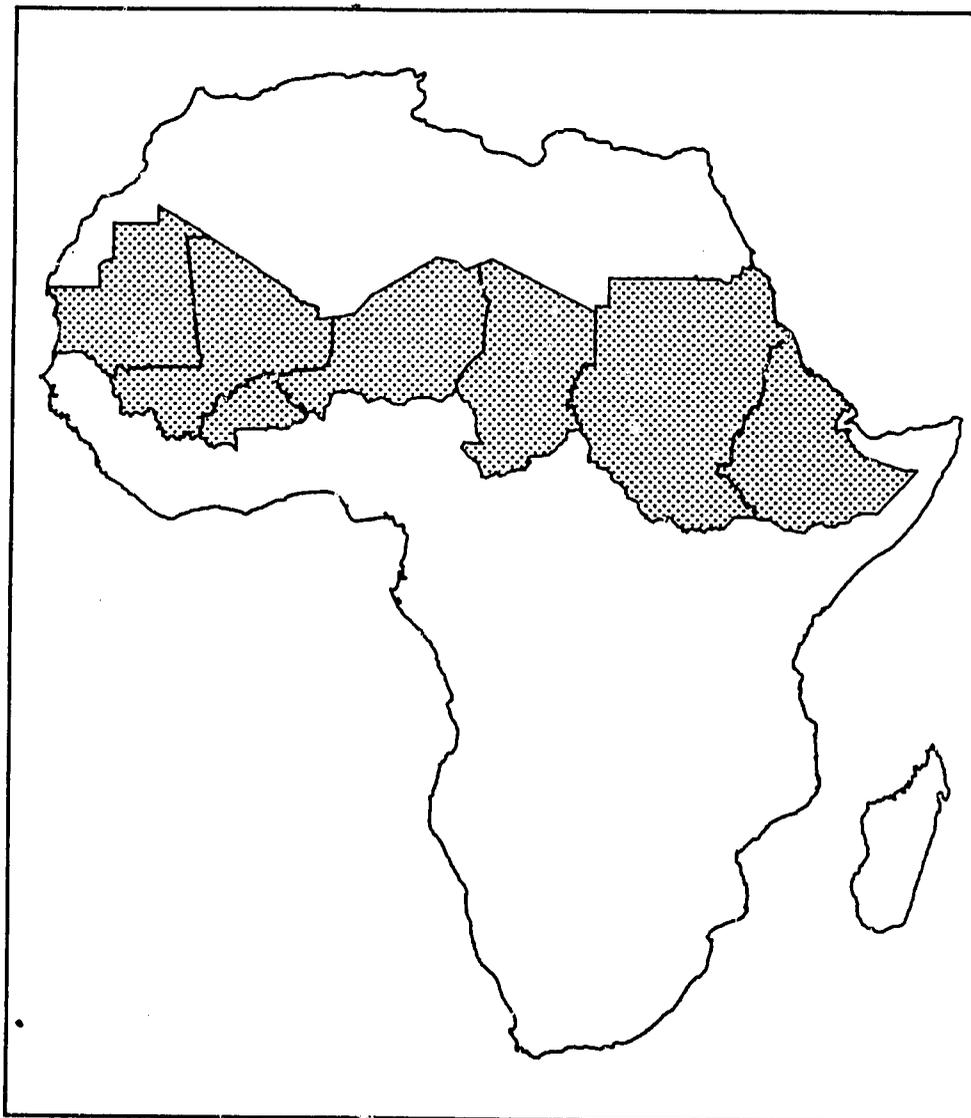


PN-ABK-652
76049

Harvest Assessment



Contains reports on:

Mauritania

Mali

Burkina

Niger

Chad

Sudan

**Ethiopia &
Eritrea**

Harvest Assessment

February 1992

Published for:

**Agency for International Development, Bureau for Africa
Office of Analysis Research and Technical Services**

Published by:

**FEWS Project, Tulane/Pragma Group
1611 N. Kent St., Suite 201
Arlington, VA 22209
(703) 243-1070**

Project No. 698-0466, Contract No. AFR-0466-C-00-9035-00

Table of Contents

FEWS Region: Near Record Harvests, Zones of Food Insecurity	1
MAURITANIA: Discouraging Harvest Offset by Abundant Commercial Imports	3
MALI: Record Harvest, Trouble Pockets Linger	11
BURKINA: Relief After Two Consecutive Bad Seasons	19
NIGER: Government Reports Near Record Cereal Harvest, Regional Deficits Persist	23
CHAD: Good Harvest Will Offset Local Shortages	31
SUDAN: Good Harvest, But Large Regional Relief Needs Remain	37
ETHIOPIA & ERITREA: Aggregate Harvest Good, Emergency Needs Slow to Disappear	43
Key Terms	Inside Back Cover

List of Maps

Map 1: Regional Summary Map	1
Map 2: Mauritania Reference Map	3
Map 3: Mali Reference Map	11
Map 4: Mali Civil Unrest	13
Map 5: Burkina Reference Map	19
Map 6: Niger Reference Map	23
Map 7: Chad Reference Map	31
Map 8: Sudan Reference Map	37
Map 9: Ethiopia & Eritrea Reference Map	43

List of Tables

Table 1: Mauritania, Provisional 1991/92 Production Estimate	5
Table 2: Mauritania, 1991/92 and 1990/91 Food Stock Status	5
Table 3: Mauritania, Projected 1991/92 Production Balance	6
Table 4: Mauritania, Projected 1991/92 Cereal Balance	6
Table 5: Mali, Estimate of Gross 1991/92 Cereal Production	13
Table 6: Mali, 1992 & Average Cereal Production Balances	14
Table 7: Burkina, Provisional Cereal Balance for 1991/92	20
Table 8: Burkina, Projected Food Aid from Donors	21
Table 9: Burkina, 1991/92 and Average Cereal Production Balance	21
Table 10: Niger, 1991/92 Cereal Production Balance using Rainfed Millet and Sorghum, Only	25
Table 11: Niger, Estimated 1991/92 Cereal Balance as of November 1, 1991	26
Table 12: Location, Numbers and Vulnerability Levels of Affected Populations in Niger	27
Table 13: Chad, 1991/92 Cereal Production Balance	33
Table 14: Chad, Annual Cereal Production since 1983/84	33
Table 15: Sudan, 1991/92 Gross Production	38
Table 16: Sudan, 1991/92 Irrigated Sorghum Production	39
Table 17: Sudan, 1991/92 Irrigated Wheat Production	39
Table 18: Sudan, 1991/92 Mechanized Sorghum Production	39
Table 19: Sudan, 1991/92 Traditional Sorghum & Millet Production	40
Table 20: Sudan, National Cereal Balance for 1992	40
Table 21: Sudan, Regional 1991/92 Cereal Production Balance	41
Table 22: 1992 Emergency Food Needs for Sudan	42
Table 23: 1991/92 Food Balance for Ethiopia and Eritrea	47

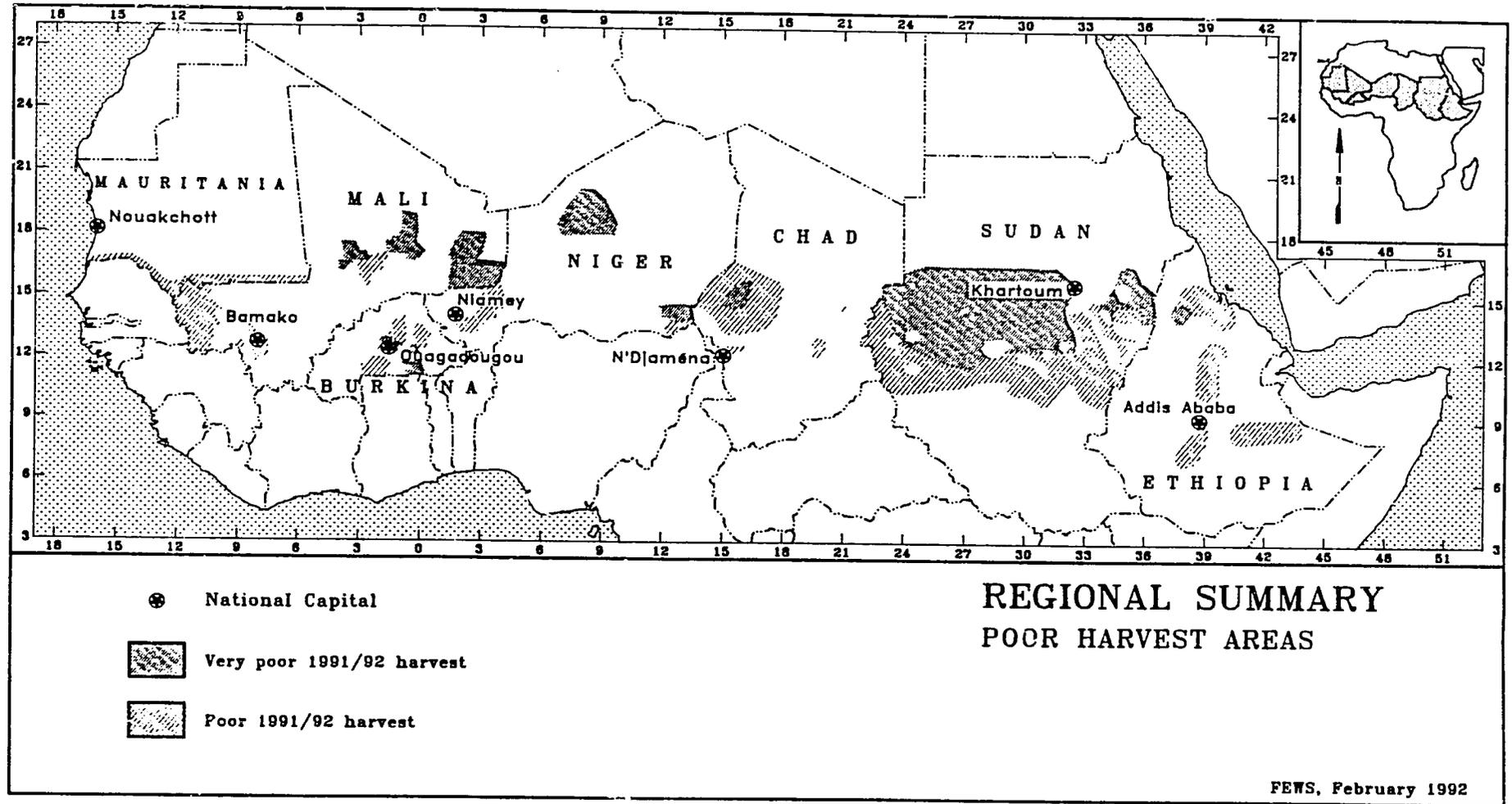
List of Appendices

Appendix A: Mauritania, 1991/92 Harvest Estimates, by Wilaya	9
Appendix B: Explanation of the Mauritanian Cereal Stock Situation	10
Appendix C: Mali, 1991/92 Cereal Production and Production Balance Estimates	16
Table C-1: Mali, 1991/92 Estimate of Cereals Production, by Cercle	16
Table C-2: Average Mali Cereal Production (1987-91), by Cercle	17
Table C-3: Mali, 1992 & Average Cereal Production Balances, by Cercle	18
Appendix D: Niger, Departmental Production and Demand Summary	29
Appendix E: Location and Vulnerability Levels of Affected Populations in Niger	30
Appendix F: FEWS Matrix of Vulnerability	50

List of Figures

Figure 1: Mali, Millet Consumer Prices, 1990-92	14
Figure 2: Mali, Terms of Trade Between Millet and Goats	14
Figure 3: Burkina, Weekly Ouagadougou Millet Prices	22
Figure 4: Chad, Millet Prices in Three Urban Markets, 1987-91	34
Figure 5: Chad, Sahelian Terms of Trade Between Sheep and Millet, 1987-91	34
Figure 6: Ethiopia & Eritrea, Purchasing Power in Addis Ababa, 1980-91	45
Figure 7: Ethiopia & Eritrea, Asmara Cereal Prices, 1984-91	46
Figure 8: Ethiopia & Eritrea, White Sorghum Prices in Hararghe, 1987-91	46

Map 1: Regional Summary Map



Near Record Harvests, Zones of Food Insecurity

Washington, February 10, 1992

SUMMARY

The 1991/92 cereal harvest was at record or near-record levels in most of the countries monitored by FEWS. In spite of this fact, civil insecurity and localized drought have created zones of food insecurity in six of the seven FEWS countries. Of these, however, only Sudan and Ethiopia are expected to require emergency food relief during 1992. The food aid required for those two countries is substantial. Mauritania, the one country that experienced poor production nationwide, may cover its remaining food needs through the commercial sector.

Mauritania

The October estimate of net cereal production (82,415 metric tons, 23 % of cereal food needs) will probably be revised significantly downward. Despite a third year of dismal harvest prospects, the amount of cereal imported commercially over the past ten months seriously narrows the cereal balance deficit. Current discussion over the numbers for 1991/92 continue, but the provisional deficit currently stands between 24,000 and 46,000 metric tons.

Mali

Excellent climatic conditions contributed to a record harvest of 2.2 million metric tons (MT) of cereals in 1991. The result has been a general decrease in cereal prices. Continued civil unrest in the North limits local residents' access to this bounty.

Burkina

Burkina's cereal production was particularly good in 1991/92 after two consecutive years of bad harvests, especially in the most of the densely populated Central Plateau. Food aid will probably be limited to donors' regular food aid programs. The national provisional cereal production estimates have now revealed a possible surplus of 86,000 metric tons. The final cereal production estimates are expected in March 1992.

Niger

Niger's near-record 1991 harvest will mean adequate food supplies for most Nigeriens through the 1992 harvest. Due to poor production and/or political unrest, food security problems persist in eastern and northern parts of the country, with an estimated 586,000 persons affected.

Chad

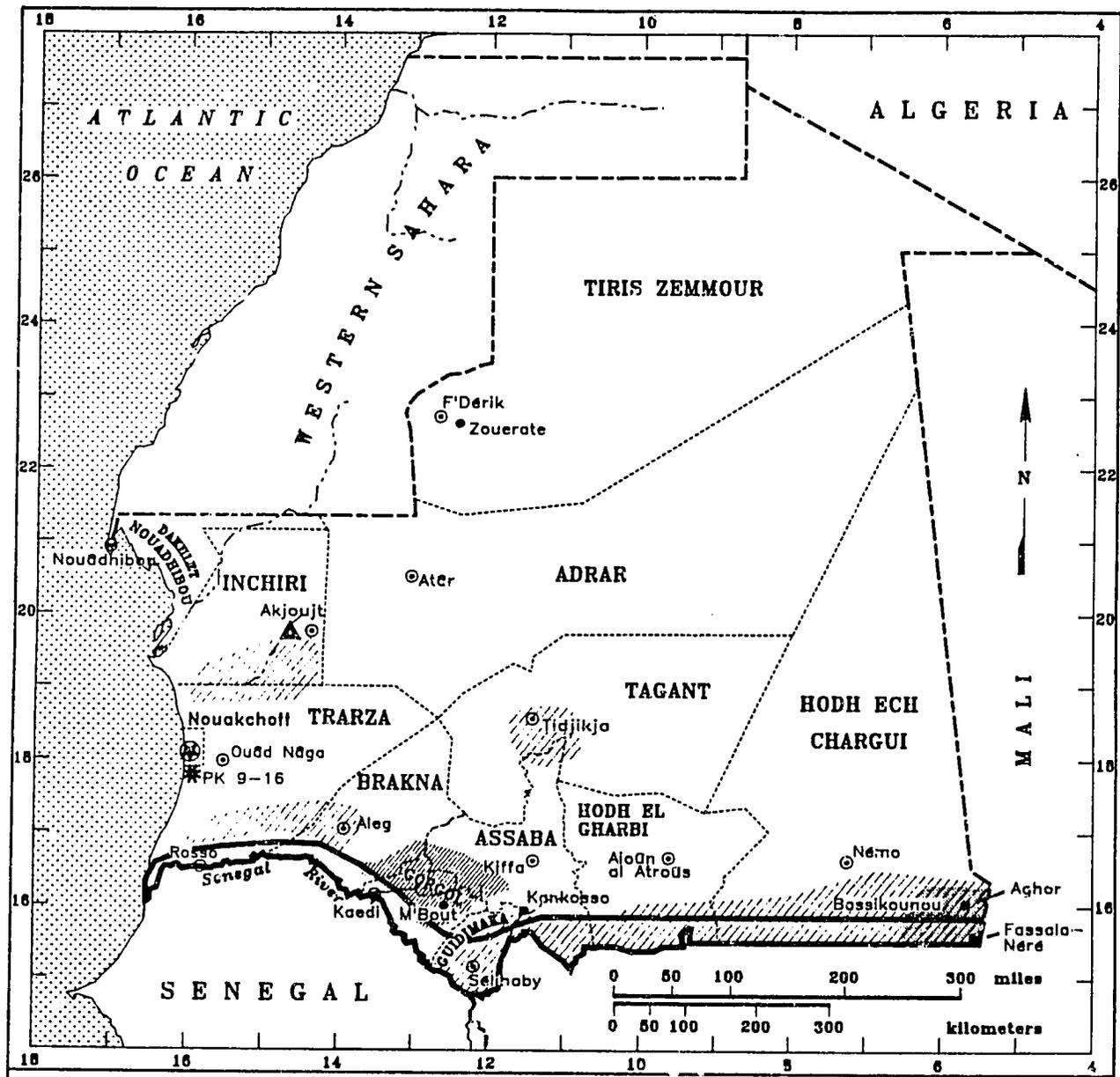
Major regional rainfed crop failure will affect Kanem and Lac prefectures, despite government prediction of record national harvest. Assistance for those affected, as well as for 16,000 refugees returning from Sudan, will be drawn from in-country stocks. No emergency food aid imports will be required to meet the needs of these two populations.

Sudan

The 1991/92 cereal production of 3.5 million metric tons could cover aggregate consumption needs. A large part of this substantial harvest took place in the irrigated and mechanized sectors. Emergency relief will still be necessary, however, for subsistence households whose production was poor and whose resources will not allow them to purchase sufficient food, particularly in western Sudan and parts of eastern and central Sudan. In addition, emergency food needs remain for large numbers of drought and war displaced persons in North and South Sudan and for some refugees.

Ethiopia & Eritrea

The aggregate 1991 Ethiopia and Eritrea harvest estimate is the second highest on record. Although the end of civil war in the North has improved people's lives, recent assessments of those "at-risk" put emergency food needs in excess of one million MT. Emergency food is needed (particularly in Eritrea, Tigray and Hararghe), but the amounts cited are hard to reconcile with recent food price decreases, nutrition rate stability and confined episodes of severe food stress. Further study of sub-national food security issues and close monitoring of vulnerable populations are necessary if 1992 emergency aid is to be effective, yet not damp the desirable effects of recent agricultural reforms.



M A U R I T A N I A

**HARVEST ASSESSMENT
REFERENCE MAP**

- ⊗ National Capital
- ⊙ Wilaya Capital
- Cities and Towns
- International Boundary
- Wilaya Boundary
- - - - Intermittent Drainage
- ▨ Below average pasture conditions
- ▧ Average pasture conditions
- ▩ Displaced Malians
- ▲ Flood disaster
- ⬡ Agricultural zone--poor harvest
- * Slumdwellers

Source: FEWS/Mauritania
FEWS, February 1992

Map 2: Mauritania Reference Map

MAURITANIA

Discouraging Harvest Offset by Abundant Commercial Imports

Report released by AmEmb/Mauritania on January 15, 1992

SUMMARY

Harvest prospects range from poor to catastrophic throughout Mauritania's agricultural belt (along the southern border—see Map 2). Most irrigated and river recessional crops are still several months away from harvesting (often half of annual production), while some lowland recessional crops are currently in the process of being harvested with much lower yields than projected. Ongoing data collection and anecdotal reports suggest that the 82,414 metric tons (MT) net cereal production first estimated by the annual Joint Food and Agriculture Organization/Committee to Combat Drought in the Sahel (FAO/CILSS) evaluation team in October will have to be revised sharply downwards. Even if the current production estimate stands, a mere 23% of Mauritania's global cereal needs will be met by production this year. The net cereal deficit will extend to all regions, as they have in the past three consecutive growing seasons. The 1991/92 cereal deficit is currently under discussion between the donors and the Government of the Islamic Republic of Mauritania's (GIRM) Food Security Commission (CSA). The deficit is presently calculated at approximately 46,000 MT.

FACTORS AFFECTING FOOD AVAILABILITY

Harvest Outcome

The 1991/92 harvest will closely resemble that of 1990/91 in global figures. The large majority of traditional farmers now face their third consecutive devastating season. Domestic production in Mauritania depends upon planting schemes that include rainfed (*dieri*), irrigated, river recessional (*walo*), and passive and diked lowland agriculture (*bas-fonds* and *decrue*,¹ respectively), with each scheme usually contributing one-quarter of Mauritania's annual cereal production. All four production schemes have been adversely affected by the very late start and weak outcome of the 1991 rainy season, as mentioned in the 1991 FEWS Pre-Harvest Assessment.

¹ *Decrue* agriculture is usually treated as a subset of *bas-fonds* in reports on the progress of Mauritania cereal production, although *decrue* production statistics are sometimes reported separately.

Rainfed crops (*dieri*) have been harvested. Total production was estimated at 17,061 MT net, approximately 27% lower than 1990/91 (23,337 MT net). Unfortunately, all three of the other production schemes are also falling behind the pre-harvest predictions. River recessional crops (*walo*) are still maturing, but actual surface area planted is much less than originally envisioned. *Bas-fonds* crops are in varying stages, but insufficient soil moisture threatens yield. Some irrigated rice is now being harvested in parts of Trarza and Brakna *wilayas*,² but the majority of the rice crops are still maturing. Rice yields are reported to be between two and three metric tons per hectare, rather than the more usual four.

Preliminary production estimates put forward by the FAO/CILSS mission held in October set 1991/92 net cereal production at 82,414 MT (see Table 1). As of mid-January, the GIRM Agricultural Statistics Bureau (ASB) has still not released formal production estimates for the 1991/92 season, nor have they officially accepted the FAO/CILSS provisional evaluation results. Unfortunately, environmental circumstances and various information concerning crop conditions since the FEWS Pre-Harvest report leads FEWS/Mauritania to believe that actual production will be even less than the October estimate.

Pastoral Conditions

Strong and steady rains did not begin until late in July and ended by mid-October, giving 1991 a short growing season with limited biomass development. The Normalized Difference Vegetation Index (NDVI—see inside back cover) showed uneven green-up because of the irregularity and poor spacing of the rains. Because heavy rains only fell in August and September, insufficient soil moisture caused pastures to dry out quickly after the rains ceased. The pastoral band between south Kankossa and M'Bout was particularly poor (see Map 2). Overgrazing and crowding around water points in the southeastern Hodh *wilayas* was a concern because of influx of Malian Tuaregs and their animals. However, insecurity in the area kept normal transhumance to a minimum. Overall, as mentioned in the FEWS 1991 Pre-Harvest Assessment, pasture conditions varied widely from above average in some zones (Guidimaka, southern

² In order of precedence, Mauritania's administrative units are *wilayas* and *moukhataas*. These were formerly called regions and departments.

Table 1: Mauritania, Provisional 1991/92 Production Estimate (MT)

Planting Scheme	Sorghum	Millet	Rice	Corn	Total
Dieri	16,153	3,919	0	0	20,072
Bas-fonds	15,400	0	0	550	15,950
Walo	18,258	0	0	826	18,884
Decrue	9,160	0	0	0	9,160
Irrigated					
(parastatal)	0	0	25,883	32	25,915
(offseason)	0	0	11,921	0	11,921
(private)	0	0	8,748	0	8,748
Total Gross	58,771	3,919	46,552	1,408	110,650
Total Net	49,955	3,331	27,931	1,197	82,414

Source: FAO/CILSS evaluation team, October 1991

Notes: A standard 15% loss is applied to the coarse cereal crops and 40% to paddy rice to arrive at net production. Irrigated (parastatal) figures include both SONADER and M'pourie perimeters. SONADER is the Mauritanian rice production parastatal, the M'pourie rice project is funded by the People's Republic of China. Except for *dieri* crops, the October FAO/CILSS production statistics are not broken down by administrative unit. Appendix A contains a table of production statistics disaggregated by *wilaya* and cropping scheme, constructed by FEWS/Mauritania in order to calculate regional food needs and projected cereal deficits.

Hodhs, southeastern Trarza *wilayas* and northern patches), to very poor in others (northern Gorgol and western Assaba *wilayas*).

Existing Food Stock Information

The first cereal balance exercise for the 1991/92 year derived a provisional 45,933 MT deficit estimate. This rather unalarming figure can only be attributed to the substantial arrival of commercially imported cereals over the last year. These imports were triple the amount of what was planned or expected, proving once again the strength of the private sector (see Appendix B for a detailed explanation of this situation). Despite the relatively abundant stocks, FEWS/Mauritania still believes that household-level food stocks are minimal at best after the third poor growing season. In contrast, the technical committee responsible for deriving the annual cereal balance (Commission

Table 2: Mauritania, 1991/92 and 1990/91 Food Stock Status (MT)

Stock Type	1991/92	1990/91
On-Farm Stocks	5,000	5,000
CSA Stocks	50,362	12,347
Private Sector (commercial)	16,200	6,000
SONIMEX	4,821	10,300
Total	76,383	33,647

Sources: CSA, SONIMEX, CPA, FEWS/Mauritania

Notes: The 1991/92 Food Security Commission (CSA) stock figure includes approximately 4,000 MT of the USAID wheat for sale (available since 1990/91) and other for-sale cereals brought in by donors such as the European Community (EC) and the United Nations World Food Program (WFP), for distribution in 1991. Because of problems with sales, these cereals are still awaiting sale (see Appendix A). SONIMEX is the national import/export company. Estimates of private sector stock are not easily obtainable. Most of the arrivals are distributed quickly, but this figure, 10% of the total amount brought in last year, was chosen for purposes of analysis.

de Programmation Alimentaire—CPA) is adopting a figure of 5,000 MT as a base figure for household-level stock quantities. Other carry-over stocks are shown in Table 2.

Projected Food Aid and Commercial Imports/Exports

The annual cereal balance exercise was undertaken by the CPA at mid-January. Projected 1991/92 commercial imports total 163,000 MT (private sector imports are 43,000 MT of wheat, 30,000 MT of rice and 60,000 MT of wheat flour; SONIMEX imports are 30,000 MT of rice). No official cereal exports are expected (given the very poor harvest prospects and the continued border closure with Senegal). Unofficial cereal exportation of wheat and wheat flour to Mali and even Senegal is probably on the rise (considering the large quantities of commercial imports last year). Although hard to quantify, some estimates of unofficial exports range from 8,000 to 10,000 MT being transported over the border each year.

Early estimates of Mauritania's cereal deficit are not nearly as alarming as those projected last year. The CPA has constructed a provisional table that includes FAO/CILSS production estimates and all food-aid pledges up to date. In this scenario, the 1991/92 deficit is currently 45,933 MT.

Projected Food Consumption Needs

Earlier projections of the food deficit have changed following updated information on harvest prospects. Regional production data remains unavailable, as the ASB has not yet released any statistics concerning surface area cultivated by *wilaya* (formerly "region"). Similar to last year's pattern, FEWS/Mauritania expects that this information will differ significantly from the 1990/91 breakdown of regional production. For analytical

purposes, FEWS/Mauritania has broken down this year's global production estimate to the *wilaya* level by applying several past season production scheme percentages that best compare to this year's conditions. Official *wilaya*-level production data should be available in March.

Table 3 shows the FEWS/Mauritania estimate of Mauritania's cereal production balance¹ by *wilaya*. Population figures are calculated by applying a 2.7% annual growth rate to

the official 1988 census figures. Cereal needs are calculated using the official consumption figure of 165 kilograms per person per year. Malian refugee requirements are based on a six month ration at 400 grams a day (73 kilograms per person).

Table 4 presents a projected national cereal balance for 1992. The table compares figures used by the CPA and FEWS/Mauritania analyses. Both scenarios use the FAO/CILSS provisional production estimates for 1991/92. The

Table 3: Mauritania, Projected 1991/92 Production Balance (MT)

<i>Wilaya</i>	1992 Population	Cereal Needs	Total Net Production	Production Balance	% 1992 Needs Met
Hodh ech Chargui	208,691	34,434	7,462	-26,972	22
Hodh el Gharbi	162,007	26,731	5,438	-21,292	20
Assaba	176,630	29,144	3,281	-25,863	11
Gorgol	190,692	31,464	21,904	-9,560	70
Brakna	208,868	34,463	13,204	-21,259	38
Trarza	260,506	42,983	17,230	-25,753	40
Guidimaka	124,555	20,552	5,145	-15,407	25
Tagant	73,836	12,183	8,750	-3,433	72
Sub-total for Agricultural Wilayas	1,405,785	231,954	82,414	-149,540	36
Non-agricultural Wilayas	628,968	103,780	0	-103,780	0
Sub-total for Mauritanian Population	2,034,753	335,734	82,414	-253,320	25
Needs of Malian Refugees	18,000	1,314	0	-1,314	0
Total	2,052,753	337,048	82,414	-254,634	24

Sources: GIRM Census Bureau (CEDES), FAO/CILSS evaluation results, UNHCR, FEWS/Mauritania.

Note: See the notes in Appendix A for explanations of percentages applied to derive production estimates for each *wilaya*.

Table 4: Mauritania, Projected 1991/92 Cereal Balance (MT)

	CPA	FEWS
1992 Mauritanian Population	2,147,000	2,034,753
Annual per capita consumption rate for non-refugees (kg)	165	165
1992 Refugee Population	28,000	18,000
Annual per capita consumption rate for refugees (kg)	165	73
1991/92 CEREAL CONSUMPTION REQUIREMENTS		
Expected 1991/92 Cereal Consumption for General Population	354,255	335,734
Expected 1991/92 Cereal Consumption for Refugee Population	4,620	1,314
Seed and Feed Loss	9,770	9,770
Replenishment of Stocks (not available for consumption)	41,200	41,200
Total Cereal Requirement	409,845	388,018
1991/92 CEREAL SUPPLY		
Net Cereal Production	82,414	82,414
Available In-Country Stocks	76,383	76,383
Programmed Food Aid & Food-for-Sale for 1991/92	42,115	42,115
Expected 1991/92 Commercial Imports	163,000	163,000
Total Available Cereal Supply for 1991/92	363,912	363,912
PROVISIONAL CEREAL BALANCE FOR 1991/92	-45,933	-24,106

Sources: The European Community, CSA, WFP, SONIMEX, FAO/CILSS, FFP, and FEWS/Mauritania.

Note: The CPA adopts a higher population figure than the one used by FEWS/Mauritania for calculating food-needs (population: 2,175,000 vs 2,052,753 food needs: 358,875 MT vs 337,048 MT). A second difference is in the treatment of refugee food needs—FEWS/Mauritania uses the UNHCR planning figure of 400 grams per day over a six-month period (annualizes to 73 kg), the CPA uses the general population consumption rate of 165 kg over full year.

¹ A cereal production balance is the amount of cereal needs met by local production before stocks on-hand, commercial imports and food aid are taken into account.

higher population figure was adopted by the CPA to accommodate an influx of Mauritanian repatriates returning from Senegal in 1989. The CPA has also included 28,000 Malian refugees. FEWS/Mauritania believes the influx of Mauritians from Senegal was negated by an equal or larger population leaving the country during the same period, however, and has included 18,000 Malians as is currently reported by The United Nations High Commission on Refugees (UNHCR), rather than 28,000. Finally, the CPA expects the Malian refugees to remain in Mauritania for a full year and to require the same amount of cereals as the general populations. FEWS/Mauritania, on the other hand, accepts the UNHCR expectations that the Malians will remain in Mauritania for only half a year and will require only the cereal ration that the UNHCR plans to provide (73 kg per person for six months).

FACTORS AFFECTING FOOD ACCESS

Economic Data

Food stress is considered to be reduced from last year, given the food distributions that have taken place since the start of June 1991. Poor global production has kept traditional cereal prices higher than normal for this time of year. A slight drop in sorghum prices in the southern interior markets followed the rainfed harvest, but prices are again on the rise due to the limited quantities harvested and of the relatively poor expectations for the ensuing *walo* and *bas-fonds* cereal crop harvest.

UPDATE ON VULNERABILITY

Approximately 18,000 Malian refugees are inhabiting three main camps (Bassikounou, Aghor, and Fassala Néré) in the southeastern corner of Mauritania (see Map 2). Another 10,000 are reported to have moved into the area, but remain outside of the camps. UNHCR and GIRM authorities are continuing to monitor this slowly increasing, highly vulnerable population (see Appendix F for FEWS' definitions of levels of vulnerability to and risk of famine). A new census or registration of the population residing in camps was scheduled for the end of January. This will assist in the targeting of emergency food and supplies over the next six months. Three main food-aid distributions are tentatively scheduled for January, April and June. Donors recently have been solicited for various food contributions (including a request to the U.S Government for 1,296 MT of wheat) to help cover needs until the end of June 1992.

Apart from food need issues, the Coopération Française (the French analog to AID) was to start drilling for a new water source in the area of the three camps by the end of January, with plans to finish before the end of February, thus ameliorating the insufficient and polluted water-supply problems. An outbreak of measles caused several deaths during January. At mid-

January, UNHCR arranged financing for additional medical supplies to combat the epidemic. They also organized a field mission to the camps with qualified medical personnel to quantify and stabilize the situation.

Heavy rains fell in northern Mauritania in mid-December, creating flood conditions around Akjoujt. The rains destroyed 140 mud houses, as well as many of the local crops. Several NGOs and donors have since distributed blankets, tents and some food aid (rice, milk powder, and wheat) to help mitigate the disaster. World Vision had plans to begin rebuilding 60 of the houses that were lost, starting in January. Both the GIRM and NGOs are addressing the needs of this moderately vulnerable population.

Other populations previously identified as "at risk" of famine include Nouakchott slum dwellers residing at PK 9-16 (see Map 2) and a large percentage of the farming families in the River Valley. The two groups received free food distributions between June and September 1991, thus reducing their extreme vulnerability to moderate and high vulnerability, respectively. Slum dwellers still face many hardships, but as explained in the 1991 FEWS Pre-Harvest Assessment, the quality of life is slowly improving, as is evidenced by the newly built medical dispensary, new schools, and improved transportation into town. River Valley farmers are also experiencing improved conditions despite their third consecutive poor growing season. While household-level food stocks after harvest will not suffice until next year and are considered minimal at best, the previously imposed ban on river fishing (stemming from the border closure with Senegal in August 1989) has been lifted since last spring, so that fish can complement cereal food supplies. In addition, reduced tensions along the Senegal border have encouraged a return of herds back into the region, increasing the availability of meat and dairy products in the border area. A further factor contributing to reduced food stress is unofficial trade across the river. Although the border is still officially closed, decreased military surveillance has led to resumed border trade with Senegal, which traditionally has been an important part of the unofficial economy and has had an enormous impact on food security.

UPDATE

During February 1992, Médecins Sans Frontières (MSF) staff found that 30% of 1,500 children surveyed at the southeastern camps were severely malnourished. Severe malnutrition is defined here as having an upper arm circumference of less than 12 centimeters. In addition, it appears that more than 400 children died during January and February from a variety of causes (including measles). MSF vaccinated over 1,500 children against measles during their visit.

CONCLUSIONS

The harvest outlook for 1991/92 is poor and follows two consecutive poor-production years. Although final estimates of production will not be available for several months, preliminary figures (82,414 MT net) provide a baseline for provisional cereal balance estimates. Mauritania will cover only 23% or less of its current food needs via its 1991/92 harvest, but large initial stock reserves will help make up for low production figures. Since the June 1991 Vulnerability Assessment, two new groups have become vulnerable. These are (1) approximately 18,000 highly vulnerable Malian refugees residing in three main camps in the southeastern corner of Mauritania and (2) the occupants of about 140 homes that were destroyed near Akjoujt by flooding in December. Both of these groups

are being assisted by the GIRM, NGOs or UNHCR. Two other groups (slum dwellers outside Nouakchott and farmers in the Senegal River Valley) were labeled as "at-risk" in May, but have since experienced an improvement in their conditions. The slum dwellers (living at PK 9-16) are now moderately vulnerable, and the River Valley farmers are highly vulnerable.

Even though domestic production is discouraging, there should not be wide-spread hunger or famine during 1992 because of unprecedented commercial imports over the last ten months. This is not to say that food stress will not be felt in different pockets of the country, especially those already mentioned as vulnerable. The remaining deficit situation must be addressed without delay. The main questions left to be answered are whether further donor assistance will be required in 1992 and whether commercial cereal imports will close the cereal food gap.

APPENDIX A: Mauritania, 1991/92 Harvest Estimates, by Wilaya

Wilaya	Dieri	Walo	Bas-Fonds	Decrue	Irrigated Rice	Other Irrigated Crops	Off-Season Rice	Gross Total	Net Total
Hodh ech Chargui	3,418	0	5,361	0	0	0	0	8,779	7,462
Hodh el Gharbi	3,816	0	2,582	0	0	0	0	6,398	5,438
Assaba	2,117	0	1,743	0	0	0	0	3,860	3,281
Gorgol	2,903	10,876	0	0	12,639	0	4,348	30,766	21,904
Guidimaka	5,109	225	0	0	724	32	249	6,339	5,145
Brakna	1,575	4,554	6,264	0	3,306	0	1,144	16,843	13,204
Tagant	1,134	0	0	9,160	0	0	0	10,294	8,750
Trarza	0	3,229	0	0	17,962	0	6,180	27,371	17,230
Total	20,072	18,884	15,950	9,160	34,631	32	11,921	110,650	82,414

Sources & Notes: Regional production was broken down as follows:

Dieri: These figures were obtained from the FAO/CILSS evaluation.

Walo: FEWS/Mauritania believes that environmental conditions were comparable to those of 1989/90, and therefore applied the same percentage by *wilaya* using FAO/CILSS 91/92 estimates of *walo* production.

Bas-Fonds: FEWS/Mauritania applied the 1990/91 regional production percentages using the FAO/CILSS 91/92 estimates. Even though rains were generally poorer this season, timing and spacing were similar.

Decrue: This figure was obtained from the FAO/CILSS evaluation via SONADER.

Irrigated: FEWS/Mauritania applied FAO/CILSS production estimates to the latest breakdown of land area (perimeters) being farmed. This information was furnished by SONADER. FEWS/Mauritania applied the same production percentages used in 1991/92 for both private and off-season irrigated production.

Appendix B: Explanation of the Mauritanian Cereal Stock Situation

The final 1990/91 cereal balance closed with a 27,000 MT deficit, even though final CSA stock levels were higher than 50,000 MT. The cereal food deficit was particularly alarming during the first phase of the cereal accounting exercise of 1990/91 (more than a 100,000 MT deficit). The massive response by the food aid donors was extremely beneficial to the populations suffering food stress. Even so, food aid that arrived destined for sale (developmental versus emergency distribution) had particular difficulties reaching needy people as a result of massive commercial wheat imports.

At the end of 1990, reports from UNICEF and the Health and Social Affairs Ministry noted that infant malnutrition was on the rise throughout the country and that severe malnutrition was threatening specific areas. Following these reports, the GIRM launched a formal request to all food aid donors for assistance and authorized the private sector to import 36,000 metric tons of wheat to help cover the 100,000 MT projected cereal deficit. Immediately after this, taking into consideration the then upcoming Gulf crisis and its uncertain effects, the GIRM felt that the severity of the situation merited opening the door to increased wheat imports by the private sector.

Unfortunately, a tax of only 5% was applied to commercially imported wheat. Wheat brought in by the donors as food-for-sale was fixed at a price of 23 oughiya per kilogram (UM/kg). This fixed price for wheat was derived after a study on producer prices and was applied in order to protect the domestic producer (traditional cereals include sorghum, millet, and maize). This situation, along with particularly low international wheat prices, allowed the private sector to import up to 72,000 MT of wheat, which they were then able to sell at significantly lower prices than those set for food-aid wheat brought in for sale by the donors. The consequence was the inability to sell the food aid. This explains the initial stock reserves in 1991/92 of more than 50,000 MT. Multiple consequences include:

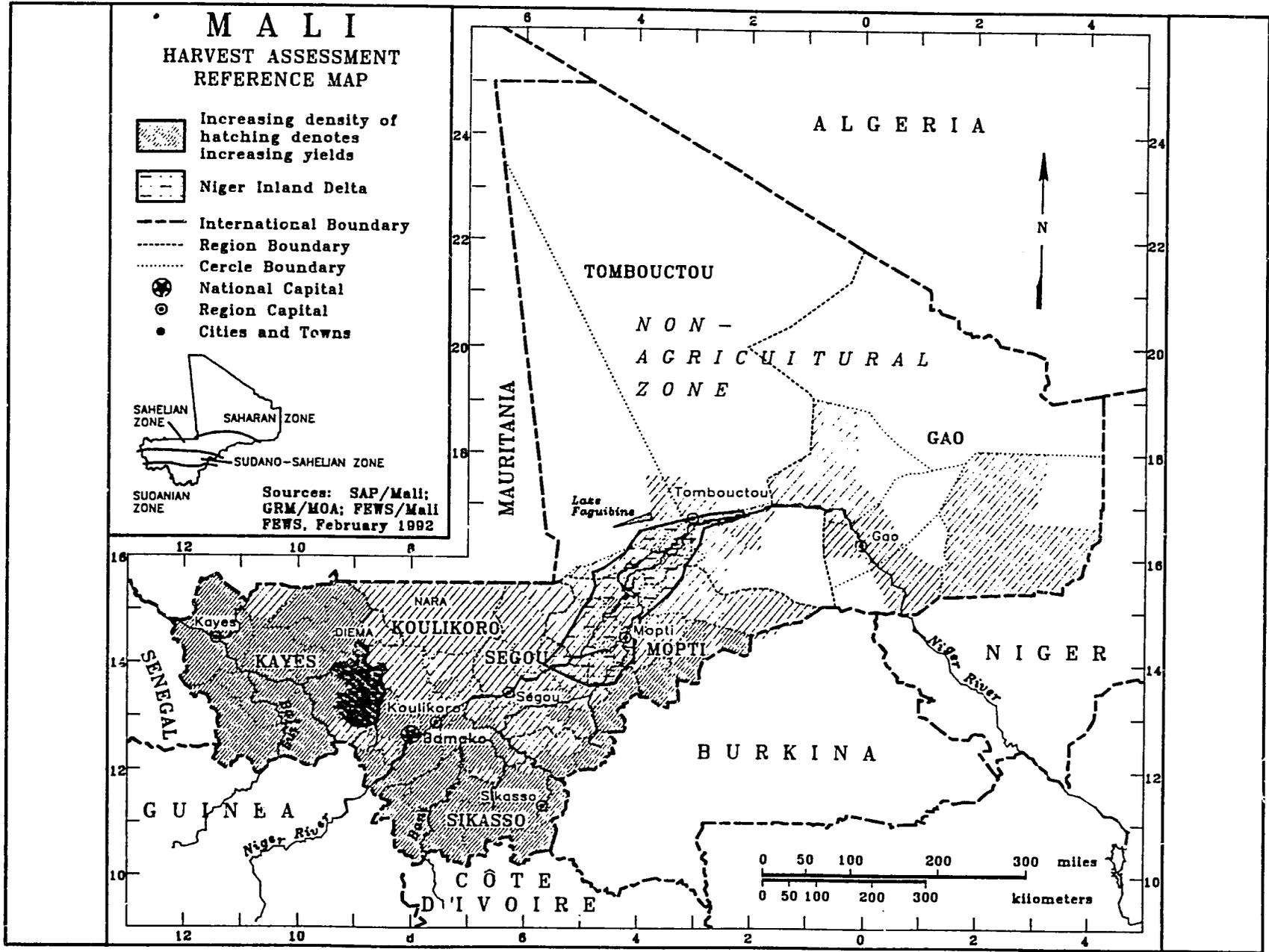
- Additional stocking and warehouse costs for food aid, as well as the risk of spoilage.
- Lack of counterpart funds (funds generated by the sale of food aid), which help finance and support development projects.
- Lack of counterpart funds that help finance the transport and logistic costs of emergency food-aid or free distribution.
- Endangerment of the rules made to protect local production.

Since the counterpart funds have begun to run out, the GIRM has begun to realize the severity of the situation. In theory, a 45% tax on commercial wheat imports will be imposed by the Financial Law of 1992. This 45% tax should be vigorously enforced beginning in January and was agreed upon as a fair amount by all the players involved in "cereal politics." The tax will permit Mauritania to respect its commitments to the World Bank surrounding the liberalization of cereal imports, while at the same time raising the price of imported wheat to a level that does not interfere with local cereal production.

Last year's massive commercial wheat imports were accompanied by massive food aid imports that were in direct response to GIRM requests (85,000 MT, of which 29,000 MT were destined for free distribution). Free distributions did take place between June and September of 1991, helping to reduce the extreme food stress that was previously reported, but the majority of wheat destined for sale through auctions remains in Nouakchott warehouses.

Map 3: Mali Reference Map

Mali Harvest Assessment



Record Harvest, Trouble Pockets Linger

Report released by USAID/Mali on January 23, 1992

SUMMARY

The 1991/92 harvest was the best on record, with an estimated cereal harvest of 2.2 million metric tons (see Map 3 for cercle¹ locations). Local areas of crop failure have been reported in western Ténenkou and Youvarou cercles. Those victims of crop failure continue to suffer for a third consecutive year. Much of the harvest not consumed by the growers will likely go towards exports, into reconstituting household stores, and national stocks and thus may not be available to the market. The less cereal there is on the market, the less will be available to non-growers and to those living in production-deficit² areas. USAID/Mali estimates an overall cereal deficit of 14,800 metric tons (MT).

Access to food has improved generally in Mali with the fall in cereal prices. For rural farmers, this access is limited by the debt burden incurred during the previous lean years. Access is also severely limited for those populations affected by civil unrest in the North. Food and material assistance will be necessary for at least 15,000 displaced persons in the North of Mali. Another 20,000 to 50,000 displaced people currently in neighboring countries will need ongoing assistance if a settlement of the conflict in the North is reached, allowing the displaced to return home.

FACTORS AFFECTING FOOD AVAILABILITY

Harvest Outcome

The 1991/92 crop season will produce the largest harvest on record. Climatic conditions were good to excellent throughout most of the country. Only Youvarou, Ténenkou and northern Mopti cercles in Mopti Region reported significantly below average harvests. Even in these cercles, poor harvests were localized. Crop conditions were good in the agricultural zones

¹ In order of precedence, Mali's administrative units are regions, cercles, and arrondissements.

² A cereal production balance is the amount of cereal needs met by local production before stocks on-hand, commercial imports and food aid are taken into account.

of Tombouctou and Gao regions as well, though civil unrest may affect the commercialization of the harvest.

Crop production in the Sahelian Zone was generally excellent in spite of the late onset of rains, because the season lasted longer than usual. The south and west of the country received good rains over a long period. The areas reporting poorer harvests along the northwestern Inland Delta of the Niger River suffered an early end to rains.

River levels reflected the good rains farther south. This has resulted in an excellent harvest in flooded rice paddies. It also indicates that harvests should be good in recessional agriculture and vegetable gardens, particularly in the North along the Niger. The exception to this may be in areas where herd concentrations might interfere with recessional agriculture, along the northern reaches of the Niger.

Although infestations of grasshoppers and blister beetles and a fear of major influxes of Senegalese grasshoppers from Mauritania were reported, crop pests did not cause any significant failure in the harvest. Favorable breeding conditions, however, may have resulted in large egg deposits, which could lead to large populations during the next crop season.

A total estimated harvest of over 2.2 million MT of cereals was reported by the Government of the Republic of Mali (GRM) joint National Statistics Service/National Agricultural Service (DNSI/DNA) Agricultural Survey (see Table 5). The final report is not due out until mid-1992. Harvest estimates at the cercle level were made by allocating the reported production for the 11 agroclimatic zones using the percent average contribution of constituent cercle production from the period 1987-91 as reported in DNSI/DNA Survey results (see Appendix C for 1991/92 and average 1987-91 cercle-level production statistics).

Pastoral Conditions

As a result of good rains, range and pasture conditions were excellent. All areas of livestock production reported good vegetative conditions. Transhumance patterns were disrupted, however, by civil unrest in the North and the Inland Niger Delta (see Map 3 for location of the Inland Delta and Map 4 for an estimate of the geographic extent of civil unrest). This has resulted in large herd concentrations. There has been an early use of winter grazing lands and over-use of pastures that are

Table 5: Mali, Estimate of Gross 1991/92 Cereal Production

Region	Millet	Sorghum	Rice	Maize	Fonin	Total
1. Kayes	18.65	97.31	2.10	19.24	0.02	137.32
2. Koulikoro	102.75	166.23	16.82	33.40	2.41	321.61
3. Sikasso	131.12	229.77	44.01	157.75	9.36	572.01
4. Ségou	309.29	204.43	56.85	14.30	21.72	606.59
5. Mopti	197.71	22.06	199.62	0.96	6.42	426.77
6. Tombouctou	16.94	6.63	77.34	0.00	0.00	100.91
7. Gao	0.64	2.11	39.55	0.00	0.00	42.30
Total	777.10	728.54	436.29	225.65	39.93	2,207.51

Source & Notes: 1991/92 production estimate used DNSI/DNA Agricultural Survey results for the 11 agroclimatic zones in Mali. The 1987-91 average contribution from each *cercle* to its constituent agroclimatic zone was used to disaggregate 1992 data to the *cercle* level. Historical average production based on final joint DNSI/DNA Agricultural Survey reports for agricultural years 1986/87 to 1990/91.

normally used during transit between rainy season and dry season ranges. Severe range degradation is reported in Ténenkou, Youvarou, and Niafunké *cercles*. Further large herd concentrations are reported in Nara, Diéma, Djenné, and Mopti *cercles*. The Mopti Regional Office for Development and Livestock (ODEM) has recommended provision of 4,000 MT of supplemental feed to affected herds from March until the onset of the 1992 growing season. Local authorities feel that this amount may, in fact, be too low. GRM experts have also voiced the concern that these large concentrations may encourage major disease outbreaks in the herds.

The large herd concentrations have also given rise to conflicts between pastoralists and farmers. Herds have remained in areas

that are seasonally cropped and invaded fields near rangelands. This exacerbates an increasingly critical situation where transhumant pastoralists are suffering declining access to ranges that sedentary farmers are using for diversifying into livestock production.

Existing Food Stock Information

Much of the surplus expected from the harvest is likely to go into restocking of household and village grain reserves. Reserves had been essentially exhausted by previous poor harvests. As a result, much of the harvest may not enter the market.

Current GRM stocks remain below capacity. Commercial stocks of the GRM Agricultural Product Marketing Office (OPAM) were 1,272 MT at the end of December 1991. National Security Stocks (SNS) were 26,389 during the same period. A call for bids has been issued to purchase locally 30,000 MT of grain for the SNS during the first quarter of 1992.

Projected Food Aid and Commercial Imports/Exports

France has reported its intention of purchasing 3,000 MT of sorghum in Mali to be shipped to Mauritania as food aid to displaced persons there. Belgium will donate 3,000 MT of wheat during the first quarter of 1992. USAID/Mali has requested from the U.S. Government 4,000 MT of American sorghum to be brought in late 1992 to reimburse distributions from security stocks to populations affected by civil unrest in the North, should the need arise. OPAM is in the process of auctioning 10,000 MT U.S. food aid rice which is currently stored in-country.

The GRM National Transport Office (ONT) reported that 4,991 MT of rice, 1,994 MT of wheat, and 480 MT of semolina were in GRM warehouses in Dakar pending importation as of 14 January. During the same period, 5,170 MT of rice were in GRM warehouses in Abidjan.

Map 4: Mali Civil Unrest

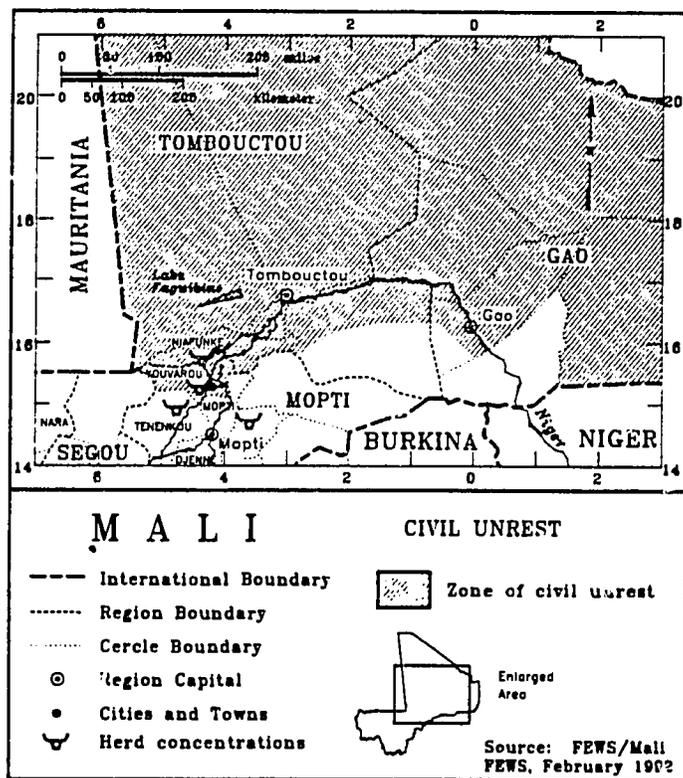


Table 6: Mali, 1992 & Average Cereal Production Balances

Region	92 Population	Net 91/92 Production	92 Need	92 Balance	Average Balance
1. Kayes	1,182.02	115.05	218.67	-103.62	-90.35
2. Koulikoro	2,185.45	266.09	404.30	-138.21	-45.26
3. Sikasso	1,439.58	463.82	266.32	197.50	129.41
4. Ségou	1,492.30	496.64	276.08	220.56	142.72
5. Mopti	1,393.81	295.15	257.85	37.30	-17.45
6. Tombouctou	613.27	59.47	113.44	-53.97	-43.68
7. Gao	412.17	22.51	76.25	-53.74	-56.96
Total	8,718.60	1,718.73	1,612.91	105.82	18.43

Sources & Notes: Population calculated based on regional growth rates from census data. Available grain uses production estimates less milling rate of 0.85 for millet and sorghum, 0.9 for fonio, 0.8 for maize, and 0.51 for rice. Annual cereal consumption based on USAID/Mali standard of 135 kilograms per person per year.

Projected Food Consumption Needs

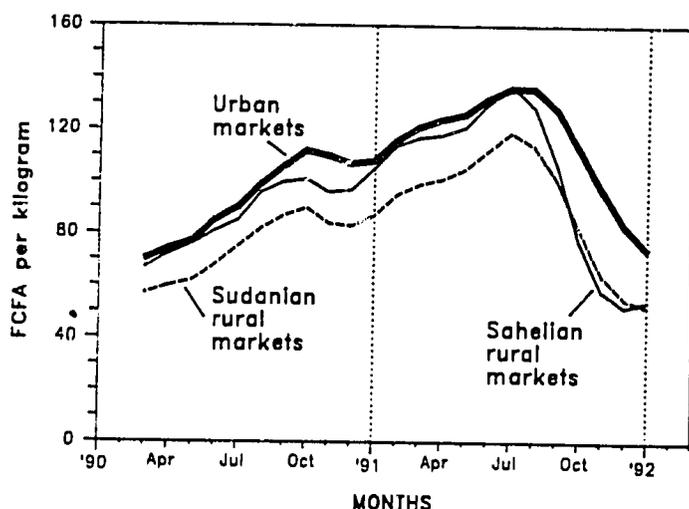
Regional cereal balances look very favorable this year, as compared to the average of the past five years (see Table 6). Using USAID/Mali values for cereal consumption, milling rates, and population estimates based on *cercle*-level census data, a production surplus in cereals balances of 105,820 MT for 1992 as compared to an average of 18,430 MT for the period 1986-91 (see Appendix C for the *cercle*-level balance). When non-food uses, stock-replenishment requirements, expected exports, and anticipated imports are included, USAID/Mali has determined that a net deficit of 14,800 MT may occur in 1992.

FACTORS AFFECTING FOOD ACCESS

Economic Data

Cereals prices have fallen markedly from their high points during the final quarter of 1991 (see Figure 1). During 1991,

Figure 1: Mali, Millet Consumer Prices, 1990-92



Source: Monthly average consumer millet prices from SIM reports.

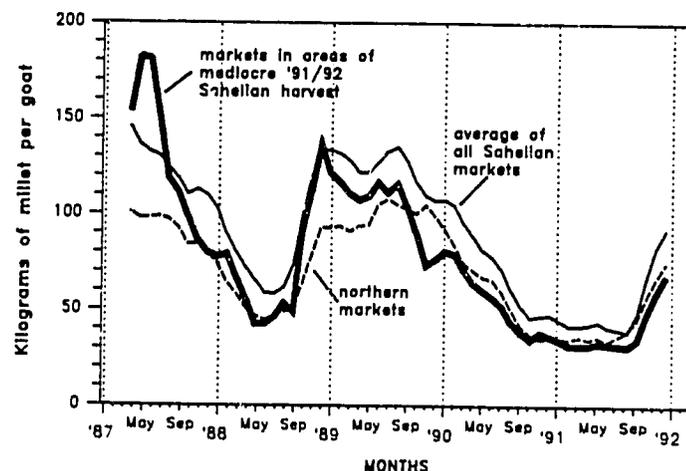
Note: Prices used are nominal prices.

cereals had neared the mid-1988 record highs. Producer and consumer cereal prices have now neared what is considered their normal range by most market analysts. Government and donor purchases of grain early in 1992 are being encouraged in order to maintain producer price levels.

Average prices in rural markets in the Sudanian and Sahelian zones of Mali differed little at the end of 1991, though they are lower than in urban markets. Price differentials during the same period in 1990/91 were more substantial, perhaps indicating the impact of low supplies in Sahelian markets.

The exchange value of goats to grain, indicating rural access to cereals, has improved from October 1991 (see Figure 2). These terms of trade are still lower than during the same period in 1989, when they were highest. The improvement of these terms of trade reflect most strongly the decline in cereal prices and, to a lesser extent, a general but slight increase in goat prices.

Figure 2: Mali, Terms of Trade Between Millet and Goats



Source: Monthly SAP reports

Note: "Good" corresponds to markets in *cercles* generally having better than average harvests in 1991/92, according to SAP reports. "Mediocre" corresponds to markets in *cercles* generally having an average to less-than-average harvest in 1991/92, according to SAP reports.

Market access continues to suffer in the northern zones affected by civil unrest. This is particularly the case for Tuareg and Maur populations who have left urban centers. Continued violence has maintained the situation for several months.

UPDATE ON VULNERABILITY

The high level of vulnerability felt over the past year among small scale agriculturalists and agropastoralists throughout the Sahelian Zone of Mali has diminished considerably as a result of favorable harvests. Small pockets of moderately vulnerable agriculturalists may still be found in western Ténenkou and Youvarou *cercles* due to continued mediocre to poor crop conditions (see Appendix F for FEWS' definitions of levels of vulnerability to and risk of famine). The remaining agricultural population will still not have escaped significant vulnerability until they have been able to repay debts accrued during the previous difficult years.

The population in the North is now highly vulnerable, including approximately 15,000 people displaced by the civil unrest. That group continues to grow in vulnerability as instability reduces the flow of trade and access to markets becomes more limited. Pastoral populations in the Delta may move from moderate to high vulnerability if they begin to suffer significant herd losses as a result of poor range conditions (from overcrowding of herds) and outbreaks of disease among herd concentrations.

If a settlement between northern rebels and GRM is achieved, an influx from neighboring countries of from 20 to 50 thousand displaced persons may be expected. These groups would return with minimal resources and would need assistance in re-establishing their original production activities.

CONCLUSIONS

Mali's overall food situation has improved significantly since June 1991, primarily as a result of an excellent national harvest. This harvest should allow household food stocks to be replenished and improve access to purchases of grain on the market.

The available cereal surplus will be small, however, and some donor imports of grain may be necessary. This will be particularly the case for the population in the North suffering from the effects of civil unrest and for those areas in Mopti Region suffering yet another poor harvest.

A population affected by civil unrest, 15,000 locally displaced and 20,000 to 50,000 displaced in neighboring countries will need assistance in re-establishing their farms, herds and businesses, if a peace agreement is achieved. In the interim, the locally displaced population may expect increasing hardship as the dry season progresses. Up to 4,000 MT of cereals, as well as other staples, may be necessary.

Appendix C: Mali, 1991/92 Cereal Production and Production Balance Estimates

Table C-1: Mali, 1991/92 Estimate of Cereal Production, by Cercle

Cercle	Millet	Sorghum	Rice	Maize	Fonio	Total
Kayes	0.71	14.63	0.00	3.76	0.00	19.10
Bafoulabé	0.64	12.09	0.42	2.04	0.00	15.19
Diéma	7.21	25.77	0.00	5.94	0.01	38.93
Kéniéba	0.00	4.13	0.21	1.72	0.01	6.07
Kita	4.06	18.75	1.47	4.21	0.00	28.49
Nioro	5.45	16.50	0.00	0.66	0.00	22.61
Yélimané	0.58	5.44	0.00	0.91	0.00	6.93
Koulikoro	6.12	12.47	0.00	0.39	0.00	18.98
Banamba	33.88	5.44	0.00	0.04	0.00	39.36
Dioila	18.73	80.73	1.31	27.00	0.18	127.95
Kangaba	0.24	4.72	7.04	0.69	0.00	12.69
Kati	4.28	14.48	8.47	4.53	1.32	33.08
Kolokani	18.36	20.72	0.00	0.70	0.91	40.69
Nara	21.14	27.67	0.00	0.05	0.00	48.86
Bamako	0.00	0.00	0.00	0.00	0.00	0.00
Sikasso	17.98	50.30	20.80	39.76	0.44	129.28
Bougouni	12.29	39.12	6.16	23.67	4.34	85.58
Kadiolo	11.99	11.18	8.84	21.08	1.47	54.56
Kolondiéba	3.60	11.18	0.50	10.91	1.37	27.56
Koutiala	55.44	78.56	1.09	32.55	0.00	167.64
Yanfolila	0.90	7.76	6.62	23.49	1.47	40.24
Yorosso	28.92	31.67	0.00	6.29	0.27	67.15
Ségou	132.01	42.76	4.09	1.35	7.33	187.54
Baraoueli	16.70	49.18	0.18	1.91	0.00	67.97
Bla	34.73	39.73	0.09	5.57	3.26	83.38
Macina	59.38	19.42	2.68	0.06	0.80	82.34
Niono	26.78	0.28	44.60	2.41	0.00	74.07
San	34.60	26.33	3.65	2.57	6.97	74.12
Tominian	5.09	26.73	1.56	0.43	3.36	37.17
Mopti	7.18	4.19	116.26	0.28	0.11	128.02
Bandiagara	45.79	3.27	0.00	0.00	4.70	53.76
Bankass	62.28	3.49	0.00	0.37	1.50	67.64
Djenné	9.93	9.18	30.51	0.19	0.00	49.81
Douentza	16.49	0.19	0.00	0.00	0.00	16.68
Koro	35.54	0.76	0.00	0.11	0.11	36.52
Ténenkou	12.64	0.69	46.27	0.01	0.00	59.61
Youvarou	7.86	0.29	6.58	0.00	0.00	14.73
Tombouctou	0.00	0.05	3.62	0.00	0.00	3.67
Diré	3.96	0.32	34.31	0.00	0.00	38.59
Goundam	2.41	5.75	3.76	0.00	0.00	11.92
Gourma-Rharous	2.53	0.00	1.34	0.00	0.00	3.87
Niéfunké	8.04	0.51	34.31	0.00	0.00	42.86
Gao	0.00	1.57	14.02	0.00	0.00	15.59
Ansongo	0.64	0.47	10.48	0.00	0.00	11.59
Bourem	0.00	0.07	15.05	0.00	0.00	15.12
Kidal	0.00	0.00	0.00	0.00	0.00	0.00
Menaka	0.00	0.00	0.00	0.00	0.00	0.00
Total	777.10	728.54	436.29	225.65	39.93	2,207.51

Source & Note: 1991/92 production estimate used DNSI/DNA Agricultural Survey results for the 11 agroclimatic zones in Mali. The 1987-1991 average contribution from each *cercle* to its constituent agroclimatic zone was used to disaggregate 1992 data to the *cercle* level.

Table C-2: Average Mali Cereal Production (1987-91), by Cercle

Cercle	Millet	Sorghum	Rice	Maize	Fonio	Total
Kayes	0.80	14.64	0.00	7.26	0.00	22.70
Bafoulabé	0.70	12.11	0.12	3.94	0.00	16.87
Diéma	5.64	23.11	0.00	1.54	0.01	30.30
Kéniéba	0.00	4.15	0.06	3.32	2.22	9.75
Kita	4.49	18.75	0.41	8.10	0.15	31.90
Nioro	4.23	14.79	0.00	0.17	0.00	19.19
Yélimané	0.64	5.48	0.00	1.75	0.00	7.87
Koulikoro	6.74	12.44	0.00	0.75	0.47	20.40
Banamba	37.27	5.41	0.00	0.09	0.00	42.77
Dioila	19.54	61.53	0.43	22.47	0.11	104.08
Kangaba	0.88	7.70	1.10	1.08	0.00	10.76
Kati	15.71	23.61	1.32	7.03	1.32	48.99
Kolokani	20.23	20.74	0.00	1.36	0.30	42.63
Nara	16.45	24.80	0.00	0.01	0.00	41.26
Bamako	0.00	0.00	0.00	0.00	0.00	0.00
Sikasso	18.74	38.40	6.78	33.07	0.25	97.24
Bougouni	12.78	29.84	2.01	19.62	2.49	66.74
Kadiolo	12.44	8.42	2.88	17.49	0.84	42.07
Kolondiéba	3.83	8.61	0.16	9.06	0.79	22.45
Koutiala	57.89	59.97	0.36	27.06	0.00	145.28
Yanfolila	0.97	5.99	2.15	19.50	0.85	29.46
Yorosso	30.17	24.18	0.00	5.23	0.15	59.73
Ségou	132.26	20.88	1.18	1.60	4.20	160.12
Baraoueli	16.70	24.02	0.05	2.26	0.00	43.03
Bla	34.69	19.42	0.03	6.60	1.87	62.61
Macina	59.53	9.50	0.77	0.07	0.46	70.33
Niono	20.88	0.25	9.31	0.63	0.00	31.07
San	39.14	24.77	3.65	5.15	2.44	75.15
Tominian	22.24	13.18	0.45	0.51	1.93	38.31
Mopti	11.32	2.64	43.16	0.47	0.11	57.70
Bandiagara	41.17	3.96	0.00	0.00	0.96	46.09
Bankass	56.13	4.23	0.00	0.50	0.31	61.17
Djenné	15.65	5.79	11.33	0.32	0.00	33.09
Douentza	14.91	0.24	0.00	0.00	0.00	15.15
Koro	31.99	0.92	0.00	0.15	0.02	33.08
Tnenkou	19.93	0.43	17.15	0.01	0.00	37.52
Youvarou	12.42	0.18	2.43	0.00	0.00	15.03
Tombouctou	0.00	0.17	1.70	0.00	0.00	1.87
Diré	6.06	1.14	6.26	0.00	0.00	13.46
Goundam	3.67	20.71	0.69	0.00	0.00	25.07
Gourma-Rharous	2.53	2.35	1.34	0.00	0.00	6.22
Niafunké	12.29	1.83	6.27	0.00	0.00	20.39
Gao	0.00	5.14	6.58	0.00	0.00	11.72
Ansongo	0.64	1.54	4.93	0.00	0.00	7.11
Bourem	0.00	0.24	7.08	0.00	0.00	7.32
Kidal	0.00	0.00	0.00	0.00	0.00	0.00
Menaka	0.00	0.00	0.00	0.00	0.00	0.00
Total	824.29	588.20	142.14	208.17	22.25	1,785.05

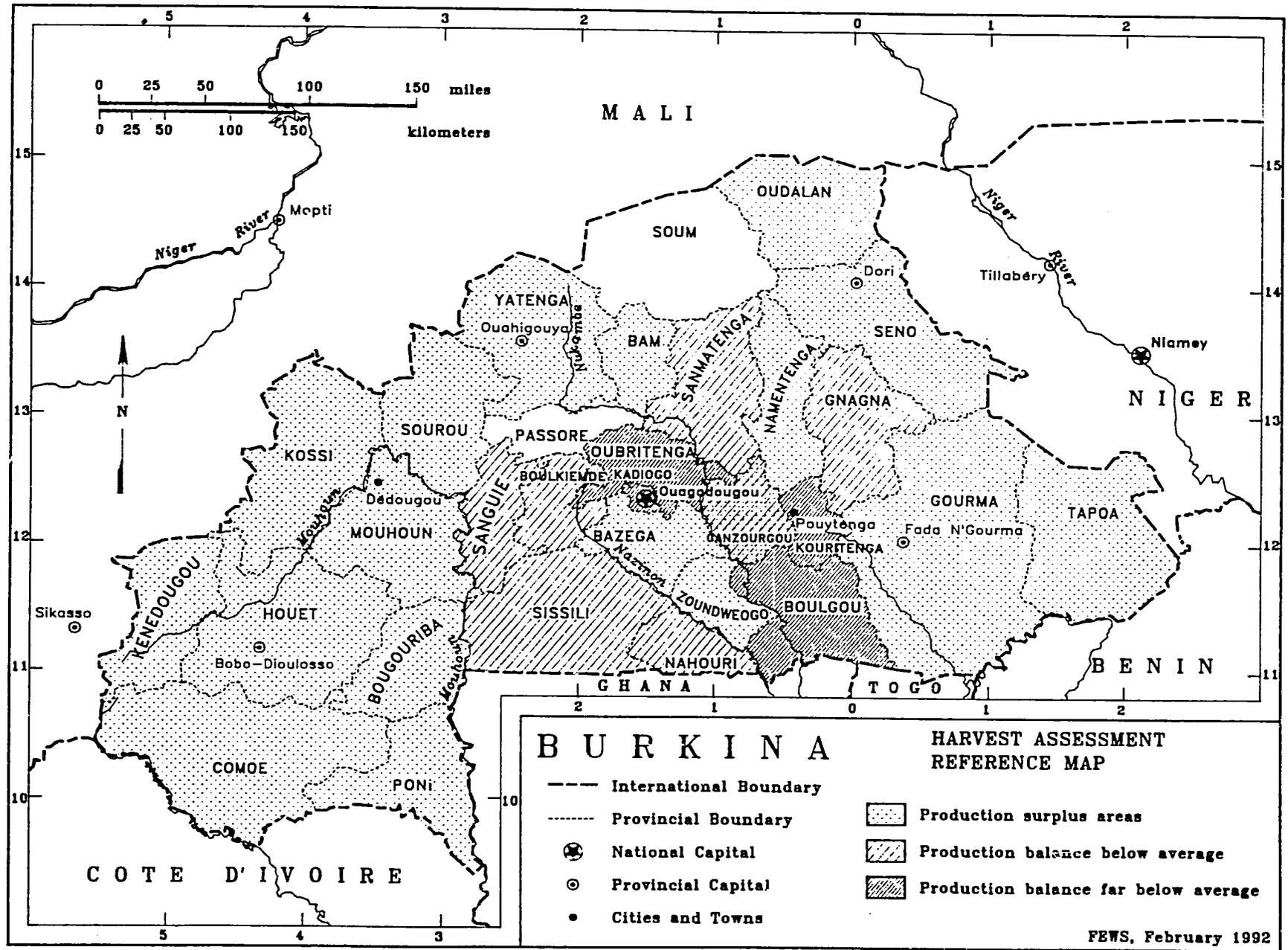
Source & Note: Historical average production based on final joint DNSI/DNA Agricultural Survey reports for agricultural years 1986/87 to 1990/91.

Table C-3: Mali, 1992 & Average Cereal Production Balances, by Cercle

Cercle	92 Population	Net 91/92 Production	92 Need	92 Balance	Average Balance
Kayes	278.01	16.05	51.44	-35.39	-29.82
Bafoulabé	157.44	12.68	29.13	-16.45	-12.73
Diéma	127.95	32.79	23.67	9.12	3.76
Kéniéba	106.93	5.00	19.78	-14.78	-11.29
Kita	265.98	23.50	49.20	-25.70	-19.61
Nioro	144.21	19.19	26.68	-7.49	-9.46
Yélimané	101.50	5.84	18.77	-12.93	-11.20
Koulikoro	141.18	16.11	26.12	-10.01	-7.50
Banamba	121.61	33.45	22.50	10.95	15.06
Dioila	302.01	106.98	55.87	51.11	36.14
Kangaba	63.21	8.36	11.69	-3.33	-2.23
Kati	389.63	25.08	72.08	-47.00	-26.38
Kolokani	173.39	34.59	32.07	2.52	6.12
Nara	169.56	41.52	31.37	10.15	5.64
Bamako	824.86	0.00	152.60	-152.60	-72.11
Sikasso	408.09	100.86	75.50	25.36	6.59
Bougouni	234.48	69.68	43.37	26.31	13.04
Kadiolo	102.72	42.39	19.01	23.38	15.37
Kolondiéba	100.40	22.78	18.58	4.20	-0.36
Koutiala	335.42	140.49	62.05	78.44	65.53
Yanfolila	139.47	30.85	25.80	5.05	-0.78
Yorosso	119.00	56.77	22.01	34.76	30.02
Ségou	468.81	158.32	86.73	71.59	53.98
Baraoueli	139.55	57.62	25.82	31.80	11.72
Bla	173.96	70.73	32.18	38.55	23.07
Macina	159.15	69.11	29.44	39.67	31.73
Niono	190.78	47.67	35.30	12.37	-9.00
San	222.33	61.98	41.13	20.85	23.34
Tominian	137.72	31.21	25.48	5.73	7.88
Mopti	279.15	69.28	51.64	17.64	-14.11
Bandiagara	197.28	45.93	36.50	9.43	4.10
Bankass	160.63	57.55	29.72	27.83	22.74
Djenné	133.90	31.95	24.77	7.18	0.03
Douentza	163.14	14.18	30.18	-16.00	-16.65
Koro	232.56	31.05	43.02	-11.97	-13.15
Tnenkou	154.48	34.93	28.58	6.35	1.37
Youvarou	72.67	10.28	13.44	-3.16	-1.78
Tombouctou	139.06	1.89	25.72	-23.83	-16.12
Diré	172.19	21.13	31.85	-10.72	-11.75
Goundam	118.30	8.86	21.89	-13.03	-0.48
Gourma-Rharous	83.34	2.83	15.41	-12.58	-10.99
Niafunké	100.38	24.76	18.57	6.19	-4.34
Gao	168.67	8.48	31.20	-22.72	-21.49
Ansongo	74.49	6.29	13.78	-7.49	-9.77
Bourem	63.81	7.74	11.81	-4.07	-8.78
Kidal	38.00	0.00	7.03	-7.03	-6.54
Menaka	67.20	0.00	12.43	-12.43	-10.38
Total	8,718.60	1,718.73	1,612.91	105.82	18.43

Sources & Notes: Population calculated for cercles based on growth rates for their corresponding regions from census data. Available grain uses production estimates less milling rate of 0.85 for millet and sorghum, 0.9 for fonio, 0.8 for maize, and 0.51 for rice. Annual cereal consumption based on USAID/Mali standard of 185 kilograms per person per year.

Map 5: Burkina Reference Map



FEWS, February 1992

Relief After Two Consecutive Bad Seasons

Report released by USAID/Burkina on January 30, 1992

SUMMARY

The Government of Burkina (GOB) estimates the 1991/92 national cereal production balance (cereal production minus consumption needs) to be a surplus of 86,000 metric tons (MT). The national cereal surplus (cereal production, stocks and imports minus consumption needs) is about 227,201 MT. The major part of this surplus is in 18 provinces (see Map 5). These include the provinces of Yatenga, Oudalan and Séno, which are traditionally deficit zones. The result has been drop in cereal prices for cereals throughout the country. The GOB has not as yet requested emergency food aid.

FACTORS AFFECTING FOOD AVAILABILITY

Harvest Outcome

Early planting and above average rainfall made the 1991 cereal production the best year ever. Provisional cereal production estimates are available from the Ministry of Agriculture and Livestock/Department of Studies and Planning (MAE/DEP). The methodology used for these estimates was to ask the 2,500 farmers participating in the Government of Burkina (GOB) National Agricultural Sample Survey to rate this year's cereal production to that of last year.

The resulting estimate of gross cereal production for 1991/92 is 2.23 million MT. This is slightly higher than the FEWS pre-harvest estimate of 1.98 million MT. Both estimates indicate a cereal production record for Burkina. This record production comes as a relief for the country after two consecutive bad years. Farmers will be able to rebuild their stocks, which have been depleted after two average to below-average harvests (see Table 7).

Pastoral Conditions

Pastures were in very good condition throughout the year due to the above average rainfall throughout the country. Surface water for livestock has also been available in most provinces. These particularly good conditions will delay livestock movement to traditionally favorable zones (mostly to the eastern and southern provinces).

Table 7: Burkina, Provisional 1991/92 Cereal Balance (MT)

1992 Population	9,461,979
Annual per capita consumption rate (kg)	190
1991/92 CEREAL CONSUMPTION REQUIREMENTS	
Expected 1991/92 Cereal Consumption	1,797,775
Replenishment of Stocks (not available for consumption)	83,000
Total Cereal Requirement	1,880,775
1991/92 CEREAL SUPPLY	
Net Cereal Production	1,883,355
Available In-Country Stocks	54,861
Programmed Food Aid for 1991/92	34,444
Expected 1991/92 Commercial Imports	135,316
Total Available Cereal Supply for 1991/92	2,107,976
1991/92 CEREAL BALANCE	227,201

Source: GOB/MAE/DEP

Existing Food Stock Information

As of December 26, 1991, the Office National des Céréales (OFNACER) food stocks consist of price stabilization stocks of 44,452 MT and security stocks of 976 MT. On-farm stocks are estimated by the MAE/DEP to be 4,281 MT as of October 31, 1991. Other stocks immediately available for consumption are 50,580 MT. The available stocks total 54,861 MT. They are expected to increase national food security, given the national cereal production surplus.

Projected Food Aid and Commercial Imports/Exports

Food aid may be limited this year to donors' regular food aid programs. These are outlined in Table 8, below. Emergency food aid may not be needed at this time. An estimated 2,000 MT of cereals will be imported by the National and Provincial Drought Commissions (CNLES) to reinforce food security stocks.

Food Consumption Needs

The cereal production balance compares net cereal production (85% of gross) to consumption needs for the population (assumed to be 190 kilograms per person per year). It gives a general indication of the amount of cereal available for the

Table 8: Burkina, Projected Food Aid from Donors

Agency	Commodity	MT
World Food Program (WFP)		
Regular Food Aid		12,981
Other Commodities		1,333
Japan	Rice	1,636
Catholic Relief Services (CRS)		
School Feeding		10,080
Food for Work	Cereals	2,058
Emergency Program	Local cereals	700
	300 million CFA of Wheat	4,500
France	Wheat	5,000
	White sorghum	3,000
European Community (EC)		5,000
Canada	Wheat	5,000
Italy		10,000
Expected 1991/92 Commercial Imports		
	Wheat	35,000
	Rice	100,000
Total Projected Food Aid		195,988

Source: WFP/Burkina, FEWS/Burkina, and CRS/Burkina.

market and is therefore a good indicator of the economic situation of the small-holder agriculturists, who depend on cereal production for their livelihood. In times of complete crop failure over large areas, which disrupts the cereal market by making cereals unavailable, the production balance gives an indication of the quantity of cereal necessary to support a population.

The provisional cereal production balance for 1991/92 indicates a possible surplus in Burkina of 86,000 MT. This is a record, above the 1985-90 average. Table 9 summarizes the cereal production balance by province and compares the 1991/92 balance to the 1985-90 average cereal balance. From the provisional cereal balance estimates, 18 (60%) of Burkina's 30 provinces have surplus production this year. Smallholder agriculturalists in these provinces will have less food access-related stress, owing to the overall good cereal production.

FACTORS AFFECTING FOOD ACCESS

Market Conditions

Cereal prices monitored by the OFNACER market information system (SIM) have dropped significantly in both cereal surplus areas and deficit areas. In Dédougou, Mouhoun Province, which is traditionally cereal-production surplus, the millet price fell from a high of 112 West African francs per kilogram (FCFA/kg) in early September to 48-49 FCFA/kg during the second week of December. For the same region at the same period of 1990, millet prices dropped from 81

Table 9: Burkina Provisional 1991/92 Cereal Production Balance Compared With 1985-90 Average

Province	April 1992 Population	1985-90 Average Balance	1991/92 Balance	1991/92 Difference from Average
Boulgou	478,046	-7,202	-69,899	-62,696 *
Oubritenga	333,561	-3,658	-40,597	-36,938 *
Kadiogo	700,535	-96,876	-130,042	-33,166
Sanmatenga	413,315	-7,057	-30,905	-23,848 *
Sissili	307,635	3,244	-15,896	-19,140
Kouritenga	232,998	-19,197	-36,620	-17,422
Gnagna	280,857	1,817	-10,183	-12,000 *
Ganzourgou	229,671	3,294	213	-3,081 *
Sanguié	238,198	-212	-2,903	-2,690 *
Boulkiemdé	400,390	-10,535	-11,899	-1,364
Nahouri	124,623	-8,800	-9,718	-918
Passoré	236,327	-3,056	-2,917	138
Comoé	306,368	15,941	16,910	969
KénéDougou	166,354	13,568	14,863	1,295
Gourma	360,624	9,539	13,686	4,148
Tapoa	194,703	2,186	7,716	5,530
Soum	223,395	-15,480	-9,125	6,355
Zoundwéogo	179,497	-3,323	6,066	9,389
Sourou	322,593	-6,167	5,177	11,344
Houet	748,760	7,127	19,236	12,109
Oudalan	126,990	-10,422	3,922	14,344
Séno	273,731	-10,697	7,661	18,358
Bougouriba	248,282	9,075	32,426	23,351
Eam	176,013	-8,128	15,603	23,731
Mouhoun	347,412	10,433	36,192	25,759
Poni	264,675	2,555	33,642	31,087
Bazéga	361,225	-5,445	51,997	57,442
Yatenga	566,536	-41,907	24,958	66,865
Kossi	400,624	30,549	99,831	69,282
Namentenga	218,041	-6,125	66,182	72,307
Total	9,461,979	-154,959	85,579	240,538

Source: GOB/MAE/DEP

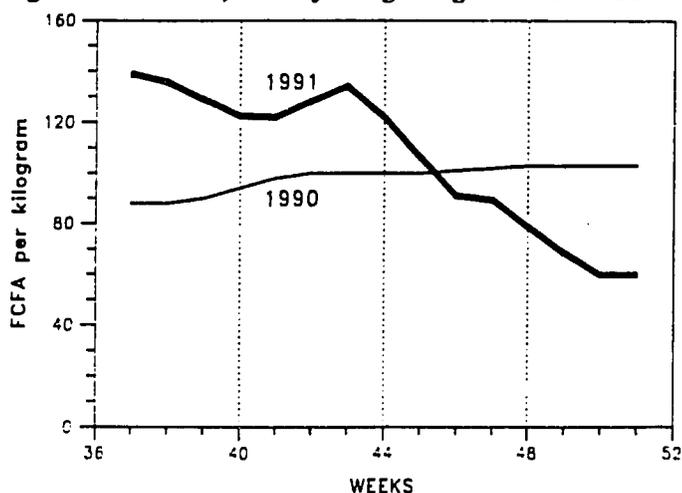
Notes: Balance is based on consumption requirement of 190 kg/person/year. A "*" indicates normally deficit provinces with two consecutive years of greater than average cereal deficits.

FCFA/kg at the end of August to 68 FCFA/kg in the second week of December. Similar price behavior was seen in Ouagadougou (see Figure 3). The significant 1991 cereal price drop is an indicator of a good harvest year. Millet prices in deficit areas remained steady. In the Pouytenga market (Kouritenga Province), millet prices remained near 78 FCFA/kg from August until December.

Other Economic Resources

Other important sources of household income in Burkina are remittances from family members working in urban areas and in Côte D'Ivoire, livestock production, and artisanal gold

Figure 3: Burkina, Weekly Ouagadougou Millet Prices



Source: GOB/OFNACER

Note: Prices used are nominal prices.

mining. These activities are extremely important in the provinces that are chronically cereal deficit (in Table 9, those provinces where 1985-90 average balance is negative). There have been no significant changes in the amount of remittances. The *Système d'Alerte Précoce du Sahel (SAP/Sahel)* and the *Projet Statistiques Animales (PSA)* reports show slight variability (high/low) in livestock prices. This is indicative of good pastoral conditions and pastoralists not feeling the need to reduce their herds. Agropastoralist purchasing power is likely to be good, given the high quality animals they will be able to sell this year. Gold mining can provide a subsistence living for approximately 75,000 people in the northern half of Burkina.

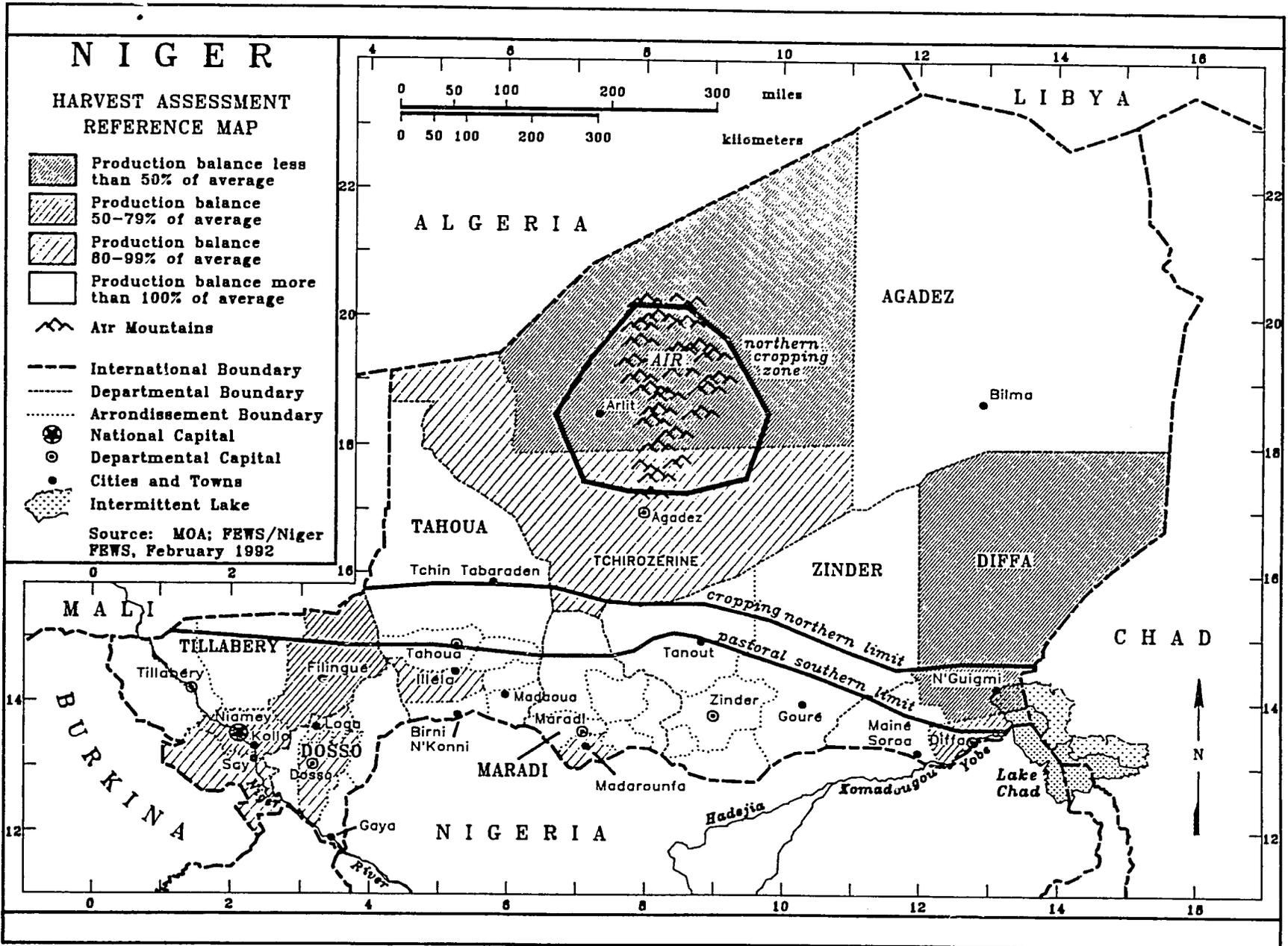
UPDATE ON VULNERABILITY

Coming into 1992, 11 provinces have below average cereal production balances (see Map 5). One million people may be moderately vulnerable in these provinces (see Appendix F for FEWS' definitions of levels of vulnerability to and risk of famine). Of the 11 provinces, four are usually deficit and have had below average cereal production balances for two consecutive years (see Table 9). About 100,000 small-holder agriculturalists (10% of the total population) in these four are depleting household assets and are therefore highly vulnerable to food shortages. There are no extremely vulnerable populations identified in Burkina at this time. Several of the moderately vulnerable provinces have requested emergency food aid. However, the GOB has not yet made any formal request of the donors.

CONCLUSIONS

Burkina had a record cereal production year. Even so, 11 provinces had a cereal balance below average. Four have had below average balance for two consecutive years. The primary source of income for food has been severely reduced for the populations of these provinces who depend on cereal production for their livelihood. In these groups, 10% of the small-holder agriculturalists are, respectively, moderately and highly vulnerable. No emergency food aid has been officially requested by GOB. In-country supplies should be adequate to cover regional deficits.

Map 6: Niger Reference Map



Government Reports Near Record Cereal Harvest, Regional Deficits Persist

Report Released by USAID/Niger on January 24, 1992

SUMMARY

Niger's national food supply is the best since 1988/89, although severe production deficits exist in Diffa, N'Guigmi, Tchén Tabaraden and Filingué arrondissements¹ again this year (see Map 6). Banditry and political unrest in northern Niger may hamper a normal movement of cereals, animals and goods to market, causing shortages while also weakening buying power. Weak purchasing power in the four severely deficit arrondissements may also limit the movement of food from surplus to deficit areas. As a result, the cereal surplus may not ease vulnerability in the more isolated areas of northern and eastern Niger, where 586,000 people are at moderate to high levels of vulnerability (see Appendix F for FEWS' definitions of levels of vulnerability to and risk of famine).

FACTORS AFFECTING FOOD AVAILABILITY

Harvest Outcome

According to Niger's Ministry of Agriculture (MOA), the 1991/92 cereal harvest was the best since 1988's record harvest and superior to the 1988/89 harvest in some areas. Other important rainfed crops, such as *niébé* (cowpeas), peppers and onions, also hit production records in 1991, according to MOA statistics.

The MOA estimate of 2.31 million metric tons (MT) gross production of millet and sorghum for 1991/92 is much greater than the 1.69 million MT in 1990/91 and almost equal to the 2.33 million of 1988, a record year. Tillabéry, Dosso and Tahoua departments all reported 1991/92 cereal production surpassing 1988/89 figures. In addition, gross *niébé* production topped 517,000 MT in 1991, more than double the 1990/91 harvest.

Although all Niger departments but Agadez registered overall millet and sorghum production above the 1980-90 average,

¹ In order of precedence, Niger's administrative units are departments, arrondissements and communes.

Tillabéry, Tahoua and Diffa had arrondissements which experienced production at levels considerably lower than their respective departmental averages. Of these, N'Guigmi and Diffa arrondissements were the hardest hit—N'Guigmi with 79% of 1990/91 and 28% of average production, and Diffa with 103% of 1990/91 and 79% of average. Although Filingué and Tchén Tabaraden arrondissements both had production considerably higher than in 1990/91, production in 1991/92 was still slightly below the 1980-90 average.

The current Government of Niger (GON) 1991/92 cereal production figures differ only slightly from the October estimates presented in the October update of the 1991 FEWS Pre-Harvest Assessment Niger chapter.² The December figures show a 3,903 MT decrease from the October estimates in gross sorghum production in Tahoua Department. This change does not substantially affect the production balance in either of the affected arrondissements in the department (Birni N'Konni and Madaoua).

Cereal Production Balance

The cereal production balance³ shown in Table 10 indicates over 100% of the 1991/92 consumption requirement will likely be met by the 1991/92 rainfed cereal production. It should be noted, however, that although there is a 13% national surplus, important sub-national shortages still exist. Only Dosso, Maradi and Zinder departments will produce a significant surplus in all arrondissements (see Appendix D for a detailed summary of the percent of needs met in each arrondissement in 1991/92 as compared to 1990/91 and the average).

Pastoral Conditions

Fodder production in the agricultural zone of the country has been more than adequate this year (see Map 6). Although GON reports indicate that pasture quality appears to be poorer than in 1990/91 and than on average, sustained livestock feeding is

² The update is a USAID Mission cable.

³ A cereal production balance is the amount of cereal needs met by local production before stocks on-hand, commercial imports and food aid are taken into account.

Table 10: Niger, 1991/92 Cereal Production Balance using Rainfed Millet and Sorghum, Only (MT)

Department	Estimated Net 1991/92 Production	Consumption Requirements	Production Balance	Percent of Needs Met
Tillabéry	390,573	392,636	-2,063	99
Dosso	300,690	256,005	44,685	117
Tahoua	356,636	314,123	42,513	114
Maradi	448,746	346,437	102,309	130
Zinder	441,626	344,255	97,371	128
Diffa	27,075	41,297	-14,222	66
Agadez	723	51,309	-50,587	1
Total	1,966,059	1,746,062	219,997	113

Sources: FEWS/Niger population projected from GON 1988 census based on official arrondissement-level population growth rates from GON Census Bureau; GON/MOA rainfed millet and sorghum production estimates released December 15, 1991; USAID/Niger consumption requirement (190 kilograms per year (kg/yr) for nomad and urban populations; 220 kg/yr for farming populations).

Notes: Niamey Commune is included in the line for Tillabéry Department, as Tillabéry is its major supplier of cereals. All production figures are net of gross by 85%. "Production balance" equals net estimated production minus the consumption requirement. "Kilograms per capita" equals production divided by population. "Percent requirements met" equals estimated production divided by cereal requirement. See Appendix D for sub-department details on cereal production and demand.

guaranteed in this zone by the sheer quantity of pasture production and the existence of substantial quantities of agricultural residues (*niébé* straw, in particular).

The MOA has found that pasture production in the pastoral zone is less than required to feed normal animal concentrations, particularly in Agadez and Diffa departments and in Tanout and Tchén Tabaraden arrondissements. This may result in many nomadic herders moving into the agricultural zone in search of animal fodder and lead to an increase in vulnerability for sedentary agropastoralists in pastoral areas.

Food Stock Information

As of mid-January, there were approximately 71,000 MT of millet reported in the GON security stock, up from 44,000 MT in November. An additional 3,829 MT of rice were in stock with the rice parastatal. Donor carryover stocks totaled approximately 4,075 MT and on-farm carryover stocks were estimated at 72,619 MT. With the exception of donor stocks, all reserves are higher than those reported for 1990.

In addition to 4,237 MT of food stocks now held by private traders, the GON is seeking to commercialize 72,000 MT of cereal stocks held by parastatals and cooperatives. The GON also wants to commercialize through various cooperatives 15,000 MT of *niébé*, 3,000 MT of peanuts and 1,000 MT of peppers.

Projected Food Aid and Commercial Imports/Exports

The GON Early Warning System (SAP) is completing a food needs assessment for Niger. No government request for food assistance has yet been made, although there is an expectation

that assistance to meet "deficit village" cereal requirements may be requested in February. Unlike past years, the GON is using both production indicators (cereal production versus consumption needs) and qualitative vulnerability/needs assessments to determine local assistance requirements.

The United Nations World Food Program (WFP) intends to provide 6-8,000 MT of cereal under its regular program. The Germans plan to provide 4,000 MT from the security stock to German-supported food-for-work projects in Tillabéry, Tahoua and Agadez departments (i.e., internal reallocation). No other food assistance pledges have been noted. With this year's cereal surplus, most donors would only be expected to provide assistance if overwhelming evidence of acute shortages appear later in 1992.

The GON is estimating that commercial cereal imports in 1992 will be approximately 100,000 MT, given the near record harvest and surplus. This is less than the estimated 1991 imports of 130,000 MT and more than the estimated less-than-67,000 MT imported in 1989, following the record 1988/89 harvest.

Projected Food Consumption Needs

The estimated national cereal consumption requirement for Niger is just over 1,746,000 MT, based on USAID/Niger consumption rates for rural-sedentary, herder and urban populations. Therefore, using official GON figures for total net cereal production (2,004,059 MT—see Table 11), the estimated 1991/92 national cereal production balance for Niger is a surplus of almost 258,000 MT. The overall cereal balance could be a surplus of 498,255 MT, when in-country stocks and expected commercial and food aid imports are considered (see Table 11).

Table 11: Niger, Estimated 1991/92 Cereal Balance (MT) as of November 1, 1991

1991/92 Population		8,160,279
Annual per capita consumption rate (kg)		190/220
1991/92 CEREAL CONSUMPTION REQUIREMENTS		
Expected 1991/92 Cereal Consumption		1,746,062
Total Cereal Requirement		1,746,062
1991/92 CEREAL SUPPLY		
Net Cereal Production		2,004,059
Net Rainfed Millet and Sorghum	1,966,059	
Net Irrigated Production	28,000	
Net Off-Season Production	10,000	
Available In-Country Stocks		132,258
Public Reserve Stock	44,000	
Public Working Stock	7,327	
Commercial Stocks	4,237	
On-Farm Stocks	72,619	
Donor Stocks	4,075	
Programmed Food Aid for 1991/92		8,000
Expected 1991/92 Commercial Imports		100,000
Expected 1991/92 Commercial Exports		0
Total Available Cereal Supply for 1991/92		2,244,317
PROVISIONAL CEREAL BALANCE FOR 1991/92		498,255

Sources: Rainfed millet and sorghum production figures are based on MOA statistics released on December 15, 1991. The consumption requirement of almost 1.8 million MT is calculated by applying the USAID/Niger consumption rates (190 and 220 kg per person per year for nomadic and farming populations, respectively) to 1991/92 population projections, based on the GON census of 1988 and a national growth rate of 3.3%. Total stocks of approximately 125,000 MT include the GON security stock (public reserve stocks), public working stocks from the national rice parastatal and wheat mill, commercial stocks, on-farm stocks and donor stocks (approximately 4,075 MT of sorghum held by the WFP) as reported by the SAP and the Office des Produits Vivriers du Niger (OPVN). Anticipated cereal imports of approximately 100,000 MT reflect commercial cereal imports as estimated by the GON as of December 15, 1991. Commercial cereal imports include millet, sorghum and corn from neighboring countries, as well as rice and wheat from outside of Africa.

Notes: All production estimates (rainfed and off-season/irrigated) are netted at 85% of gross production to account for feed, seed and post-harvest loss. Irrigated and off-season cereal production, which includes rice, wheat, corn, and *fonio*, is estimated at last year's level as reported by the MOA.

FACTORS AFFECTING FOOD ACCESS

Cereal Market

Data from the cereal price market information system (SIM) for November and the first three weeks of December indicate that millet prices are falling throughout most of the country due to ready availability of stocks from surplus production in Dosso, Tillabéry, Maradi and Zinder departments. This decline continues the trend that began in August. The most notable decreases in price in November and December occurred in Filingué and Tillabéry arrondissements. In Diffa and Agadez departments, however, millet prices were generally stable or rose slightly during November and December, after generally declining since August.

Except in Diffa Department and in Loga and Gaya arrondissements, Nigerien millet prices were generally lower in December 1991 than they were in December 1990. When compared to average, however, December 1991 prices were generally higher throughout Niger and appear to be highest with respect

to the average in Diffa and Dosso departments. High prices in Diffa can be explained in part by the area's deficit cereal production, but no information is available to explain the high levels of prices in Dosso Department, which, by all reports, has large surpluses in all arrondissements.

Livestock Market

Data from the MOA indicates that animal prices remained relatively stable from September through December 1991, except in Agadez and Maradi departments. In Agadez, prices for all types of cattle dropped sharply from September to December, while prices for other animals remained relatively steady. Maradi also saw a decline in cattle prices over the period.

Generally stable animal prices in combination with falling millet prices have resulted in markedly improved herder terms of trade¹ in most of the country since August. This trend, while

¹ "Terms of trade" is defined here as the kilograms of millet obtainable per adult male goat.

slowing in some cereal deficit areas, can be expected to continue because of the surplus national cereal supply.

Economic Summary

The strong 1991/92 harvest suggests that there will be a decreased Nigerien reliance on trade with Nigeria to cover cereal needs. At the same time, the value of the Nigerian *naira* is continuing to fall, making Nigerien products less competitive than Nigerian products, reducing Nigerien export incomes, and thereby creating in Niger production disincentives for export goods.

There has been an increasing shortfall between GON revenues and the amount needed to cover basic outlays. In addition to almost no GON funding for day-to-day operating costs (fuel, utilities), salary payments to civil servants have frequently been late and there are proposals for an across-the-board reduction in civil service salaries in the form of a special solidarity tax. The resulting reduction of income across the country to families supported by relatives who are civil servants will greatly increase this group's vulnerability to food insecurity.

The near record harvest and resulting national cereal surplus improves perceptions of the economic situation in the short term. At the same time, weak purchasing power in deficit zones may prevent the movement of sufficient food stocks from surplus to deficit areas. Consequently, areas that have had deficit production may not acquire the cereals necessary to meet their consumption requirements through regular market channels.

Banditry and political unrest have increased in northern areas of Niger during the last two months. As a result, there may be adverse impacts on the movement of cereals, goods and livestock to certain markets, reducing supplies and raising prices locally.

UPDATE ON VULNERABILITY

Farmers and Agropastoralists

Tillabéry Department: In Filingué Arrondissement, 82% of overall 1992 consumption needs may be met by 1991/92 cereal production, according to official GON production figures. Although the relatively good harvest will improve food availability, a third deficit year in a row and depletion of household resources will cause up to 294,000 people in Filingué Arrondissement to remain highly vulnerable (see Table 12; see also Appendix E for further details).

Tahoua Department: Tchén Tabaraden Arrondissement is chronically deficit in cereal production. The arrondissement's 1991/92 production will only meet about 56% (the average) of its overall consumption needs. In addition, current civil disruption will likely slow the flow of grain needed to fully cover consumption needs. As a result of these factors, at least 41,000 people who were previously classified as moderately vulnerable are now highly vulnerable.

Diffa Department: Rainfed cereal production registered a deficit for the third year in a row in this chronically deficit

Table 12: Location, Numbers and Vulnerability Levels of Affected Populations in Niger

Department Arrondissement	Vulnerability Levels		% of Total Population of Area
	Moderate	High	
Tillabéry Filingué		294,000	92
Tahoua Tchin Tabaraden	16,000	41,000	73
Diffa Diffa	2,500	59,000	95
N'Guigmi	6,500	4,000	39
Mainé Soroa	39,000		46
Agadez Tchirozérine	15,000	46,000	75
Arlit	10,000	31,000	42
Bilma		3,000	34
Zinder Tanout	7,000		3
Gouré	12,000		7
Affected Arrondissements	108,000	478,000	51
Niger Overall	108,000	478,000	7

Sources: FEWS/Niger; USAID/Niger

Note: See Appendix E for further details.

department. Production in both Diffa and N'Guigmi is severely deficit by both national and departmental GON estimates. Although official GON figures show production in Mainé Soroa Arrondissement will be sufficient to meet local food requirements in 1991/92, more recent departmental data show 1991/92 production only able to meet 77% of needs. These data cause an estimated 4,000 people in N'Guigmi and 59,000 people in Diffa arrondissements who were previously thought to be moderately vulnerable to be classed now as highly vulnerable, and approximately 35,000 inhabitants of Mainé Soroa Arrondissement to be named moderately vulnerable.

Agadez Department: Agadez is not a cereal production zone and relies on imports from the rest of Niger for 99% of its annual cereal consumption needs. Current civil disruption in many areas could act to restrain the movement of grain needed to cover normal consumption requirements, with a consequent increase in prices and decreased terms of trade for herders. As a result, it is estimated that at least 83,000 people could be moderately vulnerable to food insecurity in the department.

Nomadic Herders

Herder vulnerability in the agricultural zone of Niger continues to be significantly lower due to generally good grazing and watering conditions. Replenishment of the water table should lead to excellent winter grazing on perennial grasses and crop residue.

The vulnerability of herders in Diffa Department and northern areas of Niger has increased substantially owing to poor pasture and rising grain prices in both regions and, in the North,

instances of civil conflict. As a result, an estimated 82,000 nomadic herders in Agadez Department, northern areas of Tanout, Gouré and Tchintabaraden arrondissements and Diffa Department are estimated to be moderately vulnerable.

CONCLUSIONS

The supply of cereal in Niger during the 1991/92 consumption year will be the best since 1988/89. Most Nigeriens will experience minimal food insecurity through the 1992 harvest and should be able to set aside cereal stocks and increase assets as potential coping mechanisms against future poor harvests.

Despite the generally good harvest, abnormal vulnerability to food shortages persists in the Diffa, N'Guigmi, Tchintabaraden and Filingué arrondissements due to a poor crop season and, in parts of Agadez Department and Tanout and Gouré arrondissements, due to banditry, political unrest and less than adequate animal fodder. A reduction in the vulnerability levels for all these areas depends on the unimpeded and minimum-cost movement of cereal from the surplus zones to areas of shortage.

The GON is currently facing severe financial problems and does not have sufficient funds to cover minimum operating costs (e.g., salaries and services). These financial problems preclude any action by the GON to facilitate the movement of cereal, whether through economic incentives or direct intervention (transportation). The reported size of the cereal surplus and the small size of the populations at-risk (less than 7% of the nation) work against a donor assistance effort until such time as severe human suffering becomes evident.

Appendix D: Niger, Departmental Production and Demand Summary

Tillabéry Department had its best harvest in several years, with surplus production in all arrondissements except Filingué. Nevertheless, 82% of overall needs and nearly 100% of requirements for sedentary populations in Filingué may be met by rainfed cereal production. Téra Arrondissement fared particularly well, with GON estimates showing a production surplus of 131%. This is significant because, although Téra on average just meets its consumption needs, it met only 56% of its requirements in 1990/91 and required food aid. In addition, Ouallam and Tillabéry arrondissements will have substantial surpluses in 1991/92. These arrondissements were also deficit in 1990/91 (meeting 65 and 46% of needs, respectively), required food aid in 1990/91 and have been deficit on average.

Dosso Department has a cereal surplus of up to 17%, with all arrondissements expected to meet consumption needs more than comfortably. All arrondissements in Dosso usually met their consumption needs, on average, over the period from 1980 to 1990—only Loga Arrondissement was slightly deficit in 1990/91.

Tahoua Department as a whole has a cereal surplus of up to 15%, but Tchín Tabaraden and Illéla arrondissements remain deficit. Tchín Tabaraden is located in a marginal agricultural zone and only met 41% of its cereal needs in 1990/91. This year, however, it is reported that Tchín Tabaraden rainfed production will meet about 56% (the average) of its overall needs and nearly 100% of consumption needs for sedentary populations. It is reported that Illéla will meet 96% of its overall consumption needs in 1991/91, as compared to 70% in 1990/91.

Maradi Department has an overall production surplus of up to 30%. All arrondissements are also estimated to have significant surpluses. On average, all arrondissements in Maradi will meet their consumption needs, but in 1990/91, both Dakoro and Mayahi arrondissements were slightly deficit.

Zinder Department has produced up to 28% more than its overall cereal consumption requirement in 1991/92. According to the GON figures, all arrondissements have significant surpluses. Except for Gouré (average 77% of needs met), all arrondissements in Zinder usually meet cereal consumption needs. In 1990/91, however, all arrondissements except Matameye registered deficits and required food aid. It should be noted, however, that analysis of rainfall and other seasonal data through Projet Espace yield estimates reveals it unlikely that Tanout Arrondissement could have attained nearly its reported production level.

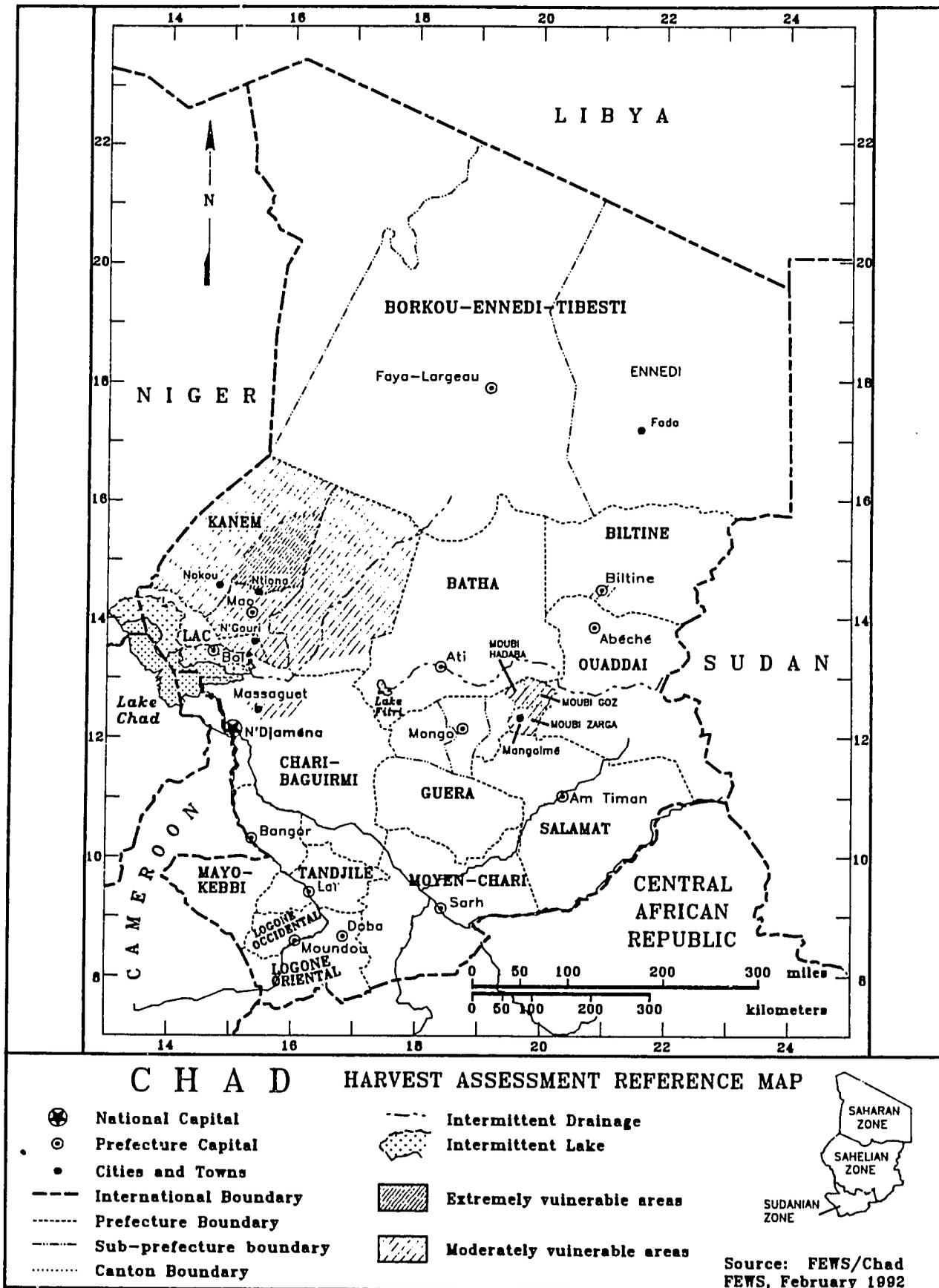
Diffa Department registered a deficit for rainfed cereal production for the third year in a row, with Diffa Arrondissement the hardest hit. Production in both Diffa and N'Guigmi is severely deficit, but while it appears from official GON estimates that production in N'Guigmi will at least meet the needs of the small sedentary population, the same populations in Diffa will be severely deficient in cereals. This relatively positive outlook in N'Guigmi may be less than accurate, however, because more recent GON departmental estimates show an almost 50% reduction in cereal production estimates. Although official GON figures show production in Mainé Soroa Arrondissement (which was deficit in 1990/91 and on average) will be sufficient to meet food requirements in 1991/92, the more recent departmental estimates show 1991/92 production only able to meet 77% of needs. Historically, all arrondissements in Diffa Department have been deficit in cereal production (1980-90 average). However, record *niébé* and other cash crop (e.g., pepper, bean and onion) production in 1991/92 in all arrondissements may help offset deficit millet production.

Agadez Department will meet less than 1% of its cereal consumption requirement, as expected. It lies outside of the agricultural zone and is chronically production deficit. Production this year in Tchirozérine, the most agricultural arrondissement, will only meet about 4% of its cereal requirement. That is slightly lower than in 1990/91 and the average.

**Appendix E: Location, Numbers, Socioeconomic Groups and Vulnerability Levels
of Affected Populations in Niger**

Arrondissement	Number	Socioeconomic Group	Percent of Group Affected	Vulnerability Level
Filingué	294,000	agropastoralists	100	high
Tchin Tabaraden	16,000	nomadic herders	50	moderate
	41,000	agropastoralists	100	high
Tanout	7,000	nomadic herders	50	moderate
Gouré	12,000	nomadic herders	50	moderate
Diffa	2,500	nomadic herders	50	moderate
	59,000	agropastoralists	100	high
N'Guigmi	6,500	herders	50	moderate
	4,000	agropastoralists	100	high
Mainé Soroa	4,000	nomadic herders	50	moderate
	35,000	agropastoralists	50	moderate
Tchirozérine	15,000	nomadic herders	50	moderate
	46,000	agropastoralists	100	high
Arlit	10,000	nomadic herders	50	moderate
	31,000	agropastoralists	100	high
Bilma	3,000	agropastoralists	100	high
Total Affected	586,000			

Sourc.: FEWS/Niger; USAID/Niger



Map 7: Chad Reference Map

Good Harvest Will Offset Local Shortages

Report Released by USAID/Chad on January 17, 1992

SUMMARY

The excellent 1991 rainy season ensured optimal growing conditions in most of Chad. A record harvest is estimated by the Government of Chad (GOC) Bureau of Agricultural Statistics. However, local crop failures caused by regional drought conditions and grasshopper attacks are putting residents of Kanem and Lac prefectures at a higher level of vulnerability than others in the Sahelian zone (see Map 7). An estimated 12,000 to 16,000 Chadian refugees are scheduled to begin returning from Sudan in January 1992. UNHCR will provide assistance to the returnees. Their needs, as well as those of the residents of Kanem and Lac, will be addressed using in-country resources.

Throughout the country, cereal prices have been falling since August. As of mid-January, millet prices are at their lowest levels in three years. This is an indication of increased grain availability following harvest. Animal prices have been improving slowly. Combined with low cereal prices, the food-buying power of Sahelian pastoralists has also improved.

FACTORS AFFECTING FOOD AVAILABILITY

Harvest Outcome

In mid-October 1991, the GOC Bureau of Agricultural Statistics (BSA) released its preliminary gross national cereal production estimate of 890,000 metric tons (MT) for the 1991/92 agricultural season (see Table 13). This is the highest production level recorded since regular harvest data reporting resumed in 1984 (see Table 14). Despite this record estimated production, certain areas in agriculturally-marginal zones experienced widespread failure of rainfed crops this season, notably Kanem and Lac prefectures. In these areas, inadequate rainfall and grasshopper attacks were the main cause for this year's crop failure.

Moreover, heavy late season rains which fell in south-central and southwestern Chad in late October will likely result in the October production estimates being revised downwards in March 1992. According to field agents of the BSA and the National Office for Rural Development (ONDR), these late

rains caused considerable damage to long-cycle rainfed crops, which were then in the grain formation stage. The extent of this damage has not yet been quantified.

Pastoral Conditions

Pastoral conditions remain satisfactory in the Sahelian zone, except in Kanem prefecture and N'Gouri sub-prefecture of Lac. Pastoral production has been generally good, as is evidenced by the recovering livestock prices. Seasonal migration towards the Lake Chad and Lake Fitri basins began in November, which is the normal time for this movement to occur. Satellite derived NDVI analyses indicate that vegetative conditions in these major dry-season grazing areas remain excellent (see inside back cover for an explanation of NDVI).

Food Stock

Public sector food stocks totaled 31,000 MT as of November 30, half of which has been designated to replace the National Security Stock used in response to 1990 crop failures. Both CARE and the United Nations World Food Program (WFP) are prepositioning much of this stock in regional warehouses.

Reports from the European Community-funded Système d'Alerte Précoce (SAP) project indicate that the private grain stock in the Sahelian zone is satisfactory, except in western Kanem, eastern Lac, and eastern Guéra (Moubi Goz Canton—Map 7).

Projected Food Aid

The GOC has planned food aid distributions in Lac Prefecture, Kanem Prefecture, and Mangalmé Sub-prefecture (Guéra Prefecture). It is expected that 600 MT of sorghum will initially be sent to the two sub-prefectures of Lac. The amount to be distributed to other locations has yet to be determined. All food aid distributions will be covered from existing stocks.

Projected Food Consumption Needs

Chad has never had a population census. Current population figures are derived from a partial population survey carried out in the 1960s. Years of civil war and the drought of the early 1980s has dramatically altered demographic distribution in

Table 13: Chad, 1991/92 Cereal Production Balance (MT)

Zone/Prefecture	Area Planted (ha)	Gross Production	Net Production	April 1992 Population	1992 Consumption Need	% of Needs Met
Saharan Zone						
B.E.T.	0	0	0	111,951	15,785	0.0
Saharan Sub-Total	0	0	0	111,951	15,785	0.0
Sahelian Zone						
Batha	73,038	20,040	17,034	283,451	39,967	42.6
Biltine	37,000	13,250	11,263	179,923	25,369	44.4
Chari-Baguirmi	158,038	117,000	99,450	1,222,516	172,375	57.7
Guéra	118,398	79,425	67,511	258,078	36,389	185.5
Kanem	44,042	8,865	7,535	337,815	47,632	15.8
Lac	71,785	35,820	30,447	259,428	36,579	83.2
Ouaddaï	122,776	50,695	43,091	432,807	61,026	70.6
Salamat	76,000	68,260	58,021	141,459	19,946	290.9
Sahelian Sub-Total	701,077	393,355	334,352	3,115,477	439,282	76.1
Sudanian Zone						
Logone Occidental	74,558	57,290	48,697	360,654	50,852	95.8
Logone Oriental	126,500	95,175	80,899	334,200	47,122	171.7
Mayo-Kebbi	148,525	127,780	108,613	693,448	97,776	111.1
Moyen-Chari	157,958	119,490	101,567	661,206	93,230	108.9
Tandjilé	101,130	97,710	83,054	336,408	47,434	175.1
Sudanian Sub-Total	608,671	497,445	422,828	2,385,916	336,414	125.7
Total	1,309,748	890,800	757,180	5,613,344	791,482	95.7

Sources: Production—GOC/BSA; Population—GOC/BSPE/DSEED

Notes: A cereal production balance is the amount of cereal needs met by local production before stocks on-hand, market activities and food aid are taken into account. Net production equals 85% of gross production. Consumption rate equals 141 kilograms per person per year.

Table 14: Chad, Annual Cereal Production since 1983/84

Season	Gross Production	Population	Per Capita Production (kg)	Net Production	Consumption Need	% Need Met	Production Shortfall	Total Food Aid	Food Aid as % of Deficit
1983/84	446,000	4,679,685	95.3	379,100	659,836	57.5	280,736	61,914	22.1
1984/85	346,000	4,787,317	72.3	294,100	675,012	43.6	380,912	117,032	30.7
1985/86	716,000	4,897,426	146.2	608,600	690,537	88.1	81,937	67,198	82.0
1986/87	646,000	5,010,066	128.9	549,100	706,419	77.7	157,319	32,358	20.6
1987/88	569,000	5,125,298	111.0	483,650	722,667	66.9	239,017	26,005	10.9
1988/89	769,000	5,243,180	146.7	653,650	739,288	88.4	85,638	11,811	13.8
1989/90	696,000	5,363,773	129.8	591,600	756,292	78.2	164,692	17,870	10.9
1990/91	604,700	5,487,140	110.2	513,995	773,687	66.4	259,692	24,958	9.6
1991/92	890,800	5,613,344	158.7	757,180	791,481	95.7	34,301	—	—

Sources: Production—GOC/BSA, GOC/ONDR; Population—GOC/BSPE/DSEED; Food Aid—USAID/PUFF

Note: Consumption rate equals 141 kilograms per person per year.

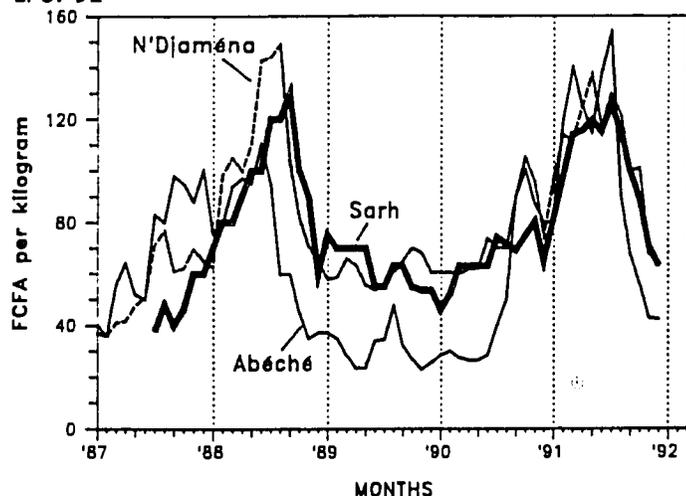
Chad. Because of the questionable quality of population figures for Chad, food consumption needs estimates (i.e., food balance calculations) will not yield useful results. Moreover, it has proven in the past that cereal production levels of 650,000 to 700,000 MT equal food self-sufficiency for Chad, as evidenced by the build-up of surpluses and falling market prices. Even when late season rains may have decreased cereal yield in the south, the current 1991/92 estimated production level of 890,000 MT stands well above this accepted level of national self-sufficiency.

FACTORS AFFECTING FOOD ACCESS

Economic Data

At the beginning of the rainy season, cereal prices in Chad were at their highest levels since 1984. Since August 1991, these prices have decreased significantly (Figure 4). The last time a similar price drop occurred was following the good

Figure 4: Chad, Millet Prices in Three Urban Markets, 1987-91

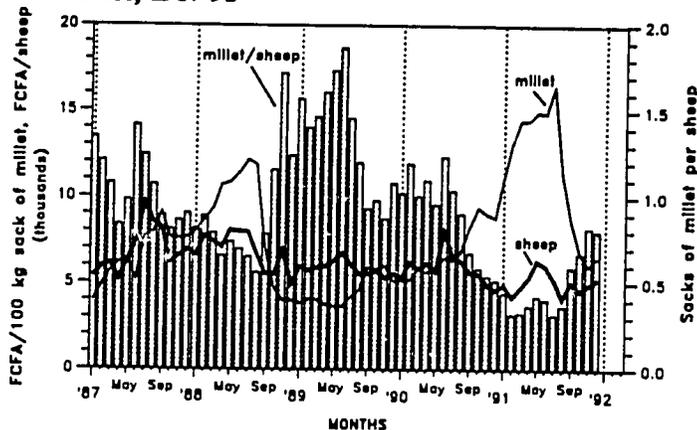


Sources: GOC/ONC, GOC/SIM, SAP/Chad, USAID/Chad, FEWS/Chad
 Note: Prices used are nominal prices.

harvest of 1988. Millet prices are now at or near the level of the stable period of 1989.

Similarly, terms of trade for pastoralists was at their lowest in four years at the beginning of the rainy season (Figure 5). With improving pasture conditions and falling grain prices, the buying power of pastoralists and agropastoralists has been improving steadily since.

Figure 5: Chad, Sahelian Terms of Trade Between Sheep and Millet, 1987-91



Sources: SAP/Chad, USAID/Chad, FEWS/Chad
 Note: Prices used are nominal prices.

UPDATE ON VULNERABILITY

In June 1991, FEWS estimated that 164,000 persons in the Sahelian zone were extremely vulnerable to famine (see Appendix F for FEWS' definitions of levels of vulnerability to and risk of famine). Since then, the excellent agropastoral season

of 1991/92 has resulted in the recovery of animal prices and increased grain supply throughout most of that territory. Consequently, the vulnerability status of Chad's Sahelian population has decreased significantly, except for the inhabitants of Kanem and Lac prefectures, and three cantons in Mangalmé sub-prefecture of Guéra Prefecture (see Map 7).

Kanem and Lac Prefectures

Agriculturalists and agropastoralists of Kanem and Lac prefectures are experiencing a third consecutive year of failed harvest and poor pastures. While other areas of Chad received adequate rainfall, these two prefectures received little rain during most of the 1991/92 season. A massive outbreak of grasshoppers in September and October 1991 effectively destroyed most remaining rainfed crops. According to SAP reports, people around the town of Ntiona (Nokou Sub-prefecture, in Kanem Prefecture) are the most affected.

In Lac, off-season agriculture in interdunal depressions and the maize crop of the Lake Chad polders¹ should help to improve food availability. However, recent military conflict in the region has affected personal security. It is unclear at this point on how these events will affect food security in the region.

Mangalmé Sub-prefecture of Guéra Prefecture

Three cantons in Mangalmé Sub-prefecture (Guéra Prefecture) have reported local losses due to grasshopper attacks and elephant herds. These cantons—Moubi Goz, Moubi Hadaba and Moubi Zarga—have been targeted for food aid distributions. The number of persons affected in this area is expected to be small, as the damage is of a localized nature.

Ennedi Sub-prefecture of Borkou-Ennedi-Tibesti Prefecture

This pastoral region in the northeast received food aid in 1991 due to extremely high rates of malnutrition registered by the Ministry of Public Health. Although Libya delivered another 1,100 MT cereals to this region in November, the nutritional status of the population there bears monitoring because of the generally depressed economic conditions and the relatively high percentage of war widows and orphans.

Returning Refugees

An estimated 12,000 to 16,000 Chadian refugees are scheduled to return from western Sudan to Ouaddaï and Biltine prefectures starting January 1992. UNHCR is preparing an assistance package including a modest amount of local currency, nine months of food rations from in-country stocks (still to be

¹ A polder is a tract of low land reclaimed from a lake, river or sea by means of a high embankment.

negotiated with WFP), blankets, and plastic tarps. Nevertheless, the vulnerability level of these returnees will remain moderate until they have successfully passed through the 1992/93 agricultural season.

CONCLUSION

The excellent 1991 rainy season has resulted in an estimated record harvest. Most of Chad is benefitting from increased

grain supply and relatively low grain prices. Major shortages continue to affect Kanem and Lac prefectures, where crops were lost to local drought conditions and grasshopper attacks. Assistance for residents of these prefectures will be drawn from the existing in-country stocks. Chadian refugees returning from Sudan will receive a UNHCR assistance package, drawing also from in-country resources. No emergency food aid imports will be required.



Map 8: Sudan Reference Map

Previous Page Blank

SUDAN

Good Harvest, But Large Regional Relief Needs Remain

Report released by USAID/Sudan on February 4, 1992

SUMMARY

In 1992, Sudan could be food self-sufficient on a national level. The estimated total 1991/92 domestic cereal production of 3.5 million metric tons (MT) is slightly above average, an impressive performance in light of mediocre to poor climatic conditions. With the addition of current in-country stocks and estimated imports, national cereal availability will exceed domestic requirements by over half-a-million metric tons. Thus, Sudan moves this year from the national food emergency of 1991 to a situation of local rather than national deficit, in which available food must be properly distributed. In January of 1992, the Government of Sudan (GOS) vowed to assist in this distribution to address recurrent production deficits and food assistance needs, leaving only the balance of extraordinary needs to be satisfied by donors.

Emergency relief needed from donors will again be considerable, and, according to FEWS/Sudan calculations, could reach 393,000 MT of cereals plus 99,000 MT of pulses and oil (492,000 MT total). These needs could increase substantially if the GOS does not provide its promised assistance.¹ In addition, refugees will require up to 42,700 MT of cereals plus pulses and oil. Supplementary foods will be required to continue critical, special feeding programs for particularly vulnerable groups. These figures do not represent actual import requirements, however, in light of the good 1991/92 domestic production and sizable in-country relief carryover stocks.

A large proportion of those who required emergency relief in 1991 will not benefit significantly from the good 1991/92 harvest. For the majority of subsistence producers, 1991/92 production was very poor, or failed (see Map 8). In addition, these producers have had insufficient access to the market, caused by seriously reduced resources and a depletion of assets over the past two years. For most of the displaced population and camp-resident refugees, conditions have not improved with regard to resources, access to land, income, employment, and food. In many instances, conditions worsened.

¹ The United Nations World Food Program (WFP) has calculated donor input at 670,430 MT.

Deficits and emergency needs are not spontaneous, unexpected, or episodic in 1992. Rather, they recur on a yearly basis as a consequence of ongoing perennial structural, infrastructural, economic, and political factors that act against the establishment of an effective resource redistribution system. This year, as in recent years, deficits and emergency needs have been increased further by poor climate.

FACTORS AFFECTING FOOD AVAILABILITY

Overall Agricultural Performance

The large 1991/92 production increase to 3.5 million MT (FEWS/Sudan estimate), compared to 1990/91's 1.9 million MT, is due to moderately better climatic conditions and a tremendous GOS emphasis on cereal crop production in the mechanized and irrigated agricultural sectors (see Table 15). The GOS has claimed a 1991/92 harvest of four million MT. The impressive national production in 1991/92 was achieved by almost doubling irrigated sorghum production and more than doubling wheat production, as compared with average output. Except for the anticipated irrigated wheat, all sectors produced significantly more than last year, with mechanized cereal tripling last year's production. The entire traditional subsistence agricultural sector, however, performed very poorly. It experienced widespread crop failure and poor yields in harvested areas, in spite of significant increases in cultivated area and relatively increased production over last year.

Table 15: Sudan, 1991/92 Gross Production (000 MT)

Sector	Average Production (1985-89)	1990/91 Production	1991/92 Production
Irrigated Sorghum	469	516	836
Irrigated Wheat	257	680	650
Irrigated Maize	0	0	50
Mechanized Sorghum	1,965	545	1,508
Traditional Cereal	640	197	471
Total	3,331	1,938	3,515

Sources: FEWS/Sudan, Ministry of Agriculture

Irrigated Sector

The total estimated irrigated sorghum and millet production of 836,000 MT is 38% greater than last year and 44% greater than average (see Table 16). This is primarily due to increases in area cultivated in cereal crops and greater use of fertilizer and improved seeds. The 1,249,000 *feddans*¹ planted to sorghum this year is a record. The 10-year average is 784,000 *feddans*. This year, maize was experimentally cultivated for the first time and produced 50,000 MT. Wheat production from an anticipated cultivation of 805,000 *feddans* could be slightly less than last year's record harvest, but will be more than double the average (see Table 17). In addition, it is possible that the actual area planted could exceed current estimates.

In recent years, the irrigated sector's contribution to national production has increased considerably owing to expanded area cultivated and improved inputs. From 1985 to 1989, the average contribution to national production was 22%. In 1990/91 (when

Table 16: Sudan, 1991/92 Irrigated Sorghum Production (000 MT)

Area	Average Production (1985-89)	1990/91 Production	1991/92 Production
White Nile	12	40	56
Blue Nile	24	39	64
Suki	20	19	35
Gezira/Managil	268	254	447
Rahad	43	85	95
Tokar	18	0	6
Gash	21	23	31
Northern State	26	10	65
New Halfa	37	46	37
Total	469	516	836

Sources: FEWS/Sudan, Ministry of Agriculture

Table 17: Sudan, 1991/92 Irrigated Wheat Production (000 MT)

Area	Average Production (1985-89)	1990/91 Production	1991/92 Production
White Nile	18	91	42
Blue Nile	5	13	15
Gezira/Managil	151	331	432
Rahad	6	29	45
Northern State	50	164	80
New Halfa	26	48	32
Other (Darfur + Suki)	na	4	4
Total	257	680	650

Sources: FEWS/Sudan, Ministry of Agriculture

¹ One feddan equals 1.03 acres, or 0.418 hectares.

rains failed), it was 62%, and in the 1991/92 season it will contribute 45% to total national production.

The parastatal irrigated agriculture corporations generally provided sufficient seeds, fertilizer, water, and land preparation to farmers. In Gezira, which accounts for over half of irrigated production, improved seeds were used on about half of the sorghum and fertilizer on about 30%. All Gezira wheat will be fertilized. The only difficulties arose from planting delays caused by insufficient early rains, and mid-season water shortages in one scheme due to pump and electricity problems.

Mechanized Sector

The 1991/92 1.5 million MT mechanized sorghum and millet harvest is almost triple that of 1990/91 and only about 25% less than average (see Table 18). Although climatic conditions were less than ideal and yields were generally lower than average, high production was achieved by large increases in planted and harvested area. About 11.3 million *feddans* of sorghum and millet were planted, of which about 7.8 million *feddans* were productive. Tractors, harvesters, and spare parts were in short supply, but were sufficient to conduct the harvest. Local labor supply for harvesting was also sufficient.

Erratic, poorly distributed rains resulted in high proportions of planted area being unharvestable. Also, American bollworm and locust infestations on sorghum caused varying degrees of damage, from minor to complete crop loss. Overall losses of cereal crops were estimated by the plant protection department at 5-6%. Tree Locusts and millet head worm attacked millet in the milky stage in North and South Kordofan, causing some crop damage but no significant losses.

Table 18: Sudan, 1991/92 Mechanized Sorghum Production (000 MT)

Area	Average Production (1985-89)	1990/91 Production	1991/92 Production
Kosti	230	77	198
Gedaref	891	184	782
Renk	72	23	64
Damazine	604	244	429
Dilling	168	17	35
Total	1,965	545	1,508

Sources: FEWS/Sudan, Ministry of Agriculture

Traditional Sector

Overall, traditional rainfed production was more than double last year, but only 74% of average (see Table 19). In North Kordofan, production was more than triple last year but only 37% of average. In North Darfur, production was almost double that of last year and slightly over one third of average.

Table 19: Sudan, 1991/92 Traditional Sorghum & Millet Production (00 MT)

Area	Average Production (1985-89)	1990/91 Production	1991/92 Production
Central State	219	48	50
North Kordofan	144	14	53
South Kordofan	74	35	54
North Darfur	66	14	26
South Darfur	137	86	197
Southern States	na	na	91
Total	640	197	471

Sources: FEWS/Sudan, Ministry of Agriculture

In both North Darfur and North Kordofan, most production was localized in the more southern areas, with widespread crop failure elsewhere. Cash crop production, a primary buffer against cereal crop deficits in Kordofan, was also poor.

The greatest production improvement over last year was for South Darfur, which alone among traditional farming areas surpassed its production average. This was due to favorable weather conditions and extensive planting. Overall in the traditional sector, areas planted this year were greater than average. But, as with the mechanized areas, only about half of the area planted can be harvested. The worst performance was in Central State, where production was barely better than last year and less than one fourth of average. Erratic, poorly distributed, and, in more northern areas, insufficient rains were the primary reason for crop failures and greatly reduced yields. Insufficient seeds were also a problem in some areas. In addition, Tree Locusts, millet head worm and birds caused considerable crop damage in some areas.

Southern Sudan

There were severe limitations on the amount of area sown in the South, caused by insecurity and lack of inputs. Most areas have been plagued by heavy rains, flooding and pests, which have damaged or destroyed crops. Overall production is expected to be greater than in recent years, however, and has been estimated by the Ministry of Agriculture at 91,000 MT.¹

Meat, dairy, fish and vegetables are important food sources in southern Sudan, but available quantities of these are currently unknown. Heavy livestock losses to theft and disease suggest meat and dairy are scarce. Both fishing and vegetable cultivation are limited by insecurity and lack of inputs and equipment, except in the Nasir area.

¹ The United Nations Food and Agriculture Organization (FAO) estimates southern Sudan traditional sector production at 406,000 MT, which would require cultivation of over four million feddans. This is unprecedented in recent times and, if true, would make the South almost entirely food self-sufficient. The figure is widely disputed and cannot be verified or substantiated.

Pastoral Conditions

General pastoral conditions this year are considerably better than in 1990/91, even in areas that have had uneven rain distribution and poor crop production. The severe livestock losses of 1990/91 will make herd recovery slow, but there are indications that livestock herds are increasing in size and in good health.

Food Balance and Regional Surplus/Deficits

The national food balance (Table 20) indicates that there will be ample cereal quantities in-country to meet national consumption needs. A regional food balance indicates where surpluses and deficits exist and where redistribution must take place if all food needs are to be met (see Table 21). The regional balance also indicates recurrent, or status quo, deficits, much of which are normally satisfied by local mechanisms and without outside assistance.

FACTORS AFFECTING FOOD ACCESS

Food needs calculations must account for alternate emergency household resources and food stress factors. This year, there are factors which could increase deficits and food aid needs, and others which could help mitigate and decrease needs. Food access will be influenced by grain availability in the market. Following two poor production years during which stocks were

Table 20: Sudan, Provisional National Cereal Balance for 1991/92 (MT)

1992 Population	26,215,000
Annual Northern Per Capita Consumption (kg)	120
Annual Southern Per Capita Consumption (kg)	90
1991/92 CEREAL CONSUMPTION REQUIREMENTS	
Total expected 1991/92 Cereal Consumption	2,996,000
1991/92 CEREAL SUPPLY	
Net 1991/92 Production	2,987,750
Household Stocks	nil
Commercial and Government Stocks	200,000
Carryover Relief Stocks	145,000
Expected Commercial Imports	400,000
Expected Commercial Exports	-100,000
Total Available Cereal Supply for 1991/92	3,632,750
1991/92 CEREAL BALANCE	636,750

Sources & Notes: Population is projected from the 1983 census using Census Department growth rates. The annual per capita consumption rate is based on household consumption studies. Net production equals gross production minus 15% for feed, seed, and loss. Estimate of commercial and government stocks are based on WFP 1991 import estimates and GOS/RRC wheat reserve estimates. The expected commercial imports figure is the minimum estimate based on recent (seven-year) average imports, but could increase due to removal of import restrictions in 1992. The expected commercial exports figure is for currently known commitments. Additional cereal exports have been banned.

Table 21: Sudan, Regional 1991/92 Cereal Production Balance (000 MT)

State	1992 Population	1992 Consumption	Net 1991/92 Production	1991/92 Balance	Average Production (1985-89)	Average Balance (1985-89)
Red Sea	919	110	31	-79	38	-59
Kassala	1,953	234	803	569	828	634
Northern	1,167	140	149	9	63	-73
Central	5,345	641	1,563	923	1,318	759
Khartoum	4,185	502	0	-502	0	-387
North Kordofan	2,122	255	45	-210	121	-113
South Kordofan	1,538	185	76	-109	193	23
North Darfur	1,749	210	22	-188	54	-133
South Darfur	2,270	272	168	-104	113	-125
South	4,968	447	131	-316	102	-336
Total	26,216	2,996	2,988	-8	2,830	177

Sources & Notes: The population estimate has been adjusted for shifts of displaced from the South to the North. Khartoum deficits are usually met by Central and Kassala surpluses. Population includes displaced persons. Production for the South includes that of the Renk mechanized area, little of which is consumed elsewhere in the South.

depleted, farmers with surplus production will restock household supplies and try to establish a reserve against future deficits rather than putting stock on the market. Surplus also may be held off the market until prices increase later in the year.

Cereals that reach the market still may not help some groups. Western Sudan is always production deficit to some degree. This is usually offset by market purchases, using assets in the form of livestock, cash crops, and alternate income and savings. Consecutive poor harvests have required greater than normal food purchases and have seriously reduced household resources. These households may be unable this year to purchase food to balance a further year of greater than usual production deficits.

On the positive side, extensive cultivation in the mechanized sector will improve food security for many by providing employment, although prospects for migrant laborers from outside these areas appear small. This year's considerable cereal production is already decreasing market prices and will increase supply significantly, making cereals more widely available for the first time in over one year. Better pastures this year have led to some herd regeneration and better animal health, which will improve food security for all rural groups, particularly pastoralists and nomads. Animal sale prices have been steadily increasing, which will enable far greater purchasing power with which to buy grain.

UPDATE ON VULNERABILITY

Large numbers of subsistence farmers, displaced persons, and refugees remain extremely vulnerable this year (see Appendix F for FEWS' definitions of levels of vulnerability to and risk of famine). Young children and pregnant and lactating mothers in these groups are particularly at-risk. Very poor harvests and seriously depleted resources will continue to make food security

and food access difficult for farmers in North Darfur, North and South Kordofan, and White Nile provinces.

Nomadic groups may be less vulnerable this year because of better pastures, reversing herd loss trends and allowing some restocking. In addition, lower food prices combined with improved livestock prices (as a result of export) will improve terms of trade for grain in the pastoralists' favor. Continuing high child malnutrition rates in Red Sea Province, however, indicate that relief and supplemental feeding is still required there.

Urban residents throughout North Sudan may be less vulnerable this year because increased production should lower food prices. Southern Sudan city dwellers remain highly vulnerable, however, because of exorbitant food prices and stock shortages resulting from food transport restrictions and inadequate local food production.

Displaced persons, totalling an estimated 4 million, are partially or totally dependant on relief and will remain so in the coming year. Some find occasional work or conduct marginal farming, but overall they have little resources or means with which to survive. In the Khartoum area alone, there are an estimated 1.8 million long-term and short-term displaced, resulting from multiple droughts and the ongoing war in the South. As many as one million are integrated into the local economy and are generally able to meet their basic food needs. The remainder reside in camps. Many are seriously in need of medical assistance, health facilities, and basic housing. They can sometimes meet their minimum food needs, but often require food aid in the form of targeted supplementary feeding programs.

In southern Sudan, there are an estimated one-and-a-half million displaced persons, including 270,000 Sudanese returnees from Ethiopia. Emergency food needs are critical for

many, particularly those gathered around garrison towns. Needs far exceed delivery capacity. Some of the displaced have been able to grow limited crops, however, and generally better production in the South this year, compared to the last several years, should reduce their vulnerability slightly.

CONCLUSIONS

Emergency Food Needs

While status quo (structural) deficits are always expected and are usually addressed by household and market mechanisms, particularly serious shocks such as successive total crop failure exceed the local ability to cope and necessitate emergency assistance. These shocks have occurred in Sudan for several years, making it difficult for status quo deficits to be balanced and impossible for above-average (extraordinary) deficits to be met locally. Emergency food needs are those which exceed the long-term status quo regional deficits (Table 21, last column). Emergency assistance this year will have to cover these extraordinary needs and, because of weakened coping mechanisms, some of the structural deficits as well.

The GOS has declared that sufficient food is available from the current 1991/92 harvest season to meet domestic consumption requirements.¹ However, some portion of emergency requirements will still need to be addressed by donors. In some areas, such as Darfur and South Sudan, logistical and political realities limit donor food delivery capacity.

Based on these factors, the total donor emergency assistance planned for 1992 will be 393,600 MT cereals (492,000 MT total food when pulses and oils are included—see Table 22). This is a substantial reduction from the assessed 1991 total needs of 1.2 million MT. An additional 52,000 MT will be needed for refugees. Of the total needs, 145,000 MT of relief carryover stocks are already in-country. Additional food could be purchased in-country in light of considerable food balance surpluses. Donor food import requirements will therefore be 399,000 MT or less (total needs, including those for refugees, minus carryover).

In contrast, the WFP has calculated total Sudan food needs in 1992 (excluding refugees) at 1.143 million metric tons. After

Table 22: 1992 Emergency Food Needs for Sudan: (MT)

Area/Group	Needs
Red Sea	21,000
North Kordofan	99,000
South Kordofan	22,100
North Darfur	88,500
White Nile	40,000
Khartoum (displaced)	35,000
South Sudan	88,000
Sub-total	
Cereal	393,600
Pulses & Oil	98,400
Total Non-Refugee Food	492,000
Refugees	
Cereal	42,700
Pulses & Oil	9,500
Total Food Needs	544,200

Notes: Only regions where donor relief may be necessary are included. The estimate of emergency food needs has been adjusted for regional delivery capacity. The food needs estimate is based on a standard rate of 400 grams per day per person (or 146 kg/yr) of cereals and 50 grams per day per person each of pulses and edible oil. This calculation differs from the 120 kg and 90 kg rate used to determine the food balance, which is based on actual, historic (status quo) consumption. The emergency ration is based on a calorie rate that would normally be satisfied by a combination of foods in a non-emergency situation.

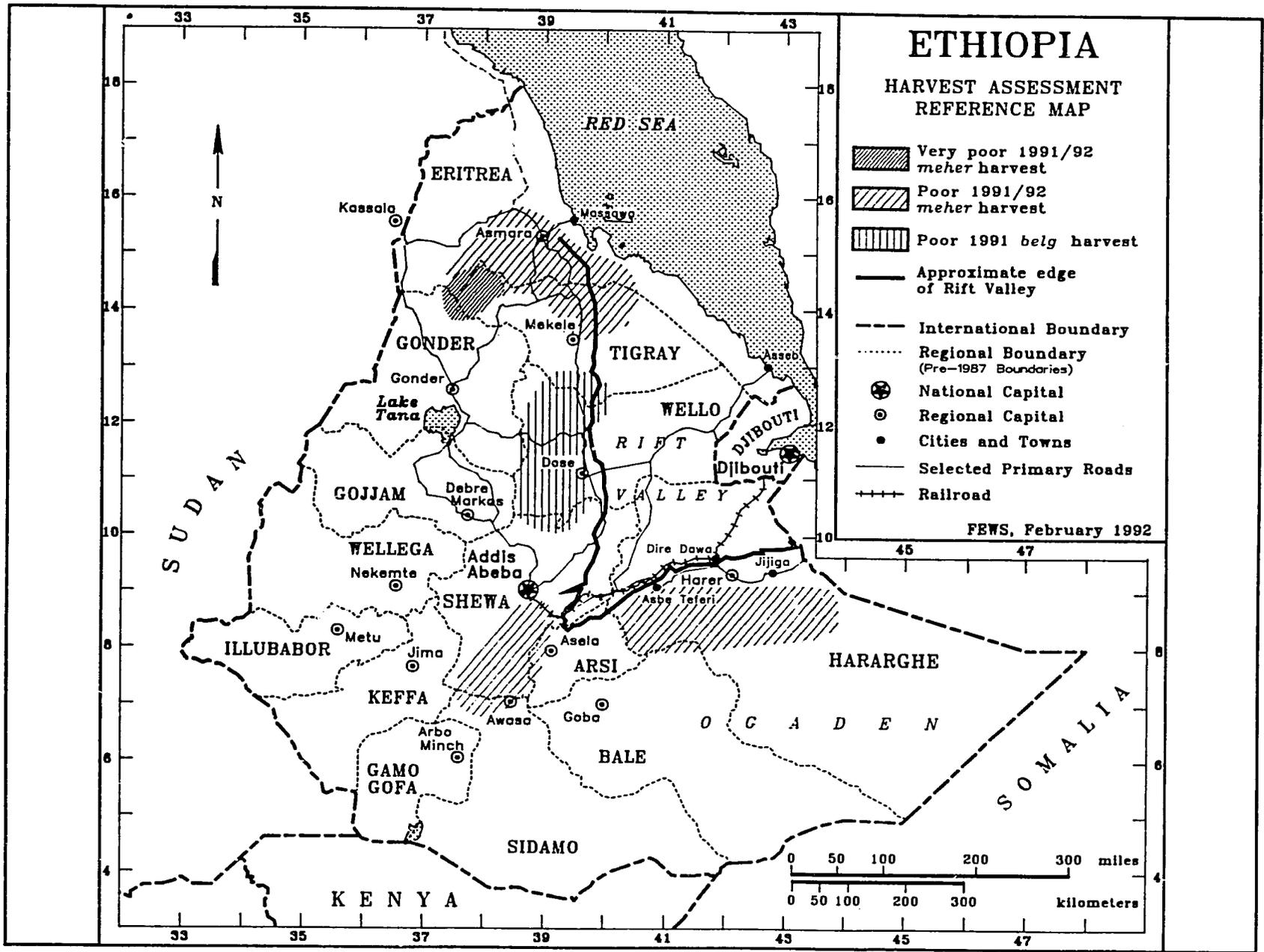
their adjustments for logistical capacity and GOS input, WFP has put the total emergency food needed from donors at 670,430 MT.

In addition to basic emergency food rations, large quantities of supplementary foods will be needed for particularly vulnerable groups including pregnant women, children, and the elderly. Persistent very high rates of malnutrition throughout Sudan verify the need to continue current feeding programs.

In the coming months it will be important to monitor food prices to determine whether they are in fact decreasing sufficiently to improve food security. It will also be important to monitor government actions and policies with respect to control of market prices and redistribution of surpluses, as well as government import and export activities. Other indicators will be human movement in response to poor harvests.

¹ The GOS has insisted that it needs no donor food assistance at all, but requires assistance transporting in-country surpluses to deficit areas.

Map 9: Ethiopia & Eritrea Reference Map



ETHIOPIA & ERITREA

Aggregate Harvest Good, Emergency Needs Slow to Disappear

Report released by FEWS/Ethiopia on February 5, 1992

SUMMARY

Overall, Ethiopia experienced a second consecutive year of above average aggregate production during 1991. A second year of good rains, optimism over agricultural and marketing reforms, and high 1990 farm-gate prices resulted in the second highest harvest on record, only slightly less than that of 1990. Localized sub-optimal rainfall and continued civil strife, however, resulted in pockets of significant production deficit (see Map 9). This was particularly the case in Eritrea, Tigray and Hararghe, where household resources are already strained. The vulnerability of populations in these deficit areas and the vulnerability of demobilized soldiers, their families and others displaced by the political events of 1991 will remain extreme for at least another year (see Appendix F for FEWS' definitions of levels of vulnerability to and risk of famine). Levels of vulnerability in the rest of the country have begun to decline. A joint United Nations Food and Agriculture/World Food Program (FAO/WFP) mission has estimated 1992 emergency food needs in Ethiopia and Eritrea to be approximately 1.1 million metric tons (exclusive of reserve stock replenishment). Other evidence, however, reconciles poorly with this level of emergency need. While not conclusive, recent decreases in prices, stable nutrition levels, and limited occurrences of severe food stress suggest that lower levels of food assistance could suffice in ensuring food security this year. Additional information and analysis is crucial if food assistance in post-war Ethiopia and Eritrea is to effectively address emergency needs without damping desirable market forces.

FACTORS AFFECTING FOOD AVAILABILITY

Harvest Outcome

In late December, a joint FAO/WFP Crop and Food Supply Assessment Mission forecast total 1991/92 production of cereals and pulses in Ethiopia at 7.04 million metric tons (MT). Two months earlier, the FAO forecast cereal and pulse production in Eritrea at 70,000 MT. Together, total 1991/92 production for Ethiopia and Eritrea is forecast at 7.11 million MT. By these

estimates, the aggregate 1991/92 harvest is the second largest on record, only 4.8% below last year's record production.

Such strong performance in the face of disruptions caused by the May 1991 political events reflects a second consecutive year of generally favorable *meher* (main) season growing conditions. Also reflected are continued increases in area cultivated as a result of farmer optimism over recent agricultural reforms and elevated 1991 farm-gate prices. Improved security of land tenure, liberalization of agricultural marketing and increased availability of credit over the previous year have offset much of the negative impact caused by disruptions in the delivery of agricultural inputs in mid-1991.

In spite of a second year of good production at the national level, serious production shortfalls still exist at the local level. These shortfalls will sustain relatively high levels of emergency food needs for at least another year. Inadequate *belg* (early) and *meher* rains throughout much of the North have led to a second consecutive year of seriously reduced harvests, particularly in lowland areas. Irregular main season rainfall combined with lingering civil strife to reduce the harvest potential of small areas in the rest of the country, especially for stalk crops in Bale, the Rift Valley, and mid- to low-altitude areas of Hararghe.

Pastoral Conditions

Pastoral conditions were fair to good in most highland areas by late 1991. However, lowland pastoral areas in Eritrea, Tigray, Hararghe, Sidamo and North and South Omo¹ have not fared as well. In the Ogaden, a strong primary rainy season (March to April) brought much-needed relief to a pastoral population that had suffered from drought conditions for three seasons running. Unfortunately, secondary 1991 season rainfall (October to November) was again inadequate. Increased mobility of herds resulting from the end to civil strife will help to mitigate some of the negative impact on herd size and health in the North. The opposite is probably true in Hararghe and the Ogaden.

¹ "North and South Omo" are two post-1987 regions covering approximately the same territory as pre-1987 Gamo Gofu Region, in southwestern Ethiopia.

Private Food Stocks and Commercial Trade

Private food stocks will likely be of little significance in Eritrea, Tigray, Wello, Gonder and Hararghe. Consecutive years of drought and civil strife have certainly depleted household resources in these regions. In theory, a second good year of agricultural production in the typically productive central and western highlands would suggest that household food stocks in these latter areas could be substantial, especially in Gojjam, Shewa, Arsi, and pockets of Wellega, Illubabor and Keffa.

In the near term, exhausted foreign currency reserves guarantee that very little food will be imported into the country by the government or large scale commercial enterprises. However, 1992 holds much promise for increased regular (non-emergency) food assistance as well as donor foreign exchange support for imports. It remains to be seen just what incentives will exist for cross-border trade with the Sudan and the Gulf states and how that trade might be measured. There have been reports in Eritrea and the Ogaden of increased exports of livestock to the Middle East.

FACTORS AFFECTING FOOD ACCESS

Food Systems

Annual food consumption requirements in Ethiopia and Eritrea, especially in those areas with chronic production deficits, have traditionally been met through a variety of means, not the least of which is off-farm resources. Many households have never been self-sufficient in agriculture, relying more on income from livestock sales, wage labor and petty trade than on their own crops, even in the best of agricultural years. Therefore, a thorough understanding of vulnerability requires not only an assessment of agricultural production, but a knowledge of herd size and health, trade flows, wage labor opportunities, market prices, terms of trade, credit resources and much more.

The end to general hostilities in the Ethiopian civil war has significantly improved food access by restoring some of these off-farm income opportunities to households. Markets have re-opened, commercial and petty trade have picked up, and labor and pastoral migration have improved. As a result, prices have declined, supplemental income opportunities are increasing, and herd viability and health is beginning to recover. The absolute contribution of off-farm income opportunities in 1992 is difficult to predict, but the reintroduction of diversity to the household income equation cannot help but improve food security by restoring non-assistance avenues of response to poor crops even in the face of continued drought.

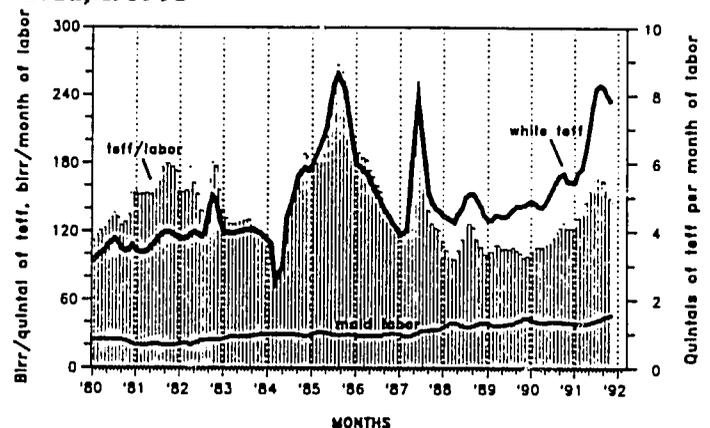
One of the key factors in household access to food throughout rural Eritrea and Ethiopia is livestock. The trade, or sale, of

livestock for grain is a key part of the food supply picture in areas where agricultural self-sufficiency is impossible. Good pastures and restored rights of trade and migration bode well for this type of activity in most parts of the central and western highlands. In the North and East however, where persistent drought and civil warfare have had a negative impact on livestock production over the past few years, a household's ability to draw on livestock resources will be limited. The benefits to be gained from recent improvements in rainfall, trade and migration will be delayed until herd size and health can be rebuilt to a level suitable for sustained offtake.

Economic Data

Cereal price levels increased over the 18 months beginning April 1990, reflecting political uncertainty, the intended impact of the March 1990 economic reforms, and persistent production deficits in the North and East. However, late 1991 cereal prices began to decline, most likely due to consolidation of the reforms, cessation of war-related disruptions, and consecutive years of strong aggregate agricultural production. Price levels and trends in Addis Ababa show the magnitude of these movements (see Figure 6). From April 1990 to August 1991, nominal prices increased more than 60%. Prices peaked in September 1991 and then continued to decline through December. Although nominal prices approached levels seen during the 1984/85 crisis, real purchasing power was not as seriously affected, as illustrated by the *teff*-to-maid wage terms of trade in Figure 6.

Figure 6: Ethiopia & Eritrea, Purchasing Power in Addis Ababa, 1980-91

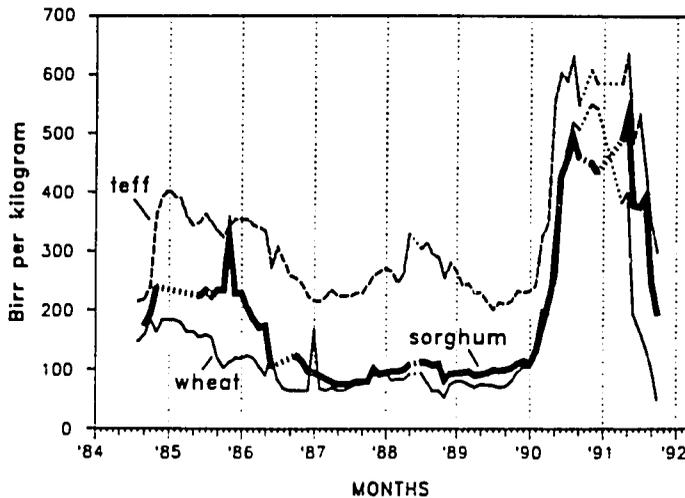


Sources: Transitional Government of Ethiopia/Central Statistics Authority (TGE/CSA); FEWS/Washington

Note: Purchasing power is presented in terms of months of labor for each quintal (100 kg) of *teff*. Prices used are nominal prices.

Eritrea provides a striking example of this recent shift in price trends with a dramatic price increase after the February 1990 capture of Massawa and a similarly dramatic decline following the May 1991 defeat of the former "Government of the People's Democratic Republic of Ethiopia" (GPDRE) forces (see Figure 7). Between June and December 1991, *teff* prices in Asmara

Figure 7: Ethiopia & Eritrea, Asmara Cereal Prices, 1984-91



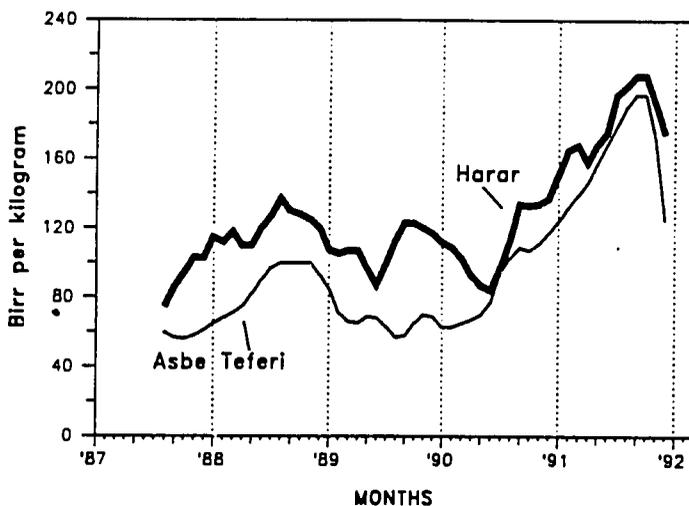
Sources: TGE/Agricultural Marketing Corporation (AMC); Eritrean Catholic Secretariat (ECS); FEWS/Washington

Note: The prices used are nominal prices.

fell 60%. The decline was not limited to *teff*; the price of wheat dropped by more than 90% in the same period. This price behavior is not the sort that would reflect either a failure of the main rainy season, or a 75% harvest failure in Eritrea for 1991/92. The behavior is probably due to a combination of food aid effects, a better-than-expected 1991/92 harvest, and a changed marketing and distribution environment. More information is needed before the relative impacts of these factors can be determined.

Cereal price levels and trends in Hararghe exhibit similar behavior (see Figure 8). From mid-1990 to September 1991,

Figure 8: Ethiopia & Eritrea, White Sorghum Prices in Hararghe, 1987-91



Sources: TGE/AMC/Planning and Market Research; FEWS/Washington

Note: The prices used are nominal prices.

white sorghum prices increased over 150%. Nevertheless, in September 1991 prices began to fall significantly throughout the region. The earlier increase is consistent with recorded drought, increased political instability, economic reforms and the collapse of associated markets in Somalia. The more recent price decline is curious, however, because it occurs in a year when all other indications suggest that drought, civil instability and the collapse of trade with Somalia are continuing. Once again, the effects of food aid distributions, economic reforms and the fall of the old political order probably account for much of this apparent contradiction.

UPDATE ON VULNERABILITY

In June 1991, FEWS estimated that up to 7 million people throughout Eritrea and Ethiopia were extremely vulnerable to famine. A second year of favorable main-season rainfall, continued agricultural and marketing reforms and the end to civil warfare in Eritrea and Tigray have improved the overall food security situation of approximately 5 million of these people. The remaining 2 million people—encompassing primarily the economic and politically displaced and those living in pockets of persistent drought and civil strife—are likely to remain extremely vulnerable in 1992.

Consecutive years of drought and civil strife in Eritrea, Tigray and parts of Wello again limited annual income in 1991/92. These factors will continue to deplete remaining resources—or wealth—of many households. Falling prices and increased trade and mobility will, however, help to offset a mediocre harvest in these regions, with the result that vulnerability for many should begin to decline. Since livestock play a key role in household wealth in all of these areas, substantial reduction in vulnerability will only come after herd size and strength improve to the point that sustainable offtake levels are restored.

Drought-affected pastoralists and agropastoralists in Hararghe and the Ogaden continue to face additional pressures posed by political instability and the presence of several hundred thousand Somali refugees and repatriated Ethiopians. However, as mentioned above, cereal prices have fallen significantly since September 1991 and terms of trade (maize for goat) have improved. However, because these changes only restore terms of trade to a third of what they were a year ago, the vulnerability of this population, while improved, will remain serious.

An estimated 1.3 million demobilized soldiers and their dependents lost their sole means of support when the Dergue (former Mengistu regime) fell in May. So did an additional 360,000 people "displaced" for political or economic reasons. Many of these people no longer have access to food at any cost and are likely to remain extremely vulnerable until they can be re-absorbed into a peacetime economy. Concern is also increasing over the vulnerability of urban dwellers, who must adjust

Table 23: 1991/92 Food Balance for Ethiopia and Eritrea (000 MT)

1991/92 Population (millions)		53.4
Annual Status Quo Per Capita Consumption Rate (kg)		143.1
1991/92 CEREAL & PULSE CONSUMPTION REQUIREMENTS		
Total Cereal & Pulse Requirement		7,642
1991/92 CEREAL & PULSE SUPPLY		
Net 1991/92 Production (unmilled)		6,043
Gross 1991/92 Production	7,110	
Seed Requirement	356	
Post-Harvest Losses	711	
Net Drawdown in AMC Stocks Expected in 1992		0
Commercial Food Imports		50
Food Exports		0
1991 Regular Food Aid Carry-over Stocks		0
1991 Emergency Food Aid Carry-over Stocks		200
Total Available Cereal & Pulse Supply for 1991/92		6,293
PROVISIONAL CEREAL & PULSE BALANCE FOR 1991/92		1,549

Sources: 1980/81-1983/84 status quo calculations from 1989 USAID/Addis Ababa Food Needs Assessment for Ethiopia; population, gross domestic production, commercial food import, contribution to food security reserve, and the emergency food aid carryover from 1991 estimates from the FAO/WFP 1991 Crop and Food Supply Assessment Mission.

Notes: Food estimates are in cereal equivalents. The balance does not take into consideration likely changes in private or commercial food stock positions, nor does it take into account possible contributions to the Food Security Reserve. The seed requirement is estimated at 5% of gross production. Post-harvest losses are estimated at 10% of gross production. The net drawdown of AMC stocks, food exports, and the carryover of regular food aid stocks from 1991 are unknown.

to higher retail food prices and reduced access to subsidized staple foods.

1992 Food Aid Needs

Total consumption needs in Ethiopia and Eritrea traditionally are estimated using an aggregate food balance sheet approach to determine the gross food deficit for the year, and then further refining that estimate through the enumeration of emergency food needs (multiplying the estimated number of people at risk by a standard ration for the period of time over which they are expected to need assistance).

Given the available data, the 1992 food balance sheet suggests an aggregate food deficit for Ethiopia and Eritrea on the order of 1.549 million metric tons (see Table 23).¹ This is up nearly half a million tons over 1991, partially reflecting 360,000 MT less agricultural production in 1991/92 than in 1990/91, and partially reflecting a 215,000 MT increase in consumption needs resulting from a 2.9% population growth. While the aggregate food deficit provides a general snapshot of the health of the food

sector in a given year, it should not be mistaken for a measure of emergency food needs. Emergency needs depend upon a variety of factors, in particular the spatial distribution of the deficit. For this reason, an enumeration of food needs by numbers of people judged to be "at risk" was carried out by the FAO/WFP assessment team. The enumeration approach suggests a total emergency food requirement in Ethiopia and Eritrea in 1992 of 1.1 tons for 8.4 million people.

Both food balance sheet analyses and enumerations are information-intensive methodologies that depend heavily upon estimates of national-level agricultural production, household stocks, imports, exports, losses and off-farm income resources. Civil war and its concomitant restrictions on travel and information collection made past crop and harvest assessments very difficult. Breakdowns in agricultural reporting networks after May 1991 and lingering civil strife made assessment efforts difficult in 1991 as well. For these reasons, the analysis of emergency food needs is inherently imprecise and must be evaluated against a host of additional physical and socioeconomic indicators.

These other indicators do not appear to support the high levels of emergency assistance suggested in the food needs estimates above. Agricultural prices levels have risen (an expected and intended result of agricultural reforms), but are retreating from the very high levels of the 18 months prior to October 1991. Except in areas of widespread insecurity (Hararghe and the Ogaden), nutrition levels have remained very stable. The only reported unseasonal migration of people involves demobilized

¹ Initial FEWS and FAO estimates of aggregate 1992 food deficit are different. This is due to a one-time 5% correction (increase) in Ethiopia population figures undertaken by the Ethiopian Relief and Rehabilitation Commission (RRC) in 1991. The 1992 food balance sheet uses a status quo annual per capita consumption rate. Any population corrections such as the RRC's should be applied retroactively to base-year population figures in order to similarly revise estimates of status quo consumption per capita (a base-year analysis). In revising the USAID base-period analysis, FEWS found that status quo consumption fell by considerably less than initial FAO estimates would suggest.

soldiers. For these reasons, the above estimates of food aid required in 1992 should be taken as the upper limits of what is needed, assuming no serious interruptions in trade or migration occur. Additional information and more sophisticated analysis is required if we are to improve our understanding of optimal aid levels and make necessary refinements in the targeting of such assistance. With the end to civil war, such refinements may now be possible.

CONCLUSION

A second consecutive year of strong agricultural production has resulted in the second largest harvest on record for Ethiopia

and Eritrea. Much of Ethiopia and Eritrea have benefitted from the end to civil hostilities and renewed vigor in trade, markets and personal mobility. Pockets of drought and civil unrest persist. Together with a large number of economically and politically displaced households, people in these areas will remain extremely vulnerable until they can be reintegrated into a postwar economy. Current high levels of estimated emergency food needs, however, are difficult to reconcile with other indicators of food availability and access, which suggest stable and declining food stress. Further investigation and analysis are necessary to ensure that 1992 food assistance levels are both sufficient to meet emergency needs and not so great as to damp the desirable effects of recent agricultural reforms.

Appendix F: FEWS Matrix of Vulnerability

Level of Vulnerability	Conditions of Vulnerability	Typical Coping Strategies and/or Behaviors	Interventions to Consider
SLIGHTLY VULNERABLE	<p>Maintaining or Accumulating Assets</p> <p>and</p> <p>Maintaining Preferred Production Strategy</p>	<p>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.</p> <p>Production Strategy: any changes in production strategy are largely volitional for perceived gain, and not stress-related.</p>	Developmental Programs
MODERATELY VULNERABLE	<p>Drawing-down Assets</p> <p>and</p> <p>Maintaining Preferred Production Strategy</p>	<p>Assets/resources/wealth: coping measures include drawing down or liquidating less important assets, husbanding resources, minimizing rate of expenditure of wealth, unseasonal "belt-tightening" (e.g., drawing down food stores, reducing amount of food consumed, sale of goats or sheep).</p> <p>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.).</p>	Mitigation and/or Development: Asset Support (release food price stabilization stocks, sell animal fodder at "social prices", community grain bank etc.)
HIGHLY VULNERABLE	<p>Depleting Assets</p> <p>and</p> <p>Disrupting Preferred Production Strategy</p>	<p>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).</p> <p>Production Strategy: coping measures being used have a significantly costly or disruptive character to the usual/preferred household and individual lifestyles, 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).</p>	Mitigation and/or Relief: Income and Asset Support (Food-for-Work, Cash-for Work, etc.)
EXTREMELY VULNERABLE or AT-RISK	<p>Liquidating Means of Production</p> <p>and</p> <p>Abandoning Preferred Production Strategy</p>	<p>Assets/resources/wealth: liquidating "production" resources (e.g., sale of planting seed, hoes, oxen, land, prime breeding animals, whole herds).</p> <p>Production Strategy: Seeking non-traditional sources of income, employment, or production that preclude continuing with preferred/usual ones (e.g., migration of whole families).</p>	Relief and/or Mitigation: Nutrition, Income and Asset Support (food relief, seed packs, etc.)
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 Aeronautic 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 orbiter 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 infra-red 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% (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.