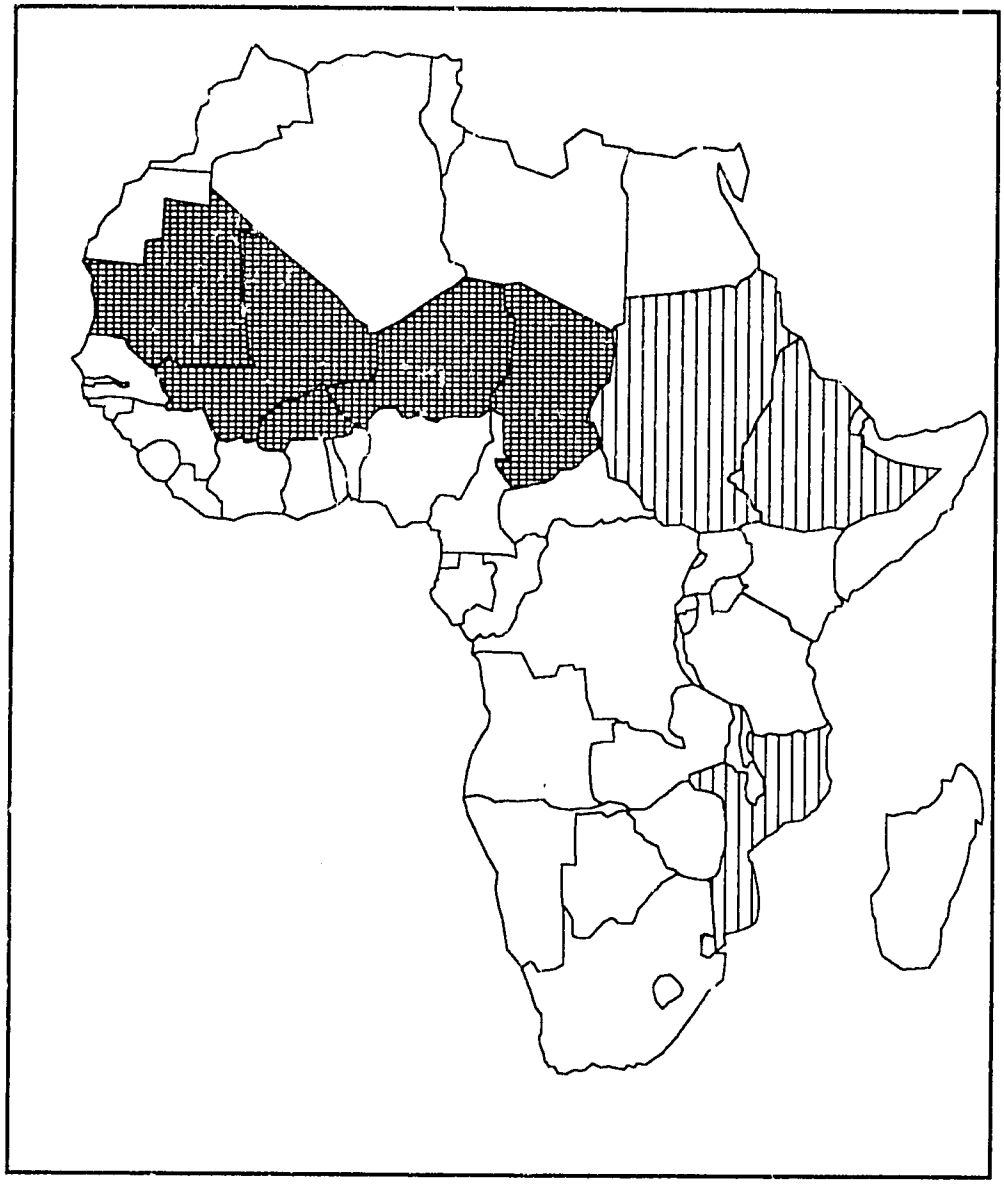
Report Number 11
May 1987

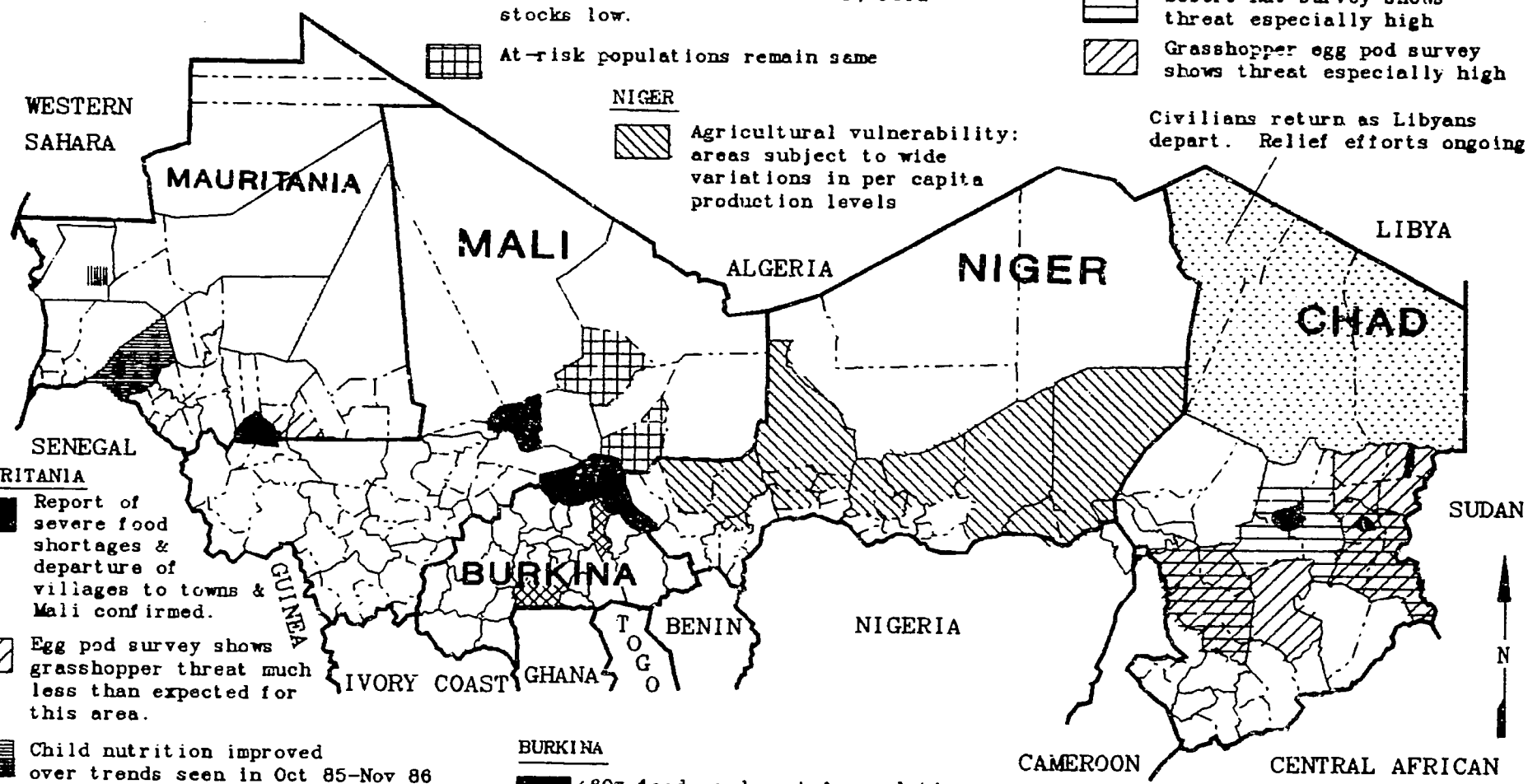
FEWS Country Report

BURKINA, CHAD, MALI, MAURITANIA, and NIGER



Africa Bureau
U.S. Agency
for International
Development

Summary Map



FEWS/PWA, May 1987

MAP 1: CHAD, NIGER, BURKINA, MAURITANIA, MALI

Famine Early Warning System Country Report

BURKINA
CHAD
MALI
MAURITANIA
NIGER

Rains Approach

Prepared for the
Africa Bureau of the
U.S. Agency for
International Development

Prepared by
Price, Williams & Associates, Inc.
May 1987

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INTRODUCTION

This is the eleventh in a series of monthly country reports issued by the Famine Early Warning System (FEWS). Burkina, Chad, Mali, Mauritania, and Niger are combined in one report. Individual country reports will be resumed next month as the crop cycle begins again. These reports are designed to provide decisionmakers with current information and analysis on existing and potential nutritional emergency situations. Each situation identified is described in terms of geographical extent, the number of people involved, or at-risk, and the proximate causes insofar as they have been discerned. Information sources are cited in the text. Information has, whenever possible, been presented in the form of quantified data. When quantified data do not exist, qualitative data are used.

Use of the term "at-risk" to identify vulnerable populations is problematical since no generally agreed upon definition exists. Yet it is necessary to identify or "target" populations in-need or "at-risk" in order to determine appropriate forms and levels of intervention. Thus, FEWS reports will employ the term "at-risk" to mean...

> ...those persons 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.

Perhaps of most importance to decisionmakers, the process underlying the deteriorating situation is highlighted by the FEWS effort, hopefully with enough specificity and forewarning to permit alternative intervention strategies to be examined and implemented. Food assistance strategies are key to famine avoidance. Other types of intervention, however, can be of major importance both in the short-term and in the long-run, including medical, transport, storage, economic development policy change, etc.

Where possible, estimates of food needs are included in the FEWS reports. It is important to understand, however, that no direct *a priori* relationship exists between numbers of persons at-risk and the quantity of food assistance that may be needed. This is because famines are the culmination of slow-onset disaster processes which can be extremely complex.

The food needs of individual populations at-risk depend upon when in the disaster process they are identified, and the extent of the cumulative impact on the individuals concerned. Furthermore, the amount of food assistance required, whether from internal or external sources, depends upon a great number 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).

FEWS does not collect primary data. Rather, it receives information from various domestic U.S. and international agencies and private voluntary organizations, and from government agencies in the countries under study via in-country FEWS Public Health Advisors. The information is then examined, compiled and analyzed for its predictive potential. Without the ongoing cooperation of all these organizations, FEWS could not function.

In particular, this report owes a debt to various offices of the US Agency for International Development (AID), USAID/Ouagadougou, USAID/N'Djamena, USAID/Bamako, USAID/Nouakchott, and USAID/Niamey; Peace Corps/Mauritania; the Government of Burkina (GOB) Ministry of Agriculture, National Cereal Marketing Board (OFNACER), and National Institute of Statistics and Demography; the Government of Chad (GOC) Ministry of Food Security and Displaced Persons (MSAPS) and the multi-ministry-donor-PVO Food Action Committee (CASAD); the Government of the Republic of Mali (GRM) Committee for Aid to the Victims of the Drought (CNAVS) Systeme d'Alerte Precoce (SAP, Early Warning System); the Government of the Islamic Republic of Mauritania (GIRM) Crop Protection Service (CPS) and Food Security Commission (CSA); the Government of the Niger (GON) Office of Food Products (OPVN); the European Agency for Development and Health (AEDES); the UN World Food Program (WFP); Catholic Relief Services (CRS), Doctors Without Borders (MSF), World Vision (WV), Terres des Hommes (TDH), CARE, and OXFAM.

FEWS is operated by AID's Office of Technical Resources in the Bureau for Africa in cooperation with numerous USG and other organizations.

SUMMARY

The provinces in **Burkina** that are currently at-risk and most likely to have cereal deficits this year are Seno, Oudalan, and Soum. The limited food availability in Seno and Oudalan is complicated by potential inaccessibility as the rains approach. Evidence suggest that Burkina's capacity to feed its people with domestically grown crops is declining. Burkina's grasshopper campaign, scheduled to begin May 1, could save about $22 million if the 450,000 hectares (ha) targeted for treatment are as acutely affected as last year's treated area. **Chad's** zones of vulnerability continue to be Borkou-Ennedi-Tibesti (B.E.T.) Prefecture, south-central Batha Prefecture, eastern Biltine Prefecture and northwestern Ouaddai Prefecture. Chad is currently experiencing a rodent infestation that will threaten the 1987 harvest from the start of planting. The number and location of populations at-risk in **Mali** have changed little from previous months. There are approximately 106,000 people at-risk in Bourem and Ansongo Cercles (Gao Region), and another 350,000 to 685,000 people in Gao, Tombouctou, Mopti, and Koulikoro Regions are affected by serious stress on the food supply. In **Mauritania**, there has been a confirmed report that 11,000 to 22,000 people have left their villages in one area along the Mali border because of severe food shortages. Nutrition data have shown that rates of malnutrition have measurably declined in Brakna Region, after a 14 month trend of increase. In contrast, malnutrition rates in Akjoujt Town, Inchiri Region, have continued to increase through the harvest season. Patterns and characteristics of agricultural vulnerability in **Niger** have been mapped and analyzed in this report.

Key Events

- The rainy season begins in early May in Burkina and southern Chad, and should begin by the end of the month in the Sudanian zones of Mali and Niger.

- The first treatment phase of the grasshopper control programs should be underway by the end of the month -- ahead of the hatching of the first generation -- in all countries but Mauritania, which will have about a one month respite.

BURKINA

Burkina's 1986 record cereal harvest of 1.9 million metric tons was unevenly spread throughout the country. While most provinces have cereal surpluses, four provinces are experiencing severe cereal deficits (less than 60% of food needs met), and three provinces are experiencing moderate cereal deficits (less than 85% of food needs met). Provinces likely to experience stress on food supply during the coming lean season, in order of expected severity, are: Oudalan, Seno, Soum, Namentenga, Yatenga, and Sissili (Map 2).

Inaccessibility

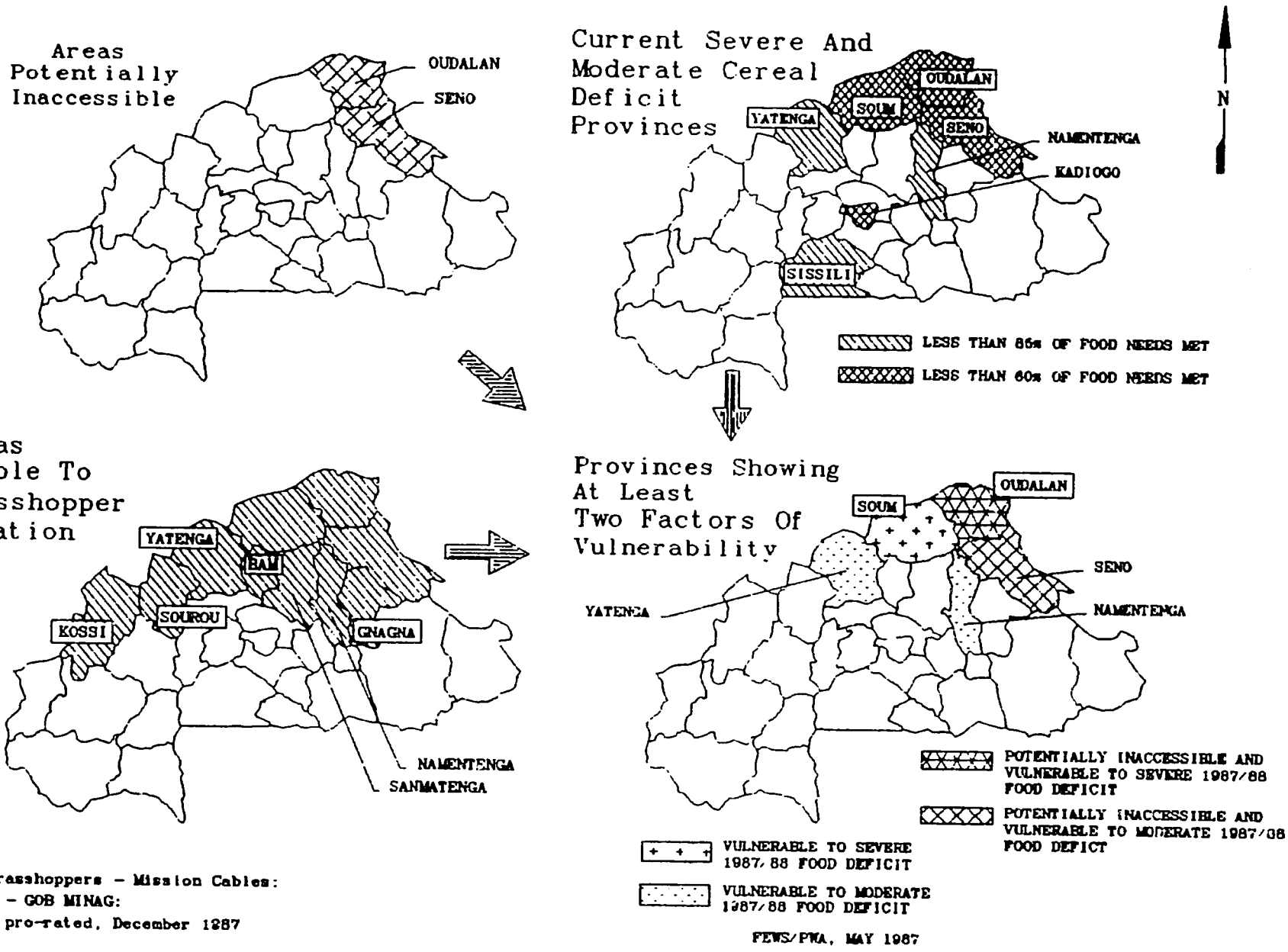
Of the provinces listed above, Oudalan and Seno are most vulnerable to food shortages. Cereal production and current OFNACER stocks meets 47.8% and 60.8% of food needs respectively. It is unlikely, in view of the past three harvests, that farmers in these two provinces have significant on-farm cereal stocks (Table 1). Additionally, the main road that runs from Ouagadougou to Dori, the capital of Seno Province, and continues to Gorom-Gorom, the capital of Oudalan Province, is prone to washing out during the rainy season. These two provinces could become rapidly isolated as the rains intensify. Since cereal stocks are simultaneously diminishing at this time, Oudalan and Seno should be closely monitored.

Agricultural Conditions

Agricultural production has been poor for the past three years in the provinces shown in Table 1. All of these provinces have experienced severe production deficits in at least one year out of the past three, and five of the provinces have recently weathered two such years. Soum, Oudalan, and Kadiogo have each endured three successive years of severe production deficits. This portends severe food deficits in 1988 for populations in Soum and Oudalan provinces. Projecting from 1986 and 1987 figures, Soum and Oudalan will meet 51.1% and 37.6% of their respective food needs in 1988 (see Table 1 for explanation). Cereal prices and malnutrition rates should be monitored for sudden escalations as the harvest approaches in October. Kadiogo, while experiencing the greatest per capita cereal production deficit, is of the least concern as it is the administrative hub of Burkina, and the majority of its population is not dependent upon agriculture for their main source of income.

Sanmatenga, Namentenga, Sissili, and Seno Provinces are likely to confront moderate cereal deficits in 1988. They, like the other provinces below, have failed to meet more than 85% of food needs in any one of the past three years. Although one of those years, 1984 (which supplies 1985 food needs), was exceptionally poor, net cereal production in 1985 and 1986 was excellent for Burkina, meeting 102.1% and 101.7% of food needs, respectively.

Zones of Vulnerability



Source: Grasshoppers - Mission Cables:
Food Needs - GOB MINAG:
GOB census pro-rated, December 1987

Map 2: Burkina

Sluggish agricultural production in these provinces during the past two years, when most provinces had cereal surpluses, suggests that it is unlikely they will respond robustly during this agricultural year.

Table 1: Percent of Food Needs Met[1]

Province	1985	1986	1987	1988 Estimate[2]
Kadiogo	24.3[3]	5.7	8.3	6.4
Oudalan	4.4	58.9	47.8	51.1
Soum	48.4	28.4	49.7	37.6
Seno	25.8	82.3	53.9	65.1
Yatenga	28.5	58.5	73.8	65.4
Sissili	57.2	81.5	82.6	77.8
Namentenga	68.9	40.4	83.6	60.9

Source: GOB MINAG: GOB Census pro-rated from 1985 to October 1986 and 1987.

(1) Figures do not include OFNACER stocks.
(2) Estimate based on the average cereal production for 1985 and 1986, and 1988 projected population.
(3) This figure appears far too high and may include GOB stocks.

Preliminary evidence suggests that Burkina's capacity to feed its people with domestically grown crops is declining. The 1986 harvest of 1.9 million metric tons (MT) was 5% greater than the 1.8 million MT harvested in 1985. Yet, the 1986 harvest met 0.4% less of the national food needs than the 1985 harvest. If 1985 and 1986 were below average years for Burkina, this trend might not be worrisome. But, according to United Nations Food and Agricultural Organization reports, 1986 gross cereal production was a record, exceeding the 1980-1985 average by 151% and surpassing "normal" production by 154%. "Normal" is defined as a ten year average that assumes no climatic abnormalities or other man-made causes interfered with production. In the past two years, cereal production in Burkina has hovered about the 100% threshold for cereal self-sufficiency. Unless increased yields or hectarage can register record harvests at an exponential rate, production will not keep pace with Burkina's 2.5% growth rate and subsequent years will be marred by spiraling cereal deficits.

Grasshoppers

It is estimated that the entire grasshopper campaign (Phases I and II) will require $3.4 million in assistance. As of March 14, $2.96 million have been pledged by the international community. Phase I, is scheduled to

begin after the first major rains, which usually occur in early May. Although eggpod surveys in anticipation of the 1987 campaign were not carried out, the location of hopper outbreaks will be detected by field staff who are in a position to report on hopper sightings. The USAID mission has reported that the original Phase I target of 50,000 hectares (ha) to be controlled by ground treatment and 100,000 ha by air, has changed. A greater than expected effectiveness by the three truck-mounted mist blowers, as well as an increased number of village agents and donations for small backpack sprayers, will allow a larger portion of the campaign to occur on the ground. The aerial target has, concurrently, been reduced. The exact number of hectares targetted for ground treatment will depend upon the number and intensity of grasshopper sightings.

Current pledges of propoxur exceed the 700 MT necessary for ground treatment during Phase I, however, late delivery may pose problems. The total anticipated stocks of 32,500 liters of fenitrothion 1000 ULV (used for aerial treatment) for this phase are sufficient to treat 130,000 ha. This is more than adequate for the aerial treatment target of the first phase, and it is expected that surplus stocks will be carried over to help meet the Phase II aerial treatment target of 275,000 ha. In addition to this expected surplus, 60,000 liters of fenitrothion ULV 1000 have been pledged for Phase II. The ground treatment goal for the second phase is 25,000 ha.

CHAD

Chad's 1986 cereals harvest was as good as any in the past twenty years. Even so, there are still a few places where local production will not be sufficient to meet all of the food needs during the upcoming lean season (basically June through September or October). While food prices have begun to rise, as is usual at this time of year, the price of millet in N'Djamena during early 1987 has consistently been less than half that seen during the same period in 1986. The Government of Chad (GOC) has identified a growing threat to the upcoming crop season from rodents. At present, there are insufficient supplies in-country with which to address the problem. The grasshopper control campaign has been organized, and supplies for the aerial portion have begun to arrive. There appear still to be gaps in supplies and funding for the ground portion, however, which could prolong the entire effort.

Populations At-Risk

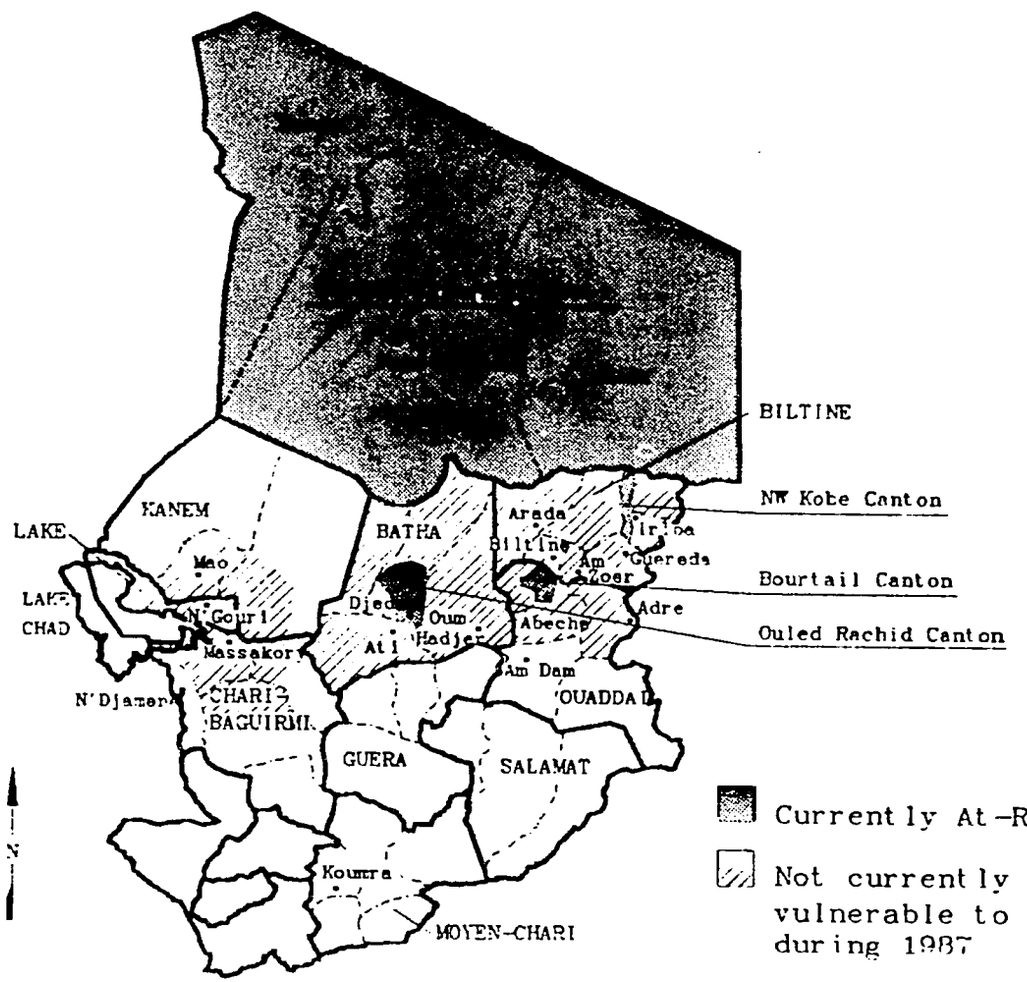
Areas of Chad containing populations at risk of nutritional crisis before the end of the upcoming lean period include, in order of decreasing immediacy: all of Borkou-Ennedi-Tibesti (B.E.T.) Prefecture; Ouled Rachid Canton of Djedaa Sub-prefecture, Batha Prefecture; Northwest Kobe Canton of Iriba Sub-prefecture, Biltine Prefecture; and Bourtail Canton of Abeche Sub-prefecture, Ouaddai Prefecture (Map 3). Individual villages in other areas of Chad's sahelian zone will also require some amount of food assistance during the summer.

The food for meeting the need identified so far is available in-country in the form of emergency food aid, regular food aid, and food-for-work reserves. The Food Action Committee (CASAD, a multi-donor-PVO-GOC ministry committee) is advocating the use of Chadian grain for food aid activities whenever possible. The UN Drought Relief Organization (UNDRO) has begun a campaign to provide relief to people returning to B.E.T. Barring unforeseen widespread calamity, it is unlikely that any further external food aid will be required for Chad during 1987.

Grain prices have begun to rise in most of the market towns of the sahelian zone, which is usual as the annual lean period approaches. As would be expected, the rise is most pronounced in the smaller market towns that are near the areas currently noted as at-risk. Data at this level have been collected only since June 1986, however, so it is not possible to tell whether the degree of price increase seen in any particular market signals an alarming scarcity of grains. In every market monitored, there was a drop in grain prices at the end of harvest, which is a good sign. In N'Djamena, the one market which

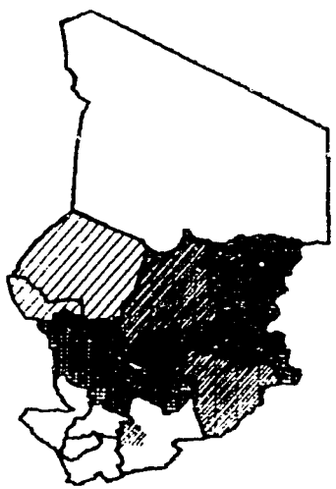
MAP 3: CHAD

Zones of Vulnerability



Currently At-Risk

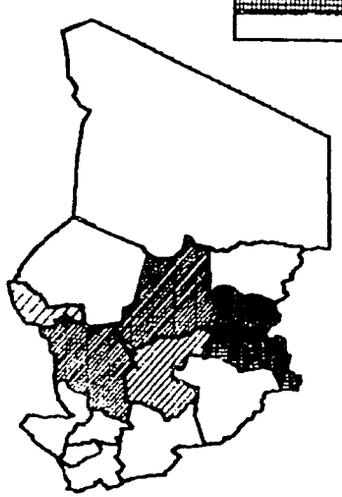
Not currently At-Risk, but vulnerable to crop failure during 1987



Threat* from Grasshoppers

Potential Threat to Crops

Minimal
Low
Somewhat High
High
No Data



Threat* from Desert Rats

Source: Post information from Mission cables; Canton level risk factor information from AEDES FEWS/PWA, May 1987

*See Table 2 for quantitative measures. Please note that survey site locations are not known by FEWS/PWA, nor are the number of sites surveyed for rats known. The prevalence data has been generalized here to the prefecture level, however

has been monitored since early 1985, prices for the staple grains (millet and sorghum) are less than half those seen during the same period in 1986 and less than a quarter of the prices recorded for early 1985. This overall fall in grain prices signifies the strength of the last two harvests.

Strife

In B.E.T. the need for food aid is immediate. Civilians are returning to areas recently deserted by the Libyans. While not all of the civilians are destitute, there is currently little food in the local markets. It is also reported that date plantations and truck gardens at oases in the prefecture are in sad repair and overrun by rodents. Determination of the total B.E.T. population at-risk is difficult, however, because the population of the prefecture is uncertain. B.E.T. and the areas adjacent to it were not included in the 1964 demographic survey, the base from which all current population estimates for Chad are derived. So far, newly opened areas have been surveyed by CASAD member organizations for size of population and degree of need. Grain and other foodstuffs have been shipped as the locations and sizes of at-risk populations are identified. The UNDRO is planning a support and relief program for people returning to B.E.T. If UNDRO is able raise sufficient funds to serve its estimated target population*, the program should be able to quite adequately meet B.E.T.'s 1987 food needs.

The people in B.E.T. will most likely not totally recover by the end of 1987 from the dislocations caused by the recent strife and the previous drought. Not being an agricultural area, a watch must be kept on the price of livestock and food stuffs in the B.E.T. markets, as well as any nutrition surveys that might be carried out, in order to monitor the rehabilitation process. A quick drop in animal prices coupled with consistently high or increasing food prices would be a signal that the rehabilitation process requires bolstering.

Agro-Economic Conditions

In February, CARE distributed approximately one-month's food aid to the 13,000 people of Ouled Rachid Canton (Batha Prefecture), an area at-risk due to failed harvests, weak herds, and insufficient resources for

*The UNDRO figure is close to six times USAID's pre-liberation 1987 population estimate for B.E.T. Prefecture, and a bit more than twice the UN Food and Agriculture Organization's (FAO) 1985 population estimate for the prefecture. It probably reflects expectations about the degree of the return flow of former B.E.T. residents who are now displaced to other parts of Chad or are refugees or migrant workers in other countries.

other means of income generation, hence food acquisition. Further distributions will be made based on the response of the canton's grain and livestock markets after the initial distribution. If the markets stabilize at decent prices, further aid may not be necessary.

Also in February, AEDES recommended to the CASAD that a two-month supply of cereals be pre-positioned in Northwest Kobe Canton (Biltine Prefecture), to be distributed at the discretion of local officials. This recommendation was based on: the relatively high rate of child malnutrition* seen in NW Kobe; the finding that by January only 20% of the canton's 4,000 people were still consuming grain from the 1986 harvest; and, very probably, the isolation of that area during the rainy season. Because of the good size and health of the canton's camel and cattle herds, however, the situation in NW Kobe was not considered as alarming as that found previously in Ouled Rachid.

In Bourtail Canton (population 12,000), Ouaddai Prefecture, the 1986 harvest was quite low, primarily because of pest damage. From its survey, however, AEDES found that about 60% of the population still have 1986 production to consume, and the rest of the population is either purchasing food, gathering wild foods, or still has access to production from 1985. This area should not need emergency food relief during this rainy season (starting about June through the beginning of October), but AEDES did recommend that seed stocks be replenished. This canton is in the area under the greatest threat from pests in Chad (Map 3). If seed stocks run low and/or the pest control programs are ineffective, the area could experience a substantial food deficit by the end of 1987.

The people in these three cantons, having suffered through environmental stress this year, will have the lowest capacity of Chad's people to withstand harvest deficits in 1988. Next in order of vulnerability are the people in territories just surrounding these three, and then those in the territories to the east and southeast of Lake Chad (Map 3). This last area, although the first identified as potentially at-risk during 1987, has shown the most resilience to environmental stress, primarily due to the influence of Lake Chad agriculture and fishing, the availability of markets, and the area's closeness to N'Djamena, hence relative ease of shipping.

*Of children under five years of age who were surveyed (i.e., children between 65 and 109 cm in height), 9.6% were severely malnourished (less than 80% of the standard weight for their heights).

In Chad, there will continue to be individual areas at-risk because of local agricultural shortfalls, regardless of the size of the national harvest. The size of the national harvest, however, will be a major factor in determining whether the local shortfalls can be made up from grains from other regions of Chad, or whether external food aid might be required.

Pests
Rodents

The primary pests plaguing Chad now are rodents. While it is not clear that the rodent problem is more severe than usually experienced, a March survey in Batha, Chari-Baguirmi, Guera, Lake, and Ouaddai Prefectures (Map 3) showed all but Lake Prefecture to contain sites where the density of the rodent infestation was considered sufficient to destroy all seeds that will be planted in the area. Ouaddai Prefecture, where each of the sites tested was well above that threshold, was in the most vulnerable position. Following Ouaddai Prefecture, Batha and Chari-Baguirmi Prefectures were found to be the next most vulnerable areas (Table 2). The situation is sufficiently serious that in mid-April the GOC formally asked the donor community for assistance in controlling the pests.

Table 2: Chad, Pest Prevalence Surveys

Prefecture	Rat Prevalence[1]	Grasshopper Eggpod Prevalence # Sites Above Threshold[2]	Range[3] (#/m^2)	Avg[3] (#/m^2)
Batha	10-50%	31 of 33	na	26
Biltine		--	--	--
Chari-Baguirmi	10-40%	13 of 13	19-676	171
Guera	10-25%	26 of 26	22-180	68
Kanem		7 of 38	12-016	15.5
Lake	5-15%	0 of 14	--	--
Moyen-Chari		12 of 26	14-189	55
Ouaddai	30-60%	26 of 26	60-291	172
Salamat		21 of 27	12-102	23

Source: Mission Cables; GOC Ministry of Agriculture

(1) The reporting cable did not mention the number or locations of survey sites. For ease of displaying the information and because the cable presented the results at the prefecture level, the numbers are shown here at the prefecture level. The results are the percentage of 30 slices of sweet potato spread about a one hectare plot which showed evidence of rats. According to the surveyors, a result of 5% is considered cause for eradication measures to be employed and a result of 20% or above indicates the presence of enough rats to destroy all of the seeds planted in the area.
(2) The threshold grasshopper eggpod density used for considering a site "at-risk" was 12 eggpods per square meter.
(3) The range and average were calculated for only those sites above the threshold density of 12 grasshopper eggpods per square meter.

USAID/N'Djamena, with technical assistance from the AID Office of Foreign Disaster Assistance (OFDA), is assessing the situation further. As of April 17, 11 of the 300 MT of rodenticide necessary to cover the estimated 150,000 affected hectares (based on the above survey) had been pledged. To prevent the destruction by rodents of seeds planted at the start of the rainy season (June and July), control measures should be underway by the end of May. Considering the amount of materials on hand, this is not likely to happen.

The rodents could be at least as much of a problem this year as they were in 1986, when they caused a considerable amount of crop damage. While the rodent infestation by itself may not wipe many farmers out, farmers will have to replant after rodents eat the planted seed, and may have to replant again if the rodents attack seedlings. This can shrink the amount of seed available for replanting after any subsequent loss to grasshoppers, and can push the effective date of planting further into the growing season, shortening the time available for maturation of the crops. This in turn can have a negative effect on the final yield.

Grasshoppers

The grasshopper control campaign in Chad is well organized. Training of field agents began in mid-February, and should continue through the end of April. The total need for pesticides has been estimated, and the pesticides for at least the aerial component (split between France and the U.S.) have been ordered. (The U.S. pesticide share, 90,000 liters of malathion, began to arrive in N'Djamena on April 25.) As of April 17, however, only about one-third of the pesticide needed for ground control* was in-country or had been pledged. Also unmet as of that date was a portion of general operating costs and a portion of in-country travel and support costs for the nine ground-based scouting teams. The ground control component of the campaign is essential. The lack of a timely, effective ground control program could increase the cost of the aerial component immensely, and may leave the grasshoppers a window of opportunity for breeding and laying eggs, as happened in 1986. This in turn could leave 1988 crops vulnerable again to inordinate grasshopper attack.

The results of grasshopper eggpod surveys have already been analyzed for eight of nine prefectures surveyed (Table 2, above). These results have been used to set priorities for the control campaign. The initial effort

*Total pesticide needed for ground control is 750 metric tons (MT) of powder.

will emphasize ground control. This will be followed by aerial control as needed. As of April 17, the total area to be treated by air was 300,000 ha; as of April 28, the total area targeted for both aerial and ground control was 560,000 ha. The second figure is close to half the area harvested in grains in 1986. Not all of the target area will be cropland, however, and the plans probably allow for multiple treatment of areas, as needed.

Ouaddai and Chari-Baguirmi Prefectures have the potential for severe, widespread grasshopper infestations in addition to the likelihood of damaging rat infestations noted above. The results from Guera Prefecture show that widespread infestations should also be expected there. Although the results for Biltine Prefecture are not yet in, it is expected that it will be as densely infested with eggpods as is Ouaddai Prefecture. Infested sites were not sprayed in Biltine last year, because the necessary supplies and equipment arrived in Chad too late to be useful in that area.

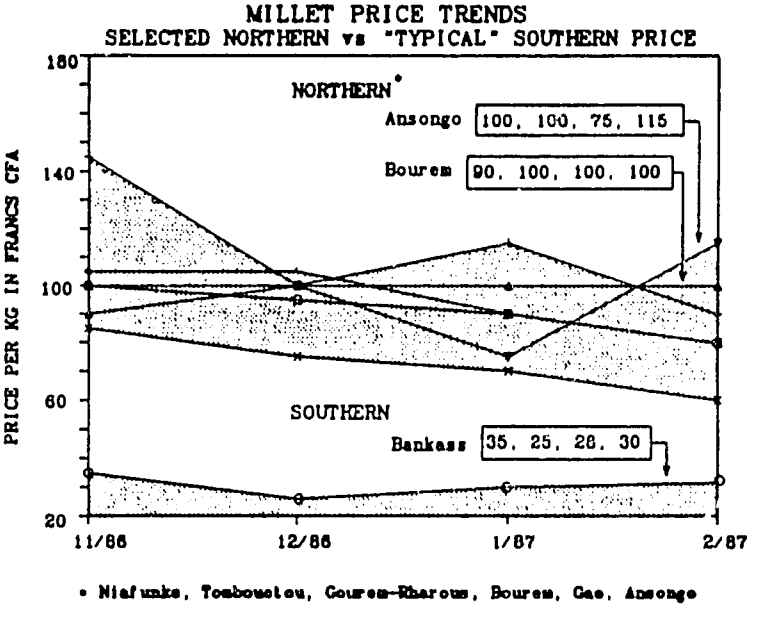
MALI

The number and location of populations at-risk in Mali have changed little from previous months. There are approximately 106,000 people in the two cercles previously identified by FEWS as "at-risk", Bourem and Ansongo (Gao Region). Another 350,000 to 685,000 people in Gao, Tombouctou, Mopti, and Koulikoro Regions are affected by serious stress on the food supply (see Reference Map 11 for locations). Current data show a general stability in food prices, and nutritional surveys in Tombouctou Region show levels of severe malnutrition within "normal" limits. There is continuing discussion within the government, and in the donor community, about free food distributions which were recommended, but did not occur, and others which may not have reached some of the more isolated needy populations.

Market Prices

The retail price of millet has remained stable in most areas during the past four months (see Figure 1). Nevertheless, regional and sub-regional differences in the relative market prices of millet are common. Prices will most likely begin to show a normal rise as the dry season ends, the rainy season begins, and stock levels fall.

Figure 1:



Grasshoppers and Locusts

The Malian grasshopper control campaign for 1987 aims to treat 75,000 ha by ground and 100,000 ha by air during the first phase, and 350,000 ha by air during the second phase. The pesticides required for this coverage include

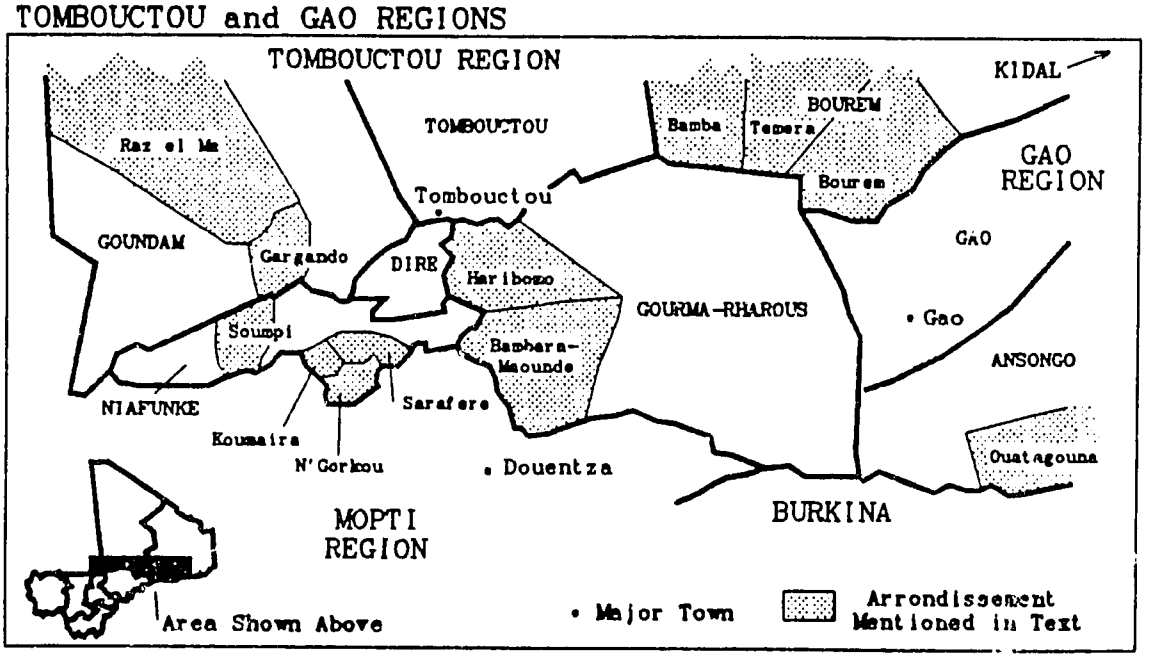
600 metric tons of propoxur and 225,000 liters of fenitrothion. By the end of April, approximately 100 MT of locally formulated propoxur had been pre-positioned, and another 200 MT were soon to be put in place. Approximately 320 MT of propoxur, promised from international donors, have yet to be delivered. If they are received before late May, ground treatment should be able to proceed as planned.

Displaced Persons

Reports indicate that the number of displaced people nationally is stable overall, with notable concentrations still in the town of Gao (4,000, see Map 4 for location), and in the town of Kidal (2,000). The increase in the number of displaced persons in the town of Douentza, mentioned in the previous FEWS report, has reversed itself, with most of the new arrivals apparently now moving on (to an unknown destination).

Map 4:

TOMBOUCTOU and GAO REGIONS



FEWS/PWA/87

Population movements in the northern parts of the country, reported by various organizations during the month of February, appear to be normal annual movements. Most of the movements are undertaken by primarily sedentary populations, particularly young males, moving out of the rural areas at the beginning of the dry season to go to towns in search of casual labor and money. This is a traditional pattern, occurring during those months

when there is no agricultural activity, and in areas where food stocks are insufficient to last until the next harvest. Some of these migrants join relatives already living in the towns, while others set up temporary camps around urban centers. The SAP (Systeme d'Alerte Precoce) reports, however, that there are some abandoned villages in the cercles (Map 4) of Goundam (Raz el Ma and Gargando arrondissements) and Niafunke (Soumpi, Koumaira, N'Gorkou, and Sarafere arrondissements), both in Tombouctou Region, and in the cercles of Bourem (Bamba, Temera and Bourem arrondissements) and Ansongo (Ouatagouna arrondissement) in Gao Region. This may indicate greater than normal stress in these areas.

Health/Nutrition

In general, health and nutrition levels, as measured through recent surveys, remain stable. UNICEF conducted a nutrition survey in February in the cercle of Dire, Tombouctou Region. The rate of severe malnutrition was found to be 8.5% (below 80% weight for height norms), a level which is not considered abnormal in this area. The SAP carried out a nutrition survey in February in the cercle of Gourma-Rharous (Haribomo and Bambara-Maounde arrondissements), Tombouctou Region. The rate of severe malnutrition there was found to be 7% (below the 80% weight for height norms). Family-level food consumption information, collected from 200 families during the survey, showed that 54% are eating primarily cereals, while 46% are eating "famine foods" (leaves, wild grain, etc). Of the 200 families, 42% purchased their food on the market, 24% received food from donations and gifts (e.g., food distribution programs or family members working outside of the area), and the remaining 34% subsist on gathered food. None of the families claimed to have any stocks from the local harvest. Despite the currently "normal" nutritional levels in the area, the SAP recommended that the situation be closely monitored, as the population has very limited purchasing power, and is dependent upon cereals available on the market. An increase in the price of cereals would make access to food difficult for much of this population.

Food Aid

The SAP continues to recommend the pre-positioning of cereal stocks in those areas where nutritional problems may occur prior to the next harvest. Currently, the SAP's recommendations include Gao, Mopti and Koulikoro Regions (see FEWS Reports 9 and 10). The SAP now recommends that 300 MT of cereals be pre-positioned in the arrondissements of Bambara-Maounde and Haribomo in the cercle of Gourma-Rharous, Tombouctou Region, areas where nutritional vulnerability and socio-economic stress have been confirmed by SAP surveys.

The follow-through on SAP food distribution recommendations is still problematic. While a total of 3,300 MT of cereals had been released by the Ministry of Interior for distribution at the end of December 1986, the recommended distributions in the cercle of Nara have not been implemented. Additionally, recent food distributions carried out by the National Committee for Aid to Victims of the Drought (CNAVS) in Gao Region were apparently poorly targeted and may not have reached the most needy populations. A letter from the Presidency to the Ministry of Interior has advised that all general food distributions (except Food For Work projects and feeding centers) should be suspended, pending study of the situation.

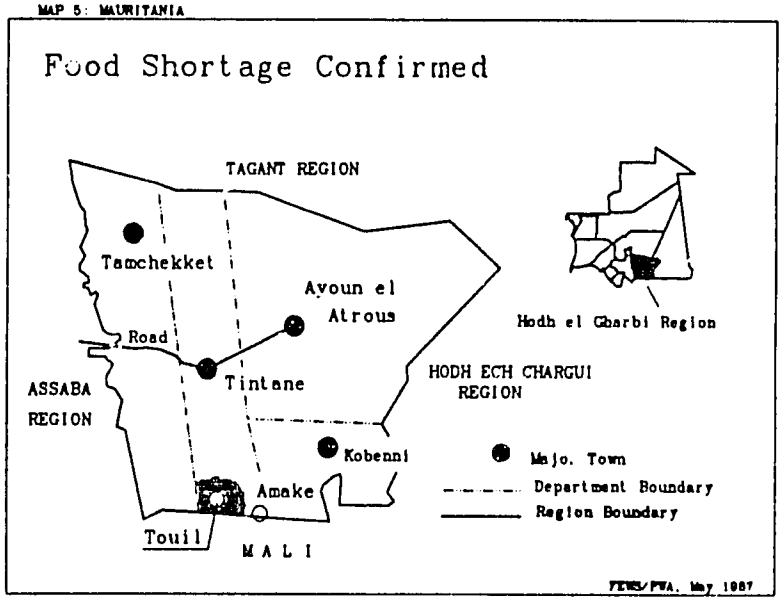
MAURITANIA

Mauritania's lean season has begun with reports of food shortages in Hodh el Gharbi and Trarza Regions. In most areas where nutrition levels are being tracked, whether via feeding center records or nutrition surveys, the nutritional status of children improved after the harvest, as would be expected. The prime exception to this trend is seen in Akjoujt Town, in Inchiri Region. Plans have been set for the 1987 grasshopper campaign, but not all of the necessary supplies have been pledged. The first grasshopper eggpod surveys (southern Hodh el Gharbi Region) have shown egg densities to be much lower than expected.

Food Security

In early February there was a report from Touil Arrondissement (Map 5) that there was a severe food shortage due to poor and erratic rainfall and heavy grasshopper damage during 1986 (agriculture in Touil is mainly rainfed). The food shortage was severe enough that from one to two-thirds of the arrondissement's 33,000 people left their villages to seek work in nearby towns or in Mali. A joint USAID, UN World Food Program (WFP), UN Development Program (UNDP), Catholic Relief Services (CRS) mission confirmed the report in early April. It was not clear, though, that all of the people who left had done so because of crop failures. People often take their cattle out of the area after the rains have stopped, and those with heavy debts often go to Mali to work after the harvest is finished in their own villages. The team decided that the situation did not warrant emergency food relief -- the people who lacked food reserves had already left the area. The team did recommend that the planned May/June distribution of food aid by the Government of the Islamic Republic of Mauritania's (GIRM) Food Security Commission (CSA) be carried out at the substantial level distributed in October 1985 (230 MT). This would, according to the mission, act as an incentive to bring the farmers back to the area at the start of the rainy season to start preparing the land for the next crop cycle.

MAP 5: MAURITANIA



There have been further reports of food shortages in Trarza Region, although the sites were not specified. At same time, Rkiz Department (a prime rice growing area in

Trarza, see Map 12 for location) has reported a production surplus. The areas reporting a food shortage are most likely north of the irrigated cropping zone along the Senegal River, Mauritania's southwestern border. There will probably be more such reports of food shortages over the summer.

Nutrition

Except for the information from Inchiri Region, the most recent nutrition data are encouraging, though expected with the harvest season. CRS feeding center records from December 1986 through February 1987 show that the previously reported trend of increase in severe child malnutrition* has continued in Akjoujt Town, Inchiri Region (Map 6). Inchiri is not an agricultural area, so Mauritania's 1986/1987 harvest will have little effect on the availability of food in the area. In contrast, the feeding center records for the same period from Brakna Region show the previously reported increase in severe malnutrition to have slowed down immensely with the harvest. This trend is supported by a second Doctors Without Borders (MSF) survey completed in Brakna Region in February 1987 (Table 3). MSF did not cover exactly the same territory that it had covered in its first survey in August 1986, however. In fact, MSF only repeated its survey in eight villages in Bababe Department. For those eight villages, the average percentage of severely malnourished children remained at about 10%.

Table 3: Mauritania, Percent of Children Severely Malnourished in Brakna Region

Department	Aug/Sep 1986		Jan/Feb 1987	
	Avg	Range	Avg	Range
Bababe	12.6	1.2-39.6	7.0	0.0-18.0
Maghta Lahjar	19.5	0.0-37.1		
M'Bagne			7.9	0.0-34.8
Overall	16.0	0.0-39.6	7.6	0.0-34.8

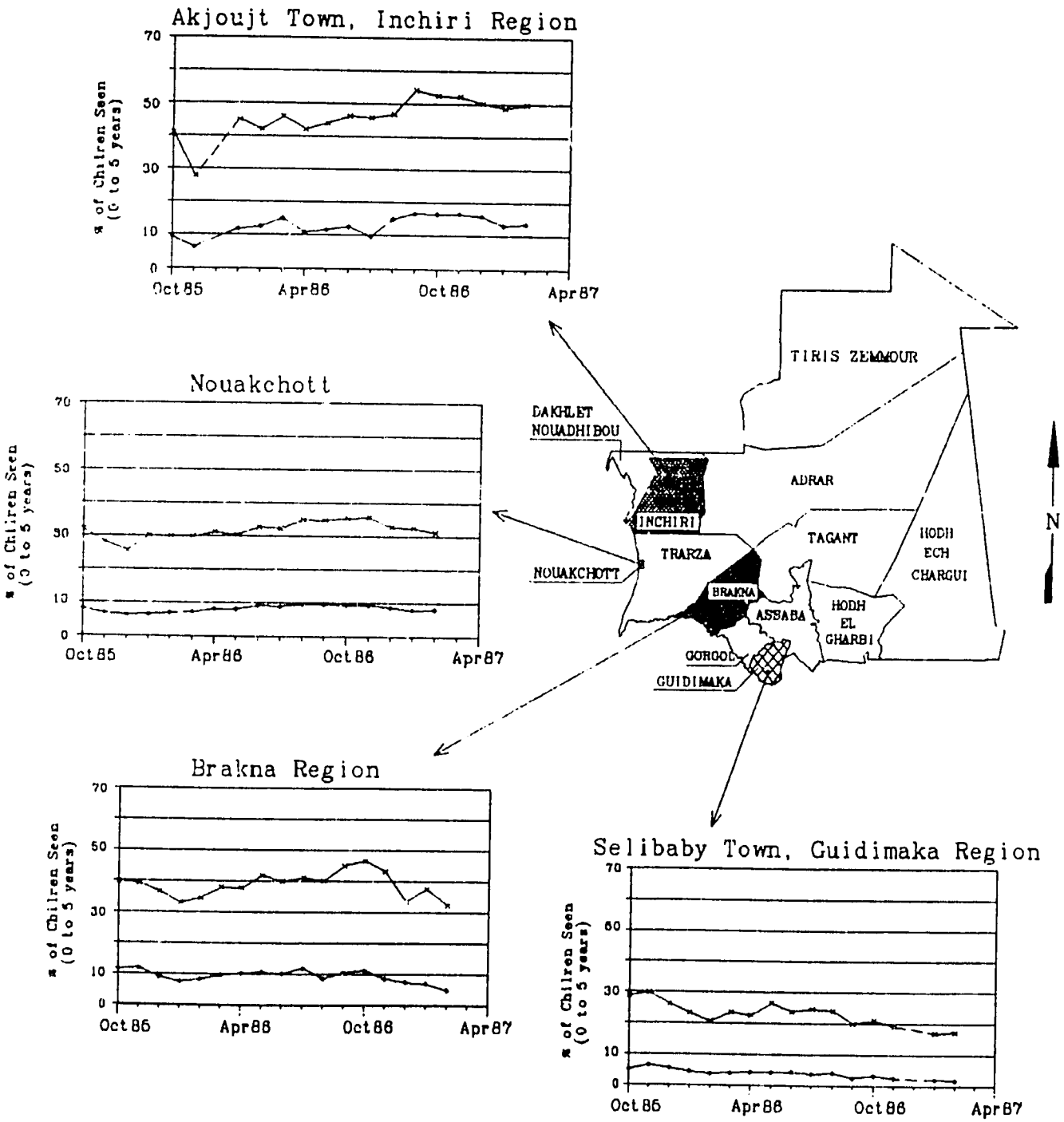
Source: MSF; FEWS/Mauritania

The new CRS information for Selibaby Town, Guidimaka Region, shows that the nutrition situation there continues to improve as it has since October 1985, although the rate of improvement has slowed down a bit. Finally,

*CRS uses a weight for age standard for judging nutritional status, while Doctors Without Borders (MSF) uses a weight for height standard. A child is severely malnourished when it weighs less than 80% of the standard, and is acutely malnourished when weighing less than 70% of the standard.

MAP 6: MAURITANIA

Trends in Nutritional Status
October 1985 to February 1987



× Severe malnutrition (<80% of standard weight for age)
◇ Acute malnutrition (<70% of standard weight for age)

Source: CRS/Mauritania (Feeding Center Records); FEWS/Mauritania
FEWS/PWA, May 1987

the trend in the CRS feeding center records for Nouakchott over the period from October 1985 through February 1987 is inconclusive. While the nutrition rates still appear to be declining somewhat, the rates have varied a great deal over the 17 month period, so that the trend is no longer statistically significant.

Grasshoppers

The GIRM's December 1986/January 1987 grasshopper control action plan identifies treatment zones and the amount of pesticides and equipment to be pre-positioned in or near each of them. The bulk of the zones are along Mauritania's southern borders with Mali and Senegal, including most of Gorgol Region, Mauritania's only grain surplus area. The GIRM Crop Protection Service (CPS) is also planning for control activities near Atar Town, Adrar Region, and Akjoujt Town, Inchiri Region (see Map 12 for locations). These last two areas would be habitats for Desert Locusts, rather than grasshoppers.

The action plan includes eggpod surveys in January and February, training and pre-positioning of materials through May (including 400 MT of powder to be used by villagers), ground control efforts from June through August and aerial control from September through next January. Ground control is to treat 109,500 ha and use 876 MT of pesticide powder. The aerial component is to treat 209,000 ha and use 103,500 liters of pesticide. It is not clear that all of the commodities necessary for supporting the control campaign have been covered by donor pledges.

One key element in the GIRM's plan is the egg pod surveys that have been carried out since January. As the results of the surveys are analyzed, the treatment plan will be revised. The first set of results are surprisingly low -- the areas surveyed around Kobenni and Touil (see Map 5 for locations), both areas of high infestations in late 1986, are showing a range of *Oedaleus senegalensis* eggpod densities from zero to 1.55 per square meter, and average *O. senegalensis* eggpod densities of 0.44 and 0.27 eggpods per square meter, respectively. (Eggpods of the grasshopper *Krausseria angulifera* were also noted.) This is in sharp contrast to December findings nearby in Mali, where densities of over 10 eggpods per square meter were noted. It may be that the late fall aerial grasshopper control campaign was successful in containing the insects before breeding took place. At any rate, this area in southeastern Mauritania should not be in difficulty from grasshoppers at the first rains in June or July, although the second generation of grasshoppers in nearby Mali may cause that area of Mauritania trouble as they move north with the rains in the late summer.

NIGER

With the approach of the 1987 rainy season, this report focuses on patterns of agricultural vulnerability in Niger. Net per capita agricultural production, and variability of annual per capita production levels have been mapped and analyzed below. The analysis uses 1982 to 1986 agricultural production data on primary (cereals) and secondary (pulses, tubers) crops from the Ministry of Agriculture of the Government of Niger. These two variables (net per capita production and variability of annual per capita production) have then been combined to prepare a map of agricultural vulnerability. The results suggest that the addition of secondary crop production data to analyses of agricultural vulnerability do not appreciably change the patterns that one would expect to see without that data. The analysis also shows the utility of an indicator of variability in annual per capita agricultural production to conceptually distinguish between differing types of agricultural fragility found in Niger.

Introduction

The grain harvests of 1985 and 1986 in Niger were in sharp contrast to the extremely poor one of 1984. Both of the later years set new records for production of cereals in Niger. Despite these high levels of national grain production, there are still a great many people without sufficient cereals to satisfy their annual food needs, as estimated by various agencies. A large portion of the 715,000 people categorized as "at-risk" by the government of Niger, live in rural farming villages where the local harvest produced enough to satisfy only 30% or less of the annual grain requirement.

Grain harvest figures are, nevertheless, incomplete pictures of the range and amount of locally grown food products available in most villages. Much local agricultural production is in the form of pulses (niebe and voandzou), tubers (sweet potatoes and potatoes), and a variety of other wild and cultivated products that are found in most areas of Niger. As greater note is made of the contribution of these foods to the Nigerien diet, more systematic attempts are being made to include them in food balance assessments. With this new information, more accurate identification of the locations and sizes of populations facing food shortages, and the severity of their food deficits, will become possible.

Appendix I presents a table of arrondissement-level agricultural production data from 1982 to 1986, and includes the major grains, pulses, and tubers, except sweet potatoes. In the table, all figures were converted into millet calorie-equivalent quantities, post-harvest losses were deducted, and the net millet-equivalent

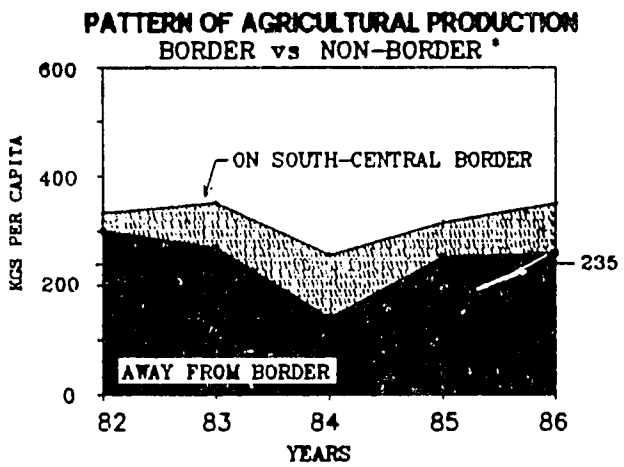
production was divided by an estimated population figure, to obtain a net per capita agricultural production level for each arrondissement, for each year. The brevity of the historical records shown in the table permits only tentative analyses of trends and patterns. Furthermore, secondary crop production estimates are subject to the same, or greater, problems of estimation (including small sample size, lack of quality control, etc.) as found with agricultural production estimates at any level in Niger.

An examination of several different patterns of agricultural potential follows, the purpose being to 1) map agricultural vulnerability, and 2) determine whether the addition of secondary crop information greatly changes the pattern of agricultural vulnerability.

Border vs Non-Border Agricultural Potential

As in the rest of the western Sahel, the progressive drop-off of rainfall in Niger, as one moves from the south to the north, is responsible for the most obvious pattern of differing agricultural potential. Most of Niger's agricultural output is produced south of the 14th degree of latitude, in a zone encompassing roughly an eighth of the nation's total land area. The southern border orientation of agriculture can be clearly seen (see Figure 2) in a comparison of the net per capita millet-equivalent agricultural production of all those arrondissements touching the southern border*, with those away from it. As would be expected, border areas were significantly more productive (more than 100 kgs per person difference in 1984) than non-border areas between 1982 and 1986. The gap between the two groups in per capita production increased in 1984, reflecting the relatively greater impact of drought on production in the more northern areas.

Figure 2:



* Agadez Departement excluded.

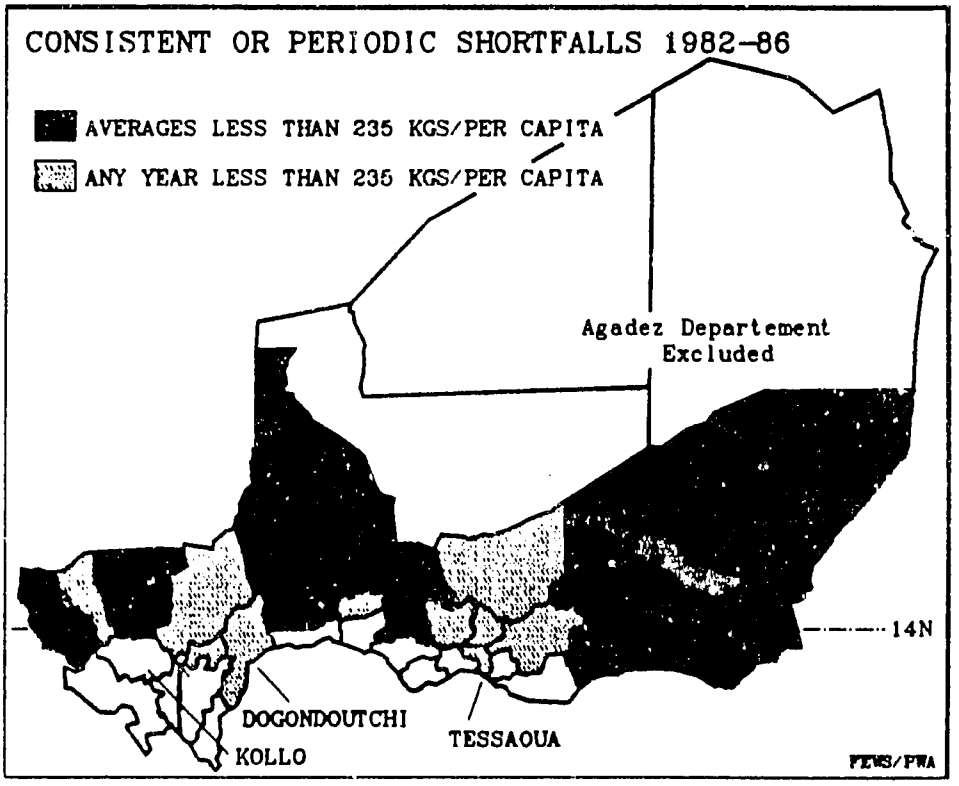
Patterns of Regular and Periodic Agricultural Production Shortfall

For the purposes of this analysis, a per person annual agricultural food requirement for rural farming populations of 235 kgs (205 kgs of cereals plus 30 kgs of other agricultural products) has been used for each arrondissement. This figure may overstate an arrondissement's requirements where there is a large number of pastoralists, and does not apply well to urban populations, but is a reasonable point of departure for this brief analysis.

* The "border" group excludes those arrondissements to the east of Magaria, where rainfall isohyets curve southward. The Agadez Department was excluded from this analysis because of the small role agriculture plays in this largely pastoral area.

The arrondissement figures for per capita millet-equivalent agricultural production between 1982 and 1986 can be loosely sub-divided into three groupings: those showing an average annual production of less than 235 kgs per person between 1982 and 1986, those in which production did not meet the 235 kg level in at least one year, and those in which the average production was greater than 235 kg for each of the five years. The first two groups are mapped in Map 7.

Map 7:



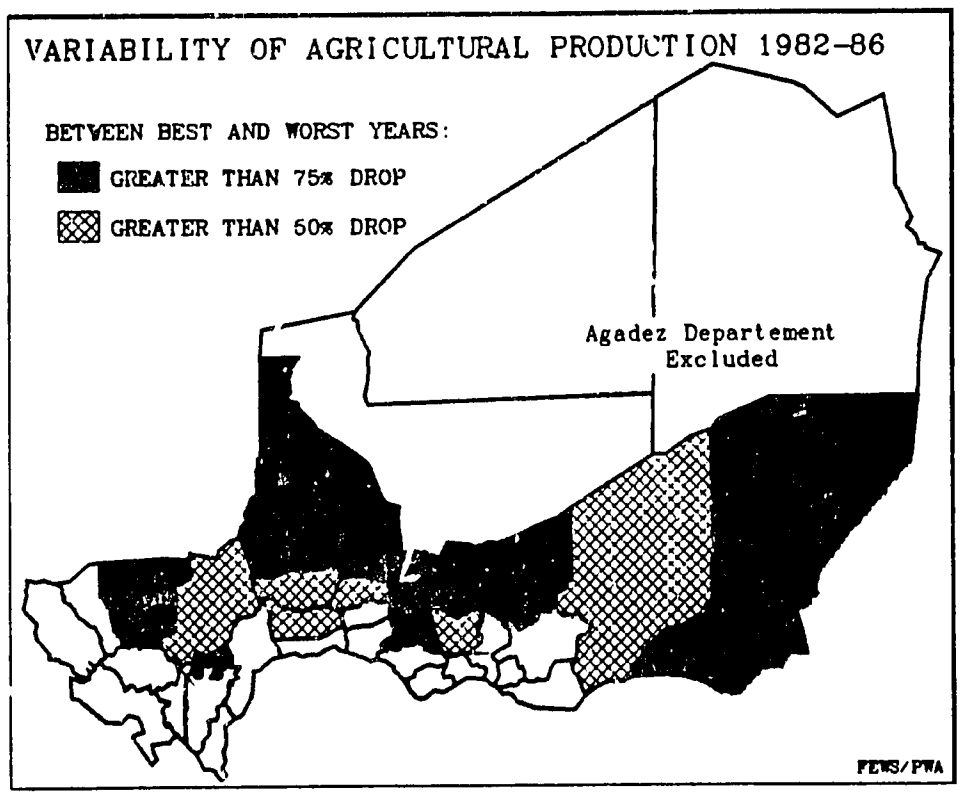
The pattern shown in Map 7 is very similar to the border/non-border grouping described earlier. Exceptions to the border group include Tessaoua and Dogondoutchi, which although "border" arrondissements, each contain large areas in the north where low production figures cancel out higher production levels in the south. Kollo Arrondissement is another exception. Although not on the border, it contains large rice schemes, near Niamey, that effectively pull production levels within that arrondissement up to levels found in the "border" arrondissements. The overall pattern shown is as would be expected.

Patterns of Variability in Agricultural Production

The amount of variance in annual agricultural production levels is another aspect of how well local agricultural production meets the food needs within an arrondissement. In an area where average production is always above annual needs, variance in production levels is a minor annoyance. In areas of consistent deficits, or those chronically near the boundary between self-sufficiency and shortfall, variance takes on a much different character, and may require more severe and/or more frequent use of coping mechanisms.

Map 8 displays those arrondissements in which the variability of annual per capita agricultural production in millet caloric-equivalents is significant. Two levels are shown: those arrondissements in which production in the worst year was less than 25% of the production in the best year (a 75% drop in production between the best and the worst year), and those in which production in the worst year was half of that in the best year (a 50% drop). Those arrondissements in which the inter-annual variation was less than 50% are not shaded. Because of the juxtaposition of extremes in production levels (a very poor year in 1984 with two record years in 1985 and 1986) in the five year record being examined, the pattern seen here may be much more pronounced than if a different, or longer, time frame were used.

Map 8:

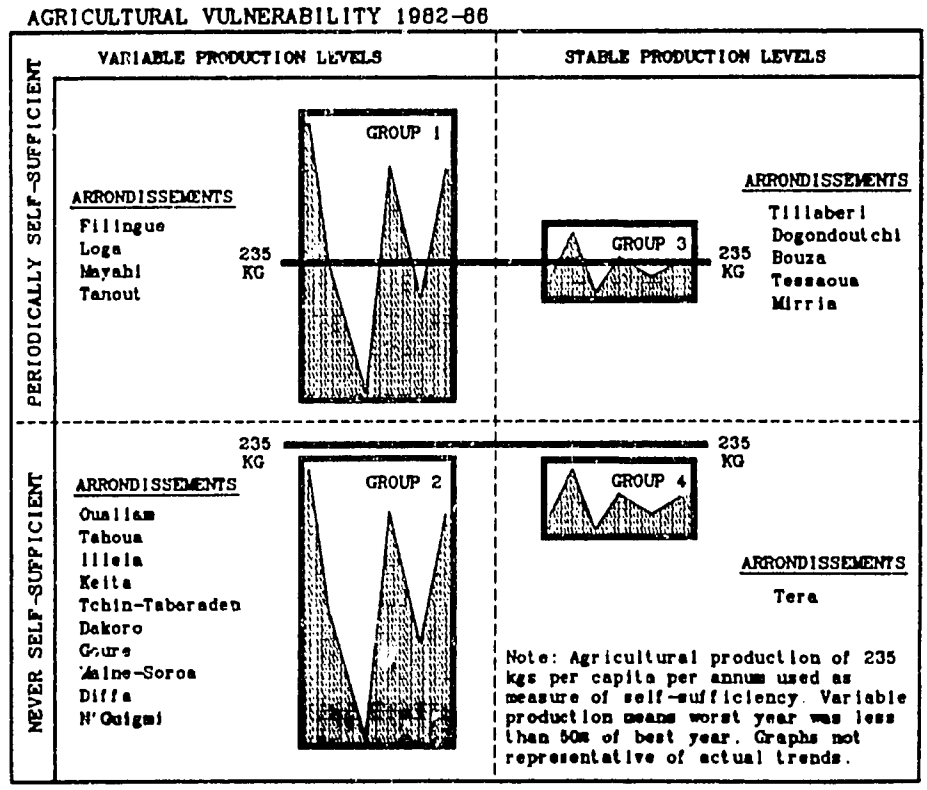


The same border/non-border pattern is again apparent. Areas of margiral production include those in which the greatest swings in production levels are found. The significance of the problem posed by this variation is, however, highly dependent upon the patterns seen in the previous map of absolute production levels. For example, an area in which production is always above local requirements would have less reason to employ severe coping mechanisms when levels of surplus vary, than an area in which average production levels periodically or regularly fall below what is needed. By combining the factors seen in these two maps, a classification of agricultural vulnerability can be established, which describes an arrondissement's agricultural potential in terms of absolute level of production, and the size of the variation in annual production levels.

A Classification of Agricultural Vulnerability

Using these two maps, arrondissements with either regular or periodic production shortfalls, or with wide inter-annual variation in production levels, have been divided into four conceptual groups of vulnerability (Figure 3).

Figure 3:



During the period from 1982 to 1986, Groups 1 and 2 were both characterized by wide swings in production levels, but Group 1 had only periodic shortfalls of agricultural production, while Group 2 was never self-sufficient in

average production. Groups 3 and 4 both displayed relatively stable production levels, yet Group 3 had only periodic shortfalls, and Group 4 was never self-sufficient in average production.

In noting the arrondissements which fall into these classes (groups) of vulnerability, one observes that the addition of secondary crops to the arrondissement food balances produces few surprises in the names that make up the groups, particularly for the most vulnerable Group 2. Most informed observers would come up with many of the same names for this group. However, if asked for a conceptual differentiation between the nature of the agricultural vulnerability of neighboring arrondissements like Tillaberi and Ouallam, or Keita and Bouza, a response might be less easily apparent to observers. Nevertheless, the per capita production levels and degree of inter-annual variation in production levels are quite different in both cases, and likely force the use of differing overall coping strategies. A baseline of data covering a longer time-frame than that examined here is needed to see how significant this difference may be.

It is interesting that the arrondissements displaying relatively low production and wide variation (Groups 1 and 2), form a single seamless block (see inside front cover) from Ouallam to N'Guigmi. These arrondissements seem to display an agricultural fragility that would warrant their being designated priority areas for ongoing monitoring and remote sensing coverage in bad, and even in moderately good years. Those arrondissements in Group 1 probably also merit extra attention for the sheer uncertainty of their agricultural outcome in any particular year, as opposed to those in Group 2, for which even the best years will likely be years of food production deficits.

Appendix I. NIGER Agricultural Production and Population 1982-88

Arrondissement	Millet Equivalent Production/Per Capita Production										Population & Rate of Growth Estimates					
	'82 Product	'82 PerCap	'83 Product	'83 PerCap	'84 Product	'84 PerCap	'85 Product	'85 PerCap	'88 Product	'88 PerCap	1982	1983	1984	1985	1986	Growth Rate
	mt															
KOLLO	94838	0.616	102139	0.643	87394	0.532	98765	0.581	106237	0.605	153589	158831	164251	169856	175653	0.033
TERA	66184	0.269	68173	0.268	50365	0.191	72508	0.268	89471	0.318	246043	254440	263123	272102	281388	0.033
TILLABERI	56950	0.352	48255	0.288	50741	0.293	40928	0.229	90512	0.489	161851	167374	173096	178993	185101	0.033
OUALLAM	79166	0.440	72156	0.388	7596	0.039	34795	0.175	34955	0.170	179941	186082	192432	198999	205790	0.033
FILINGUE	94071	0.385	99753	0.395	49192	0.188	83896	0.311	84821	0.304	244182	252515	261132	270043	279259	0.033
SAY*	52054	0.456	56448	0.478	44038	0.361	50638	0.401	77776	0.596	114170	118068	122096	126262	130571	0.033
LOGA	28278	0.440	33787	0.513	7381	0.109	32453	0.470	41883	0.591	64254	65834	67463	69112	70811	0.024
BIRNI N'GAOURE*	70849	0.450	67421	0.418	53508	0.324	56049	0.331	79447	0.458	157407	161278	165243	169307	173470	0.024
DOSSO*	87534	0.578	95557	0.616	63657	0.401	80845	0.497	103536	0.621	151351	155073	158886	162793	166796	0.024
DOGONDOUTCHI*	79909	0.269	91556	0.301	66679	0.214	108309	0.340	137383	0.420	296539	303831	311302	318957	326800	0.024
GAYA*	47000	0.401	52045	0.434	43074	0.350	55955	0.444	81773	0.634	117109	119989	122939	125963	129060	0.024
TAHOUA	49811	0.333	49403	0.323	23944	0.153	34671	0.217	48599	0.298	149603	152815	156093	159441	162861	0.021
ILLELA	57863	0.397	56612	0.380	11102	0.073	31042	0.200	53214	0.335	145913	149043	152240	155505	158841	0.021
KEITA	36161	0.256	44192	0.307	20841	0.140	30254	0.201	43953	0.288	141165	144173	147265	150424	153651	0.021
BOUZA	61600	0.392	51760	0.322	44442	0.271	42844	0.256	41506	0.242	157339	160714	164162	167683	171280	0.021
MADAOUA*	32046	0.207	65360	0.414	39418	0.245	58618	0.356	60676	0.361	154479	157792	161177	164635	168166	0.021
BIRNI N'KONNI*	80633	0.469	88290	0.491	50161	0.279	87499	0.477	87603	0.468	172035	175728	179495	183345	187278	0.021
TCHIN-TABARADEN	9800	0.088	9270	0.079	4665	0.039	6141	0.050	19336	0.155	114265	116718	119220	121777	124389	0.021
MADAROUNFA*	90001	0.554	97247	0.582	70523	0.410	76871	0.435	83474	0.459	162338	167015	171826	176776	181868	0.028
GUIDAN ROUMJI*	84371	0.522	94931	0.571	60196	0.352	61588	0.350	66540	0.367	161674	166332	171123	176053	181124	0.028
AGUIE*	84871	0.453	83011	0.428	54846	0.282	53707	0.344	68939	0.430	143169	147294	151537	155902	160393	0.028
TESSAOUA*	87969	0.393	82357	0.358	65655	0.277	68874	0.282	82958	0.331	223607	230043	236675	243493	250507	0.028
DAKORO	77269	0.379	61650	0.294	17931	0.083	65645	0.296	64854	0.284	203837	209709	215750	221965	228359	0.028
MAYAHI	91913	0.536	64628	0.366	39577	0.218	72628	0.389	56194	0.292	171640	176584	181671	186904	192288	0.028
MIRRIAH	133317	0.380	143375	0.398	103318	0.279	146167	0.384	145709	0.372	350873	360609	370616	380900	391470	0.027
MAGARIA*	150813	0.416	152538	0.409	122115	0.319	134940	0.343	147778	0.365	362821	372889	383237	393871	404801	0.027
MATAMEYE*	79469	0.609	66977	0.500	54139	0.393	54524	0.385	60376	0.415	130419	134038	137758	141580	145509	0.027
TANOUT	85923	0.389	50246	0.289	14660	0.082	61692	0.335	73791	0.390	169400	174101	178932	183897	189000	0.027
GOURE	41016	0.316	30797	0.231	15712	0.114	51324	0.364	39100	0.270	129976	133583	137290	141100	145015	0.027
DIFFA	22136	0.412	4723	0.088	1100	0.020	15045	0.265	9853	0.170	53668	54672	55698	56740	57804	0.018
N'GUIGMI	4714	0.132	375	0.010	0	0.000	1059	0.028	280	0.007	35605	36276	36956	37648	38354	0.018
MAINE SOROA	16181	0.191	6839	0.079	644	0.007	15801	0.174	13803	0.151	84788	86377	87996	89646	91326	0.018
TOTALS	2094509		2069887		1338408		1885676		2196343		5305034	5449815	5598856	5751671	5908983	

* indicates a "border" arrondissement.

Sources: Agricultural production data from Ministry of Agriculture converted into millet equivalent production (millet & sorghum=1.00, rice=1.086, niebe=1.05,maize=1.07,potatoes=.258). 1985 data incomplete. FEWS/Niger population estimates do not include commune populations. Population estimates for 1982 to 1985 determined using growth rate shown.

PROVINCES

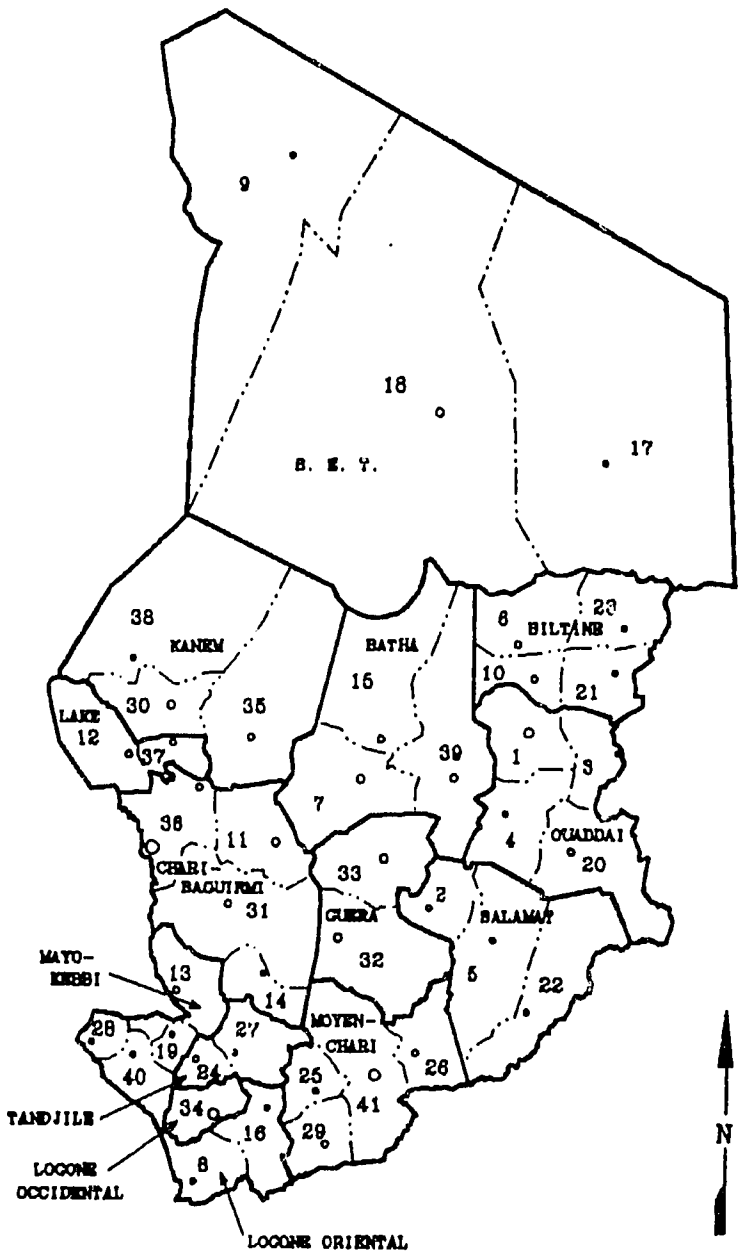
FEWS/PWA, February 1987

MAP 9: BURKINA

Administrative Units

(Prefectures & Sub-prefectures)

Sub-prf	PRF
1. Abeche	OUA
2. Abou Deia	SAL
3. Adre	OUA
4. Am Dam	OUA
5. Am Timan	SAL
6. Arada	BIL
7. Ati	BAT
8. Baibokoum	LOr
9. Tibesti	BET
10. Biltine	BIL
11. Bokoro	ChB
12. Bol	LAK
13. Bongor	MK
14. Bousso	ChB
15. Djedaa	BAT
16. Doba	LOr
17. Ennedi	BET
18. Borkou	BET
19. Gounou	MK
20. Goz Beida	OUA
21. Guereda	BIL
22. Haraze	SAL
23. Iriba	BIL
24. Kelo	TAN
25. Koumra	MCh
26. Kyabe	MCh
27. Lai	TAN
28. Moissala	MCh
29. Mao	KAN
30. Massenya	ChB
31. Melfi	GUE
32. Mongo	GUE
33. Moundou	LOc
34. Moussoro	KAN
35. N'Djamena/ Massakory	ChB
36. N'Gouri	LAK
37. Nokou	KAN
38. Oum Hadjer	BAT
39. Pala	MK
40. Sarh	MCh



o Main Town in Sub-prefecture

——— Prefectures

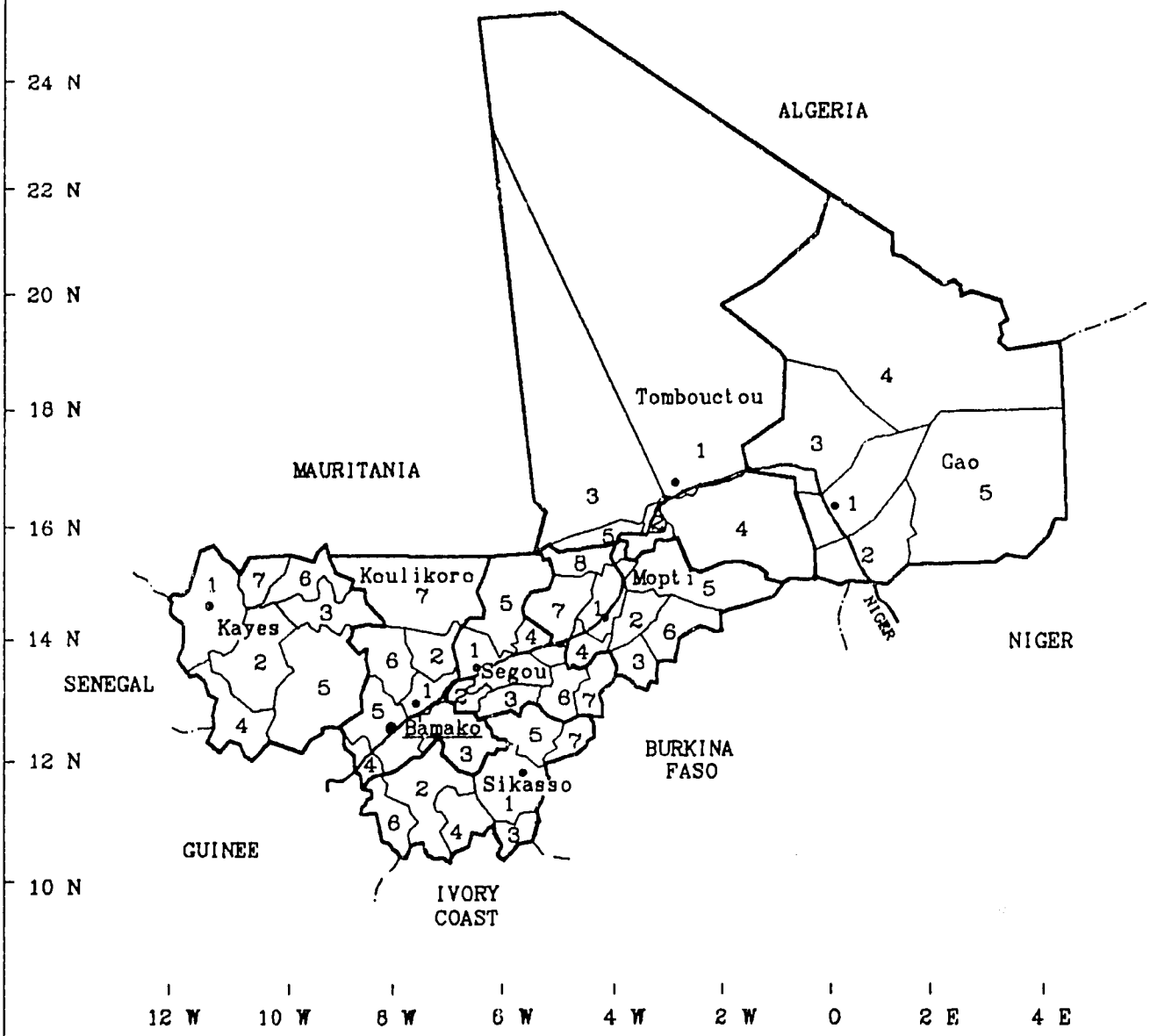
— - - — - - Sub-prefectures

Source: 1989 Map in Eng.; Two Undated Maps in Fr.; Map Athors Unknown

FEWS/PWA, May 1987

MAP 11: MALI

Administrative Units: Regions & Cercles



REGIONS and CERCLES

KAYES
1. Kayes
2. Bafoulabe
3. Diema
4. Kenieba
5. Kita
6. Nioro
7. Yelimane

KOULIKORO
1. Koulikoro
2. Banamba
3. Dioila
4. Kangaba
5. Kati
6. Kolokani
7. Nara

SIKASSO
1. Sikasso
2. Bougouni
2. Kadiolo
4. Kolondieba
5. Koutiala
6. Yanfolila
7. Yorosso

SEGOU
1. Segou
2. Baraoueli
3. Bla
4. Macina
5. Niono
6. San
7. Tominian

MOPTI
1. Mopti
2. Bandiagara
3. Bankass
4. Djenne
5. Douentza
6. Koro
7. Tenenkou
8. Youvarou

TOMBOUCTOU
1. Tombouctou
2. Dire
3. Goundam
4. Gourma-Rharous
5. Niafunke

GAO
1. Gao
2. Ansongo
3. Bourem
4. Kidal
5. Menaka

Other Int'l Boundaries

Region Boundary

Cercle Boundary

● National Capital

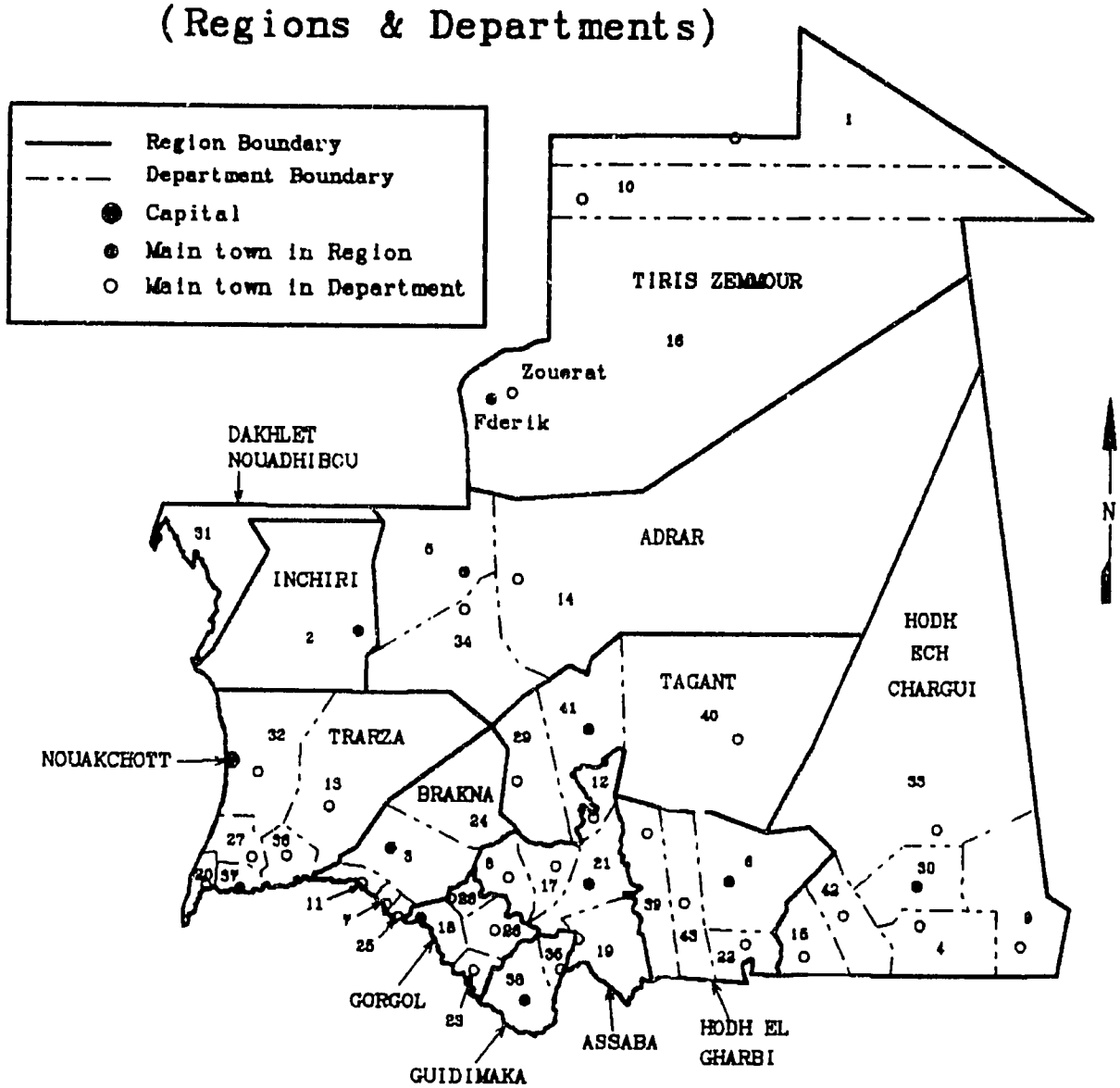
• Regional Capital

200 km

FEWS/PWA 1/87

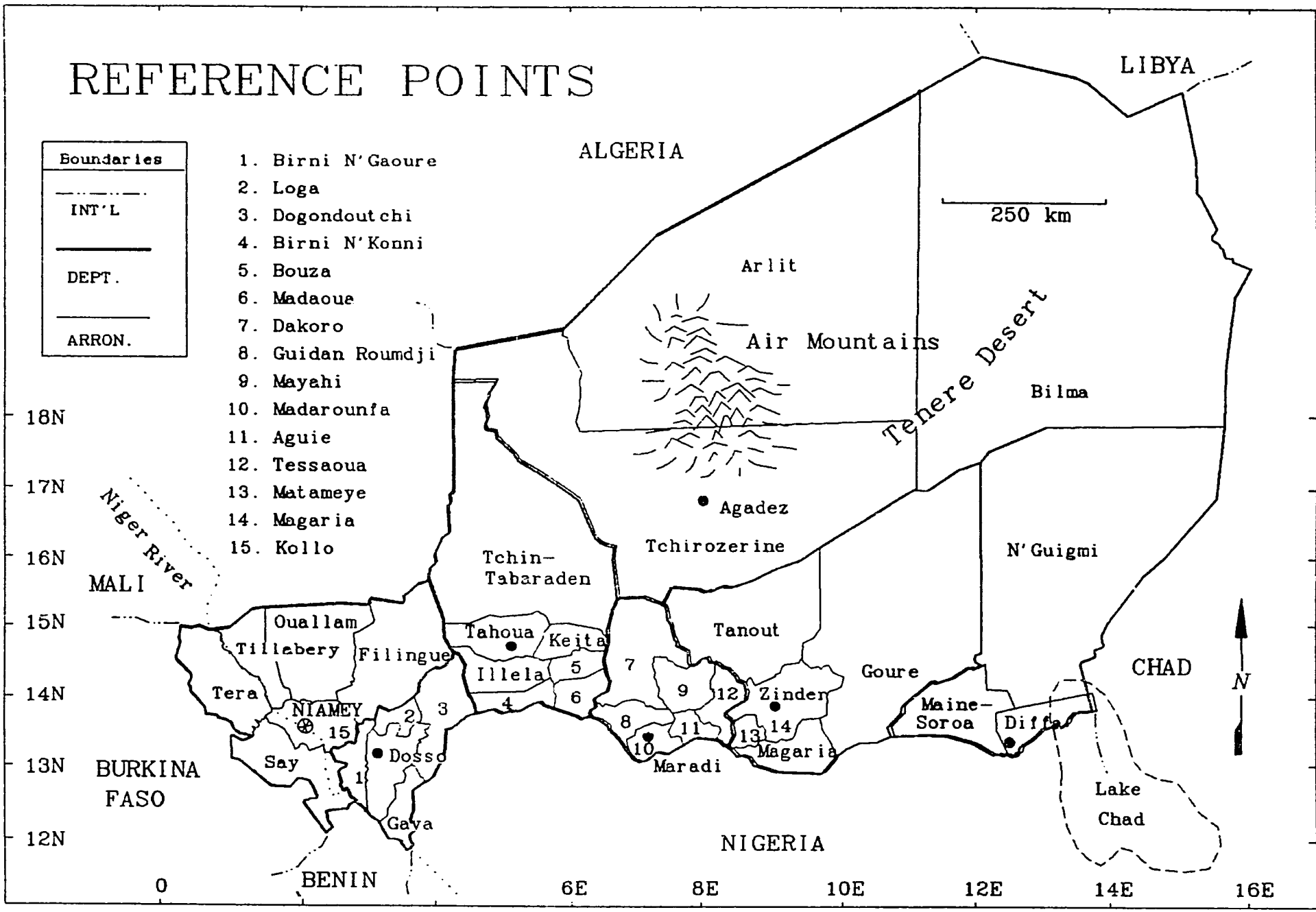
Administrative Units

(Regions & Departments)



Departments	RGN	Department	RGN	Department	RGN
1. Ain Ben Tili	TZ	16. Fderik/Zouerat	TZ	30. Nema	HC
2. Akjoujt	IN	17. Guerou	AS	31. Nouadhibou	DN
3. Aleg	BR	18. Kaedi	GO	32. Oued Naga	TR
4. Amourj	HC	19. Kankossa	AS	33. Oualata	HC
5. Atar	AD	20. Keur Massene	TR	34. Oujeft	AD
6. Ayoun el Atrous	HG	21. Kiffa	AS	35. Ould Yenge	GU
7. Bababe	BR	22. Kobenni	HG	36. Rkiz	TR
8. Barkewol el Abiod	AS	23. Maghama	CO	37. Rosso	TR
9. Barsikounou	HC	24. Magta Lahjar	BR	38. Selibabi	GU
10. Bir Mogrein	TZ	25. M'Bagne	BR	39. Tamchekket	HG
11. Boghe	PR	26. Mbout	GO	40. Tichit	TA
12. Boumdeid	AS	27. Mederdra	TR	41. Tidjikja	TA
13. Boutilimit	TR	28. Monguel	GO	42. Timbedgha	HC
14. Chinguetti	AD	29. Moudjeria	TA	43. Tintane	HG
15. Djigueni	HC				

Source: FEWS/Mauritania 1986; IGN 1980
FEWS/PWA, MAY 1987


REFERENCE POINTS
Boundaries
INT'L
DEPT.
ARRON.
1. Birni N'Gaoure
2. Loga
3. Dogondoutchi
4. Birni N'Konni
5. Bouza
6. Madaoua
7. Dakoro
8. Guidan Roumdji
9. Mayahi
10. Madarounfa
11. Aguie
12. Tessaoua
13. Matameye
14. Magaria
15. Kollo
ALGERIA
LIBYA
250 km
Arlit
Air Mountains
Tenere Desert
Bilma
Agadez
Tchirozerine
N'Guigmi
Tchin-Tabaraden
Niger River
MALI
Ouallam
Tillabery
Filingue
Tera
NIAMEY
Say
Dosso
Gaya
BURKINA FASO
BENIN
Tahoua
Keita
Illela
Tanout
Goure
Zinder
Maradi
Magaria
Maine-Soroa
Diffa
CHAD
Lake Chad
NIGERIA
N
18N
17N
16N
15N
14N
13N
12N
0
6E
8E
10E
12E
14E
16E

MAP 13: NIGER