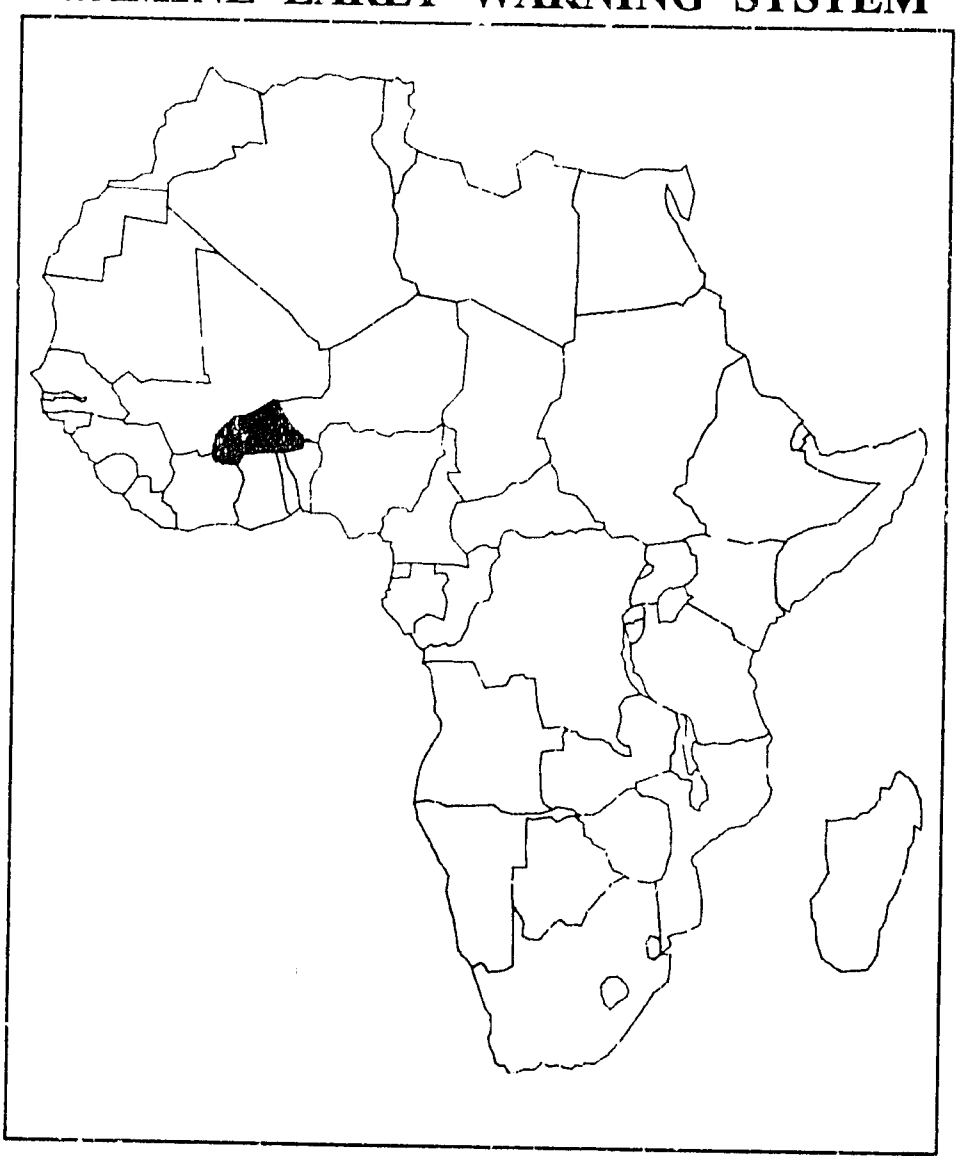
PN-ABB-408

BURKINA

Excellent Harvest

FAMINE EARLY WARNING SYSTEM



Produced by the Office of Technical Resources - Africa Bureau - USAID

FAMINE EARLY WARNING SYSTEM

The Famine Early Warning System (FEWS) is an Agency-wide effort coordinated by the Africa Bureau of the U.S. Agency for International Development (AID). Its mission is to assemble, analyze and report on the complex conditions which may lead to famine in any one of the following drought-prone countries in Africa:

- **Burkina**
- **Chad**
- **Ethiopia**
- **Mali**
- **Mauritania**
- **Niger**
- **Sudan**

FEWS reflects the Africa Bureau's commitment to providing reliable and timely information to decision-makers within the Agency, within the seven countries, and among the broader donor community, so that they can take appropriate actions to avert a famine.

FEWS relies on information it obtains from a wide variety of sources including: USAID Missions, host governments, private voluntary organizations, international donor and relief agencies, and the remote sensing and academic communities. In addition, the FEWS system obtains information directly from FEWS Field Representatives currently assigned to six USAID Missions.

FEWS analyzes the information it collects, crosschecks and analyzes the data, and systematically disseminates its findings through several types of publications. In addition, FEWS serves the AID staff by

- preparing FEWS Alert Memoranda for distribution to top AID decision-makers when dictated by fast-breaking events;
- preparing Special Reports, maps, briefings, analyses, etc. upon request; and
- responding to special inquiries.

Please note that this is the last monthly Country Report that will be published in this format. A new reporting schedule and format are being prepared.

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FEWS Country Reports, Bulletins, Alert Memoranda, and other special studies are prepared for USAID's Africa Bureau by **Price, Williams & Associates, Inc.**

The work of the FEWS Field Representatives is coordinated by **Tulane University's School of Public Health and Tropical Medicine.**

NOTE: This publication is a working document and should not be construed as an official pronouncement of the U. S. Agency for International Development.

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December 1988

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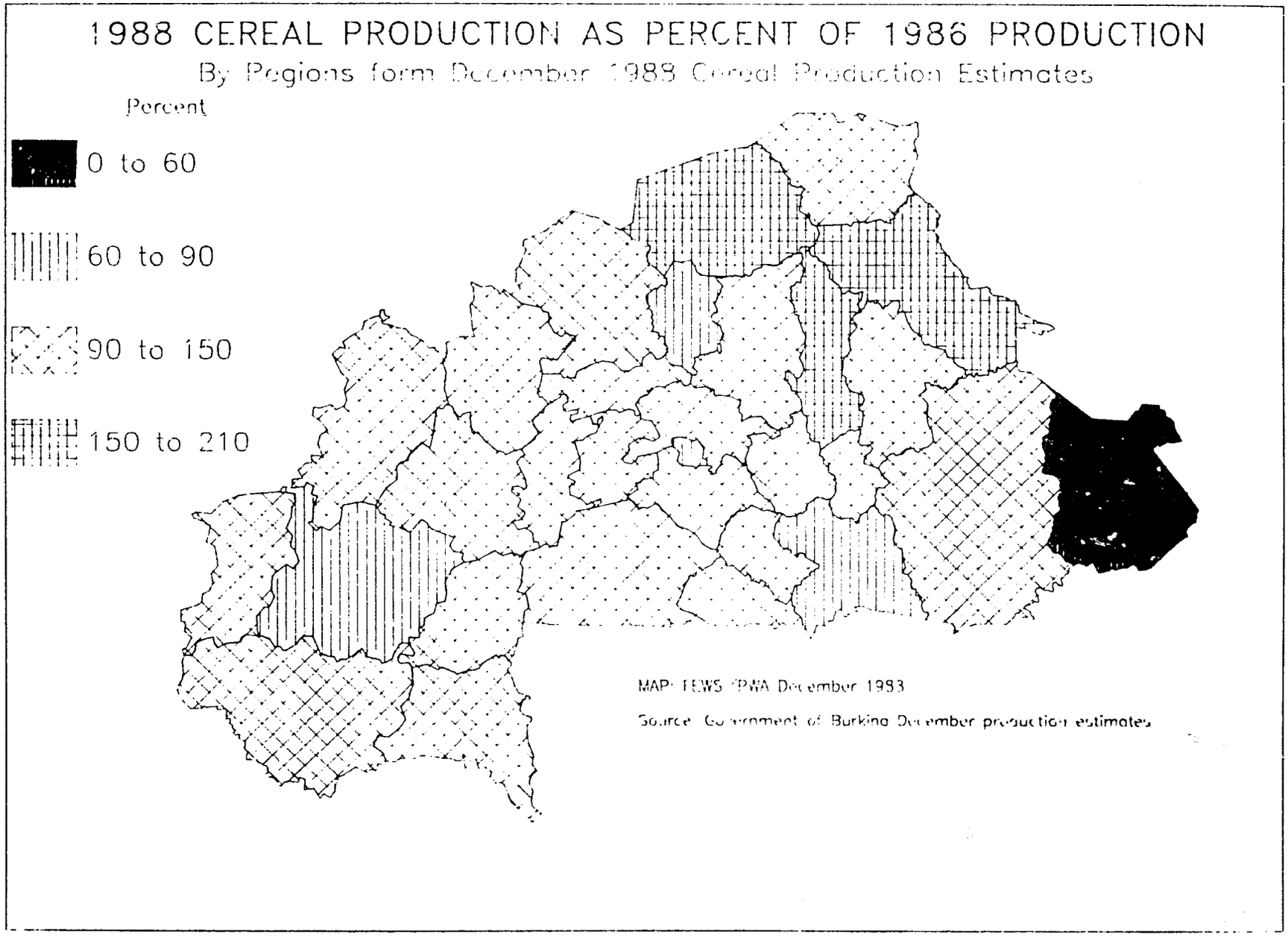
Map 1: Summary Map



Excellent Harvest

Summary

The Government of Burkina (GOB) estimates an excellent 1988 cereal harvest that will exceed the previous record harvest of 1986. The plentiful production will help eliminate year-long food supply problems stemming from last year's poor harvest. High prices and a lack of public stocks were a problem throughout most of the year. Heavy rains, flooding, and the consequent loss of key transport routes exacerbated the food shortages in some areas, especially in the North. This year's excellent harvest will leave only one of Burkina's 30 provinces, the northern Sahelian province of Oudalan, with substantially less grain than it requires for its annual needs. Some of the 6,000 metric tons (MT) of Section 416(d) sorghum sent by the U.S. to relieve the grain shortage in Burkina's Sahelian provinces was distributed in areas affected by flooding.

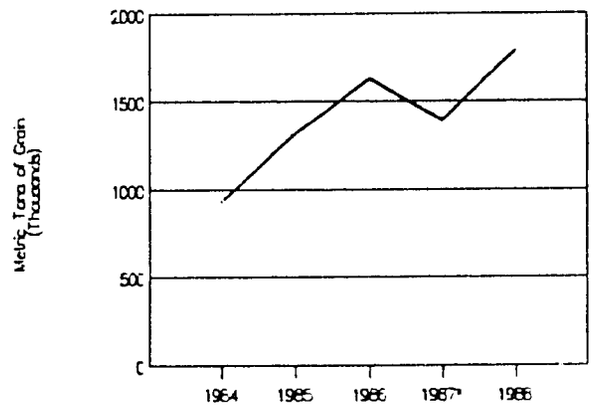
Areas of Food Shortage and Vulnerability in 1988

The northern provinces of Burkina experienced food supply problems throughout the rainy season. Extremely high cereal prices and a lack of public stocks in these areas exacerbated the effects of a very poor harvest in 1987. The Government of Burkina made its initial request for 15,000 MT of food aid in January 1988, when it estimated that approximately 200,000 people would be at-risk in the provinces of Oudalan, Soum, Séno, Yatenga, Bam, Sanmatenga, Namentenga, Sourou, Passoré, and Oubritenga. The GOB distributed 2,000 MT of cereals, financed through the sale of rice donated by the Italian government, in seven of the provinces at risk. Non-governmental organizations (NGOs) responded to the GOB's request with 3,000 MT of grain that were sold below market price. The German Federal Republic contributed 7,000 MT of grain that was also sold below market price (1,500 MT of this grain were not sold because of shipping problems). The United States contributed 6,000 MT of Section 416 (d) sorghum. This grain was not distributed to its target areas until late in the season, due to GOB logistic and organizational problems.

1988 Agricultural Production

The GOB estimates that this year's gross cereal harvest will yield 2,100,563 MT, which is 585,759 MT more than the 1987 harvest estimate and 213,482 MT greater than the record harvest of 1986 (see Figure 1). This year's estimate is still only preliminary; it is based on a sample from only 22 of Burkina's 30 provinces. Estimates for the remaining 8 provinces were developed by increasing last year's estimates by 104%. This excellent agricultural year was primarily due to the exceptional rains of 1988. Map 3 shows a comparison of 1988 and 1986 rainfall and suggests why the 1988 harvest was so much better than that of 1986.

Figure 1



Abundant rains in the northern province of Oudalan (150% to 200% of 1986 rains) enabled farmers there to increase production by 25% over the 1986 level and nearly three times over the 1987 level. Nevertheless, Oudalan Province historically does not produce enough cereal to meet local consumption requirements and this year's exceptional production will still meet only half of the coming year's estimated cereal needs. Oudalan's normal marginal conditions were not helped by shortages of seed for planting and crop damage from flooding (especially to sorghum). Tapoa Province, which in 1986 and 1987 produced a cereal surplus, this year will produce just barely enough to meet its needs (see Map 1 and Table 1). A reduced level of production for Tapoa Province (43% below 1986 levels) conforms with observed precipitation levels below those of 1986 (Map 3), and reports of drought in northern Togo.

Rangelands in Burkina have clearly benefitted from this season's good rains. Livestock should be in generally good shape for the coming dry season. These conditions will be particularly beneficial for this year's crop of heifers and bulls; they will be able to enter into the dry season well-fed and stronger than in recent years. Milk products should be in abundance due to good forage and easily accessible surface water.

Rainfall

Rainfall data for the 1988 growing season shows that, as a whole, this year's rains have been well above the short-term average (1984 to 1987) and close to the 30-year average. The isohyet maps (2, 3, and 4) show that cumulative rainfall in Burkina was above that of 1986 and above the 1984-1987 average. Maps 2 and 3 show that the areas around Ouagadougou (Kadiogo, Oubritenga, and Bazega) received less rain than other parts of the country. The apparently poor rainfall in these areas is consistent with estimates of relatively low production increases there.

Most of the areas in Burkina that FEWS had identified as vulnerable in the June 1988 Vulnerability Report experienced abundant rains, well distributed across the growing season. The provinces judged to be particularly vulnerable to food shortages if 1988 yielded a poor harvest were Yatenga, Bam, and the northern regions of Sanmatenga and Namentenga Provinces. Map 3 shows that this year's cumulative rainfall in these areas was well above that of 1986. Barring still to be received evidence of a drastic reduction in area planted, or confirmation of excessive damage from pests or floods, this year's harvest should equal or surpass the 1986 production level (as reported by the GOB). These areas will end the season with good to excellent cereal stocks and with livestock in good or very good shape.

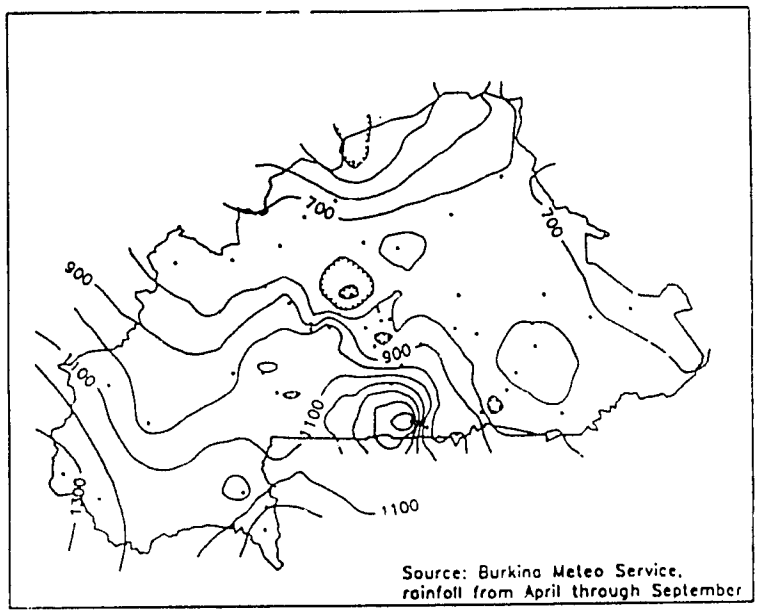
Vegetation Index

Further confirmation of the exceptional nature of this growing season is provided by the vegetation index (Normalized Difference Vegetation Index, see NDVI on inside back cover). This year's NDVI is well above that of the 1984 to 1987 average. It is interesting that although the Fada-N'Gourma area of Burkina was the only area that received less than the long-term (30 year) average rainfall in Burkina,

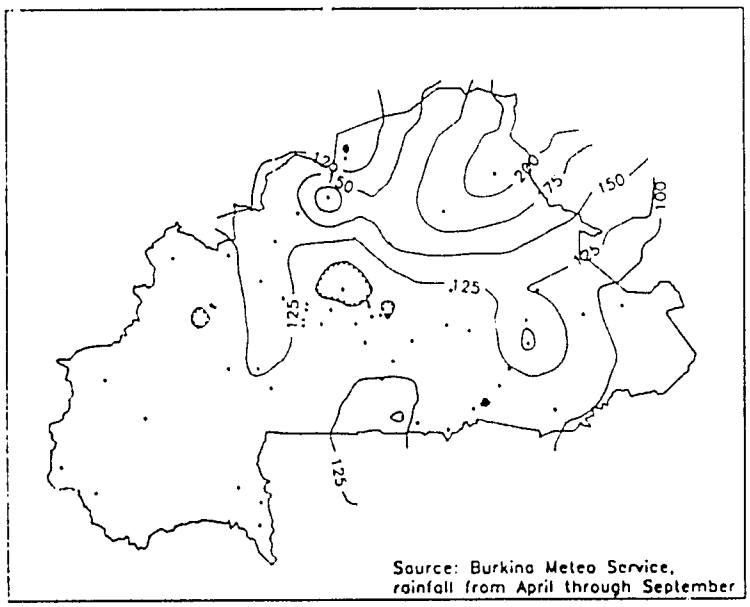
Maps 2, 3 and 4

BURKINA 1988 CUMULATIVE RAINFALL (MM)

Map 2



BURKINA PERCENT RAINFALL 1988 TO 1986



Map 3

PERCENT: 1988 RAINFALL TO 84–87 MAXIMUM

Map 4

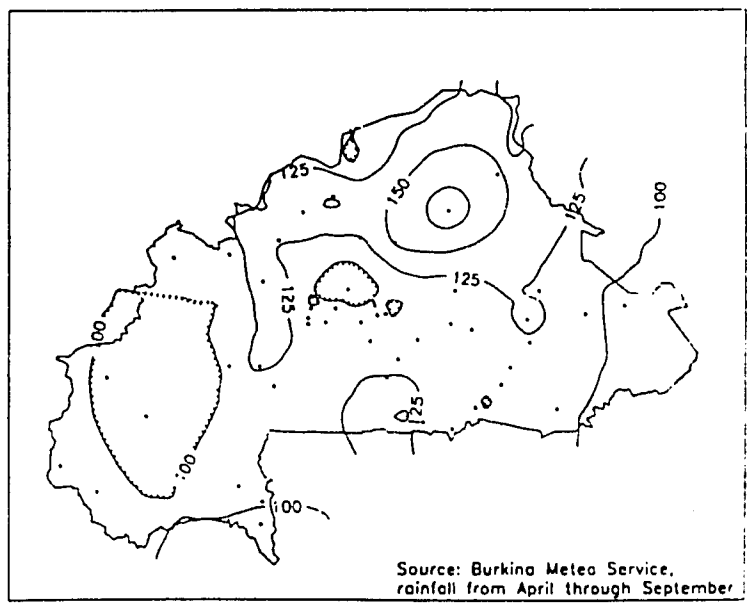


Table 1

BURKINA FASO CEREAL BALANCE SHEET 1984 TO 1988

Province	Population Estimate for June 1989	Gross Cereal Production 1988	Net Cereal Production (MT) 1984	1985	1986	1987*	1988	Cereal Needs (MT) 1984	1985	1986	1987	1988	% Cereal Needs Met by Local Production 1984	1985	1986	1987	1988	1987 Prod. as % of 1986	1988 Prod. as % of 1986	1988 Prod Months of Stocks on Hand
Bam	171,005	37,190	16,055	28,181	38,488	10,600	31,612	31,448	31,629	31,995	2,035	32,833	51%	89%	120%	35%	96%	29	80	11.6
Bazega	336,055	96,808	48,216	69,053	79,672	52,487	82,287	58,560	59,322	60,876	62,470	64,523	82%	116%	131%	91%	128%	69	97	15.3
Bougouriba	235,300	74,588	37,746	49,880	48,189	44,459	63,400	42,349	42,716	43,459	44,214	45,178	89%	117%	111%	109%	140%	98	127	16.8
Boulgou	441,568	100,180	38,413	86,760	96,489	64,233	85,153	76,946	77,947	79,989	82,084	84,721	50%	111%	121%	85%	100%	70	83	12.1
Boulkiemde	381,064	96,791	41,044	67,969	64,721	43,965	82,272	69,576	70,044	70,990	71,948	73,164	59%	97%	91%	66%	112%	72	123	13.5
Comoe	278,876	90,211	63,187	69,258	66,208	65,330	76,679	47,731	48,468	49,976	51,532	53,544	132%	143%	132%	137%	143%	103	108	17.2
Ganzourgou	213,140	62,238	17,469	39,735	56,530	37,023	52,902	37,409	37,859	38,777	39,716	40,923	47%	105%	146%	101%	129%	69	89	15.5
Gnagna	255,207	66,808	6,259	48,706	51,019	61,921	56,787	43,680	44,354	45,735	47,158	49,000	14%	110%	112%	142%	116%	127	104	13.9
Gourma	327,427	107,885	29,167	43,195	91,168	45,740	91,702	56,041	56,906	58,677	60,503	62,866	52%	76%	155%	82%	146%	53	94	17.5
Houet	385,448	121,675	74,605	89,111	133,895	86,474	103,424	111,256	113,408	117,863	122,530	74,006	67%	79%	114%	76%	140%	67	123	16.8
Kadiogo	18,118	7,123	18,196	4,497	8,244	2,478	6,055	86,731	89,802	95,637	102,086	3,479	21%	5%	9%	3%	174%	30	2019	20.9
Kenedougou	152,958	44,826	32,667	34,025	41,602	32,103	38,102	26,654	27,001	27,708	28,434	29,368	123%	126%	150%	122%	130%	81	86	15.6
Kossi	364,146	136,015	54,026	72,730	86,203	119,771	115,613	63,000	63,881	65,680	67,530	69,916	86%	114%	131%	192%	165%	146	126	19.8
Kouritenga	214,250	46,977	21,738	29,254	31,272	27,889	39,930	37,603	38,056	38,979	39,923	41,136	58%	77%	80%	76%	97%	94	121	11.6
Mouhoun	318,739	88,180	57,830	66,249	75,557	59,790	74,953	55,145	55,916	57,491	59,110	61,198	105%	118%	131%	109%	122%	83	93	14.7
Nahouri	114,860	28,002	13,483	15,381	16,895	16,414	23,802	20,087	20,339	20,851	21,377	22,053	67%	76%	81%	83%	108%	102	133	13.0
Namentenga	208,350	65,249	22,373	13,190	32,728	14,182	55,462	38,041	38,297	38,814	39,338	40,003	59%	34%	84%	39%	139%	46	164	16.6
Oubritenga	317,799	69,358	31,571	60,951	60,842	40,574	58,954	58,025	58,415	59,204	60,003	61,017	54%	104%	103%	73%	97%	71	94	11.6
Oudalan	116,118	16,289	765	10,370	10,244	4,216	13,846	20,162	20,434	20,989	21,560	22,295	4%	51%	49%	21%	62%	43	127	7.5
Passore	231,234	78,871	36,358	47,705	65,752	29,081	67,040	43,139	43,305	43,638	43,974	44,397	84%	110%	151%	71%	151%	47	100	18.1
Poni	249,086	58,576	39,540	45,121	49,751	33,375	49,790	44,831	45,218	46,005	46,805	47,824	88%	100%	108%	77%	104%	71	96	12.5
Sangui	228,777	66,268	21,104	39,461	47,899	32,706	56,328	41,771	42,052	42,620	43,195	43,925	51%	94%	112%	82%	128%	73	114	15.4
Sanmatenga	391,275	105,935	48,725	56,744	73,590	35,877	90,045	70,422	71,032	72,267	73,523	75,125	69%	80%	102%	53%	120%	52	118	14.4
Seno	252,680	60,615	9,690	31,559	24,977	18,794	51,523	43,873	44,465	45,674	46,915	48,515	22%	71%	55%	43%	106%	79	194	12.7
Sissili	278,504	61,939	23,061	33,855	41,701	115,772	52,643	46,987	47,804	49,481	51,217	53,473	49%	71%	84%	244%	98%	290	117	11.8
Soum	209,206	46,637	15,045	9,088	19,120	27,955	39,641	36,325	36,815	37,816	38,844	40,168	41%	25%	51%	78%	99%	154	195	11.8
Sourou	295,107	75,212	30,910	49,768	56,300	46,154	63,930	51,056	51,770	53,228	54,727	56,661	61%	96%	106%	91%	113%	66	107	13.5
Tapoa	177,138	36,046	25,827	28,099	53,371	44,327	30,639	30,318	30,786	31,744	32,732	34,011	85%	91%	170%	145%	90%	86	53	10.8
Ystenga	551,806	108,991	24,976	51,352	77,128	44,462	92,642	102,946	103,341	104,136	104,937	105,947	24%	50%	74%	45%	87%	62	118	10.5
Zoundweogo	167,016	45,080	31,062	26,546	32,028	31,680	38,318	29,631	29,945	30,582	31,233	32,067	105%	89%	105%	110%	119%	105	114	14.3
TOTAL	8,725,835	2,100,563	931,108	1,317,794	1,631,879	1,394,020	1,785,479	1,521,743	1,541,129	1,580,880	1,621,985	1,675,360	61%	86%	103%	86%	107%	83	103	12.8

* 1987 data is aproximate it represents a 7% reduction of 1987 provincial production. New figures for 1987 data is not yet available by province.

satellite imagery shows the vegetation level in this area was well above the 1984 to 1987 average (rainfall from 1988 was above the quite low 1984 to 1987 average, but below the long-term average). Indeed, vegetation levels were above average throughout much of the country for the duration of the growing season (see Map 5).

Pests

Crop damage from locusts and grasshoppers was not as serious this year as had been predicted earlier in the season. This was in part due to the extreme northern position of the Inter-tropical Convergence Zone (see explanation of ITCZ on inside back cover), which kept grasshoppers and locusts farther north than usual. However, the abundant rains provided good vegetation and breeding conditions for the pests. Especially for Desert Locusts, the larger than normal populations that will be left in Burkina and those that may go to, and later return from, winter breeding areas in North Africa may produce a significant threat to crops in Burkina next year.

Floods

Burkina suffered considerable damage from floods as a result of the August rains. Sixteen persons died and 1,144 houses were destroyed by flooding and excessive moisture. While some damage to fields was reported, the increase in production due to good rainfall will more than compensate for any flood damage to fields. The exception is in Oudalan Province, where significant portions of the planted areas were damaged during the floods, reducing production in the province. Oudalan is the only province in Burkina where flood damage has been described as having had a significant negative impact on the harvest.

Cereal Prices

The prices of millet and sorghum have dropped in all markets. There is as yet no indication of whether the prices of coarse grains will drop to such an extent that they will depress the cereals market or create a disincentive for farmers to plant as much or more land next year.

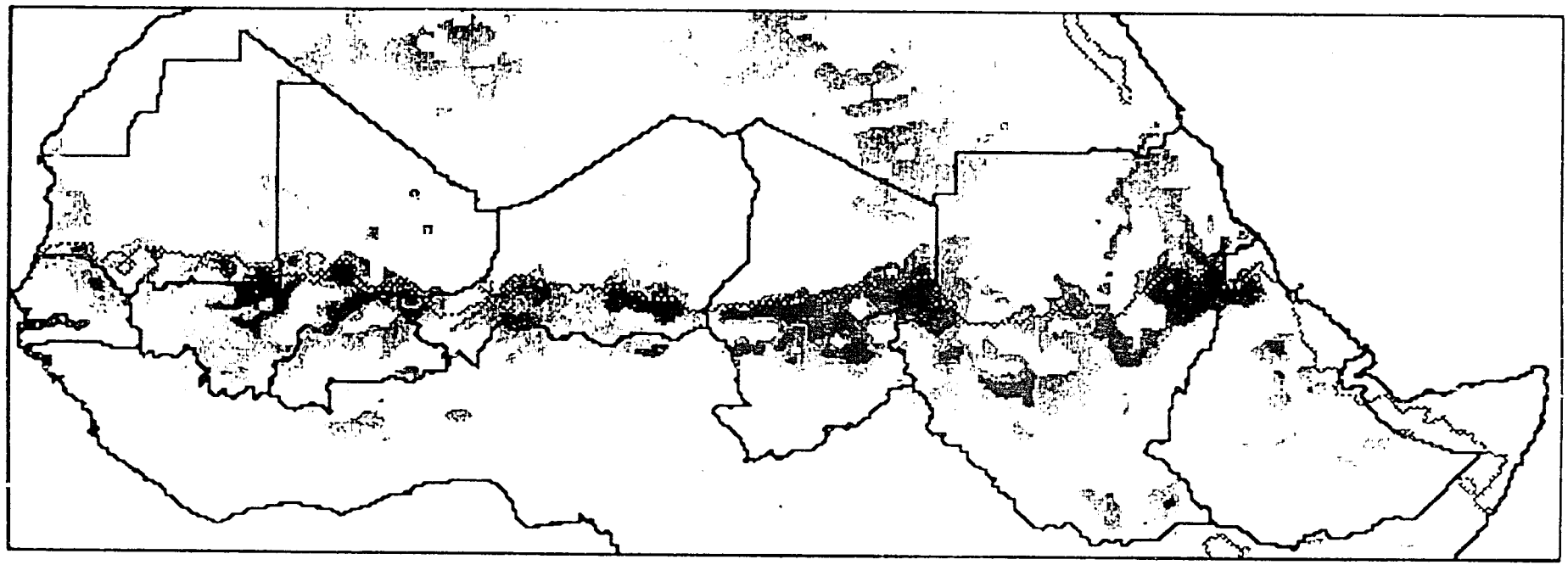
Outlook

Burkina ends this agricultural season with a very good harvest and should be able to meet most of its national cereal needs for the coming year. There will be no areas that are vulnerable to severe grain shortages other than Oudalan Province, and perhaps Tapoa Province if harvest estimates are found to be optimistic or pest damage under-estimated. Nevertheless, in Oudalan, the usual need to purchase grain and to supplement the diet with other food items will be much less than in recent years, due to its relatively good harvest. In other areas, the vulnerabilities to food shortage will be at a more local level than the province, and much harder to track during the year. It will be important to track two factors as the year progresses: (1) estimates of on-farm cereal stocks in areas of potential vulnerability and (2) levels of public and private cereal stocks in the North.

Regional Summary

From Mauritania east to Ethiopia, the FEWS-monitored countries report excellent rainfall (in terms of recent history) during the 1988 growing season. Satellite imagery showed vegetative potential to be very good, and in some areas better than the historical (1982-1987) maximum (see Map 5). While estimates vary, record production can be expected in Sudan, Chad, Niger, and Mali. Production is expected to be good or better in Ethiopia and Burkina. The only exception to this good agricultural year may be Mauritania, which is the only country where predictions of significant (at a national level) locust damage might be borne out. Mauritania, however, is a grain-importing nation even in the best of years.

Regional NDVI Greater than Historical Maximum



Areas where 1988 NDVI reached levels significantly higher than the 1982-87 record

····· Historic northing of the 0.2 NDVI contour (which corresponds very closely with the 1988 contour)

The areas of greatest vulnerability currently lie where war and civil strife limit access to food. There is a famine among displaced people in and around the Southern Region of Sudan. In Ethiopia, civil war in Eritrea and Tigray continues to make populations there extremely vulnerable to famine. Elsewhere, vulnerable populations are more localized.

Key Terms

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

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

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

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

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

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