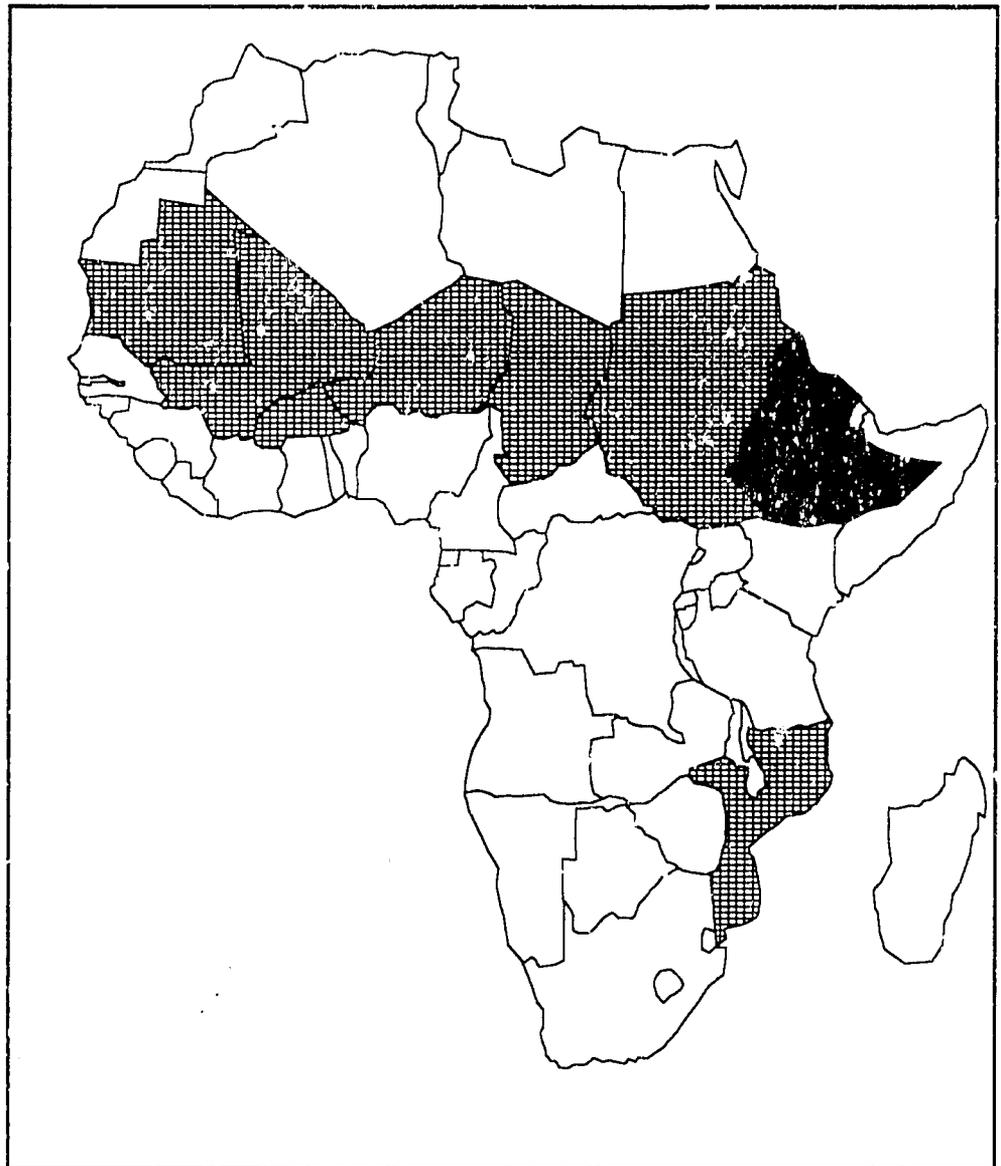


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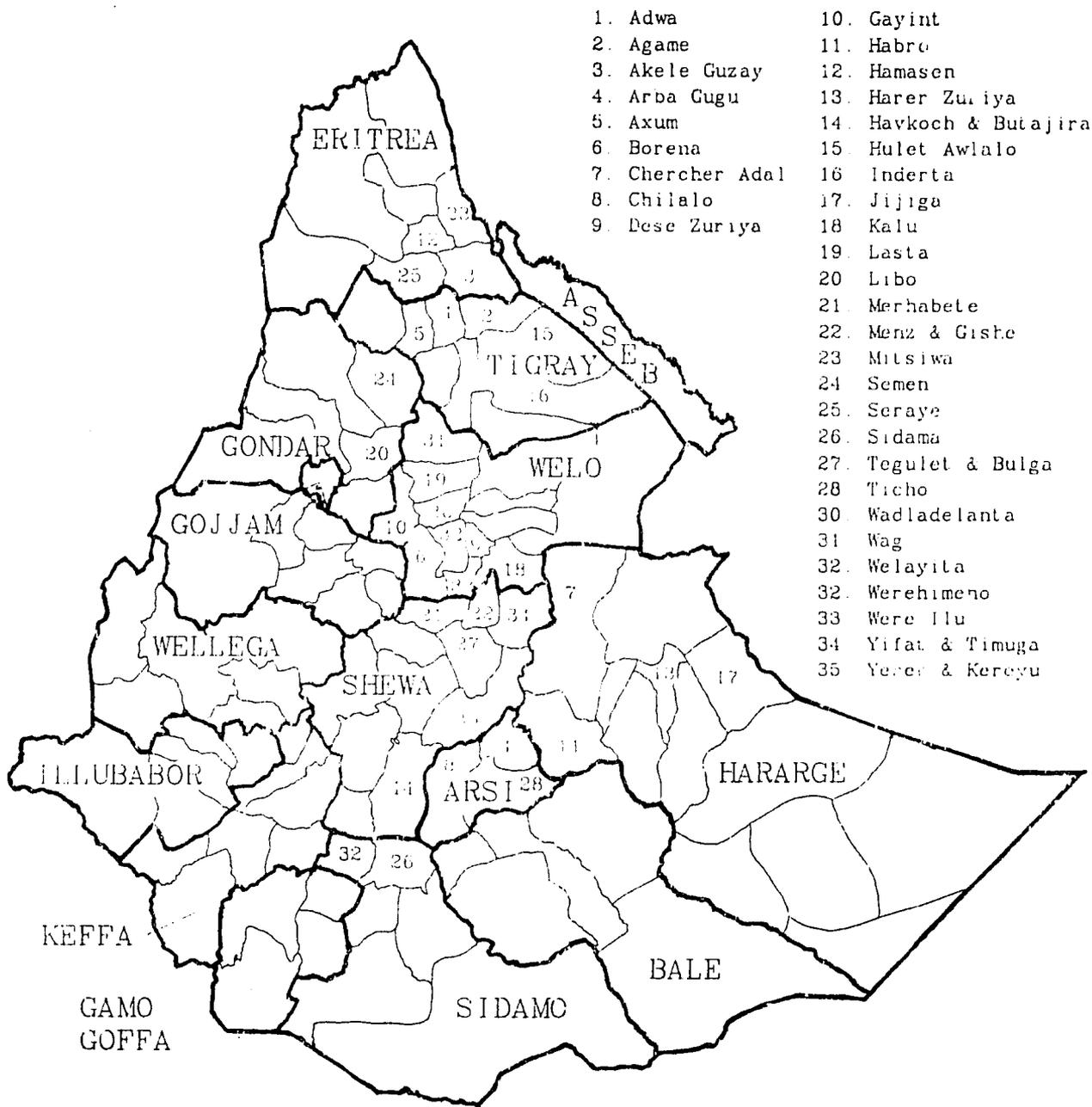
ETHIOPIA



Africa Bureau
U.S. Agency
for International
Development

Ethiopia

Regions & Awrajas



ETHIOPIA

Poor Harvest Prospects

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

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

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SUMMARY

Current crop conditions indicate that Ethiopia will almost certainly face a significant shortfall from its normal level of main season cereal production. Early reports in September indicate that rainfall has not greatly improved, and will not stop the deteriorating crop conditions in many parts of the country. Up to 13.7 million people live in areas most severely affected by this season's dry spell and resulting crop losses. The Ethiopian Relief and Rehabilitation Commission estimates that the emergency food deficit for 1988 will almost double that of 1987, at approximately 950,000 metric tons (MT). This emergency deficit is in addition to the "structural" (regularly occurring) food deficit of approximately 478,000 MT. Donors appear convinced of the magnitude of potential 1988 food needs, and have recently begun increasing emergency food assistance pledges, and discussing how inland transport costs may be met. It is too early to say whether the national grain and pulse harvest will be as bad as in 1984, although this certainly seems possible. It appears certain, nevertheless, that large numbers of people will exhaust their food reserves by November or December. Recent Ethiopian government actions appear oriented toward a somewhat more open disclosure of pertinent information than in the past. However, the results of several field surveys of crop conditions in late August have not yet been reported. More, and better, information will be needed to accurately judge both the conditions on the ground, and the willingness of the Ethiopian Government to respond fully to the humanitarian needs of a large number of its people.

CROP CONDITION INDICATORS

Rainfall: The small number of, and infrequent reporting by, Ethiopian rain stations make it difficult to determine rainfall in any specific area, especially during the current season. Available data are a mix of station reporting and estimates derived from Meteosat images. In order to make an early assessment of crop conditions, these unvalidated rainfall estimates have been used. The following summary of rainfall is preliminary, particularly for recent periods, and will be modified as reports from habitually late stations are received.

Earlier in the year, in the pastoral south of the country (particularly in the Ogaden area of Hararge Region), early rains were greatly deficient, causing a severe drought during March and April. In the Highlands, rains during the "Belg" (short) season were generally above average in most agricultural areas. In parts of the central Highlands, rains recorded at some stations were far above normal, sometimes threatening crops with erosion and flooding. In cumulative rainfall, the period from April to the end of June was estimated to be within the wettest 10% of historical records for the area. These rains helped to produce what most observers believe to be a generally excellent "Belg" season harvest. While this harvest may comprise only 5% of national cereal production, locally it can be very important.

In a very striking reversal, "Meher" (main season) rainfall between June 21 and July 18 was very low, within the driest 10% of historical records. This dry trend continued through the first week of August, when it was followed again, in a number of areas, by very heavy rains. The cycling between extremely heavy and extremely light rains led to an unusual circumstance in which Ethiopia was placed on the "Global Precipitation Anomalies" maps in NOAA's Climate Analysis Center report

(August 8, 1987) as within both the driest 10% of historical records (during July 12 through August 8) and the wettest 10% (from May 1 to July 31). These anomalies were located in a band running down the eastern side of the central highlands and into the southern highlands. The sustained dryness during July and August, and earlier destructive runoff from torrential rains provides a sobering reminder that annual or even seasonal rainfall totals alone may be poor measures of crop development and the potential harvest.

More recently, rainfall has been less volatile, yet still relatively light. This is particularly true for the southern highlands. Jijiga (Hararghe Region) had received approximately 37% of normal cumulative rainfall by the end of the first week in September. Other stations in the central highlands report approximately 60% to 80% of normal as of the same date.

Satellite Vegetation Index : Given the poor rainfall information, the mountainous terrain, and a tenuous security situation in many parts of the country, it is more difficult in Ethiopia than in many other countries to determine current crop conditions. NVDI satellite imagery¹, while its interpretation is still the subject of continuing research, is an additional tool that may help to determine vegetative conditions (and by cautious inference, crop conditions). Several different presentations of July, August and early September images are provided below, with the object of *better specifying areas in which crop development is likely to have suffered significantly.*

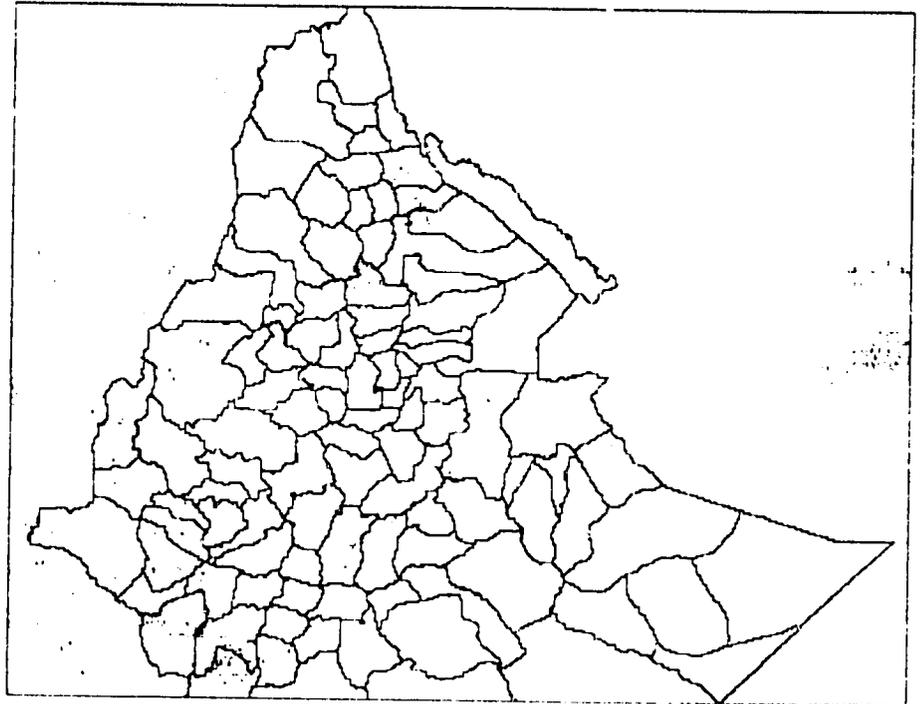


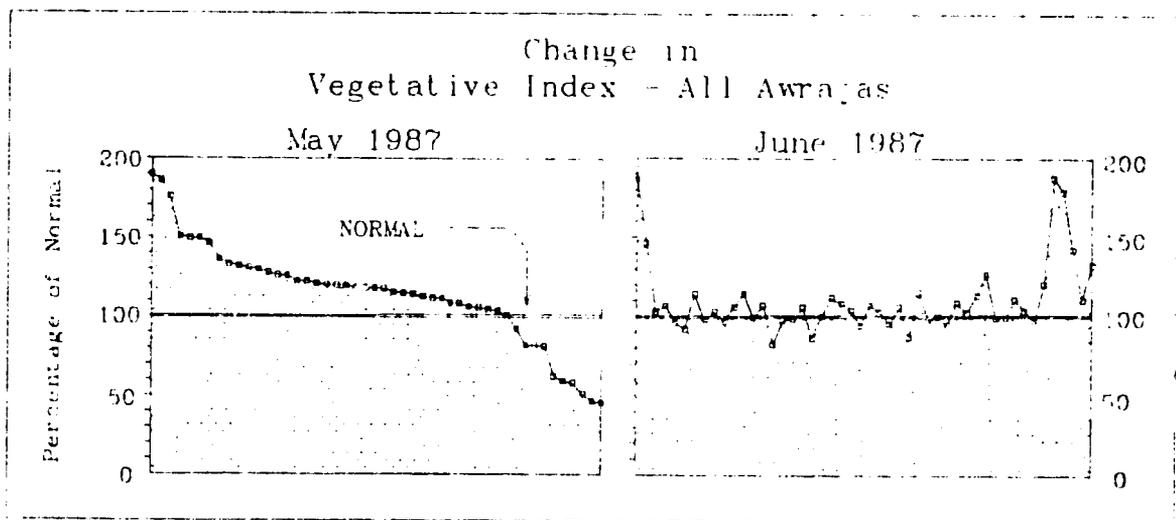
Image 1: Below-Average Vegetative Vigor, September 1-10, 1987

¹ The Normalized Difference Vegetation Index (NDVI) is derived from NOAA AVHRR GAC data. The photo-synthetic capacity, or vegetative vigor displayed by these images is generally believed to be indicative of the condition of vegetation on the ground, and, at least inferentially, of the growing conditions for crops and pastures. These relationships are, however, only indirect and still the subject of continuing research.

Recent Vegetative Trends - Vegetation indices are generally improving in most agricultural areas. Early rainfall reports indicate that this increase may not continue, as rains have continued very poor in most areas. For those areas that have already lost their crops, the improving vegetation indices and rainfall situation are not particularly significant. For those where farmers have re-seeded, particularly with short-cycle crops, these indicators are not much comfort. Continuing below-average levels are seen in south-central Eritrea, north-central Tigray, the highlands of Hararghe, and very scattered areas in the rest of the southern highlands (Image 1).

Seasonal Trends - At the beginning of May, and even in early June, most awrajas in Ethiopia, except several in Hararghe Region, displayed better levels of vegetative vigor (see Figure 1) than average², due to generally good "Belg" season rains (that began in March). The impact of increasingly poor rains in late June and early July, over large areas of the Highlands, began to show in vegetation index levels in early July, particularly in specific river valleys (see Images 2-7, which compare current levels with the 1981-86 average).

Figure 1:



Most awrajas declined significantly in vegetative vigor between the first ten days of May and the first ten of June. The very low values seen on the right-hand side of the May graph are composed primarily of Hararghe Region awrajas, which increased to above-average values over the month of May.

The July 11-20, 1987, image shows the emergence of the most persistent area of probable crop stress, located along the border between Welo and Gonder Regions. The area covers the upper reaches and tributaries of the Tekeze River, and extends through much of the eastern side of Wegera, Libo, and Gayint awrajas (Gonder), and the western sides of Wag, Lasta, Wadla Delanta

² Based on 1982-86 period for which imagery is available.

Image 2

July 1-10, 1987

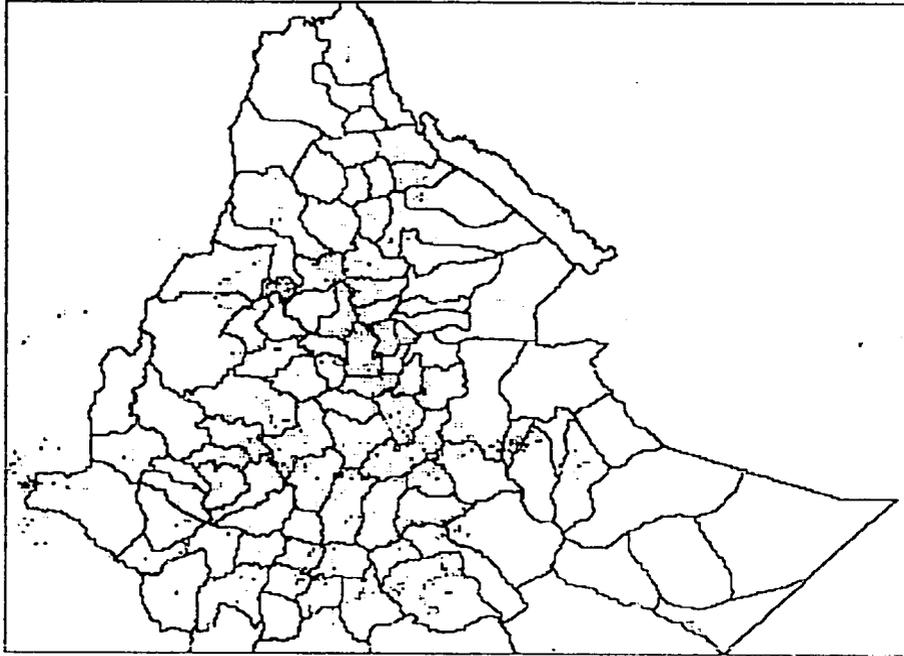


Image 3

July 11-20, 1987

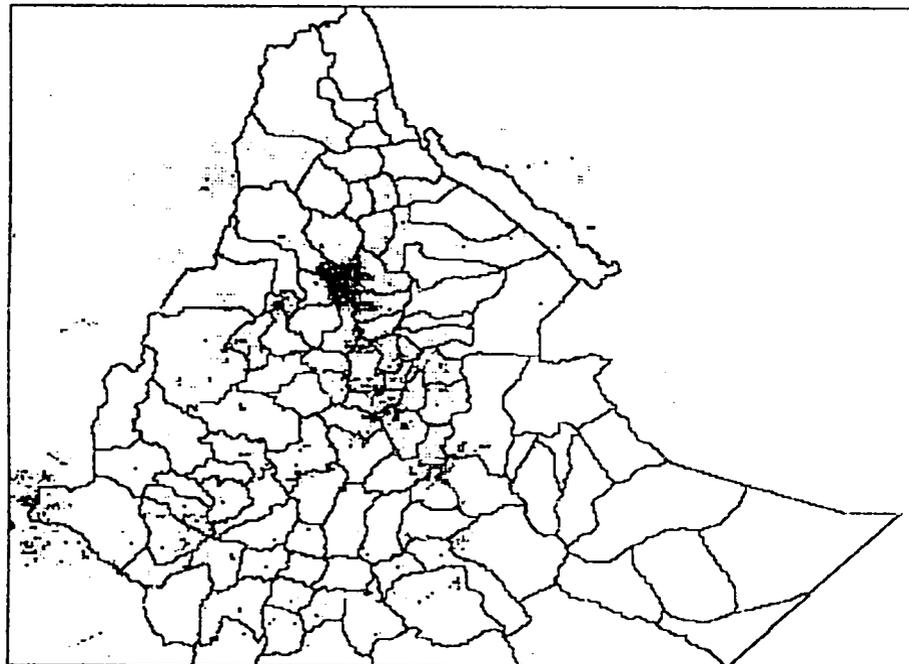
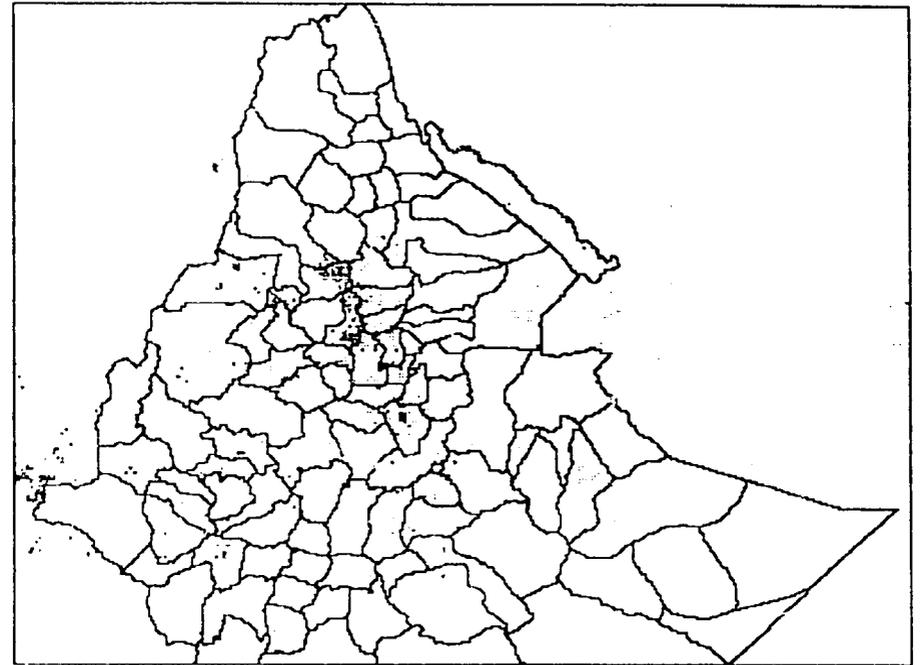


Image 4

July 21-31, 1987

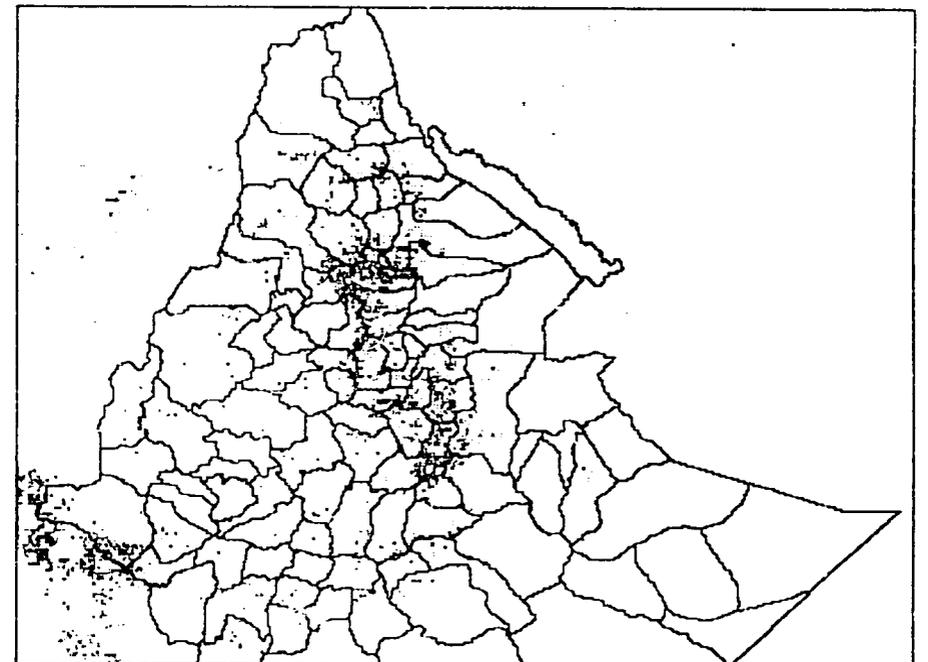


Image 5

August 1-10, 1987

Image 6

August 11-20, 1987

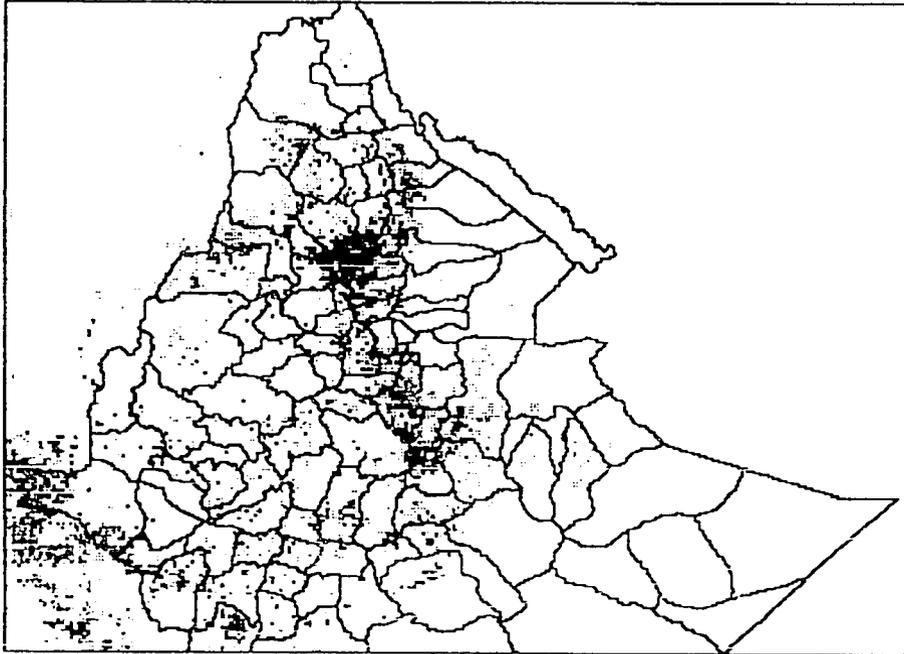
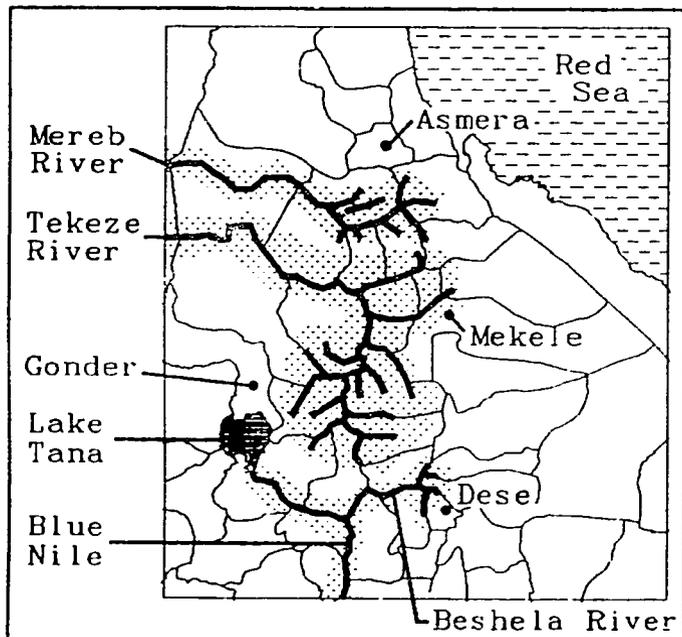
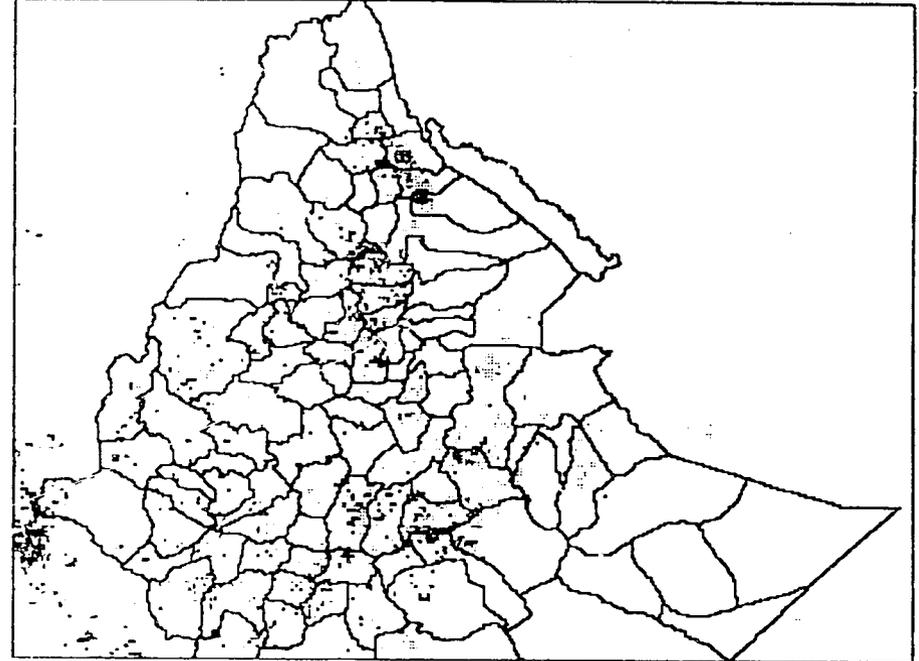


Image 7

August 21-31, 1987



Dark areas indicate below average vegetative vigor compared to 1981-86

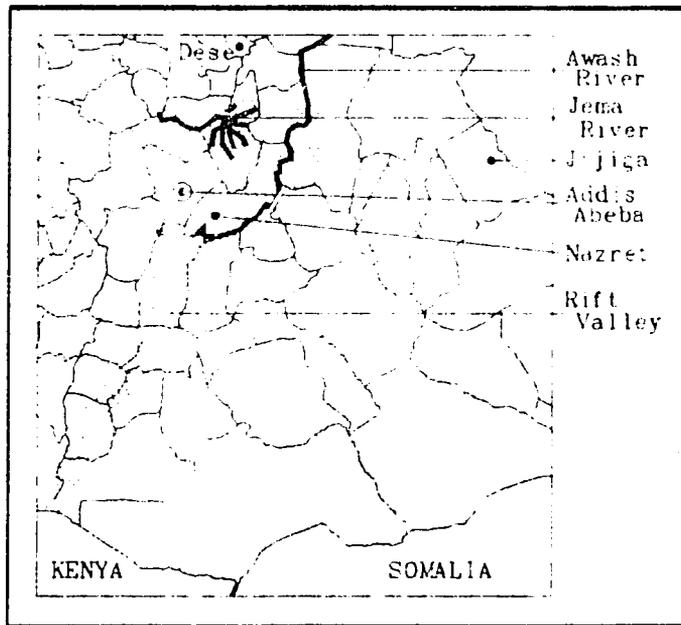
Map 2: Northern Awrajas

and Borena awrajas (Welo). In Borena, this area centers upon the Beshela and Abay (Blue Nile) river valleys.

By the end of July, the area of below-average vegetative values began to extend further to the northeast (much of the eastern edge of the highlands going up through Tigray Region to Asmera town in Eritrea, and particularly in the Mereb River valley) and to the south (Were Himeno, Were Ilu, and Kalu Awrajas in Welo Region; along the Jema River in Merhabete, Yifat and Timuga, and Menz and Giske Awrajas, and in the foothills of Tegulet and Bulga, and Yerer and Kereyu Awrajas in Shewa Region; and a portion of the Rift Valley, following the Awash River from approximately Nazret to north of the town of Awash).

By the end of August, vegetative vigor began to increase in many areas, reflecting rains in the middle of that month. Nevertheless, this improvement

Map 3: Southern Awrajas



may have come too late to improve crop prospects in those areas most severely affected. Below-normal vegetative values continued to be recorded in south-central Eritrea and north-central Tigray Regions, in many areas along the eastern side of the central highlands, and in widely scattered areas in the south (notably around Gamo Awraja in Gamo Gofa Region; Welayita, Sidama, and Gedio Awrajas in Sidamo Region; and in the Shebele River valley, between Arsi and Bale

Image 8

Vegetative Vigor Compared to Lowest Values 1981-86

Image 9

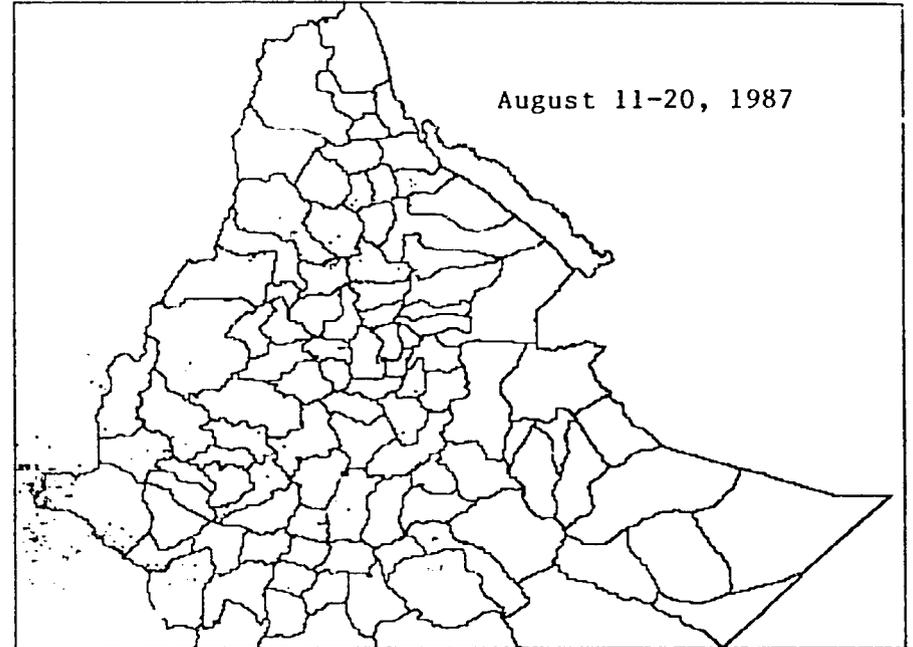
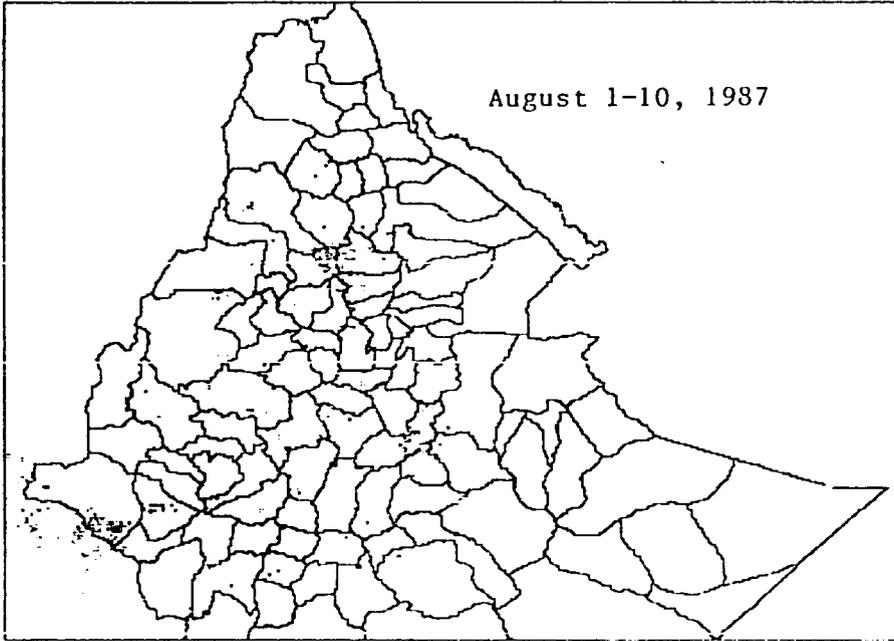
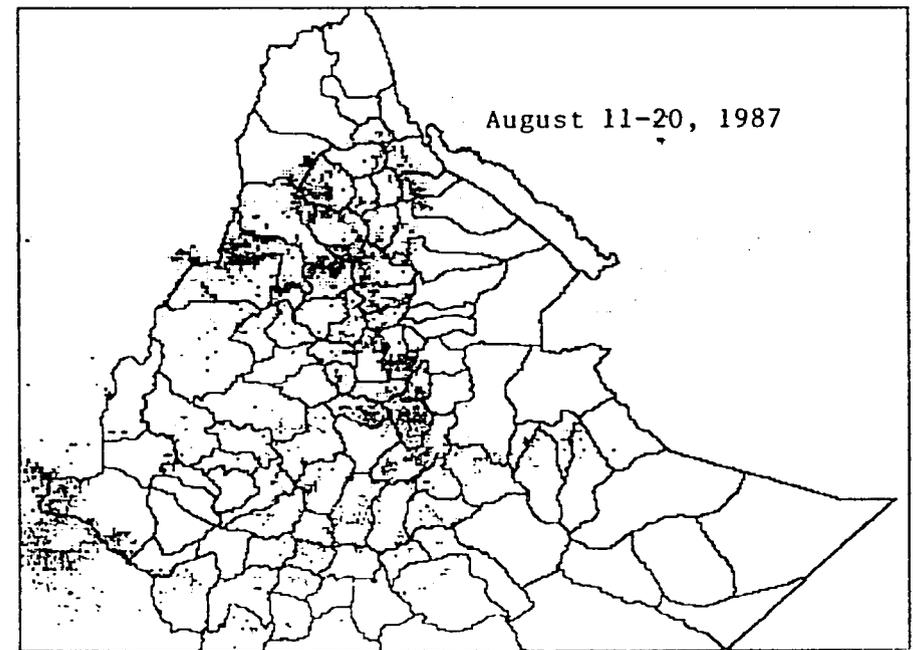
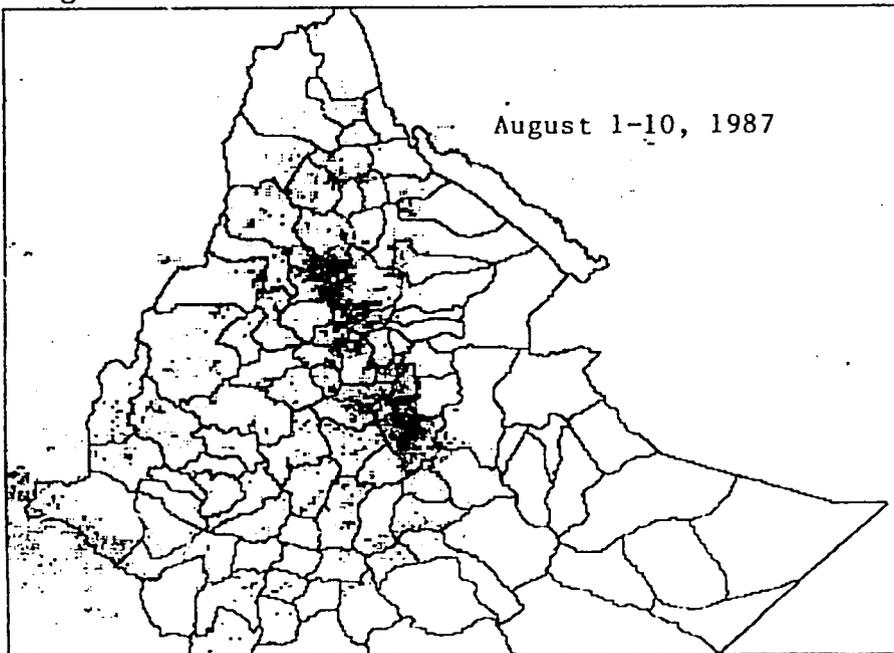


Image 10

Vegetative Vigor Compared to 1984

Image 11



Dark areas = below the lowest values and below 1984 values.
 Images shown above are one each for August 1-10 and August 11-20, 1987.

Significance of the Below-Normal Index Values³ - While Images 2-7 show areas with index values below the 1981-86 average, Images 8 and 9 compare the NDVI values from the first and second decades of August (August 1-10 and August 11-20) with the lowest historical index values for these periods. *Some 1987 NDVI values in the awrajas of Wag, Libo, Lasta, Gayint, Hulet Awlalo, and Agame, the Rift Valley, and the southern tip of Gambela, are lower than any recorded from 1981 to 1986.*

A comparison of this year's vegetative conditions with those of another year, particularly a recent one that was widely considered to be very bad, will help to place current conditions in a more meaningful context. The obvious year for comparison is 1984, a drought year in which the widespread failure of the harvest caused millions of Ethiopians great hardship and, in many cases, death. Images 10-11 compare the first 20 days of August 1987 with August 1984. Vegetative conditions were worse than in 1984 in many of the same areas identified in Images 4, 5, 6, 8 and 9. This would tend to *reaffirm the likelihood that there was significant vegetative stress in these areas.*

Several other areas display NDVI readings which are worse than in 1984. However, in the western areas of Gonder and Chilga Awrajas, 1984 may not have been quite as bad as elsewhere in Ethiopia, and the comparison yields somewhat less reason to suspect stress in those areas now. The strongly negative areas seen in Gambela do not cover important crop areas.

(Probable) Most Severely Affected Areas - Many awrajas are currently receiving food assistance for pre-existing, and sometimes chronic, food shortages. In some cases, these problems will be worsened by the poor rains in June and July. In other awrajas, it is likely that the poor rains will now result in imminent food shortages. Based on the rainfall and satellite imagery examined above, *substantial areas within the following awrajas appear to have been most severely affected by poor crop conditions during this main cropping season:*

ERITREA: Hamasen, Mitsiwa, Seraye, Akele Guzay
TIGRAY: Agame, Adwa, Hulet Awlalo, Inderta
WELO: Wag, Lasta, Wadla Delanta, Borena, Were Ilu
GONDER: Libo, Gayint, southern Wegera
SHEWA: Merhabete, Menz and Gishe, Yifat and Timuga, Tegulet
and Bulga, Yerer and Kereyu
HARERGHE: Jijiga, Habro
SIDAMO: Welayita, Sidama

³ The NDVI index's utility lies in its ability to relate vegetative conditions in one area to previous or subsequent conditions in that same area. Indications of the rate of change of conditions, longitudinal statistical comparisons, and relative rankings of a time period to others in which conditions were known, are the most meaningful measures of the significance of the NDVI values. It is yet very difficult to relate the NDVI index to an absolute level of crop health or stress. Research does show that NDVI values are related to the absolute amount of biomass on the ground, and to its photosynthetic capacity. Nevertheless, an enormous amount of "ground-truth" about soil types, vegetative characteristics, atmospheric conditions, and many other factors is required to make relatively accurate use of these measures in assessing absolute conditions on the ground.

Crop prospects are not uniformly poor in each awraja. Possible consequences may range from large crop losses in some (most likely in Eritrea, Tigray, Welo, and Harerghe), to significant yield reductions in others (Shewa, Arsi, Gonder). Some awrajas not found on this list may also face a poor harvest. This would be particularly true for areas in which "average conditions" (the primary yardstick used in interpreting the satellite imagery seen above) are still too poor to yield a significant crop. There is also a substantial chance that potential yields could be further reduced by continuing dryness, or by late rains during the harvest period.

AT-RISK POPULATIONS

According to the United Nations Emergency Prevention and Preparedness Group (EPPG), there are an estimated 13.7 million people in areas of Ethiopia affected by the

Table 1:

POPULATIONS AT RISK & EMERGENCY FOOD NEEDS

| REGIONS | 1985 | 1986 | 1986 | 1987 | 1987 |
|-----------|------------|-----------|-----------|-----------|---------|
| | AT-RISK | AT-RISK | MT | AT-RISK | MT |
| ARSI | 220,000 | 19,670 | - | - | - |
| BALE | 195,580 | 99,000 | - | 30,450 | 6,100 |
| ERITREA | 827,000 | 650,000 | 255,200 | 399,450 | 65,200 |
| GOJJAM | 163,580 | 0 | - | 0 | - |
| GONDER | 860,240 | 441,944 | 69,600 | 220,920 | 33,300 |
| GAMO GOFA | 279,280 | 153,470 | - | 26,870 | 4,400 |
| HARARGHE | 1,744,200 | 1,516,720 | 243,600 | 358,250 | 65,800 |
| ILLUBABOR | 0 | 101,600 | - | 208,970 | 32,100 |
| KEFFA | 29,000 | 90,000 | - | 38,810 | 5,800 |
| SIDAMO | 675,490 | 441,800 | 58,000 | 220,920 | 40,500 |
| SHEWA | 1,332,250 | 587,540 | 116,000 | 185,110 | 28,100 |
| TIGRAY | 1,429,390 | 1,000,000 | 197,200 | 358,250 | - |
| WELLEGA | 149,190 | 116,470 | - | 117,630 | - |
| WELLO | 2,897,380 | 1,926,950 | 255,200 | 334,370 | 53,300 |
| TOTAL | 10,802,580 | 7,145,164 | 1,160,000 | 2,500,000 | 334,600 |

Sources: USAID, RRC, WFP. These estimates are given here to provide a brief context for current discussions. Some of them (like the 1987 At-Risk number) were later revised, and those changes may not be reflected here.

recent drought. The prolonged dry spell during June, July and early August affected most of Eritrea and Tigray, western Wello and the highlands of Hararghe, as well as localized areas within Shewa, Gonder, Sidamo, Arsi and Bale. As a result of expected Meher crop losses, the EPPG estimates the cereal deficit could reach 1.5 million tons. On September 7th, the Ethiopian Relief and Rehabilitation Commission (RRC) issued a preliminary appeal for 950,000 MT of emergency food aid for 1988. This is almost double the amount requested for 1987 (See Table 1). Regional assessments of current conditions follow below.

Eritrea - This drought prone region is estimated to have lost all of this year's main season cereal production from its only growing season of the year. The EPPG estimates some 2.9 million people are in affected areas of Eritrea. The Food and Agriculture Organization (FAO) estimates 1.2 million will require relief as a result of this drought, beginning in November or December 1987, and continuing for eight to nine months. There are currently 660,000 beneficiaries of relief activities who are judged to be at-risk as a result of prior situations. The RRC estimates that emergency food aid needs for 1988 will total 152,000 MT, or 16% of national needs.

Tigray - Some observers estimate that drought-prone Tigray may have lost up to two-thirds of its limited agricultural production due to the prolonged dry spell. The EPPG estimates 1.8 million people are in areas of Tigray affected by the drought. The RRC estimates emergency food needs at 218,500 MT, or 23% of the national total. FAO's assessment team has fixed the number of people in Tigray likely to require relief (due to drought) at approximately 1.5 million. The security situation in the region renders the formulation of at-risk estimates difficult, and means that delivery of relief food to Mekele, Axum, Adwa, and other distribution points will likely require convoys or airlifts. Donors are being urged to expedite deliveries of pledged emergency food aid so that full advantage may be taken of early convoys to these areas to build up emergency food stocks in preparation for the large anticipated need beginning in November.

Wello - Meher crop losses in Wello were estimated at 25% in late August. Since then, rainfall has continued very light and losses could rise higher than this. The EPPG estimates that 2.5 million people are in the affected areas. The RRC estimates emergency food needs for 1988 at 180,500 MT (19% of national needs). World Vision Relief Organization (WVRO) believes some areas will need emergency assistance as early as September. Wello already has some 535,250 people receiving food distributions as a result of last year's poor Meher crop. Fortunately, Wello enjoyed a good Belg season harvest in June this year, which should provide a limited cushion from immediate emergency food needs. Belg production normally accounts for 10% of total food grain production in this region.

Hararghe - While the highlands of northern Hararghe had an unusually wet Belg season (its normal Belg production is low, approximately 12,000 MT), an estimated 60% of the Meher crops may have been lost. Some two million people are believed to live in the affected areas. The RRC estimates emergency food needs at 247,000 MT, 26% of the national total. CARE has determined the most severely affected areas to be all of Jijiga (where losses may be highest), Wobera and Gursum Awrajas; southern Chercher Awraja; Rift Valley woredas in Habro Awraja; and much of Harar Zuriya Awraja. While some hope existed that rains in August would allow some short-cycle crops to be harvested, rains have continued greatly below normal.

Shewa - Dryness may have reduced the Meher crop in northeastern Shewa by 25% or more. The EPPG estimates two million people are in the affected areas. The RRC estimates 1988 emergency food needs at 28,500 MT (3% of national needs). FAO describes the affected areas as localized parts of northern Shewa (also see above), but Food for the Hungry International reports a serious

condition in southern Shewa and is preparing an appeal for emergency food aid. Shewa is the largest grain surplus producing region and is believed to have had a good Belg season this year. This may help in some measure to offset Meher crop losses in localized areas of the region.

Gonder - Southeastern Gonder, specifically southern Wegera, eastern Libo and Gayint Awrajas, suffered from severe dryness during June and July; much of the rest of the region is in relatively better shape. There is also a security situation which obstructs the flow of information about conditions in Gayint. The RRC estimates 1988 emergency food needs at 38,000 MT (4% of national needs).

Sidamo - FAO has assessed conditions in Sidamo as favorable except in localized parts. In most of Sidamo, enset (false banana) traditionally helps to offset cereal shortfalls, and the enset blight of recent years has receded in importance. Nevertheless, the RRC estimates emergency food needs in 1988 at 25,650 MT. The chronically drought-affected Welayita Awraja is estimated to have lost 28% of all cereal crops and 32% of all pulses this Meher season. This, with an estimated 12% reduction in Belg production this year, can be expected to create a significant emergency food need by November. One million people are believed to be in the affected area.

Bale & Arsi - These two regions are generally believed to be in better condition than those discussed above. The RRC estimates 1988 emergency food needs at 9,500 MT for Bale, and 19,000 MT for Arsi. Although an area of state farms along their common border may have been severely affected, a near normal crop is still possible if short-maturing seeds were available as they were in western Ethiopia last year, and if the rains continue. Arsi is normally a grain surplus producing region and the highland areas have not recently experienced major food shortages.

FOOD AID

As of September 8th, food donors had responded to the Government of the People's Democratic Republic of Ethiopia's (GPDRE) appeal for 950,00 MT in emergency food aid for 1988 with some 85,000 MT in new pledges, not yet confirmed. The U.S Government is currently discussing the shipment of a further 115,000 MT. In addition to food aid, the GPDRE has stressed the need for assistance with internal transport costs. The international community is closely monitoring developments, and is aware of the four-month lead time required to get food aid shipped, unloaded, and into position by the time it is needed (initial need is generally expected to occur between November and January). Prompt action may help to prevent mass migrations of people to feeding centers, avoiding the attendant health risks of both migrations and concentrations.

Nevertheless, there is concern among donor governments over the failure of the Ethiopian government to institute needed agricultural reform measures in the country. The long-standing and severe food deficits are certainly not helped by current agricultural and economic policies, although this year's drought would have created emergency food requirements with or without these reforms

(Implementation can be expected to have a long-term, rather than immediate, impact on production levels). Similarly, while the RRC has been generally more forthcoming than in the past with information about projected food deficits, donors will continue to require more and better regional detail (e.g., available stocks, food production, populations at-risk, etc.) than provided thus far with the GPDRE's 1988 appeal.

FAMINE EARLY WARNING SYSTEM

This is the fourteenth/fifteenth in a series of monthly reports on Ethiopia issued by the Famine Early Warning System (FEWS). It is designed to provide decisionmakers with current information and analysis on existing and potential nutrition emergency situations. Each situation identified is described in terms of geographical extent and the number of people involved, or at-risk, and the proximate causes insofar as they have been discerned.

Use of the term "at-risk" to identify vulnerable populations is problematic 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 for the present, until a better usage can be found, 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 FEWS effort highlights the process underlying the deteriorating situation, hopefully with enough specificity and forewarning to permit alternative intervention strategies to be examined and implemented. Food assistance strategies are key to famine avoidance. However, other types of intervention 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 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 the 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 estimates of food needs presented periodically in FEWS reports should not be interpreted to mean food aid needs, e.g., as under PL480 or other donor programs.

FEWS depends on a variety of US Government agencies, private voluntary organizations (PVO's), international relief agencies, foreign press and host government reports as sources of information used in the country reports. In particular, a debt of gratitude is owed to many individuals within various offices of the US Agency for International Development (USAID) who routinely provide valuable information: the offices of Food For Peace and Voluntary Assistance (FFP/FVA), and the Office of Foreign Disaster Assistance (OFDA). Additional useful information is also provided by the National Oceanic and Atmospheric Administration's National Environmental Satellite, Data, and Information Service (NOAA/NESDIS), the Cooperative Institute for Applied Meteorology at the University of Missouri (CIAM), the National Aeronautic and Space Administration (NASA), the UN Food and Agriculture Organization (FAO) Global Information and Early Warning System (GIEWS), the World Food Programme, and other U.N. agencies

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