

SPECIAL REPORT

FAO/WFP CROP AND FOOD SUPPLY ASSESSMENT MISSION TO SUDAN

11 February 2004

Mission Highlights

- A record cereal harvest of 6.3 million tonnes is forecast for Sudan in 2003/04, of which 82 percent will be sorghum, as a result of favourable rains, timely availability of agricultural inputs and few significant outbreaks of pests or diseases.
- At this level, production is about 63 percent higher than last year's production and 47 percent above the average of the previous five years and is expected to result in a large cereal surplus in 2004.
- Market prices for sorghum have begun falling sharply in the main producing areas; financial difficulties thus threaten farmers and could result in sharp reductions in area planted next season.
- Livestock and pasture conditions are better over most of the country than they have been for several years, and the water levels in water holes (*hafirs*) are generally satisfactory.
- Despite the bumper harvest and favourable prospects for peace in southern Sudan, about 3.6 million people in Sudan will need targeted food assistance during 2004 mainly due to civil unrest. The recent escalation of conflict in Darfur region alone is estimated to have resulted in substantial losses of cropped areas and led to the displacement of about 1.2 million people.
- The food aid needs of war-affected and localized food-deficit areas are estimated at 249 000 tonnes.
- In view of the ample domestic cereal availability, local purchases for food aid requirements are highly recommended to support markets and ensure locally-acceptable varieties of cereals.

1. OVERVIEW

An FAO/WFP Crop and Food Supply Assessment Mission visited southern Sudan from 9 to 30 October 2003 and northern Sudan from 8 November to 1 December 2003 in order to estimate cereal production and food supply and assess food aid needs from the current harvest of mainly sorghum and millet and to make an early forecast of wheat production in 2004 from areas prepared for planting. Based on these estimates of production and carryover stocks, the Mission assessed the 2003/04 cereal supply/demand including export potential and import requirements for the marketing year 2003/04 (November–October).

The Mission received the full cooperation of the Federal Ministry of Agriculture and the Humanitarian Aid Commission, both of which assigned senior staff to accompany the Mission. Pre-harvest data on area and yield were provided by the State Ministries of Agriculture and the various irrigation schemes, which the Mission cross-checked during field visits and interviews with farmers, herders and traders. Discussions were also held with key informants from local government administrations, United Nations agencies and non-governmental organizations (NGOs).



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In the Government-held areas of southern Sudan, location-specific information was provided by the African Centre for the Constructive Resolution of Disputes (ACCORD), Action Contre la Faim (ACF), Oxfam-UK, ICRC, IRC, NCA, Sudan Council of Churches, Sudan Aid, Swedish Free Mission, Women's Self-Help and German Agro-Action. In the rebel-held areas, the Mission obtained information from the FAO emergency units in Nairobi, Lokichokio and Rumbek, as well as from WFP staff and USAID FEWS reports. Location-specific information was provided by several NGOs, including Norwegian People's Aid (NPA), Catholic Relief Services (CRS), Medair, World Relief, CARE, Oxfam-UK, Tear-Fund and VSF-Belgium.

Rainfall throughout most of the country was generally favourable during the 2003 cropping season, and cereal production benefited from a relatively low incidence of pests.

In **northern Sudan**, the areas under mechanized and traditional cropping increased significantly in 2003 in response to the good rains, and yields in both sectors were generally very satisfactory. The irrigated sector saw a further small reduction in area and a consequent drop in production. Nevertheless, aggregate production across the three sectors is considerably better than the previous year and well above the long-term average. In the west, however, the level of civil unrest increased in many parts of Darfur during the cropping season. Many farmers in the conflict affected areas were either not able to plant or to weed their fields and those who were are likely either to lose their crops to marauders' livestock or be unable to harvest them because of security problems.

In **southern Sudan**, growing conditions were better than last, with generally well-distributed rainfall and a low incidence of pests. In addition, increased security has allowed the cultivation of more land in the traditional sector and a significant expansion of the area under mechanized production. Consequently, the 2003/04 cereal production will be considerably higher than that of the previous year.

Overall, generally favourable growing conditions have resulted in a record cereal crop in 2003/04 which is forecast at about 6.3 million tonnes, comprising 5 million tonnes of sorghum, 784 000 tonnes of millet, 356 000 tonnes of wheat (to be harvested in April/May 2004), 107 000 tonnes of maize and 35 000 tonnes of rice. At this level, cereal production is 63 percent larger than last year's crop and about 47 percent above the average of the previous five years. This record cereal crop will result in ample supplies in 2003/04. Prices of cereals, mainly sorghum, have shown a sharp decline and are expected to fall further with the arrival of the bulk of the harvest on local markets.

Livestock throughout the country are generally in good condition; with the expected national surplus of grain and declining prices, the terms of trade for pastoralists have markedly improved.

Increased export earnings from oil over the past several years and continued livestock exports to countries in the Arabian Peninsula have continued to boost economic activity. Furthermore, favourable prospects for ending the long-running civil war are expected to boost the agricultural and other economic sectors in southern Sudan.

The overall food situation is therefore highly favourable: there is the possibility of increased food availability and access for a large number of vulnerable groups except in the west where the situation is less transparent. Large quantities of grain could also be exported, provided that export markets are secured, particularly in some neighbouring countries. It is also essential that the Strategic Reserve Authority replenish its stocks in a timely manner in order to ensure that prices do not fall below the cost of production.

Despite these positive developments, an estimated 3.6 million people will need food assistance amounting to 249 278 tonnes. The escalating civil conflict in the three Darfur states has already caused a massive displacements of over a million people, and access to food has been sharply curtailed. People have lost the bulk of their current harvest; if the conflict is not resolved in the next few months, it is highly probable that they will also miss the upcoming planting season and thus lose next season's harvest as well.

In the northern Sector an estimated 1.96 million people are expected to need 177 688 tonnes of food aid. However, the three Darfur States account for about 79 percent of the total food assistance requested for the northern Sector – 1.18 million beneficiaries and 140 585 tonnes of assorted food commodities. The remaining 21 percent (37 103 tonnes) will be used to save lives, improve nutritional status and sustain the livelihoods of approximately 0.78 million people elsewhere in the country. Excluding the Darfurs, there should be a 37 percent

reduction in the number of beneficiaries and 59 percent reduction in food needs compared with estimated needs in 2003.

In the southern Sector, an estimated 1.64 million people will need 71 590 tonnes of food assistance; this represents a 2 percent decline in the number of beneficiaries and an 11 percent decrease in food aid needs compared to estimates for 2003. The numbers of beneficiaries for food assistance could have been lower but the voluntary return of about 300 000 IDPs who will require food assistance in 2004 caused the estimates to be readjusted upwards. These returnees will also require agricultural inputs (seeds, hand tools, fishing equipment and support to livestock) to enable them resume their farming activities.

Preliminary analysis shows that about 400 000 IDPs and 110 000 refugees will be returning to their places of origin or choice in Sudan during the first 12 months of the implementation of the peace agreement. These individuals are currently not covered by any WFP assistance, but it is expected that they will require food aid en-route, return packages and community based assistance at their places of return (seeds, hand tools, fishing equipment and support to livestock).

2. RECENT ECONOMIC DEVELOPMENTS

For much of the period after independence, from the late 1960s to the early 1990s, Sudan approached economic development through an expanded role for the state, both as investor and manager of enterprises. Beginning in 1969, the majority of private enterprises were nationalized, and interventionist policies such as price controls and credit and exchange rate restrictions were introduced. These policies, together with the cost of war, mainly in southern Sudan, contributed to the subsequent decline of the Sudanese economy. In the period from the late 1970s to the early 1990s, huge fiscal and balance-of-payment deficits, runaway inflation, difficult living conditions and the emigration of professional and skilled Sudanese mainly to the Gulf countries characterized the economic situation of this country.

A serious implementation of economic reforms began in the mid-1990s. The results of the reforms were evident in four main areas: the role of the state was reduced and that of the private sector increased; price and market controls were relaxed and incentives for production restored; the economy was stabilized and inflation dropped substantially from 130 percent in 1996 to 4.9 percent in 2001; and economic growth started up once again. GDP grew on average by 3.8 percent per annum during 1990–1995 and then accelerated to an average of 6.6 percent per annum during 1996–2000. The corresponding annual growth rate in income per caput was 4 percent during the period 1996–2000. Average annual income per caput was US\$359 in 2001.

Oil exports have significantly boosted the Sudanese economy and triggered large changes in both the macro-economic environment and Sudan's external position and relations. Oil exports rose from zero in 1998 to US\$1 269 million in 2001, when they accounted for 75 percent of exports. In 2000, as a result of oil-export earnings, external trade figures registered a surplus for the first time in more than 20 years of US\$440 million; this figure fell back slightly in 2001 to 304 million. Oil revenue in the first half of 2002 amounted to US\$709 million. Oil exports in 2004 are expected to drop by 19 percent as a result of a decline in oil prices. Consequently, the current-account deficit will widen, increasing further in 2005 to US\$1.5 billion (7 percent of GDP). Real growth is forecast to accelerate to 6.9 percent by 2005.

The agricultural sector continues to be the main source of sustained growth and the backbone of Sudan's economy in terms of contribution to GDP: the share of agriculture in total GDP was estimated at 37 percent in the early 1980s. As agriculture declined in importance between the mid-1980s and early 1990s, contribution to GDP fell to 28 percent; however, it recovered to about 39.1 percent in 2002. Agriculture remains the main source of employment and household income in rural areas, where 65 percent of the population is to be found. Moreover, about 80 percent of the labour force is employed in agricultural and agro-related industries. The volume of agricultural exports increased during the 1990s with an annual growth ranging from 6–34 percent for gum arabic and cotton thread, respectively. Sesame exports overtook both groundnuts and cotton as traditional agricultural exports during the 1990s. In 2000, sesame exports earned US\$145 million. In 2001, agricultural exports accounted for 25 percent of total exports compared to 96 percent in 1990. This sharp reduction has been attributed mainly to an increase in oil exports. Livestock exports are expected to regain their 1990s position, following last year's lifting of the Gulf countries' ban on animal imports from Sudan in 2000.

Foreign exchange reserves in terms of this year's (2004) imports have increased from 0.3 months in 1999 to 1.7 months in 2003. However, widespread poverty, skewed income distribution and inadequate delivery of social services remain serious problems. Peace is a necessary precondition for the reduction of poverty and improvement of food security, but it is not the only one. Enormous investments are needed for the reconstruction and development of the country and, despite increases in government revenues, will require external financing. However, the prospects for external financing are uncertain because Sudan is a heavily indebted poor country (HIPC) that has struggled with a high and rising external debt since the late 1970s. The current debt is estimated at about US\$21.1 billion – most of which is on non-concessional terms and in arrears. In net present-value terms, the debt is about 10 times the value of exports (including oil), 14 times the value of government revenue (including oil) and 135 percent of the GDP. Following any peace agreement, it is essential that immediate action be taken to facilitate clearance of arrears and access to HIPC-debt relief and concessional financing on favourable terms.

The vast size of the country and its fragile ecological systems make particular demands on transport facilities, communications and other infrastructure services. Low public investment in rural areas results in major constraints to rural producers: the distances are long from major producing areas to large urban markets. Improved road networks will definitely reduce marketing costs and result in higher incomes for producers and lower prices for consumers. Improved roads will also facilitate access to social services, especially health and education.

Funding for public investments in infrastructure and the delivery of basic services for agricultural development has remained minimal. Total annual development expenditures averaged only 2.3 percent of GDP during 1998–2001; the share of agriculture, irrigation, water supply and transport averaged only 1.1 percent. Expenditures in the development budget for agriculture, transport services and water averaged 0.63 percent of GDP during 1998–2002. It is recommended that public resources be reallocated from the non-agriculture to the agriculture sector, that social services remain protected; and that public expenditures within agriculture be reallocated away from subsidized irrigation schemes toward pro-poor services such as agricultural research and extension in the rainfed areas where the majority of the poor reside.

3. CEREAL PRODUCTION IN 2003/04

3.1 Main factors affecting production in 2003

3.1.1 Agricultural finance and credit

The provision of short-term agricultural credit for the irrigated and mechanized rainfed sectors has in general been good this year. According to the Agricultural Bank of Sudan, lending has increased by 25 percent over the past three years. Despite a very significant contribution to national production, the traditional sector is effectively denied access to credit by the stipulation that borrowers must possess a minimum of 500 *feddans* (about 200 ha). Bank credit is used mainly to finance production activities such as ploughing, weeding and harvesting. Banks providing agricultural credit include the Agricultural Bank of Sudan, the Omdurman Bank, the Islamic Bank, the Bank of Khartoum, Baraka, the French Bank and the Commercial Bank. This year, the Agricultural Bank of Sudan helped finance the operations of more than 450 000 farmers in the central and eastern regions of White Nile and South Kordofan at a total outlay of about 5 billion Sudanese dinars (SD).

Since last year, farmers have been responsible for purchasing their own inputs (mostly fertilizers) either from their own resources or using bank loans. If they use bank loans, these must be repaid prior to harvest. As a result, fertilizer use continued to decline this year, especially in the north's mechanized rainfed sector. Clean seed of appropriate varieties was reported to have been readily available in most high-production areas.

3.1.2 Rainfall

Average annual rainfall in Sudan ranges from almost zero in the north of the country to 1 800 mm in the southern state of Western Equatoria.

The rains in 2003 began slightly late over much of the country but then continued (with a few exceptions) very favourably throughout the cropping season. Effective rainfall started between March and May over most of the south, in May in parts of South Darfur and West Kordofan (which was earlier than usual), and in late June and

early July in most of the rest of the country's rainfed agricultural areas. Good rainfall distribution at the beginning of the season limited the requirement for replanting to the minimum. One exception was in sections of the major irrigation schemes, where floods following extremely heavy rains at the end of July destroyed significant areas of established crop. Gezira reported damage to 5 000 *feddans*, while Rahad reported flooding of 30 000 *feddans* of sorghum, 10 000 *feddans* of groundnuts and 3 000 *feddans* of cotton. New Halfa reported damage to 7 500 *feddans* of sorghum and 9 800 *feddans* of other crops. Outside of the irrigation schemes, the same flooding caused serious damage to houses and peri-urban vegetable plots, especially in Kassala, but affected traditional and rainfed mechanized cereal production only slightly. The country's two major spate irrigation schemes, Tokar and Gash, benefited from good, well-distributed floods this year. Tokar, which received only eight floods in 2002, received fourteen in 2003 between 27 July and 21 September. Rainfall continued adequately in many areas of the north and south until October, though there were isolated instances of premature cessation in early September in parts of White Nile, Gedaref and Kassala.

Rainfall this year in Red Sea state, which began in early August, was the highest in five years. However, the rains stopped at the end of September when much of the crop was approaching the grain-filling stage; only about 30 percent of the total area planted is expected to produce. Pasture, on the other hand, was able to benefit. The coastal winter rains, which usually begin around mid-November, had not yet fallen by the middle of the last dekad of that month.

The level of the River Nile was high this year, although not as high as during the record year of 1988. This resulted in a good *demira* sorghum crop in River Nile state, in sharp contrast to last year's almost complete failure when water level of the river was unusually low.

3.1.3 Area planted

A larger area of cereal crop was planted this year than last and, largely as a result of the good rains, the rate of attrition has been low. Compared with last year, the area to be harvested has increased by 30 percent. A 400 percent expansion in the traditional sector in the south can be seen mainly as the increasing security in that part of the country. By the same token, the harvestable area under traditional cultivation in much of the region has diminished this year as a result of increasing insecurity. Among the three sectors, the rainfed mechanized sector showed the greatest overall expansion (56 percent), resulting mostly from an increase in the area planted to sorghum. The area planted to millet, although very much the minor crop in this sector, showed an increase of more than 350 percent over last year. The irrigated sector covered a similar area as last year, with some marked variations within the sector. For instance, the two spate schemes of Tokar and Gash expanded significantly (and Gash is expected to expand further in the coming years with the implementation of an IFAD-funded development), while the productive areas on the Gezira and Rahad schemes diminished, partly as a result of flood damage.

3.1.4 Agricultural inputs

The principal users of fertilizers, pesticides, herbicides and improved seed in Sudan are the farmers in the irrigated sector. Fertilizer use is reported to have declined further this year as a result of last year's policy change concerning the purchase and distribution of fertilizer through the scheme management bodies. Fertilizer – predominantly urea – was at one time provided to registered farmers at favourable rates by the corporations managing the schemes. The corporations have now withdrawn this service, with the result that farmers must find and negotiate their own credit and identify suppliers if they wish to purchase fertilizer.

In contrast, the use of improved seed increased again this year, with many scheme corporations providing their farmers with seed either free or at cost. Improved sorghum varieties used this year include Wad Ahmed, Gadam Hamam and Arfa Gadamek, while the premium-priced Tabet continues to be widely planted. The traditional sector in the north has also benefited from timely seed distributions through the FAO Emergency Unit and various NGOs. In the south, most seed was home-produced, though increased security has meant that there is more seed available on the market. Various NGOs and FAO conducted seed distribution programmes in the south as well.

The mechanized sector saw some improvement in numbers of operational tractors this year. In the high-production areas of the central and eastern regions, farmers reported a labour shortage for weeding and harvesting, presumably as a result of high production.

3.1.5 Weeds, pests and diseases

In the north, the good rains generally encouraged vigorous weed growth. However, some producers (presumably those who had planted at the optimal time) reported that crop growth and canopy formation were sufficiently vigorous to crowd out and smother the weeds, with the result that weeding was less onerous this year. Some areas reported that the cost of weeding was higher than usual, and that increased demand had led to a labour shortage. *Striga* remains one of the most important weeds in sorghum fields, with some farmers switching to millet to avoid it. The area affected by *Striga* is increasing in GOS-held parts of the south, where shifting cultivation is being abandoned in favour of settled agriculture with a concomitant reduction in soil fertility. The thorny mesquite tree *Accacia propolis* continues to colonize new areas in irrigation schemes. New Halfa and Tokar have been particularly affected; about 100 000 *feddans* (40 000 ha) of the New Halfa scheme are infested by the tree, which has also rendered unusable more than 50 percent of Tokar's 102 000 *feddans* of flooded land. In New Halfa, a programme of manual tree removal has begun, but progress is slow.

This year has seen a relatively low incidence of cereal pests. American bollworm (*Helicoverpa armigera*) and sorghum bug (*Agonoscelis pubescens*) caused some yield reduction, but infestation levels in general have not been serious. Control of the sorghum bug was carried out by several State Ministries of Agriculture during the first half of the year prior to planting. Grasshoppers, especially *Edaleus senegalensis*, a relative newcomer to Sudan, are reported to have caused significant crop damage in parts of the west. In parts of North Kordofan, it was estimated that *E senegalensis* had caused some damage to as much as 60 percent of the millet crop. Millet headworm (*Heliocheilus albipunctella*) was reported in the west but appears to have been present at normal levels.

Surveys carried out during the period June–September indicated that the numbers of solitary desert locusts were increasing in response to the good rains and that there was danger that they might swarm. North Kordofan, River Nile and Khartoum states appeared to be most at risk, with about 31 000 ha affected, of which 5 000 were treated. Hopper bands were later observed inland from Sinkat in Red Sea State, but no crop damage from swarms had been reported. However close monitoring is required in 2004.

There were serious outbreaks of the watermelon bug (*Aspongopus viduatus*) this year in North and West Kordofan, where the watermelon is an important ingredient in the coping strategy of much of the population: it serves as a source of clean moisture for human consumption, income from the sale of the seeds and fodder. Losses of more than 90 percent were reported in parts of North Kordofan, while in West Kordofan total destruction was recorded. The watermelon bug is relatively easy to control by manual removal and indeed has been so controlled in the past in response to a WFP food-for-work incentive. In North Kordofan, for instance, 280 bags (the food for work project was 1 bag of food against one bag of bugs) of the pest were collected in one season. It seems odd that the survival of the crop itself provides insufficient incentive for carrying out such a simple control measure.

Quelea quelea is classified as a national pest and, as such, is controlled in the north by the federal MOA. Control this year has been effective, with only localized and relatively minor damage to crops being reported. In the south, security concerns continue to preclude the use of aerial spraying, and late-maturing sorghum varieties are particularly vulnerable to attack. Rats and army worms were troublesome at the beginning of the season in South Kordofan.

Crop disease levels in the north have been low this year, though some sorghum smut was reported in South and West Kordofan and at Gash. In the south, rosette virus and leafspot affected the production of groundnut to some extent, and mosaic virus the production of cassava.

3.2 Cereal production forecast

Total national cereal production for Sudan in 2003/04 is forecast at 6.33 million tonnes, comprising 5 million tonnes of sorghum, 784 000 tonnes of millet, 356 000 tonnes of wheat (to be harvested in April/May 2004), 107 000 tonnes of maize and 35 000 tonnes of rice. Total cereal production will be about 63 percent above that of last year and 47 percent above the average for the preceding five years. Production figures by state for 2003/04, and comparisons with those for 2002/03, are given in Table 1. Cereal areas, yields and production by region for the past five years are given in Table 2.

3.3 Other crops

In South Darfur and West Kordofan the area under groundnut increased in response to the high prices obtained for last year's crop. Similarly, the area under sesame, especially in White Nile, Blue Nile and Gedaref, has increased. Karkade (*hibiscus* sp.) production has increased in West Kordofan, and the area under cotton in Tokar showed marked expansion in expectation of good financial returns. The year 2003 was bad for watermelon in North and West Kordofan, with the loss of most of the production to the watermelon bug (which returned after a quiet year in 2002).

3.4 Livestock

Sudanese livestock are generally in good body conditions due to the availability of pasture and water and concerted efforts by FAO and NGOs to provide technical support to community-based animal health delivery services. The Rinderpest Campaign in the south has been rather successful and vaccination against the disease ceased as of June 2002 in Jonglei and Equatoria and a Rinderpest surveillance programme has been established to closely monitor the situation.

The good rains this year have resulted in better pasture than has been seen for several years in most parts of the country, with many areas having sufficient pasture to see them through the year until the return of the rains. In areas where *hafirs* are plentiful, water levels are generally very satisfactory. In the marginal-rainfall areas of North Darfur, West Kordofan and Red Sea, water for livestock is always a problem even when pasture is relatively plentiful. The year 2003 was no exception to this rule, and herders will move their stock as usual, though possibly at a slightly later date and possibly not so far afield. Even in areas such as Blue Nile State, which habitually has sufficient pasture for its livestock, cattle movement is dictated by access to water.

Livestock prices have risen in response to the favourable climatic conditions, with herders seeing this year as an opportunity to increase their herd size and fatten their animals for sale.

Table 1. Sudan: Cereal production forecasts for 2003/04 and estimates of 2002/03 production ('000 tonnes)

State/Scheme	Sorghum		Millet		Wheat		Total		2003 as % of 2002
	2002	2003	2002	2003	2002	2003	2002	2003	
Irrigated									
Northern	13	12	0	0	144	130	157	142	90
River Nile	100	145	0	0	53	55	153	200	131
Sennar	62	40	0	0	0	0	62	40	65
White Nile	49	67	0	0	7	0	56	67	120
Gezira	424	285	0	0	151	154	575	439	76
Rahad	74	39	0	0	0	0	74	39	53
Suki	40	21	0	0	0	0	40	21	52
New Halfa	42	59	0	0	4	14	46	73	159
Gash	43	59	0	0	0	0	43	59	137
Tokar	2	3	3	2	0	0	5	5	100
Kassala	12	1	0	0	0	0	12	1	8
Upper Nile	1	10	0	0	0	0	1	10	1 000
Sub total	862	741	3	2	359	353	1 224	1 096	89
Mechanized									
Kassala	81	180	0	0	0	0	81	180	222
Gedaref	473	1 176	5	95	0	0	478	1 271	266
Blue Nile	87	284	1	6	0	0	88	290	330
Sennar	46	407	2	13	0	0	48	420	875
White Nile	104	222	16	21	0	0	120	243	202
N. Kordofan	4	8	0	0	0	0	4	8	200
S. Kordofan	123	134	0	0	0	0	123	134	109
W. Kordofan	6	6	0	0	0	0	6	6	100
S. Darfur	0	0	0	0	0	0	0	0	0
Upper Nile	80	184	0	0	0	0	80	184	230
Sub total	1 004	2 601	24	135	0	0	1 028	2 736	266
Traditional									
Gezira	48	261	0	1	0	0	48	262	546
Blue Nile	11	118	0	4	0	0	11	122	1 109
Sennar	6	180	6	20	0	0	12	200	1 667
White Nile	92	161	7	10	0	0	99	171	173
Kassala	3	14	0	0	0	0	3	14	467
River Nile	8	0	0	0	0	0	8	0	0
Red Sea	2	0	1	0	0	0	3	0	0
N. Kordofan	25	64	18	72	0	0	43	136	316
S. Kordofan	61	78	16	7	0	0	77	85	110
W. Kordofan	146	75	131	110	0	0	277	185	67
N. Darfur	7	6	79	74	0	0	86	80	93
S. Darfur	190	187	228	278	3	2	421	467	111
W. Darfur*	44	67	68	71	2	1	114	139	122
South**	422	635	0	0	0	0	422	635	150
Sub total	1 065	1 846	554	647	5	3	1 624	2 496	154
GRAND TOTAL	2 931	5 188	581	784	364	356	3 876	6 328	163

* Caution is warranted with Darfur estimates, particularly western Darfur, as they are mainly based on discussion with provincial Ministry of Agriculture staff and were difficult to verify due to insecurity.

** The sorghum data for southern Sudan includes maize.

Table 2. Sudan: Area, yield and production forecast by crop and region for 2003/04, compared with previous years

Region	Harvested area ('000 ha)						Yield (t/ha)						Production ('000 tonnes)					
	98/99	99/00	00/01	01/02	02/03	03/04	98/99	99/00	00/01	01/02	02/03	03/04	98/99	99/00	00/01	01/02	02/03	03/04
Sorghum																		
Northern	64	107	58	171	70	120	1.45	1.74	2.52	2.16	1.51	1.31	93	186	146	369	121	157
Central	2 027	1 348	1 084	1 749	1 256	2 208	0.86	0.66	0.85	0.99	0.83	0.94	1 738	886	920	1 732	1 010	2 065
Eastern	2 377	1 355	1 431	1 407	1 429	2 365	0.78	0.34	0.5	0.49	0.42	0.64	1 860	456	734	687	691	1 509
Kordofan	627	813	1 003	1 046	1 026	971	0.65	0.32	0.20	0.5	0.36	0.38	406	261	196	528	365	366
Darfur*	299	462	193	753	591	448	0.67	0.53	1.22	0.64	0.47	0.58	200	245	236	480	241	260
South**	917	550	768	799	631	969	0.58	0.57	0.57	1	1.2	0.84	535	400	529	673	503	824
Sub-total	6 311	4 635	4 537	5 925	5 003	7 081	0.77	0.51	0.59	0.77	0.61	0.73	4 832	2 434	2 761	4 469	2 931	5 188
Millet																		
Northern																		
Central	92	125	76	84	91	180	0.46	0.4	0.36	0.3	0.35	0.42	42	50	27	25	33	75
Eastern	19	35	34	32	23	160	0.68	0.4	0.47	0.47	0.39	0.61	13	14	16	15	9	97
Kordofan	1 061	1 079	775	1 146	863	1 049	0.13	0.11	0.16	0.15	0.19	0.18	140	123	123	177	165	189
Darfur*	1 571	1 138	1 197	1 660	1 460	1 182	0.3	0.27	0.27	0.22	0.28	0.36	468	309	328	363	374	423
South	20	6	5				0.35	0.5	0.6	0	0	0	7	3	3	10	0	0
Sub-total	2 763	2 383	2 087	2 922	2 437	2 570	0.24	0.21	0.24	0.2	0.25	0.30	670	499	497	590	581	784
Wheat																		
Northern	55	63	92	60	67	77	2.0	2.87	2.85	2.7	2.31	2.40	108	181	262	162	197	185
Central	55	19	31	38	37	82	0.65	1.21	1.65	1.74	1.89	1.88	36	23	51	66	159	154
Eastern	28	6	11	2	2	8	0.75	1.17	1.55	7.5	1.5	1.75	21	7	17	15	4	14
Kordofan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Darfur	3	3	4	3	3	2	1.0	1	1	1.33	1.33	1	3	3	4	4	4	2
South	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total	141	91	138	103	109	169	2.1	2.35	2.42	2.4	2.13	2.11	168	214	334	247	364	356
TOTAL	9 215	7 109	6 762	8 950	7 549	9 821							5 670	3 147	3 592	5 306	3 876	6 328

* Caution is warranted with Darfur estimates, particularly western Darfur, as they are mainly based on discussion with provincial Ministry of Agriculture staff and were difficult to verify due to insecurity.

** The sorghum data for southern Sudan includes maize.

4. AGRICULTURAL SITUATION BY REGION

4.1 Northern Region (Northern, Nile)

The population of Northern Region, which comprises Northern and River Nile States, is predominantly settled along the banks of the River Nile. Cereal production is based on irrigation, with maize and sorghum being produced in the summer and wheat being grown during the winter months. Summer cereals are grown on pumped irrigation schemes along the Nile as well as on low-lying flood plains during the *demira* season (August to October). Sorghum in this region is produced mainly as a cash or fodder crop, the preferred staple being wheat. By virtue of its comparatively cool winters and its access to irrigation, Northern Region is the country's main wheat producer, with irrigation being provided by pumps. Large areas of broad beans and vegetables are also grown during the winter and a significant amount of alfalfa is produced throughout the year.

This year the level of the river was significantly higher than last year, and the *demira* crop, which suffered almost complete failure last year as a result of low water levels, was normal. The area under sorghum increased in River Nile State but fell in Northern State. However, yields increased in both states and regional sorghum production showed an increase of about 30 percent compared with last year. The area under maize in Northern State increased this year in response to favourable market prices. The proposed area under wheat this winter is slightly larger than that achieved last year. However, successful wheat production depends on low winter temperatures and this year temperatures at the end of November in Northern State, which is usually the larger producer, were higher than normal. It is possible therefore that the proposed area may not be achieved. By 20 November, 75 percent of the intended wheat area in River Nile State had already been planted, but less than 1 percent had been planted in Northern. In Northern State, much of the area usually assigned to broad beans has been earmarked this year for wheat. If above-average temperatures persist into the wheat growing season, yields may be lower than last year. However, even with a slight reduction in this year's wheat production, total regional cereal production is expected to be slightly higher than last year.

The region's livestock are in good condition and fodder production has been and continues to be very satisfactory.

4.2 Eastern Region (Gedaref, Kassala, Red Sea)

Eastern Region includes one major irrigation scheme (New Halfa), 45 percent of another (Rahad), two spate irrigation schemes (Gash in Kassala State and Tokar in Red Sea State) and the largest rainfed mechanized farming area in the country (Gedaref).

The start of the rains was slightly later than usual over most of the region, with effective rainfall beginning in June or early July. However, once the rain began to fall the amounts and distribution were, in general, extremely favourable. One adverse effect of the otherwise good rainfall was serious flooding which occurred at the end of July and the beginning of August, damaging significant areas of land under crops in the irrigation schemes. New Halfa reported damage to 7 500 *feddans* of sorghum and 9 800 *feddans* of other crops, while Rahad reported flooding of 30 000 *feddans* of sorghum, 10 000 *feddans* of groundnuts and 3 000 *feddans* of cotton. The problem was exacerbated by poor levelling of fields and inadequate drainage capacity. The sorghum area to be harvested was smaller this year than last at Rahad, but New Halfa, despite its flood losses, saw a slight expansion. The flooding had little effect on production in the rainfed mechanized sector, but it did damage some peri-urban vegetable plots especially around Kassala. The year was very favourable in terms of flood distribution for the spate irrigation schemes. Both Tokar and Gash saw an increase in cropped area (despite increasing colonization of the flooded area of Tokar by the thorny mesquite (*Accacia proprosis*) tree) and significant increases in production of sorghum.

The favourable rains, the availability of seed, access to credit, expansion of cropped area and a relatively pest-free season all combined to bring about a bumper harvest in the rainfed mechanized sector. In Gedaref, sorghum production is expected to be about 2.5 times higher than last year, while the production of millet, which has been produced on a greatly enlarged area this year with excellent yields, is expected to be almost 20 times higher than last year.

In Red Sea State, the rains started relatively well, prompting cultivation and planting of the largest area that has been seen for several years. Crops were sown in early August with hopes of a good harvest, but by late September, when the sorghum was at the grain-filling stage, the rains stopped. Only about 30 percent of the planted area will be harvested and yields will be low. The coastal strip usually receives irregular amounts of winter rainfall that starts by mid-November; this year, no significant rain had fallen by the end of November.

Total cereal production for the region will be considerably more than twice that of last year. In the areas of high production, cereal prices are falling more rapidly and to a lower level than is usual at this time of year. Unless the government intervenes immediately through the Strategic Reserve Authority, prices are expected to continue to fall. If they fall to levels near or below the cost of production, there could be disastrous implications for next year's production, with large producers going out of business.

Sesame production has increased this year in anticipation of good prices. The crop is abundant and prices at the end of November were rising rapidly in response to bulk buying by large traders.

Livestock condition, pasture and water supplies are all better than they have been for several years, with the result that livestock prices have risen and are continuing to rise.

4.3 Central Region (Gezira, Sennar, Damazin, Blue Nile, White Nile)

Central Region is the most important grain-producing region of the country. In less favourable years, the bulk of its production often comes from the Gezira irrigation scheme. This year, however, the rainfed mechanized and traditional sectors have eclipsed the irrigated sector. The Gezira scheme showed a slight contraction in area (largely the result of difficulties in meeting the cost of maintenance) and reduced sorghum yields compared with last year. In contrast, there was a vast expansion in the area under both sorghum and millet in the rainfed mechanized and traditional sectors. Larger cultivated areas combined with favourable rainfall, adequate availability of seed, access to credit and a relatively low incidence of pests (mostly sorghum bug and American bollworm) have led to a bumper harvest. Flooding in early August was less serious in Central than in Eastern Region, but about 5 000 *feddans* of traditional farm land was damaged in Gezira State.

Total cereal production for the region will be almost twice that of last year. In response, cereal prices are falling more rapidly and to a lower level than is usual at this time of year. Unless the government intervenes immediately through the Strategic Reserve Authority, prices are expected to continue to fall. If they fall to levels near or below the cost of production, there could be disastrous implications for next year's production, with large producers going out of business.

4.4 Kordofan (North, South and West)

Agricultural production in North and West Kordofan is predominantly traditional, while South Kordofan's production is mainly from the rainfed mechanized sector. This year, rainfall in North and South Kordofan was considerably better than it was last year. In North Kordofan, after a slow start, the rains became effective in July and continued well throughout August and September. Significantly larger areas in the state were planted in millet and sorghum in the traditional sector, as well as in sorghum in the relatively small rainfed mechanized sector. In South Kordofan, where the rains began earlier, areas planted to sorghum increased in the traditional sector and decreased slightly in the mechanized sector. West Kordofan was less fortunate. Although the effective rains started early, by May the total rainfall turned out to be not very different from last year's, and localized dry spells occurred during August and September. This resulted in a slight reduction in the harvestable area under millet compared with last year, estimated at less than 60 percent of the area planted. There was also a significant reduction in the area under sorghum, which may be largely attributable to an increase in the area under groundnuts and karkade in anticipation of good prices. Compared with 2002, regional cereal production shows a slight increase, almost all from increased millet production.

Reflecting a relatively poor production year, sorghum prices in West Kordofan were higher in November this year than they were at the same time in 2002. In contrast, sorghum prices in North Kordofan, which had a better year, were lower.

Seed was provided by the MOA and several organizations, including FAO in both SPLA/M areas of the Nuba Mountains, SC/US in Kadugli and Dilling, IFAD, CONCERN and CARE in northern Kordofan. The rainfed

mechanized sector in South Kordofan is still hampered by a shortage of machinery, lack of spare parts and poor maintenance.

The incidence of grasshoppers on millet was higher than normal this year in North and West Kordofan, and some areas experienced significant yield reduction. Desert locusts were reported in North Kordofan, but damage was minor and limited to about 4 000 ha; 3 200 ha were treated. The most serious pest in the region this year was the watermelon bug, which is reported to have severely affected the watermelon crop in West Kordofan and in North Kordofan.

The region's livestock is in good condition and pasture is more plentiful than last year. In many areas, however, fire breaks have not been made this year and there is therefore a risk that much of the pasture could be lost to fire.

4.5 Darfur (North, South and West)

Darfur's crop production is almost exclusively in the traditional sector. This year, the rains in South and West Darfur started in May and were generally better than in 2002. In most of North Darfur, the effective rains started rather later, in late June and early July, and their pattern was less consistent, with some areas reporting better, and others worse, rainfall than last year.

The provision of seed was adequate, with contributions from the MOA, the Zakat fund and FAO, and levels of crop pests were normal apart from grasshoppers and watermelon bug in some areas. Production conditions can therefore be qualified as having been generally favourable this season. However, civil conflict flared up early in the season and has increased in recent months. Although large areas of millet and sorghum were planted, much of this will not be harvested as over 1 million people have been displaced during the 2003 cropping season and farmers are afraid to go to their distant fields. Marauders have looted livestock and put them into fields of maturing crops to graze them. In North and West Darfur, where the insecurity problem is the most severe, it is estimated that only about 45 percent of the millet crop will be harvested.

Livestock prices have reflected the fluctuating level of insecurity in different areas, with prices falling in response to increasing insecurity as owners attempt to sell stock which they fear they may otherwise lose. In such areas, in contrast to most of the rest of the country, the terms of trade between livestock and cereals has tilted sharply in favour of cereals. In secure areas, by late November the price of sorghum had fallen to levels below those at the same time last year.

According to the Regional Bureau of the Ministry of Agriculture, despite the reduction in harvestable area of both sorghum and millet compared with last year in all three states, regional cereal production will be slightly higher than last year by virtue of good yields¹. Apart from the problems of insecurity, livestock are healthy and the pasture situation is favourable. However, in the many areas where no fire breaks have been made, there is the risk of loss of pasture to fire.

4.6 Southern Sudan

4.6.1 Background

Southern Sudan, an area of 640 000 km² with an estimated population of 7.03 million people, has been in a state of continuous conflict since 1983. The diverse natural resources traditionally support agro-pastoralist systems which include crop and livestock production, fishing, hunting, gathering of wild fruits and honey, charcoal-making, and selling timber, building-poles and fuel-wood. In all but the heavier-rainfall areas in the south and southwest, the contribution of each activity to household food economy varies from year to year, depending on the rainfall. Over the past twenty years, such complex systems have been seriously disrupted by the civil war. Apart from the direct effects of the fighting between the GOS and rebel forces, conscription for the armed forces, terror and scorched-earth tactics, looting, cattle-raiding, interfactional and inter-tribal clashes and the unconstrained actions of marauding groups have further exacerbated the difficulties faced by both the rural and

¹ Mission members were not able to travel much, particularly in western Darfur, due to insecurity. Estimates were mainly based on discussion with provincial Ministry of Agriculture staff and were difficult to verify. Therefore, caution is warranted in using figures and statements.

urban populations throughout the south. As a result, the integrity of the region has been shattered. The outcome is a series of GOS-controlled townships, accessible for the most part only by air or by protected river and rail convoys. Communities in the surrounding rebel-held territory receive support through a variety of humanitarian aid programmes coordinated predominantly from Lokichokio, Kenya. The continuing peace talks that began a year ago with the 15th October Memorandum of Understanding bode well for an imminent, sustainable cease-fire between the GOS and rebel forces. The talks have already led to a perceptible increase in the general level of security in most areas. Only the atrocities committed by the Lord's Resistance Army (LRA) from across the border in Uganda were noted as a continuing and real threat to the expansion of farming activities within its area of influence.

Despite these positive developments, the overall socio-economic situation remains as described in previous years, with most communities in the lower-rainfall zones depending ultimately on humanitarian aid for food security. The absence of safe road and river links between the townships on either side of the conflict restricts any large-scale commercial activity between agro-ecological zones. Thus any surpluses that may be produced remaining unsold, and deficits are filled by relief flights from Kenya. Nevertheless, community-development and capacity-building programmes are gathering momentum in the south, and trade is increasing between Uganda and Equatoria (Yei) despite the poor roads and the activities of the LRA. Spontaneous trade links are also expanding in the northern rebel-held areas of the southern sector, increasing the exchanges between the farming communities in Northern Bahr el Ghazal and merchants from the north of Sudan. Similarly, there would appear to be steady trading between border villages and towns in Jonglei and Upper Nile and Ethiopia. However, with the exception of Farmers' Associations in Equatoria, the bulk of these transactions are opportunistic, individual actions that are easily disrupted by local insecurity and lawlessness. The area's weak infrastructure and the poor facilities of these farmer groups are unfortunately matched by unrealistic expectations of support that presently leave them open to commercial disappointment. Consequently, the expansion of production envisaged a couple of years ago in Yambio and Tambura has not yet happened. It would appear, therefore, that the conditions for trade exchange between surplus and deficit areas that would enable the south to return to self-sufficiency are not yet in place.

The agro-ecology of the south provides a growing season varying from 130–150 days per annum in the north to 280–300 days in the southwest. Consequently, agricultural performance varies considerably from place to place and from year to year. In the Green Belt between Tambura and Yei, at least two harvests per year from the same area are possible, while in the marginal areas of East Equatoria and Bahr el Ghazal, crop failure is common.

Agricultural production is, for the most part, based on some 1 000 000 small, hand-cultivated units. Large-scale mechanized farming is restricted to areas close to GOS-held towns. However, mechanized production on a scale similar to that found in South Kordofan, Gedaref or Kassala is restricted to parts of Upper Nile State (in the districts of Renk, Fashoda, Malut and, to a limited extent, Malakal).

In all smallholder systems in the south, farmers grow a wide range of sorghum landraces with minor crops of maize, sesame, pearl millet, finger millet and rice according to location. Other crops include, in the north of the sector, groundnuts (which make a significant contribution to the household food economy), beans, sesame, pumpkins and tobacco. In the south and central areas, cassava is the most important non-cereal crop, providing half or more of the carbohydrate ration. Minor crops of sweet potatoes, yams, coffee, mangoes, papayas and teak are also grown for home and limited commercial use.

4.6.2 Rainfall

Annual rainfall usually increases from north to south and from east to west, ranging from less than 300 mm in the dry lands of Eastern Equatoria to 1 800 mm in the Green Belt of West Equatoria. During 2003, the rains began in April–May with a few false starts and continued until October in all three Regions. Some dry periods ranging from 7 to 21 days were reported in different areas during June, July and August. Total rainfall was generally above average and higher than last year. Table 3 shows the 2003 rainfall data (with some comparisons with 2002) as collected from organizations with rain gauges located in both the south and north sectors.

Table 3. Southern Sudan; Monthly rainfall (mm), 2003 (including some comparisons with 2002)

Location	Year	Jan.	Feb.	Mar	Apr.	May	June	July	Aug	Sept.	Oct.	Total	Qualitative comments
Aweil GOS	2002			70	6	53	112	123	87	77	n.a.	528	Very poor
Aweil East	2003	0	0	0	0	164	118	102	123	127	23	657	Better than last year
Wau GOS	2002			47	25	73	174	126	188	156	n.a.	789	Below average
Rumbek	2002			0	92	121	286	139	143	81	n.a.	862	Below average
Tonj	2003	0	0	0	30	76	132	82	316	169	n.a.	805	Good
Pochalla	2002			47	66	56	61	125	66	36	119	576	Poor
Pochalla	2003			105	22	89	189	117	56	143	30	751	Better than last year
Malakal	2002			0	1	52	32	137	104	74	174	574	Very poor
Bentiu	2003			n.a.	16	35	29	187	162	93	n.a.	522	Average
South Bor	2003	0	0	0	71	71	107	102	115	61	8	535	Good
Ikotos	2003	11	21	53	122	68	230	53	153	55	46	812	Good
Yambio	2003	27	28	113	185	66	204	316	164	123	n.a.	1 226	Good
Yei	2003	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	142	68	210	n.a.	420	Good
Juba	2003	142	71	78	129	187	142	204	166	195	n.a.	1 314	Better than last year

n.a. = not available

4.6.3 Inputs

The traditional sector depends predominantly on family labour and hand power. No fertilizers, pesticides or herbicides are used, and local landraces, either farm-produced or purchased in local markets are relied upon heavily. Limited amounts of seeds were distributed in the north sector by FAO targeting primarily IDPs and by the MOA (GOS), the latter with less success as some deliveries were too late for planting. Seed supply does not appear to have limited production this year; despite concerns expressed in last year's report, seed was readily available. Animal traction has been accepted by some Dinka communities in the Bahr el Ghazal Region. However, unless support is extended to increase the distribution of ploughs and to sustain the use of those already distributed through the enhanced availability of spare parts, it is unlikely that they will have much effect.

This year in Malakal, the provision of seed was adequate from carryover stocks and purchases. The Agono variety could be bought locally, improved varieties of sorghum were purchased from Sennar. In Renk, some 60 percent of the area was planted to the improved varieties of Arfa Gadamek and Wad Ahmed. Greater use of the simple seed drill has resulted in better plant spacing, although plant population varied 80–350 plants/100 m² at the seed rates used (3.6–6.1 kg/ha). Most commercial farmers in Renk dressed their seed this year because the chemical treatment was available from the MOA. The number of tractors in Malakal went back up to 8 functioning units from 4 last year (there were 8 in 2001 and 19 in 2000). Fuel was available on the open market, but prices varied considerably according to locality: in Malakal a 200 l drum cost 22 000 SD, while in Renk the same drum cost 16 000 SD. Although very little credit was offered in Malakal to any of the schemes, because of poor repayment levels and outstanding debts, 160 million SD was disbursed by the Banks in Renk for cultivating and weeding, and more is expected to be available to pay for harvesting, labour and sacks.

4.6.4 Pest and diseases

In the traditional sector, no migratory pests were reported this year. Tree locusts were controlled by the Plant Protection office in Renk; by October spraying had begun against migratory *Quelea quelea* at two or three nesting sites. Long-cycle sorghum crops, particularly in eastern Upper Nile, are still vulnerable to *Quelea quelea* attack. The impossibility of aerial or ground spraying of nesting sites in the eastern areas of Upper Nile State

border means that the risk – so clearly demonstrated in 1998/99 – still persists. The incidence of crop disease was unexceptional this year, with normal levels of rosette virus and leaf spot on groundnuts and mosaic virus on cassava. Sorghum smut was the object of widespread seed treatment in Renk.

Striga weed was a major concern in GOS-controlled areas in both the traditional and mechanized sectors and is increasing in the south sector in locations where shifting cultivation seems to have been abandoned for the benefits of a settled society. Weeding was carried out up to three times in the traditional sector and at least once on the mechanized schemes, despite reported labour shortages and wage rates ranging from 1 000 to 4 000 SD per *feddan*.

4.6.5 Cropped area

As in previous years, the Mission's estimate of the area under traditional cropping is based on numbers of households and average size of holding per household.

For Bahr el Ghazal and Equatoria, the population figures used by the Mission have been derived from UNICEF's Multi-Indicator Cluster Survey (MICS) data, the FAO Emergency Team's Dynamic Atlas (south sector) and State MOA information for Juba, Raja, Aweil and Wau towns. For Upper Nile Region, the Mission used GOS figures from the State MOAs for Upper Nile and Unity States, and MICS figures for Jonglei. In all cases, population data have been updated for the 2003/04 marketing year using the same UNFPA-disaggregated factors for population increases that were used last year.

Table 4 shows the calculation of population and numbers of households by location. Numbers of household have been estimated using the south-sector norm of 6 persons per household. The calculation of cereal area, which is considered to be about 70 percent sorghum, is based on Mission and local estimates (MOA, SRRA) of the percentage of households actually farming in the areas visited or observed by the Mission during aerial transects. Yield data are based on field measurements by the Mission, cross-checked against key informant data and extrapolated using aerial observations and satellite imagery.

Average cereal area per household in southern Sudan increased this year because farmers took advantage of improvements in security to cultivate more land, often at some distance from their homes. In the traditional sector alone, the area under cereals this year was 757 000 ha, which is some 20 percent above last year's estimate. In North Bahr el Ghazal, the area under cereals increased despite water-logging and flooding of the riverine areas. In Raja, better security encouraged the return of some 10 000 households to farming. In Upper Nile Region, planting level has generally been sustained. In Bahr el Jebel, flooding in the southern islands in the Juba area reduced the planted and harvestable areas in some localities, causing householders to leave their dwellings until the flood subsides. However, most of the farming communities in Bahr el Jebel re-established or extended their cropping areas this year after last year's conflict-induced reductions, although some areas have been abandoned because of LRA terrorism in the Ikotos Mountains. In West Equatoria, the larger farms are reported to have reduced their area under maize in response to poor marketing opportunities for their surpluses.

Table 4. Southern Sudan: Population and household estimates, 2003/04

Region/State/County	Population North sector GOS	Population South sector MICS	Total population 2002/03	Total population 2003/04	Total households 2003/04
UPPER NILE	733 000	396 500	1 129 500	1 140 004	190 001
Upper Nile	613 000	incl. in Jonglei	613 000	618 701	103 117
Unity	120 000	100 000	220 000	222 046	37 008
Jonglei		296 500	296 500	299 257	49 876
BAHR EL GHAZAL	227 000	3 017 948	3 244 948	3 321 529	553 588
Aweil town	22 000		22 000	22 519	3 753
Aweil East		429 000	429 000	439 124	73 187
Aweil West		595 967	595 967	610 032	101 672
Twic/Abyei		283 000	283 000	289 679	48 280
Warab (Gogrial)		85 688	85 688	87 710	14 618
Warab (Tong)		598 252	598 252	612 371	102 062
North sub-total	22 000	1 991 907	2 013 907	2 061 435	343 572
Wau town	120 000		120 000	122 832	20 472
Wau	30 000	215 000	245 000	250 782	41 797
Raja	55 000		55 000	56 298	9 383
West sub-total	205 000	215 000	420 000	429 912	71 652
Rumbeck		397 536	397 536	406 918	67 820
Awarial		106 551	106 551	109 066	18 178
Yirol		306 954	306 954	314 198	52 366
Lakes sub-total	0	811 041	811 041	830 182	138 364
EQUATORIA	542 545	2 000 127	2 542 672	2 568 353	428 058
Juba	250 000		250 000	252 525	42 088
Terekeka	280 000		280 000	282 828	47 138
Yei; Kajo-Keji		465 101	465 101	469 798	78 300
Magwi		132 958	132 958	134 301	22 383
Bahr-el-Jebel sub-total	530 000	598 059	1 128 059	1 139 452	189 909
Kapoeta		179 319	179 319	181 130	30 188
Torit	12 545	439 429	451 974	456 539	76 089
East Equatoria sub-total	12 545	618 748	631 293	637 669	106 277
Tambura					
Yambio					
Maridi					
Mundri					
West Equatoria sub-total		783 320	783 320	791 232	131 872
TOTAL	1 502 545	5 414 575	6 917 120	7 029 886	1 171 648

Sources: Multi-indicator Cluster Survey (MICS) and Government of Sudan (GOS).

United Nations Population Fund (UNFPA) population growth rates: Upper Nile 0.93 percent, Bar el Ghazal 2.37 percent, Equatoria 1.01 percent. Based on 6 members per household.

4.6.6 Cereal production

Cereal production this year from the traditional sector (shown in Table 5) is a bumper crop and is expected to reach 635 000 tonnes from 757 000 ha, some 49 percent higher than last year and higher than any estimates for previous years. The average yield for traditional cereal production this year was 0.84 tonne per hectare, which was slightly higher than the average yield achieved in the best of the previous four years (0.80 tonne per hectare in 2001). It should be noted that the estimated production for this year depends on the rains continuing over the next few weeks to support the growth of immature sorghum in Upper Nile, Lakes and parts of Jonglei. A time series of estimates over the past 5 years is given in Table 6.

Table 5. Southern Sudan: Traditional sector cereal area, yield and production, 2003/04

Region/State/County	Total households 2003/04	% of farmers	Average ha/household	Yield (t/ha)	Area ('000 ha)	Production ('000 t)
UPPER NILE	190 001				106	82
Upper Nile	103 117	85	0.60	0.80	52	42
Unity	37 008	70	0.60	0.75	16	11
Jonglei	49 876	90	0.85	0.75	38	29
BAHR EL GHAZAL	553 588				402	306
Aweil town	3 753	10	0.40	2.50	<1	<1
Aweil East	73 187	95	0.70	0.66	49	32
Aweil West	101 672	95	0.80	0.70	78	54
Twic/Abyei	48 280	95	0.66	0.75	30	23
Warab (Gogrial)	14 618	95	0.70	0.80	10	8
Warab (Tong)	102 062	95	0.80	0.88	78	68
North sub-total	343 572				245	185
Wau town	20 472	20	0.40	0.65	2	1
Wau	41 797	95	0.85	0.75	38	28
Raja	9 383	90	0.70	0.85	6	5
West sub-total	71 652				46	34
Rumbeck	67 820	80	1.00	0.75	54	41
Awarial	18 178	95	1.00	0.80	17	14
Yirol	52 366	95	0.80	0.80	40	32
Lakes sub-total	138 364				111	87
EQUATORIA	428 058				249	247
Juba	42 088	35	0.60	0.75	9	7
Terekeka	47 138	90	0.60	0.75	25	19
Yei; Kajo-Keji	78 300	85	0.80	0.85	53	46
Magwi	22 383	95	0.70	0.80	15	12
Bahr-el-Jebel sub-total	189 909				102	84
Kapoeta	30 188	50	0.40	0.40	6	2
Torit	76 089	90	0.60	0.75	41	31
East Equatoria sub-total	106 277				47	33
Tambura						
Yambio						
Maridi						
Mundri						
West Equatoria sub-total	131 872	76	1.00	1.30	100	130
TOTAL	1 171 647			0.84	757	635

Table 6. Southern Sudan: Trends in traditional cereal production by State, 1999–2003

Region	1999		2000		2001		2002		2003	
	Area '000 ha	Prod. '000 t								
Upper Nile	120	83	127	91	111	92	132	73	106	82
Upper Nile	34	23	44	33	47	41	*88	41	52	42
Unity	21	14	40	34	40	32	*13	8	16	11
Jonglei	65	46	43	24	24	19	31	24	38	29
Bahr el Ghazal	158	112	273	168	286	195	312	162	402	306
North	34	23	127	68	180	109	208	83	243	185
West	29	22	70	46	26	21	31	23	46	34
Lakes	**95	67	**76	54	80	65	73	56	113	87
Equatoria	190	175	250	218	261	242	185	187	249	247
Bahr el Jebel	24	15	91	68	102	87	72	60	102	84
East	45	37	45	17	45	22	13	7	47	33
West	121	123	114	133	114	133	100	120	100	130
Total	468	370	650	477	658	528	629	422	757	635

* Population data adjustments between the three States

** Warrab in Lakes

In the mechanized sector, a far better performance than last year is anticipated in all areas, reflecting the greater investment and improved growing conditions this year. However, positive results will depend on the rest of the season remaining free of migratory pests. The Mission estimates a mixed cereal harvest of 184 000 from 205 000 ha, of which some 95 percent is sorghum, with average yield of 0.90/ha. The production time series in Table 7 indicates that the area under sorghum is almost back up to the 1998 level before low prices caused producers to plant much less sorghum and more sesame.

Table 7. Southern Sudan: Trends in mechanized sector cereal production by region, 1998–2003

Region	1998		1999		2000		2001		2002		2003		
	Area '000 ha	Prod. '000 t	Area '000 ha	Yield t/ha	Prod. '000 t								
Renk rainfed	207	157	27	18	82	52	125	101	na	na	122	0.79	96
Renk irrigated	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10	18	n.a.	n.a.	11	2.00	22
Fashoda	n.a.	60	0.90	54									
Melut	8	8	10	8	n.a.	n.a.	3	n.a.	n.a.	n.a.	8	1.00	8
Malakal	4	4	6	4	3	3	3	2	2	1	4	1.00	4
Total	219	169	43	30	85	55	141	121	2	1	205	0.90	184

n.a. =not available

4.6.7 Other crops

The agriculture potential of southern Sudan is high. A wide range of field crops other than cereals, including vegetables and tree crops, may be grown successfully in all of the States. Small quantities of oilseeds, tobacco and occasionally cotton are grown in the traditional sector for household consumption and for sales of small surpluses in local markets. Quantities of two other crops, groundnuts and cassava, are also cultivated.

Householders in Bahr el Ghazal grow groundnuts as a shorter-cycle, later alternative to sorghum and as a supplementary food crop. This year the area under groundnuts was noticeably smaller than last year because of the increased area under sorghum and a reduction in the level of distribution of groundnut seed by NGOs. In Lakes and Equatoria, including Bahr el Jebel, groundnuts are inter-cropped with cassava, sesame and sorghum as well as in small independent plots. The earlier-planted crop had already been harvested by the time the Mission visited, but later-season varieties were seen to be in good condition.

Cassava provides a family food-security safety net throughout the Green Belt, Lakes and Western Bahr el Ghazal. It is also traded in local markets in the form of tubers, dried cassava chips and cassava flour. In Rumbek, the crop is planted around plot and household boundaries. In Wau and Raga, it is planted both as a sole crop and inter-cropped with sorghum and sesame. In Western Equatoria, cassava is inter-cropped with cereals, sesame, groundnuts and beans. It is also planted at the end of a shifting rotation. Digging of tubers takes place after two years. Yields of 5–7 kg/plant this year in Yei suggest a fresh-weight harvest of 15–25 kg/ha for the Green Belt. In Raga, the alternating occupation of the area by opposed armed forces over the past three years has run cassava stocks down to a very low level, and planting material is in short supply. This shortage of planting material presents an opportunity that should not be missed to introduce mosaic-resistant plants to a community highly experienced in cassava propagation.

The mechanized sector includes large-scale sesame and guar production in Renk. Both cash crops are sold, as is sorghum, through Kosti to traders in the north. This year, both crops are in good condition.

4.6.8 Livestock

With 8 million head of cattle and 8 million head of small ruminants in south Sudan, animals contribute considerably to household food economies. Were animals to be evenly distributed, holdings would equal 16 head per household. Under current methods of husbandry and terms of trade, family holdings of 15 head of cows or 40 head of ewes or does are required for pastoralist-based food security. Holdings range from hundreds of head per individual to none, and in all parts of south Sudan except Western Equatoria more than 75 percent of the families own their own livestock.

Cattle raiding may have altered local distribution patterns in Jonglei, Upper Nile, East Equatoria and Bahr el Jebel, but no out-of-country migration, except for normal transhumance and movement of slaughter stock, is evident. Livestock condition is good this year; with fewer diseases than last year with no major outbreaks. The Rinderpest Campaign appears to have been successful and vaccination ceased in 2002 in Jonglei and Eastern Equatoria; a rinderpest surveillance system has been introduced to monitor progress. Vaccination for other endemic diseases continues on a cost-recovery basis through the activities of NGOs and FAO-supported Community Animal Health workers. Pasture and water are presently in plentiful supply in all GOS and rebel-held areas. Livestock prices are firm and are expected to rise with improved trader access as a result of the continuing peace process.

4.6.9 Food supply situation

The cereal balance sheet for the population of southern Sudan is given in Table 8. The following assumptions have been made:

- Gross production of cereals is 635 000 tonnes.
- Production from the mechanized sector is not available to the general population.
- 10 percent of the gross production is either used for seed or lost post-harvest.
- The total population is 7.03 million.
- Average per caput consumption of cereals is 84 kg per annum.

The balance shows that there will be a shortfall in Sudan of 21 000 tonnes this year. If the probably unmarketable 30 000 tonnes of surplus in Western Equatoria are excluded from the balance, some 50 000 tonnes will need to be imported. This year, regionally, Upper Nile breaks even, West Equatoria is in surplus and Bahr el Ghazal is in deficit. Cereals from the mechanized sector could easily make up the deficit in the traditional sector. However, with the exception of a few thousand tonnes from Malakal, the bulk of production is usually marketed northwards through Kosti.

Table 8. Southern Sudan: Cereal balances by state in 2004

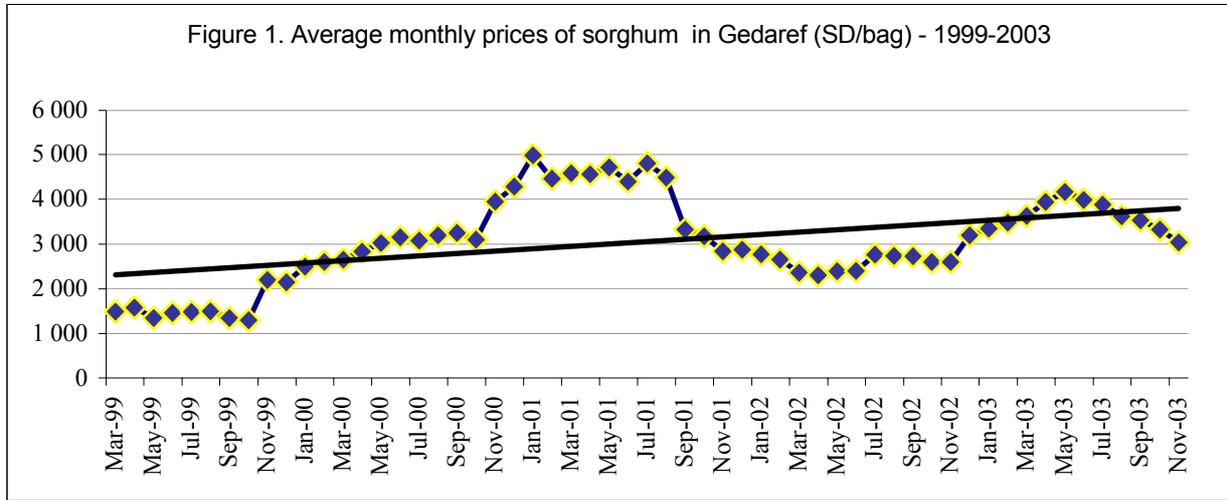
Region/State/ County	Population 2004	Gross production (‘000)	Net production (‘000)	Use per person per year (kg)	Consumption (‘000)	Surplus/ Deficit (‘000)
UPPER NILE	1 140 004	82	74		74	-0.3
Upper Nile	618 701	42	38	60	37	1
Unity	222 046	11	10	60	13	-3
Jonglei	299 257	29	26	80	24	2
BAHR EL GHAZAL	3 321 529	306	275		293	-18
Aweil town	22 519	<1	<1	133	3	-3
Aweil East	439 124	32	29	75	33	-4
Aweil West	610 032	54	49	80	48	1
Twic/Abyei	289 679	23	20	80	23	-3
Warab (Gogrial)	87 710	8	7	100	9	-2
Warab (Tong)	612 371	68	61	100	61	0
North sub-total	2 061 435	185	166		177	-11
Wau town	122 832	1	1	100	12	-11
Wau	250 782	28	26	90	23	3
Raja	56 298	5	4	100	6	-2
West sub-total	429 912	34	31		41	-10
Rumbeck	406 918	41	37	90	37	0
Awarial	109 066	14	12	90	10	2
Yirol	314 198	32	29	90	28	1
Lakes sub-total	830 182	87	78		75	3
EQUATORIA	2 568 353	247	222		225	-3
Juba	252 525	7	6	80	20	-14
Terekeka	282 828	19	17	60	17	0
Yei; Kajo-Keji	469 798	46	41	70	33	8
Magwi	134 301	12	11	67	9	2
Bahr-el-Jebel sub-total	1 139 452	84	75		79	-4
Kapoeta	181 130	2	2	100	18	-16
Torit	456 539	31	28	90	41	-13
East Equatoria sub-total	637 669	33	30		59	-29
Tambura						
Yambio						
Maridi						
Mundri						
West Equatoria sub-total	791 232	130	117	110	87	30
TOTAL	7 029 886	635	572		592	-21

5. FOOD SUPPLY SITUATION

5.1 Current market situation

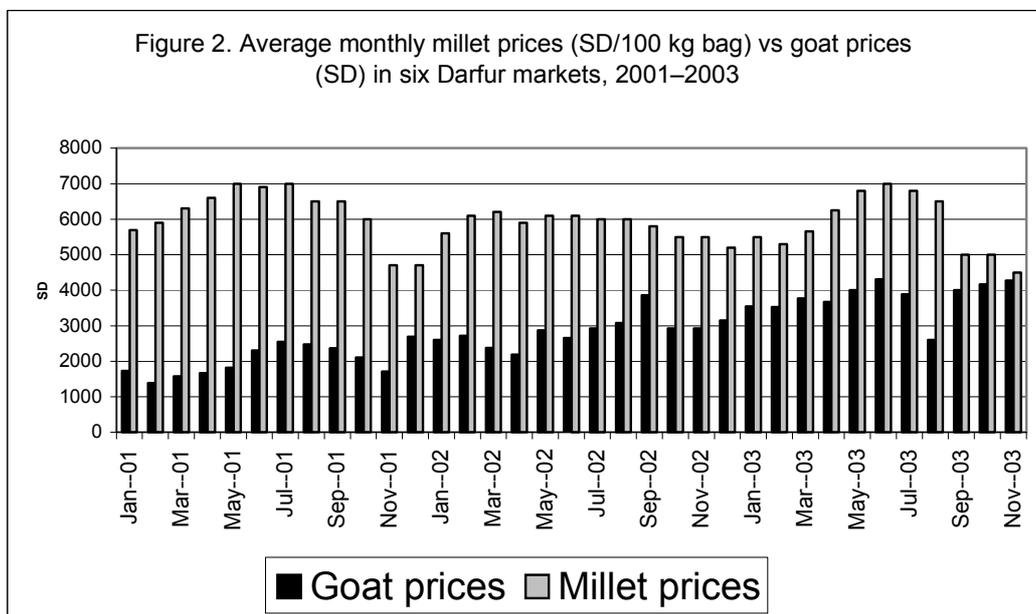
Figure 1 indicates the price of sorghum in Gedaref (a major cereals market in the country) over a five-year period (1999-2003). Average monthly prices in 2003 are shown to be generally higher than in the previous year reflecting the relatively lower harvest of the previous year. However, price levels began to ease from June 2003 coinciding with the wheat harvest and large imports of wheat that amounted to about 600 000 tonnes during January to June 2003. There are significant variations in price levels between different markets, where

traditionally deficit areas (Red Sea State and North Darfur) show relatively higher price levels than the surplus areas (Gedaref and Gezira). This is broadly consistent with expected transportation costs to move supplies from surplus to deficit areas.



The current national surplus of grain, particularly sorghum, is expected to depress prices and may negatively impact on next year's production decisions of farmers. In the short term, however, food will be much more accessible to the population in general.

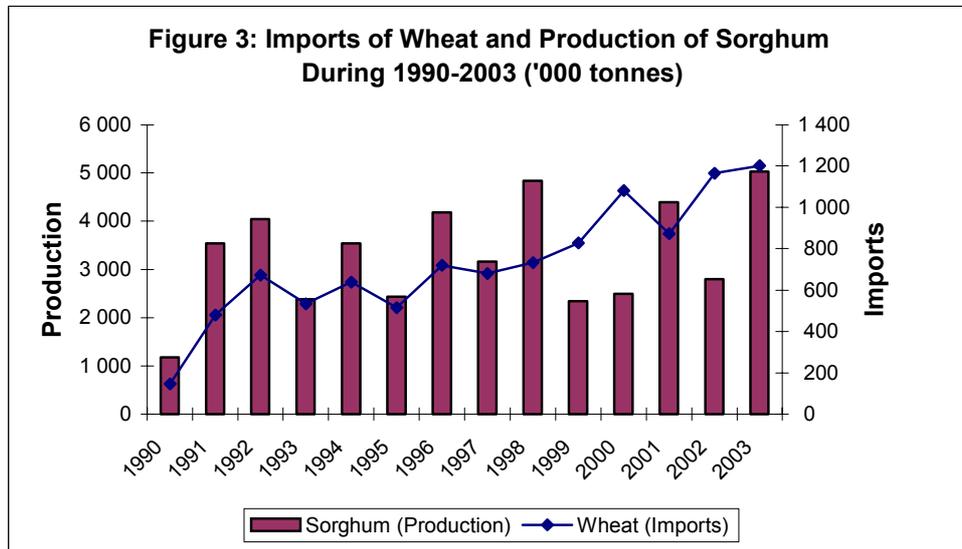
The trend of millet prices is in sharp contrast to that of livestock prices and effectively translates into improved terms of trade for livestock owners (see Figure 2, which shows convergences of grain and livestock prices at six Darfur markets, namely El Fasher, Kutum, Mellit, Tina, Kebkabiya and Um Kadada).



The substantial increases in livestock prices may be attributed primarily to the improved pasture conditions this year. Furthermore, declines in numbers of livestock as a consequence of animal raiding and armed robberies over the last several months were reported. Livestock owners sold a large number of their animals last August when the state of insecurity was worsening. This is depicted by the dip in market prices for livestock. A current high demand for animals for export, following the lift of the ban imposed on importing animals from Sudan to the

Gulf countries, is another factor in the price rise. Generally, there has been an improvement in the terms of trade for livestock owners.

Imports of wheat have risen nearly fivefold from 1990 to 2003 (Figure 3). This is a reflection of a change in consumer taste fostered by urbanisation and income increase in some segments of the society. Note the continued upward trend in wheat imports even when there is a bumper sorghum harvest (the main staple crop).



Another relatively minor but growing cereal import is rice, which increased from a mere 5 600 tonnes in 1990 to more than 35 000 tonnes in 2002.

5.2 Cereal supply/demand balance for 2003/04

Table 9 shows the cereal balance for Sudan, computed on the basis of the following assumptions:

- Opening stocks of cereals amount to 150 000 tonnes, comprising about 118 000 tonnes of sorghum held by the Strategic Reserve Authority and about 32 000 tonnes of sorghum and other grains held by individuals and commercial enterprises at the start of the 2003/04 (November/October) marketing year.
- Domestic cereal availability is about 6.48 million tonnes comprising aggregate cereal production estimated at about 6.3 million tonnes, including a forecast of wheat production for harvest in April/May and carryover (opening) stocks.
- Regional differences in diets, food production and availability, historical trends and the adverse conditions created by ongoing civil conflicts were taken into consideration in computing total cereal requirements for the country as follows:

For the northern states and garrison towns in the south, average per caput cereal consumption in 2003/04 is assumed to be 146 kg, as for last year. This consists of 80 kg of sorghum, 16 kg of millet, 47 kg of wheat, 2 kg of rice and 1 kg of maize. On the basis of a population estimate of 28.8 million in mid-2003/04, the total cereal requirement for this population is estimated at 4.2 million tonnes.

Rural areas in southern Sudan have a high intake of cassava and other root crops so that per caput cereal requirement has been estimated at 84 kg, the same as for last year. This consists of 50 kg of sorghum, 22 kg of wheat, 7 kg of millet and 5 kg of maize. Using the mid-year population estimate of 7.03 million (the best estimate from aid agencies working in southern Sudan), the total cereal requirement for southern Sudan has been estimated to be about 590 000 tonnes. This results in cereal consumption for the Sudan of 4.79 million tonnes.

- Livestock feed utilization will be greater than in previous years following this year's good harvest and an increase in livestock numbers.
- Seed requirements for the next season are based on this year's cropped areas and the following seed rates: sorghum, 7.5 kg/ha; millet, 4 kg/ha; wheat, 100 kg/ha; maize, 17 kg/ha; and rice, 75 kg/ha.
- Post-harvest losses are assumed to be 5 percent for rice and about 10 percent for all other cereals.

- Cereal exports to neighbouring countries, mainly cross border, are assumed to amount to 300 000 tonnes of sorghum.
- Commercial wheat imports are projected to rise to more than 1.2 million tonnes during the 2003/04 marketing year (November to October), following recent trends and reflecting population growth, consumer taste (especially in urban areas) and income growth in segments of Sudanese society. Some rice imports are also expected.

Table 9. Sudan: cereal balance sheet for 2003/04 ('000)

	Total cereals	Rice	Sorghum	Millet	Wheat	Maize
Availability	6 478	35	5 176	794	366	107
Opening stocks	150	0	130	10	10	0
Production	6 328	35	5 046	784	356	107
Utilization	7 707	60	5 176	794	1 570	107
Food	4 795	58	2 655	510	1 508	64
Feed	513	0	423	60	0	30
Seed	100	0.5	63	18	17	2
Post-harvest losses	629	2	503	78	35	11
Export	300	0	300	0	0	0
Closing stocks	1 370	0	1 232	128	10	0
Commercial imports	1 229	25	0	0	1 204	0

5.3 Emergency support measures to household food security

There is an urgent need for early purchase, treatment, storage and transport of local crop seeds (sorghum, millet, maize and rice) and appropriate hand tools, for distribution to needy farmers, IDPs and returnees, in time for the main planting season, starting from April 2004. Provide an estimated 650 000 war-affected households with appropriate inputs, including hand-tools, selected appropriate crop and vegetable seeds with the aim of increasing their self-reliance, reducing their dependency on food aid. Sudan's important natural fish resource is recognized to be under-utilized. In providing fishing equipment, which has been lacking due to the long lasting civil strife, and by improving post-harvest processing techniques, fish proteins will contribute to making cheap animal proteins available to the most destitute households.

Further support to the immunization campaigns and the establishment of sustainable community-based animal health care system will enable to reduce vulnerability to malnutrition and improve livelihood security of 600 000 livestock-owning families in southern Sudan and the transitional zone.

An estimated 353 500 farmers in the drought-prone and conflict-affected regions of western, eastern and southern Sudan having experienced crop failures during the 2002/03 planting season would require an estimated 5 970 tonnes of seeds (millet, sorghum, groundnuts, maize and vegetables) for the next planting season.

6. EMERGENCY FOOD AID REQUIREMENTS

6.1 Nutrition situation

Malnutrition rates in Sudan have somewhat declined from the high levels (>20 percent) experienced in 2002, but they still remain above the 15 percent critical threshold level. Compared to 2002, the overall wasting rate (acute malnutrition) declined from 24 to 21 percent. However, children in the 6–29 month-old age-group (UNICEF collects data for children under 5 years/59 months) continue to have a higher prevalence of malnutrition when compared to older children because of poor caring practices.

Upper Nile, Northern Bahr El Ghazal, Darfurs, Unity State, Red Sea and parts of Eastern Equatoria including Lafon have malnutrition rates above 20 percent, indicating a serious chronic problem. In general, the malnutrition rates are higher in the south, in particular among IDP and returnee population groups.

Nutritional survey data from the better and lean seasons shows that, though mitigated, nutrition status does not always recover after harvest or following humanitarian interventions (Unity, Red Sea State) suggesting that the nutritional situation is becoming chronic rather than seasonal in most areas because of other unmet needs. This report therefore urges caution concerning expectations of any immediate dramatic improvements in nutrition status following a better overall food supply situation in the country. Improvements, if any, are unlikely to become visible before at least 4–5 months.

Malnutrition is complex and studies should be commissioned to determine the contribution of individual factors such as security, hygiene, health, sanitation, water and childcare practices. The seasonal timing of nutritional surveys is also critical, although they are generally conducted in an ad-hoc fashion. The geographical coverage of the surveys is often not wide enough to ensure statistically significant results. It is important to conduct regular seasonal surveys to obtain comparable nutritional data.

Table 10. Malnutrition rate trends, 1999–2003

State/Region	Year					Comment Compared to 2003
	1999	2000	2001	2002	2003	
Unity	26.3	25.1	38.4	22.4	19.5	High but lower
Upper Nile (Sobat IDP camps)	n.a.	16	20.5	27.3	23.4	High but lower
Jonglei/Upper Nile (SS)	24	27	31	39.9	22.5	Improved
Bahr El Ghazal camps	n.a.	10	7	9.5	18.2	High
Bahr El Ghazal (SS)		17.8	19.6	21	20	Same
Equatorial	n.a.	9	12	n.a.	12.9	Acceptable
Equatorial (SS)- camps	n.a.	n.a.	n.a.	15	13	Improved
Kassala	8.8	7.5	5.8	17.9	17.6	Same
South Darfur	20	9.3	23	24.4	25.6	Rising
North Darfur	15	25	23.4	27	25.4	Lower
North Kordofan	15	23	18.8	23	n.a.	No latest data
West Kordofan	29	na	18.8	n.a.	n.a.	No latest data
Red Sea State	19	17.8	23.1	29.6	23	High but lower
Sinkat	18	n.a.	17.8	23.9	n.a.	No latest data
Tokar	28	n.a.	23.2	24.4	n.a.	No latest data
Halaib	20	n.a.	28.3	28.3	n.a.	No latest data

Source: Data compiled from partner NGOs, Ministry of Health and UNICEF reports.

Note: Data are compared for the same (July/August) months across the years using Wt/ht <2 Z Scores. Severe malnutrition (<-3 SD) for all areas is high and ranged from 1.6 percent in Upper Nile to 8.2 percent in the Red Sea State.

n.a.=not available

6.2 Emergency food aid needs in 2004

As indicated in the previous sections, food availability will be markedly improved in the 2003/04 marketing year following the harvest of a record cereal crop. The bumper crop in the north and good harvest of the south, compounded by the prospect of a successful end to the peace negotiations should have a beneficial effect on the food security of the majority of the population in Sudan over the next 12 months. The improved food supply situation and the reduction of constraints to the movements of food commodities from surplus to deficit areas has already led to a sizable reduction in food prices in many parts of north Sudan.

Food security prospects for the most vulnerable groups currently being assisted are expected to improve, although for many, problems of physical and economic access to food will remain. In most areas affected by recurrent droughts in previous years, the larger food availability from their own production, lower prices of cereals, higher wages in the agricultural sector and improved terms of trade are likely to reduce the dependence of affected populations on food assistance. This will also be true for chronically food deficit populations of Red Sea and Kordofan States.

The outlook for the war-affected populations in the southern sector is expected to improve as a result of the larger home-produced food this year and an improved security situation. Food assistance will still be required in 2004, but less than in previous years. Further improvements are expected if peace is achieved.

The Mission estimates that 3.6 million beneficiaries will need food assistance amounting to 249 278 tonnes of assorted food commodities – an increase of 7 percent in number of beneficiaries and 25 percent in the food needs when compared to 2003 estimates (Table 11). This increase in food assistance – despite a bumper harvest and relatively peaceful environment elsewhere – is largely attributed to the escalating civil conflict in the three Darfur states, where massive displacements of over a million people have occurred and access to food is sharply curtailed. People have not only lost a majority of their current harvest, but if the conflict is not resolved in the next few months, it is highly probable that they will also miss the upcoming planting season.

In the northern sector an estimated 1.96 million people are expected to need 177 688 tonnes of food aid. However, the three Darfur States account for about 79 percent of the total food assistance requested for this sector – 1.18 million beneficiaries and 140 585 tonnes of assorted food commodities. The remaining 21 percent (37 103 tonnes) will be used to improve the nutritional status of the malnourished and sustain the livelihoods of approximately 0.78 million people elsewhere in the country. Excluding the three Darfurs, a reduction of 37 percent in the number of beneficiaries and 59 percent in food needs is envisioned when compared with the estimated needs for 2003.

In the southern sector an estimated 1.64 million people are in need of 71 590 tonnes of food assistance – a 2 percent decline in the number of beneficiaries and 11 percent in food aid needs compared to the estimates for 2003. In fact there were originally fewer beneficiaries estimated for food assistance needed, but the voluntary return of about 300 000 IDPs who will require food assistance in 2004 – largely motivated by the relative peace and prospects of a good agricultural season – partially offset the originally estimated decrease. Improved security and favourable climatic factors have improved food access and reduced the need for food assistance for many of the individuals previously considered vulnerable.

Table 11. Sudan: WFP estimated emergency food aid needs in 2004

Region or State	ANA* estimates for 2003		ANA estimates for 2004		Percent change 2003–2004	
	Beneficiaries	Food needs (tonnes)	Beneficiaries	Food needs (tonnes)	Beneficiaries	Food needs (tonnes)
White Nile	9 140	494	10 755	428	18%	-13%
Darfur, South	157 499	13 896	339 787	37 175	116%	168%
Darfur, North	318 879	13 991	285 583	37 467	-10%	168%
Darfur, West	0	0	556 800	65 943	--	--
Kassala State	54 815	6 737	86 956	6 002	59%	-11%
Red Sea	256 000	25 176	165 900	5 664	-35%	-78%
Kordofan, North	98 340	4 315	0	0	-100%	-100%
Kordofan, West	170 165	6 156	16 535	527	-90%	-91%
Nuba Mountain	290 496	12 742	225 860	7 963	-22%	-38%
Jongelei & Corridors	217 768	12 156	161 460	5 719	-26%	-53%
Greater Bahr El Ghazal	911 013	44 126	628 136	31 049	-31%	-30%
Greater Upper Nile	698 941	45 138	574 592	25 349	-18%	-44%
Equatoria	170 356	12 411	370 021	19 195	117%	55%
Blue Nile	30 000	2 263	181 539	6 797	505%	200%
Total	3 383 412	199 601	3 603 324	249 278	7%	25%

Source: Preliminary results from the 2003/04 Annual Needs Assessment (ANA) and Mission estimates.

A successful conclusion to the peace talks will also trigger large population movements of internally displaced persons (IDPs) and refugees to their places of origin or choice. The largest movements are expected to be from north to south Sudan including IDPs who are currently living in 4 camps and 15 squatter areas in and around Khartoum. These individuals are currently not covered by any WFP support programme, but it is expected that they will require assistance en route, return packages and community-based assistance at their places of return.

The decision of IDPs to move back is generally based on the expectation of marked improvements in their livelihoods at their places of return when compared to the socio-economic conditions in their current environment. The timing of their movement is likely to coincide with the beginning of the agricultural season that normally starts with land clearing and preparation between April and June. The number of the returnees is expected to decline during the rainy season because of the inaccessibility of roads. Therefore, the most likely

timing for their return will be between January and June, and later during the harvesting season of October to December.

Preliminary analysis shows that about 400 000 IDPs will be moving back from the north to their places of origin or choice during the initial 12 months of the implementation of the peace agreement. Major concentrations of returnees are currently in Aweil (Bahr El Ghazal), Abeyie, Nuba Mountain (Kordofans), Bentui (Unity), Bor, Pibor, Phou (Jongley) and Magwi (Equatoria). Estimates suggest that the highest number of returnees will settle in Bahr El Ghazal, South and West Kordofans, Blue Nile, Jongley, Upper Nile, Unity and Equatoria.

In addition, there are over 500 000 Sudanese refugees in the neighbouring countries who may eventually return to Sudan. Their return is expected to be gradual depending on the speed of the repatriation process as well as the perceived security and socio-economic conditions in Sudan. Initial estimates suggest that not more than 110 000 refugees will return during the first 12 months of the implementation of the peace agreement. Main areas of returns will be Jongley, Upper Nile, Blue Nile and Equatoria.

Additional demand for food assistance to meet the needs of the returning IDPs and refugees can be broadly classified into three categories: 1) a travel package containing 15-days of full food rations; 2) a return package at the destination comprising of 3-months' full food rations and non-food items such as agricultural inputs and tools; and 3) community-based reintegration package for at least 6 month of full rations during 2004. Table 12 shows the estimated food needs for 510 000 returnees – 400 000 IDPs and 110 000 refugees – expected to return to their places of origin or choice during 2004. These estimates of returnees and modalities of assistance are mostly indicative and will need to be further refined when the findings and operational recommendations of the inter-agency task force established for the returnees are made available.

Table 12. Estimated food needs requirement of returning refugees and IDPs

Type of beneficiaries	No. of beneficiaries	Type of assistance	Modality of assistance	Time period	No. of days	Ration size	Food needs (tonnes)
IDP returnees	400 000	Travel package	GD	Jan–Jun Oct–Dec	15	100%	3 510
		Return package	GD	Jan–Jun Oct–Dec	90	100%	21 060
		Reintegration package	FFR, GD	Jan–Dec	180	100%	42 120
Refugee returnees	110 000	Travel package	GD	Jan–Jun Oct–Dec	15	100%	965
		Return package	GD	Jan–Jun Oct–Dec	90	100%	5 792
		Reintegration package	FFR, GD	Jan–Dec	180	100%	11 583
Total	510 000						85 030

The focus of assistance will be on community needs rather than on specific groups in order to minimize conflicts over resources.

During the 12-month period between November 2002 and October 2003, WFP delivered a total of 97 248 tonnes of emergency aid, of which 83 100 tonnes were cereals and 14 148 tonnes other food commodities. The assistance was distributed by WFP in collaboration with its partners via a combination of general food distribution, food-for-work, food-for-training and emergency school feeding programmes. The lack of strong implementing partners able to oversee the implementation and offer the required technical support has continued to limit the distribution of food for development-type interventions. Assuming that the security situation improves in 2004, it is anticipated that a larger share of food assistance (40 percent) will be channelled through FFW, FFT, FFR and ESFP programmes and less through general food distribution.

Because of the weakness of the marketing infrastructure and the lack of purchasing power of vulnerable populations, there will be only limited scope for surplus food supplies to move to deficit areas in 2004 through ordinary market mechanisms. Hence a food deficit will persist for a segment of the population, while at the same

time the north of the country will have to struggle with market surpluses, low prices and their disincentive effects on production in future years. A large part of the vulnerable populations will not be able to access the market and will continue to rely on food assistance to meet their minimum basic food needs.

Because of the ample cereal supply in north Sudan, the emergency food needs of vulnerable populations in 2004 should be met from local purchases. Donors have for several years assisted WFP and NGOs in north Sudan with funds for local purchases of cereals and to cover the internal transport and handling costs. From January to November 2003, local WFP purchases amounted to over 30 000 tonnes of sorghum, compared with 25 000 tonnes in 2002. There is an urgent need to substantially increase the amount of donations for local purchases during 2004. This could reduce the cost of the emergency operations, while at the same time it would support the domestic market and producers' incentives for the new agricultural season.

The Government of Sudan in view of the improved government revenues and the availability of food supplies with the Strategic Reserve Authority (SRA) could take over part of the relief effort, especially in chronically deficit areas where relief could be integrated with longer-term structural improvement programmes.

6.3 Other WFP programmes

The Country Programme 2002–2006 covering the School Feeding and Food for Work (FFW) activities continues to make significant contributions to efforts in disaster mitigation and peace-building through recovery and development interventions. WFP assistance is mainly concentrated in the chronic food-insecure and acute water-shortage areas of north Sudan – namely the Darfurs, Kordofans, Red Sea States and Kassala where successive drought over the past few years has eroded people's coping mechanisms and weakened their asset base further impoverishing people.

In 2002/03, WFP under its School Feeding Program distributed about 15 000 tonnes of mixed food commodities to about 360 000 school children, thereby contributing to lowering malnutrition levels in its operational areas. Under the FFW, a total of 2 500 tonnes of mixed food commodities were distributed to about 30 000 beneficiaries. WFP assistance was provided during the critical hunger period, which effectively improved households' food security while at the same time contributing to stabilizing the prices of cereal in the rural markets. Another positive contribution of WFP support under the FFW was registered in reducing the level of migration of valid workers in search of labour opportunities in bigger cities. In this way, the negative effect of migration on the available agriculture labour for the timely preparation and cultivation of land for 2003/04 was minimized.

For 2003/04, WFP food assistance under its development programme will continue to be channelled through the School Feeding and FFW Programmes to strengthen and deepen the achievements registered in the previous year in improved food security. Further efforts will be made in support of food security measures with the ultimate aim of consolidating the gains made in terms of rebuilding and restocking. Accordingly, WFP plans to continue its support to the Education Sector by feeding about 450 000 school children through the expansion of its current School Feeding Program. Additional resources will be mobilized to start off implementation of the Mother and Child Component of the Country Programme, aimed at supporting 9 000 malnourished children and 5 000 pregnant and nursing women. Total planned food aid is 15 000 tonnes. It is envisaged that an additional 5 000 tonnes of mixed commodities will be directed at water harvesting and school and health infrastructure development targeting about 30 000 beneficiaries.

The ongoing Protracted Rehabilitation and Recovery Operation (PRRO 10122) was designed to assist a monthly average of 55 000 Eritrean refugees from May to December 2002 and a monthly average of 27 500 from January to December 2003. However, the UNHCR repatriation plans have not materialized because of the closure of the Sudan/Eritrea border; therefore a larger number of refugees (a monthly average of 91 800) were continuously provided with WFP food assistance in 2003.

In June 2003, UNHCR resumed the refugee repatriation process in collaboration with the authorities of both Sudan and Eritrea. Refugee Status Determination (RSD) process and camp closure and consolidation are ongoing. The plan is to merge 20 camps into 8 camps by December 2003 and finally into 2 camps by June 2004. As a consequence, the majority of land-based refugees will become landless as they are relocated to camps with no access to land; they will rely on food aid in order to survive. This is expected to further increase

vulnerability levels in all camps. Some 3 500 refugees previously considered self-reliant will require food aid as they are relocated from Um Sagata camp, bringing the total caseload to 95 300 persons.

Taking into consideration UNHCR repatriation plans, WFP plans a gradual phasing down of the project. In Phase I (April–December 2004), WFP plans to assist a monthly average of 95 300 refugees and a monthly average of 60 000 refugees in Phase II (January 2005–March 2006).

6.4 Logistics

The Sudan emergency operation poses a major challenge in ensuring timely and cost-effective deliveries. Lack of basic infrastructure, seasonal lack of access to many of the roads, insecurity because of the conflict and access restrictions by parties to the conflict are the main issues in transport and logistics. Access has been under negotiation for many years and much was achieved during 2003 since the signing of the MOU between GOS and SPLM. The clearance process has become faster and easier, and humanitarian agencies now reach areas where assistance is required with much less difficulty than before.

Almost 60 percent of the food is transported by surface and the remaining 40 percent by air. The average transport, storage and handling costs are US\$396 per ton. About 70 percent of the WFP food aid to Sudan enters via Port Sudan, while the remaining 30 percent arrives through Kenya (Mombassa) and it is transported to Lokichoggio airbase of the OLS in northern Kenya for air and limited road delivery into southern Sudan. A limited quantity is moved through Uganda (Koboko) into southern Sudan.

Delivery cost reduction

WFP is trying to make this operation more cost effective by using surface rather than air delivery. Considerable progress has already been made following the cessation of hostilities and the opening of access to many areas. In particular WFP has:

- started cross-line surface operation by road in the Nuba Mountains;
- prepared a project document for rail rehabilitation between Babanusa and Wau; funds are expected from donors once the peace agreement is signed;
- requested funds for de-mining and emergency road repairs under the ongoing Emergency Operations (in close coordination with relevant UN agencies, three mine survey teams are already deployed from the south; similar arrangements will soon be made for road surveys in the north); and
- received significant funding from USAID for rehabilitation of major trunk roads and feeder roads in south Sudan.

Post-conflict need for air delivery

Air delivery is used for approximately 40 percent of the food aid for Sudan. Depending on the distances from the origin to the destination, airdrop costs range from US\$336–\$446 per tonne for deliveries from El Obeid in the north to locations in southern sector, and from US\$232–\$1 041 per tonne for deliveries from Lokichoggio in the south to other destinations in the southern sector. Air operations are expected to remain at the same level for the next two years and possibly increase during the next six months should the security situation worsen in the Darfurs. However, WFP will in the meantime continue to look for cheaper options of air operation such as using the less expensive AN-12 aircraft from both El Obeid and Lokichoggio until delivery by surface means takes over; and looking into the possibility of using other bases that are closer to food aid delivery areas (Malakal, Juba and Rumbek are currently under consideration). The challenge is to ensure the necessary facilities at these locations to support air delivery operations.

Road deliveries

In north Sudan, on-road delivery prices in general have increased by over 20 percent because of restricted axle load limits, worsening road conditions and increased market demand. Off-road delivery rates have increased by 50 percent for many locations and by as much as 100 percent for destinations that are distant and inaccessible from seasonal weather variations. Even with peace in the country, an immediate increase of access by surface means will not be possible until the roads have been de-mined and repaired.

Demand for trucking capacity is increasing, and it is likely to be even more significant when peace is secured. During the transition period while the trucking industry develops adequate capacity, WFP is considering the use of a dedicated trucking fleet for the first few years of peace in Sudan.

Barge operation

Barge deliveries increased from 795 tonnes in 2002 to 6 167 tonnes in 2003. However, costs have increased from 20–40 percent depending on season and demand because of limited capacity availability. WFP hopes to increase deliveries by barge in 2004 to benefit from cost savings using this cheaper mode of transport. Delivery to locations on the Juba corridor costs on average about US\$162 per tonne and an average of US\$150 per tonne on the Sobat corridor. WFP in coordination with other UN agencies plans to organize a dedicated UN barge transport fleet for the transition period after peace agreement is signed.

Rail transport

The use of rail transport by all freight forwarders in Sudan continues to decline mainly because of maintenance problems with the locomotives and rolling stock. Rail transport (as block trains) has its benefits, especially for deliveries to the west during the rainy season. WFP moved nearly 4 600 tonnes of food between Port Sudan and Nyala in West Sudan. Rail transport will continue to be used wherever it is advantageous.

6.5 Household food security prospects by region

The food economies of the different regions: the north, west, east-central and south vary according to the agro-ecological, socio-economic, and climatic factors. The north with its low population density and mostly nomadic population is only significant as a wheat producer during the winter season in the Nile valley. West Sudan is characterized by a dominant smallholder food production combined with livestock rearing and an increasing production of cash crops like sesame, groundnuts, karkadet and watermelons. By far the largest portion of agricultural production occurs on the large irrigation schemes and mechanized farms in east-central Sudan. The food security of the rural population in the east depends upon their employment in the agricultural schemes and on large farms. Household food security in the south traditionally depends on a complex system of food production, livestock, seasonal migration, informal trade, fishing and the collection of wild fruits. For nearly twenty years, this system has been severely disrupted by the war.

Darfur (North, West and South)

The Darfur States have continued to experience severe hostilities with little or no reprieve since the beginning of 2003. The conflict initially started between the Sudan Liberation Movement (SLM) and the Government of Sudan (GOS). Attacks were mainly concentrated in Jebel Mara (South and West Darfur), Kebkabyia, Tina and Kutum (North Darfur). Within a few months, however, hostilities spread across the three Darfurs, reaching most provinces of West Darfur, Sharia, Kass and North Nyala provinces in South Darfur; and Kebkabyia, Kutum, Tina, Fata Borneo and El Fasher provinces in North Darfur. The tense and volatile security situation has caused the displacement of hundreds of thousands of people and is seriously affecting household access to food.

All the three Darfur states benefited from good and well distributed rains this year, which have resulted in higher yields and improved pasture and livestock conditions. Insecurity did not affect much of the planting season except in parts of West and North Darfur, but it did affect agriculture activities at weeding stage and even more so during the November harvest period. Standing crops have reportedly been burnt by militias or trampled by their animals. Displaced villagers have reported losses of between 50–100 percent of their animal herds. Only part of an otherwise good crop has been harvested and reduction of the flow of cereals and livestock to markets has resulted in increased cereal prices and a decrease in livestock prices, particularly in conflict-affected, predominantly pastoral areas.

The full extent of the ongoing conflict on people's access to food in 2004, as well as the number of people affected, is difficult to assess at this stage. The mission has tentatively estimated that over one million people – or almost one fifth of the population – in the three Darfur states is severely affected by this conflict. Frequent re-assessment will be required throughout 2004 to update the number of IDPs and their estimated food needs.

Red Sea State

Red Sea State (RSS) remains one of the most vulnerable areas in Sudan. It has a predominant pastoralist rural community, and a high percentage of population depends on urban employment. Only in the South Tokar Delta is there significant agricultural production. The pastoralist food economy has never recovered from the devastating livestock losses during the 1984 drought; consecutive droughts have worsened the situation. Reduced demand for manual labour in the port also has affected incomes negatively. Sinkat province, where most of the IDPs are located, is a chronic food-deficit area, and most of the land there is non-arable. Agriculture production is possible only in wadis and when rains are favourable. Livestock numbers have been steadily decreasing in the last years because of consistent lack of water and pasture.

This year, however, rain has been good and most people with land in wadis planted sorghum; for the first time in five years a small crop will be produced. The main beneficial effect of the rains has been on pastures, which are in good condition. Livestock (mainly goats and sheep) numbers have increased and the conditions of the animals are improving, although water shortages are expected in the coming months. Prices of cereals have declined while those for livestock have risen, improving the terms of trade of population for the first time in many years. These factors are also expected to benefit some of the IDPs currently being assisted, who should be able to buy more of their food from the market than in previous years. However, the best way to provide assistance may be through emphasis on rehabilitation projects and on the creation of a safety-net system, given that food insecurity in the Red Sea State is chronic rather than transient.

Kassala State

The cropping system in Kassala State is a predominately smallholder traditional farming system where staple food sorghum is cultivated along with limited cash crops. Traditional farming is supported by the "Gash-Delta" and supplemented by rainfalls during July and August, along with New-Halfa irrigation scheme where some 65 000 *feddans* (about 26 300 ha) are currently cultivated under sorghum. The State hosts a considerable number of IDPs and refugees from Eritrea. Kassala State benefited from a good rainy season in 2003 after three consecutive years of drought. The State was seriously affected by the floods in July, but the effect of these floods on cereal production has been limited. The overall food security of vulnerable populations in 2004 is expected to improve as a result of increased livestock prices and reduced cereal prices. However, IDPs will continue to require food assistance especially during the lean period, but at a lower level than in 2003.

White Nile

Agriculture, both mechanized and traditional, is the major source of food and income in White Nile. The State is hosting about 153 000 drought and war affected IDPs in the two camps of Goz-Es-Salam and Laya in Kosti Province. Another 20 700 settled IDPs, mostly from Nuba Mountains and North Kordofan, are in squatter areas in Kosti province. Agricultural labour constitutes the main livelihood of the IDPs populations in camps and squatter areas. Food production in the State is expected to increase because of good rainfall, larger areas cultivated and the availability of seeds and credit for the mechanized sector. Grains supplies in the local market are good and prices have declined. The income of IDPs is expected to improve this year; they should be able to buy more of their food from the market. If the peace agreement is finalized, IDPs are expected to start returning to their places of origin, but this process will be gradual.

Kordofan (North, West and South)

The three Kordofan States have experienced less insecurity and more rains in 2003 than in previous years. The general agricultural production and food security situation are likely to show improvements over the past few years. Pests (notably grasshoppers and watermelon bug) and crop diseases have, however, hit some areas hard and sharply reduced yields. There will still be populations in the Kordofans who are prone to food deficits in 2004. They are the people who have limited access to land and/or poor capacity to cope with pests, weeds and dry spells

Blue Nile

Blue Nile has experienced more than a decade of heavy fighting prior to the 2002 cease-fire between the GOS and SPLM. Consequently, a significant segment of the population is internally displaced. The poorest and most

recently displaced are vulnerable to food insecurity despite the good agricultural season. They have limited access to land and agricultural inputs, and limited purchasing power. One of the defining characteristics of the most vulnerable groups is that they do not own any livestock. It is recommended to use food aid in the context of improving agricultural and agro-pastoral production.

Greater Upper Nile

The food economy in the greater Upper Nile region is based primarily on agro-pastoralism and fishing, which account for more than 90 per cent of livelihoods. Sorghum, fish and livestock products are the main food commodities followed by sesame, groundnuts, maize and wild fruits. Despite the overall good security situation, localized militia attacks, sporadic dry spells, pest attacks and flooding in the later half of the 2003 cropping season affected agricultural production. It is estimated that the floods destroyed about 25 percent of the short-cycle sorghum. Livestock conditions improved and cattle rustling significantly declined in 2003. Given the vast livestock population in Upper Nile, livestock products are expected to contribute substantially to annual food needs. Livestock diseases are a major cause of livestock deaths; therefore, interventions that target livestock health should be increased to sustain the sector.

Jonglei

Jonglei region is characterized by diverse livelihoods consisting mainly of agriculturalists, agro-pastoralists and pastoralists. Although crop production is the primary livelihood activity, livestock also plays an important role. The main sources of food include sorghum, cassava, fish and livestock products. The food security situation is expected to improve after above-normal rainfall and the prevailing peace. While the dry spells experienced did affect short-cycle sorghum, a good harvest is expected from the long-cycle sorghum crop. Cassava, wild fruits and game meat are also expected to contribute significantly to the food basket. Fish is also available throughout the year and contributes significantly to annual food needs and incomes. However, lack of fishing equipment is a constraint to increasing household fish supply. The cessation of hostilities among neighbouring communities has remarkably improved trade activities, which are expected to contribute significantly to the food basket. With the exception of cattle raids (among the Murle, Nuer and Mundari), the security situation has remained calm. However, food security may be undermined by the influx of returnees. There is a large concentration of returnees and IDPs in the region who are not yet integrated with the residents and they may need food-aid intervention.

Bahr El Ghazal

The main livelihood systems for 95 percent of the population are crops and livestock production. The rest depend on income generated mostly from fishing and trade. For decades, the region has experienced food shortages caused by insecurity and constrained market mechanisms. However, the recent developments in the peace process are having a positive effect on food security. The area cultivated increased in 2003 because of the planting of farmlands in the highlands that had been abandoned in the past because of distance and insecurity. But floods, dry spells and pest attacks have affected 20–55 percent of short-cycle sorghum.

Heavy rains over a short time period in 2003 caused flooding which also negatively affected crops. Still, the over-flooded rivers, in particular in low-lying areas have enhanced access to fish and improved pasture conditions for cattle.

Peace has also encouraged some IDPs to return, but they lack assets and were only able to plant on a limited scale. IDPs risk becoming a burden on the host community and increasing the overall vulnerability of the region.

Equatoria Region

The food security situation will improve in the 2004 season as a result of above-normal rainfall and relative peace in the region. These factors not only enabled farmers to increase cultivation and concentrate on agricultural activities but also improved conditions for livestock production. Despite these positive developments, eastern Equatoria remains one of the most vulnerable sections in southern Sudan in terms of food insecurity. The reasons include the activities of the Lord's Resistance Army (LRA), which have restricted agricultural production and marketing in some parts of Torit. Some of the fertile lowlands in Torit and Budi are also heavily

mined and cannot be accessed for agriculture and livestock production. Ethnic conflicts arising from cattle rustling and competition for grazing land and water resources have restricted human and livestock movements and trade.

The food security situation remains stable in Western Equatoria. Rainfall is always adequate and the area supports a highly diversified farming system. In the past a few NGOs encouraged the farmers to produce grain surpluses, which they sold to the NGOs at highly inflated prices, especially for the relief market. But this has obviously declined after the NGOs pulled out, which also caused the collapse of the inadequately trained farmers' associations. Farmers have returned to their traditional production systems, although some surpluses are still available from the wide range of crops cultivated in the area. Households will be able to meet their own food requirements and generate income through sale of crops and honey.

This report has been prepared by Messrs. S. Ahmed, H. El-Sheik, S. Goodbody, H. Kambal, W.I. Robinson and Messrs. S.A. Husain and R. Marsili 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.

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