**SPECIAL REPORT**

**FAO/WFP CROP AND FOOD SUPPLY ASSESSMENT MISSION TO ERITREA**

**27 November 2003**

**Mission Highlights**

- Prolonged drought in 2002 caused the 2002 crop production in Eritrea to almost entirely fail. The livestock sector was also severely affected. In 2003, crop production was severely constrained by erratic rains starting late and ending early. Although the amounts of *kremti* rains (June–September 2003) were about average for most areas of the country, long dry spells alternated with torrential downpours.
- Cereal production for 2003 has been estimated at around 106 000 tonnes, almost twice the amount of last year's extremely low production of 54 530 tonnes. It is still, however, only 57 percent of the average of the past 11 years and 51 percent of the forecast made in August 2003 (207 000 tonnes).
- The Mission observed that adequate *kremti* rainfall has provided good quantities of fodder and water for livestock in most areas, but these will be exhausted in 3–4 months on average in many areas.
- Support to the livestock sector, a mainstay of the rural economy and household incomes, should be a priority. This includes animal disease control, especially against contagious bovine pleuro-pneumonia (CBPP), which broke out in 2002 and could devastate the nation's cattle population.
- Cereal import requirements for 2004 have been estimated at 478 000 tonnes; it is estimated that 30 000 tonnes of this amount may be imported commercially.
- With 31 000 tonnes of cereal food aid in country or in the pipeline for distribution in 2004, the uncovered deficit, for which international assistance is needed, has been estimated at 417 000 tonnes.
- Of immediate concern are nearly 1.4 million of the most vulnerable people, who will require 219 651 tonnes of food aid (including cereals, pulses, and oil) in 2004. So far, WFP planned projects for 2004 add up to just under 200 000 tonnes.
- Timely seed support will also be needed in 2004 to enable maximum possible planting for different crops.
- In order to significantly increase crop production over the medium and longer terms, better farming practices and access to quality seeds and other inputs will be required. The future prospects of livestock will hinge on greater access to feed and veterinary services, and increased access to export markets.

## 1. OVERVIEW

In August 2003, a crop assessment was made by a Food Security Task Force with participants drawn from FAO, WFP, the Eritrean Ministry of Agriculture (MOA), NGOs and donor groups. The Task Force estimated the 2003 food crop production at 210 000 tonnes (cereal: 207 000 t). That estimate was based on the assumption that rains would continue into September and would be favourably distributed both temporally and geographically; the assumption, however, did not hold. In most areas, the rains stopped too early, and very little rain was received in September; in many places this has been the case since mid-August.

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Against this backdrop, an FAO/WFP Crop and Food Assessment Mission visited Eritrea from 25 October to 12 November 2003 to assess the 2003 production of the main cereals and pulses as well as the condition of the livestock, review the overall food situation and estimate the cereal import requirement for 2004 – including food aid needs – and identify essential support activities towards crop production and livestock management in 2004.

In Asmara, the Mission held meetings with the Eritrean Minister of Agriculture and officials of various ministries including the MOA and Ministry of National Development, the Country Representative and other officials of FAO, WFP Country Director and other WFP officials, FEWSNet and officials of several NGOs. The Mission also consulted various reports about the economic situation, poverty levels, food security, and crop production (including the report of the crop assessment conducted in August 2003).

The Mission split into two groups in order to cover five of the six *zobas* (districts) – i.e. Anseba, Gash-Barka, Debub, Maekel and Northern Red Sea – and conducted extensive field visits in most of the sub-zobas under them. Only Southern Red Sea zoba was not visited, but no crops grow there. During field visits the Mission was assisted by senior officials from the MOA as well as by an FAO official from Asmara and a UNHCR official from Barentu and accompanied by observers from FEWSNet, EU and USAID. Extensive discussions were held with zoba- and subzoba-level officials of the MOA, and interviews were conducted with farmers, pastoralists, labourers, traders and staff of some of the NGOs. Both crop production and livestock condition were reviewed in intensive discussions and interviews. Field assessments were made regarding household food security, vulnerability and coping strategies. This year's crop production and food supply were compared with the previous years in order to obtain a relative historical perspective. The Mission produced its estimates after the data and information received from secondary sources had been analysed against data, information and insights obtained during field visits. It should be noted that the briefings given by the officials of the MOA at various levels, particularly at the sub-zoba level, almost always matched the realities on the ground – which is appreciable.

The 2003 agricultural season was characterized by erratic rainfall (started late and stopped too early with long dry spells, occasional torrential rains and hailstorms) although the total seasonal *kremti* rainfall was around average in most areas. In many places, including the potentially high-producing areas of Goluj sub-zoba, two or three replantings were made necessary by precipitation problems. Little or no rain in September, and sometimes as early as the second half of August, resulted in the most damage to crops. To make matters worse, some rainfall over certain areas in late October/early November wrought further damage to late-planted crops.

However, despite adverse weather conditions and shortages of both labour and farm equipment, this year the farmers – with government encouragement and support – planted a larger total area than last year to various crops. But in certain areas the crops failed, and in other areas yields were poor compared to expected results, mainly from erratic rainfall (including torrential rain and hailstorm damage) but also from outbreaks of chafer beetles and grasshoppers.

After thoroughly examining all relevant factors, the Mission has estimated the 2003 cereal harvest at about 106 000 tonnes, which is almost double last year's production of 54 530 tonnes, but still only 51 percent of the August 2003 forecast and 57 percent of the annual average amount of cereal harvested during the past 11 years.

Concerning the availability of grazing feed and drinking water for livestock, good quantities of *kremti* rains and some October/November rains have been useful. The Mission observed that the condition of the livestock was good almost everywhere. Both the feed and water will be exhausted in many areas in some 3-4 months, however, and this will adversely affect livestock. Moreover, livestock diseases – particularly CBPP[1], lumpy skin disease and PPR[2] – are spreading. The government is taking steps to combat these diseases but much more needs to be done to successfully protect livestock. In particular, CBPP could potentially destroy what is a previously unexposed cattle population. International assistance is thus urgently needed to control this an outbreak before it is too late.

The cereal import requirement for 2004 has been estimated at 478 000 tonnes, setting the estimated domestic availability of 136 000 tonnes against the estimated total utilization of 614 000 tonnes. Given the precarious foreign exchange situation, it is anticipated that only 30 000 tonnes of cereals can be commercially imported for consumption in 2004. With about 31 000 tonnes of cereals in stock or in

[1] Contagious bovine pleuro-pneumonia.
[2] Small ruminant rinderpest.

pipelines as food aid, the uncovered cereal deficit – for which international assistance is needed – amounts to 417 000 tonnes.

The nearly 1.4 million most vulnerable people who will require emergency food assistance in 2004 have been identified: they will need about 219 651 tonnes of food including cereals, pulses and oil (see Table 10). Other population groups will also need food assistance in 2004 as their food stocks will be exhausted in approximately 4-5 months; these groups have extremely limited coping strategies.

Farmers will have access to only limited quantities of seed for planting, since many of them harvested little or nothing, and many others, who have indeed harvested some cereals, may be unable to put adequate quantities of seeds aside for saving. Critical emergency seed distribution support will thus be necessary to enable farmers to plant the maximum possible areas in various crops next year. In the case of livestock, emergency support will be needed to restructure animal health services so as to enable the sector to perform reasonably well next year.

Over the medium and longer term, appropriate policy and programme adjustments are needed in order for both the crop and livestock sectors to perform according to potential. The issues to be addressed concern better farming and livestock management practices; they include soil and water conservation, more widespread use of fertilizer by all farmers in conjunction with improved access to water through irrigation where possible, stronger extension services, provision of rural financing and marketing services establishment of secure land tenure along with improved access to land, more regional market opportunities (particularly for livestock) and ensuring secure access to feed/supplementary feed and adequate animal health services.

## 2. SOCIO-ECONOMIC SETTING

### 2.1. The economy[3]

Eritrea (including the Dahlak Archipelago) covers a geographical area of 124 320 $km^2$ and has a population of 3.56 million inhabitants (2003 figures). About 80 percent of the population is rural, but the urban population is growing rapidly, partly as a result of returning refugees from outside Eritrea and partly from high rural-to-urban migration. The population density is 28 persons per $km^2$. A large part of the country contains rugged arid mountains and is thus neither habitable nor utilizable for economic purposes. Only some two million hectares are considered potentially arable, but with unfavourable weather conditions and water shortages, only about half a million hectares is farmable. Agriculture is mainly rain fed; limited and usually unevenly distributed rainfall is a serious constraint. Irrigation coverage is negligible. Other constraints faced by the agricultural sector include pest outbreaks; shortages of labour, farm equipment and draught power; and occasional localized torrential rains and hailstorms. Finally, the country possesses extremely limited natural resources.

Eritrea is among the least developed countries and experiences a chronic food deficit. The per capita GDP (about US$200 in 2001) declined by an additional 1.2 percent in 2002 after severe drought induced the collapse of agricultural production. Moreover, income inequality as measured by the Gini coefficient, is very high (0.45). The share of income spent on food is high: about 66 percent nationwide and about 71 percent for rural areas (such high figures are to be expected in poverty situations like Eritrea's). On average over the past 11 years, domestic food production has met less than half of national requirements, and cereal production has met only about 40 percent of the total cereal requirements of 140 kg/person/annum. Food vulnerability has thus been increasing as the result of Eritrea's extremely limited and declining commercial food import capacity on the one hand, and because people are facing more and more stressful situations in trying to cope, on the other. Last year's cereal production of about 54 000 tonnes met less than 10 percent of the country's requirements.

Malnutrition is widespread and has been increasing. In 2002, the average per capita calorie requirement for the fulfilment of minimum basic needs was 2 100 Kcal/day for rural populations and 2 000Kcal/day for urban populations; but a poverty ratio of some 66 percent characterized these people, with extreme poverty

[3] This section is based on data and information obtained from the following documents in addition to interviews with relevant Government of Eritrea (GOE) officials: National Statistics and Evaluation Office (NSEO), GOE and ORC Macro (USA), *Eritrea: Demographic and health survey 2002*; NSEO, GOE, *Dimensions of poverty in Eritrea* (draft), Asmara, May 2003; IMF, *Country report (for Eritrea),* No. 03/165, Washington, D.C., June 2003; GOE, *Interim poverty reduction strategy* (first draft), Asmara, July 2003; GOE, *Eritrea: Food security strategy* (draft), Asmara, September 2003; Economist Intelligence Unit (EIU), *Eritrea Country Report September 2003* and *Eritrea Country Profile 2003*.

afflicting 37 percent of the population. Surveys conducted in March and June 2003 indicate that global acute malnutrition (GAM) attains 24–30 percent in various parts of the country, and this figure is significantly higher than the already unacceptably high levels of 15–20 percent in 2002. Nearly one-half of the adult population is illiterate; over half of all women aged 15–49 have never attended school.

The macro-economic environment is under severe pressure from high external and public-sector domestic debts which currently represent some 80 percent and 130 percent, respectively, of GDP, and the debts are increasing. The inflation rate has been persistently high over the past few years. The general retail price index was 147 percent higher in July 2003 than in 1997, and the food price index rose by 178 percent over the same period. There was a 25 percent increase in the general retail price index and a 26 percent increase in the food price index between July 2002 and July 2003. The country's foreign exchange reserve is so low that it could not cover imports for more than about one-half of one month. In 2002, the average reserve was about US$30 million, against a monthly average value of imports of about US$46 million. The current official exchange rate is Nakfa (Nkf) 13.55 to US$1, but the prevailing parallel market rates are 50–60 percent higher.

The main export items include salt, semi-processed leather goods, flowers, livestock and textiles. A wide range of items are imported, including machinery and transport equipment, spare parts, food, manufactured goods, intermediate goods, oil and chemical products. The collapse of Eritrea's regional export trade, given that the borders with Ethiopia and Sudan are closed, is a major constraint on the country's economy and its prospects. Ethiopia used to be Eritrea's major export destination; but the border conflicts with Ethiopia have closed this outlet. An upturn in exports to Sudan in 2002 led to an increase in export earnings to US$52 million for that year, compared with an annual average of US$26 million during 1998–2001; export earnings in 2002 were still less than 10 percent of the total value of imports (US$553 million) in that year. There has been a significant downturn in exports in 2003.

To conclude, widespread and deep-seated poverty, very low incomes, large food deficits, severely constrained agriculture, extremely limited export earnings and import capacity, high rates of persisting inflation, heavy and increasing external and internal debts, and social constraints (in terms of lower educational and health status, poverty and inequality), have resulted in grim prospects for Eritrea. Nevertheless, through introducing appropriate policies, investing in and marshalling human resources, restructuring agriculture to better suit the climatic and resource endowment conditions, conserving natural resources (including soil and water) and encouraging both domestic- and export-oriented industries (mainly small- and medium-sized enterprises), the country may be able to reverse the downward trends. The government is aware of the constraints and the policy directions needed to overcome them, as can be seen from the evolving Food Security document, Poverty Reduction Strategy and other policy documents. These documents recognize that substantial foreign assistance will be needed for Eritrea to address its constraints and promote economic and social development; exactly how to accomplish this will need to be worked out jointly by the government and its external development partners.

The international community has been assisting Eritrea in the following areas already: rehabilitating the war-affected population (particularly returning refugees and internally displaced people) and war-damaged infrastructure and development facilities; promoting agricultural production through measures such as seed distribution, rehabilitation of veterinary services and demonstration of conservation agriculture techniques around the country; meeting emergency needs through food aid, among other measures; and supporting activities in the education and health sectors.

Much more assistance is needed, particularly so that the long-term socio-economic prospects of the country may be developed, but critical emergency needs must not be neglected. The CAP process remains relevant. In addition, to achieve poverty reduction and food security and accelerate economic and social development, longer-term strategic and programme-based financial and technical assistance is needed. Much will depend on constructing a conducive environment for the Government of Eritrea and external development partners to work together purposefully. In that context, resolving the border dispute, demobilization, and socio-economic restructuring are crucially important issues.

## 2.2. The agricultural sector

Agriculture is the most vital sector in Eritrea despite a rather small contribution of only 12–15 percent to national GDP. The crop and livestock sectors together employ the vast majority of the population and provide the basis for food security. However, domestic food production even in good years remains well below the requirements, and the country relies heavily on commercial imports and food aid.

As stated above, arable land in Eritrea is estimated at just over 2 million ha. But given the limited and usually erratic rainfall (in terms of quantity as well as in temporal and geographical distribution) and the extremely limited irrigation facilities, the maximum area ever cultivated was only about 500 000 ha. Usually the cultivated area amounts to less than 400 000 ha. Given that Eritrea's agriculture is mostly rain fed, agricultural production is heavily dependent on weather conditions, particularly rainfall.

There are three distinct rainy seasons in Eritrea: October to February in the eastern lowlands (winter, or *bahri* rains); March to May in the highlands (spring or *azmera* rains); and June to September over the whole country apart from the coastal plain (summer or *kremti* rains). The kremti rains are by far the most important for agricultural production. Normally, rainfall varies between 400 mm and 600 mm per year in the highlands and between 200 mm and 300 mm per year in the western lowlands; coastal rainfall ranges from 0 mm to 300 mm. Rainfall patterns in the western lowlands and central highlands are broadly similar with most of the rainfall concentrated in July and August during the kremti season.

Crop production is predominantly cereal based, with barley, wheat and teff grown in the highlands and sorghum and millet grown at lower altitudes; some maize is also produced at intermediate altitudes. Limited areas of chick peas and beans are grown, mainly in the central highlands, while in the south of Gash Barka sesame is locally important.

The country has no perennial rivers or streams. Irrigation coverage is extremely limited (less than 2 percent of the total cultivated areas). Since irrigation is very largely dependent on surface water, the productive area in any year closely reflects the amount of rainfall received in the highlands. There are some micro-dams in the highlands that also depend on rainfall. Use of groundwater is obviously a possibility, but knowledge of groundwater resources is limited. Appropriate survey studies to determine the availability of groundwater, replenishment prospects and how much could be utilized for irrigation and in which areas would be very useful.

Eritrea's agricultural productivity continues to be very low because of the country's fragile rainfall regime, its often poor and shallow soils, the use of unsophisticated cultivation methods and only limited use of agricultural inputs. The border conflict with Ethiopia has also rendered an estimated 12 000 ha in Debub and most of the sub-region of Lalai Gash in Gash Barka completely unusable because of unexploded landmines. Mobilization of young people for national service has depleted the agricultural workforce in many areas.

Livestock production is an extremely important sector of the rural economy, especially in the more arid areas of the country. Although the largest herds are in the lowlands, the overall herding pattern is characterized by seasonal movement, both within the lowlands and between the lowlands and the highlands, to search for grazing areas. The principal animals are sheep and goats, followed by cattle, camels, donkeys and horses. On average, rural households possess between 3–5 sheep and/or goats. Apart from work oxen, which are often put to graze in areas specially reserved for them, most livestock are raised on an extensive system that relies on natural pasture and crop residues. As a result, there is a marked annual fluctuation in stock condition which reflects the availability of fodder and water. Livestock numbers are said to have increased in the years immediately after independence, then fallen during the two years of conflict with Ethiopia. Since then, the numbers may have risen again but sharply declined in 2002 as a consequence of severe drought, thus bringing down livestock numbers to about the same levels of 1997. Pastoralists tend to over-stock, despite the frequent shortages of fodder and water, as they usually put more store by numbers than by condition; they are often reluctant to sell off stock even when times are hard. The border conflict with Ethiopia has largely halted the movement of livestock both to traditional grazing lands across the border and to grazing areas within Eritrean territory that are still mined; it has also closed important livestock trade routes.

In addition to smallholder agriculture, the government also allocates land concessions to investors to enable crop production over relatively large areas. Concessions vary in size depending on location and water availability (rain fed or irrigated) as well as on crops. Those near seasonal river beds normally measure between 10–30 ha and produce vegetables (onions, okra, carrots, etc.) and fruits (bananas, oranges, etc.), while those in arid or semi-arid areas can be as large as 400 ha and are used primarily for cereals or oilseed crops. The contribution of concession agriculture to the country's food economy, however, is not significant, and yields are often mediocre.

## 3. FACTORS AFFECTING FOOD PRODUCTION IN 2003

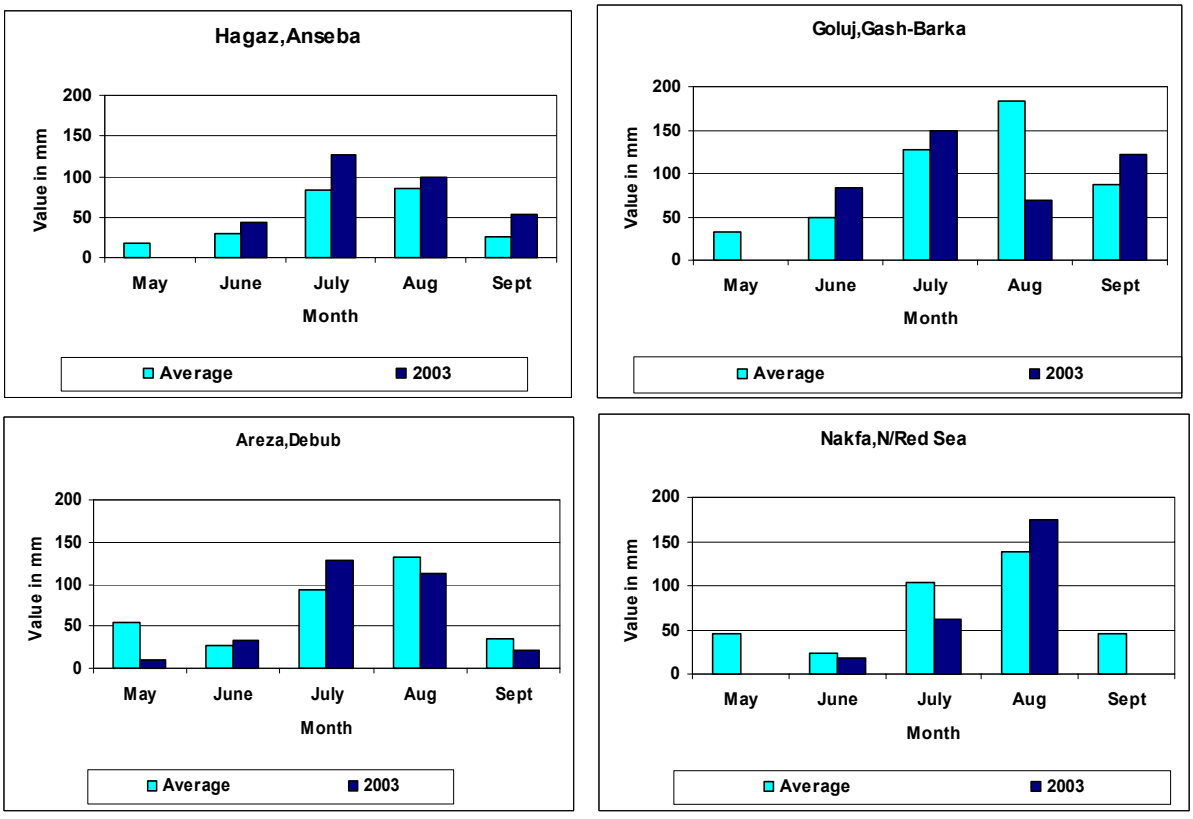
### 3.1 Rainfall

The March-to-May *azmera* rains largely failed this year throughout the highlands, for the fifth time in succession since 1998, the last "good year". This resulted in much lower-than-average plantings of long-season and high-yielding crops such as sorghum, maize, teff and finger millet. Farmers instead planted barley, wheat and summer teff, which yield less, and legumes such as horse beans and fenugreek, flax and chick peas.

The June-to-September *kremti* rains were generally late, arriving only in late June to mid-July and stopping early in the latter half of August. Crops thus lacked the necessary moisture to complete their growth cycle and properly fill the grains. In addition, in Debub there was a distinct dry spell in late July that hit crops at the early growth stage. Grain quality has consequently been very poor in most areas, and the number of filled grains in barley and wheat ears is much reduced. Sporadically heavy rainfall continued into September in certain parts of Gash Barka and this allowed for better grain fill and improved overall yields in those areas compared to the other zobas. In other parts of Gash Barka the rains stopped before September, however.

Some areas received exceptionally high rainfall during 2003. In Dekemhare, Debub zoba, rainfall from March to August amounted to 785 mm over 39 rain-days, with 282.5 and 340 mm, respectively, in July and August. However, this pattern was not repeated in the more important cropping areas such Goluj in Gash Barka, where July and August rainfall was only 78.8 mm and 69.3 mm against an average for the previous four years of 115 mm and 154.7 mm, respectively. The occasional occurrence of exceptionally heavy rainfall underlines the importance of water harvesting and of controlling the run-off from the highlands to the spate-irrigated areas in Northern Red Sea zoba.

**Figure 1. Monthly rainfall for 2003 compared with average levels since 1992**




### 3.2 Area planted

The areas planted to cereals increased to 405 859 ha, compared to the average of 360 000 ha for 11 years from 1992 and 344 000 ha in 2002. The area planted to cereals in Debub represented a record of 136 592

ha, and was assisted by large-scale seed distributions from FAO and national and international NGOs. Improved spate-irrigation infrastructure and 27 localized floods, compared with about ten floods in an average year, contributed to increasing the area planted at Sheib in Northern Red Sea. The area planted in Maekel declined from an average of about 33 000 ha to 22 656 ha because of the late arrival of the rains which caused farmers to lose hope after so many years of poor rains. In some sub-zobas, such as Ghinda in Northern Red Sea, 5 000 ha of sorghum could not be planted as rain was lacking.

Overall, the planted area in Northern Red Sea dropped from 23 080 ha in 2002 to an estimated 13 990 ha in 2003. In Gash Barka and Anseba the areas planted to cereals were respectively 187 318 ha and 45 303 ha, both considerably higher than last year's areas of 151 668 ha and 36 456 ha, respectively.

### 3.3 Means of production and inputs

Farm power

Large numbers of oxen were reported to have died from starvation and the effects of drought during 2002, and many farmers reported having sold oxen to survive, after a succession of bad harvests and also because they had no feed for them; this has left a large gap in the availability of farm power. Farmers were seen to be cooperating in sharing the oxen available for ploughing and threshing. The Mission saw many instances of four to five oxen, or a combination of oxen, donkeys and even horses being used in the traditional threshing process. However, as the hooves of donkeys and horses can cause cutting of the hardened earth threshing floor, leading to contamination of the grain, they are used only in extreme cases when no oxen are available at all. Tractors provided by a bilateral donor are made available on credit to farmers who become agricultural contractors for their neighbours. In Gash Barka and parts of Debub, a certain dependency on tractor services is building up and this often leads to delayed planting. In Debub, tractor-assisted land preparation for teff is not of the necessary quality, and poor establishment of plants results. There is an increasing dependency on tractor power which, given the small size of farms (0.75 ha on average in Debub) is uneconomical.

Labour

The shortage of labour was observed everywhere. The main cause of this shortage is the conscription of men into defence forces for long periods of time. The army does provide assistance in crop harvesting and threshing, but the extent of this assistance was difficult to ascertain.

Irrigation

The area under irrigation in Eritrea has been estimated at around 2 000 ha. There are 80 micro-dams in Debub, but they are used mainly for domestic water and for watering livestock. Small pumped irrigation schemes are numerous in Debub, Anseba and Maekel, where crops of potatoes, tomatoes and other vegetables are produced. However, water tables are reported to be dropping in many areas after three or more years of reduced rainfall. As noted above, there is considerable scope for water harvesting, primarily for domestic use and watering of livestock and also in suitable areas for small-scale irrigation.

Seed

The drought of 2002, caused widespread crop failures and thus a huge seed deficit for the 2003 season. It was estimated that only 20 percent of the nearly 16 000 metric tonnes of national seed requirement could be raised by farmers for the 2003 cropping season. An enormous humanitarian seed assistance programme, under which a large number of farmers were supplied with over 5 600 tonnes of seeds by FAO and national and international NGOs, was consequently established.

The prospects for farmer-saved seeds in 2003 are better than for last year, but in areas of total crop loss and very low yields substantial seed assistance will still need to be provided. Farmers located in about 35 percent of the overall crop area will need to be assisted with at least 5 600 metric tonnes of seeds of sorghum, pearl millet, wheat, barley, teff and chickpea.

Furthermore, in medium-potential areas, where the harvest is significantly better, it will be necessary to undertake "seed protection" campaigns by which targeted food aid will be provided to vulnerable farmers to prevent the consumption of valuable seeds which they would otherwise have saved for subsequent planting. In view of the crucial role of seed varieties adapted to the geographical area in the often fragile

agro-ecological zones of Eritrea, it is also recommended that humanitarian agencies should immediately commence the procurement, cleaning and storage of good quantities of adapted local varieties currently available at the village level and at the farm gate before they enter into trade circles, after which they become mixed with other varieties and are no longer available in sufficient purity for these areas.

These recommendations are considered critical so that farming in 2004 may resume for a large number of farmers whose continued seed insecurity will prolong the impact of the current and previous failed seasons. Recognizing that the yield potential of the seed in general use by farmers is a serious constraint to realizing higher production, the MOA introduced a National Seed Policy in May, 2002 with the primary goal of improving the production and distribution of improved seed, as well as suitably adapted seed varieties.

Fertilizers

The recommended fertilizer dressing for most of the country is 100 kg/ha of diammonium phosphate (DAP) and 50 kg/ha of urea. The total distribution of fertilizers by the Government of Eritrea since 1992, as provided by the Eritrean MOA, is summarized in Table 1 (below). During 2003, the government distributed 3 507 tonnes of fertilizers comprising 2 043 tonnes of DAP and 1 464 tonnes of urea.

**Table 1. Distribution of fertilizer (1992-2002) in quintals (100 kg)**

| TYPE | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dap | 5 919 | 7 225 | 7 223 | 10 247 | 12 778 | 8 700 | 16 881 | 17 127 | 49 209 | 41 005 | 17 458 |
| Urea | 1 871 | 2 453 | 2 443 | 3 886 | 6 531 | 6 055 | 10 798 | 5 240 | 23 683 | 20 994 | 19 162 |
| **Total** | **7 790** | **9 678** | **9 666** | **14 133** | **19 309** | **14 755** | **27 679** | **22 367** | **72 892** | **61 999** | **36 620** |

Because the government plays such an important role in fertilizer procurement and distribution, the private sector has not developed any capability in this area. The low and erratic rainfall militates against the normal absorption of these nutrients by plants in many parts of the country and their effect on yields is not always guaranteed. Fertilizer is heavily subsidized in Eritrea, but many farmers still cannot afford to buy it.

Other agricultural inputs

The Government of Eritrea also provides inputs such as seeds and pesticides to farmers. In Debub zoba in 2003, a total of 15 752 litres of liquid pesticides were provided, along with 659 kg of powdered pesticides. Total pesticide distribution in the country amounted 42 652 litres of liquids and 2 731 kg of powdered chemicals. The government also distributed 13 838 agricultural tools.

### 3.4 Pests and diseases

Pests

Army worm was the major pest, damaging sorghum, finger millet, maize, barley and pearl millet in Anseba, Gash Barka, Debub and Maekel. This pest caused a total loss of 10 000 ha of various crops in Debub. Army worm also damaged scarce grazing resources in Northern Red Sea and Anseba. Grasshoppers were the major pest in Gash Barka, affecting an estimated 14 310 ha. Chafer beetles also caused considerable damage in Gash Barka and to an estimated 4 000 ha of sorghum crops in Debub. Stem borers, which are endemic, caused some damage to maize and sorghum crops in all zobas. Stink bugs are a feared pest in Northern Red Sea.

Diseases

No major crop disease problems were reported.

Weeds

*Striga* and wild oats are the major weeds in Eritrea. Striga is widespread over the country and causes heavy losses in sorghum yields. The MOA is attempting to counteract this weed through introduction of crops such as sesame in rotation with sorghum.

Wild oats is regarded by farmers as livestock forage and is not pulled as it should be. This automatically leads to lowered yields in barley and wheat in particular. The Mission saw many fields in Debub where the wild oats completely overshadowed the crops of barley and horse beans.

Weather damage

Severe hail damage was seen in Maekel, Debub, Anseba and parts of Gash Barka in August. The hail damage often occurred at flowering time and destroyed the cereal crop, usually barley or wheat, although some maize crops were also severely damaged. Late rains in October/early November caused the catastrophic shedding of teff crops in Adi Kwala sub-zoba, the main production area for this crop and other crops in parts of Gash Barka.

### 3.5 Crop production, 2003

Table 2 shows annual cereal and pulse crop production from 1997 to 2002 along with the estimate for 2003. The table clearly illustrates the large variation from year to year in agricultural production. This year the expected production is well below the average of the past eleven years since independence (187 209 tonnes), but still almost double the amount produced in 2002. Production of pulses is expected to be lower than average, as the rains ended earlier than usual in Debub, the main production area for chickpea, the most important pulse crop.

**Table 2. Crop production in Eritrea, 1997-2003 (tonnes)**

| **Cereals** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** |
|---|---|---|---|---|---|---|---|
| Barley | 16 085 | 56 605 | 31 835 | 25 786 | 44 934 | 9 736 | 8 576 |
| Hanfez | 4 504 | 8 992 | 8 508 | 3 197 | 11 067 | 1 728 | 1 313 |
| Wheat | 5 131 | 22 945 | 19 010 | 10 579 | 25 423 | 2 637 | 3 442 |
| Maize | 6 406 | 28 986 | 15 899 | 4 054 | 9 051 | 3 008 | 4 456 |
| Sorghum | 55 316 | 269 772 | 207 197 | 52 370 | 78 759 | 28 434 | 64 061 |
| Teff | 4 150 | 18 706 | 13 147 | 10 415 | 19 551 | 3 191 | 7 161 |
| Finger millet | 3 156 | 7 622 | 5 402 | 2 716 | 12 093 | 865 | 5 187 |
| Pearl millet | 4 332 | 44 183 | 17 829 | 1 515 | 18 174 | 4 931 | 11 748 |
| **Total** | **99 080** | **457 811** | **318 827** | **110 632** | **219 052** | **54 530** | **105 944** |
| **Other food crops** | | | | | | | |
| Peas | 175 | 398 | 581 | 1 670 | 1 130 | 2 797 | 80 |
| Chick peas | 492 | 1 783 | 2 793 | 2 972 | 8 284 | 225 | 1 600 |
| Horse beans | 176 | 659 | 3 301 | 1 420 | 4 022 | 445 | 600 |
| Green peas | 364 | 399 | 718 | 722 | 2 730 | 3 484 | N/A |
| Haricot bean | 0 | 36 | 36 | 0 | 36 | 0 | 0 |
| Lentils | 1 | 0 | 272 | 116 | 211 | 110 | 100 |
| **Total** | **1 208** | **3 275** | **7 701** | **6 900** | **16 413** | **7 061** | **2 380** |

**Table 3. Cereal area, yield and production, 2003 by zoba**

| | Debub | | | Gash Barka | | | N.Red Sea | | | Anseba | | | Maekel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area (ha) | Yield (t/ha) | Prod. (t) | Area (ha) | Yield (t/ha) | Prod. (t) | Area (ha) | Yield (t/ha) | Prod. (t) | Area (ha) | Yield (t/ha) | Prod. (t) | Area (ha) | Yield (t/ha) | Prod. (t) |
| Sorghum | 38 793 | 0.10 | 3 879 | 136 379 | 0.38 | 51 688 | 8 420 | 0.70 | 5 894 | 17 311 | 0.15 | 2 597 | 30 | 0.10 | 3 |
| Maize | 9 503 | 0.40 | 3 801 | 636 | 0.13 | 83 | 1 710 | 0.20 | 342 | 1 436 | 0.15 | 215 | 77 | 0.19 | 15 |
| Pearl millet | 0 | 0.00 | 0 | 41 513 | 0.20 | 8 303 | 1 400 | 0.15 | 210 | 21 568 | 0.15 | 3 235 | 0 | 0.00 | 0 |
| Finger millet | 22 550 | 0.20 | 4 510 | 4 791 | 0.13 | 623 | 0 | 0.00 | 0 | 293 | 0.15 | 44 | 100 | 0.10 | 10 |
| Wheat | 11 537 | 0.20 | 2 307 | 386 | 0.13 | 50 | 200 | 0.15 | 30 | 536 | 0.15 | 80 | 6 497 | 0.15 | 975 |
| Barley | 20 678 | 0.25 | 5 170 | 2 900 | 0.12 | 348 | 2 225 | 0.15 | 334 | 4 159 | 0.15 | 624 | 14 003 | 0.15 | 2 100 |
| Teff | 30 827 | 0.23 | 7 090 | 410 | 0.13 | 53 | 35 | 0.00 | 0 | 0 | 0.00 | 0 | 184 | 0.10 | 18 |
| Hanfets | 2 704 | 0.30 | 811 | 303 | 0.20 | 61 | 0 | 0.00 | 0 | 0 | 0.00 | 0 | 1 765 | 0.25 | 441 |
| **Total cereals** | **136 592** | **0.20** | **27 568** | **187 318** | **0.33** | **61 209** | **13 990** | **0.49** | **6 810** | **45 303** | **0.15** | **6 795** | **22 656** | **0.16** | **3 562** |

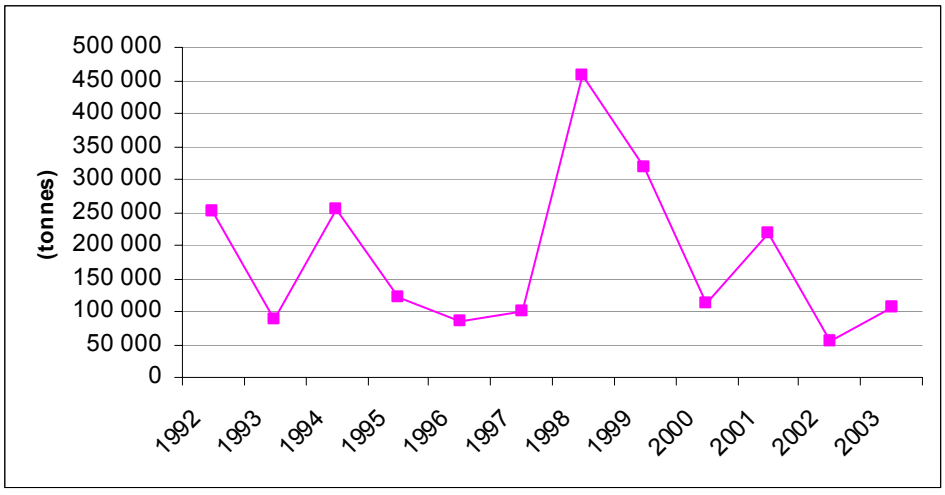
**Table 4. National cereal production 2003 by zoba (tonnes)**

| zoba | Production in tonnes | % |
|---|---|---|
| Gash Barka | 61 209 | 57.8 |
| Debub | 27 568 | 26.0 |
| Northern Red Sea | 6 810 | 6.4 |
| Southern Red Sea | 0 | 0 |
| Maekel | 3 562 | 3.4 |
| Anseba | 6 795 | 6.4 |
| **Total** | **105 944** | **100** |

**Table 5. National figures for area, yield and production 2003, with production compared to the 11-year average, by crop**

| Crop | Area (ha) 2003 | Yield (t/ha) | Production 2003 (tonnes) | Average production on 1992-2002 (tonnes) | 2003 production as % of average (1992-2002) |
|---|---|---|---|---|---|
| Sorghum | 200 933 | 0.32 | 64 061 | 98 908 | 64.8 |
| Maize | 13 362 | 0.33 | 4 456 | 10 971 | 40.6 |
| Wheat | 19 156 | 0.18 | 3 442 | 11 767 | 29.3 |
| Barley | 43 965 | 0.20 | 8 576 | 26 904 | 31.9 |
| Pearl millet | 64 481 | 0.18 | 11 748 | 16 656 | 70.5 |
| Finger millet | 27 734 | 0.19 | 5 187 | 8 078 | 64.2 |
| Teff | 31 456 | 0.23 | 7 161 | 10 354 | 69.2 |
| Hanfets | 4 772 | 0.28 | 1 313 | 3 571 | 36.8 |
| **Total** | **405 859** | 0.26 | **105 944** | **187 209** | **56.6** |

**Figure 2. Cereal production 1992-2003**



### 3.6 Other food crops

Potatoes

Potatoes are grown in Maekel, Anseba, Gash Barka and Debub, with total planted area in 2003 estimated at 779 ha. However, this crop requires irrigation for maximum yields. This year potato crops in Maekel exhibited good vegetative growth, but the number and size of tubers were reduced in many fields as a result of the premature ending of the rains in late August; this will significantly reduce yields.

Pulses

The areas under the main pulse crops are summarized in Table 6 (below).

**Table 6. Eritrea: areas cropped to main pulse crops, 2003 (ha)**

| zoba | Field pea | Chick pea | Haricot bean | Horse bean | Lentil | Vetch | Total area |
|---|---|---|---|---|---|---|---|
| Debub | 423 | 18 432 | 0 | 3 897 | 562 | 8 549 | 31 863 |
| Gash Barka | 0 | 28 | 13 | 56 | 18 | 0 | 115 |
| Maekel | 45 | 1 706 | 131 | 0 | 37 | 0 | 1 919 |
| Anseba | 0 | 126 | 36 | 88 | 0 | 0 | 250 |
| Northern Red Sea | 0 | 0 | 0 | 60 | 0 | 0 | 60 |
| Southern Red Sea | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **468** | **20 292** | **180** | **4 101** | **617** | **8 549** | **34 207** |

Chick peas are by far the most important legumes. This drought-resistant crop is grown at the end of the kremti rains in August/September. This year, the rains tailed off in mid-August leaving little residual moisture to support chick pea growth. Many crops in Debub and Maekel, the main growing areas, failed to germinate and overall yield has thus been estimated at less than 0.1 tonne per ha.

Oil seed crops

The main oil crop is sesame; a total of 28 027 ha is grown only in Gash Barka. This crop was in good condition and should yield an average quantity. Unlike most other crops grown in Eritrea, sesame has a ready market. The other oil crops are linseed and groundnut, with a total cropped area of 789 ha, of which 562 ha (71 percent) is grown in Debub. As a result of the late and short duration of the rains, linseed crops were thin and are not expected to yield well.

### 3.7 Livestock

Livestock systems

Effects of the season on livestock

No livestock census has been conducted in Eritrea in recent years. The most recent information was obtained during a survey carried out by the government in 1997. Heavy losses of livestock in 2002 may have reduced the increase in livestock population that occurred during 1997–2001. The estimated current livestock numbers are set out in Table 7.

**Table 7. Estimated livestock population in Eritrea in 2003**

| Region | Cattle | Sheep | Goats | Camels |
|---|---|---|---|---|
| Anseba | 218 923 | 124 300 | 620 023 | 25 266 |
| Debub | 490 093 | 614 069 | 706 409 | 19 382 |
| Gash Barka | 917 344 | 675 268 | 1 745 784 | 113 263 |
| Maekel | 40 505 | 149 927 | 23 556 | 0 |
| Northern Red Sea | 178 532 | 462 333 | 994 596 | 107 032 |
| Southern Red Sea | 82 060 | 103 047 | 571 417 | 53 971 |
| **Total** | **1 927 457** | **2 128 944** | **4 661 785** | **318 914** |

Livestock production systems

Livestock production is recognized as an integral component of the farming systems in Eritrea and plays an important role in supporting the livelihoods of farming households. The main livestock production systems practiced in the country are pastoral and agro-pastoral, with small numbers of stall-fed animals, mainly dairy cows. In the pastoral production system, cattle, sheep and camels are reared and are kept mainly for the supply of milk, meat and for sale to generate cash. The agro-pastoral livestock production system combines crop farming and livestock rearing and the types of livestock reared are cattle, sheep, goats, camels and equines used for milk, meat, eggs, draught power, transportation and sale as a source of income.

Farming households in the highland parts of Anseba, Maekel and Debub practice a sedentary (intensive cropping) mode farming system, and livestock are kept for the supply of draught power, milk, meat, eggs, animal manure; they also serve as pack animals. Small ruminants are mainly sold and used as a source of cash; they are less often slaughtered for home consumption.

Small-scale dairying

Quite a number of small-scale dairy farms situated within and on the outskirts of major towns supply milk to town dwellers. An estimated total of 45 000 litres of milk is supplied daily to Asmara. A high percentage of the dairy stock is pure Holstein Friesian breed and the rest are either crosses or local zebu breed. Milk is sold at an average price of Nkf 6 per litre. Most of the dairy farmers feed their stock concentrates and conserved hay and crop residues.

Poultry production

Indigenous breeds of chickens are usually kept by farmers, but in recent years the dual-purpose Egyptian Fayoumi breed has been introduced and distributed in most parts of the country. About 100 000 chicks have been distributed in Anseba and Gash Barka from mid-2002 to 2003 to vulnerable women-headed households to satisfy the need for protein requirements and for cash to be used to buy food and other items needed by the family. Distribution of chicks was also carried out in Northern Red Sea, Maekel and Debub. The recipients we spoke with said that the poultry provided income from egg sales and improved nutrition for their children. However, the cost of poultry feed is very high in relation to the price of poultry products, and under the current dry conditions, it is difficult to grow crops suitable for poultry feed. The exotic Fayoumi breed from Egypt is a very efficient egg producer as long as feed is available; but it proves inferior to local breeds when feed is limited.

Feed sources

Apart from a small area of fodder sorghum grown in Northern Red Sea region, few or no forage crops are planted in Eritrea. This leaves livestock totally dependent on natural-range vegetation and crop residues. The grass species in the rangelands mature rapidly and they quickly deteriorate in quality and become less palatable to the animals. In normal rainy seasons the carrying capacity of a rangeland plus crop aftermath extends from until January–February. Herd owners are then forced to move their livestock to other localities in search of feed and water. March, April, May and June are the critical feed shortage months when livestock undergo loss of condition and body weight.

As there is no limitation on stock numbers in the communal grazing system, overgrazing of natural rangelands has resulted in the elimination of palatable grasses and herbs and their replacement by unpalatable forage species. In addition, there is progressive encroachment by crop farmers onto rangelands, which further limits the grazing lands. The closure of the border with Ethiopia has also reduced the grazing available to pastoralists and agro-pastoralists in Northern Red Sea, Southern Red Sea and Gash Barka regions. Lower-than-average rainfall levels in some parts of the highlands have also reduced the availability of forage. The poor harvest of 2002 greatly reduced the amount of crop residues available for livestock and caused heavy mortality estimated at between 15–20 percent of herds in some areas.

General condition of livestock

Overall better crop development this year and improved rangeland conditions ameliorated the general condition of livestock with respect to last year, when there was poor range growth and virtually no crop

residues. However, crop residues will provide forage only until February, after which animals must to migrate to ever-declining rangelands. Traditional grazing lands across the border in Ethiopia and Sudan are no longer accessible as the borders are closed. Once the locally available feed on the rangelands is depleted, animals migrate to the Eastern Escarpments, some to Kerkebet and others to Laellay Gash and Lower Gash. In some situations, as in the case of Halhal and Akordat, migration begins early in October and November. A certain number of milk cows are left behind with the family. All livestock return to their home ground at the beginning of the rainy season when rangelands have enough grass for grazing.

Given the poor availability of forage and grazing, the livestock (especially sheep) look surprisingly well. This may be explained by compensatory growth from the improved grazing provided by the summer rains, but the supply and the quality of grazing are already declining. Improved vegetative growth of crops compared to last year will provide much more forage after harvest. The spate-irrigated areas of Northern Red Sea have much better sorghum crops this year, and this will provide crop residues for these areas.

Shortage of drinking water for livestock

During the dry season livestock suffer from shortages of drinking water as watering points at strategic positions within the rangeland are too scarce. Livestock often walk an average of 2.5 hours to reach a watering point and lose energy in the process which could have been used for body maintenance and growth.

Livestock diseases – animal health

Vaccinations against major livestock diseases like PPR, LSD, FMD, sheep pox, anthrax and rabies are provided annually by the veterinary staff of the MOA. Other common diseases and pests of livestock include mange mites, anaplasmosis, babesiosis, Newcastle disease and fowl pox. Treatment against various diseases is also provided in livestock clinics in the regions.

This year there was a more serious outbreak, namely contagious bovine pleuro-pneumonia (CBPP); this was confirmed in cattle trading from Ethiopia. Rapid action was taken to slaughter all the stock concerned, but as this major cattle disease had not appeared in Eritrea for almost a decade, the national herd is highly susceptible to it. It is essential that the Veterinary staff be given the necessary means to carry out surveillance and to counteract any outbreak which could devastate the national herd if left untreated. Contagious caprine pleuro-pneumonia has also been introduced in recent years, as well as lumpy skin disease of cattle.

Veterinary services

There are only fifteen veterinary surgeons in the country and no private veterinary service. In recent years, paravets have been trained to provide basic veterinary services to pastoralists and agro-pastoralists.

Marketing of livestock

Livestock markets are available in all the major towns in Eritrea. Most traders and farmers use trekking to take livestock to the market place and in the process animals lose body condition and weight, which results in a decrease of value of the animal. Last year livestock prices declined considerably from the drought situation, but this year prices have increased by an average of 40–50 percent in Gash Barka and Anseba, to Nkf 6 000 for cattle, Nkf 500 for a goat and Nkf 850 for sheep, partly from the improved availability of feed for livestock at this time of the year and also from the relative scarcity of stock following heavy losses in 2002.

## 4. SITUATION BY REGION

### 4.1. Northern Red Sea

Few crops could be produced in Northern Red Sea during the previous three years because of poor highland rains and flash floods which escaped the embankments and diversion structures of rivers flowing down from the highlands. Although diversion structures have been put in place with assistance from IFAD and some work has been done on main canals, the spate-irrigation system tends to break down in secondary and tertiary canals when faced with sudden floods. The annual average rainfall in Northern Red

Sea is 185 mm and this normally falls between October and January. Crop production is supported by spate irrigation derived from rains in the highlands between June and September for the most part.

This year, the rains in the highlands largely stopped in August, but there was sufficient water to grow sorghum, cotton and groundnuts on 3 111 ha (85 percent) of the available spate-irrigated land at Sheib. There was no rain in October and unless rain comes in November, the harvest outcome could be much reduced. However, there is good growth of sorghum already, and this should produce a reasonable crop given the high moisture-holding capacity of the soils. In addition, good supplies of forage are already assured for livestock. Should the winter rains materialize, there may be an opportunity to plant maize following the sorghum harvest to take advantage of residual moisture, but this has not been possible for some years. Crop production was not possible in the northern areas of Nakfa and Afabet and the planned 5 000 ha of sorghum in Ghinda sub-zoba could not be planted because of poor rainfall. Given better prospects for the high-yielding areas of Sheib, and assuming some winter rainfall, the mission estimates total cereal production in Northern Red Sea zoba at 6 810 tonnes in 2003, an increase of 8.8 percent over the previous year.

### 4.2. Southern Red Sea

The mission did not visit this zoba. Southern Red Sea zoba is very thinly populated, mainly with pastoralists; agricultural production is confined to a few oases where some irrigation is available. Damage to spate-irrigation infrastructure, which occurred in previous years, could not be repaired because of security constraints, as this zoba borders on Ethiopia. Therefore, no cereal production is forecast in Southern Red Sea zoba.

### 4.3. Anseba

The rains started at the end of June, but in most areas there was a 10- to 15-day total break in July which worsened the generally poor rainfall distribution. Furthermore, torrential downpours in some areas over short periods seriously damaged many crops. September rainfall was low, eventually curtailing crops well before full maturity in many areas. The overall rainfall situation led to failed crops in Habero, Selaa, Kerkebet, Asmet, Keleb, Aditekelezan and Hamelmalo. In some of these areas even crop residue amounts will be insignificant.

Other contributory factors to the poor crop situation are the unavailability of land preparation equipment and tools, lack of tractor services and insufficient draft animals.

On average, the harvested crop is expected to last about three months and although there are some coping strategies such as selling firewood and livestock, and even though remittances and labouring work are available in some locations, in general the most-affected households will be relying on food aid beyond February 2004.

Although the slightly better crop this year compared to 2002 will translate into better seed stocks saved by farmers, those who plant in areas with poor crop yields will need to be assisted with seeds if they are to resume farming in 2004. It would appear that pearl millet variety *Kona*, which is fairly drought-tolerant, has performed well in Anseba to the satisfaction of farmers. Attempts in locations such as Hagaz to build adequate community stocks of this variety through seed growers and the operation of village seed banks should be seriously supported by the humanitarian community. Total cereal production is estimated at 6 795 tonnes, a reduction of 14.1 percent on last year's level of 7 911 tonnes.

### 4.4. Maekel

The season was characterized by the failure of the asmera rains that normally fall from March to May. This prevented the planting of long-season crops such as sorghum, teff, finger millet and maize, and destroyed crops which were planted in dry ground. The kremti rains were late and poorly distributed, and they ended prematurely in mid-August, with the result that grain fill was impeded and yields are much lower than they would have been had the rains continued into September. The rains were very poorly distributed; some large planted areas such as Adi Mussa received practically no rain and suffered almost total crop failure as a result. Hail caused widespread devastation in most areas of Maekel in August, greatly reducing yields in the areas affected. Army worm caused considerable damage at the onset of the rains in July, and chafer beetles damaged sorghum crops at the milk stage. Grasshopper damage was also severe on barley and wheat crops in the early growth stages.

As the seed rate for barley is 150 kg/ha, and yields sometimes failed to reach 100kgs/ha, many farmers visited did not recoup the amount of barley seed that they had planted. Serajeka sub-zoba was one of the worst affected areas, with rainfall in July only 26.2 mm compared to an average of 180.9 mm over the past four years. Rainfall in August was 128.1 mm against a four year average of 193.9 mm. Overall, however, crops were better than the disastrous year of 2002, with production increasing by 24.7 percent to 3 562 tonnes compared to last year's total of 2 857 tonnes.

### 4.5. Debub

The asmera rains, on which the longer-season crops such as sorghum, finger millet, teff and maize depend, did not appear this year over large areas of the district. The kremti rains began in late-June, which was too late for long-season crops. As the long-season crops yield 20-30 percent more than short-term crops such as summer teff, wheat and barley, the lack of asmera rains resulted in an overall crop loss of this order. Rains were good up to the end of August in many areas but then stopped prematurely, producing moisture deficits in crops. Vegetative growth was therefore reasonable but there was insufficient moisture for normal grain fill.

Pests such as army worm caused losses of up to 10 000 ha of crops. Chafer beetles, which suck the immature sorghum grain, caused damage to 4 000 ha; grasshoppers also caused substantial damage to wheat and barley crops at an early stage of growth. In addition, hail showers in August caused even more damage, negating the effect of improved rainfall compared to the previous year. Hail was particularly damaging in Debarka, north of Mendefera.

The effect of reduced rainfall and pest and hail damage was particularly severe in the sub-zoba of Mai-mne, where many crops were almost complete failures. Farmers in this area now depend almost totally on food aid. In the important grain growing area of Mai-aini, rainfall in June, July and August, respectively, was 40.5 mm, 124.1 mm and 73 mm. This was, respectively, 16.7, 42.9 and 57.8 percent below the average for the past four years, each of which was regarded as bad. The rainfall in Mai-mne in the last good year of 1998 was 64 mm in June, 235.6 mm in July and 343.7 mm in August, well above this year's amounts.

Unseasonable rains in late October in the important teff growing area of Adi Kwala caused the total loss of an estimated 4 950 ha of teff as grains were shattered onto the soil. Overall, the estimated cereal production in 2003 is estimated at 27 568 tonnes, an increase of almost 87 percent more than last year's disastrous harvest of 14 767 tonnes.

### 4.6. Gash Barka

In Gash Barka the rains started later than usual but in many areas in the south the rains were good and well-distributed at the onset. However, in the northern areas both the amount and distribution of rainfall were poor. In all areas, rainfall ceased earlier than normal, leading to crop failure of late-planted crops and reducing the yields of those planted on time or slightly later than usual. Nevertheless, the rainfall pattern was significantly better than in 2002 and consequently a better crop output is expected in 2003, although the overall production is lower than the average over the past ten years.

The reduced crop output also reflects the series of pest infestations which afflicted this region during the growing season. Desert locusts, tree locusts, army worm and chafer beetles all took their toll on the crops. A good crop output potential of up to 10 quintals/ha is confined to certain areas of Guloj, Tesseney, Haicota, Shambuko and Upper Gash sub-zobas, but even in these areas very poor crops cover large areas. While in sub-zoba Barentu, a good degree of medium crop output of up to 5 quintals/ha is visible, the areas incorporating Forto and Dige present a very dismal picture, with total crop loss being the norm over large areas.

Many farmers, about 30–40 percent of the total number, will need to be assisted with seeds in 2004 as they have lost their crop or the harvest is too small to permit saving enough seeds.

Extension presence here is spread too thinly considering the region's place as the breadbasket of Eritrea. It is recommended that staff numbers be increased over the current maximum of five extension staff per sub-zoba to strengthen the support being provided and to assist in mitigating the effect of pests, drought and poor rainfall. Interventions in pest control and plant protection, diversion of rivers and streams,

embankment construction and the use of improved varieties need to be intensified. An improved extension service will be an important contributory factor to increased production.

Cereal production in Gash Barka is estimated at 61 209 tonnes, a substantial increase over the 22 741 tonnes achieved in 2002.

## 5. CEREAL SUPPLY/DEMAND ANALYSIS, 2004

The cereal balance sheet for 2004, (summarized in Table 8) is based on the following assumptions:

- Mid-year 2004 population is estimated at 3.66 million. This is based on the 2003 population estimate of 3.56 million and an annual population growth rate of 2.7 percent provided by the Government of Eritrea (GOE) Ministry of National Development.
- Per caput per annum cereal consumption of 150 kg is assumed, in line with the poverty estimates made by the GOE using 2 100 Kcal/person/day for the rural population and 2 000 Kcal/day for the urban population, the bulk of which has been assumed to come from cereals.
- Seed requirement for next year is estimated at 16 000 tonnes, assuming that the area planted to various crops remains broadly the same as in 2003.
- Post-harvest losses are high in Eritrea due to harvesting systems, poor carriage and storage facilities and rodent and insect damage. It has been reported by officials and farmers that the range of post harvest losses is from 15 percent to well over 20 percent of the production. A figure of 18 percent has been assumed for this exercise. A survey could be conducted to provide a more objective basis for estimating post-harvest losses.
- Discussion with government officials indicates that opening stocks of cereals on 1 January 2004 would be very small, if there are any at all. Given that the government maintains distribution channels to improve people's access to food, particularly in areas suffering from acute food shortages and in line with discussions with knowledgeable persons at the UN and in NGOs, a small quantity of opening cereal stocks of 30 000 tonnes can be assumed. A similar quantity of closing stocks is also assumed, implying that during 2004 there will be no overall stock-related impact on cereal availability.
- Eritrea's food import capacity is extremely limited, given that export earnings have amounted to 5–10 percent of the country's total import bills in recent years, and that the current foreign exchange reserves may cover imports for only half of one month. The quantity of cereals that may be commercially imported next year depends on how much foreign exchange the Government of Eritrea can divert to food imports from uses for longer-term purposes. Discussion at the Ministry of National Development indicates that although agricultural production has increased this year compared to last year, the government's capacity to import food has diminished. Whatever quantity is assumed for commercial import for 2004 is necessarily a an estimated guess. Thus, given the extreme foreign exchange shortage, the Mission assumes that up to 30 000 tonnes of cereals will be imported commercially during 2004, which is much lower than last year's cereal import levels. In the end, import capacity is completely determined by the government's perception of priorities between competing needs.
- Discussion with traders indicates that some grains are brought into the country informally, mainly from Sudan. Lacking any surveys of informal trade to provide data, such cereal imports have not been taken into account in preparing the balance sheet.

**TABLE 8. Eritrea: Cereal balance sheet, 2004 ('000 tonnes)**

| | |
|---|---|
| **Domestic availability** | **136** |
| Opening stocks | 30 |
| Domestic production | 106 |
| **Total utilization** | **614** |
| Food use | 549 |
| Seed and losses | 35 |
| Closing stocks | 30 |
| **Import requirements** | **478** |
| Commercial import capacity | 30 |
| Food aid currently in stock and in pipeline | 31 |
| **Uncovered deficit** | **417** |

The total cereal import requirement in 2004 is estimated at 478 000 tonnes. With the anticipated commercial cereal import of 30 000 tonnes and cereal food aid in stock or in the pipeline for distribution in 2004 estimated at 31 000 tonnes, the uncovered cereal deficit, for which international assistance is needed, amounts to 417 000 tonnes.

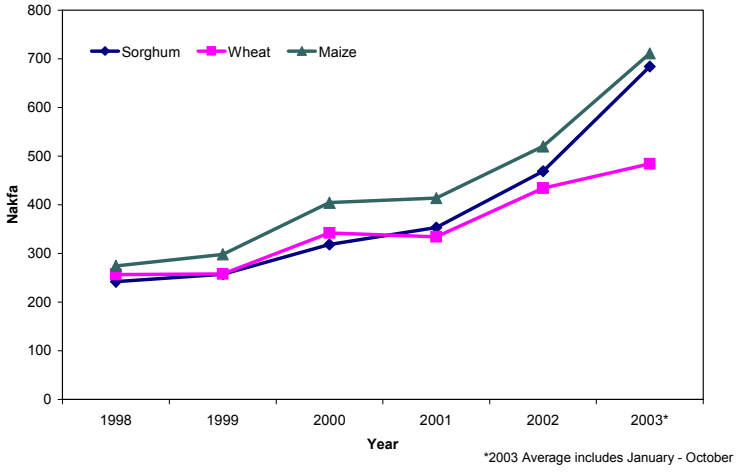
## 6. FOOD AID REQUIREMENTS FOR 2004

The prolonged drought in many parts of the country, the war with Ethiopia, the loss of livestock assets and rising poverty have left most Eritrean households in an increasingly precarious food security situation. Moving into 2004, these households are faced with a situation where many have either severely stretched or completely exhausted their coping strategies for dealing with the situation.

### 6.1 Food access and prices

Eighty percent of Eritrea's population is rural, with the majority sedentary farmers and agro-pastoralists. In an average year, Eritrean farm households harvest their crops in October/November and consume their production for about four months. To cover their food needs for the rest of the year, households rely heavily on the market, from where they meet about 80 percent of their food needs.[4] As a result of the poor 2002 harvest season, most households gathered no harvest or else consumed their production in just one month. They were therefore obliged to increase the proportion of food purchases even more to cover the gap of lost production.

**Figure 3. Annual Average Cereal Prices - Asmara Market 1998-2003 (Nakfa per 100 kg)**



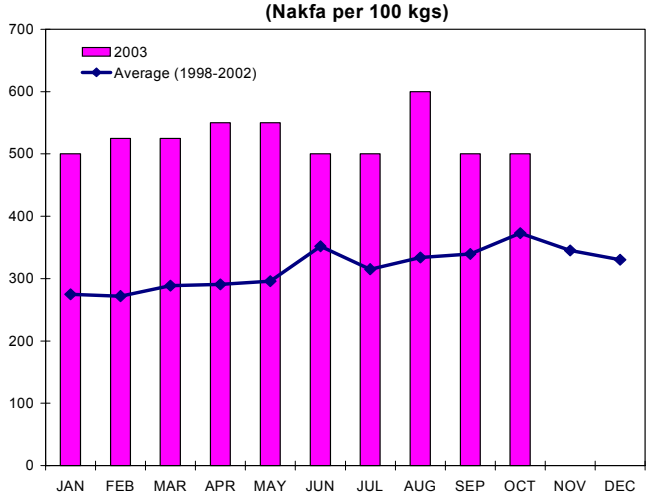

Source: Eritrean Grain Board

[4] CARE, WFP, ERREC, July 2003, Report of Rural Livelihoods Security Assessment.

As has been the case in recent years, households in 2003 were again faced with rising prices for major staples. Between 2002 and 2003, the average price for white sorghum in Asmara, Keren and Mendefera, rose by 46 percent, 50 percent and 37 percent respectively. This followed cereal price increases of up to 50 percent in some markets in 2002.

At the same time, poverty is increasing. A study undertaken in 2002/03[5] indicates that on average 66 percent of household expenditure is spent on food in urban areas, and 71 percent in rural areas. Therefore, highly market-dependant households faced with higher cereal prices are rapidly depleting their household incomes and assets in an attempt to meet their consumption needs.

**Figure 4. Price of White Sorghum in Mendefera Market (Nakfa per 100 kgs)**

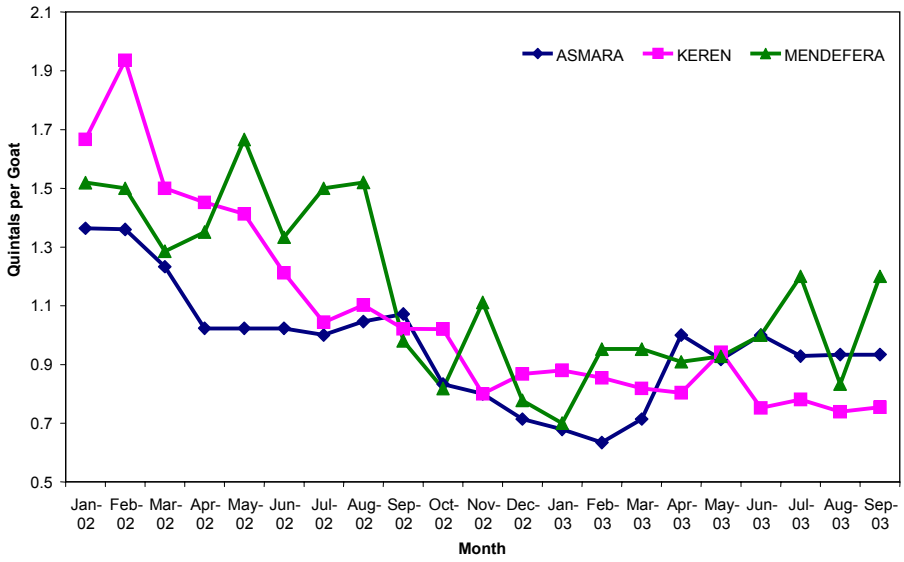



Source: Eritrean Grain Board

More than 80 percent of households own some type of livestock, and most rural households report the sale of livestock as their main source of income for food purchases. As a result of severe drought conditions and the actions of households to dispose of ailing livestock, livestock prices fell significantly during 2002 but then recovered somewhat during 2003 because there were fewer animals on the market as a result of previous sales and losses. However, this recovery in the livestock market was less marked than the rise in cereal prices, resulting in unfavourable terms of trade since early 2002. Livestock owners are therefore receiving smaller quantities of grain for their animals in 2003.

[5] Government of the State of Eritrea, National Statistics and Evaluation Office (NSEO), May 2003, Dimensions of Poverty in Eritrea – Draft Report.

**Figure 5. Sorghum Quintals (100 kg) per Male Goat 2002-03**




Source: Eritrean Grain Board, National Food Information Service

The sales have also left them impoverished in the long term, particularly as regards oxen, which is the chief productive asset for many highland households. The additional loss of draught power will negatively affect these households' future ability to cultivate food.

During 2003 the Eritrean Grain Board imported 80 000 tonnes of wheat and sorghum as part of its market stabilization policy. The sale of these grains in major markets, at prices generally at 50–75 percent of the market value of local produce during 2003, occurred intermittently between May and October depending on availability. This provided poorer households with a price reprieve, enabling them to purchase larger quantities of grain. This additional infusion of supply moderated the price of these two commodities particularly in the areas where food aid was not being provided and which were the key areas being targeted for market interventions.

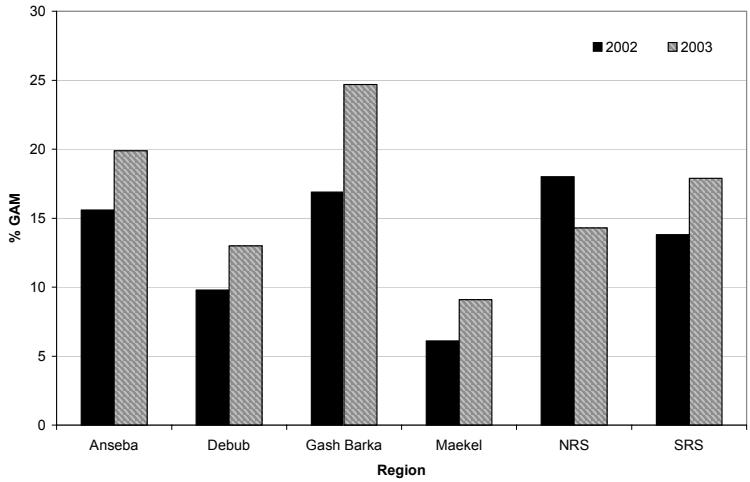
Concomitant with the drought is the impact of the border war with Ethiopia, particularly in Gash Barka and Debub, with smaller numbers of people affected in Northern and Southern Red Sea regions. Households who lived close to the border and on whose land there are still landmines and unexploded ordinances (UXOs) have been unable to return home; they are now in camps for internally-displaced persons (IDPs). These households have lost their livelihoods and are destitute. Some who have been able to resettle – formerly displaced populations and rural expellees from Ethiopia – have done so in an impoverished state as the combined toll of drought and displacement resulted in the death of the majority of their livestock. Without animals, these households have few options for income generation and almost no assets. They are unable to access market food supplies and rely almost solely on food aid to meet their consumption needs.

## 6.2 Nutrition

Nutrition surveys undertaken during the March–June hunger period indicate that the nutrition status of children under five years of age has deteriorated since mid-2002 in all regions except Northern Red Sea. As indicated in the table below, the sharpest increases in malnutrition were found in Gash Barka, which also had the highest global acute malnutrition rate (wasting) at 24 percent, an increase from 17 percent in 2002. Rates in Anseba also rose to 20 percent from 16 percent in 2002. Additionally, surveys in four of the six regions found high rates of maternal undernourishment, ranging from 30–53 percent of women, with the highest rates in Gash Barka and Anseba. Maternal nutrition is frequently used as a proxy for household food security. Higher rates of malnutrition in these areas, including higher potential areas (Gash Barka is the breadbasket of Eritrea) reflect the lack of livelihood diversity. Households depend almost solely on crop production, while most livestock here are not drought-resistant. As a result, losses of crops and livestock had major impacts on food access.

Source: Ministry of Health, UNICEF, Concern, DIA, CRS, UNHCR

**Figure 6. Global Acute Malnutrition (%) during lean season 2002,2003**




While on the average rural Eritrean children are more than one-and-one-half times as likely to be stunted and wasted as urban children (EDHS 2002), increasing levels of urban poverty are contributing to higher levels of urban malnutrition. In Debub, malnutrition among urban children under five was higher than in the rural areas. Studies also indicate that Eritrea's poorest households are located in urban areas. In a situation of high, rising food prices and limited wage/income opportunities, the food security of the urban poor is a matter of increasingly urgent concern.

The nutrition surveys cited inadequate food intake and childhood illnesses as the main factors causing the increased malnutrition rates. Between January and June 2003, the World Food Programme (WFP) had scaled down its food distributions and food rations considerably as a result of resource constraints, and reached about one-half of the targeted beneficiaries during this period.

Nutrition surveys are planned for December 2003 to provide an update of the nutrition situation in the post-harvest period and to indicate the effects of humanitarian operations that increased substantially in the second half of the year.

### 6.3 Emergency food aid needs in 2004

Households that will continue to be highly vulnerable to food insecurity include the following categories:

- Female-headed: Close to 30 percent of all households are female headed, with significant regional variations. Of these, the most vulnerable are those households that do not receive remittances. In addition, female-headed households face cultural limitations in utilizing traditional agricultural methods, e.g. ploughing with oxen. They are thus forced to resort to renting tractors for ploughing or to share-cropping, both of which result in reducing their income. Lack of male labour may also reduce area planted, with resultant lower harvests and food stocks.
- Elderly-headed households: These households are generally labour constrained, and face many of the same constraints of female headed households concerning ploughing or share-cropping.
- Large families with high dependency ratios: A sub-category here includes those households in which male members are deployed in the national service and unable to send remittances home.
- Farmers in higher-potential areas of Gash Barka and Debub regions: These households depend mainly on agriculture-based activities with little diversity, and have been hit hard by successive dry agricultural seasons. Many also lost their animals to the drought, or had to sell them because they were losing body condition, since animals in these areas tend to be less drought-resistant.
- Households depending mainly on agricultural labour: The prolonged drought has eliminated many opportunities for agriculture-based wage labour. In addition, as only limited opportunities exist for earning income in non-agricultural labour outside of the main urban centres, these households face continuously reduced incomes.

- Pastoralists and agro-pastoralists who have lost their livestock or have low livestock holdings: In general, many predominantly livestock-dependant households have weathered the drought better than crop-dependant ones. This is largely because animals in low rainfall zones tend to be more drought tolerant and therefore are less susceptible to climate variability than those in the higher rainfall- and crop-potential zones of the highlands. However, because poor rainfall and pasture conditions prevailed in both the lowland and highland areas, many households lost all of their animals. In addition, the vulnerability of households in this category with few livestock (0–5) is influenced by terms of trade between livestock and cereal. In more remote areas, particularly in Northern and Southern Red Sea regions, access to markets to sell livestock and procure food and other commodities also influences the vulnerability of pastoral households.
- IDPs who have lost their livelihoods and are residents in camps.
- Rural returnees: These previously displaced households lost many of their assets during the war with Ethiopia.
- Extreme urban poor, particularly female- and elderly-headed households. Studies indicate that the poorest households are located in the urban area, with prevalence of poverty estimated at about 80 percent in smaller towns. These households generally have little or no income, include a high number of dependants, are almost fully reliant on the market and have been particularly hard hit by the effects of the drought.

### 6.4 Coping strategies

Following the prolonged drought and the impact of the border conflict with Ethiopia, household coping strategies and kinship support systems have been severely stretched. The main hunger period, which usually lasts from May–October, was more prolonged in 2003 as households sought to meet a consumption gap. In order to cope with the difficulties of accessing food, households are engaged in a variety of coping strategies:

- The sale of livestock to buy food has been crucial in enabling households meet their consumption needs during the prolonged drought. As a result, many households have depleted their livestock holdings and may need to seek other sources of income in the coming year. A nutritional negative side-effect of the sales is that children are deprived of milk and butter.
- A significant number of households also borrow from friends and relatives to supplement their food consumption, with relative levels of indebtedness increasing, particularly within the middle-income groups. This rising debt burden constrains households' ability to direct resources acquired into improving welfare, as opposed to repayment.
- Sale of labour, especially in the larger towns. Men particularly seek daily wage opportunities as masons in the construction industry, while women mostly seek domestic work. However, outside of the larger towns, opportunities for wage employment are limited, so this type of income is not guaranteed.
- Sale of water, firewood, charcoal, doulm palm mats and other artefacts. However, environmental degradation has resulted in a reduced availability for these resources, and households are less able to rely on them.
- Collecting wild foods, e.g. cactus fruits and wild figs; this seems not to be a major strategy in this drought, possibly from reduced availability of these foods.
- Eating less-preferred foods. Many households have shifted from the preferred teff grain used for making the staple *injera* to a higher proportion of cheaper sorghum. Teff supplies, most of which were imported from Ethiopia before the border conflict, have become less available, with corresponding price increases.
- Reliance on remittances from relatives inside and outside the country. Given indications that levels of remittances to rural households may be diminishing, trends in remittances may warrant further investigation.
- Farm families have consumed their seed stocks and sold farm tools in order to meet their food requirements. Given the levels of poverty, replenishing the farm tools will be a challenge, and the loss of both seeds and tools will have a devastating effect on these households' future production.
- Reduction in the number of meals – many food-insecure households have reduced the number of their meals from two to one, and in extreme situations also skip meals, although this was not found to be widespread because some food aid was available.
- Income-generating activities, especially micro-enterprises, beehives and poultry-raising: many female-headed households have been targeted for such activities by the government They can consume the products directly or sell them to obtain income.
- Reliance on food aid.

## 6.5. Emergency food assistance

From January–November 2003, food aid receipts into Eritrea amounted to 376 000 tonnes (including 60 000 tonnes which were received for monetization). Of this amount, 35 percent was provided through WFP. The government supplements food aid distributions from its own resources through its counterpart agency, Eritrea Relief and Refugee Commission (ERREC), which also manages and distributes externally provided food aid.

However, in 2003, as a result of inadequate resources, WFP's general food distributions covered approximately 70 percent of the targeted population affected by crop failure and less than 40 percent of victims of war and drought, targeted for recovery and rehabilitation activities. As a result of resource constraints, the agency postponed the start of its projects designed to meet the needs of 900 000 victims of crop failure and drought and close to 600 000 victims of war and drought from May–July 2003. However, low levels of resources for emergency activities in most sectors were linked to a declining humanitarian situation, evidenced in higher malnutrition in early 2003.

During 2004, about 1.39 million victims of war and drought will require food assistance, as indicated in the table below. In severely drought-affected areas, quality-of-season analyses indicated that both quantity and temporal distribution of rainfall were much below normal and unable to sustain crop growth, leading to poor yields or crop failure. In moderately drought-affected areas, rainfall was slightly below normal, but the effects of pests, and natural hazards (e.g. hail) contributed to significant yield reductions. More livestock-dependant households in arid areas in this category were also indirectly affected by poor rainfall and pasture in the highland areas, which serve as dry season grazing areas, and resulted in livestock loss. Severely drought affected and war affected households – IDPs, returnees, expellees, returning refugees and refugees – will require assistance throughout 2004. Moderately drought-affected households will require assistance until June 2004.

**Table 9. Estimated vulnerable population**

| Category | No. of people |
|---|---|
| Severely drought-affected | 859 192 |
| Moderately drought affected | 335 775 |
| **Subtotal, drought-affected** | **1 194 967** |
| War-affected – IDPs | 69 200 |
| Returnees | 84 000 |
| Expellees | 1 000 |
| **Subtotal, war-affected** | **154 200** |
| Total drought + war | |
| Returning refugees | 35 000 |
| Refugees in Eritrea | 4 000 |
| **Subtotal, refugees** | **39 000** |
| **TOTAL** | **1 388 167** |

*Urban vulnerable:* According to government estimates, there are 500 000 urban vulnerable. A segment of these, predominantly poor female- or elderly-headed households, will require livelihoods support and some food assistance during 2004. Inter-agency urban vulnerability assessments are planned for the coming year, which will identify what needs exist. Where food aid is required, the assessments should indicate targeting criteria and appropriate distribution modalities, as well as provide guidance on criteria for cessation of assistance to these households. Food interventions to this group should be undertaken in combination with livelihood-support programmes to enhance productivity and income, in order to avoid food aid dependency.

Given the relatively high levels of malnutrition, there is a need to put in place safety-net mechanisms for the most vulnerable segments of the population – e.g. through supplementary feeding, school feeding programmes and food for work. In addition, there is a need for increased preventative action aimed at addressing child and maternal malnutrition, in addition to recuperation. Supplementary feeding programmes, for example, could be complemented by other nutrition interventions such as education,

immunization and dietary diversification. Possibilities for inter-agency partnerships in such interventions can be nurtured.

Food requirements are estimated at 219 651 tonnes as indicated below:

**Table 10. Emergency Food-aid requirements, 2004**

| | War-affected | Refugees | Severe-drought | Moderate drought | Total |
|---|---|---|---|---|---|
| No. of people | 154 200 | 39 000 | 859 192 | 335 775 | 1 388 167 |
| **Total (tonnes)** | **27 756** | **7 020** | **154 655** | **30 220** | **219 651** |

*Based on a ration of 180 kg per person per year for war-affected, refugees and severe-drought affected groups, and a ration of 90 kg per person per year for the moderately drought affected.

Supplementary feeding requirements for 15 000 pregnant and nursing women and therapeutic feeding for 1 200 children, who are all included in the beneficiaries above, are estimated at 1 765 tonnes.

### 6.6 WFP planned emergency assistance in 2004

Assuming that required resources is obtained, WFP intends to provide emergency food assistance to the most vulnerable 600 000 victims of crop failure and drought with general distributions and supplementary and therapeutic feeding amount to 112 162 tonnes. In addition, WFP will support 503 400 victims of war and drought with 86 640 tonnes of food assistance, as indicated in the table below. For the latter group, WFP aims to improve the household food security and nutrition status of these populations and increase access for the target communities to physical assets (through food for work), knowledge and skills. Results of the nutrition surveys planned for the end of the year will be used to refine targeting of assistance, as required.

**Table 11. WFP Planned Projects in 2004**

| Project | Target groups | Beneficiaries in 2004 | Requirements in 2004 (tonnes) |
|---|---|---|---|
| Emergency food assistance to food deficit drought-affected rural populations | Victims of crop failure and drought | 600 000 | 112 162 |
| Food assistance to war and drought-affected persons | IDPs, returnees, expellees, victims of drought | 503 400 | 86 640 |
| **Total** | | **1 103 400** | **198 802** |

### 6.7 Logistics

All food aid imports are received through the port of Massawa. During the past year, WFP port investments have improved discharge capacity at the port in order to allow for simultaneous discharge of two vessels. This has reduced demurrage charges on vessels and increased efficiency in port operations. Food is handed over at the port to ERREC, which manages clearance and forwarding, as well as transportation of the food to intermediate warehouses in Asmara, Dekhemhare, Mendefera and Keren. During the coming year, increases in the price of fuel (21 percent) and petrol (100 percent) instituted in late 2003 will result in increased transportation costs of food to beneficiaries.

## 7. Medium- and longer-term policy directions

a. Adoption of better farming practices, including the following:

- *Improved seed and more suitable crop varieties.* The Government of Eritrea adopted a Seed Policy in 2002 but there is room for improvement in the light of experiences elsewhere. Throughout Africa, for example, there are varieties of cereal, pulse and oilseed crops which are adapted to erratic rainfall that may be introduced and tested under Eritrean conditions while local plant breeding efforts continue.

- *Improved water-harvesting techniques.* Water-harvesting techniques are poorly developed in Eritrea. The use of improved planting pits, such as the *zai* of Burkina Faso and microbasins as practiced in Mali and other suitable strategies may be introduced and tested under Eritrean conditions. It is noted that these techniques are highly labour-intensive.
- *Groundwater irrigation.* A survey study is needed to ascertain the groundwater regime in Eritrea and the appropriate use of groundwater for irrigation in different potential parts of the country.
- *Conservation agriculture.* FAO is already working with the MOA on a number of demonstrations of conservation agriculture. The benefits of these techniques should become clear after 2–3 years, and it is essential that the programme continue for several years and that maximum use be made of farmer field days and other extension techniques to introduce conservation agriculture on the widest possible scale. It is recognized, however, that conservation agriculture requires the recycling of crop residues that would normally be consumed by livestock and some system of livestock control must be introduced in parallel with conservation agriculture.
- *Enclosure areas.* The MOA, in collaboration with local communities, has already begun a series of enclosures of hillsides to enable the natural range to recover from overgrazing. This has resulted in impressive growth of grasses and forage trees which can provide forage in difficult years. This practice should be strengthened.
- *Fertilizer use.* Popularization of fertilizer use in conjunction with improved water availability through irrigation and better water harvesting can be an important element towards improving agricultural yields.
- *Strengthened extension services.* Improved extension services are needed to secure better farming practices, including improved rotation of crops and better livestock management.

b. Land access and land tenure

Appropriate policies and programmes need to be adopted to improve access of the population to land with secure tenure, so as to provide incentives to the farming communities to invest in long-term agricultural improvements, such as soil and water conservation and improved livestock management.

c. In the livestock sector, the following steps are recommended:

- Proper management of livestock, including better provision of water, feed and forage and improvement of veterinary services with greater private sector involvement, where feasible.
- Improvement of rangeland through aerial seeding of appropriate legume species, using experience gained in neighbouring countries.

d. Rural finance and marketing

Rural finance and marketing facilities should be created through appropriate measures such as better communication in terms of movement of goods and people as well as telecommunication services, institutional development and active promotion of private sector involvement.

e. Opening of regional markets

Given that the regional countries had been the traditional trading partners of Eritrea, reopening of these markets by resolving border disputes would enlarge beneficial trade opportunities in various respects, including livestock.

f. Education and health

Proper emphasis needs to be placed on education and health in order to improve human capabilities which are key to economic and social development. Demobilization after the eventual resolution of the border disputes will increase the labour supply, thereby helping to overcome the current labour shortages.

g. Macroeconomic management

Stronger efforts are needed to improve the macro-economic fundamentals of the economy sufficiently: improvement in foreign exchange reserve, reduction in external and domestic debts, control of inflation, securing appropriate exchange rate, etc.

*This report has been prepared by Q.K. Ahmad, James Breen and Evaline Diang'a, under the responsibility of the FAO and WFP Secretariats with information from official and unofficial sources. Since conditions may change rapidly, please contact the undersigned for further information if required.*

*Henri Josserand*
*Chief, GIEWS, FAO*
*Fax: 0039-06-5705-4495*
*E-mail:* giews1@fao.org

*Holdbrook Arthur*
*Regional Director, ODK, WFP*
*Fax: 00256-78-260872*
*E-mail: Holdbrook.Arthur@wfp.org*

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