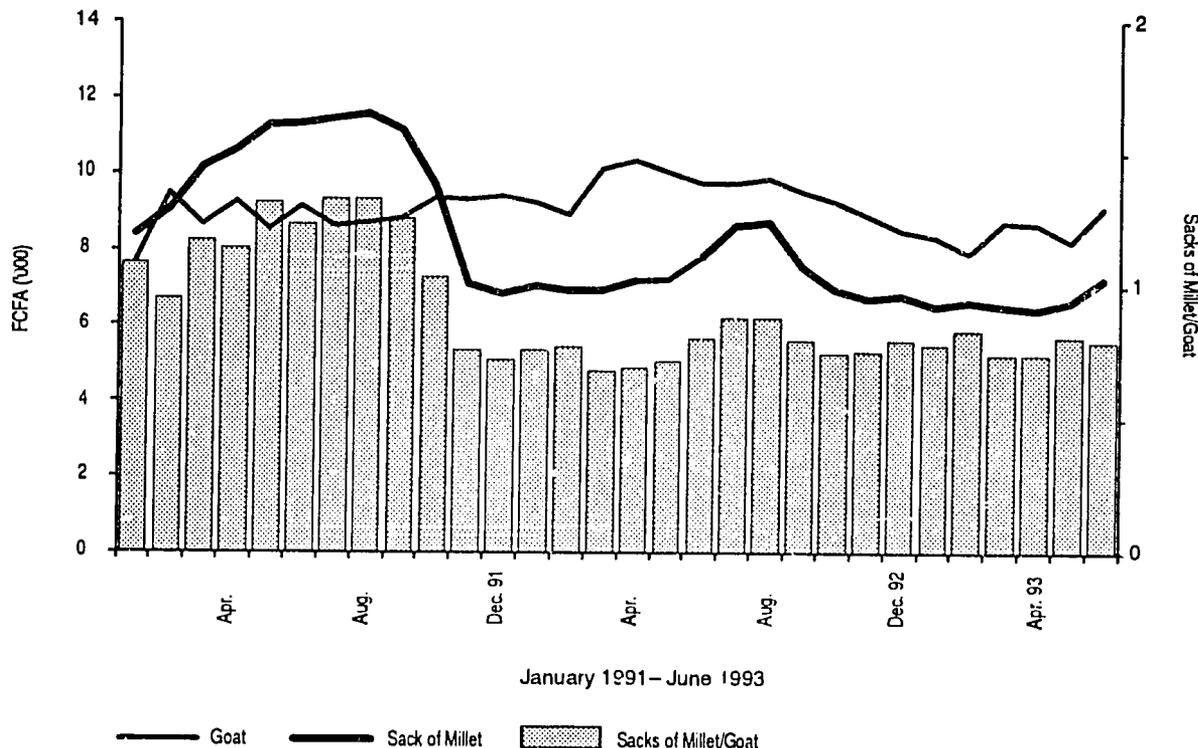
In Tapoa, the number of highly vulnerable people will increase because of expected below-average local production.

department to produce the production per capita. Using the standard deviation in this way gives an estimate of cereal production that takes into consideration the variability of annual cereal production. Production estimates were obtained by multiplying the per capita production by the population of the department in June of 1994. Department totals were then summed to get provincial estimates.

5. FEWS estimated balance=FEWS estimated net production, minus need.

6. Totals reflect rounding error.

Figure 4. Burkina: Terms of trade between millet and goats



Note: Market data shows the average millet and goat prices for Pouytenga, Kaya, Djibo, and Gorom-Gorom.

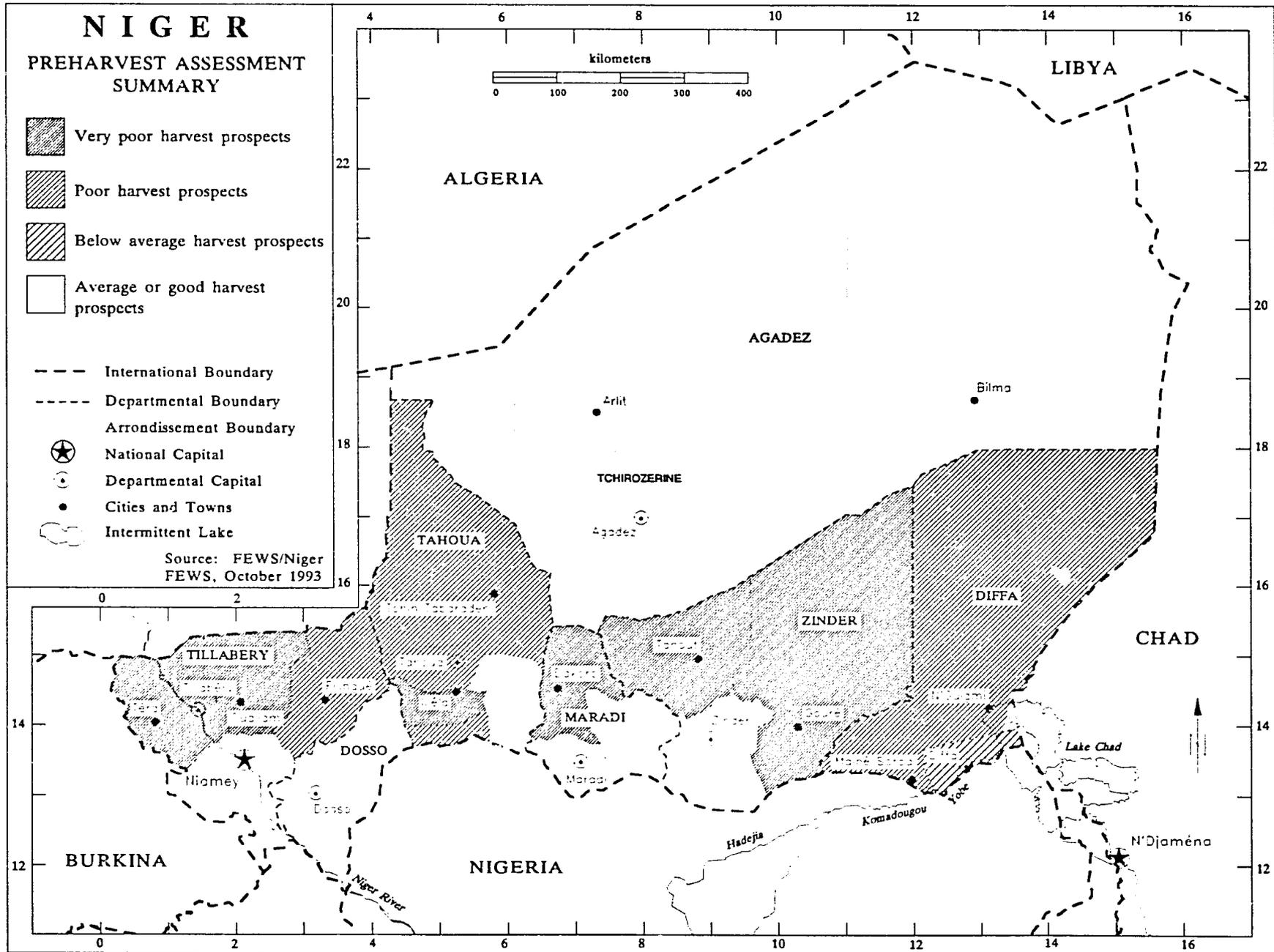
Source: OFNACER

CONCLUSIONS

Emergency assistance to Burkina will not be necessary in 1994. FEWS/Burkina estimated national cereal production for 1993/94 is 2.23 million MT. This is a surplus of 375,000 MT over estimated consumption needs. Such a large surplus will increase cereal availability and reduce cereal prices throughout the country.

Lower prices will provide some relief for severely stressed socioeconomic groups. FEWS/Burkina and other organizations will monitor the end of the cereal production season for conditions that would alter early production estimates (pest activity and an early end to the rains).

Map 6. Niger: Preharvest Assessment Summary



22

NIGER

Production/Consumption Balance Possible but Large Areas Still Vulnerable

Based on a report released by USAID/Niger on September 22, 1993

SUMMARY

Due to erratic rainfall and late planting, widely varying stages of crop development exist. Harvest potential in many areas of Niger is very mixed and uncertain. While current projections indicate national cereal production may meet national consumption requirements, four departments and as many as 11 agricultural arrondissements in the country could face severe cereal production deficits.

Poor pasture prospects and ongoing civil strife will adversely affect food security in many agropastoral and pastoral areas. The buying power of a majority of the Nigerien population remains very low and the Government of Niger (GON) has few resources to buy and redistribute cereal stocks from surplus areas to those with a deficit. As a result of these conditions, specific populations in Niger will need emergency food assistance in 1994 to alleviate the next soudure (hungry season).

An estimated 192,000 people could be extremely vulnerable and 989,000 could be highly vulnerable during the next year.

FACTORS AFFECTING FOOD AVAILABILITY

Agricultural conditions

In Niger the 1993/94 agricultural season began poorly in comparison with the 1992/93 season. Rainfall through the first week of July in many areas was irregular, weak, and poorly distributed. Significant rainfall and planting began as early as mid-May in southern Dosso and Maradi departments. First planting in most of southwestern Niger had taken place by early June. However, erratic rainfall during most of June caused the failure of many early plantings in all but limited areas of southern Tillabéry, Dosso, Tahoua and Maradi departments.

As of July 15, only 60 percent of the villages in the agricultural zone of the country had planted. This was in comparison to over 95 percent nationally at the same point in 1992. Planting coverage in the country went to 85 percent by July 31, but final plantings for some areas did not take place until the first week of August. In addition, according to the most recent Ministry of Agriculture and Livestock (MOA) report, some villages in the Department of Zinder, Tanout Arrondissement, not only planted late, but were unable to plant alternative crops.

Poor planting and growing conditions have caused widely varying stages of crop development. The harvest potential in Niger is very mixed and uncertain. An early end to substantive rains could lead to substantial harvest shortfalls.

Based on model projections and MOA reports, harvest prospects in 11 arrondissements (Téra, Tillabéry, Ouallam, Filingué, Tahoua, Illéla, Dakoro, Tanout, Gouré, Mainé Soroa and Diffa) of five departments are unfavorable. Prospects will not improve unless rains continue into October.

Field reports indicate that crops and pasture in northern Niger lacked necessary rainfall, were late-starting, and have little yield potential. Although significant crop production is not normal in northern Niger, good pasture production is critical.

Pastoral conditions

Fodder production in southern areas of the country has been near average this year. In northern Niger, NDVI imagery (see Key Terms), and recent field reports, indicate pasture production there has been very poor. NDVI images for August showed well below average vegetation in an area extending from northern Ouallam Arrondissement (Tillabéry Department) across central Tahoua and north-central Zinder departments.

Field reports from northern Tahoua and southern Agadez departments in early September indicated that pasture was only several inches high. Late season rains in these areas may eventually improve prospects, but very limited pasture is available. For additional details see departmental updates in the Vulnerability Updates section, pg. 27.

Projected cereal production and consumption requirements

Without current figures on area cultivated and yield, the rainfed millet and sorghum production estimate of slightly over 1.94 million MT is based on 1989/90 GON/GOA area-cultivated estimates for millet and sorghum and yield. These estimates are from a projection model developed and applied by the French Project Espace office located at the AGRHYMET Regional Center.

The yield model, as applied in Niger, assumes a normal end to rains in mid-September, but does not take into account yield reductions from pests and other late season variables.

The provisional national cereal production and consumption balance shown in Table 8 reveals a slight national rainfed production surplus of over 41,000 MT, with over 100 percent of the 1993/94 national consumption requirement likely to be met by this year's rainfed production. However, though there is a projected two percent national surplus, important regional and local shortages will exist. Only Dosso, Maradi, and Zinder departments are projected to produce overall surpluses. Niger's other four departments and Niamey Commune, containing nearly 50 percent of the country's population, are projected to

Table 8. Niger: Preliminary 1993/94 production projections for rainfed millet and sorghum ('000 MT)

Department	Estimated production 1993/94	Consumption requirements 1993/94	Estimated balance	Percent of needs met 1993/94	Percent of needs met 1988/92
Tillabéry	237,188	452,084	-214,896	52	94
Dosso	336,696	276,046	60,649	122	103
Tahoua	280,546	332,457	-51,911	84	93
Maradi	615,250	373,384	241,865	165	127
Zinder	459,821	367,365	92,456	125	116
Diffa	12,624	42,587	-29,963	30	52
Agadez	—	56,602	-56,602	—	2
Total	1,942,124	1,900,525	41,598	102	111

Notes: 1. Totals reflect rounding error.

2. All production figures are net of gross by 85 percent; estimated balance equals estimated production minus the consumption requirement. Kilograms per capita equals production divided by population. Percent requirements met equals estimated production divided by cereal requirement. Percent requirements met on average equals the mean of the percent requirements met by each harvest from 1988 to 1992; GON/MOA statistics used for 1985 to 1992 production.

Background on millet and sorghum production projections: Yield estimates for millet and sorghum are projected from a model developed and applied by the Project Espace at AGRHYMET based on soil moisture, planting dates and rainfall probabilities. Field data for the model are collected regularly from 35 sites in Niger, with at least one for each arrondissement in the agricultural zone.

The Project Espace yield model has been used in the 1991/92 and 1992/93 *FEWS Preharvest Assessment* reports. These projections came relatively close to *FEWS Harvest Assessment* estimates for 1991/92 and 1992/93. The area projections for rainfed millet are drawn from the MOA's 1989/90 post-harvest area-cultivated estimates. Area estimates for 1989/90 were used after determining (through comparisons of rainfall over space and time) that the 1989 rainy season was most similar to that of 1993, than any in recent history.

3. Projected food supply: All production estimates (rainfed, off-season and irrigated) are net 85 percent of gross production to account for feed, seed, and post-harvest loss.

4. Irrigated and off-season cereal production, which includes rice,

wheat, sorghum, and corn, is estimated at last year's levels, as reported by the MOA.

5. The consumption requirement of over 1.9 Million MT is calculated by applying the USAID consumption rates (190 and 220 kg per person per year for nomadic/urban and farming populations, respectively) to 1993/94 population projections based on the GON census of 1988 and arrondissement-level growth rates published by the GON Census Bureau in 1992.

6. Total stocks of approximately 60,000 MT include: total public reserve stocks (GON Security Stock); public working stocks from the national rice parastatal and the flour mill; commercial stock information is usually available from the Ministry of Economic Promotion, but none was available at the time of this report; on-farm stocks estimated at zero because of a difficult *soudure* period which depleted stocks and lack of a better figure; and donor stocks (approximately 10,000 MT of various cereal products held by the WFP, German Stock Reserve project and similar donor activities). Anticipated cereal imports of approximately 95,000 MT reflect commercial cereal imports at last year's GON-estimated level and WFP pledges.

Sources: FEWS/Niger, GON, GON/MOA, USAID/Niger, AGRHYMET.

share a more than 350,000 MT deficit. These four departments typically produce deficit figures (using the 88-92 average needs met). This year however, Tillabéry and Diffa are 40 percent below the 88-92 average.

As mentioned above, the production figures in Table 8 are conditional model projections.

The national cereal production and consumption balance is calculated using two variables:

- projected rainfed millet and sorghum production; and
- estimated cereal consumption requirements.

Rainfed millet and sorghum production comprises 95 percent of total cereal production in Niger and 70 to 80 percent of total food intake. The cereal consumption requirement is determined by applying the USAID/Niger cereal consumption rate to projected population for 1993/94. The results of these calculations are shown in Table 8.

Please note that although field reports indicate that Agadez production will be poor, there will undoubtedly be some cereal production recorded in the department. Because of erratic rain-

fall and a shortened season, projected yields could not be determined for locations in Agadez Department.

Projected national food supply

The provisional 1993/94 national cereal balance for Niger shown in Table 9 projects a production surplus of over 96,000 MT with regard to cereal consumption needs when projected off-season and irrigated cereal production are included in the calculation.

The overall cereal balance may be a surplus of over 260,000 MT when in-country stocks and reported imports are considered. As indicated above, this balance includes rainfed cereal production projections based on actual rainfall through August 31, 1993, and average rainfall and a normal end of season in mid-September.

Late season insect damage and an early or late end of normal rains, could lead to major revisions of these provisional figures.

Table 9. Niger: Provisional 1993/94 cereal balance ('000 MT)

Agricultural year	10/93-9/94
National cereals consumption	
Rate (kg/cap/yr)	190/220
Population 1993/94	8,882,347
Total requirement	1,900,525
National cereals production	
Net rainfed millet/sorghum	1,942,124
Net irrigated production	40,957
Net off-season production	13,145
Total net production	1,996,226
Production balance	95,701
Available stocks	
Public reserve stock	43,000
Public working stock	6,699
Commercial stocks	—
On-farm stocks	—
Donor stocks	10,000
Total stocks	59,699
Cereals exports	—
Domestic cereals supply	2,055,925
Cereal imports	
Commercial cereal imports	94,844
Program food aid imports	10,000
Total cereal imports	104,844
Total cereals balance	260,244

Sources: USAID/Niger consumption requirement (190 kg/person/year for nomad and urban populations; 220 kg/person/year for farming populations); FEWS/Niger population projection from GON 1988 census based on GON Census Bureau population growth rates; USAID-FEWS/Niger rainfed production estimate based on AGRHYMET mode. for yield projections and MOA 1989/90 area-cultivated statistics; irrigated production at last year's level (MOA production statistics); off-season production as last year's GON estimate; situation as of September 13, 1993 for security and public working stocks; commercial and food-aid imports at last year's levels (CNUT Statistics).

FACTORS AFFECTING FOOD ACCESS

Cereal market

Market Information System (SIM) data show that millet prices increased steadily in most of the country from March/April until mid to late July. Data through the 24th of August indicate that prices fell slightly from July highs, except in Diffa Department where prices were 11 percent higher.

Prices from March through August were considerably lower than the five-year average (1988-92) and for 1992. The normal trend for millet prices should show a price increase until sometime in July, then a falling-off during July and continued reductions through October. Prices appear to be following that trend in all regions except Diffa Department (see Figure 4). After significantly below-average prices throughout the year following the excellent 1992/93 harvest, the current rise of prices in Diffa is a good indication of an expected poor cereal harvest this year. This trend is similar to the 1989/90 season when final production in Diffa met only 12 percent of the total department's need.

Livestock market

Livestock price data for April-July show that prices across the country decreased slightly and were stable during that period. August data from Diffa, Dosso and Zinder departments indicate that animal prices rose slightly.

The combination of falling cereal prices and rising animal prices should lead to a marked improvement in terms of trade for herders and agropastoralists. However, terms of trade for Agadez and Diffa (see Figure 5) between July and August, have declined in three out of the past five years.

Economic situation

The announcement of a ban on exportation of FCFA (French West Africa Franc) has had a marked affect on that currency's parallel exchange rate with the Nigerian naira. The week following the announcement, 1,000 FCFA dropped from approximately 127 to 120 naira. Later reports indicated a reduction to 113 and even 110 naira per 1,000 FCFA, and SIM reports that on August 21 the parallel exchange of 1,000 FCFA was only 105 naira.

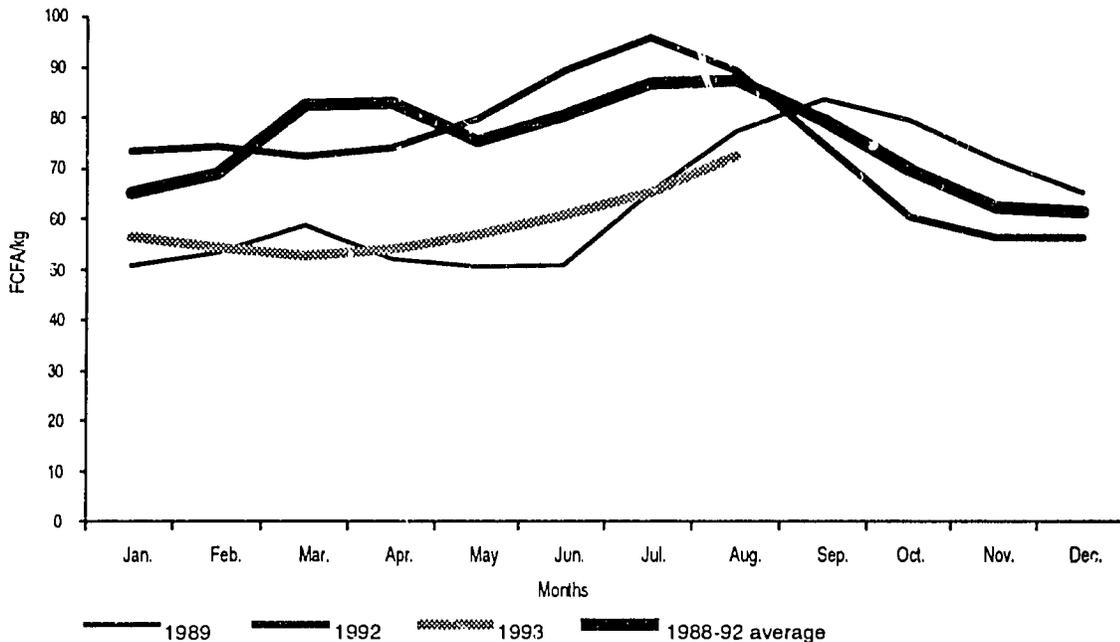
Because of Niger's 1,000 mile long border and active trade with Nigeria, reductions in the parallel exchange rate of the FCFA should have beneficial effects for Nigerien producers.

Nigerien farmers who sell products in Nigeria for naira will be able to exchange that currency for more FCFA than previously, and Nigerien produced goods should be able to better compete with Nigerian products in Niger because Nigerians will need to demand higher FCFA prices or even naira prices to maintain previous profit levels.

In contrast, Nigerien consumers, particularly in border areas will suffer because many cheap manufactured goods produced in Nigeria will now become more expensive. The likely result of this ban will be an increase in commercial exchanges in Niger conducted entirely in naira to avoid exchange/exportation issues.

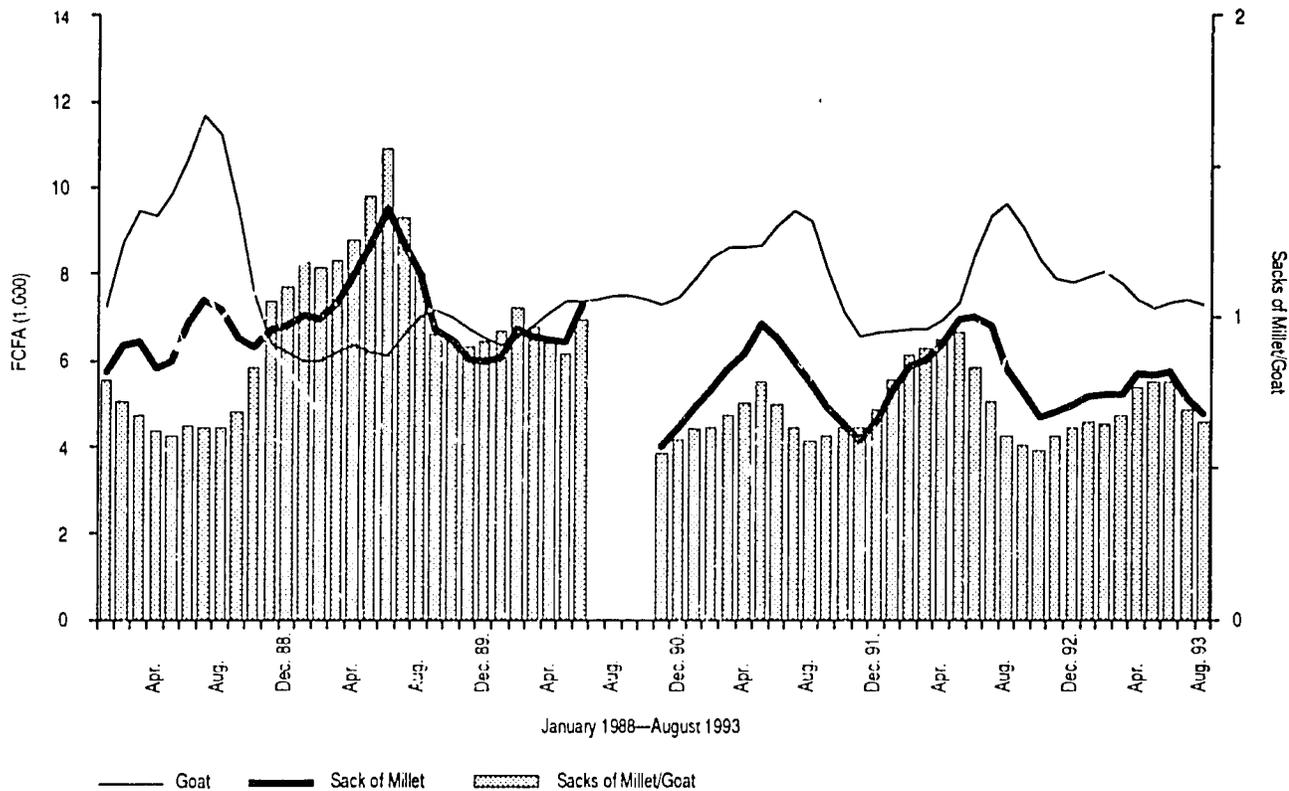
The economic situation in Niger continues to deteriorate. The GON is still more than six months behind in payments to civil servants and the trade unions have recently ordered a series of general strikes which are further crippling government services and causing disruptions in commercial and other productive activities.

Figure 5. Niger: Intra-year price comparison of millet prices—Diffa Department



Source: OPVN/SIM

Figure 6. Niger: Terms of trade between millet and goats—Diffa Department



Source: MINAG/OPVN

VULNERABILITY UPDATE

Farmers and agropastoralists

In general, conditions for farmers and agropastoralists across the country remain similar to those reported in the 1993 *FEWS Vulnerability Assessment*, except in Loga Arrondissement where a projected cereal production surplus will lower vulnerability levels.

Projected deficit production in areas of northern and central Tillabéry, Tahoua, Zinder, and northern Maradi departments will elevate levels of vulnerability for farming and agropastoral populations.

Northern and eastern Zinder Department: Although Zinder Department as a whole may have a slight rainfed cereal production surplus, both Tanout and Gouré arrondissements are projected to have major production deficits. Tanout Arrondissement normally shows a surplus but deficit production in 1992/93 required over 10,000 MT of assistance. A second straight year of poor production coupled with less buying power and poor pasture will make up to 192,000 people in Tanout extremely vulnerable. Deficit production and poor pasture could cause up to 158,000 people in Gouré Arrondissement to be highly vulnerable.

Tillabéry Department: Deficit production in 1992/93, late planting, and projected poor cereal and pasture production in Filingue, Ouallam and Tillabéry arrondissements will leave up to 275,000 agropastoralists highly vulnerable to food insecurity. Late rains and planting in Téra Arrondissement will affect production (expected to be poor), resulting in up to 300,000 agropastoralists becoming moderately vulnerable.

Agadez Department: Agropastoralists in western Agadez Department are generally sedentary herders who in an exceptionally good year meet no more than 10 percent of their own consumption requirements from cereal production, but indications are that this year they may be unable to meet any portion of their cereal requirements through production. These requirements must be filled through cereal bought with income from other types of production—particularly livestock sales.

Relatively low livestock terms of trade, poor pastures, and civil insecurity continue to limit access to food stocks and have crippled alternative income generation. These conditions cause approximately 98,000 people in Tchirozerine and Arlit arrondissements to remain highly vulnerable.

Tahoua Department: Projections indicate that cereal production in Illéla, Tahoua, and Tchén Tabaraden arrondissements will be poor this year. Illéla only met approximately 57 percent of its cereal consumption requirements in 1992/93 and production is projected to be even less this year—meeting only 22 percent. Tahoua Arrondissement, which generally meets most of its needs, is also projected to have deficit production. Although Tchén Tabaraden is mainly a pastoral arrondissement and is not

normally expected to produce enough cereal for its own needs, both cereal and pasture production this year are expected to be poor making up to 228,000 people in Illéla and Tchén Tabaraden arrondissements highly vulnerable, and up to 223,000 in Tahoua Arrondissement moderately vulnerable.

Diffa Department: If rains do not continue until early October, the MOA predicts farmers in Mainé Soroa and Diffa arrondissements will have poor harvests. Cereal production projections for these areas, assuming rains end in mid-September, indicate production will be considerably lower than average. However, a continuation of rains through the end of September would substantially improve production prospects. Cereal production last year was excellent and cereal and animal prices in the last year have been considerably lower than average. Since these areas have diversified income scales, poor cereal production in Mainé Soroa and Diffa arrondissements would make up to 138,000 agropastoralists only moderately vulnerable.

Northern Maradi Department (Dakoro Arrondissement) is likely to have poor cereal production in 1993/94. If this projection is accurate, agropastoral populations in Dakoro will become at least moderately vulnerable.

Nomadic herders

Vulnerability levels for herders in the pastoral zone have increased since the 1993 *FEWS Vulnerability Assessment*. Due to extremely poor pasture conditions, relatively low animal terms of trade, and poor access to cereal stocks, up to 230,000 herders in the pastoral zones of Agadez and northern Tillabéry departments and Tchén Tabaraden, Dakoro, Tanout, Gouré, and N'Guigmi arrondissements, are considered highly vulnerable.

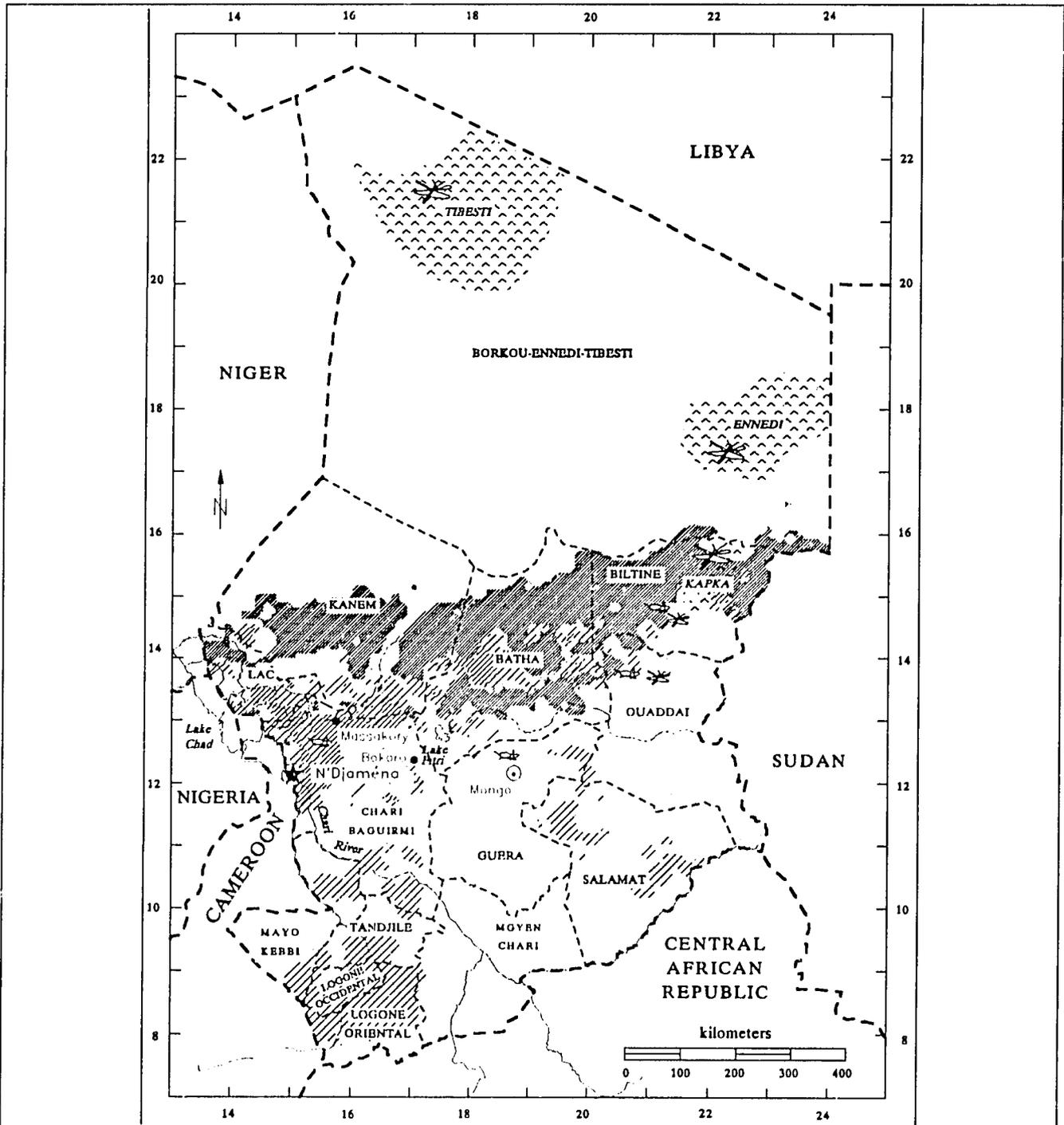
CONCLUSIONS

Although the projections in this report indicate that national production may just meet consumption requirements, a majority of departments and as many as 11 agricultural arrondissements in the country could post severe deficit cereal production. Poor pasture prospects and civil strife will adversely affect food security in many agropastoral (marginal) and pastoral areas.

Specific populations in Niger will need emergency food assistance in 1994 to survive the *soudure* during the next agricultural season (June-September). Based on harvest projections, an estimated 192,000 agropastoralists in Tanout Arrondissement will be extremely vulnerable and up to 989,000 people in Agadez Department and Tillabéry, Filingue, Ouallam, Illéla, Tchén Tabaraden, Dakoro, and Gouré arrondissements will be highly vulnerable to famine during the next year.

FEWS/Niger will continue to monitor food security conditions, especially in areas with potentially poor harvests.

Map 7. Chad: Preharvest Assessment Summary



CHAD

PREHARVEST ASSESSMENT SUMMARY

- | | |
|--|--|
| <ul style="list-style-type: none"> ⊗ National Capital ⊙ Prefecture Capital ● Cities and Towns - - - International Boundary - - - Prefecture Boundary - · - Intermittent Drainage ◡ Intermittent Lake ⋯ Mountains | <ul style="list-style-type: none"> Very poor harvest prospects Poor harvest prospects Below average harvest prospects Average or good harvest prospects Desert Locusts African Migratory Locusts Senegalese Grasshoppers |
|--|--|



Source: FEWS/Chad
FEWS, October 1993

CHAD

Mediocre Sahel Harvest; Average Prospects in the South

Based on a report released by USAID/Chad on September 16, 1993

SUMMARY

Production will be poor or below average in most of the northern Sahelian zone (see Map 7). Harvest prospects in the south are average in the southwest, and good in the southeast. Although the 1993 rainy season started early in southern Chad, a month-long drought in June seriously disrupted development of crops planted early in the south, delayed planting in the north, and forced replanting in many areas. Despite a return to more regular rainfall in July, climatic conditions remained irregular.

By September, a resurgence of grasshopper and other crop pests were causing significant damage to cereal crops in the Sahelian zone. Desert Locusts were also reported in the breeding areas of the Tibesti, Ennedi, and Kapka mountains. Climatic conditions and losses to pests will adversely affect harvest prospects.

In the Sudanian zone, adequate soil moisture reserves offset some negative effects of the irregular rainfall. When compared to the Sahelian zone, the crop pest situation is calm.

FACTORS AFFECTING FOOD AVAILABILITY

Agricultural Conditions

The 1993 rainy season started early in the Sudanian zone. Planting of short-cycle crops occurred in May. In June, a prolonged drought across most of the country forced farmers to abandon some fields. The southwestern prefectures were affected most by drought conditions. Some crops planted in May were lost and surviving ones were stunted. The drought period also delayed planting of other crops in the Sudanian and Sahelo-Sudanian zones.

When regular rainfall returned in July, planting resumed in the south and started in the north. During the remainder of the rainy season fluctuations in climatic conditions resulted in periodic drought periods throughout Chad. Rainfall was poorly distributed in space and time. Consequently, replanting was common in the Sahelian zone where emerging crops did not survive the dry periods. Overall area planted in the Sahelian zone is less than in 1991/92 and 1992/93 and the planting date is also ten to twenty days later than average. By early September, most crops are in the grain formation stage. With rainfall expected to continue in the Sahelian zone through mid-September, cereal crops should reach complete maturation.

In the Sudanian zone, after the June drought, rainfall was irregular but sufficient to maintain adequate soil moisture. Crops planted in July developed normally. By early September, long cycle crops were in the elongation to head formation stages. Because of delayed planting, some crops are stunted and will not reach their normal size. Crop yields will be lower than average in some areas. The most affected areas are the southwestern prefectures of Logone Oriental, Logone Occidental, Tandjilé, and Mayo Kebbi. In the southeast only the extreme western areas of Moyen Chari Prefecture were affected by the June drought.

In the Sahelian zone the resurgence of grasshoppers and grain-eating birds, compounded with the arrival of Desert Locusts, is causing great concern (see Map 7). Heavy concentrations of grasshoppers mixed with African Migratory locusts have been observed in the eastern prefectures of Ouaddaï and Biltine. Density in some areas reached 100 individuals per m². Other concentrations of grasshoppers, principally Senegalese Grasshoppers (*Oedaleus senegalensis*), are reported in Massakory and Mongo. Populations of grain-eating birds are increasing in Kanem, Lac, and Mayo Kebbi prefectures. These pests are causing significant damage to cereal crops. The Chadian Crop Protection Service (DPVC) has treated some areas but grasshopper concentrations remain high.

Since June, several swarms of Desert Locusts have overflown northern Chad. Some swarms have dispersed in the mountainous areas of the Tibesti, Ennedi, (Borkou-Ennedi-Tibesti) and Kapka (Biltine). The ecological conditions in these areas are favorable for reproduction and some hatchings of Desert Locust larvae have occurred. It is possible that when the rains end and the wind shifts, some Desert Locusts will descend to the Sahelian zone and cause damage to cereal crops.

Despite poor rainfall distribution, overall cumulative amounts are only slightly below average in areas where recessionary agriculture is practiced. The wadis and depression areas are flooded. Farmers are preparing recessionary sorghum nurseries for transplanting when flooded areas begin to dry. Some nurseries have been attacked by grasshoppers. In general, however, the outlook for recessionary agriculture is near normal.

Rainfed crops, affected by irregular rainfall and crop pest attacks, will produce poor to mediocre harvest amounts in the Sahelian zone. This includes the major production areas of northern Chari Baguirmi (Bokoro) and southern Batha. In the south, harvest prospects are average in the southwest and good in the southeast.

Table 10 shows historic national cereal production levels. Based on comparisons of cumulative rainfall, dekad-to-dekad

rainfall, and price behavior, the 1993/94 harvest should be slightly higher than the 1990/91 level, unless a late season locust attack occurs. This level of expected production represents an overall production deficit for Chad. The national cereal consumption need is estimated at around 700,000 MT.

Pasture Conditions

Table 9. Chad: Cereal production 1983/84-1992/93 ('000 MT)

Year	Gross production
1983/84	425,400
1984/85	345,000
1985/86	804,000
1986/87	635,000
1987/88	549,000
1988/89	808,000
1989/90	616,000
1990/91	602,000
1991/92	812,000
1992/93	914,800
Average	651,100

Pasture conditions in the Sahelian zone are below average. NDVI imagery (see Key Terms) shows later-than-average emergence of pastures in Biltine, Batha, and Kanem prefectures. At the end of August, significant pockets of dry areas remained in Kanem, Batha, northwestern Biltine, and north-

western Ouaddaï. Figure 7 shows intra-annual comparison of NDVI values in Biltine Sub-prefecture. The late 1993 start and low biomass values are evidence of poor pasture conditions. Pastures also not do extend as far north as in the two previous years. In 1992, good pasture conditions existed up to 100 km further north than in 1993.

Food Stocks and Flows

As of August 31, 1993, there were 13,800 MT of food aid in Chad. Of this amount, approximately 13,400 MT is composed of national food security reserves. These stocks could be drawn upon to cover some of the expected production shortfalls. Additional food aid will likely be required. Local currency generated from sales of US wheat flour could be used to buy cereal from the south or from neighboring regions, and to pay distribution costs. Some cereal imports may become necessary if grasshopper and locust attacks intensify before harvest.

FACTORS AFFECTING FOOD ACCESS

Economic data

After two good harvests, cereal prices in Chad remained low during the lean period (June-September) of 1993. Millet prices in the Sahelian zone are at their lowest levels since 1989. In July 1993, cereal prices started increasing in the Sahelian zone (see Figure 8). In 1992, prices fell in August with the expectation of a good harvest. The current increase in millet prices is an indication of the lack of confidence in the upcoming harvest. Because of increasingly poor harvest prospects for the Sahelian zone, market supply is decreasing as merchants

Figure 7. Chad: NDVI analyses for Biltine Sub-prefecture

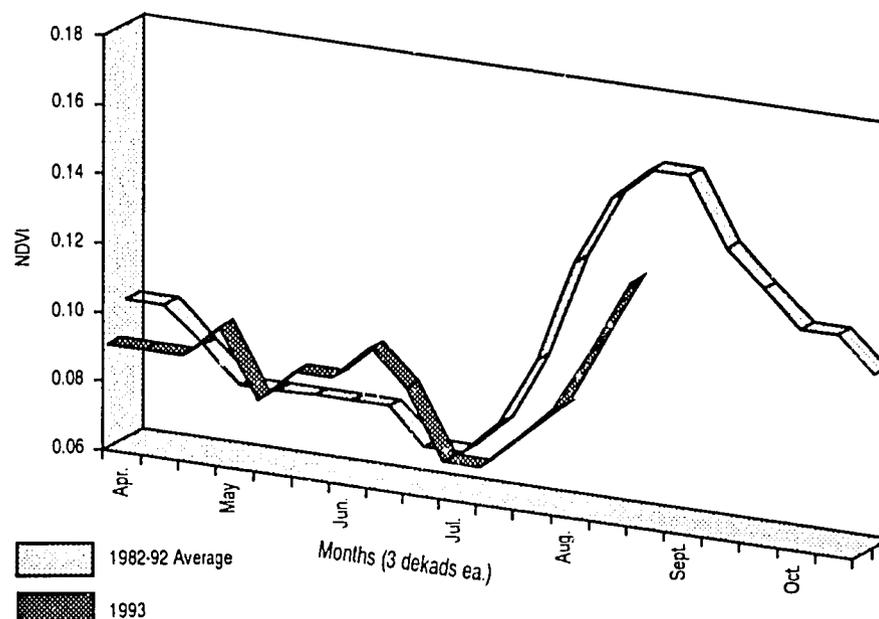
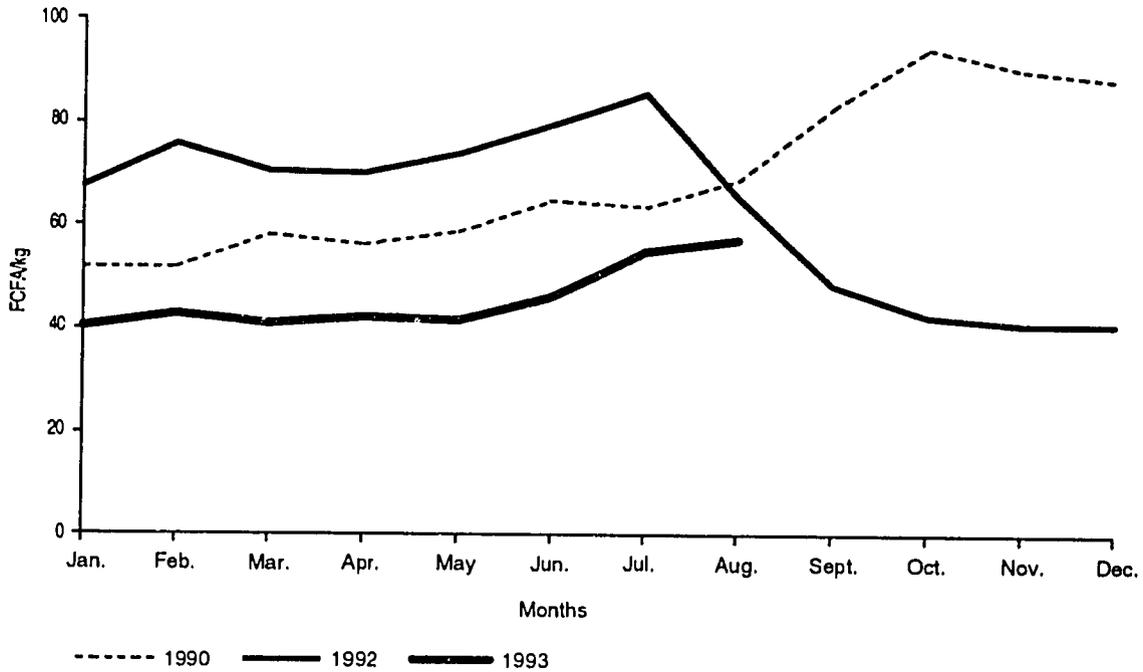


Figure 8. Chad: Sahelian zone millet prices 1990, 1992, 1993



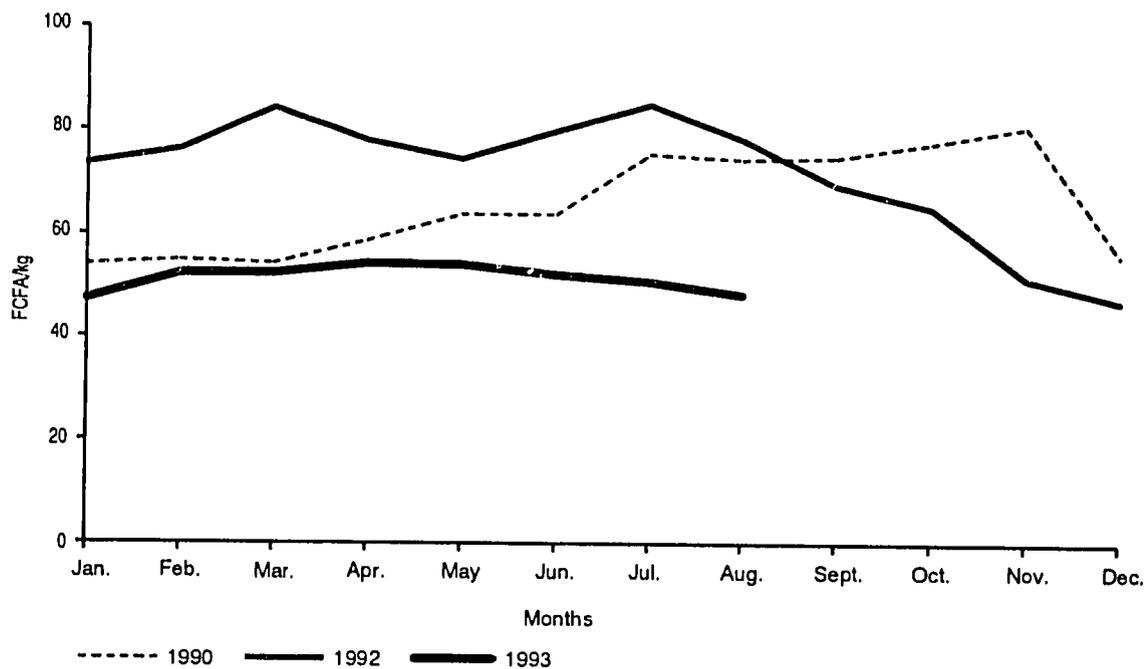
Source: SAP/Chad

and villagers alike begin to conserve their cereal stock. The current price trend is similar to the last drought year of 1990/1991.

Figure 9 shows the millet price trend in the Sudanian zone. After remaining low throughout most of 1993, prices decreased slightly in August. This decrease indicates that at least an average harvest is expected. This is consistent with price seasonality during average to good years.

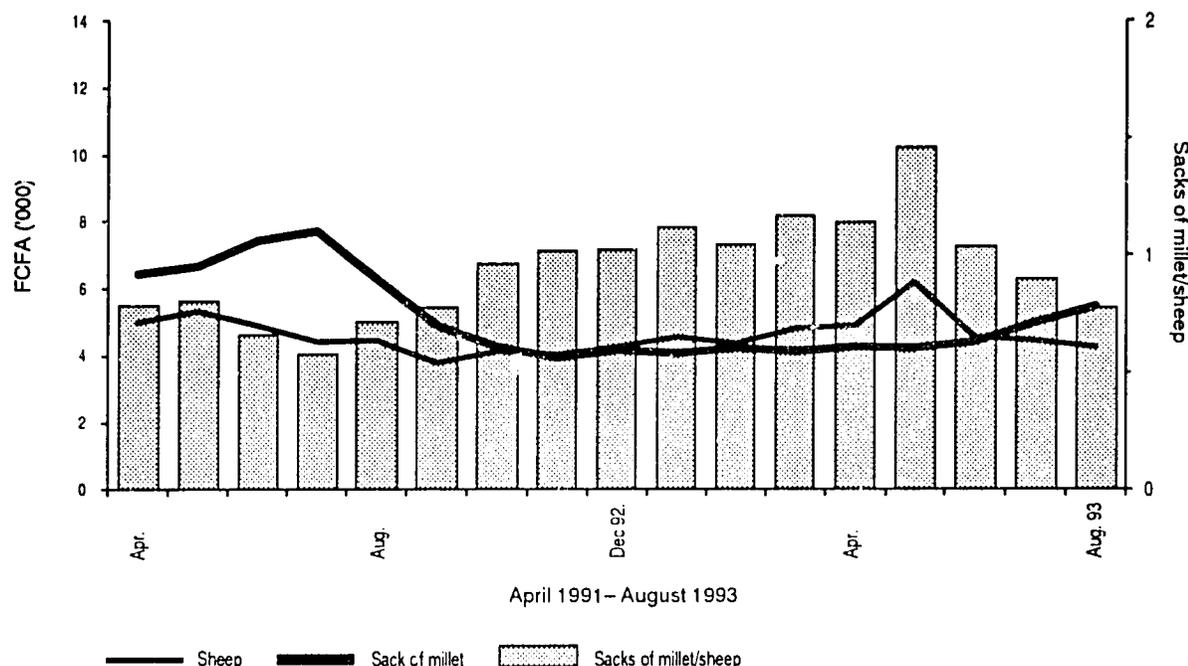
Figure 10 shows the terms of trade between sheep and millet in eastern Chad. The bars represent the number of bags of millet obtained by selling one sheep. This characterizes the purchasing power of Sahelian zone herders who draw their income from animal products and animal sales. Sheep prices peaked in May 1993, while millet prices only started increasing in June and July. The combined effect is a drop of the purchasing power of herders from about 1.5 bags per sheep in

Figure 9. Chad: Sudanian zone millet prices 1990, 1992, 1993



Source: SAP/Chad

Figure 10. Chad: Terms of trade between millet and sheep—Sahelian zone



Source: SAP/Chad

May to less than one bag per sheep in August. Loss of purchasing power, and poor pasture conditions in the Sahelian zone spell increased hardship for Sahelian zone herders for the 1993/94 season.

Vegetable gardening represents another major source of income in certain Sahelian zone regions—Kanem, Lac, Ouaddaï prefectures. Income from the sales of vegetable products will supplement rural household income. However, the combined effects of increasing cereal prices (Figure 7) and decreasing terms of trade derived from animal products (Figure 8) are slowly eroding the overall purchasing power of rural Sahelian zone households.

VULNERABILITY UPDATE

The 1993 FEWS Vulnerability Assessment identified two groups of populations requiring assistance during the preharvest lean period. The first group consists of approximately 35,000 persons in three Sahelian zone prefectures—Kanem, Batha, and Biltine. This group received a four-month food-aid ration in June and July. Due to discouraging harvest prospects, the status of this remains highly vulnerable. Depending on the severity of grasshopper attacks, the vulnerability level of Sahelian populations may increase in 1994.

The second group consists of approximately 45,000 persons in Logone Oriental who have lost some of their 1992

harvest due to local civil strife. The International Committee of the Red Cross (ICRC) has taken charge of relief efforts for this population. Ration distributions started in July and were completed in August. The ICRC representative who recently visited the region reported that most of the affected villages have recovered well on their own. All of the villages, except one, have planted crops for the 1993/94 season. Due to late planting—because of civil disturbances and June drought—crop yields in this region will be slightly below average. Some affected villages may eventually require assistance in 1994.

CONCLUSION

Due to climatic irregularities and crop pest attacks, overall harvest prospects for the Sahelian zone are poor to below average. Conditions in the Sudanian zone are better but much below the excellent conditions of 1992. Average to good prospects are expected.

After two good years, commercial and on-farm cereal stocks are high. These stocks, together with the national food security stock, will cover some of the expected production shortfalls, but some additional food aid may be necessary in 1994.

Map 8. Ethiopia: Preharvest Assessment Summary



35

ETHIOPIA

Average Harvest is Possible if Rainy Season Ends Well

Based on a report released by USAID/Ethiopia on September 22, 1993

SUMMARY

The 1993 growing season has been affected by erratic and unusual weather patterns. Main-season crops have suffered from excess rain (in the west and north) and from drought stress (in the north-central and eastern sections). Pest infestations have been unusually high, and fertilizer sales are down 15 percent from last year. In spite of these factors, an average harvest of cereal and pulses is projected provided the rains continue through the end of September. The national overview masks significant regional variations. Localized crop failures may severely affect vulnerable areas and groups.

The belg (secondary) season production was mixed, with crop failures, especially in North Shewa, and reduced area planted. Overall belg and meher (main) production levels will probably be close to the last three to five year averages.

Pastoral conditions are generally excellent. Non-agricultural factors that normally affect food security (grain and livestock prices, wage rates, civil strife) are positive.

Overall, the 1994 food security outlook is cautiously optimistic. No major emergency food needs are predicted; however, targeted assistance to problem areas, and program food aid in response to Ethiopia's structural food deficit, are still needed.

FACTORS AFFECTING FOOD AVAILABILITY

Agricultural conditions

Belg (secondary) season—February to May

Belg crops, harvested in August and September, contribute 5-10 percent of national yearly production, but account for more than half the annual food supply in some areas. Table 11 and Map 8 summarize the main features of the 1993 season in the most important growing areas. The Relief and Rehabilitation Commission (RRC)/Early Warning System (EWS) reports that the *weredas* (fourth level administrative unit) of Mamo Midir, Lalo Midir, Gera Midir in North Shewa, Ambassel in South Wello, Buguna and Guba Lafto in North Wello, Ginir, and Mena in Bale and Kucha, Humbo, Damot Woide, Damot Gale, Konso, and Mirab Abaya in North Omo, have suffered significant crop losses and will face localized food shortages.

Of the minor *belg* areas (not included in the table), southern Tigray expects a much better harvest than last year, despite rain and pest damage. The location of major and minor *belg* areas is shown in Map 9.

Estimates in Arsi, East and West Harerghe are good, except for several poor pockets. In the failed southern region *weredas* (Hadiya, Kembata, Alaba and Timbaro), very little *belg* harvest is expected but the food security impact will be minimal. The 1993 harvest is expected to balance out to average or slightly below-average production.

Meher (main) harvest—*kiremt* rainy season—June to September

Rainfall

Many cereal growing areas experienced an early start to the main rainy season. In the bimodal (*belg* and *meher* producing) areas the seasons overlapped—the rains continued through May, without the usual dry spell. The cumulative rainfall for May and June was above normal, with very heavy rain causing floods and crop damage. This was followed by an extended dry period during July and August in the east and north (affecting Harerghe, Tigray and Wello), similar to conditions during the drought year of 1985. This year the dry spell broke throughout these areas in late August and early September, reviving hopes for some of the sorghum and for short-cycle late crops (*teff*, chickpeas and lentils).

Because of the erratic weather pattern, late planting was pervasive. In some zones (Tigray, Wello, North and South Shewa, Arsi and Bale) the May planting of short-cycle crops was delayed by excess soil moisture. In contrast, late planting of *teff* in Harerghe was due to insufficient rain in July and August.

The Ministry of Agriculture estimates that as of August 30, 18,870 hectares of crops were replowed or irreversibly damaged due to excessive rain or hail, and 10,370 hectares due to drought stress.

Other factors

Fertilizer sales were around 15 percent (19,000 MT) lower than last year's record. The biggest reductions in fertilizer use are in the *belg* areas of Shewa and Arsi; while supplies were abundant, usage was reduced by unclear government price and subsidy policy late into the *belg* season. Farmers also cited lack of credit, though this has not changed since last year.

Pest attacks are above average this year, presumably due to the weather pattern (see Map 8). Ecological conditions were favorable for locust breeding, and stem borers thrived during the mid-season dry spells).

Major infestations include:

- Stem borers in Wello, East and North Shewa, Harerghe

Table 11. Ethiopia: Overview of the 1993 secondary (*belg*) season—major areas only

Region/Zone *	Importance of Belg		Summary of 1993 conditions
	RRC ** (percent)	CSA *** (percent)	
Southern Ethiopia/North Omo	60-70	28	<p>Weather: Rain started on time and was adequate in January & April; poor in February & March (planting); excessive in May. Stopped 2 weeks early.</p> <p>Other factors: shortage of plow oxen; pest damage to sweet potato (major staple crop).</p> <p>Harvest assessment: planted area reduced due to unfavorable rain distribution; maize then badly damaged by excessive rain during planting and germination, and by drought during flowering and maturation. Not clear how widespread these conditions are: earlier assessments suggested average production for the zone overall. Significant losses now reported in Mirab Abaya, Kucha, Damot Gale, Damot Woide, Humbo & Konso weredas.</p> <p>Weather: Late onset (2-4 weeks) was followed by erratic distribution and amounts in most areas. Some weredas had a dry spell mid-May to June; others received excessive rain in April-May.</p>
Oromia (Region 4)/Bale	40	16	<p>Harvest assessment: erratic rains caused some localized reduction in area planted and crop damage. Production loss may be significant in Ginir and Mena weredas, but most parts of Bale expect a far better harvest than the last two production seasons (Meher 1992/3 and Belg 1992).</p>
Amhara (Region 3)/ North Wello and South Wello North Skewa	up to 25	33 21 11	<p>Weather: Rains started late (2 weeks to 2 months), and were inadequate during preparation and planting. Excessive rain and hail in highland areas of both zones (variously during germination, growth, flowering & maturation).</p> <p>Harvest assessment: poorer than last year in Ambassel highlands (S. Wello), Buguna and Guba Lafto (N. Wello); but better than last year's in the remaining areas.</p> <p>Weather: Rains started early, in January, but then stopped. February and March were dry, followed by heavy rains from mid-April to May.</p> <p>Other factors: Very low fertilizer application, due to high prices, lack of credit, and unclear government subsidy policy.</p> <p>Harvest assessment: Near-total failure in most weredas. Even more-successful areas (such as Mezezo) have been badly affected by alternate shortage and excess of rain, and expect only around 50 percent of potential production. In Mamo Midir, Gera Midir, Lalo Midir, Kewat and Mafud weredas, virtually no crops were sown because of the dry spell. Fields were left bare or sown later with Meher crops. In the first three weredas, crops have now failed for three consecutive seasons (Belg 1992, Meher 1992/93, Belg 1993).</p>

Notes: * Major *belg*-producing zones (i.e. areas where the *belg* harvest is an important factor in the total food supply), in order of RRC's estimate of *belg* as percent of annual grain production. These zones correspond to the former regions of the same names.

** RRC estimate of the contribution of the *belg* harvest to annual grain production, by zone. Some *weredas* within each zone have a higher dependence on the *belg* than these figures suggest. [Belg Assessment Report, September 1993].

*** Actual assessed *belg* production as percent of total in 1989/90, according to the most recent Agricultural Sample Survey conducted by CSA [Statistical Bulletin 103, 1992].

- and North Omo;
- Armyworm in Tigray, South Wello, and the Harerghe lowlands;
- Grasshoppers in Tigray, North and East Shewa, West and East Gojam, North and South Wello, North and South Gonder, Arsi, Bale, East and West Harerghe, and the western zones;
- Bush crickets in the north and central zones; and
- Locusts (Desert and African Migratory) in East Harerghe, Dire Dawa, Tigray, South and North Wello, North Shewa, and Afar.

Locust damage so far seems to be minor in crop and pasture areas. Timely control measures by the CPRD (Crop Protection and Regulatory Department) and DLCO-EA (Desert Locust Control Organization for Eastern Africa) prevented higher losses. Much of the damaged crop land in the east was replanted. Re-invasions from the Gulf and Sudan in mid-October, followed by breeding and migration into southeast Ethiopia (Ogaden) and southern Somalia, remains a serious threat that could affect the main (*meher*) season harvest.

Crop prospects

The maize and sorghum (the most important subsistence cereals) crop started well with the early rains, but excessive rains in April and May followed by dry spells in June, caused extensive damage. Both crops are reported to be in poor condition in the lowlands of North Omo, Afder areas of West Harerghe, Jijiga, most of the East Harerghe lowlands, Tigray, North and South Wello, East Gojam, lowland North Shewa and parts of the Rift Valley areas. Maize seems to have suffered badly in the east (where it is grown largely for home consumption in the hungry months before the main harvest), and in the surplus producing areas of the southwest. The sorghum fields generally need more rain due to late planting or growth checking from drought stress. The continuation of rain through the end of September, and in some places through mid-October, could significantly raise final sorghum production totals (although losses are inevitable in areas which suffered severe mid-season drought stress).

The output of short-cycle crops (wheat, *teff* and pulses) cannot yet be judged. In the highlands, and in late-planted lower zones, crops are still in the early stages of development. Many farmers in the drought affected areas are hoping to substitute a late crop of pulses for failed grain fields. If the rainy season carries on into October, this may boost overall pulse production. Enset (false banana—a major staple in parts of the southwest) is doing well this year.

No quantitative estimates of the harvest are available at this point in the season. The Ministry of Agriculture expects the total area prepared for planting to be one to two percent higher than last year, but the area actually planted will be lower. The area-planted factor combined with yield losses due to drought-stress, waterlogging, numerous pest infestations, and reduced fertilizer use, will contribute to a considerably reduced harvest, much short of the 1992 record.

A strong end to the season could allow for production totals in line with trends from the last three to five years. If an unfavorable rainfall pattern develops during the remaining

weeks of the growing season, Ethiopia could experience a worrisome drop in aggregate production that would represent a significant drop in per capita production.

Regional highlights

Agricultural conditions are affected by local geography, even within quite small areas. For example, excessive rain has damaged long-cycle “stalk” crops (maize and sorghum) in the northern and western regions, while prolonged dry spells have been the major problem in the drought-prone zones of the north, center and east.

Despite localized rain and hail damage, the western maize and sorghum belt is thought to have had a generally favorable season.

In Tigray, Wello, North Shewa, Harerghe and the Rift Valley (North Omo, Sidamo) the lack of soil moisture in July and August stressed the sorghum and maize and prevented the planting of *teff*. Crop conditions at the end of August were alarming. The early September rains have improved the potential sorghum yield, and should have allowed farmers to substitute pulses in fields prepared for *teff* or replowed after the failure of earlier crops, if and where seed was available.

South Wello has generally had better rainfall than North Wello, where *weredas* in the east (lowlands) and north (highlands) had either no rain, or late and irregular rainfall up to the end of July. August was dry throughout North Wello until rainfall began again in the last dekad.

In most of Tigray, the rains stopped at the end of July but returned during the last week of August. If rainfall continues to the end of September the overall harvest should be reasonable. Severe localized losses are predicted in parts of western, central, eastern and southern Tigray.

In West Harerghe there are significant maize and sorghum losses in some areas (including the sorghum-producing belt of Assebot/Mieso). Widespread late planting in Habro will make the zone uncomfortably dependent on a late continuation of the rains. Although the area cultivated is greater than last year due to improved security, yields will be reduced. Conditions in East Harerghe are generally better, but localized crop failures exist (such as the near-total loss of the maize crop in the Babile area).

Farming areas of the Ogaden are having a record harvest of maize and sorghum due to the exceptional moisture and vegetation conditions this year (see Map 8).

Pastoral conditions

Pastoral conditions are generally excellent, and should support some recovery of stock numbers after the losses of recent drought years (see Map 9 for location of pastoral areas). Livestock are reported to be in good shape everywhere. The main rainy season for the pastoral areas of the south and southeast (Ogaden, Borena, South Omo), and lowland parts of Bale, eastern Tigray and Wello, is between March and May. Secondary rains are expected in October/November.

Food stocks and flows

The Government of Ethiopia—Emergency Food Security

Reserve (EFSR) is projected to stand at around 50,000 MT (well short of the 205,000 MT target) by the end of 1993. Carryover from this stock into 1994, and consequently the capacity to respond to relief needs, will be severely limited.

World Food Programme representatives reported food aid stocks of around 33,000 MT (in-country and at the Djibouti port) as of September 16. These stocks are intended for 1993 operations. No projections for 1994 are expected until after the FAO (United Nations Food and Agriculture Organization)/WFP assessment is completed in November. Carryover stocks of food aid are likely to be minimal.

The EGTE (Ethiopian Grain Trade Enterprise), formerly AMC (Agricultural Marketing Corporation), expects its year-end stock on December 31, 1993 to be 92,536 MT of cereal, pulses, and oilseeds.

No information is currently available on private and commercial stocks, or projected trade flows. For reference, commercial imports of cereal and pulses averaged 40,000 MT per year between 1987/88 and 1991/92, and were tentatively forecast by FAO at 50,000 MT for 1993. Commercial exports averaged 14,000 MT during the same period and were also forecast by FAO at 50,000 MT for 1993. Food aid averaged 93 per cent of imports, and nearly nine per cent of the total domestic supply of the same commodities, over the same period.

Table 12. Ethiopia: 1993/94 Production Forecast: Indicative high and low parameters ('000 MT)

	High estimate	Low estimate
Projected Meher 1993/4 (cereals & pulses)	6,750	6,200
+ Representative 1994 Belg forecast (cereals & pulses)*	508	467
- 15 percent non-food uses = total net production (cereals & pulses)**	6,170	5,667
+ 18 percent cereal equivalent of enset/ root crops & animal products***	1,110	1,020
= projected net domestic food production	7,280	6,687

Notes: * Forecast on the assumption that the *belg* harvest contributes 7 percent of aggregate annual production (FAO estimates for 1987/88 to 1991/92 average 7.4 percent); The central Statistical Administration's (CSA) most recent agricultural sample survey (1989/90) estimated the *belg* at 8 percent of the total national harvest. In the major *belg*-producing areas, the secondary harvest is important in filling the food supply gap before the next *meher* harvest. The impact of the 1993 *belg*, good or bad, will be felt in the current year and will not directly affect the food supply in 1994.

** Nonfood uses consist of seed, feed, waste and industrial uses (15 percent is the FAO norm used in Ethiopia assessments)

*** Approximation from FAO estimates for 1987/88 to 1992/93.

Table 13. Ethiopia: 1994 Consumption needs—high and low parameters

	1994 consumption needs at status quo consumption rate of 157 kg/cap/yr ('000 MT)	1994 consumption needs at target consumption rate of 180 kg/cap/yr ('000 MT)
Low estimate	53,740	9,673
High estimate	56,100	10,098

Sources/Notes: 1. "Status quo" consumption rate as used by FAO/WFP needs assessments for Ethiopia.

2. "Target" consumption rate derived from the work of Simon Maxwell (1986) and Richard Caldwell (1992). Compare also the consumption norms in other FEWS countries [Mauritania 165 kg; Burkina 190 kg; Niger 190 kg nomad & urban, 220 kg farming populations].

3. Low population figure from FAO mid-1993 estimate. *FAO/WFP Crop and food supply assessment mission to Ethiopia*. December 1992. Projected at official growth rate of 2.9 percent.

4. High population figure based on RRC regional estimates for 1993. "Food Supply Prospects in 1993." December 1992. Projected at official growth rate of 2.9 percent.

FACTORS AFFECTING FOOD ACCESS

Projected consumption needs

Ethiopia has a long-term structural food deficit. Even in good years, production does not match consumption needs. Quantitative projections of production are extremely tentative at this stage. Table 12 suggests some parameters for high and low aggregate food production, based on earlier FAO calculations.

Consumption requirements are also difficult to pinpoint, as population estimates vary (a new census is due to be conducted in April 1994). Table 13 projects food needs at high and low population figures, and with "status quo" and "target" per capita consumption rates. These two tables together imply a production-consumption gap, at the status-quo level, of between 1.2 and 1.8 million tons (low population estimate), or 1.5 and 2.1 million tons (high population estimate).

Note that these parameters do not take account of end-of-year stocks or trade. Information for a full cereal balance sheet will not be available until November or December.

VULNERABILITY UPDATE

Resource-poor farmers in many areas will be affected by local crop failures, even if the national harvest is average. Quantitative estimates of production by region and zone will be needed before the extent of these problems can be specified. Localized food stress can already be predicted in parts of

Hareghe, Tigray and Wello (areas which are usually in production deficit, even in good years).

Pastoralists should generally have a good year, judging by current conditions. Vulnerability in the main livestock areas should be substantially reduced.

The overall grain supply, and therefore prices, could significantly affect the food security of urban groups and rural purchasers (including pastoralist and deficit farmers). This still depends on the final harvest outcome.

CONCLUSIONS

The most optimistic food security outlook for 1994 is for a mediocre overall harvest, with sub-national crop failures causing localized stress, and generally above-average pastoral conditions. As noted above, there is a national food deficit even in good years which will require continued food aid. This deficit is unevenly distributed geographically and socioeconomically. The areas most likely to suffer crop losses this year (Hareghe, Wello, Tigray) are traditionally drought and famine-prone areas. They are also areas where the final *meher* harvest is most in question as farmers anxiously watch the last few weeks of rain. Despite the best of outcomes, the poorest in these and other areas will continue to be

vulnerable to food shortages, and need targeted assistance for the indefinite future.

The worst-case scenario based on current conditions would be for the rains to stop early, and for the locusts to return in time to cause significant damage to standing crops. Either of these events (especially the former) could sharply reduce the expected harvest and would seriously affect the more vulnerable food-deficit areas.

Rainfall and field reports through the end of season will be closely followed. The major unknown factor remains the final harvest outcome, both nationally and at local levels.

Pastoral conditions, currently very good, will also need monitoring. Market conditions, particularly grain to animal terms of trade, may be affected by crop failures in areas which supply pastoralist markets, such as West Hareghe. Unfavorable terms of exchange may negate the recovery of stock numbers in such areas.

Other economic factors affecting food security appear generally favorable wage rates are high (especially in Tigray), grain prices are low, livestock prices are stable. Underlying all of these, peace continues to prevail in almost all areas.

The food security outlook remains optimistic. No major emergency food operations are expected to be needed in 1994. However, if emergencies do arise, very limited food stocks will be available for distribution to those in need.

FEWS Vulnerability Index

Level of Vulnerability	Conditions of Vulnerability	Typical Coping Strategies and/or Behaviors	Interventions to Consider
SLIGHTLY VULNERABLE	Maintaining or Accumulating Assets	Assets/resources/wealth: either accumulating additional assets/resources/wealth or only minimal net change (normal "belt-tightening" or seasonal variations in) assets, resources or wealth over a season/year. i.e., coping to minimize risk.	Developmental Programs
	and Maintaining Preferred Production Strategy	Production Strategy: any changes in production strategy are largely volitional for perceived gain, and not stress related.	
MODERATELY VULNERABLE	Drawing-down Assets	Assets/resources/wealth: coping measures include drawing down or liquidating less important assets, husbanding resources, minimizing rate of expenditure of wealth, unseasonable "belt-tightening" (e.g., drawing down food stores, reducing amount of food consumed, sale of goats or sheep).	Mitigation and/or Development: Asset Support (release food price stabilization stocks, sell animal fodder at "social prices", community grain bank etc.)
	and Maintaining Preferred Production Strategy	Production Strategy: only minor stress-related change in overall production/income strategy (e.g., minor changes in cropping/planting practices, modest gathering of wild food, inter-household transfers and loans, etc.).	
HIGHLY VULNERABLE	Depleting Assets	Assets/resources/wealth: liquidating the more important investment, but not yet "production," assets (e.g., sale of cattle, sale of bicycle, sale of possessions such as jewelry).	Mitigation and/or Relief: Income and Asset Support (Food-for-Work, Cash-for Work, etc.)
	and Disrupting Preferred Production Strategy	Production Strategy: coping measures being used have a significantly costly or disruptive character to the usual/preferred household and individual life-styles, to the environment, etc. (e.g., time-consuming wage labor, selling firewood, farming marginal land, labor migration of young adults, borrowing from merchants at high interest rates).	
EXTREMELY VULNERABLE or AT-RISK	Liquidating Means of Production	Assets/resources/wealth: liquidating "production" resources (e.g., sale of planting seed, hoes, oxen, land, prime breeding animals, whole herds).	Relief and/or Mitigation: Nutrition, Income and Asset Support (food relief, seed packs, etc.)
	and Abandoning Preferred Production Strategy	Production Strategy: Seeking nontraditional sources of income, employment, or production that preclude continuing with preferred/usual ones (e.g., migration of whole families).	
FAMINE	Destitute	Coping Strategies Exhausted: no significant assets, resources, or wealth; no income/production.	Emergency Relief (food, Shelter, medicine)

Key Terms

At Risk — FEWS Reports employ the term “at risk” to describe populations either currently, or in the near future, expected to have insufficient food, or resources to acquire food, to avert a nutritional crisis (i.e., progressive deterioration in health or nutritional condition below the status quo). “At risk” populations require specific intervention to avoid a life-threatening situation. Food needs estimates are sometimes included in FEWS reports. Famines are the culmination of a slow-onsetting process, which can be extremely complex. The food needs of specific “at risk” populations depends upon the point in this process when the problem is identified and the extent of its cumulative impact on the individuals concerned. The amount of food assistance required, from either internal or external sources, depends upon many considerations.

Vulnerability — FEWS Reports use the term “vulnerability” to indicate relative susceptibility to food insecurity of groups of people or areas. In FEWS usage, vulnerability is always characterized by its degree: slight, moderate, high, or extreme. Extreme vulnerability is synonymous with “at risk.” Vulnerability is a dynamic concept that incorporates both chronic and current conditions. Chronic vulnerability involves long-term conditions that predispose a particular group or region to food insecurity. Current vulnerability highlights short-term changes in food security status and their implications. Vulnerability analysis involves three levels of concern: food availability, food access, and food utilization. These levels are linked by a common analytical framework that interprets all relevant information for its food security impact on the diversified income generating possibilities of different groups of households.

ITCZ — The Intertropical Convergence Zone (ITCZ) is equivalent to a meteorological equator; a region of general upward air motion and relatively low surface pressure bounded to the north and south by the northeast and southeast Trade Winds, respectively. The upward motion in the ITCZ forms the rising branch of the meridional Hadley Circulation. The ITCZ moves north and south following the apparent movement of the sun. It is at its most northerly position in the summer months. 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, with local convective activity organized by westward moving “Easterly Waves.”

NDVI — Normalized Difference Vegetation Index (NDVI) images are created at the laboratory of the National Aeronautics and Space Administration (NASA) Global Inventory Modeling and Monitoring System (GIMMS). The images are derived from Global Area Coverage (GAC) imagery (of approximately seven kilometers 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 orbit satellites remotely sense the entire Earth and its atmosphere once each day and once each night, collecting data in five spectral bands. Bands 1 and 2 sense reflected red and infrared wavelengths, respectively, and the remaining three bands sense emitted radiation in three 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.

METEOSAT — METEOSAT-based Rainfall Estimates. FEWS uses estimates of current rainfall based on cold cloud duration as measured by thermal infrared radiometers on the METEOSAT satellite. The estimates are calculated every 10 days by the Department of Meteorology at the University of Reading in the U.K. Cold cloud duration correlates well with thunderstorm generated rainfall and, thus, is suitable for use in the semi-arid Sahel. The method works best on level terrain; hilly areas may produce local enhancements or rain-shadow areas that are not detected. In level areas the method has an accuracy of “rain/no rain” of at least 85 percent (based on a comparison with ground data). At a dekadal (ten-day) scale, 80% of rainfall amounts under 60 millimeters (mm) are accurate to plus or minus 10 mm, while rainfall over 60 mm is accurate to plus or minus 20 mm. This accuracy is acceptable for use in the FEWS-monitored region given that the method provides near-real-time coverage for a large area at a resolution of less than 10 kilometers.