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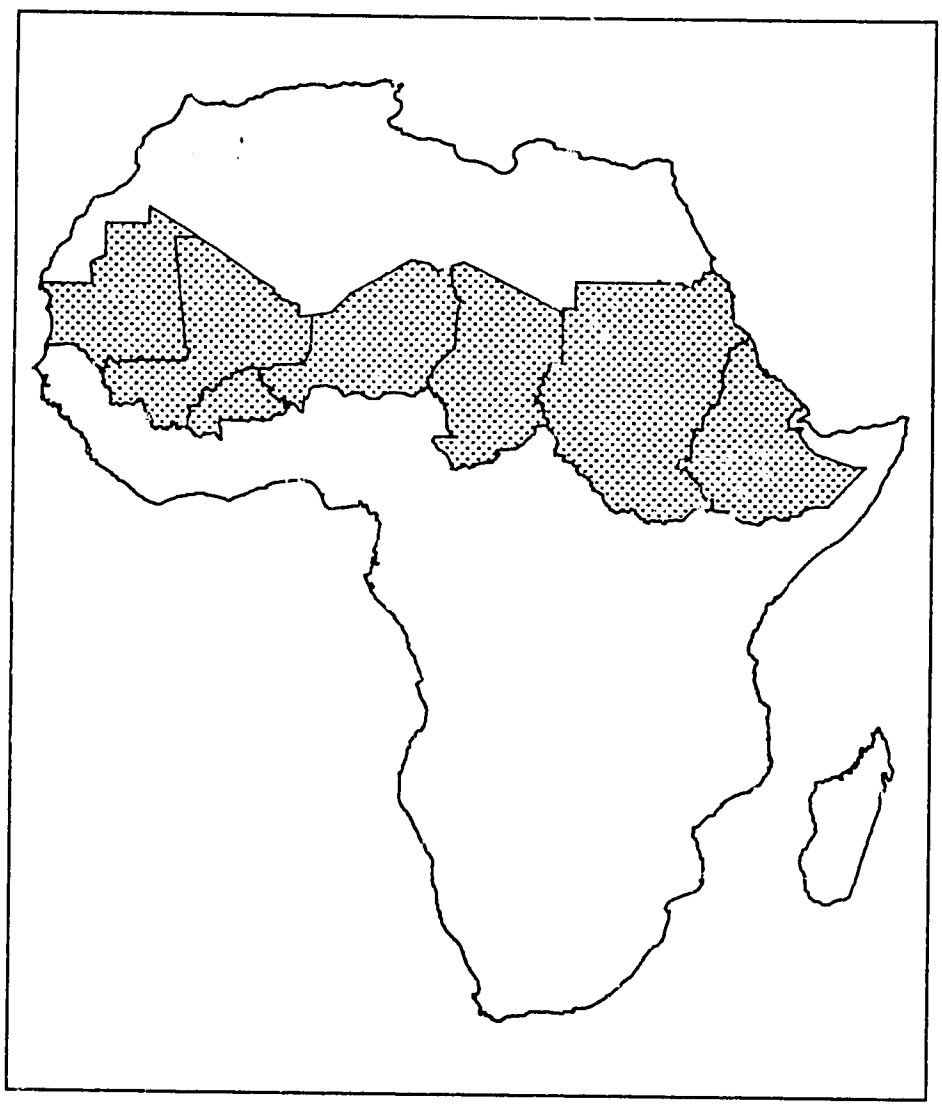
Harvest Assessment of Cereal Production



Contains reporting on:

Mauritania
Mali
Burkina
Niger
Chad
Sudan
Ethiopia

Country Assessments prepared by USAID Missions and FEWS Field Representatives in each FEWS-monitored country during the month of December 1989. Published by FEWS/Washington for the Agency for International Development, Bureau for Africa.

Harvest Assessment of Cereal Production

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Contents

Executive Summary i

Map 1: Regional Summary of Trouble Spots ii

FEWS Region: Average Harvest in the Sahel, Populations At-Risk in the East 1

Mauritania: Average, Deficit Harvest, Food Aid Needs Covered 4

Map 2: Mauritania, Harvest Assessment Summary Map 4
Table 1: Mauritania, 1989/90 Wilaya Cereal Production and Needs 5
Table 2: Mauritania, 1990 National Cereal Balance 6

Mali: National Grain Surplus, Yet Local Pockets of Food Shortage in 1990 8

Map 3: Mali, Harvest Assessment Summary Map 8
Table 3: Mali, Comparison of 1987, 1988, and 1989 Cereal Production 9
Table 4: Mali, Cercle Level Production in Areas of Heavy Grasshopper Damage 10
Table 5: Mali, Projected 1990 Population 10
Table 6: Mali, Coarse Grain Needs Met Through Local Production 11
Table 7: Mali, Rice Needs Met Through Local Production 11
Table 8: Mali, Estimates of Coarse Grain Needs Met in Mopti Region 11
Table 9: Mali, End of Year Cereal Stocks 12
Table 10: Mali, Grain Removed from OPAM Warehouses 12
Table 11: Mali, Recent Producer and Consumer Prices 13
Table 12: Mali, Prices for Food Aid Rice 13

Mali: Appendices A through E 15

Table A1: Mali, Gross 1987 Production by Region and Crop 16
Table A2: Mali, Net 1987 Production by Region and Crop 16
Table B1: Mali, Gross 1988 Production by Region and Crop 17
Table B2: Mali, Net 1988 Production by Region and Crop 17
Table C1: Mali, Gross 1989 Production by Region and Crop 18
Table C2: Mali, Net 1989 Production by Region and Crop 18
Table D1: Mali, Cereal Needs Met Through Local Production 19
Table E1: Mali, SAP Designated At-Risk and Vulnerable Arrondissements 20

Burkina: Production, Imports, and Stocks Cover National Needs 22

Map 4: Burkina, Harvest Assessment Reference Map 22
Table 13: Burkina, Summary 1989/90 Cereal Balance 23
Table 14: Burkina, Cereal Balance by Province for 1989 and 1985-88 Average 24

Niger: Niger Government Appeals for Aid in Meeting Localized Food Shortages 26

Map 5: Niger, Harvest Assessment Reference Map 26
Table 15: Niger, Net 1989 Rainy Season Cereal Production 28
Table 16: Niger, Provisional 1989/90 Cereal Needs Assessment 29

Chad: In-Country Stocks Adequate to Meet Localized Food Shortages 34

Map 6: Chad, Harvest Assessment Reference Map 34

Table 17: Chad, Gross Production, 1984 - 1989 35

Table 18: Chad, Principal Economic Activities in Mao Sub-prefecture, Kanem Prefecture 36

Chad: Appendix F 37

Table F1: Chad, National Cereal Balance 38

Table F2: Chad, Cereal Balance by Climate Zone and Prefecture 38

Sudan: Carry-Over Stocks Cover Western Needs, Aid to South Uncertain 40

Map 7: Sudan, Harvest Assessment Reference Map 40

Table 19: Sudan, Millet and Sorghum Production for Government Held Areas 41

Table 20: Sudan, Combined Millet and Sorghum Production in the West 42

Table 21: Sudan, National Cereal Balance 42

Table 22: Sudan, Food Deficit Estimates in the West 42

Table 23: Sudan, Vulnerable Areas in the West 44

Ethiopia: Severe Food Shortages Threaten 46

Map 8: Ethiopia, Harvest Assessment Reference Map 46

Table 24: Ethiopia, Peasant Sector Production of Cereals, Pulses and Oilseeds 47

Table 25: Ethiopia, USAID Food Needs Assessment 48

Table 26: Ethiopia, Forecast Food Balance for Peasant Sector by Geographic Zone 49

Map 9: Ethiopia, Vegetation Conditions in Eritrea and Tigray Regions 50

Executive Summary of Reports

FEWS-MONITORED REGION

The 1989/90 harvest has been average throughout the Sahel and government-held areas of Sudan. Traditional coping mechanisms appear to be functioning well in the localized areas of production deficit, except in highly deficit areas of Niger and Mauritania's Senegal River valley. Civil war has contributed to and exacerbated the drought-induced crop failure in northern Ethiopia (see Map 1). The at-risk population in southern Sudan, while much smaller than that of Ethiopia, is increasing with the intensification of fighting between the Government of Sudan (GOS) and the Sudanese People's Liberation Army (SPLA).

MAURITANIA

USAID/Mauritania expects that cereal production will be average in 1989/90, covering 35% of cereal needs. The Mauritanian government expects production to be closer to last year's record crop, which covered 43% of needs. Civil disturbances continue to threaten food security in the Senegal River valley. Regardless of the production estimate used, any cereal deficit can be met with already existing and programmed resources.

MALI

Near-record cereal production plus in-country stocks will cover national consumption needs. The Malian government has authorized grain exports and waived the export tax on grain for 1990. While there are localized food shortages, no need for emergency food aid is envisioned.

BURKINA

Combined 1989/90 cereal production, in-country stocks, and expected imports will cover 1990 consumption needs. Although emerging signs of economic stress are evident in the Sahel region, no need for emergency food aid is envisioned.

NIGER

While the 1989/90 harvest is above average, the Government of Niger has requested donor assistance to cover its estimated 1990 production deficit. Cereal deficits in Tillabery and Zinder departments are of particular concern. USAID/Niger believes that supplies available in Niger should be adequate to meet needs, but notes that institutions for meeting localized needs are only recently formed, making assistance to deficit areas difficult.

CHAD

The 1989/90 harvest will meet most of Chad's cereal requirements. Harvests are poor in some locations, especially in northern pastoralist zones. In the North, non-farming activities should provide enough resources to make up for the loss of crops. No need for emergency food aid is currently envisioned.

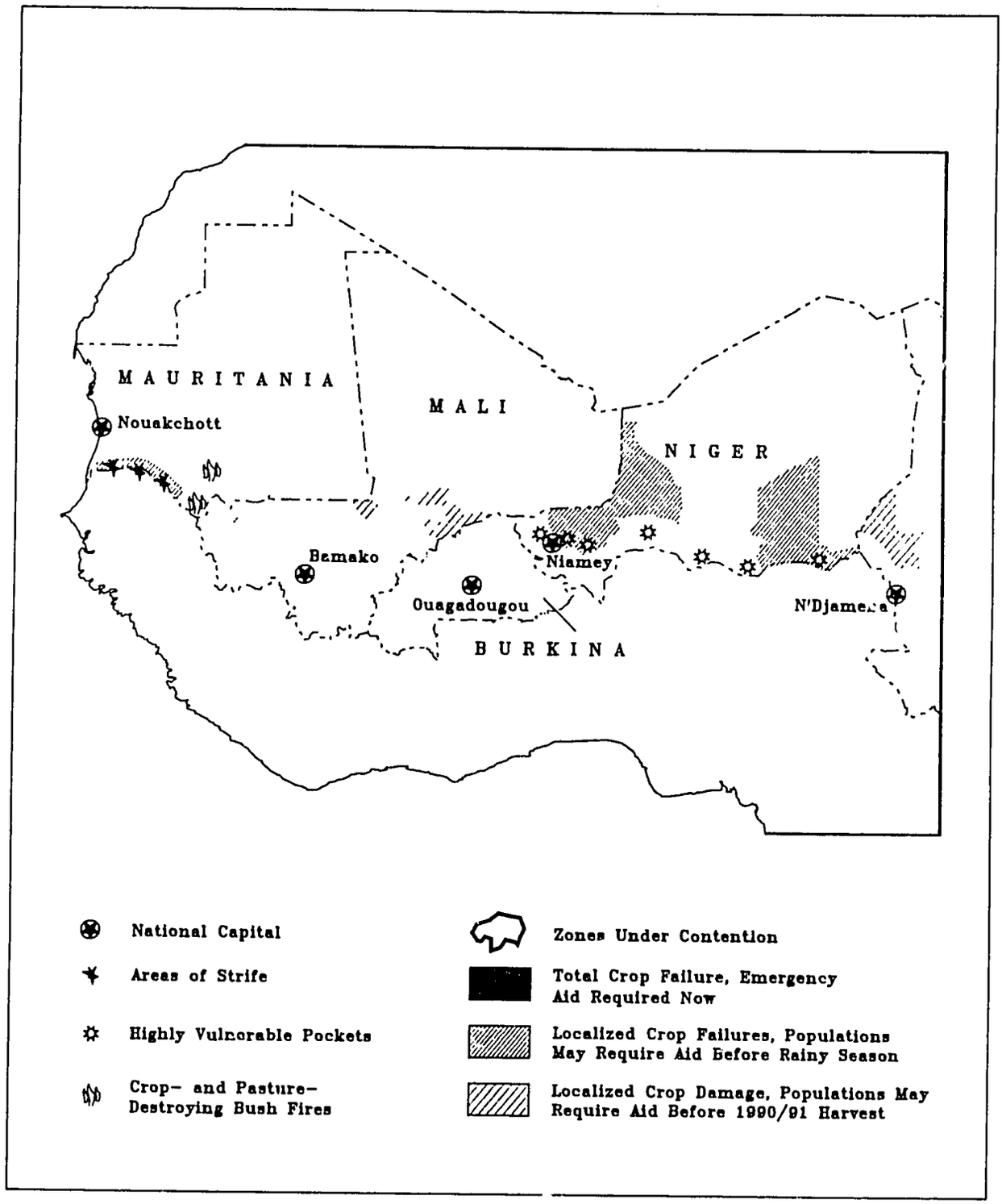
SUDAN

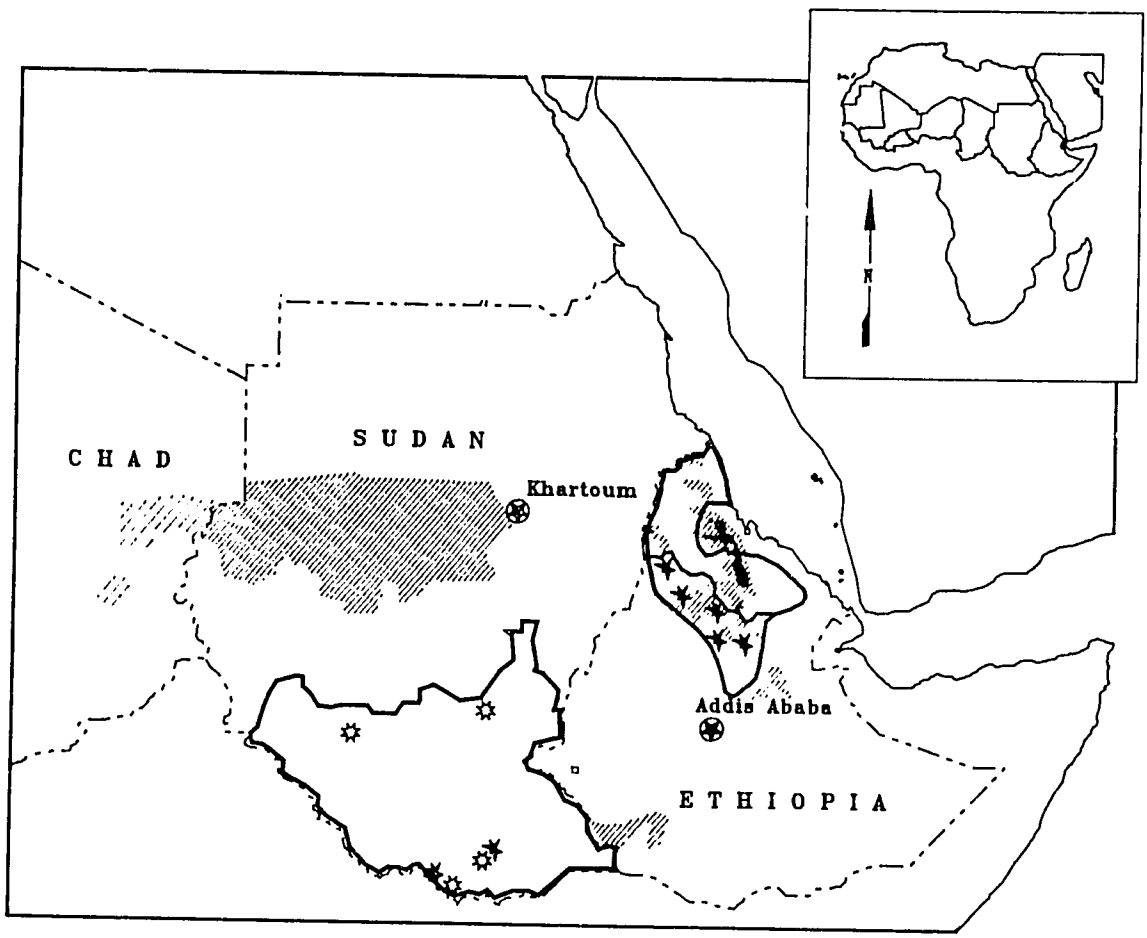
The 1990 harvest in government-held areas is average. Localized production deficits in the west can be met by domestic production and grain reserves. Aside from substantial scheduled relief activities in the South, no need for emergency food aid assistance is envisioned. There are serious concerns, however, that programmed aid to the South will not be allowed by the GOS and the SPLA or delivered.

ETHIOPIA

In large parts of both Eritrea and Tigray, the 1989/90 main season crop was as poor as in 1984. More than 3.5 million people will require immediate emergency assistance in these areas. The spreading conflict hinders access to millions of those affected by food shortages. Elsewhere in Ethiopia (especially in specific areas of Gonder, Wello, Harerge and Shewa), as many as 1.5 million people will require emergency aid. Donor pledges to-date total half of the 750,000 mt of emergency relief needed during 1990.

Map 1


MAURITANIA
MALI
NIGER
BURKINA
Nouakchott
Bamako
Niamey
Ouagadougou
N'Djamena
National Capital
Areas of Strife
Highly Vulnerable Pockets
Crop- and Pasture-Destroying Bush Fires
Zones Under Contention
Total Crop Failure, Emergency Aid Required Now
Localized Crop Failures, Populations May Require Aid Before Rainy Season
Localized Crop Damage, Populations May Require Aid Before 1990/91 Harvest



REGIONAL SUMMARY

POST-HARVEST TROUBLE SPOTS

FEWS, January 1990

Report prepared by the FEWS/Washington Office, January 26, 1990

FEWS Region

Regional Harvest Assessment of Cereal Production

Summary

The countries of the western and central portions of the FEWS-monitored region attained average harvests in 1989/90, although with pocket areas of deficit. At-risk situations are evident in the eastern portion of the region, however, particularly in northern Ethiopia and southern Sudan.

Northern regions of Ethiopia showed a grave shortfall in cereal production in 1989/90 (see Map 1). Drought has cut the harvest in Eritrea and Tigray regions to 20 and 50%, respectively, of the 1980 to 1983 average. These crop failures are compounded by two severe aroughts in the preceding four years and war, both of which have reduced the populations' abilities to cope. Some 3.5 to 5 million people are at risk of famine and will require at least 750,000 metric tons (mt) of emergency aid in the near future, of which 366,000 mt had been pledged by early January. Delivery of relief will be severely obstructed if conflict continues in the area.

Information from southern Sudan indicates that this last harvest has been excellent in those rural areas where the relative lack of strife has allowed people to farm. A fragile situation exists, however, in urban areas of southern Sudan where people fleeing conflict have gathered. In the towns of Juba, Malakal, Wau, and Yei, the depletion of food supplies and constraints on relief organizations have put at least 275,000 displaced people in an at-risk position.

Regional Issues

Adequate harvest with pockets of deficit: Deficit cereal production areas appear in each of the Sahelian countries monitored by FEWS, despite average harvests at the national level. Deficit pockets may be caused by civil strife, drought, or other natural disasters such as pest infestations. This year's deficit pockets are mostly due to the highly localized nature of rainfall patterns in the Sahel. Civil strife has played its role in southern Sudan and southwestern Mauritania.

Production deficits do not always imply household food shortages: In spite of crop failures, no immediate food access problems are expected in Chad's northern Sahel. Most of the people in the area are pastoralists, and their herds are substantially rebuilt following the devastation of the mid-1980s drought, providing households a ready source of food and cash income. Most households in this zone also earn income during the off season by participating in cottage industry and sending members to Lake Chad and urban areas to take jobs. This diversified income base serves as a buffer from the impact of reduced household crop production, thereby providing households with additional means of obtaining food.

Exogenous influences: With the average harvest of 1989/90, there is an inclination to assume that there will be no food access-related stress in most FEWS-monitored countries. Throughout the region, however, there are influences exogenous to food production systems that will negatively affect food access in specific locations during 1990. External shocks from strife, inadequate infrastructure and institutional constraints (for example, inappropriate or ineffectual institutions for moving surplus cereals or stocks to deficit areas) will confound normal coping mechanisms by not allowing households time to adjust to poor crop conditions.

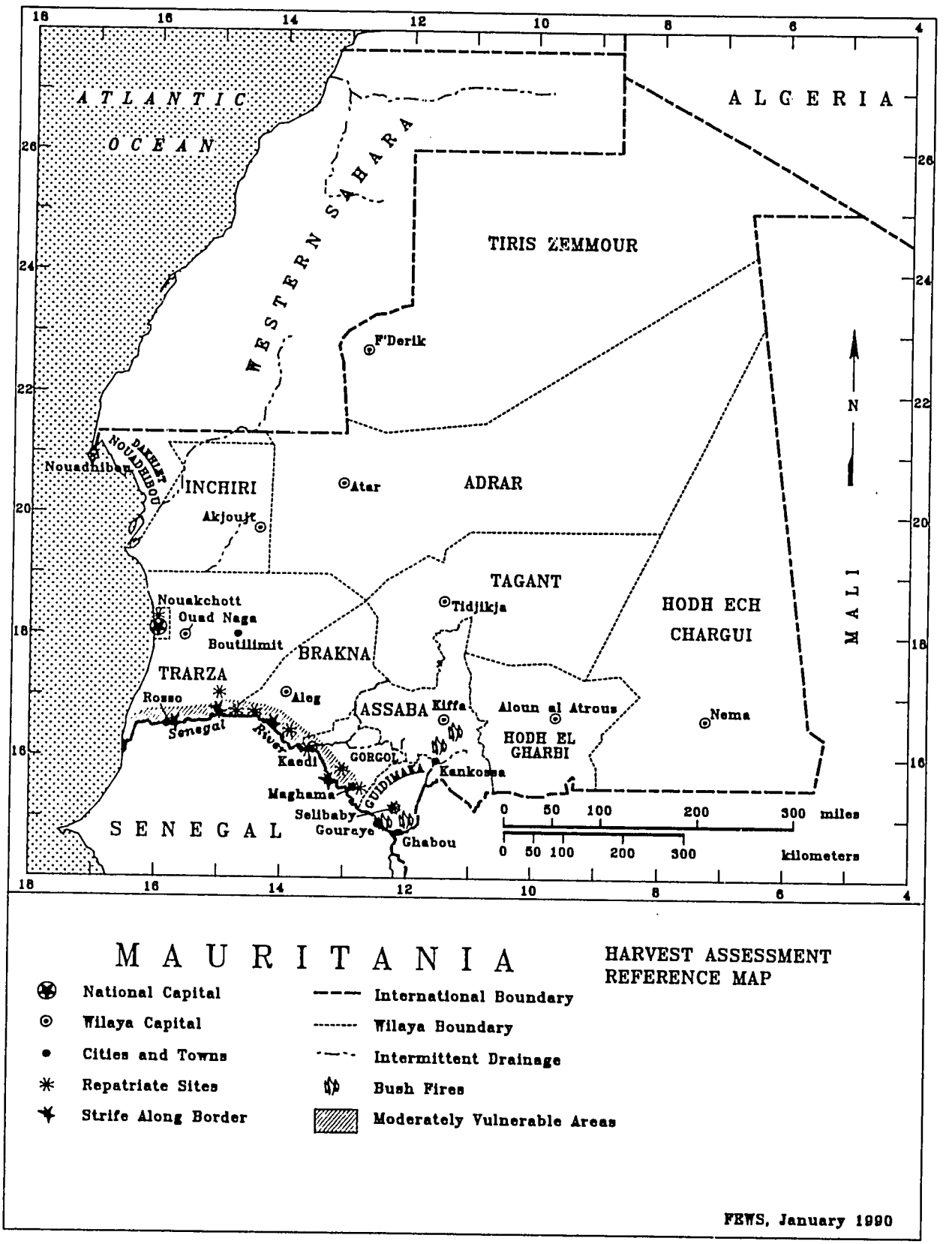
Exogenous hindrances can also limit access to food supplies for certain groups of people. As an example, the closed Mauritania-Senegal border deprives rice farmers of their usual markets for sales and purchases, restricting their ability to raise money and their access to food. Outside shocks can also alter donor decisions. For example, decision makers often depend on the smooth operation of institutions outside of their influence in planning interventions. In Sudan, donors have planned their response based on the expectation of acquiring relief grain from publicly held in-country stocks. In a hypothetical situation, the Government of Sudan might decide that raising foreign exchange by exporting those publicly held cereal stocks would better serve the national interest than distributing the stocks domestically. Under such a hypothetical scenario, the donors would find themselves having to scramble for timely sources of relief grain. (This scenario is not currently expected.)

What to do with a national surplus? The aggregate cereal surplus in Mali could cover the food needs of deficit arrondissements in Mali, or food needs in neighboring countries. A similar situation could arise in other FEWS countries over the years, particularly in Burkina and Sudan. Private marketing channels for inter- and intra-regional trade could serve to balance cereal supply and demand between surplus and deficit regions. Market development, the policy environment, and explicit incentives (that is, relaxation of export controls as in Mali, triangular trade agree-

ments, export subsidies, etc.) will positively influence the private market alternative. The evolution of market reforms in Mali should be closely monitored in order to judge their applicability to other countries within the region.

Everyone is vulnerable. The question is, to what degree? Pockets of deficit food production are labeled as vulnerable to famine in regular reporting and conversation. Vulnerable is used to describe both physical areas and segments of society. Definitions of vulnerability range from a specific percentage of food needs being met to the idea that individuals will die without timely intervention. An operational definition of vulnerability that would have the same meaning, and influence the same level of action by decision makers, has been lacking. FEWS views all people as being vulnerable to famine. What distinguishes people is their degree of vulnerability, which is dependent upon the resources they can mobilize to cope with their status.

Map 2


ATLANTIC OCEAN
ALGERIA
WESTERN SAHARA
TIRIS ZEMMOUR
F'Derik
N
Nouadhibou
DAKHLET NOUADHIBOU
INCHIRI
Akjoujt
Atar
ADRAR
TAGANT
Tidjikja
HODH ECH CHARGUI
MALI
Nouakchott
Ouad Naga
Boutilimit
BRAKNA
TRARZA
Rosso
Aleg
ASSABA
Kiffa
Aioun el Atrous
HODH EL GHARBI
Nema
Senegal
River
Kaedi
GORGOL
GUIDIMAKA
Kankossa
Maghama
Selibaby
Gouraye
Ghabou
SENEGAL
0 50 100 200 300 miles
0 50 100 200 300 kilometers
MAURITANIA
HARVEST ASSESSMENT REFERENCE MAP
National Capital
Wilaya Capital
Cities and Towns
Repatriate Sites
Strife Along Border
International Boundary
Wilaya Boundary
Intermittent Drainage
Bush Fires
Moderately Vulnerable Areas
FEWS, January 1990

Report prepared by FEWS/Mauritania and USAID/Mauritania and received in Washington on December 15, 1989

Mauritania

Average, Deficit Harvest, Food Aid Needs Covered

SUMMARY

Although the Government of the Islamic Republic of Mauritania (GIRM) does not agree with the predictions of USAID/Mauritania's Office of Agricultural Resources (OAR/M), information indicates a reduction in net cereal production over last year. If the OAR/M production estimates are reasonably accurate, about 35% of Mauritania's cereal needs will be met this year, compared to 43% with last year's bumper crop. Final production figures will not be available until at least the end of February, due to the multiple cropping cycles in Mauritania. The annual cereal balance is currently under discussion between the donors and the Commission for Food Security (CSA). As is usual in this desert country, all wilayas (formerly "region") will be deficit and dependent upon commercial and food-aid imports, regardless of which production estimate is used. A decision will be made regarding the official deficit and the need for food aid pledges by mid-January. The CSA has adequate warehousing at all wilaya and moukhataa (formerly "department") capitals. If deliveries and distributions are well organized, future food access should not present difficulties. At this writing, OAR/M has reason to believe that, even with lower production than last year, the cereal deficit will be met with already existing and programmed resources.

FACTORS AFFECTING FOOD SECURITY

Harvest Outcome - The annual joint Food and Agriculture Organization/Committee to Combat Drought in the Sahel (FAO/CILSS) mission, held in October, estimated total production at 128,600 metric tons (mt), a difference of 30,000 mt from Agricultural Statistics Bureau (ASB) estimates. The GIRM continues to use the preliminary ASB production estimates, which put this year's cereal production at 158,000 mt. Practically all rainfed crops have been harvested. Most river recessional (*walo*) crops are in elongating to panicle-formation stages. Harvesting of the irrigated rice crop continues. Lowland recessional (*bas fonds*) crops are still in maturing stages. The ASB will make its second and final estimate of the 1989/90 agricultural campaign in February.

OAR/M believes that river recessional crop production will be at least 20% lower than last year for a variety of reasons (no confirmation of this information is presently available): (1) the 1989 peak level of the Senegal River was 10.6 meters, compared to 11.5 meters in 1988, flooding less acreage and affording a smaller river recessional crop; (2) cross border unrest continues and has deterred people from planting in recessional areas; and (3) the population shifted significantly as a result of events in April, creating a shortage of skilled labor for recessional agriculture.

Food Deficit Estimates - Earlier projections of the food deficit have changed for two main reasons. First, the present analysis is based on population estimates for 1990 rather than 1989. Second, while there are still no final estimates available for agricultural production, OAR/M believes that production will be less than previous estimates. The present analysis includes these reductions.

Table 1 presents OAR/M's best estimate of food needs disaggregated by *wilaya* (formerly "region"). These figures are based on an average annual per capita cereal consumption of 176 kilograms (kg) and an estimation of the 1990 population that assumes a 2.8% growth rate. Production was calculated

Table 1: Mauritania, 1989/90 Wilaya Cereal Production and Needs (mt)

Wilaya	Population	Cereal Needs	Gross Production	Net Production	Cereal Balance
Hodh ech Chargui	220,219	38,869	22,815	19,393	-19,476
Hodh el Gharbi	160,979	28,413	21,389	18,181	-10,232
Assaba	169,939	29,994	4,175	3,548	-26,446
Gorgol	189,923	33,521	20,514	15,654	-17,867
Brakna	196,438	34,671	30,632	25,375	- 9,296
Trarza	211,983	37,415	33,507	20,531	-16,884
Guidimaka	123,301	21,763	10,997	9,472	-12,291
Adrar	64,076	11,309	0	0	-11,309
Dakhlet Nouadhibou	63,410	11,192	0	0	-11,192
Tagant	68,960	12,171	0	0	-12,171
Tiris Zemmour	35,656	6,293	0	0	- 6,293
Inchiri	14,409	2,543	0	0	- 2,543
Nouakchott	409,877	72,343	0	0	-72,343
Total	1,929,170	340,499	144,028	112,154	-228,345

Sources: CEDES; USAID/OAR/M; ASB

by agricultural sector as follows: rainfed crop production was based on this year's FAO/CILSS estimates; river recessional crops were reduced 20% from last year's *wilaya* figures; the irrigated crop estimate used last year's figures (with a 20% reduction in Trarza Wilaya to account for reduced agricultural resources resulting from the events of April and May); and lowland recessional production figures were taken from last year.

Earlier cereal balance and food needs assessments were disaggregated by commodity and used 1989 population figures and FAO/CILSS production estimates. OAR/M will disaggregate the current assessments by commodity as soon as final production estimates are available. Table 2 presents the preliminary national cereal balance for 1990.

Table 2: Mauritania, 1990 National Cereal Balance[1] (mt)

Consumption Balance from Table 1:	-228,345
Seed and Feed Loss (seed 2,722; feed 8,000)	-10,722
Variation of Stocks	-3,200
Total Consumption	-242,267
Commercial Imports	158,889
Food Aid Imports (pledged to-date, including the 20,000 mt of wheat expected to be pledged by the USAID/Food for Peace 206 program)	57,000
Total Imports	215,889
Overall Cereal Balance	- 26,378

Sources: USAID/OAR/M; CSA; ASB; SONIMEX
[1] All figures are in milled terms.

The multi-donor food group continues intensive negotiations with the GIRM on several food security issues, including establishment of a food security stock. The above analysis does not include security stock figures. When agreed figures become available, the current deficit estimate will change. Cooperation by the GIRM in resolving these issues will impact the levels of 1990 and future food aid pledges.

Food Stocks - The CSA and National Import/Export Company (SONIMEX, a parastatal) stock levels are approximately the same as those reported earlier (i.e., approximately 19,000 mt of wheat, 10,500 mt of millet and sorghum, and 19,700 mt of SONIMEX-held rice, giving total cereals of about 49,000 mt). There are currently ongoing food distributions, both free and for sale. Future deliveries are expected to change the stock situation significantly and will be detailed in future reporting.

Other Resources - Earlier reports indicated that village and city populations would have less access to meat and dairy products than their herds normally provide. Closure of the Mauritania-Senegal border and civil strife in the Southwest have had a significant impact on traditional grazing patterns. While transhumant and nomad populations move on with their herds when pasture is depleted, village dwellers are obliged to send off their herds, reducing their access to meat and dairy products. Transhumant and nomad populations, which traditionally have been well-dispersed and moving south by November, were grazing their herds further north and keeping close to large population centers, probably because of cattle raiding. This has caused over-grazing and may be responsible for an unusually large number of accidental ground fires around large population centers. The Prefect of Kankossa (in Assaba Wilaya) indicated that the area around Lake Kankossa would be over-grazed by the end of November (see Map 2). In 1989, 13 grass fires were attributed to these populations around the town of Kiffa, in central Assaba Wilaya. Guidimaka Wilaya has also suffered several bush fires. One of three active fires noted on an OAR/M field trip (29 October - 3 November), was expected to burn everything between Ghabou and Gouraye. The Mission received reports that these large southern fires were a result of cross border raids. If this is true, and if they continue, they will further deplete available pasture.

Food Aid Requirements - Earlier reports noted that the deficit requirement of Mauritania after accounting for local production, commercial imports, and initial donor pledges was about 35,000 mt of cereals. The level of food security stocks remains to be negotiated between the multi-donor food security group and the GIRM. See the section on "Food Deficit Estimates" above for clarification of the difference between the earlier figure and the figure presented in this report.

Non-Food Needs - Health supplies were adequate throughout Mauritania during early October. The supplies were furnished by donors in response to GIRM requests for support of repatriates and other humanitarian needs. However, an October survey of villages just north of the Senegal River in Trarza Wilaya (from Boutilimit to Rosso) indicated that mobile health teams responsible for immunizing infants and providing rainy season malaria prophylaxis had been inoperative since April because of the tensions. As a result, infant children in that *wilaya* are at some greater risk of disease.

POPULATIONS VULNERABLE TO OR AT RISK OF FOOD EMERGENCIES

Numbers and Locations of Displaced and Refugee Populations OAR/M continues to estimate the number of displaced persons (DP) returned from Senegal to be no higher than 105,000, of whom 18,000 are living in officially supported camps. The 2,710 DP formerly in Nouakchott camps were moved to river areas in Trarza, Brakna and Gorgol *wilayas*. This move could place these DP in a more vulnerable position due to continued instability along the river.

Other Vulnerable Populations - The non-DP populations along the Senegal River between Maghama in Gorgol Wilaya and the Atlantic Coast are still considered particularly vulnerable by OAR/M, and in many cases more vulnerable than the DP population in the same area (see Map 2). The Catholic Mission and CARITAS have indicated to FEWS/Mauritania that several of the villages on the river not directly affected by expulsions or the influx of DP are suffering a higher degree of food access-related stress than the DP in neighboring villages. This is due to

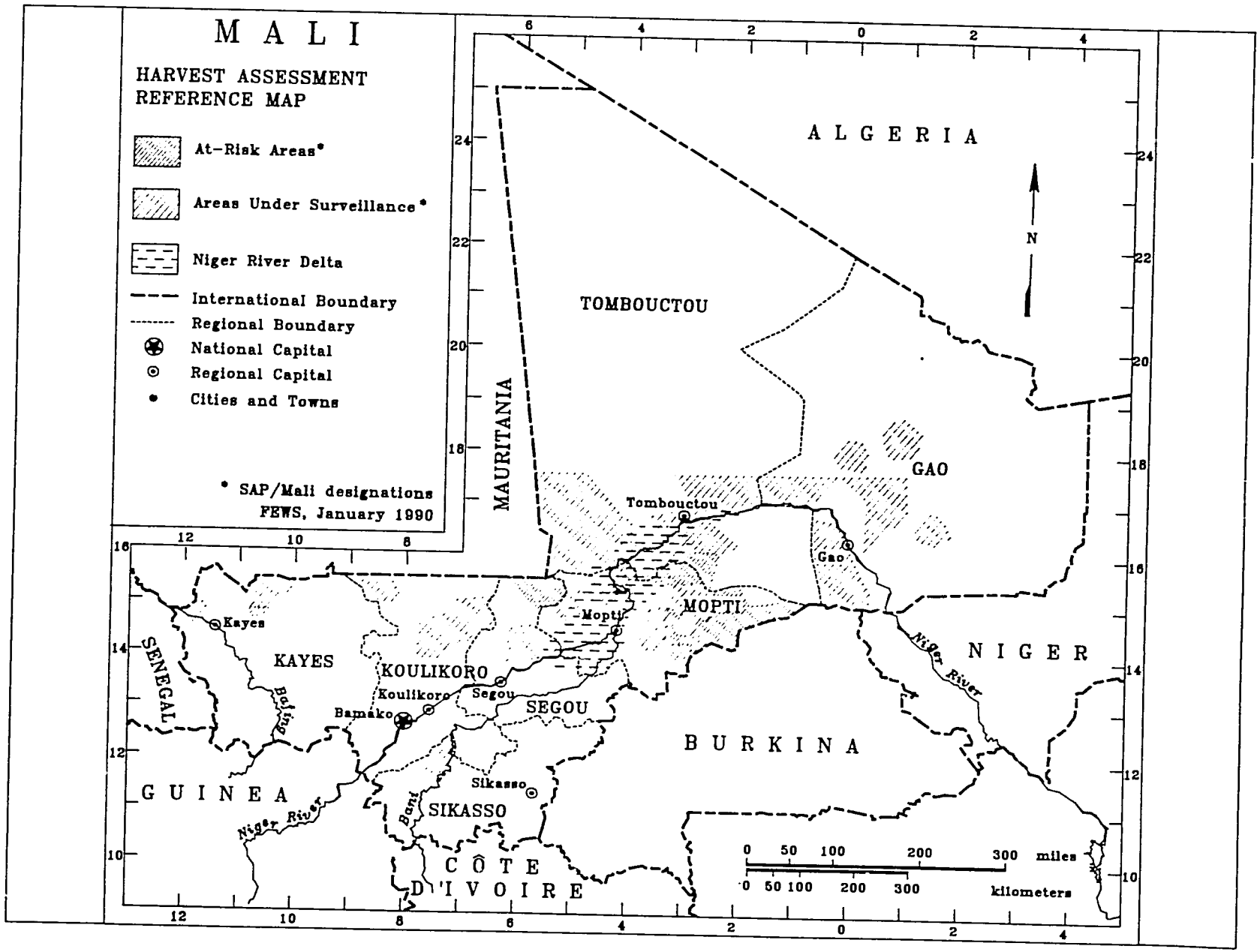
a variety of factors including: increasing prices of basic food items; civil strife, causing late planting and loss of traditional fields, especially river recessional crops (*walo*); loss of income earned in Senegal from work and/or trading; and loss of herds to cross border raiding, requisitioning and sending of herds to safer pastures. At this time, it appears that none of these groups have been targeted by the GIRM to receive food aid. OAR/M is attempting to obtain more accurate information and confirmation of the village names and numbers of people affected.

Small irrigated-rice farmers in the Senegal River valley are another vulnerable group. Under multi-donor-imposed conditions for structural adjustment loans, the CSA has been restricted in the volume of its rice purchases. Private traders would take up the slack under normal conditions. However, the closing of the Senegal border has blocked unofficial, cross-border trade, reducing the stimulus for private traders to enter the rice market. The contracted market for local rice, uncompetitive local production and marketing costs, and competitively priced Asian imports will likely force local, small-irrigated rice farmers to sell at a loss.

Causes of Risk or Vulnerability - The situation in the river valley remains unstable. Security concerns continue to be the most important factor affecting agricultural activities, particularly the cultivation of recessional lands along the Senegal River. A subsequent poor harvest is expected in the Program of Reinsertion of Repatriates (PPR) from irrigated perimeters.

Cereal prices continue to rise throughout the interior, particularly in the river area. Despite ongoing deliveries of donated and CSA cereals, USAID/Mauritania continues to receive reports of rising prices in this area. Price rises are expected to continue over the next few months, due to the anticipated reduction in agricultural production and other factors, including disrupted border trade with Senegal (which has traditionally been an important part of the unofficial economy).

Map 3


MALI
HARVEST ASSESSMENT
REFERENCE MAP
At-Risk Areas*
Areas Under Surveillance*
Niger River Delta
International Boundary
Regional Boundary
National Capital
Regional Capital
Cities and Towns
* SAP/Mali designations
FEWS, January 1990
ALGERIA
N
TOMBOUCTOU
MAURITANIA
GAO
Tombouctou
Gao
MOPTI
Mopti
NIGER
Niger River
KAYES
Kayes
SENEGAL
Bafing
KOULIKORO
Koulikoro
Bamako
Segou
SEGOU
BURKINA
GUINEA
Niger River
Bani
Sikasso
SIKASSO
CÔTE D'IVOIRE
0 50 100 200 300 miles
0 50 100 200 300 kilometers

Report prepared by FEWS/Mali and USAID/Mali and received in Washington on December 21, 1989

Mali

National Grain Surplus, Yet Local Pockets of Food Shortage in 1990

SUMMARY

Production estimates of the 1989/90 harvest approximate last year's record level. Mali again has a coarse grain surplus and a moderate rice deficit. Contrary to USAID/Mali's expectations, downward estimates in official production figures for Mopti Region have not been announced, leaving open the question of the actual food security status of certain populations in this region. The Système d'Alerte Précoce (SAP/Mali, the Malian early warning system) has identified arrondissements in Mopti Region where food needs cannot be met through available household resources. National security stocks in-country will cover food needs of at-risk populations. Outside emergency assistance is not anticipated. Given the high level of merchant and cooperative stocks that remain after last year's record harvest and the favorable results of the 1989/90 harvest, the Government of the Republic of Mali (GRM) has authorized grain exports and has once more waived the export tax on grain for the year.

FACTORS AFFECTING FOOD SECURITY

Harvest Outcome - The National Agricultural Service (DNA) and the National Statistics Service (DNSI) have maintained the production estimates that were announced in October. Total gross production is estimated at 2,164,474 metric tons (mt), with total net production estimated at 1,717,600 mt. These figures mirror 1988/89 production levels (1989/90 production is 99% of 1988/89 production) and show national production to be 32% higher than 1987/88 levels (see Table 3). Production statistics for 1987, 1988, and 1989 are provided by crop and region at the end of this chapter in Appendices A, B, and C.

A certain degree of skepticism exists concerning the 1989/90 production figures for Mopti Region and the estimated rice production figures. Previously, the Regional Agricultural Service estimated that 42% of total hectares planted in Mopti Region had been lost to the combined effects of grasshoppers, other insects, birds, flooding, and drought. It was anticipated that these losses would be taken into account at the national level and that the figures released in October would be adjusted downward. This has not taken place. An official from the National Agricultural Statistics Service stated that the losses in Mopti Region were important at the local level in certain areas, but when taken into account at the national level did not significantly reduce national production.

In order to gauge the importance of localized losses, USAID/Mali calculated the average contribution of each *cercle* (sub-region administrative unit) to regional production over the last four years. The average percent of regional production for *cercles* where large grasshopper losses were reported in 1989 are shown in Table 4. The total production for Mopti Region in the *cercles* where grasshoppers caused significant damage is estimated at 205,389 mt. Losses of 42% of Mopti Region production implies a loss of 86,267 mt of grain, which is not important at the national level (4% of total production), but could be a contributing factor to food shortages in Mopti, Douentza, Youvarou, Koro and Tenenkou *cercles*.

Due to low flood levels in the Niger Delta over the last two months (see Map 3 for location), agricultural authorities have been predicting that the rice harvest will suffer this year, yet the production figures that were released by the DNA and the DNSI show a 14% increase in rice production for Mali. Current GRM estimates show an 11,380 mt increase in gross rice production over 1988/89 levels in Mopti Region and a 20,869 mt increase in

Table 3: Mali, Comparison of Gross 1987/88, 1988/89, and 1989/90 Cereal Production[1]

Regions	1987/88 Production (mt)	1988/89 Production (mt)	Estimated 1989/90[2] Production (mt)	1989/90-1987/88 (%)	1989/90-1988/89 (%)
Kayes	207,187	183,417	239,225	115	130
Koulikoro	253,303	382,181	373,600	147	98
Sikasso	398,102	432,436	404,963	102	94
Segou	405,698	650,793	600,769	148	92
Mopti	319,681	428,250	420,931	132	98
Tombouctou	31,898	90,279	93,598	293	104
Gao	21,599	27,222	31,388	145	115
Total	1,637,468	2,194,578	2,164,474	132	99

Source: Joint DNA/DNSI Survey

[1] Gross and net disaggregated cereal production by region and grain for 1987, 1988 and 1989 are provided in Appendices A, B and C, respectively.

[2] 1989/90 figures are provisional estimates. Definitive production figures for 1989 will be made available in May 1990.

Table 4: Mali, Estimated Cercle-Level Production for Areas Suffering Heavy Grasshopper Damage (mt)

Region	Cercle	Usual % Regional Production	Estimated 1989/90 Production
Kayes	Nioro	19	48,229
	Yelimane	3	6,388
Koulikoro	Banamba	13	48,353
	Nara	10	38,980
Segou	Segou	38	167,330
	Macina	12	51,916
	Niono	5	21,122
Mopti	Mopti	12	49,618
	Douentza	5	21,600
	Koro	10	41,690
	Youvarou	3	14,052
	Tenenkou	20	78,429
Tombouctou	Niafunke	54	43,245
Total			630,952

Source: FEWS/Mali, using DNSI figures

Segou Region. Other informants, including SAP/Mali and the Suivi Alimentaire du Delta-Seno (SADS, a non-governmental organization early warning group for Mopti Region), contradict these predicted increases in rice production. Based on qualitative information reported by their field agents, they conclude that rice production in Mopti and Segou regions will be lower than last year's levels, not higher. SAP/Mali concurs with the GRM estimation that rice production will be higher than last year's levels in Gao and Tombouctou regions.

Food Deficit Estimates - Two consumption requirement figures are used in the calculation of projected food deficit or surplus. The USAID/Mali Mission uses a five-year status quo annual consumption figure of 185 kilograms (kg) per person per year, consisting of 155 kg of coarse grains and 30 kg of rice. The GRM uses an annual consumption figure of 167 kg per person per year, with 142 kg of coarse grains and 25 kg of rice. A recent national consumption study has been conducted and results will be available in 1990. With updated information, USAID/Mali and the GRM will likely use the same annual consumption figure. The general impression is that the GRM consumption figure will be increased to at least 185 kg per person per year.

All population figures in the following estimates were calculated from 1987 census data using region-specific adjusted growth rates (see Table 5). Regional growth rates were adjusted by multiplying the census growth rates by a factor of 1.415 in order to bring the national growth rate to 2.54%. This is the accepted national growth rate in Mali and is the figure used in Mission food balance sheet exercises.

Based on this year's production, consumption requirements of 185 kg per person, and assuming no carry-over stocks, Mali has a net national cereal surplus of 195,586 mt. Using the 167 kg per person consumption figure increases this surplus to 343,673 mt. When production figures are disaggregated into coarse grains and rice, Mali shows a coarse grain surplus of 274,675 mt (using 155 kg per person), or 381,627 mt (using 142 kg per person) and a rice deficit of 79,090 mt (using 30 kg per person) or 37,953 mt (using 25 kg per person). Regional disaggregation indicates that all regions except Gao and Tombouctou have met their consumption needs for coarse grain through local production (see Table 6). It is interesting to note that both Gao and Tombouctou appear to be self sufficient in rice production, along with Segou and Mopti (see Table 7). The percent of needs met by the combined local production of all cereals is presented in Appendix D.

These calculations indicate that Mopti is self sufficient in grain. Adjusting the Mopti figures for losses, as in the "Harvest Outcome" above, leaves regional net coarse grain production at 200,603 mt and Mopti Region self sufficient in grain (see Table 8). However, the majority of this year's production will come from Bankass and Djenne *cercles* and the southern half of Koro Cercle. The remaining *cercles* in Mopti Region will probably not meet their food needs through local production.

Food Stocks - Complete cereal stock information is given in Table 9. Information about on-farm stocks comes from the National Agriculture Service. The information is based on an on-farm survey that was conducted for the first time in 1989. In Table 9, on-farm stocks are presented separately because of questions regarding their accuracy.

Free food distributions based on 1988/89 SAP/Mali recommendations continued during November. Table 10 presents updated quantities of grain removed from Malian Food Security Stock Management Service (OPAM) *cercle*-level warehouses for these distributions. Grain remains to be distributed in Dire (48 mt), Gourma Rharous (170 mt), Almoustarat (385 mt), Temena (237 mt), Bamba (461 mt), Diamou (163 mt) and to the displaced populations of Segou (127 mt).

Market Data - *Cereal Prices:* The unexpected September to October rise in producer prices has been reversed. A possible cause of the price increases may have been the extensive press coverage of the grasshopper threat to production. Expectations of production shortfalls could have led farmers and merchants to hold back supply. Price falls between October and November in most markets monitored by the Système d'Information sur le Marché Céréalier (SIM) follow the pattern expected after a harvest (see Table 11). Declines in producer prices varied

Table 5: Mali, Projected 1990 Population

Region	Census Growth Rate (%)	Corrected Growth Rate	Corrected Population
Kayes	1.87	2.65	1,122,162
Koulikoro	2.28	3.23	1,314,876
Sikasso	1.70	2.41	1,429,337
Segou	1.98	2.80	1,459,589
Mopti	1.07	1.51	1,328,687
Tombouctou	-0.77	-0.39	448,424
Gao	0.33	0.47	392,467
Bamako	4.19	5.93	731,565
Total	1.70	2.54	8,227,107

Source: USAID/Mali, using the 1987 DNSI Census

Table 6: Mali, Coarse Grain Needs Met Through Local Production

Region	Net Coarse Grain Production (mt)	Coarse Grain Needs (GRM rate) (mt)	% Needs Met at GRM Rate	Coarse Grain Needs (USAID rate) (mt)	% Needs Met at USAID Rate	Per Capita Production (kg)
Kayes	201,570	159,347	126	173,935	116	180
Koulikoro	311,820	186,712	167	203,806	153	237
Sikasso	330,376	202,966	163	221,547	149	231
Segou	376,259	207,262	182	226,236	166	258
Mopti	273,930	188,674	145	205,946	133	206
Tombouctou	54,400	63,676	85	69,506	78	121
Gao	1,522	55,730	3	60,832	3	4
Bamako	0	103,882	0	113,393	0	0
Total	1,549,877	1,168,249	133	1,275,202	122	188
Surplus (mt):		381,627		274,675		

Source: FEWS/Mali, using DNA and DNSI production figures

Table 7: Mali, Rice Needs Met Through Local Production

Region	Net Rice Production (mt)	Rice Needs (GRM rate) (mt)	% Needs Met at GRM Rate	Rice Needs (USAID rate) (mt)	% Needs Met at USAID Rate	Per Capita Production (kg)
Kayes	0	28,054	0	33,665	0	0
Koulikoro	1,677	32,872	5	39,446	4	1
Sikasso	5,032	35,733	14	42,880	12	4
Segou	80,507	36,490	221	43,788	184	55
Mopti	50,317	33,217	151	39,861	126	38
Tombouctou	15,095	11,211	135	13,453	112	34
Gao	15,095	9,812	154	11,774	128	38
Bamako		18,289	0	21,947	0	0
Total	167,724	205,678	82	246,813	68	20
Deficit (mt):		-37,953		-79,089		

Source: FEWS/Mali, using DNA and DNSI production figures

Table 8: Mali, Needs-Met Estimates in Mopti Region, Revised for Losses

Region	Net Coarse Grain Production (mt)	Coarse Grain Needs (GRM rate) (mt)	% Needs Met at GRM Rate	Coarse Grain Needs (USAID rate) (mt)	% Needs Met at USAID Rate	Per Capita Production (kg)
Mopti	200,603	188,674	106	205,946	97	151

Source: FEWS/Mali, using DNA and DNSI production figures

Note: 86,267 gross loss equals 73,327 net loss. 273,930 - 73,327 = 200,603.

Table 9: Mali, End of Year Cereal Stocks (mt)

Organizations	Millet, Corn, Sorghum, and Wheat Stocks	Date	Paddy Rice Stocks	Date	Other Rice Stocks	Date
OPAM SNS	47,435	12-09	-	-	-	-
OPAM COM	4,646	12-09	-	-	-	-
OPAM (Private)	208	11-30	-	-	-	-
OPAM	-	-	-	-	15,074	12-09
CCIM (Private)	15,890	11-30	-	-	-	-
DNACOOP	13,788	09-30	-	-	-	-
CMDT	2,660	11-30	31	11-30	-	-
ODIPAC	500	09-30	-	-	-	-
WFP	2,733	09-30	-	-	-	-
NGO	2,590	09-30	-	-	-	-
ON	-	-	24,107	11-30	4,227	11-30
ORS	-	-	1,399	11-30	997	11-30
ORM	-	-	1,200	10-31	522	10-31
Private	-	-	-	-	4,000	11-30
Subtotals	90,450		26,737		20,820	
On-Farm Stocks	323,152	08-31	48,992	08-31	0	08-31
Totals	413,602		75,729		20,820	
GRAND TOTAL	510,151					

Source: USAID/Mali, using OPAM, CCIM, DNACOOP, CMDT, ODIPAC, WFP, NGO, ON, ORS, ORM and DNA figures

Table 10: Mali, Quantities of Grain Removed from OPAM Warehouses for Free Food Distributions

Cercle Warehouse	Stock Removed (mt)	Beneficiary Arrondissement
Mopti	7.0	Koro
	7.0	Mopti
Goundam	113.0	Gargando
	135.0	Raz el Ma
Gao	180.0	N'Tillit
Ansongo	270.0	Talataye
	10.5	Ansongo
Bourem	10.5	Bourem
Menaka	154.0	Tidarmene
	204.0	Inekar
Nioro	31.4	Touroungoumbe
Total	1,122.4	

Source: OPAM

Table 11: Mali, Recent Producer and Consumer Prices (FCFA per kg)

Producer Price Ranges

	Nov 89	Oct 89	Sep 89
Millet	25-62	28-72	23-75
Sorghum	25-63	30-56	23-53
Maize	17-41	20-47	27-45
Paddy Rice	50-110	52-101	47-103
BB Rice	107-178	101-150	102-148
RM40 Rice	139-180	138-180	136-180

Consumer Prices and Price Ranges

	Bamako			Outside Bamako		
	Nov 89	Oct 89	Sep 89	Nov 89	Oct 89	Sep 89
Millet	65	65	66	25-96	28-125	29-125
Sorghum	65	65	67	32-103	36-125	47-125
Maize	64	67	68	28-89	30-100	53-100
BB Rice	175	176	179	112-200	100-200	83-200
RM40 Rice	189	190	192	146-240	138-225	129-225

Source: SIM

between 1 and 35% for millet, sorghum, and corn, with the majority of markets experiencing price falls of between 10 and 20%. Producer prices for paddy rice fell in four out of six markets where paddy was available. A slight downward trend in the producer price for RM40 and BB rice varieties was also noted.

There were slight declines (between 2 and 10%) in consumer cereal prices in most markets. However, some markets did experience large fluctuations in consumer prices. In Djenne, the price of millet rose 43% between October and November. Kadiana and Koliendieba registered price rises of 13 and 18%, respectively. These same markets showed price rises for sorghum of between 15 and 28%. Consumer markets with exceptionally large declines in sorghum price include Kita (30%), San (20%) and Tombouctou (34%).

Security Stock Sales: As mentioned in earlier reports, OPAM has started selling approximately 10,000 mt of coarse grains from the National Security Stock (SNS) as part of its technical rotation program. In a sealed bid sale at the end of October, merchants offered prices for millet and sorghum that varied between 30 and 45 FCFA per kg. As of December 2, 1989, a total of 5,628 mt of grain had been removed from OPAM warehouses. Merchants will remove the remaining 3,447 mt of grain before the end of December, as stipulated in their OPAM contracts. The low prices OPAM received for the sale of SNS stocks (due to the continuing surplus of grain on the Malian national grain market) will not allow OPAM to self-finance the replacement of SNS grain. In 1989, the average price OPAM paid merchants to reconstitute security stocks was 52 FCFA/kg in first round bidding (10,125 mt) and between 53 and 73 FCFA/kg in second round bidding (19,125 mt). As previously reported, the donor group, Program for Restructuring the Cereal Markets (PRMC), has agreed to cover the difference.

OPAM purchases of approximately 13,500 mt of grain will begin after establishment of its grain provision plan at the end of December. Bids for 1989/90 harvested grain will be opened in Bamako for 4,000 mt, in Segou for 7,600 mt, and in Mopti for 1,000 mt. Transfers of SNS grain from Segou will allow the reconstitution of SNS stocks in Tombouctou (3,000 mt) and Gao (4,200 mt).

On November 8, 1989, OPAM announced the sale of 2,200 mt of food-aid rice in Kayes, Mopti and Gao regions. This sale is the first intervention by OPAM in the rice market since June 20, 1989, when OPAM sold 4,000 mt of rice. The Minister of Finance had asked OPAM to temporarily suspend sales of food aid rice until the Office du Niger, the major rice parastatal, sold off some of its rice. Office du Niger rice had to be sold at promotional prices in order to stimulate demand. The Office du Niger sold 9,000 mt of RM40 rice at 142,285 FCFA per mt and 2,300 mt of BB rice at 128,785 FCFA/mt. Prices received by OPAM for the food aid rice, sold under a sealed bid system, are presented in Table 12. OPAM also announced the sale of 350 mt of rice in Tombouctou, for which bids have not yet been opened. OPAM is preparing for an auction sale, tentatively scheduled for January 1990, of 3,600 mt of US rice that recently arrived in Mali as part of USAID/Mali's contribution to the PRMC.

Table 12 : Mali, Prices Received by OPAM for Food Aid Rice

Location	Quantity	Type	Source	Price
Kayes	400 mt	RM40 Rice	WFP	162
Mopti	800 mt	RM40 Rice	USA	135
Gao	500 mt	RM40 Rice	WFP	160
Gao	500 mt	RM40 Rice	USA	135

Source: OPAM

Grain Exports: In an effort to address the problem of surplus grain in a saturated national market, the GRM has announced the elimination of the 8% export tax on grain. The PRMC, for its part, has put into place a special export incentive for merchants who participated in PRMC credit/storage programs but have not sold their stocks in the present saturated market. Those merchants who export grain and fully reimburse their PRMC loans will be credited 7,500 FCFA/mt for each metric ton of grain exported. Reimbursement is contingent on the merchant providing proof of export. Recent application of a high import tax on commercial rice imports could result in traders stockpiling cheap local rice in anticipation of a potential rice shortage. This development is being monitored closely by the Mission.

Other Resources - Farm incomes in the cotton producing areas, Sikasso and Koulikoro regions, should be bolstered by the very

good cotton harvest. In the Delta area of Mali (Segou and Mopti regions), the fishing season will be less than average. Pasture conditions are good throughout Mali, ensuring the food security of pastoralists and agropastoralists.

An experimental money-for-work program might be implemented this year in remote, isolated areas in northern Mali. Research by USAID/Mali and other organizations has shown that market development by the private sector might be stimulated in these areas if potential consumers had increased access to capital.

Food Aid Requirements - The GRM has specifically requested that all donor aid to the cereals sector in 1990 be in the form of financial aid, rather than food aid, due to the large domestic surplus. The GRM has asked that in-kind program aid be eliminated where possible. Project aid continues (primarily Food-for-Work and infant feeding), with all donors exploring ways to make their contributions with locally purchased grain where possible. Japan (which is not a member of the multi-donor group) is the only donor at present that has food in the pipeline (2,000 mt of rice). The World Food Program (WFP) has estimated that it needs approximately 8,000 mt of grain for its Food-for-Work program in 1990. WFP is exploring the possibility of purchasing this grain on the local market.

Emergency food aid from donors is not anticipated in 1990. Although SAP/Mali has a preliminary list of at-risk and under-surveillance arrondissements, they have not quantified needs for these populations. In informal discussions, SAP/Mali has advised OPAM that 6,000 mt of grain should suffice for free food distributions in 1990.

Non-Food Needs - Funding mechanisms are being explored to guarantee distribution and transport of free food to target populations. This should eliminate the problems faced in 1989 when negotiations for the transport of SAP/Mali-recommended free food distributions held up actual distributions by several months.

POPULATIONS VULNERABLE TO OR AT-RISK OF FOOD EMERGENCIES

Numbers and Locations of Vulnerable and At-Risk Populations The November SAP Bulletin identified "at-risk" and "vulnerable" populations in various *cercles* (summarized in Map 3 and listed in Appendix E). The Mopti Region arrondissements classified as at-risk by SAP/Mali are the only areas where food needs cannot be met through available household resources. In February, SAP/Mali will reevaluate the status of vulnerable populations, either moving them to its at-risk category or classifying them as not at risk of facing a food crisis before the next harvest. With the reevaluation, SAP/Mali will quantify food needs of all at-risk arrondissements and make recommendations for free food distributions.

Causes of Risk or Vulnerability - Grasshoppers damaged crops, with resultant harvest losses, in almost all of the SAP/Mali-designated at-risk or vulnerable arrondissements. In some cases, pockets of drought prevented crops from completing their development cycle. Drought effects were apparent in Boni, Mondoro and Hombori arrondissements in Douentza Cercle and all arrondissements in Youvarou and Tenenkou *cercles*. Low flood levels in Mopti and Segou regions contributed to decreased rice production.

Evidence of Populations Coping with Food-Access Related Stress - *Cereal Prices:* As noted above, prices fell between October and November in most markets covered by the SIM. However, market prices rose between October and November in the following SAP/Mali-monitored *cercles*:

- *Kayes Region:* Diema, Kayes, Nioro
- *Koulikoro Region:* Kolokani, Nara
- *Segou Region:* Niono
- *Mopti Region:* Bankass, Djenne, Tenenkou Youvarou
- *Gao Region:* Ansongo

Prices in almost all markets in Mopti Region are higher than at the same time last year. Contrary to the 1987 scenario, however, GRM officials do not anticipate that prices in the region will skyrocket. Merchants should be able to keep deficit markets supplied with abundant supplies from other areas, thereby mitigating price rises.

Migrations: In many rural areas, out-migration is a common phenomenon and not necessarily a sign of food access related stress. When out-migrations are unusually large, however, they do reflect food insecurity. SAP/Mali has reported unusually large out-migrations in the following areas:

- *Koulikoro Region:* Guire
- *Segou Region:* Macina, Nampala, Niono, Pogo, Sokolo
- *Mopti Region:* Bandiagara, Douentza, Koro, Youvarou
- *Tombouctou Region:* Gourma, Gourma Rharous, Niafunke

SAP/Mali also reports the continued arrival of Mauritanians in Aourou Cercle (in Kayes Region).

APPENDICES TO MALI CHAPTER

The gross and net production figures for three consecutive seasons in Mali are provided in Appendices A, B and C for comparison purposes. Net figures are net of losses due to seed, stock and waste. The following grain-specific coefficients were used to calculate net from gross production: millet and sorghum (0.85), corn (0.80), paddy rice (0.51) and *fonio* (0.90). Appendix D presents the percent of food needs met by the 1989/90 harvest under GRM and USAID/Mali assumptions. Appendix E lists the arrondissements that SAP/Mali considers vulnerable or at-risk.

APPENDIX A: Definitive Gross and Net Production Estimates for 1987/88

Table A1: Mali, Definitive Gross 1987/88 Production by Region and Crop (mt)

Region\Crop	Millet	Sorghum	Corn	Rice	Fonio	Total
Kayes	32,791	132,130	39,442	1,074	1,750	207,187
Koulikoro	110,897	110,637	26,193	5,574	0	253,303
Sikasso	101,881	170,874	101,117	19,153	5,378	398,102
Segou	200,751	64,058	11,307	121,121	8,420	405,698
Mopti	235,922	18,815	548	64,395	0	319,681
Tombouctou	11,586	1,823	0	18,488	0	31,898
Gao	0	14,836	0	6,763	0	21,599
Total	693,828	513,176	178,607	236,568	15,548	1,637,468

Source: DNSI

Table A2: Mali, Definitive Net 1987/88 Production by Region and Crop (mt)

Region\Crop	Millet	Sorghum	Corn	Rice	Fonio	Total
Kayes	27,872	112,311	31,554	548	1,575	173,859
Koulikoro	94,262	94,041	20,954	2,843	0	212,101
Sikasso	86,599	145,243	80,894	9,768	4,840	327,344
Segou	170,638	54,449	9,046	61,772	7,578	303,483
Mopti	200,534	15,993	438	32,841	0	249,806
Tombouctou	9,848	1,550	0	9,429	0	20,827
Gao	0	12,611	0	3,449	0	16,060
Total	589,754	436,200	142,886	120,650	13,993	1,303,480

Source: DNSI

APPENDIX B: Definitive Gross and Net Production Estimates for 1988/89

Table B1: Mali, Definitive Gross 1988/89 Production by Region and Crop (mt)

Region\Crop	Millet	Sorghum	Corn	Rice	Fonio	Total
Kayes	11,333	131,562	36,867	0	3,655	183,417
Koulikoro	163,017	172,015	42,958	2,080	2,111	382,181
Sikasso	155,827	150,514	112,574	10,064	3,457	432,436
Segou	323,435	157,590	21,818	136,989	10,961	650,793
Mopti	315,611	25,358	0	87,281	0	428,250
Tombouctou	30,610	33,851	0	25,818	0	90,279
Gao	73	1,539	0	25,610	0	27,222
Total	999,906	672,429	214,217	287,842	20,184	2,194,578

Source: DNSI

Table B2: Mali, Definitive Net 1988/89 Production by Region and Crop (mt)

Regions	Millet	Sorghum	Corn	Rice	Fonio	Total
Kayes	9,633	111,828	29,494	0	3,290	154,245
Koulikoro	138,564	146,213	34,366	1,061	1,900	322,104
Sikasso	132,453	127,937	90,059	5,133	3,111	358,693
Segou	274,920	133,952	17,454	69,864	9,865	506,055
Mopti	268,269	21,554	0	44,513	0	334,336
Tombouctou	26,019	28,773	0	13,167	0	67,959
Gao	62	1,308	0	13,061	0	14,431
Total	849,920	571,565	171,375	146,799	18,166	1,757,823

Source: DNSI

APPENDIX C: Provisional Gross and Net Production Estimates for 1989/90

Table C1: Mali, Provisional Gross 1989/90 Production by Region and Crop (mt)

Regions	Millet	Sorghum	Corn	Rice	Fonio	Total
Kayes	17,570	178,920	39,080	0	3,655	239,225
Koulikoro	185,840	121,360	61,000	3,289	2,111	373,600
Sikasso	69,850	209,210	112,580	9,866	3,457	404,963
Segou	255,510	161,180	15,260	157,858	10,961	600,769
Mopti	312,980	9,290	0	98,661	0	420,931
Tombouctou	30,000	34,000	0	29,598	0	93,598
Gao	80	1,710	0	29,598	0	31,388
Total	871,830	715,670	227,920	328,870	20,184	2,164,474

Source: DNSI

Table C2: Mali, Provisional Net 1989/90 Production by Region and Crop (mt)

Regions	Millet	Sorghum	Corn	Rice	Fonio	Total
Kayes	14,935	152,082	31,264	0	3,290	201,571
Koulikoro	157,964	103,156	48,800	1,677	1,900	313,497
Sikasso	59,373	177,829	90,064	5,032	3,111	335,409
Segou	217,184	137,003	12,208	80,507	9,865	456,767
Mopti	266,033	7,897	0	50,317	0	324,247
Tombouctou	25,500	28,900	0	15,095	0	69,495
Gao	68	1,454	0	15,095	0	16,617
Total	741,057	608,321	182,336	167,725	18,166	1,717,603

Source: DNSI

APPENDIX D

Table D1: Mali, 1989/90 Cereal Needs Met through Local Production

Region	Net Production (mt)	Cereal Needs (GRM rate) (mt)	% Needs Met at GRM Rate	Cereal Needs (USAID rate) (mt)	% Needs Met at USAID Rate	Per Capita Production (kg)
Kayes	201,570	187,401	108	207,600	97	180
Koulikoro	313,497	219,584	143	243,252	129	238
Sikasso	335,408	238,699	141	264,427	127	235
Segou	456,767	243,751	187	270,024	169	313
Mopti	324,247	221,891	146	245,807	132	244
Tombouctou	69,495	74,887	93	82,958	84	155
Gao	16,617	65,542	25	72,606	23	42
Bamako	0	122,171	0	135,340	0	0
Total	1,717,600	1,373,927	125	1,522,015	113	209
Surplus:	343,673	195,586				

Source: FEWS/Mali, using DNSI figures

Note: All cereals needs were calculated by adding rice and coarse grain needs and not by multiplying population figures in each region by 167 or 185 kg per person per year.

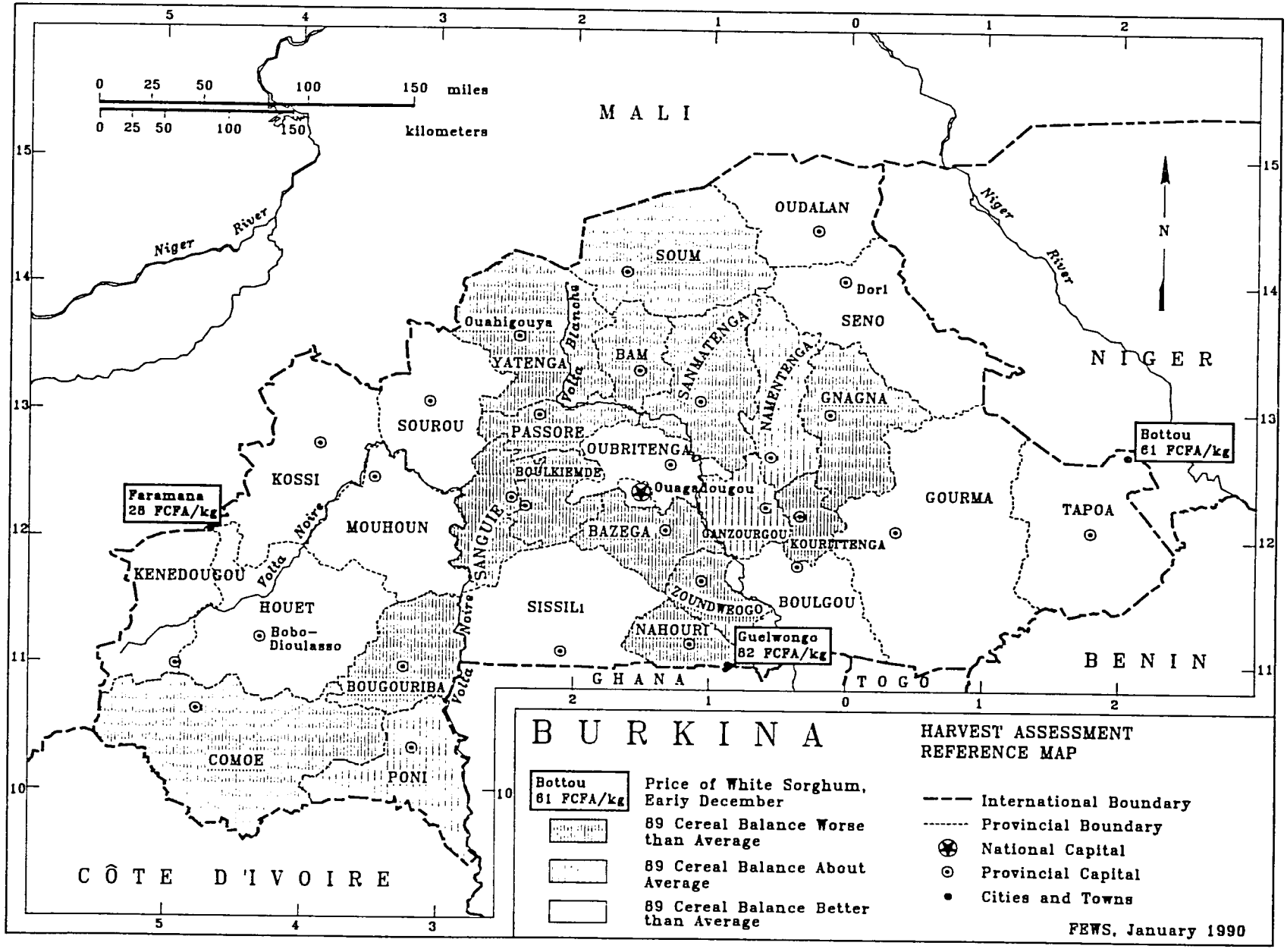
APPENDIX E

Table E1: Mali, SAP/Mali-Designated At-Risk and Vulnerable Arrondissements

Region	Cercle	At-Risk Arrondissement	Vulnerable Arrondissement
Koulikoro	Banamba	-	Boron
		-	Sebete
	Nara	-	Guire
		-	Mourdiah
Segou	Macina	-	Monimpebougou
	Niono	-	Niono Central
		Nampala	-
		-	Pogo
		-	Sokolo
Mopti	Bandiagara	Ningari	-
		-	Bandiagara
		-	Dourou
		-	Goundaka
		-	Kanigougouna
		-	Kendie
		-	Sangha
	Douentza	Boni	-
		Mondoro	-
		N'Gouma	-
		-	Bore
		-	Douentza Central
	Koro	Diankabou	-
		Dinangourou	-
		Dioungani	-
		Madougou	-
	Tenenkou	-	Dioura
	Youvarou	Sah	-
		-	Youvarou
		-	Ambiri
		-	Dogo
		-	Gathiloumo
		-	Guidiosare
Tombouctou	Tombouctou	-	Ber
		-	Bourem Inaly
		-	Tin Aguelhaj
	Goundam	-	Douekire
		-	Gargando
		-	Raz el Ma
		-	Tilemsi
	Gourma Rharous	Bambara Maounde	-
		-	Horibomo
	Niafunke	-	Niafunke
		-	Banikane
		-	Koumaira
		-	Lere
		-	N'Goukou
		-	Sarafere
		-	Soumpi
Gao	Gao	-	Djebock
		-	N'Tillit
	Ansongo	-	Talataye
		-	Tessit
	Bourem	-	Almoustarat
		-	Bamba
		-	Temera
	Menaka	-	Tidarmene
		-	Inekar

Source: SAP/Mali November Bulletin

Map 4


0 25 50 100 150 miles
0 25 50 100 150 kilometers
MALI
NIGER
BENIN
TOGO
GHANA
CÔTE D'IVOIRE
Niger River
Volta Noire
Volta Blanche
N
OUDALAN
SOUM
Dori
SENO
GNAGNA
GOURMA
TAPOA
Ouahigouya
YATENGA
BAM
SANMATENGA
NAMENTENGA
SOUROU
PASSORE
OUBRITENGA
BOULKIEMDE
Ouagadougou
BAZEGA
ZANZOURGOU
KOURITTENGA
SANGUIE
KOSSI
MOUHOUN
KENEDOUGOU
HOUET
Bobo-Dioulasso
SISSILI
ZOUNDWEOGO
BOULGOU
NAHOURI
BOUGOURIBA
COMOE
PONI
Faramana 28 FCFA/kg
Bottou 61 FCFA/kg
Guelwongo 82 FCFA/kg
BURKINA
HARVEST ASSESSMENT REFERENCE MAP
Bottou 61 FCFA/kg
Price of White Sorghum, Early December
89 Cereal Balance Worse than Average
89 Cereal Balance About Average
89 Cereal Balance Better than Average
International Boundary
Provincial Boundary
National Capital
Provincial Capital
Cities and Towns
FEWS, January 1990

Report prepared by FEWS/Burkina and USAID/Burkina and received in Washington on December 19, 1989

Burkina

Production, Imports, and Stocks Cover National Needs

SUMMARY

National cereal production figures from the Ministry of Agriculture (MOA) show a total cereal production of 1,952,000 metric tons (mt). This figure is 10% higher than the 1985-1988 average and 9% lower than the record of last year. The 1989/90 production results in a deficit of 52,000 mt for 1990 with respect to projected consumption needs. This is considerably better than the 1985-1988 average annual cereal deficit of 108,000 mt, but worse that the record 118,000 mt surplus of last year. At the national level, Burkina has a cereal surplus in 1989/90 once production, stocks and imports are considered (see Table 13).

Disaggregation of the national-level data indicates production shortfalls on the Central Plateau and in the chronically deficit Sahel provinces of Soum and Oudalan (see Table 14). The worst deficits since 1984 occurred in the southern provinces of Bazega, Zoundweogo and Nahouri, but local grain trade and on-farm stocks will be adequate to cover the deficits in these provinces. Additional information will be required to determine the nature of the situation in Seno Province. The Government of Burkina (GOB) has not yet announced any plans for intervening in these areas.

FACTORS AFFECTING FOOD SECURITY

Harvest Outcome - Gross cereal production during the 1989 growing season was 1,951,671 mt, as compared to 2,091,302 mt for the excellent year of 1988 and 1,750,679 mt for the 1985-1988 average. The cereals counted include sorghum, millet, maize, rice, and *fonio*. The cereal balance shown in Table 13 uses net cereal production. Net production reflects losses during harvest and preparation and seed reserves. It is 85% of gross production for all cereals except rice, which is 55% of gross.

Projected cereal production deficits and surpluses, disaggregated by province, are presented in Table 14. Population figures were provided by the MOA and are exponential extrapolations from the 1985 census, using provincial growth rates derived from a comparison with the 1975 census. The cereal needs for Burkina are set at 190 kilograms (kg) per person per year.

The USAID/Burkina Mission is concerned that the high levels of production reported by MOA in Seno Province are not in line with other reports of widespread crop failure (caused by a major grasshopper infestation and an early end of the rains). Seno showed a 23,000 mt deficit in the provisional figures and now shows a 9,000 mt surplus. Système d'Alerte Précoce-Sahel (SAP/Burkina, an early warning system funded by OXFAM and Save the Children Fund/United Kingdom) estimates deficits for Seno Province of 25,000 mt rather than the surplus reported by the MOA. The Mission feels SAP/Burkina is more accurate in its projected deficit. In the South, Comoe Province has had its worst year since 1984, but still has a surplus of 11,000 mt. The far eastern and far western provinces have cereal balances that are above average (see Map 4). The Central Plateau provinces, excluding Oubritenga, have below average to average cereal balances.

Food Stocks - This year, for the first time, the MOA has included an estimate of on-farm stocks. The estimates, available only by region, totalled 196,591 mt as of October 31. Stocks are very low

Table 13: Burkina, Summary 1989/90 Cereal Balance

Per Capita Annual Requirement			190	kg
Projected Population for April 30, 1990			8,939,132	
Total Consumption Requirement			1,698,435	mt
Net 1989/90 Cereal Production			1,646,369	mt
Stocks				
Stabilization OFNACER	24,127	mt		
Security OFNACER	35,053	mt		
Planned Food Aid Imports	25,000	mt		
Planned Commercial Imports	117,500	mt		
On-Farm Stocks	196,591	mt		
Commercial Stocks	(unknown)			
Donor Stocks	(unknown)			
Total Known Stocks			398,271	mt
Cereal Exports			0	
Total Known Available Cereal			**2,044,640**	**mt**
Total Consumption Req't (above)			1,698,435	mt
Cereal Balance			346,205	mt

Sources: MOA; National Institute for Statistics and Demography (INSD); OFNACER; WFP

in the Sahel region. Most of the on-farm stocks are in the southern parts of the country.

Market Data - Cereal prices continue to show very little change. The Office National des Céréales (OFNACER) reports that mid-October white sorghum prices from 15 locations in Burkina averaged 58 FCFA per kg, with a range of 30 to 93 FCFA/kg. In early December they averaged 60 FCFA/kg. At Faramana, on the Burkina-Mali border due west of Ouagadougou, white sorghum was 28 FCFA/kg in late October (see Map 4). At Bottou, on the Niger border, it was 61 FCFA/kg. At Guelwongo, on the Ghana border, it was 82 FCFA/kg. The price which OFNACER will pay producers for millet, sorghum and maize during the upcoming buying campaign has been fixed at 50 FCFA per kilogram.

Food Aid Requirements - Even if the MOA has over-estimated cereal production, it is clear that there is a sufficient cereal supply on the national level. However, the serious and widespread crop failures in the Sahel may necessitate some form of intervention, because signs of economic stress are appearing and market forces are not strong enough to supply the Sahel region.

POPULATIONS VULNERABLE TO OR AT RISK OF FOOD EMERGENCIES

Anecdotal information suggests that out-migration from the Sahel is occurring at a higher rate than in the last several years. In addition, more Malians than usual are coming into northern Burkina, indicating that there are areas of personal hardship in Mali. There are, as yet, no reports of food access related stress.

The following anecdotal information was obtained from the SAP/Burkina coordinator in Dori:

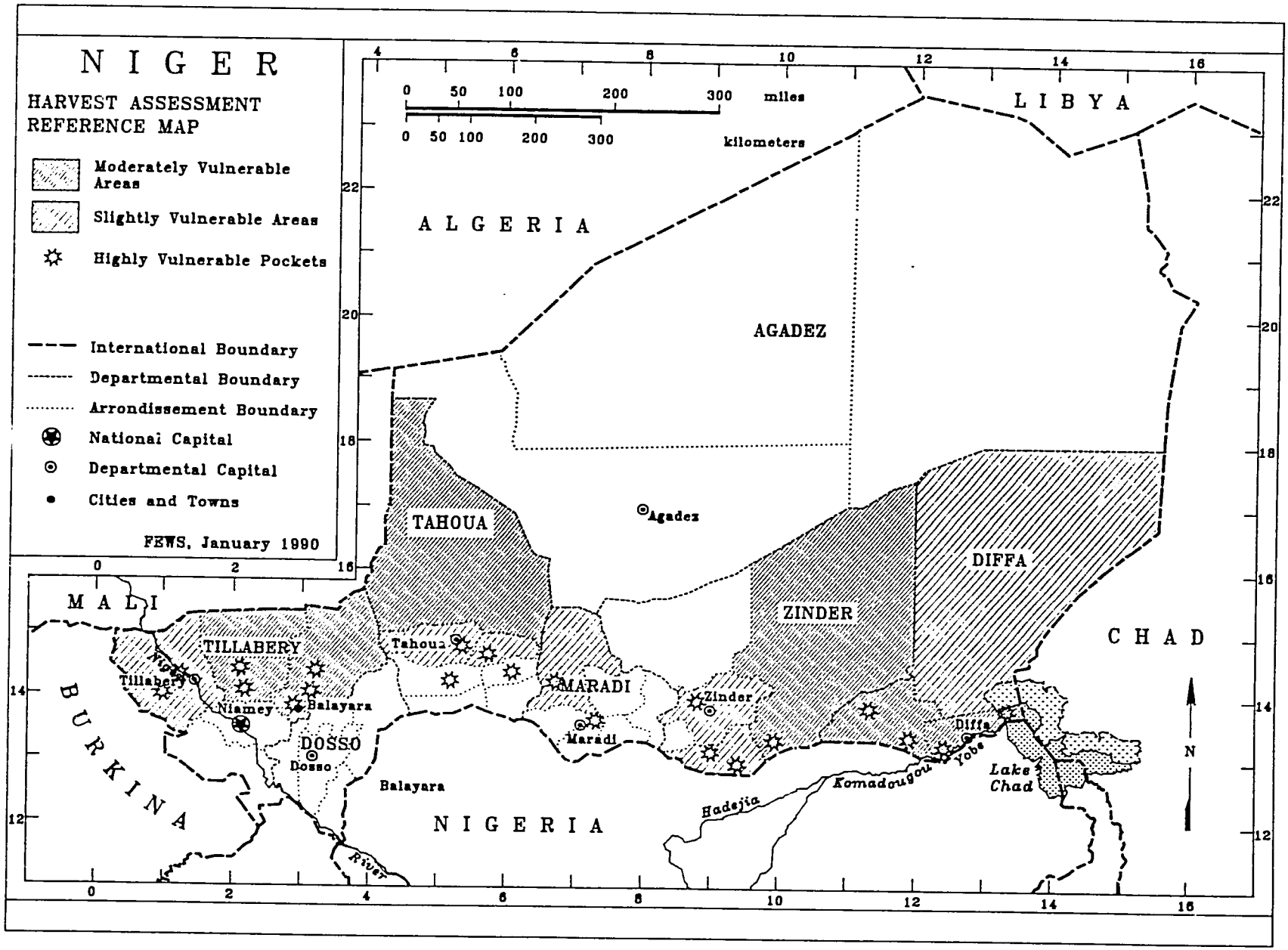
- *In the provincial capitals of Burkina's Sahel,* the demand for identification (ID) cards is higher than last year at the same time. People get ID cards when they expect to be leaving the country.
- *At Dori,* OFNACER reports a high level of grain sales to Malians. Malians have sold cattle for 45,000-50,000 FCFA per head, 25,000 FCFA less than the price at which Burkinabe herders are willing to sell. The price difference reflects the very poor growing conditions in northern Mali.
- *Also at Dori,* there are no producer-sellers of grain in the market. Commercial traders are selling grain at 7,500 FCFA per 100 kg sack, the same as the official OFNACER price.

Table 14: Burkina, Cereal Balance by Province for 1989 and 1985-1988 Average (mt)

Province	April 1990 Population	Net 1989 Production	Surplus or deficit 1989	Surplus or deficit 1985-88 Avg
Bam	171,192	24,210	-8,317	-4,602
Bazega	341,106	32,882	-31,928	9,201
Bougouriba	248,952	48,493	1,192	11,375
Boulgou	451,420	103,330	17,560	6,305
Boulkiemde	387,885	57,991	-15,707	-5,738
Comoe	286,494	65,716	11,282	17,771
Ganzourgou	217,730	50,842	9,474	7,983
Gnagna	262,638	47,530	-2,371	3,482
Gourma	337,231	87,093	23,019	13,364
Houet	689,398	166,533	35,547	-19,551
Kadiogo	611,374	25,768	-90,393	-94,663
Kenedougou	157,088	47,100	17,253	9,339
Kossi	376,834	121,204	49,605	20,577
Kouritenga	220,884	31,011	-10,957	-8,217
Mouhoun	326,782	82,908	20,819	9,228
Nahouri	117,912	5,422	-16,981	-3,058
Namentenga	211,231	33,940	-6,194	-7,179
Oubritenga	323,144	69,212	7,815	-5,005
Oudalan	119,682	14,549	-8,190	-11,243
Passore	231,687	35,051	-8,970	9,331
Poni	254,391	47,959	-376	-333
Sanguie	230,759	44,595	751	3,015
Sanmatenga	397,255	57,605	-17,873	-7,240
Seno	257,980	58,100	9,084	-11,422
Sissili	285,450	78,703	24,467	-5,498
Soum	210,540	20,445	-19,558	-14,063
Sourou	303,437	58,308	655	-1,675
Tapoa	182,073	40,677	6,083	2,467
Yatenga	555,414	66,353	-39,176	-33,300
Zoundweogo	171,169	22,839	-9,683	1,743
Total	8,939,132	1,646,368	-52,067	-107,607

Source: MOA

Map 5


NIGER
HARVEST ASSESSMENT
REFERENCE MAP
Moderately Vulnerable Areas
Slightly Vulnerable Areas
Highly Vulnerable Pockets
International Boundary
Departmental Boundary
Arrondissement Boundary
National Capital
Departmental Capital
Cities and Towns
FEWS, January 1990
0 50 100 200 300 miles
0 50 100 200 300 kilometers
LIBYA
ALGERIA
AGADEZ
Agadez
TAHOUA
Tahoua
DIFFA
Diffa
ZINDER
Zinder
MARADI
Maradi
CHAD
MALI
TILLABERY
Tillabery
Niamey
Balayara
DOSSO
Dosso
BURKINA
NIGERIA
Niger River
Balayara
Hadejia
Komadougou Yobe
Lake Chad
N

Report prepared by FEWS/Niger and USAID/Niger and received in Washington on December 29, 1989

Niger

Government of Niger Appeals for Aid in Meeting Localized Food Shortages

SUMMARY

Despite average production at the national level, several areas of Niger will begin experiencing serious food access problems by April brought on by a poor 1989 harvest and weakened purchasing power (see Map 5). While overall food supplies available in Niger are adequate to meet foreseen need, the degree to which market mechanisms and/or Government of Niger (GON) relief efforts can adequately respond to localized cases of food insecurity is uncertain.

FACTORS AFFECTING FOOD SECURITY

Harvest Outcome - The net national 1989/90 rainfed cereal production of 1,492,269 metric tons (mt) is approximately 25% below the previous year's surplus production, but 10% above the 1980 to 1989 average. Rainfed cereal production includes millet, sorghum, corn, rice, *fonio* and wheat. The following paragraphs and Table 15 describe the national information, disaggregated by department and arrondissement.

- *Diffa Department:* Aggregate production is 69% below last year and 47% below average. Although a structurally deficit department, Diffa production did not fall to 1984/85 levels. Diffa Arrondissement shows the lowest production, while N'-Guigmi shows an increase over both last year and the average.
- *Dosso Department:* Overall production is 9% below last year but 12% above average. Gaya Arrondissement shows an increase over both last year and the average. All arrondissements register a surplus with regard to consumption needs.
- *Maradi Department:* Department-wide production is 21% below last year but 29% above average. However, Dakoro Arrondissement registers below average production with a greater than 20% deficit.
- *Tahoua Department:* Aggregate production is 21% below last year but 15% above average. Structurally-deficit Tchin Tabaraden Arrondissement registers its lowest production of the decade, while Bouza registers its highest. Keita and Tahoua arrondissements show moderate production deficits.
- *Tillabery Department:* Department-wide cereal production is one-third less than last year, about 15% below average but 15% above the famine year of 1984/85. Filingue, Tillabery, and Kollo arrondissements show the greatest 1989/90 reductions in production. Filingue, Ouallam, Tillabery, and Tera arrondissements show the largest gaps between production and consumption needs.
- *Zinder Department:* Overall production is 33% below last year but 10% above average. At the arrondissement level, however, production has fallen below average. Deficits have been registered in Mirriah, Magaria, and Gouré arrondissements. Production in Magaria fell below 1984/85 levels.

Food Deficit Estimates - Cereal balance figures under four scenarios differ in two ways from earlier reported provisional figures (described below and presented in Table 16). First, gross rainfed production figures are slightly higher in all scenarios by 500 mt as a result of modified GON figures. Second, available stocks in the USAID/Niger estimate and in Scenarios 2 and 4 are slightly lower (by 3,867 mt) due to reestimation of commercial stocks.

The USAID/Niger commercial stock figure was calculated as half of the difference between last year's cereals surplus and this year's gross on-farm stocks. The other half of the difference is assumed to have moved across the border. The figure for gross on-farm stocks was calculated from the GON on-farm stocks survey of September 1989.

The USAID/Niger population figure departs slightly from the GON figure because of the use of different extrapolation methods. USAID/Niger applies arrondissement-specific growth rates, while the GON applies a uniform national growth rate to each arrondissement. The arrondissement-specific rates vary considerably from the national growth rate and account for the differing total population figures. The USAID/Niger Mission and FEWS adhere to arrondissement-specific growth rates in order to better ascertain disaggregated food needs. Under the aforementioned changes, USAID/Niger estimates a cereal surplus of 230,121 mt. The GON balance remains at a 91,399 mt deficit.

Four scenarios are posited to reflect the effect of differing figures for commercial stocks, on-farm stocks and consumption needs:

Scenario 1 accepts GON figures for available stocks but uses the lower, USAID/Niger per capita consumption requirement. The lower consumption requirement changes the GON estimate from a 91,000 mt deficit to a 163,000 mt surplus. The Mission will continue to use the lower consumption rate until evidence demonstrates a higher rate. The GON, with Comité Permanent Inter-Etat de Lutte Contre la Sécheresse dans le Sahel (CILSS)

Table 15: Niger, Net 1989/90 Rainy Season Cereals Production

Department Arrondissement	1990 Population	Production (mt)	Consumption Requirement	Balance (mt)	% Needs Met
Agadez	227,567	8,077	43,238	-35,161	19
Agadez Commune	59,027	184	11,215	-11,031	2
Tchirozérine	77,214	6,123	14,671	-8,548	42
Arlit	82,196	1,603	15,617	-14,014	10
Bilma	9,130	167	1,735	-1,568	10
Diffa	195,182	9,764	39,325	-29,561	25
Diffa Commune	17,074	131	3,244	-3,113	4
Diffa	64,421	1,686	13,322	-11,636	13
N'Guigmi	29,506	5,388	5,889	-501	91
Mainé Soroa	84,181	2,559	16,870	-14,311	15
Dosso	1,098,247	257,054	228,887	28,167	112
Dosso Commune	32,524	0	6,179	-6,179	0
Dosso	233,974	62,200	48,954	13,246	127
Boboye	220,488	48,177	46,303	1,874	104
Loga	94,513	20,988	19,781	1,207	106
Dogondoutchi	340,706	75,802	71,035	4,767	107
Gaya	176,042	49,887	36,635	13,252	136
Maradi	1,494,860	379,073	308,118	70,955	123
Maradi Commune	133,837	0	25,429	-25,429	0
Madarounfa	205,135	57,236	42,635	14,601	134
Guidan Roumji	228,197	86,659	47,867	38,792	181
Dakoro	276,097	45,036	56,986	-11,950	79
Mayayi	239,589	67,675	50,124	17,551	135
Aguié	183,695	42,348	37,842	4,506	112
Tahoua	1,376,996	267,819	281,342	-13,523	95
Tahoua Commune	56,535	0	10,742	-10,742	0
Tahoua	200,930	35,665	41,761	-6,096	85
Illéla	184,083	38,890	38,246	644	102
Keita	164,694	28,254	34,510	-6,256	82
Bouza	187,118	49,245	39,295	9,950	125
Madaoua	232,672	49,946	47,060	2,886	106
Konni	271,309	62,518	54,593	7,925	115
Tchin Tabaraden	79,655	3,301	15,135	-11,834	22
Tillabery	1,861,249	254,946	379,268	-124,322	67
Niamey Commune	435,705	11,197	82,784	-71,587	14
Kollo	261,062	49,504	54,092	-4,588	92
Say	180,630	46,033	37,932	8,101	121
Tera	313,130	55,529	64,218	-8,689	86
Tillabery	164,109	27,899	34,256	-6,357	81
Ouallam	201,050	26,070	42,092	-16,022	62
Filingue	305,563	38,714	63,894	-25,180	61
Zinder	1,503,636	318,536	306,983	11,553	104
Zinder Commune	137,977	2,880	26,670	-23,790	11
Mirriah	448,893	78,125	93,225	-15,100	84
Magaria	371,419	54,993	75,363	-20,370	73
Matameye	176,190	52,107	36,467	15,640	143
Tanout	200,794	116,581	40,603	75,978	287
Gouré	168,363	13,850	34,655	-20,805	40
Overall	7,757,737	1,495,269	1,587,161	-91,892	94

Sources: GON 1988 Census; FEWS/Niger population extrapolation; MOA/Agricultural Statistics Division production data; USAID/Niger consumption requirement (190 kg/person/year for nomads; 220 kg/person/year for farmers)

funding, will undertake a nationwide one-year consumption study starting in February 1990.

Scenario 2 uses GON figures for consumption and on-farm stocks, but uses USAID/Niger's revised estimate of commercial stocks. This reduces the GON deficit figure to a quarter of the official estimate. Although USAID/Niger numbers for commercial stocks are derived rather than calculated, the Mission firmly believes that they are more realistic than the GON assumption of no commercial stocks.

Scenario 3 uses GON figures for consumption and commercial stocks but includes the GON gross, rather than net, estimate of on-farm stocks. In 1989, the GON undertook a survey of on-farm cereal stocks with CILSS financing. Stocks were estimated at 267,853 mt for 1989, but were adjusted for losses and October consumption by the GON. The figure was reduced by approximately 40,000 mt (15%) for losses. However, potential losses are included at the beginning of every consumption year (October). Considering them again at the end of the consumption year counts them twice.

The GON also reduced the on-farm stock figure by 125,000 mt for consumption during the month of October. However, consumption needs for October are also counted at the beginning of each consumption year. Counting them at the end of the year makes the consumption year thirteen months. This "double netting" for both losses and October consumption yielded a net on-farm stock of 102,360 mt at the beginning of the 1989/90 harvest. USAID/Niger and other donors do not agree with the procedures used to derive the net stock figure, but no resolution

Table 16: Niger, Provisional 1989/90 Cereal Needs Assessment (mt)

	USAID/Niger	GON	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Date	12-20-89	12-20-89	12-20-89	12-20-89	12-20-89	12-20-89
Agricultural Year	1989/90	1989/90	1989/90	1989/90	1989/90	1989/90
Per Capita Consumption (milled kg/cap/yr, nomad/farmer rates)	190/220	200/250	190/220	200/250	200/250	200/250
Population	7,757,737	7,793,456	7,757,737	7,793,456	7,793,456	7,793,456
Consumption Requirement	1,587,161	1,841,378	1,587,161	1,841,378	1,841,378	1,841,378
Security Stock Replenishment	80,000	80,000	80,000	80,000	80,000	80,000
Total Consumption Requirement	1,667,161	1,921,378	1,667,161	1,921,378	1,921,378	1,921,378
Gross Rainfed Production	1,760,561	1,760,561	1,760,561	1,760,561	1,760,561	1,760,561
Net Rainfed Production	1,492,269	1,492,269	1,492,269	1,492,269	1,492,269	1,492,269
Net Irrigated Production	49,480	49,480	49,480	49,480	49,480	49,480
Net Off-Season Production	20,000	20,000	20,000	20,000	20,000	20,000
Net Domestic Cereal Production	1,561,749	1,561,749	1,561,749	1,561,749	1,561,749	1,561,749
Public Working Stocks	5,870	5,870	5,870	5,870	5,870	5,870
Public Reserve Stocks	80,000	80,000	80,000	80,000	80,000	80,000
Commercial Stocks	67,303	0	0	67,303	0	67,303
On-Farm Stocks	102,360	102,360	102,360	102,360	267,853	267,853
Donor Stocks	0	0	0	0	0	0
Total Available Stocks	255,533	188,230	188,230	255,533	353,723	421,026
Total Cereal Exports	0	0	0	0	0	0
Domestic Cereal Supply	1,817,282	1,749,979	1,749,979	1,817,282	1,915,472	1,982,775
Balance Before Imports	150,121	-171,399	82,818	-104,096	-5,906	61,397
Total Commercial Cereal Imports	80,000	80,000	80,000	80,000	80,000	80,000
Cereal Balance (milled)	230,121	-91,399	162,818	-24,096	74,094	141,397

Sources and Notes:

USAID/Niger estimate = GON net on-farm stocks figure; commercial stocks as half of difference between last year's surplus and this year's gross on farm stocks (assuming the other half of the difference moved across the border)

Scenario 1 = GON figures, USAID/Niger consumption figure

Scenario 2 = GON figures, USAID/Niger commercial stocks figure

Scenario 3 = GON figures, gross on-farm stocks figure GON gross on-farm stock figure from survey accepted as on-farm stocks (no double netting or double consuming)

Scenario 4 = GON figures, USAID/Niger commercial and gross on-farm stocks figures

of the issue has been reached. Scenario 3 employs the larger on-farm figure without the reductions noted above, resulting in a surplus of 74,094 mt.

Scenario 4 follows the similar reasoning of Scenario 3, changing only the level of commercial stocks, and results in a cereal surplus of 141,000 mt.

Food Stocks - Available cereal stocks, discussed in the preceding section, are estimated between 188,000 and 421,000 mt, including aggregate on-farm stocks of between 102,000 and 268,000 mt. The commercial stock estimate of 67,000 mt is a conservative estimate, because it accounts for only half the difference between last year's surplus and this year's on-farm stocks. Assuming that the other half was exported is speculative, at best. Without official cross-border trade statistics, it is difficult to estimate how much of last years' surplus grain left the country. Given information gathered during the Mission's recent field assessment, the GON assumption of no commercial stocks is unrealistic.

Field observations indicate that on-farm stocks are low despite the 1988/89 bumper harvest. Last year's surplus was used to pay off debt, hold marriages and participate in traditional social activities. Current stocks are estimated to be enough for another three months in the best agricultural zones and for shorter periods in deficit zones. In areas of moderate cereal prices, families are attempting to stretch their reserve stocks by buying grain in the market.

Other Resources - See the department level summaries in the section "Numbers and Locations of Vulnerable and At-Risk Populations" presented below.

Market Data - Average nationwide millet prices have risen approximately 20% since the end of September, with significant regional distinctions based on such factors as current year production, available stocks, and access to Nigerian imports. Tillabery Department (a deficit area) currently has the highest prices, about 6,000 to 7,500 FCFA per 100 kilogram (kg) sack. Prices range from 5,000 per 100 kg sack in Filingue Arrondissement to almost 9,000 FCFA in Balayara and are reported to be rising steadily. Prices in Zinder Department (an area experiencing poor a harvest this year) range from 4,400 FCFA in Magaria to 5,500 FCFA in Zinder. Greater availability of stocks from last year's harvest and relatively low cost millet from Nigeria contribute to continued moderation in prices. Millet prices are beginning to climb in northern Zinder, but appear stable elsewhere.

Millet prices in other regions of Niger exhibit a similar pattern based on overall cereal availability. In Tahoua Department (an area with uneven production this year), prices range from 6,000 to 8,000 FCFA per sack. Maradi Department (a surplus area) reports prices in the 5,000 to 6,000 range. Sorghum prices have followed the same evolution, although remaining at a slightly lower average price. Average nationwide prices for sorghum in late November were approximately 10% above last year's price at the same time.

Livestock prices are low throughout Niger, ranging from 25% to 40% less than last year at this time. Herds are healthy, with ample water and pasturage. The prices are depressed due to the weakness of both local and Nigerian markets.

Food Aid Requirements - On December 5 of 1989, the GON and the United Nations Food and Agriculture Organization (on behalf of the GON) issued an appeal to donors for food aid. The appeal, also issued to the United States Government, requested aid to cover the GON's estimated 1989/90 production deficits. At present, the USAID/Niger Mission believes that supplies available in Niger and within the West African region should be adequate to meet most supply requirements. The Mission's assessment would change substantially if the stocks held by the Office des Produits Vivriers du Niger (OPVN) could not be used to meet supply deficits.

If the OPVN reserve stock of 80,000 mt were to be released for targeted free distribution, approximately $21 million would be required from donors and/or the GON for its purchase and distribution. If, on the other hand, the reserve stock were sold to the private sector through a bid and tender system (which OPVN is allowed to do), donor or GON financing might not be necessary. This issue is discussed in the section on "Institutional Factors" below.

POPULATIONS VULNERABLE TO OR AT RISK OF FOOD EMERGENCIES

Causes of Risk or Vulnerability - *Determination of Risk:* The Mission's Food Security Operations Group (FSOG) has established preliminary criteria for assessing national food security. Field assessment trips were conducted on the basis of arrondissement-level agricultural production statistics and GON deficit village lists. The first step was the classification by the FSOG of each arrondissement into one of five zones: high risk, vulnerable, status quo, surplus, or non-agricultural. Classifications were determined from GON-based production statistics and USAID/Niger's standard annual per capita cereal consumption rates.

FSOG-designated high risk zones show rainfed cereal production that is at least 30% lower than cereal consumption needs. A 30% cereals deficit results in a cereal consumption level of 133 kg per capita per year. This is below the nutritionally established survival need of 138 kg per capita per year. The FSOG feels that further analysis is essential to determine the need for emergency intervention in these areas. An FSOG-designated vulnerable zone's cereal production is from 10 to 30% short of cereal consumption needs. Close monitoring is considered necessary in these zones to detect pockets of significant shortage. Status quo zone consumption needs have been met by plus or minus 10% and require periodic monitoring to detect pockets of food insecurity. Surplus zone cereal production has surpassed status quo consumption needs by more than 10%. This does not preclude potentially vulnerable deficit pockets. Disaggregated production statistics are needed to reveal such pockets.

The second step involved visits to cantons in arrondissements where over 20,000 people were affected by production deficits greater than 30%. This information was provided by the GON deficit village list. Administrative officials, extension agents, canton and village chiefs, farmers, and market traders were interviewed. The resulting vulnerability assessment, described in the following section, was based on questions regarding cereals availability, purchasing power, population movement and market activity.

Institutional Factors: Short term vulnerability to local food shortages is increased by the incomplete development of a response mechanism at the national level and a lack of funds to use in-country cereal stocks. These problems delay assistance to deficit areas and may result in food supply problems despite adequate private and government stocks at the national level.

The current structure for responding to potential food shortages includes the Système d'Alerte Précoce (SAP/Niger, the national early warning structure), the GON/Donor Mixed Commission for the management of food assistance (through OPVN), and the Ministry of Interior infrastructure responsible for distribution to needy persons (local government officials and traditional chiefs). The SAP/Niger structure exists on paper but has not become operational. The OPVN Mixed Commission (in which USAID/Niger participates) is charged with reviewing plans for urgent food distribution. The Mixed Commission has only recently been formed. Without information from SAP/Niger or plans from the Ministry of the Interior, the Commission cannot act. Furthermore, the manner in which the Mixed Commission should operate has not been established to the satisfaction of all its members. The result is that an accurate assessment of needs and subsequent response planning is not taking place in a timely manner.

If free distribution is warranted, these institutional problems would be further compounded by a lack of GON and donor financial resources. Elements of the Mixed Commission propose that cereal held by OPVN (80,000 mt) be used to cover only local supply deficits through targeted free distribution. However, the agreements created by the Mixed Commission prevent OPVN from releasing cereal without equal value replacement. At current prices, free distribution of OPVN stocks (value and transportation) would cost approximately $21 million. Bilateral agreements limit the amount of cereal which OPVN can release to approximately 54,000 mt, worth $14 million. Even this figure is beyond the immediate resources of donors and the GON. External food assistance could be needed in Niger if it takes too long to devise a mechanism for the release of OPVN stocks.

The problems outlined above could hinder the GON and donors' abilities to respond to local food problems. Efforts are currently underway to resolve these institutional problems, led by the United Nations Development Program (UNDP), the United Nations Food and Agriculture Organization (FAO) and the United Nations World Food Program (WFP).

It is too early to know if the private sector can supply consumers in deficit areas with sufficient cereal at an affordable price. A positive recent development has been the creation of commercial arrangements among USAID/Niger-supported cooperatives in deficit and surplus areas for the purchase, shipment and sale of cereal at competitive prices.

Numbers and Locations of Vulnerable and At-Risk Populations - The GON reports that 4,864 villages (representing almost half of Niger's villages) experienced production deficits this season, with a total of approximately 3,140,000 persons affected. USAID/Niger recently conducted a field assessment of the areas most seriously affected to determine the impact of this deficit. The structurally deficit departments of Diffa and Agadez were not included in the assessment, as the seriousness of the situation in Diffa was clear from the start and the Agadez economy is not dependent on cereals for subsistence. Based on the GON report and the vulnerability criteria stated above, the following areas are most vulnerable to food insecurity during 1990. These areas represent approximately 15% of the country's population. More detailed information about absolute numbers and locations of populations at-risk is not available at this time. The FSOG is currently refining GON figures based on information gathered during the recent field assessment.

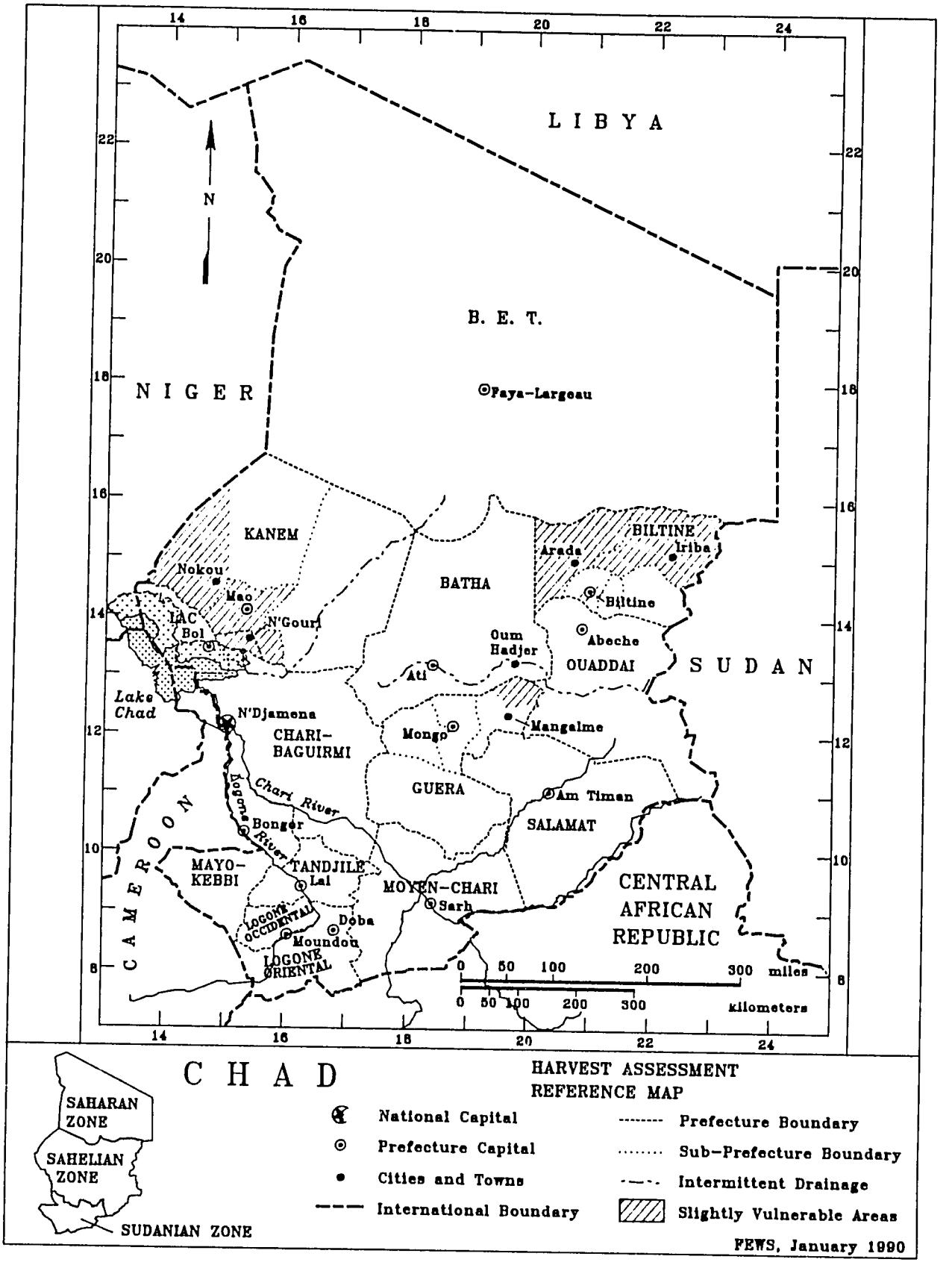
- *Dosso Department:* Although arrondissement level production statistics and the vulnerability criteria stated above show Dosso to be self sufficient in cereals, deficit pockets have been reported in the northern cantons of the department. The FSOG will conduct a field assessment to evaluate the severity of these deficits.
- *Maradi Department:* Despite surplus production at the department level, Dakoro Arrondissement experienced low cereal production due to widespread grasshopper infestations. Unlike most areas in Niger, Dakoro did not produce a bumper crop in 1988 and the resulting low reserves limit cereal stocks to one or two months (for up to 30% of the arrondissement population). Other income generating activities are limited because off-season agriculture is not practiced and the cowpea crop was consumed by grasshoppers.
- *Tahoua Department:* Although Tchin Tabaraden, Keita, and Tahoua arrondissements appear vulnerable from a cereals production perspective, the most vulnerable zone in Tahoua is Illéla Arrondissement. Isolated pockets (representing up to 20% of the arrondissement's population) are so low in cereal stocks that some households are stretching meals and eating millet only once every two or three days. Purchasing power is weak because off-season gardening is not practiced and grasshopper infestations reduced cowpea and groundnut production. Millet prices throughout the department are high and cereal is sold in small quantities.
- *Tillabery Department:* In addition to the department-wide cereals deficit affecting up to 30% of the population, the arrondissements of Filingue, Ouallam, Tillabery, and Tera are affected by low on-farm stocks, high cereal prices and low purchasing power. The pockets of greatest vulnerability are Imanan and Tondikandia cantons in Filingue Arrondissement; Tondi-Kwindi Canton in Ouallam; Anzourou Canton in Tillabery; and Dargol and Kokorou cantons in Tera. The

harvest in Anzorou, Dargol and Kokorou cantons is reported to be as bad as that of 1984/85. Parts of Tondi-Kwindi experienced total crop failure. None of the aforementioned cantons has more than three months of on-farm stocks left. Tondi-Kwindi has only one month left and Imanan and Kokorou cantons have already depleted their stocks. Local commercial stocks are expected to last through March, at which time grain will have to be imported from greater distances and sold at perhaps double the current prices.

Cereal prices are already higher than the pre-harvest period and are steadily increasing everywhere. In Imanan, Ouallam and Tondi-Kwindi, households without stocks are buying small quantities of millet weekly on the market, as they cannot afford 100 kg sacks. Purchasing power is low because normal income generating activities are not as successful as usual. Grasshoppers are threatening dry-season gardening yields in Filingue, Ouallam, and Tillabery arrondissements. Off-season production is needed both for home consumption and sales to purchase millet. Households in these areas are forced to sell small ruminants to buy millet at a time when livestock prices are abnormally low (more than 50% below normal, but not as low as either 1987 or 1984). Income from seasonal migration to the coast is not forthcoming because of the cocoa crisis in the Ivory Coast, which has produced widespread unemployment. Young men are migrating earlier and in larger numbers in Filingue, and entire families are migrating in Tondikandia and Anzourou. In Ouallam, extended families who settled on the coast in 1984/85 are now returning unemployed. The months of March to June (traditionally the lean season) could be critical for the areas mentioned above and merit continued monitoring.

- *Zinder Department:* Despite a positive department level cereals balance, Gouré Arrondissement and Termini and Mirriah cantons in Mirriah Arrondissement had harvests as bad as 1984. Bande, Wacha, Dungass, and Magaria cantons in Magaria Arrondissement are reporting only two more months of stocks and describe the situation as worse than 1987. Approximately 10% of the population may be affected. In addition, these areas suffered from serious grasshopper invasions that wiped out cash crops. Off-season agriculture is heavily practiced in Mirriah and Magaria arrondissements, but over-production of the limited varieties has reduced economic returns. Off-season agriculture is not practiced in Gouré, however, and livestock activity is compromised by an influx of herders from neighboring Diffa Department competing for the same pasture. Livestock prices are reported to be 25 to 40% of last year's figures and are expected to continue dropping. An exodus of young men to northern Nigeria and coastal countries has begun earlier and at a higher rate than in 1987.

Map 6


LIBYA
N
B. E. T.
Faya-Largeau
NIGER
KANEM
Nokou
Mao
LAC
Bol
N'Gouri
BATHA
BILTINE
Arada
Iriba
Biltine
Abeche
Oum Hadjer
OUADDAI
SUDAN
Ati
Lake Chad
N'Djamena
CHARI-BAGUIRMI
Mongo
Mangalme
GUERA
Am Timan
SALAMAT
Chari River
Logone River
Bongor
CAMEROON
MAYO-KEBBI
TANDJILE
Lai
MOYEN-CHARI
Sarh
CENTRAL AFRICAN REPUBLIC
LOGONE OCCIDENTAL
Doba
Moundou
LOGONE ORIENTAL
0 50 100 200 300 miles
0 50 100 200 300 kilometers
CHAD
HARVEST ASSESSMENT REFERENCE MAP
SAHARAN ZONE
SAHELIAN ZONE
SUDANIAN ZONE
National Capital
Prefecture Capital
Cities and Towns
International Boundary
Prefecture Boundary
Sub-Prefecture Boundary
Intermittent Drainage
Slightly Vulnerable Areas
FEWS, January 1990

Report prepared by FEWS/Chad and USAID/N'Djamena and received in Washington on December 21, 1989

Chad

In-Country Stocks Adequate to Meet Localized Food Shortages

SUMMARY

A United Nations Food and Agriculture Organization (FAO) crop assessment team estimates cereal production for 1989/90 to be 674,000 metric tons (mt). Crop failure in the northern portions of Kanem and Biltine prefectures will be compensated by off-season agriculture, animal husbandry, and other economic activities. The average price of millet in the Sahelian zone has dropped slightly and remained stable in N'Djamena. In-country stocks will be sufficient to meet localized food deficits. Food aid imports will not be required above those already programmed.

FACTORS AFFECTING FOOD SECURITY

Harvest Outcome - An FAO crop assessment team, in collaboration with the Ministry of Agriculture and Rural Development (MINAG) and local Comité Permanent Inter-Etat de Lutte Contre la Sécheresse dans le Sahel (CILSS) representatives, visited Chad from October 3 to 25 and provided a preliminary cereal crop estimate of 674,000 mt. This figure represents a 16.6% reduction from the 808,000 mt bumper harvest of 1988 (see Table 17). However, a significant change in production estimation methodology makes comparison of this year's harvest with those of previous years difficult. Production estimates for 1989/90 were calculated by MINAG and FAO using extrapolation figures for the number of production units that were larger by 25%. Thus, the production figure for 1989/90 is considerably higher than it would have been under the previous estimation methodology.

An October analysis by the USAID/Chad Mission's Food Security Operations Group (FSOG) found the current harvest to be analogous to that of 1987/88. The harvest is adequate, but generally poor in the northern pastoralist zones. Off-season agriculture in lowlands, herding, and other economic activities will make up for lost crops in the northern portions of Kanem and Biltine prefectures.

Market Data - The average price of millet in the Sahelian zone dropped slightly in November. The average price of millet decreased from 49 FCFA per kilogram (kg) to 44 FCFA/kg in the 12 Sahelian markets regularly monitored by the European Community-funded Système d'Alerte Précoce (SAP/Chad). The highest prices were those in northern Kanem Prefecture (80-110 FCFA/kg), while the lowest were in southern Ouaddai Prefecture (16-20 FCFA/kg). Prices in N'Djamena remained stable. There is no new price data available for the South.

Food Deficit Estimates - A food balance exercise for Chad is highly speculative, given the weakness of data concerning population, consumption requirements, production estimates and stocks. The Mission's FSOG does not base its determination of whether or not to request food aid on the theoretical deficit or surplus obtained using this method. However, in an attempt at an order of magnitude assessment, national and disaggregated cereal balances are given in Tables F1 and F2 in the appendix to this chapter.

Food Stocks - As of October 31, in-country food aid stocks (cereal and non-cereal) totaled 10,978 mt, most of which were for an ongoing World Food Program (WFP) project. This total does not include figures for the WFP offices in N'Djamena and Moundou that have not reported. In addition to the WFP stock, the National Cereals Office manages a security stock of 9,729 mt and a price stabilization stock of 5,509 mt.

Other Resources - USAID/Chad reports that there is no information available on non-food resources.

Food Aid Requirements - No additional food aid imports are required above those already programmed. Whatever emergency feeding requirements may arise during the next nine months will be highly localized and of short duration. Cereals needed for such distributions could be drawn from existing stocks.

Non-Food Needs - USAID/Chad reports that there is no information available on non-food needs.

Table 17: Chad, Gross Cereal Production, 1984 - 1989 (mt)

Year	Production
1984/85	313,000
1985/86	685,000
1986/87	730,000
1987/88	573,000
1988/89	808,000
1989/90	674,000

Sources: MINAG; FAO; CILSS

POPULATIONS VULNERABLE OR AT RISK OF FOOD EMERGENCIES

Vulnerable Populations - A combination of inadequate rainfall and pest damage has compromised cereal production in several areas north of the 14th parallel (in Lac, Kanem and Biltine prefectures) and at least one area south of the 14th parallel (in Guera Prefecture), which will result in food-access related stress (see Map 6). The National Committee on Refugees reported that 9,530 people returned to N'Djamena between January and October 1989, but these people are not considered vulnerable.

SAP/Chad considers the stressed areas "at-risk", but employs this term differently than FEWS. FEWS considers at-risk populations as requiring a specific intervention in order to avoid a life-threatening situation. The Mission's FSOG does not believe that a sufficient number of famine indicators have been accumulated to warrant the use of the FEWS terminology. While cereal production is clearly insufficient in these zones, the populations will begin to use indigenous coping strategies to gain access to cereals. SAP/Chad intends to conduct socio-economic (Phase III) studies of these areas from November 1989 through January 1990 to provide a clearer picture of potential needs. Using FEWS terminology, the Mission FSOG considers the seven regions listed below as vulnerable, implying that some of the population may require assistance prior to the 1990/91 harvest.

- *Nokou Sub-Prefecture (Kanem Prefecture):* Cumulative rainfall through the end of September was 120 millimeters (mm) and no rainfed millet was harvested. SAP/Chad reports cereal reserves have been exhausted, the price of millet in September rose from 76 FCFA/kg to 110 FCFA/kg, and pasturage is poor. However, Nokou rarely registers a good millet harvest and most families practice off-season agriculture in the 27 Nokou wadis. When pasture is poor, certain family members take herds further south, while others remain to farm the wadis.
- *Mao Sub-Prefecture (Kanem Prefecture):* Only 79 mm of rain were registered, precluding any rainfed millet production. Village-level cereal reserves have been depleted, cereal prices have begun to rise and pasture is inadequate. However, a 1988 SAP/Chad survey of two cantons in this region showed a highly diversified economic base, with rainfed agriculture ranked as a principal activity for only 1.4% of the families questioned. The reported principal economic activities are listed in Table 18.

Table 18: Chad, Principal Economic Activities in Mao Sub-prefecture, Kanem Prefecture

Activity	% of Families for Whom Activity was Principal
Manual Labor	26.4
Raising Livestock	19.4
Cottage Industries	20.0
Commerce	20.1
Religious Activities	11.1
Other	3.0

Source: SAP/Chad Phase III survey, February 1988

Crop failure by itself does not necessarily put a population in the at-risk category. Crop failure is more the rule than the exception in both Mao and Nokou sub-prefectures. However, rising cereal prices and the lack of pasture could make access to food difficult in coming months.

- *N'Gouri Sub-Prefecture (Lac Prefecture):* Grasshoppers and insufficient rainfall caused extensive crop damage. Local canton chiefs estimate that the cereal harvest will cover no more than two months' consumption needs. On-farm reserves have been depleted. Population displacements from the N'Gouri area towards Lake Chad and N'Djamena are expected. Migration towards the lake to work in the polders or towards urban centers for employment is a common coping mechanism for the N'Gouri population.
- *Mangaime Sub-Prefecture (Guera Prefecture):* Two cantons in this region, Moubi Goz and Moubi Hadaba, are considered at-risk by SAP/Chad. The failed harvest has already resulted in rural displacement of families seeking employment in Ati, Oum Hadjer and Mongo. This is a chronically cereal-deficit region and local markets are generally supplied from grain-surplus zones. As mentioned for Mao above, access to cereals is secured through diverse income-generating activities, particularly cottage industries. Furthermore, SAP/Chad Phase III surveys showed consumption of wild grains and other edibles is normal for 99% of the population in this region. Paradoxically, the price of millet in Mangalme dropped during September and remains one of the lowest in the country (22 FCFA/kg).
- *Biltine Sub-Prefecture (Biltine Prefecture):* Cumulative rainfall at the end of September was 157.5 mm, rendering attempts to grow millet futile. No harvest is expected in Ouled Djama Canton, considered by SAP/Chad as at-risk. The other cantons in Biltine Sub-Prefecture will also register poor harvests.
- *Arada Sub-Prefecture (Biltine Prefecture):* This is a pastoral region that seldom registers an adequate cereals harvest. Only 215.4 mm of rain fell this year. There are no fixed villages in this sub-prefecture, as most of the estimated 8,000 persons are based in the town of Arada. Livestock represent the primary economic resource and, since 1985, herds have been reconstituted to their pre-drought size. However, inadequate pasture development has been reported and will result in an unseasonably early southward progression of the herds. The price of millet remained stable during September.
- *Iriba Sub-Prefecture (Biltine Prefecture):* This is another region that seldom grows enough grain to feed itself. Iriba registered a significant deficit during the 1988/89 bumper harvest. Cereals are supplied from Sudan and further south. Livestock represent a steady source of income and are exchanged for grain. Consumption of wild grain and other edibles is widely practiced. Despite the poor 1988 harvest, no food crises occurred in this region and no emergency food aid was distributed.

To summarize, SAP/Chad has listed the above seven regions as at-risk. The Mission's FSOG, however, notes that these regions are chronically cereals-deficit and does not believe that sufficient information exists at present to apply the FEWS "at-risk" terminology. The SAP/Chad Phase III surveys programmed for these regions will provide the necessary additional information to determine whether outside assistance will be necessary.

APPENDIX TO CHAD CHAPTER

Appendix F contains a national cereal balance for Chad and a prefecture-level production balance (i.e., local cereal requirements compared against local production, without consideration of commercial, public, or household stocks -- estimates for these latter items do not exist for the prefecture level). Accompanying notes detail data sources and quality.

APPENDIX F

Table F1: Chad, National Cereal Balance (mt)

Net Cereal Production	573,081
Public Working Stocks (Oct 31)	5,509
Public Reserve Stocks (Oct 31)	9,729
Commercial Stocks	40,000
On-farm Stocks	na
Donor Stocks (Sep 30)	8,500
Donor Pipeline	9,500
Commercial Cereal Imports	36,000
Commercial Cereal Exports	na
Total Available Stocks	682,319
Total Consumption Requirement	783,980
National Cereal Balance	**-101,661**

Sources: see explanatory notes below

Table F2: Chad, Cereal Balance by Climate Zone and Prefecture (mt)

Climate Zone and Prefecture	Population	Cereal Needs	Net 1989/90 Production	Balance
Saharan Zone	112,000	8,960	na	-8,960
Sahelian Zone	2,772,000	383,180	238,925	-135,295
Prefecture				
Batha	441,000	59,535	37,042	-22,493
Biltine	221,000	29,835	10,926	-18,909
Chari-Baguirmi	864,000	116,640	46,674	-69,966
Guera	260,000	35,100	53,658	18,558
Kanem	251,000	33,885	2,576	-31,309
Lac	169,000	22,815	13,705	-9,110
Ouaddai	432,000	58,320	49,481	-8,839
Salamat	134,000	18,090	24,863	6,773
Sudanian Zone	2,672,000	400,800	334,156	-66,644
Prefecture				
Logone Occidental	374,000	56,100	33,490	-22,610
Logone Oriental	386,000	57,900	74,800	16,900
Moyen-Chari	661,000	99,150	78,760	-20,390
Mayo-Kebbi	872,000	130,800	87,063	-43,737
Tandjile	379,000	56,850	60,043	3,193
Total	5,556,000	783,980	573,081	-201,939

Sources: see explanatory notes below

Explanatory notes for Tables F1 and F2:

a) *Annual per capita requirements:* Three different rates were established by the FAO in 1985: 80 kg for the Saharan zone, 135 kg for the Sahelian zone, and 150 kg for the Sudanian zone. These rates are arbitrary and are not based on any consumption studies (see Map 6 legend for the locations of Chad's three climate zones). The figures attempt to differentiate the dietary habits of the people in the Far North, who rely

heavily on milk products and dates, from those living further south. It is important to point out that if cereals consumption in the Far North can be decreased due to substitution of milk products and dates, then a similar reduction can be made for cereals consumption in the Far South, where tubers are a mainstay of the diet. However, tuber production and consumption are not taken into account in establishing annual food requirements.

b) *Population:* There has never been a census for Chad. Current population figures are extrapolated from a partial 1964 survey with no adjustments made for massive population outflows and inflows caused by drought, warfare and unstable economic conditions. For the 1989/90 season, the Mission's FSOG applied a 2.36% growth rate to the Government of Chad (GOC) 1988 population figure of 5,428,000.

b) *Net production:* Gross production was estimated by a FAO crop assessment team. Net production was calculated by subtracting 15% to account for seed reserves and post harvest losses.

d) *Public working stocks:* These are the price stabilization stocks managed by the National Cereals Office as of October 31.

e) *Public reserve stocks:* These are the security stocks of local cereals contributed by the Dutch and Japanese governments. The Belgian Government, through the WFP, will contribute 3,000 mt in fiscal year 1990.

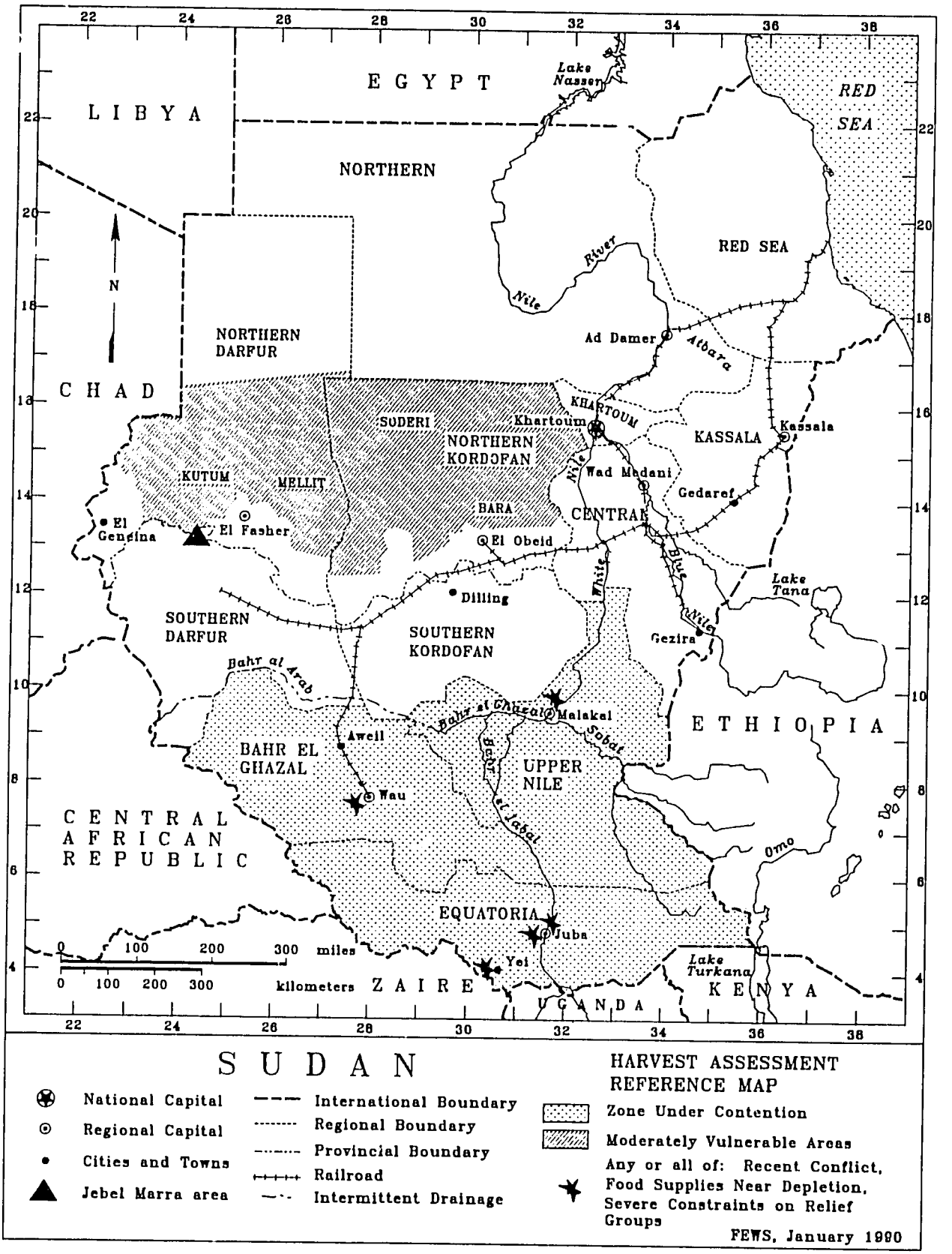
f) *Commercial stocks:* The Mission uses the same figure that was used in 1988 by the Ministry of Agriculture and Rural Development. No other data are available.

g) *On-farm stocks*: Not available.

h) *Donor stocks:* As of September 30, these are primarily WFP stocks (cereals only).

i) *Donor pipeline:* Includes a projected arrival of 4,500 mt of WFP cereals for ongoing School Feeding, Vulnerable Groups, and Food-for-Work projects. Also includes Mission's Section 206 program 5,000 mt flour consignment. At this writing, flour was arriving in N'Djamena. Proceeds from the sale of the flour will be utilized to procure local cereals for the national security stock.

Map 7



SUDAN

HARVEST ASSESSMENT REFERENCE MAP

- National Capital
- Regional Capital
- Cities and Towns
- Jebel Marra area
- International Boundary
- Regional Boundary
- Provincial Boundary
- Railroad
- Intermittent Drainage
- Zone Under Contention
- Moderately Vulnerable Areas
- Any or all of: Recent Conflict, Food Supplies Near Depletion, Severe Constraints on Relief Groups

FEWS, January 1990

Report prepared by FEWS/Sudan and USAID/Khartoum and received in Washington on December 15, 1989

Sudan

Carry-Over Stocks Cover Western Needs, Aid to South Uncertain

SUMMARY

In government-held areas of Sudan, 1989 production of the primary staple grains (millet and sorghum) is estimated at 2,623,000 metric tons (mt), with an additional 293,000 mt of wheat. These figures correspond to 50% of last year's record harvest and 95% of the historic nine year average from 1980 through 1988. Production in 1989, combined with estimated aggregate grain stocks of 1,090,000 mt and wheat imports of 600,000 mt, gives total national grain resources of 4,606,000 mt. National grain consumption has been estimated at 3,890,000 mt. No external food aid will be required to alleviate localized deficits in areas unaffected by security concerns. In fact, there should be some surplus carried over to next year.

Late rains, localized drought conditions, pests, lack of inputs, and continuing security problems in 1989 caused reduced production throughout eastern, central and western Sudan. Nevertheless, surpluses will be obtained from mechanized farming areas, offsetting the more serious drought induced production deficits of western Sudan. In the West, government, farmer and donor/non-governmental organization (NGO) stocks are low, but private trader stocks from last year will offset deficits for those who can pay for food. Localized and highly targeted relief will be necessary in parts of Northern Darfur and Northern Kordofan provinces for farmers who cannot buy food. The key concern for alleviating serious food insecurity is financing, fuel and logistics for transportation of food.

The United Nations Food and Agriculture Organization (FAO) has issued its report on the recent joint US Agency for International Development (USAID)/FAO production assessment. Although USAID/Sudan and FAO aggregate production estimates differ slightly (because of different sources for some figures), the conclusions support those of USAID/Sudan. Both institutions say that the situation in the West requires no imports, but rather can be addressed using current stocks and surplus from domestic production in Sudan's Central and Eastern regions.

In southern Sudan, there are indications that production will be good in those areas unaffected by security concerns. However, given the security situation expected to prevail in 1990 in the South and the uncertainty now facing the implementation plans for Operation Lifeline Sudan II (OLS II), it is certain that substantial amounts of relief food will be required for 1990 in southern Sudan.

FACTORS AFFECTING FOOD SECURITY

Harvest Outcome - Overall, estimated production appears slightly less than average, but does not indicate a serious aggregate grain shortfall. Production in the traditional sector may be greater than the historic average. However, harvest survey teams are still in the field, many areas have not yet begun to harvest and there are no figures available for provinces in southern Sudan. Present production figures are based on mid-season surveys of area planted and yield estimates. Comparison with previous years should be made with caution. Past year figures are estimates (rather than measurements) made by the Ministry of Agriculture (MOA). Their estimates have been extremely inaccurate for the traditional sector.

The three agricultural sectors presented in Table 19 represent different aspects of national production. The irrigated sector supplies food for its own tenant farmers and for migrant cotton pickers. Irrigated wheat is almost exclusively grown for consumption in cities. This year's production is estimated at 293,000 metric tons (mt). Production from the mechanized sector is almost entirely surplus, and is often divided between internal needs and export. The traditional sector supplies grain for its own consumption and is historically deficit. Supplies may then

Table 19: Sudan, National Millet and Sorghum Production for Government Held Areas (000 mt)

Agriculture Sector	84-88 Avg	1984	1985	1986	1987	1988	1989
Irrigated	480	446	667	459	356	472	395
Mechanized	1,870	390	2,350	2,406	862	3,341	1,500
Traditional	690	419	924	697	301	1,107	728
Total	3,040	1,255	3,941	3,562	1,519	4,920	2,623

Source: MOA/Department of Agricultural Statistics

Table 20: Sudan, Combined Millet and Sorghum Production for Western Sudan (000 mt)

Province	82-86 Avg	86/87	87/88	88/89	89/90
Northern Kordofan	93	131	80	285	236 (N+S)
Southern Kordofan	208	203	107	425	
Northern Darfur	50	76	26[1]	438[2]	153
Southern Darfur	202	158	62[1]	206	260

Sources: MOA; APU

[1] These data are questionable and probably greatly understated.

[2] This figure is from reliable surveys by the Agricultural Planning Unit (APU), and contrasts with the MOA figure of 114.

come from the mechanized sector. The traditional sector is monitored for level of deficit and the mechanized sector for level of available surplus.

Table 20 disaggregates the national production figures for the areas most vulnerable to food insecurity in Sudan. These are primarily traditional rainfed agricultural areas that are historically deficit, even in very good years. Past years' figures are from the MOA. These estimates are sometimes based on small samples. Serious methodological flaws have been found resulting in errors of as much as 400%. For example, the record year of 1988/89 shows less production in Southern Darfur Province than estimates for this year, which is considered a moderate drought year. Production from one large mechanized area in Southern Kordofan Province (Dilling) and a very small area in Southern Darfur Province are included in these figures. These two areas, along with the Jebel Mara area in Darfur, usually produce surpluses that stay within these regions.

The area planted in Kordofan and Darfur regions was reduced by up to 50% from last year. Area planted in specific surplus areas of the West was also down from last year, by about 30% and 48% in Jebel Mara and Dilling, respectively. Agricultural conditions and rainfall were generally good in these areas and the shortfall in area planted is attributed to tribal and civil conflict. This situation will reduce the available surplus for drought affected deficit areas in the northern part of the West.

The Dilling mechanized area of Southern Kordofan, usually a very important grain supplier for the West, will produce about half of last year's 359,000 mt of sorghum. Similarly, the traditionally surplus area of El Geneina in Northern Darfur, which produced double its needs last year, will produce a minimal surplus in 1989/90.

No quantitative figures or verified production information is available for Government of Sudan (GOS) and Sudan People's Liberation Army (SPLA) areas in the South affected by the ongoing civil conflict. However, satellite imagery and informant field reports indicate that these areas have had abundant rain, are having a very good agricultural season (in many areas considerably better than the historic average), and many areas expect an excellent harvest.

Although growing conditions have been quite good in GOS-held areas of the South, agricultural activities have been disrupted. There are large displaced populations in the towns of Wau, Juba, Malakal, and Aweil who are unable, or not permitted, to farm.

In SPLA areas, farmers generally carry out agricultural activities without incident. However, a problem does exists in a heavily populated part of Aweil District and donors are currently trying to move food there by train. With the anticipated good harvest, combined with the OLS II contribution of 25,000 mt for displaced and stressed groups, there should be no need for additional food requirements in SPLA areas for 1990. This assumes that the GOS and SPLA permit the planned OLS II operations to be implemented. There are serious concerns that OLS II will not take place.

Table 21: Sudan, National 1990 Cereal Balance (000 mt)

Population	19,474,000
Consumption Requirements[1]	3,894
Production	2,916
Stocks	1,090
Wheat Import	600
Total	4,606
Surplus	712

Source: FEWS/Sudan, using various sources

[1] Using a consumption rate of 200 kg/person/year

Food Deficit Estimates - According to current estimates (see Table 21), there will be a production surplus for 1990 at the aggregate national level (for government-held areas). With a projected aggregate surplus, the problem for Sudan in 1990 will not be quantity, but distribution. While near average production will occur in many parts of Sudan, shortfalls will occur in the traditionally deficit agricultural areas of Northern Darfur and Northern Kordofan provinces. Table 22 provides disaggregated production and projected needs for these areas in western Sudan.

Table 22: Sudan, Food Deficit Estimates for 1990 in the West (000 mt)

Region or Province	1990 Population (000)	Consumption Requirement	1989 Production	Deficit	Carry-Over	Projected Needs
Kordofan Region	3,730	746	236	-510	0	510
Northern Darfur	1,597	319	154	-165	128	37
Southern Darfur	2,141	428	260	-168	0	168

Source: FEWS/Sudan, using various sources

Population projections in Tables 21 and 22 are from United Nations World Food Program (WFP) estimates, which are based the 1983 census. These figures represent settled populations and nomads, do not account for population movements, often employ differing growth rates, and may be unreliable.

Very little is known about actual consumption in Sudan. The per capita consumption figure used in Tables 21 and 22 does not account for differences in requirements by differing groups (age, pastoralists versus farmers, etc.). Accounting for these differences may lower aggregate consumption requirements. The 200 kilograms (kg) per person per year figure is generous and provides a worst case scenario, allowing for sizable losses from feed, seed, and waste.

Carry-over stocks are calculated from 1988 production minus 1989 consumption. In most cases, farmers have depleted their stocks and carry-over is held by private merchants or relief organizations. It is impossible to accurately estimate the quantity of carry-over cereals remaining in the province in which it was grown.

With the above caveats on the data used in these calculations, the resulting deficits and projected needs should be used with care. Past experience bears this out and emphasizes the need for disaggregated analysis. For example, although Northern Darfur was exceptionally productive last year, two area councils showed combined deficits of 44,191 mt. In 1987, considered to be a very bad year, 3,364 mt of relief proved sufficient for these same two councils. Similarly, Kordofan Region figures from last year's bumper harvest showed a 190,000 mt deficit.

Food Stocks - Aggregate national food stocks are estimated at 1,090,000 mt and include private, public and donor reserves. Field reports indicate that on-farm stocks are minimal, with some areas believed to be virtually depleted. According to Agricultural Bank of Sudan (ABS) estimates, private traders may still be holding stocks of about 800,000 mt. The ABS estimates its total national stocks at 250,000 mt, although reserves are very low in Kordofan Region (totaling 2,250 mt) and nil in Darfur Region. Normally, the ABS would not have stocks this late in the season, but the GOS has prohibited release of stocks, or export, until more is known about 1989 production. Donor and NGO stocks in Northern and Southern Darfur total 7,167 mt. As of November 1, Kordofan stocks were 5,404 mt, but were programmed for displaced persons rather than farmers suffering drought. Most of the stock is in Southern Kordofan Province. Nationally, an additional 36,000 mt are held in reserve by USAID/Sudan for distribution to the displaced.

Markets are full with last year's stock in both Kordofan and Darfur regions, especially the southern districts. It is believed that private traders still hold substantial stocks from last year's abundant harvest. This reserve may be adequate for two to three months according to traders in these areas. Although markets are full, prices in the West are 25 to 50% higher than last year and continuing to rise. In eastern Bara and eastern Soderi, food prices are very high, while livestock prices are abnormally low.

Non-Food Resources - Farmers in western Sudan complement their farm income with cash crop revenues, migrant labor and minimal sales of small livestock. The bumper crop of 1988 allowed many cash crop farmers to save some revenues. However, recent low government-imposed sesame prices have lowered expected revenues from 1989 production and may act as a disincentive to 1990 plantings. Good off-farm employment opportunities exist in most areas this year, particularly in migrant labor, beginning in the irrigated sector and later in the mechanized sector.

Food Aid Requirements - USAID/Sudan food stocks total 36,000 mt, and could be used for displaced persons under OLS II. Additional food is available in Kenya. While USAID/Sudan can allocate available relief stocks, no plans have yet been made for relief of drought victims. Historically, the United States Government (USG) has been responsible for supplying relief assistance to Kordofan Region. The European donor community usually takes primary relief responsibility in Darfur Region. For both Kordofan and Darfur, it is expected that relief grain will be acquired from stocks already in Sudan.

Non-Food Needs - The most important non-food needs are transportation and supporting services for relief efforts. Requirements include financing of temporary storage, administration, transportation contracts, and distribution. The estimated cost of these services is 50 million Sudanese pounds for the 35,000 mt planned by USAID/Sudan for distribution to displaced persons under OLS II. Total USG non-food costs under OLS II for seeds, tools, air transport, camp support and relocation are expected to be about $15 to $17 million. In addition, seeds for cash and food crops are needed in Northern Kordofan and Northern Darfur provinces, where repeated failed plantings have depleted seed stocks.

POPULATIONS VULNERABLE TO OR AT RISK OF FOOD EMERGENCIES

The majority of at-risk and vulnerable populations in Sudan are people displaced by civil conflict (DP). They are located in Khartoum and near towns in Southern Kordofan Province and southern Sudan provinces. The DP total 3,580,000, including those in areas held by the SPLA. Approximately 1,800,000 of the total DP are in the Khartoum area. There is an ongoing program of relief resources and strategies for the DP in Sudan.

A particularly at-risk group is the 184,600 displaced persons in the town of Juba (see Map 7). Food reserves have been depleted due to the banning of relief flights. At this writing (late January), there are 1,000 mt in Juba, about thirteen days supply, and the town is being shelled. The 90,000 DP in the towns of Malakal and Wau are particularly vulnerable because relief organizations in these areas have had their radios confiscated, making relief communication and coordination impossible. In addition, the town of Yei has been taken by the SPLA and the expatriate staff evacuated.

Newly vulnerable groups include farmers in the drought stricken areas of Darfur and Kordofan regions. These farmers have insufficient 1989 grain production, carry-over stocks, and off-farm income to purchase marketed grain. In addition, there are farmers who, although not displaced, live in areas where they

Table 23: Sudan, Vulnerable Areas in the West

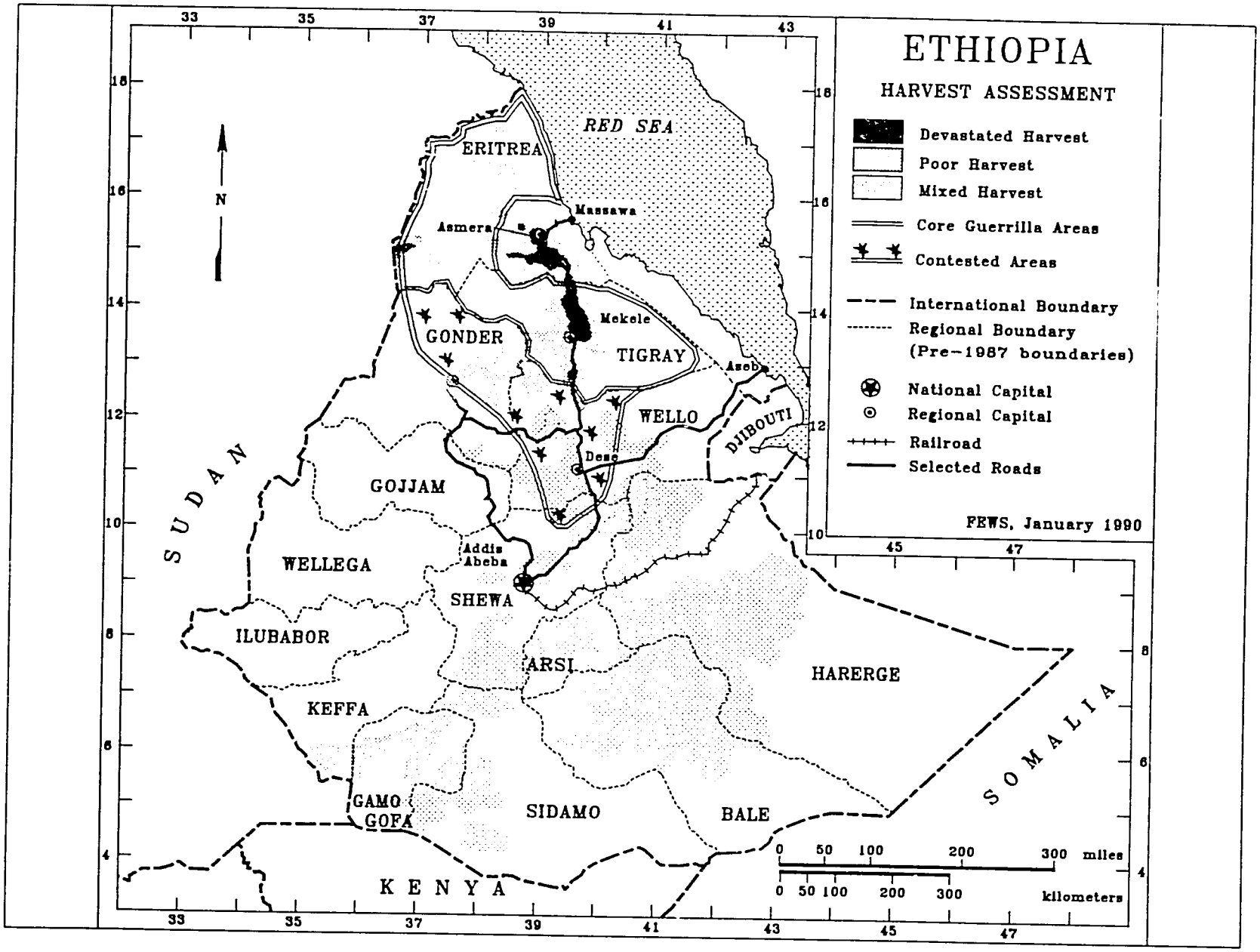
Province	Area Council	Main Cause
Northern Kordofan:	Bara	Drought
	Soderi	Drought
	Umm Ruwaba (northern)	Drought
	En Nahud	Drought
Northern Darfur:	Mellit	Drought
	Kutum	Drought & Conflict
	Kebkabiya	Conflict

Source: FEWS/Sudan, using various sources

cannot practice unhindered agriculture because of conflict. Although it is always difficult to accurately estimate the number of vulnerable people in a given area, Table 23 summarizes the vulnerable areas and the immediate causes of vulnerability.

The areas in Table 23 are chronically deficit and coping mechanisms, such as migrant labor, are well developed. In Northern Kordofan Province, four out of five area councils are deficit this year. Bara and Soderi have been particularly hard hit (see Map 7). Field reports indicate that traditional coping mechanisms have failed in eastern Soderi and eastern Bara. The people in these areas are living on gifts of food and gathered wild foodstuffs. There are no reserves, no money, and livestock have already been sold off. Many people, especially women, have been unsuccessful in finding work. Those who have found work find wages reduced from last year. Large scale migration is an accurate indicator of severe food insecurity and no such migrations have been reported. However, entire families in eastern Soderi have moved to Khartoum, indicating very serious local conditions. Another vulnerable group showing signs of increasing stress is the Kordofan nomads and transhumants now seeking work in Gezira and Gedaref, which they normally do not do.

In Northern Darfur, three of the five provincial area councils are food deficit to varying degrees. Mellit and Kutum will have very serious deficits, according to the Agricultural Planning Unit. Even during the deficits of 1987, however, very little food was needed for relief.


ETHIOPIA
HARVEST ASSESSMENT
Devastated Harvest
Poor Harvest
Mixed Harvest
Core Guerrilla Areas
Contested Areas
International Boundary
Regional Boundary
(Pre-1987 boundaries)
National Capital
Regional Capital
Railroad
Selected Roads
FEWS, January 1990
RED SEA
ERITREA
Asmera
Massawa
Mekele
GONDER
TIGRAY
Aseb
WELLO
DJIBOUTI
Dese
SUDAN
GOJJAM
WELLEGA
Addis Abeba
SHEWA
ILUBABOR
ARSI
HARERGE
KEFFA
SOMALIA
GAMO GOFA
SIDAMO
BALE
KENYA
N
0 50 100 200 300 miles
0 50 100 200 300 kilometers

Map 8

This report is based upon an assessment prepared by William Faught for USAID/Addis Ababa and received in Washington on December 12, 1989

Ethiopia

Severe Food Shortages Threaten

SUMMARY

For the third time in five years, drought has sharply restricted production in the vulnerable northeastern regions of Ethiopia. Main season crop production has totally failed in major parts of the farming zones of both Eritrea and Tigray (see Map 8). Crop production has fallen approximately 80 and 50%, respectively, from the base period average in each region (1980/81 to 1983/84). Lesser though still important production shortfalls are also found in Wello, Gonder, and Harerge regions and in parts of the South. Current estimates of the total number of people requiring emergency assistance range from 3.5 million to over 5 million. The forecast production of major crops for the country as a whole (peasant sector cereals, pulses and oilseeds -- 5,917,000 metric tons) is only about 5% below the production of 1988/89 and 3% below the average for the base years of 1980/81 through 1983/84. However, the cumulating impact of an estimated annual population growth rate of 2.9% will result in a new low in net per capita domestic supply (110 kilograms) and a consequent shortfall of approximately 1,600,000 metric tons (mt) from 1990 consumption requirements. About 850,000 mt of this shortfall are judged to be either a recurring "structural" deficit, or covered by regular food aid assistance programs. Emergency food assistance requirements for 1990 are judged to be approximately 750,000 mt. As of early January, emergency assistance pledges for 1990 total 366,000 mt. Only quick action by the Government of Ethiopia, rebel groups and donors to acquire and distribute food will avert a serious human catastrophe in northern Ethiopia.

FACTORS AFFECTING FOOD SECURITY

Harvest Outcome - The following regional harvest forecasts are composed of an estimate of the 1989/90 *meher* (main) crop and an estimate of the 1990 *belg* (secondary, spring) crop, which is taken as being equal to the 1989 *belg* crop estimate. The two northwestern and two southwestern regions show increases in gross production of about 6% over 1988/89 (see Table 24). Their harvests will, therefore, fall slightly below the average production over the base period. Forecast production for 1989/90 is about equal to that of 1988/89 in the five southern and central regions. The combined southern regions' harvest forecast substantially exceeds its base period average and the central regions' forecast is moderately higher. In contrast, the forecast production in the northeastern regions is only about 55% of both 1988/89 production and base period production.

Food Needs and Availabilities - The shortfall of 1.6 million mt between net available domestic supplies and traditional consumption requirements could possibly be met with commercial imports and shipments of relief food (see Table 25). However, there is some evidence that, with the increased frequency of droughts, people have tended to reduce their consumption of traditional cereals, pulses and oilseeds and increased their production and consumption of roots, tubers and livestock products. For example, in the drought year of 1987/88, the net

Table 24: Ethiopia, Peasant Sector Production of Cereals, Pulses and Oilseeds -- Combined Meher and Belg Season Estimates for a Base Period, 1988/89, and 1989/90 (000 mt)

Zone and Region	Base Avg. 1980/81-1983/84	1988/89	1989/90
Northwest			
Gonder	590	414	433
Gojam	794	705	727
Subtotal	1,384	1,119	1,160
Southwest			
Ilubabor/Keffa	479	487	551
Wellega	487	494	519
Subtotal	966	981	1,070
South			
Sidamo/Gamo Gofa	276	477	505
Bale	86	124	130
Harerge	383	482	444
Subtotal	745	1,083	1,079
Central			
Arsi	493	583	632
Shewa	1,717	1,721	1,720
Subtotal	2,210	2,304	2,352
Northeast			
Eritrea	191	270	41
Tigray	232	330	132
Wello	795	596	498
Subtotal	1,218	1,196	671
Total	6,523	6,683	6,322

Sources and Notes: Basic data from Central Statistical Authority; estimates adjusted by USAID/Ethiopia for some regions on basis of information from other sources. Estimates for several regions have been combined to minimize inconsistencies due to establishment of new regional boundaries. Estimates for 1988/89 Belg production used for 1989/90 projections.

Table 25: Ethiopia, USAID Food Needs Assessment -- Cereals, Pulses and Oilseeds (000 mt)

	Base Avg. 1980/81-1983/84	1988/89	1989/90 Projection
Status Quo Consumption:			
-Kilogram Per Capita[1,2]	147.2	147.2	147.2
-Population (millions)[2]	40.3	48.7	50.1
Total Consumption	5,932	7,169	7,375
Gross Domestic Production:			
of Peasant Sector[3,4]			
-Meher Season	6,333	6,268	5,917
-Belg Season	190	415	415
of State Farms	250	222	239
Total Gross Domestic Production	6,773	6,905	6,571
Adjustments for:			
Seed Requirements (3%) and Post-Harvest Losses (12%)	1,016	1,036	986
Net Changes in AMC Stocks[3]	na	-63	0
Food Exports[1,3]	36	25	25
Total Net Domestic Supplies Available	5,721	5,907	5,560
In-Shipments Needed to Maintain Per Capita Consumption	211	1,262	1,815
Commercial Imports[3]	36	0	100
In-Shipments of Food Aid[1,5]	273	447	na
Carry-In Food Aid Stocks Consumed or Available[4]	na	415	110
Unmet Needs	-98	400	1,605

Sources:

[1] 1988/89 USAID Food Needs Assessment for Ethiopia, January 1989

[2] January 1984 population census and projection by Central Statistical Authority (CSA) based on assumed annual increases of 2.9 percent

[3] Basic statistical information from CSA, adjusted by USAID/Ethiopia in some instances on basis of information from other sources

[4] Includes cooperatives

[5] World Food Program

Notes: The above conclusions are based on reports of climatic and growing conditions by the Government of Ethiopia's (GOE) Relief and Rehabilitation Commission, other early warning systems and non-governmental organizations; a national balance sheet analysis of crop projections by the Food Information System project of the CSA; and the annual CSA report entitled 1989/90 Crops, Weather and Food Situation released in December. A national balance sheet analysis has been made by USAID/Ethiopia each year since 1986. The present analysis has been confined to cereals, pulses and oilseeds, because no estimates were available on production or supplies of milk, roots and tubers (included in earlier analyses). Otherwise, the same procedures were followed in this analysis as those followed in USAID/Ethiopia's 1988/89 analysis and described in that report.

domestic supply of 4.612 million mt, a carry-forward of 415,000 mt, and commercial imports and relief shipments of 1.300 million mt provided about 117 kilograms (kg) per capita. Even in the very good crop year of 1988/89 (with a net domestic supply of 5.863 million mt and in-shipments of food and drawdown of stocks totalling about 750,000 mt), supply would have been only 134 kg per capita. Many of the root and tuber crops tend to be more drought resistant. Also, these crops are not subject to required sale to the Agricultural Marketing Corporation (AMC) at low, controlled prices.

Production of livestock products is affected by reduced rainfall, but probably reacts less quickly and to a lesser degree than the traditional crops. Pasture conditions and livestock development are reported to have been generally favorable in 1989 in both pastoral and cropping areas (even in some areas in the northeastern regions). Therefore, available livestock products may help to cushion the effects of shortages of traditional foods in many areas.

Medium-Term Trends - Calculations of probable immediate- and near-future shortfalls are of importance for short- and intermediate-term planning. Restoration of normal rainfall in the future may restore production to pre-drought levels of the 1980/81 to 1983/84 base period. However, with about 25 percent more people, the small shortfalls of the base period will not be restored easily. With little likelihood of a reversal of the population trend in the near future and a low likelihood of a major short-term increase in agricultural production, the upward trend in consumption requirements and food deficits is likely to continue.

In early 1988, the government modified its policies regarding farm product prices, quota establishment, operation of private traders and movement of farm products. However, these modifications were modest and the eventual responses of farmers should be expected to be similarly modest. Even modest responses will take some time to evidence themselves. Donors were quick to respond to the policy changes by initiating the development projects agreed upon. In general, good progress has been made on getting these projects underway in spite of some of the difficulties resulting from the escalation in hostilities. Even so, major increases in agricultural production cannot reasonably be expected for some time.

POPULATIONS VULNERABLE TO OR AT RISK OF FOOD EMERGENCIES

Some indication of relative levels of need is provided by looking at local populations and area surpluses or deficits, relative to historical consumption levels. These regional calculations must be viewed with caution because of the questionable nature of the data on which they are based. Population figures are based on projections from the 1984 census. An annual growth rate of 2.9% is assumed for all regions, although the actual rate probably varies among regions. Normal movement and relocation of people has likely been disrupted by the recurrent droughts, resettlement programs and continued warfare in many areas. Consumption patterns certainly differ among and within regions, even during the base period for which consumption rates of basic commodities were calculated. As suggested above, these consumption patterns have probably shifted and the rate of change varied among different areas. Because of these data weaknesses, information in this section should be considered as indicative of relative needs and surpluses or deficits, not as absolute measures.

The per capita domestic supplies that are expected to be available in each geographic area in 1990 vary from a low of 54 kg in the drought-affected northeast to 168 kg in the surplus-producing central area (Table 26). Per capita supplies in the Northwest and Southwest of 132 and 127 kg, respectively, fall moderately below the national base period status quo consumption rate of 147 kg, with projected deficits of 115,000 mt and 144,000 mt. In the Northwest, where generally favorable weather prevailed (except in eastern Gonder), the deficits may not be of an emergency nature and might be met through regular assistance programs, or possibly through substitution of other available foods. An emergency situation would develop, however, if large numbers of needy people in Tigray or Wello were unable to obtain assistance in their home areas and were forced to migrate westward in search of food.

Table 26: Ethiopia, Forecast for Peasant Sector Net 1989/90 Production, 1990 Per Capita Supplies, and 1990 Deficits or Surpluses -- Cereals, Pulses and Oilseeds by Geographic Zone

Geographic Zone	Net Production (000 mt)	Per Capita Supplies (kg)	Deficit or Surplus (000 mt)
Northwest	986	132	-115
Southwest	910	127	-144
South	917	72	-703
Central	1,999	168	244
Northeast	570	54	-993
Total	5,382	107	-1,711

Sources and Notes: Derived from preceding tables and regional population projection by CSA. Deficit or surplus is measured relative to levels required to maintain national status quo consumption levels.

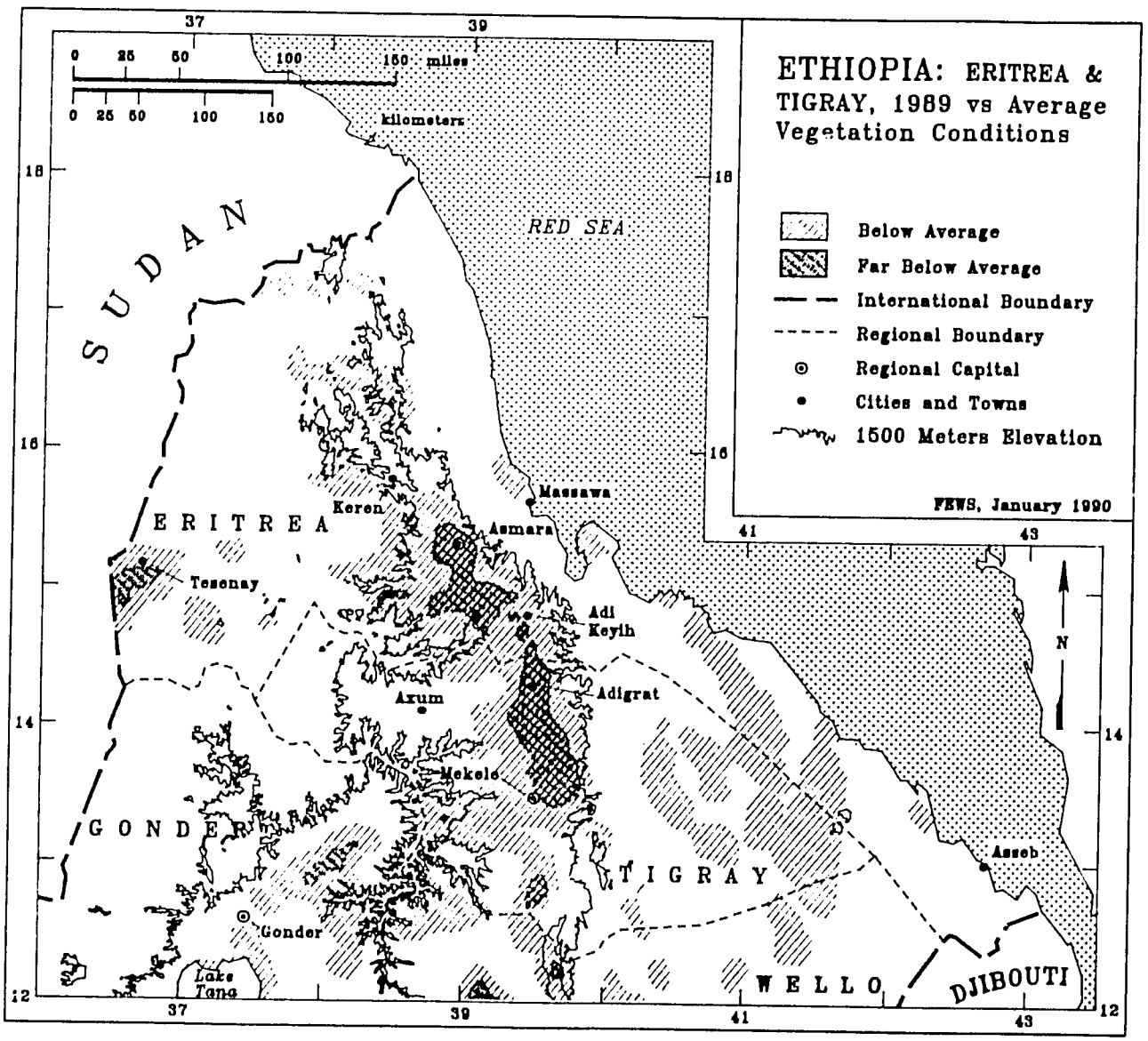
A considerably different situation prevails in the southern regions. The southern and eastern portions of these regions are pastoral areas with very low population density. People in these areas depend primarily upon food from their livestock and normally consume very small quantities of cereals, pulses and oilseeds. In western, crop-producing areas of the southern regions, root crops are produced and consumed extensively. As a result of these conditions, it might be expected that per capita production and consumption of cereals, pulses and oilseeds in these areas would be at a rate far below that in the remainder of the country. However, in the more densely populated upland cropping areas (particularly in Harerge), large quantities of cereals, pulses and oilseed are consumed. Shortages occur regularly in Harerge, and large quantities of relief food are normally provided even in good years. The production forecast for the southern regions is almost up to last year's production and is about 45% above the base period. Rangelands and

livestock are in good condition in both the uplands and lowlands. However, the unfavorable ratio of human to productive natural resources will probably necessitate substantial regular and emergency food assistance in 1990 and coming years.

Information on developments in the portions of the northeastern regions not under government control ranges from limited to non-existent (especially for Tigray). Nevertheless, information provided from satellites and limited field reports, as well as the situation in the adjacent government-controlled parts of Eritrea and Wello, indicates the strong likelihood of an emergency drought situation, particularly in central and eastern Eritrea and Tigray. Map 9 shows how season-long growing conditions appear to have been worst in agricultural areas above 1,500 meters elevation. Early reports indicate more favorable conditions in western Wello and Tigray. There is a clear consensus that massive relief assistance will be needed. Fighting has made provision of emergency relief in large parts of these regions extremely difficult. Even if surpluses existed in regions outside the northeast area, they could not be easily or quickly moved to affected areas, particularly those areas outside government control.

Most of the government and non-government organizational structures and physical facilities established during the 1987/88 drought are reported to be intact, although trucks and other transport facilities are two years older and will need extensive repairs and replacement of parts. There is an expressed need for establishing an effective coordinating mechanism for relief activities as quickly as possible and for obtaining the speedy agreement of all parties concerned to the establishment of at least one open road or relief corridor over which supplies can be moved into Tigray and Wello. Needs cannot be fully assessed, nor effective plans made, until a decision on this access is made.

Map 9



Key Terms

At Risk - FEWS Reports employ the term "at risk" to describe those populations or areas either currently or in the near future expected to be lacking sufficient food, or resources to acquire sufficient food, to avert a nutritional crisis (i.e., a progressive deterioration in their health or nutritional condition below the status quo), and who, as a result, require specific intervention to avoid a life-threatening situation.

Where possible, food needs estimates are included in the FEWS reports. It is important to understand, however, that no direct relation exists between numbers of persons at risk and the quantity of food assistance needed. This is because famines are the culmination of slow-onset disaster processes which can be complex in the extreme. The food needs of individual populations at risk depend upon when in the disaster process identification is made and the extent of its cumulative impact on the individuals concerned. Further, the amount of food assistance required, whether from internal or external sources, depends upon a host of considerations. Thus the food needs estimates presented periodically in FEWS reports *should not* be interpreted to mean food aid needs, e.g., as under PL480 or other donor programs.

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

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

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

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