# S P E C I A L  R E P O R T

## FAO/WFP CROP AND FOOD SECURITY ASSESSMENT MISSION TO SOUTHERN SUDAN

**17 February 2010**

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME**

**WORLD FOOD PROGRAMME, ROME**

*This report has been prepared by Swithun Goodbody, Benjamin Badjeck, Elijah Mukhala and Arif Husain, Chiara Brunelli, Charisse Tillman and Anders Petersson, under the responsibility of the FAO and WFP Secretariats with information from official and other sources. Since conditions may change rapidly, please contact the undersigned for further information if required.*

*Henri Josserand*
*Principal Officer, GIEWS*
*Trade and Markets Division, FAO*
*Fax: 0039-06-5705-4495*
*E-mail: giews1@fao.org*

*Amer Daudi*
*Regional Director and Country Representative*
*WFP, Sudan*
*Fax: 00249 83 248003*
*E-mail: Amer.Daudi@WFP.org*

*Please note that this Special Report is also available on the Internet as part of the FAO World Wide Web* www.fao.org *at the following URL address:* http://www.fao.org/giews/ and http://www.wfp.org/food-security/reports/CFSAM

*The Special Alerts/Reports can also be received automatically by E-mail as soon as they are published, by subscribing to the GIEWS/Alerts report ListServ. To do so, please send an E-mail to the FAO-Mail-Server at the following address:* ***mailserv@mailserv.fao.org****, leaving the subject blank, with the following message:*

***subscribe GIEWSAlertsWorld-L***

*To be deleted from the list, send the message:*

***unsubscribe GIEWSAlertsWorld-L***

*Please note that it is now possible to subscribe to regional lists to only receive Special Reports/Alerts by region: Africa, Asia, Europe or Latin America (GIEWSAlertsAfrica-L, GIEWSAlertsAsia-L, GIEWSAlertsEurope-L and GIEWSAlertsLA-L). These lists can be subscribed to in the same way as the worldwide list.*

# TABLE OF CONTENTS

**Page**

**Mission Highlights**

- A late and sporadic start to the rainfall season led to a significant amount of re-planting, the virtual loss of the first crop in areas of bimodal rainfall, and poor yields in many other parts of the country.
- Civil insecurity increased in 2009, with unprecedented levels of cattle raiding, escalating tribal conflict, and occasional incursions by the Lord's Resistance Army, all of which have hampered agricultural production.
- Net cereal production from the traditional sector this year is expected to be 660 000 tonnes, approximately 38 percent below last year's adjusted figure of 1.07 million tonnes, and 10 percent below the previous five years average (adjusted) of 733 000 tonnes.
- Cereal production from the rainfed mechanized sector is expected to be 148 000 tonnes, a drop of about 10 percent from last year's figure of 165 000 tonnes, and 20 percent below the average for the previous five years of 185 000 tonnes. Production from the mechanized sector is for Northern Sudan and therefore not counted towards South Sudan requirements.
- The annual cereal consumption requirements for South Sudan are estimated at approximately 885 000 tonnes against a net cereal production of 660 000 tonnes, resulting in a short fall of about 225 000 tonnes.
- The food assistance requirements are estimated at 155 000 tonnes to assist a monthly average of about 1.8 million beneficiaries. The number of beneficiaries is expected to rise gradually during the year, reaching over four million at the peak of the lean season. Assistance will be provided for severely and moderately food insecure residents, IDP, returnees and refugees.
- Heightened competition for scarce pasture is expected to lead to further conflict among pastoralists. Cattle in pastoralist areas this year started moving from high to low ground in search of pasture one to two months earlier than usual.
- 2009 has seen an unusually high level of cattle sales amongst pastoralist communities who normally regard their herds as social rather than commercial assets.
- The terms-of-trade of grain to livestock is heavily in favour of grain, indicating its relative shortage.
- The re-opening and improvement of rural trunk roads has continued over the last twelve months to obvious positive effect. The very poor condition of feeder roads now needs to be addressed.

## 1. OVERVIEW

An FAO/WFP Crop and Food Security Assessment Mission (CFSAM) visited Southern Sudan from 19 October to 14 November 2009 to estimate cereal production and assess the overall food-security situation. The Mission included representatives from the Government of Southern Sudan (GOSS), the Ministry of Agriculture and Forestry (MoAF), the Southern Sudan Relief and Rehabilitation Commission (SSRRC), FEWSNet, FAO and WFP.

The Mission held meetings with officials of various ministries including the Ministry of Agriculture and Forestry (MAF), the Ministry of Animal Resources and Fisheries (MARF), the Southern Sudan Relief and Rehabilitation Commission (SSRRC), the Southern Sudan Centre for Census, Statistics and Evaluation (SSCCSE), and UN and other international agencies including the World Bank, the Joint Donor Team and USAID. Location-specific information was obtained from relevant state and local authorities such as the SSRRC and the state Ministries of Agriculture (SMoA), and NGOs including Intermôn, Oxfam, Vétérinaires sans Frontières (VSF), Concern Worldwide, Amurt, and Action Contre la Faim (ACF). The Mission also benefited from the findings, released in September 2009, of a Mid-Season Rapid Crop Assessment (RCA) mission carried out between 10 and 21 August 2009 by representatives from GOSS, MoAF, SSRRC, SSCCSE, FEWSNet, FAO and WFP.

The present Mission, comprising five teams, visited all ten states of Southern Sudan. The improvement in civil security since the Comprehensive Peace Agreement (CPA) of 2005 (despite some deterioration this year compared with 2008) facilitated the movement of the teams around the country; there were, however, still some areas that were inaccessible due to tribal and other conflict.

The following counties were visited[1] (see Figure 1):

**Northern Bahr el Ghazal**: Aweil Centre, Aweil East, Aweil West
**Western Bahr el Ghazal**: Wau, Jur River, Raja
**Unity**: Leer, Koch, Guit, Rubkona, Mayendit, Mayom
**Warrap**: Gogrial West, Twic, Tonj South,
**Lakes**: Rumbek East, Cueibet, Yirol West, Wulu
**Upper Nile**: Malakal, Panykang, Renk
**Jonglei**: Bor, Pochalla, Pibor, Boma
**Central Equatoria**: Kajo-Keji, Yei, Morobo, Lainya, Terekeka
**Western Equatoria**: Yambio, Nzara, Ibba, Maridi
**Eastern Equatoria**: Torit, Ikotos, Magwi

**Figure 1**


Information obtained from State Ministries of Agriculture, farmers, traders, herders, NGOs and international agencies was cross-checked against field observations on individual farms and while passing through agricultural areas. The Pictorial Evaluation Tool for Crop Harvest Assessment in South Sudan and field measurements were used to assess crop yields. The Mission carried out market surveys in the main centres and also had access to WFP's ongoing database of market prices throughout Southern Sudan. The Mission received invaluable support (both technical and logistical) from the FAO Emergency Unit in Juba, the Sudan Institutional Capacity Programme Food Security for Action (SIFSIA) (Juba and Khartoum), and WFP's Vulnerability Analysis and Mapping (VAM) Unit. Rainfall estimates provided by EU/JRC for 2009 were compared with local rain-gauge data and accounts of rainfall provided by farmers and other informants. Further rainfall and NDVI data for Southern Sudan were provided by SIFSIA.

In accordance with the approach adopted in previous years, the Mission's calculation of cereal production was based on:

- Estimates of the numbers of farm households in each county.
- Standard estimates of the average area (hectares) per farm household under cereals for each county, adjusted according to Mission observations made during field visits.

[1] Southern Sudan's first census was carried out in April 2008. Some counties were re-named and others were sub-divided, with the result that there is incomplete correspondence between the counties named in the present report and those named in previous CFSAM reports (see Annex 1 for further information).

- Estimates of average cereal yield (tonnes per hectare) for each county.

The product of these three factors gives a cereal production figure for each county. These county figures are then added to provide cereal production figures for each of the ten states and for Southern Sudan as a whole.

A late and sporadic start to the rains was the chief constraint to crop production this year in Southern Sudan; this led to a significant amount of re-planting, the virtual loss of the first crop in areas of bimodal rainfall, and poor yields in many other parts of the country. Agricultural production was further hampered by an increase in civil insecurity. 2009 was characterised by unprecedented levels of cattle raiding, escalating tribal conflict, and occasional incursions by the Lord's Resistance Army. At 660 000 tonnes, net cereal production from the traditional sector this year is expected to be approximately 38 percent below last year's adjusted figure of 1.07 million tonnes, and 10 percent below the adjusted average of the previous five years of 733 000 tonnes. Cereal production from the rainfed mechanized sector is expected to be 148 000 tonnes, a drop of about 10 percent from last year's figure, and 20 percent below the average for the previous five years of 185 000 tonnes. The production of 148 000 tonnes from the mechanized sector is destined for Northern Sudan and therefore not counted towards the South Sudan requirements. Livestock condition is generally good at present, but, following a poor rainy season, pasture is expected to deteriorate rapidly in the coming months.

The annual cereal consumption requirements for South Sudan are estimated at approximately 885 000 tonnes against a net cereal production of 660 000 tonnes, resulting in a short fall of about 225 000 tonnes.

Overall the food security situation in South Sudan is likely to sharply worsen in 2010. The four main contributors are: 1) drought or below average and erratic rainfall, probably the worst in the last five years which is also a regional concern; 2) increased incidences of insecurity including tribal fighting exacerbated by early livestock migration due to shortage of water and pasture; 3) unseasonably high staple food prices; and 4) the uncertainty about the up coming elections and its perceived aftermath.

The food assistance requirements for 2010 are estimated at 155 000 tonnes to meet the food needs of an average monthly caseload of about 1.8 million beneficiaries. These include severely and moderately food insecure residents, IDP, returnees and refugees. The beneficiary caseload and monthly food requirements are expected to gradually increase from the start of the year and peak in May and June, reaching over four million vulnerable people, before starting to decline in July. The steep spike anticipated during May and June is commensurate with the height of the lean season where providing food assistance to moderately food insecure households will also be critical. The beneficiary caseload is expected to fall below half a million from September onwards depending on the performance of 2010 agricultural season.

## 2. BACKGROUND TO SOUTHERN SUDAN

### 2.1 General

Southern Sudan shares the Sudanese pound with the rest of the country since its adoption as the national currency in 2007. This common currency and the fact that Southern Sudan's budget is almost entirely dependent on the share of oil revenue it receives from the central Government (and therefore on the latter's own budget conditions despite clear provisions to the contrary) imply that Southern Sudan's macroeconomic situation should be viewed through that of the country as a whole.

#### 2.1.1 Specific economic aggregates

Foreign Exchange Reserves

Oil has been the main driver of Sudan's economic growth in recent years, propping GDP annual growth rate to 6.6 percent in 2008, when it accounted for 60 percent of central Government revenues and 95 percent of exports. It currently accounts for about 98 percent of Southern Sudan revenues [2].

But the sharp decline in oil prices in towards the end of 2008 placed enormous pressure on the country's finances. Net foreign exchange reserves dropped from USD 2.0 billion in August 2008 to about

[2] IMF Country Report No. 09/218, Sudan Staff-Monitored Program for 2009 – 10 (July 2009).

USD 1 billion (1.2 months of import coverage) by year- end. For most of 2009, Sudan's foreign exchange reserves have hovered around USD 600–USD 700 million worth only one month of export coverage. [3]

The strain on public finances has also led to accumulation of arrears (including delays in oil revenue transfers to sub-national governments, notably the GoSS). This has highlighted the urgent need to review the central Government's fiscal and budgetary policy in order to rebuild foreign exchange reserves, safeguard critical social programs, honour peace-related commitments such as the implementation of the CPA (Comprehensive Peace Agreement signed in 2005 with the GoSS), and reduce the country's dependence on oil revenues. To that end the central Government (The Government of National Unity–GoNU) in June 2009 engaged in an 18-month IMF staff-monitored programme slated to end in December 2010[4].

This programme will help increase non-oil Government revenue by:

- Streamlining the tax system: reduction in VAT exemptions, lowering personal income tax threshold; increasing value added tax in some sectors such as the telecommunications (15 to 20 percent).
- Review of the subsidy scheme.
- Better targeting of budget outlays.

But the recent recovery in oil prices and the prospects of obtaining about USD 90/barrel in 2010 according to forecast, may provide some leeway to the GoNU and to the GoSS as both are being pressured to engage in peace-related expenditures in the run-up to the 2010 general elections and the referendum on possible Southern Sudan independence in 2011.

Still, the reconstitution of foreign exchange reserves will continue to be hampered by the dwindling inflow of FDI on account of the credit crunch on the international financial markets and concerns about political risks associated with the planned elections and referendum.

Exchange rates

The SDG: USD exchange rate averaged SDG 2.10 =USD1 in 2008 and is forecast at SDG 2.34 = USD 1 in 2009, and should not exceed SDG 2,50 = USD 1 in 2010, according to analysts [5].

The slight depreciation that may occur between 2009 and 2010 should not by itself worry consumers of imported foods, as world food prices have substantially declined since their peak in 2008. It is even argued that the Government's slow reaction to falling oil prices in late 2008 and the consequent dwindling of foreign exchange reserves prevented a rapid depreciation of the SDG exchange rate against the dollar, putting further pressure on the diminishing foreign exchange reserves.

Since March 2009, the central bank has been managing a controlled float of the exchange rate, notably through the sale and purchase of currencies. Other restrictions have also been put in place, such as a cap of EUR 3 000 (USD 4 380) or equivalent on the amounts of foreign exchange allowed for travel abroad. These stop-gap measures designed to prop up the SDG are expected to be rescinded in 2010 [6].

Inflation

Overall inflation averaged 14.3 percent in 2008 and is forecast at 12.3 percent and 10.5 percent for 2009 and 2010 respectively. The downward trend is in large part attributable to the decline in international commodity prices and to the weakening USD. But as commodity prices recover world markets, inflation is likely to flare up anew [7].

In Southern Sudan, surveys for the consumer price index (CPI) are essentially conducted in Juba by the Southern Sudan Centre for Census, Statistics and Evaluation (SSCCSE). They comprise items ranging from food to housing, fuel and restaurant meals. The resulting 'all item' index decreased by -0.05 percent in September 2009, compared with a 5.86 percent increase in August, 2009. The overall increase for the year ended September 2009 was 1.5 percent. The annual increase for the food category was even lower: 0.44 percent.

[3] Sudan EIU Country Report, October 2009.
[4] IMF, Ibid.
[5] EIU, Ibid.
[6] IMF, Ibid.
[7] EIU, Ibid.

But these downward trends in CPIs should be considered with caution as they do not cover the rural sector, or small, isolated towns, notably in Southern Sudan where markets remain generally segmented or otherwise dysfunctional. As will be shown later on the exceptionally low agricultural production expected this season consequent to the dry spell that thwarted crop development particularly in the period June-August 2009, has already triggered a price hike for cereals and livestock in the villages and rural towns the Mission visited. This upward pressure is expected to last till at least mid-2010, when the harvests from the next cropping season become available, barring unfavourable rain conditions or other systemic shock.

### 2.1.2 Agriculture and the GOSS budget for 2009

As stated above, oil accounts for 98 percent of GoSS revenues. But despite the burgeoning construction and services sectors as well as some oil-related activities noted in counties of Unity State, the vast majority of households in Southern Sudan derive their livelihoods from agriculture and natural resources supplemented by food aid for the most vulnerable groups. Indeed, with its 640 000 sq. km of generally fertile land, a wide range of agro-ecological systems extending from the so-called Greenbelt in the south-west to an open savannah in the north, a river network comprising a long stretch of the Nile and its many tributaries well stocked with fish, Southern Sudan holds the potential for a robust, vibrant agricultural sector that could generate gainful employment for millions of its citizens if the requisite investments are made. Such a prospect positions agricultural sector development as a most viable option for the GoSS as it strives to reduce its overdependence on oil through economic diversification.

However, budget allocations to the sector have not so far reflected its potential, and the overall objective assigned to it by the Government, namely 'to ensure food security and improve livelihoods and incomes for all the people'. Thus, out of an approved total budget of **SDG 4 806 346 089 in 2009**[8], only **SDG 37 000 000** was earmarked for the Ministry of Agriculture and Forestry, and **SDG 3 200 000** for the Ministry of Animal Resources and Fisheries. **The combined allocations for these two ministries amount to only about 1.8 percent of the budget.** It is noted that a large share of ministries budgets (over 60 percent) is devoted to salaries and operating costs, leaving 40 percent for capital expenditures. But this remains insignificant given the small amounts allocated. As the Mission observed during its field visits, the acute dearth of resources translates into understaffed and poorly equipped agricultural services at the state and county levels, which severely constraints extension outreach and any other assistance that the public sector could provide to rural communities.

The lack a comprehensive, needs-based and coherent plan or programme dulls the attention the agricultural sector should be receiving in terms of public and private investments. Currently, donors, NGOs, and the Government engage in rather small, stand- alone projects whose impact is limited in scope, efficiency and time, as they are not coordinated to converge towards specific national objectives, building and using synergies and complementarities in the process.

Programme coordination should start with the other ministries/commissions responsible for the natural resources sector, namely the Ministry of Cooperatives and Rural development, the Ministry of Wildlife Conservation and Tourism, and the Southern Sudan Land Commission.

## 2.2 Agriculture

Southern Sudan experiences both unimodal and weakly bimodal rainfall regimes, the bimodal areas covering much of Greater Equatoria (Western, Central and Eastern Equatoria), and the unimodal areas the rest of Southern Sudan. This results in a range of growing seasons from 280-300 days in the southern parts of Southern Sudan to 130-150 days per annum in the northern parts. Agricultural performance consequently varies considerably from place to place and from year to year, ranging from the possibility of two harvests per annum in Greater Equatoria between Tambura and Kejo-Keji, to one harvest in the unimodal areas further north. However, in years of poor rainfall it is not uncommon for crops to fail in the marginal areas of Eastern Equatoria and Northern Bahr el Ghazal.

Agricultural production is, for the most part, based on small, hand-cultivated units, often farmed by women-headed households. Following the loss of large numbers of draught animals during the civil war, FAO and NGO-based extension agents have made, and continue to make, efforts to introduce or re-introduce animal traction on a small-scale in Central Equatoria, Western Equatoria, Lakes, and Bahr el Ghazal. However, despite the interest professed by farmers, the 2008 CFSAM concluded that the policy

[8] GoSS, Approved Budget for 2009.

of providing ploughs and oxen free of charge was flawed because farmers tended to sell their oxen for slaughter after two or three years of work. Only in the Upper Nile districts of Renk, Melut and Wadakona, and to a limited extent in Malakal and Bentiu (Unity State), is tractor-farming conducted at a level that could be compared with the commercial farms of South Kordofan and Blue Nile States. However, GOSS recently purchased more than 90 tractors from India and distributed at least seven to each of the ten states with the objective of encouraging the mechanization of land preparation and other field operations. The tractors are, in principle, availed for hire by farmers, farmer groups and cooperatives, usually at a cost of about SDG 50/feddan for land preparation.

Smallholder farming systems in Southern Sudan encompass a wide range of sorghum landraces, with minor crops of maize (often grown close to homesteads for green consumption), bulrush millet, finger millet and upland rice according to location. Cassava is widely grown, especially in the centre and south but also in the north-west, depending on access to planting material. In the north of Southern Sudan especially, but also elsewhere, in particular in areas of sandy soil and in years when the rains arrive late, groundnuts make an important contribution to household diet, and, as a cash crop, can contribute to household income. Okra, cowpea, greengrams, bambara nuts, sesame, pumpkin and tobacco are also widely grown. In the south and central areas, and in parts of Western Bahr el Ghazal, cassava is the most important contributor to the household food economy, providing at least half of the carbohydrate ration; in parts of Central and Western Equatoria, sweet potato, yam, coffee, mango and papaya are also common.

Taking into account regional variations in crop production and access to wild foods and animal products, WFP food economy estimates of the late 1980s, adjusted upwards by the CFSAM in 2003, suggested that war and immediate-post-war annual cereal use ranged from 60 to 120 kg/caput/annum according to location. In 2008, the CFSAM adjusted this consumption estimate upwards to a range from 80 to 120 kg/caput/annum to take into account an increase in area under cultivation, higher cereal yields, and the changing dietary norms of the population, especially in urban centres, resulting from an increase in the number of salaried employees and hence in the amount of cash in circulation. The changes in dietary norms have been assumed this year to constitute the main determining factor for consumption, despite the overall reduction in national cereal production compared with last year. Hence similar consumption figures have been used to those used last year, with only some minor downward adjustments in some areas.

The ravaged and virtually unusable road network that resulted from the many years of civil war prior to CPA has, since then, received the attention of GOSS. The benefits resulting from de-mining, clearance and grading of many of the major trunk roads are very evident; consumer goods are now found in abundance in many urban centres where they would not have been found one or two years ago. However, feeder roads are still mostly unusable, and this continues to be an obstacle to farmers' access to inputs, as well as a serious disincentive to surplus production.

## 3. CEREAL PRODUCTION, 2009

Because of Southern Sudan's continuing infrastructural shortcomings - in particular, poor communications and a poorly trained and poorly equipped extension service - cereal production still has to be assessed using the proxy indicators of estimated numbers of farming households per county and estimated average area of cereal production per farming household. These two figures are then combined with estimates of average cereal yield per county, and the product of these three factors gives an estimate of production per county. The possible weakness of some of the data on which crop production estimates are based - such as population figures (see Annex 1) and assumptions concerning the average area of land under cereals per household for a whole county - means that the final production figures should not be regarded as necessarily exact but rather as best estimates under the prevailing circumstances.

### 3.1 Area estimates

Numbers of farming households per county have been derived primarily from the census data of 2008 (see Annex 1), which include numbers of households (both farming and non-farming) per county. The April 2008 figures have been adjusted for mid-2009 on the assumption of a population growth rate of 2.052 percent per annum. Numbers of returnees (IDPs and refugees) per state have been provided by the International Organization for Migration (IOM) and the Southern Sudan Relief and Rehabilitation Commission. The figures used for the proportion of households that are farming households in each county have been developed over the past several years by FAO, WFP and others on the basis of extensive observation and interviews. Likewise, the figures used for the average area under cereal

cultivation per farming household have been developed over several years and are modified each year on the basis of the information provided by farmers and others involved in agriculture locally. Factors determining the area under cereal this year in the traditional sector included the late and sporadic start to the rains, which acted as a disincentive to extensive cultivation and, in many cases, rendered the land too hard for easy preparation; shortages of seed (especially in areas where re-planting was required), appropriate cultivation tools, draft power and labour; an almost universal shortage of mechanization; and, in many areas, civil insecurity, which displaced some farmers and dissuaded others from planting far from their homes. Estimates of the total area under cereals in each county in 2009, and the figures from which they are derived, are given in Table 1. The cereal area in Southern Sudan this year (852 000 ha) was similar to that of last year (853 000 ha) [9]; Upper Nile Region saw a reduction from 237 000 to 218 000 ha, while both Bahr el Ghazal and Equatoria Regions both saw slight increases (see Table 5).

**Table 1: Southern Sudan - Estimated Settled Population, Farming Households and Cereal Area in 2009**

| State/County | Population April 2008[1/] | Households April 2008[1/] | Population mid-2009 | Households mid-2009 | % farming households | No. farming households | Average ha/hh[2/] | Total area ha |
|---|---|---|---|---|---|---|---|---|
| **Upper Nile** | **964 353** | | **993 367** | **146 836** | | **98 378** | | **77 460** |
| Returnees | | | 5 927 | 988 | 60 | 593 | 0.50 | 296 |
| Renk | 137 751 | 22 491 | 141 049 | 23 029 | 38 | 8 751 | 2.00 | 17 502 |
| Manyo | 38 010 | 6 389 | 38 920 | 6 542 | 90 | 5 888 | 0.84 | 4 946 |
| Fashoda | 36 518 | 5 897 | 37 392 | 6 038 | 90 | 5 434 | 0.84 | 4 565 |
| Melut | 49 242 | 7 108 | 50 421 | 7 278 | 38 | 2 766 | 2.00 | 5 531 |
| Maban | 45 238 | 9 829 | 46 321 | 10 064 | 80 | 8 051 | 0.63 | 5 072 |
| Maiwut | 79 462 | 10 477 | 81 364 | 10 728 | 80 | 8 582 | 0.63 | 5 407 |
| Luakpiny/Nasir | 210 002 | 29 030 | 215 029 | 29 725 | 80 | 23 780 | 0.63 | 14 981 |
| Longochuk | 63 166 | 8 278 | 64 678 | 8 476 | 80 | 6 781 | 0.63 | 4 272 |
| Ulang | 85 044 | 11 521 | 87 080 | 11 797 | 80 | 9 437 | 0.63 | 5 946 |
| Baliet | 48 010 | 7 258 | 49 159 | 7 432 | 80 | 5 945 | 0.63 | 3 746 |
| Malakal | 126 483 | 16 892 | 129 511 | 17 296 | 50 | 8 648 | 0.42 | 3 632 |
| Panykang | 45 427 | 7 268 | 46 515 | 7 442 | 50 | 3 721 | 0.42 | 1 563 |
| **Jonglei** | **1 358 602** | **192 424** | **1 414 954** | **201 002** | | **165 017** | | **103 558** |
| Returnees | | | 23 827 | 3 971 | 78 | 3 098 | 0.50 | 1 549 |
| Old Pangak | 110 130 | 14 572 | 112 767 | 14 921 | 90 | 13 429 | 0.63 | 8 460 |
| Khorflus | 99 068 | 11 963 | 101 440 | 12 249 | 90 | 11 024 | 0.63 | 6 945 |
| Ayod | 139 282 | 16 886 | 142 616 | 17 290 | 90 | 15 561 | 0.63 | 9 804 |
| Duk | 65 588 | 10 242 | 67 158 | 10 487 | 90 | 9 438 | 0.63 | 5 946 |
| Wuror | 178 519 | 26 862 | 182 793 | 27 505 | 90 | 24 755 | 0.63 | 15 595 |
| Nyirol | 108 674 | 15 270 | 111 276 | 15 636 | 90 | 14 072 | 0.63 | 8 865 |
| Akobo | 136 210 | 17 713 | 139 471 | 18 137 | 80 | 14 510 | 0.63 | 9 141 |
| Pochala | 66 201 | 10 445 | 67 786 | 10 695 | 80 | 8 556 | 0.63 | 5 390 |
| Pibor | 148 475 | 22 741 | 152 029 | 23 285 | 50 | 11 643 | 0.63 | 7 335 |
| Twic East | 85 349 | 14 376 | 87 392 | 14 720 | 90 | 13 248 | 0.63 | 8 346 |
| Bor South | 221 106 | 31 354 | 226 399 | 32 105 | 80 | 25 684 | 0.63 | 16 181 |
| **Unity** | **585 801** | | **633 157** | **78 324** | | **60 041** | | **37 084** |
| Returnees | | | 33 332 | 5 555 | 65 | 3 611 | 0.60 | 2 167 |
| Pariang | 82 443 | 10 461 | 84 417 | 10 711 | 70 | 7 498 | 0.70 | 5 249 |
| Abiemnhom | 17 012 | 1 806 | 17 419 | 1 849 | 80 | 1 479 | 0.46 | 681 |
| Mayom | 120 715 | 15 216 | 123 605 | 15 580 | 80 | 12 464 | 0.46 | 5 734 |
| Rubkona | 100 236 | 10 069 | 102 636 | 10 310 | 50 | 5 155 | 0.46 | 2 371 |
| Guit | 33 004 | 3 232 | 33 794 | 3 309 | 80 | 2 647 | 0.70 | 1 853 |
| Koch | 74 863 | 7 955 | 76 655 | 8 145 | 90 | 7 331 | 0.70 | 5 132 |

[9] Adjusted in accordance with the population figures of the 2008 Census.

| State/County | Population April 2008[1/] | Households April 2008[1/] | Population mid-2009 | Households mid-2009 | % farming households | No. farming households | Average ha/hh[2/] | Total area ha |
|---|---|---|---|---|---|---|---|---|
| Leer | 53 022 | 7 044 | 54 291 | 7 213 | 80 | 5 770 | 0.70 | 4 039 |
| Mayendit | 53 783 | 6 608 | 55 071 | 6 766 | 90 | 6 090 | 0.70 | 4 263 |
| Paynijar | 50 723 | 8 676 | 51 937 | 8 884 | 90 | 7 995 | 0.70 | 5 597 |
| **Warrap** | **972 928** | | **1 023 775** | **178 155** | | **157 730** | | **118 901** |
| Returnees | | | 27 555 | 4 593 | 83 | 3 812 | 0.45 | 1 715 |
| *Abyei* | 52 883 | 7 896 | 54 149 | 8 085 | 80 | 6 468 | 0.65 | 4 204 |
| Twic | 204 905 | 34 124 | 209 810 | 34 941 | 95 | 33 194 | 0.65 | 21 576 |
| Gogrial West | 243 921 | 44 987 | 249 760 | 46 064 | 80 | 36 851 | 0.80 | 29 481 |
| Gogrial East | 103 283 | 18 518 | 105 756 | 18 961 | 80 | 15 169 | 0.80 | 12 135 |
| Tonj North | 165 222 | 29 688 | 169 177 | 30 399 | 95 | 28 879 | 0.80 | 23 103 |
| Tonj East | 116 122 | 19 752 | 118 902 | 20 225 | 95 | 19 214 | 0.80 | 15 371 |
| Tonj South | 86 592 | 14 540 | 88 665 | 14 888 | 95 | 14 144 | 0.80 | 11 315 |
| **N Bahr el Ghazal** | **720 898** | | **805 687** | **148 016** | | **128 248** | | **71 239** |
| Returnees | | | 67 531 | 11 255 | 58 | 6 528 | 0.50 | 3 264 |
| Awiel North | 129 127 | 24 892 | 132 218 | 25 488 | 95 | 24 214 | 0.55 | 13 317 |
| Awiel East | 309 921 | 56 877 | 317 341 | 58 239 | 95 | 55 327 | 0.55 | 30 430 |
| Awiel South | 73 806 | 14 052 | 75 573 | 14 388 | 80 | 11 511 | 0.70 | 8 058 |
| Awiel West | 166 217 | 28 661 | 170 196 | 29 347 | 95 | 27 880 | 0.55 | 15 334 |
| Awiel Centre | 41 827 | 9 081 | 42 828 | 9 298 | 30 | 2 790 | 0.30 | 837 |
| **W Bahr el Ghazal** | **338 431** | | **351 686** | **61 808** | | **48 723** | | **39 365** |
| Returnees | 5 000 | 833 | 10 273 | 1 712 | 68 | 1 164 | 0.50 | 582 |
| Raja | 54 340 | 10 199 | 55 641 | 10 443 | 75 | 7 832 | 0.70 | 5 483 |
| Jur River | 127 771 | 20 770 | 130 830 | 21 267 | 60 | 12 760 | 0.75 | 9 570 |
| Wau | 151 320 | 27 722 | 154 943 | 28 386 | 95 | 26 966 | 0.88 | 23 730 |
| **Lakes** | **695 730** | | **767 886** | **103 783** | | **90 066** | | **68 900** |
| Returnees | | | 55 500 | 9 250 | 82 | 7 585 | 0.45 | 3 413 |
| Cuebit | 117 755 | 17 283 | 120 574 | 17 697 | 95 | 16 812 | 0.70 | 11 768 |
| Rumbek North | 43 410 | 4 953 | 44 449 | 5 072 | 80 | 4 057 | 0.95 | 3854 |
| Rumbek Centre | 153 550 | 16 817 | 157 226 | 17 220 | 80 | 13 776 | 0.95 | 13 087 |
| Wulu | 40 550 | 6 517 | 41 521 | 6 673 | 95 | 6 339 | 0.70 | 4 438 |
| Rumbek East | 122 832 | 15 514 | 125 773 | 15 885 | 80 | 12 708 | 0.90 | 11 437 |
| Yirol West | 103 190 | 14 786 | 105 660 | 15 140 | 90 | 13 626 | 0.75 | 10 219 |
| Yirol East | 67 402 | 8 972 | 69 016 | 9 187 | 90 | 8 268 | 0.75 | 6 201 |
| Awerial | 47 041 | 7 481 | 48 167 | 7 660 | 90 | 6 894 | 0.65 | 4 481 |
| **Western Equatoria** | **619 029** | | **645 857** | **121 122** | | **106 427** | | **116 241** |
| Returnees | | | 12 008 | 2 001 | 50 | 1 001 | 0.45 | 450 |
| Tambura | 55 365 | 13 316 | 56 690 | 13 635 | 90 | 12 271 | 1.00 | 12 271 |
| Nagero | 10 077 | 2 144 | 10 318 | 2 195 | 90 | 1 976 | 1.00 | 1 976 |
| Nzara | 65 712 | 16 319 | 67 285 | 16 710 | 90 | 15 039 | 1.10 | 16 543 |
| Ezo | 80 861 | 18 201 | 82 797 | 18 637 | 90 | 16 773 | 0.95 | 15 934 |
| Yambio | 152 257 | 25 353 | 155 902 | 25 960 | 90 | 23 364 | 1.20 | 28 037 |
| Ibba | 41 869 | 10 478 | 42 871 | 10 729 | 90 | 9 656 | 1.10 | 10 622 |
| Maridi | 82 461 | 13 118 | 84 435 | 13 432 | 90 | 12 089 | 1.10 | 13 298 |
| Mvolo | 48 134 | 6 559 | 49 286 | 6 716 | 80 | 5 373 | 1.20 | 6 447 |
| Mundri West | 33 975 | 4 027 | 34 788 | 4 123 | 80 | 3 299 | 1.20 | 3 958 |
| Mundri East | 48 318 | 6 821 | 49 475 | 6 984 | 80 | 5 587 | 1.20 | 6 705 |
| **Central Equatoria** | **1 103 592** | | **1 169 942** | **190 013** | | **125 067** | | **120 797** |
| Returnees | | | 39 930 | 6 655 | 50 | 3 328 | 0.50 | 1 664 |

| State/County | Population April 2008[1/] | Households April 2008[1/] | Population mid-2009 | Households mid-2009 | % farming households | No. farming households | Average ha/hh[2/] | Total area ha |
|---|---|---|---|---|---|---|---|---|
| Terekeka | 140 396 | 25 095 | 143 757 | 25 696 | 90 | 23 126 | 1.10 | 25 439 |
| Juba | 372 413 | 58 439 | 381 329 | 59 838 | 50 | 29 919 | 0.80 | 23 935 |
| Lainya | 89 315 | 13 984 | 91 453 | 14 319 | 60 | 8 591 | 0.95 | 8 162 |
| Yei | 201 443 | 33 292 | 206 266 | 34 089 | 60 | 20 453 | 0.95 | 19 431 |
| Morobo | 103 603 | 15 709 | 106 083 | 16 085 | 60 | 9 651 | 0.95 | 9 168 |
| Kajo Keji | 196 422 | 32 552 | 201 124 | 33 331 | 90 | 29 998 | 1.10 | 32 998 |
| **Eastern Equatoria** | **906 126** | | **943 681** | **160 178** | | **118 467** | | **98 028** |
| Returnees | | | 15 862 | 2 644 | 77 | 2 036 | 0.60 | 1 221 |
| Torit | 99 740 | 19 822 | 102 128 | 20 297 | 85 | 17 252 | 0.74 | 12 767 |
| Lopa/Lafon | 106 161 | 17 197 | 108 702 | 17 609 | 85 | 14 967 | 0.75 | 11 226 |
| Kapoeta North | 103 084 | 15 974 | 105 552 | 16 356 | 50 | 8 178 | 0.95 | 7 769 |
| Kapoeta East | 163 997 | 29 441 | 167 923 | 30 146 | 50 | 15 073 | 0.95 | 14 319 |
| Kapoeta South | 79 470 | 11 849 | 81 373 | 12 133 | 50 | 6 066 | 0.95 | 5 763 |
| Budi | 99 199 | 16 773 | 101 574 | 17 175 | 90 | 15 457 | 0.72 | 11 129 |
| Ikotos | 84 649 | 16 521 | 86 675 | 16 917 | 90 | 15 225 | 0.95 | 14 464 |
| Magwi | 169 826 | 26 274 | 173 892 | 26 903 | 90 | 24 213 | 0.80 | 19 370 |
| **Southern Sudan** | **8 265 490** | **1 502 526** | **8 749 991** | **2 630 651** | | **2 097 359** | | **1 625 389** |

1/ Census figures of April 2008.
2/ Adjusted, where necessary, from the figures of 2008 on the basis of field observation and information from the field Annual population growth rate: 2.052 percent.

Estimates of the areas under mechanized cereal production in the north of Southern Sudan were provided by the relevant SMoAs. Along with estimated yield and production figures, they are presented in Table 4.

### 3.2 Factors affecting yields

The principal factors affecting cereal yield in the traditional sector this year were:

- The late and sporadic start to the rains, which led either to poor establishment for those crops planted at the recommended time, or to late planting.
- Time of planting with regard to the actual start of effective rainfall; for example, sorghum planted in June often performed acceptably, whereas sorghum planted two or three weeks later in early July in the same area often performed very poorly.
- Civil insecurity (ethnic conflict and incursions by the Lord's Resistance Army), which in many areas resulted in crops being poorly tended.

#### 3.2.1 Assessment method

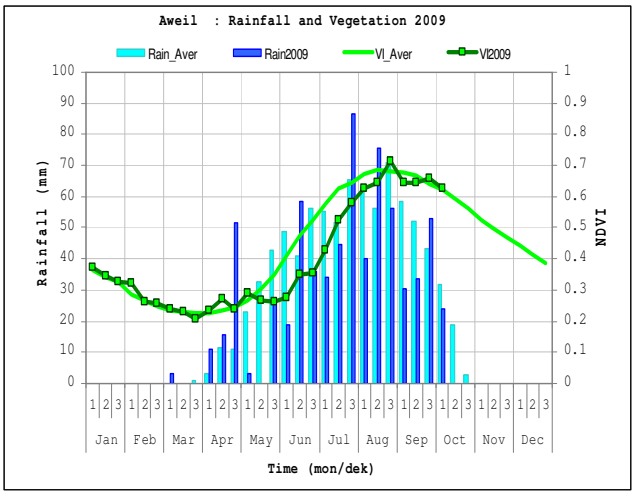
The figures used by the 2008 CFSAM for areas under cereal per household in the traditional sector were taken as a starting point for estimating this year's areas. Adjustments were made to those figures where necessary on the basis of information supplied by farmers concerning the size of field cultivated and the amount of seed used relative to last year, and on the basis of observation and measurement in the field.

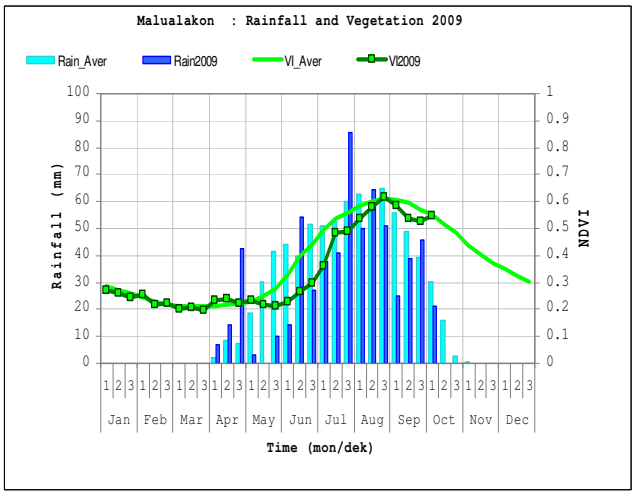
Cereal yields were mostly estimated visually using PET, both in farmers' fields and while passing through areas of crops. Plant densities were measured in farmers' fields and combined with average grain yield per plant to give an estimate of yield per hectare. Account was taken of farmers' own yield estimates relative to previous years, and modifications were made where deemed necessary. For those crops that had recently been harvested, an investigation of the farmstead granary combined with measurement of the area from which it had been harvested often provided a credible indication of yield.

### 3.2.2 Rainfall

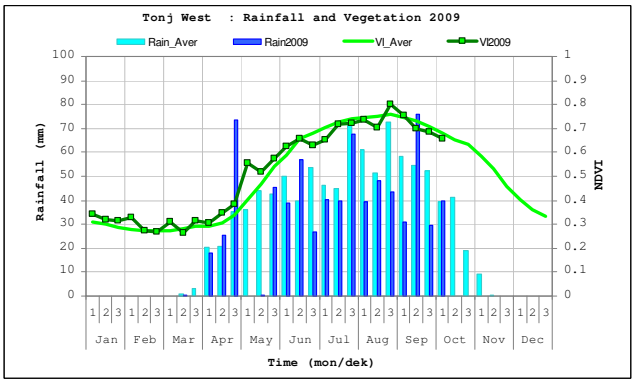
**Figure 2: Southern Sudan - Rainfall distribution and vegetation indices in different states, 2009**

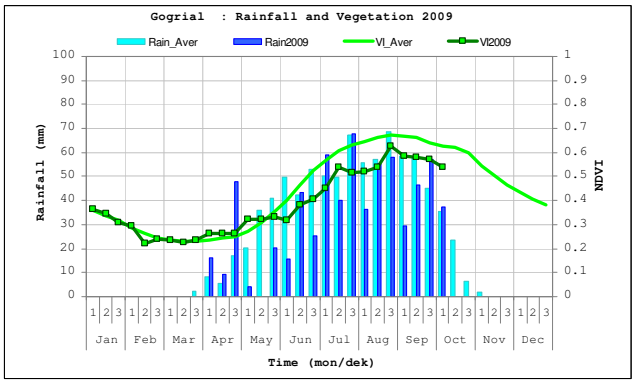
**Northern Bahr el Ghazal**



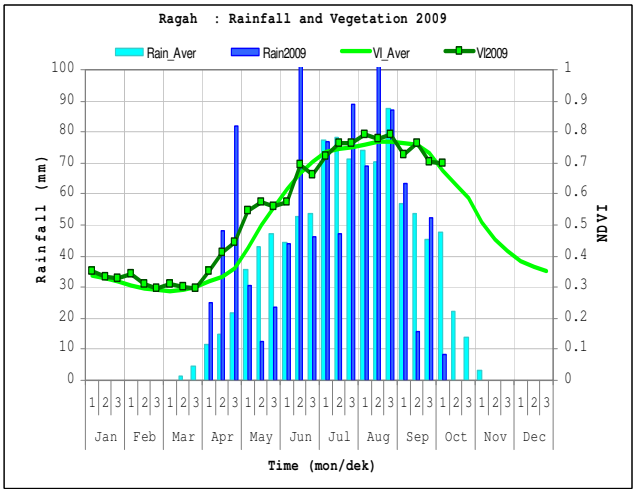



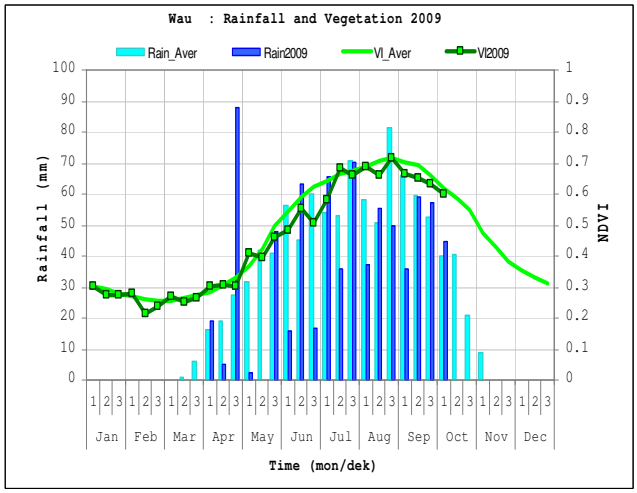

**Warrap**

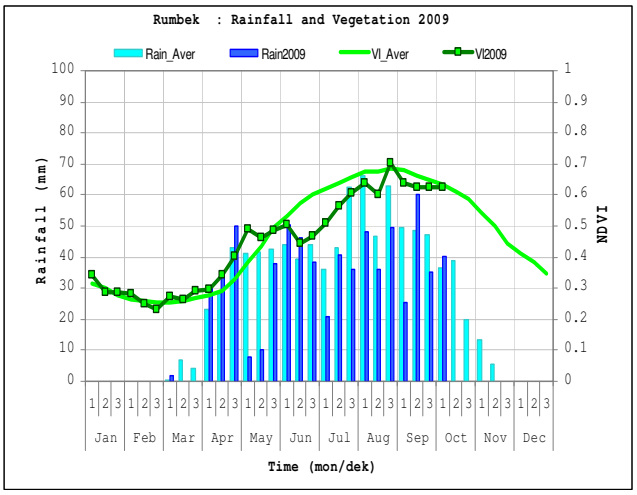


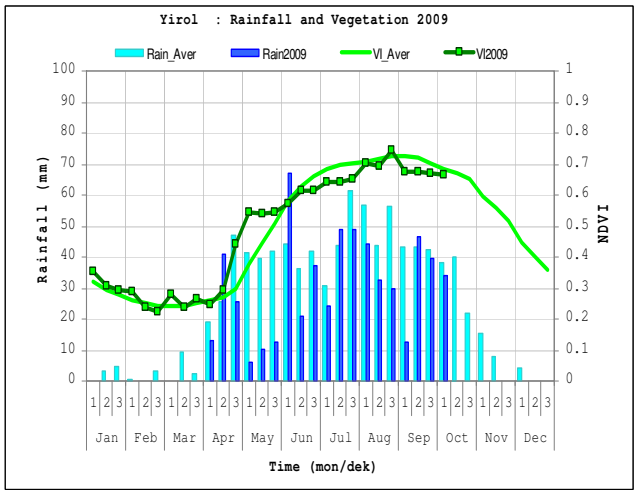




**Western Bahr el Ghazal and Lakes**

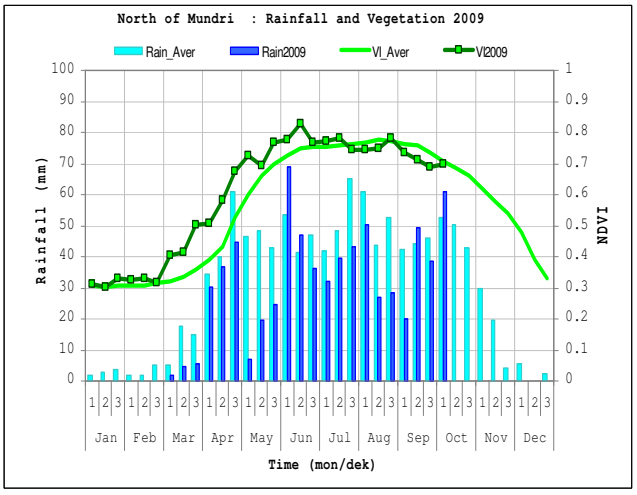


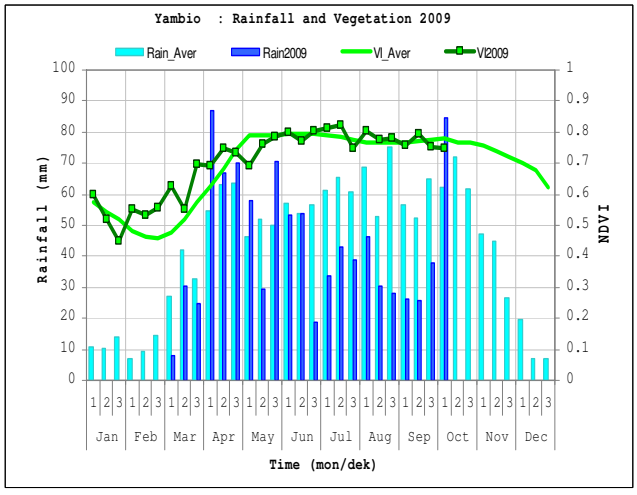



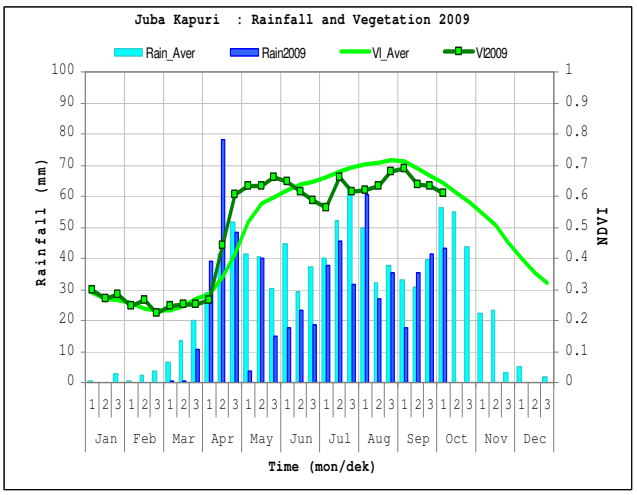


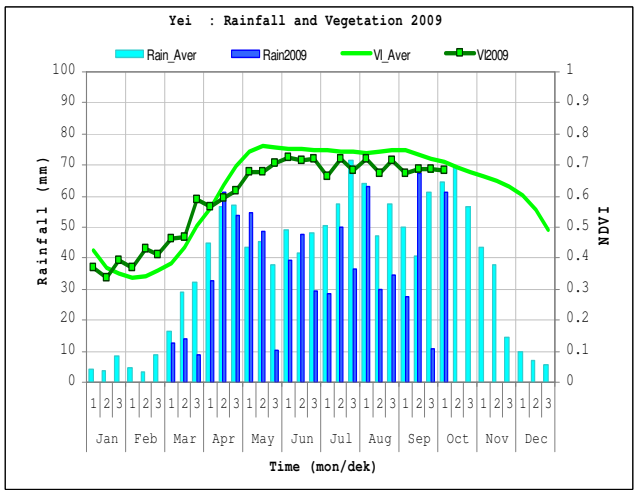




## Green Belt, including south Central Equatoria

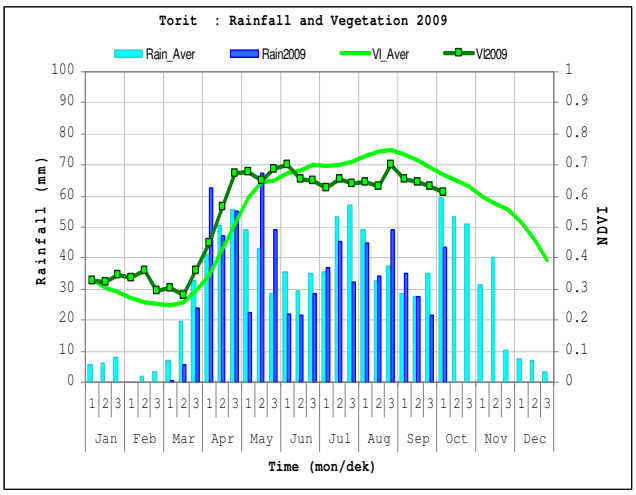


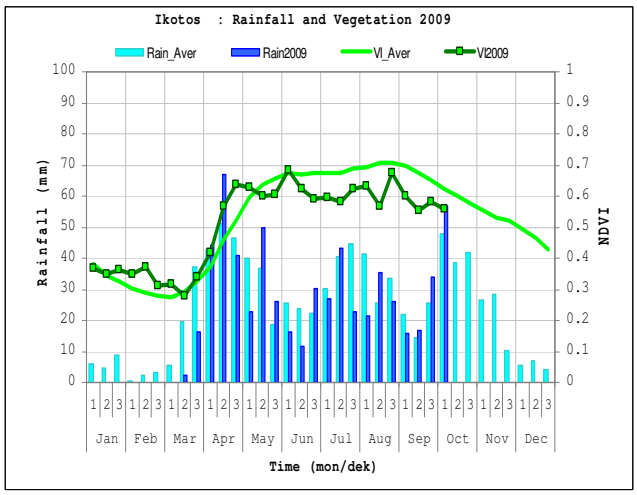



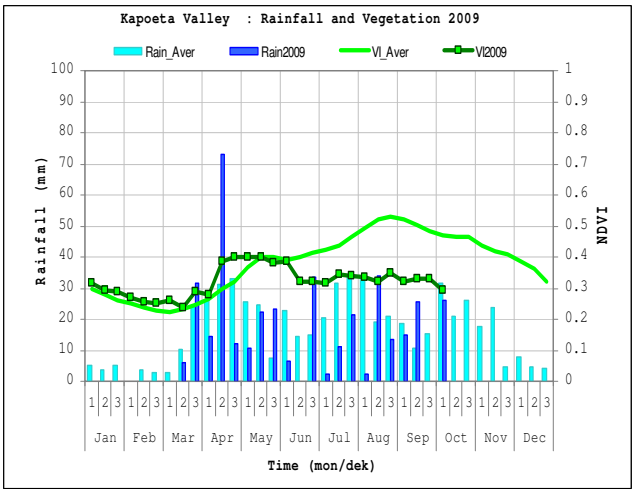



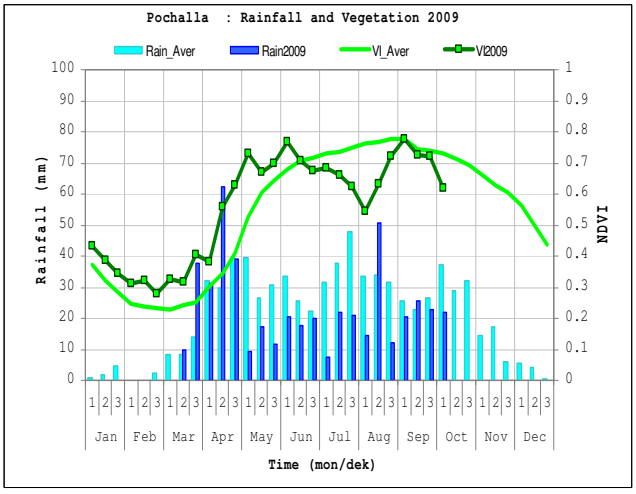
## Eastern Equatoria

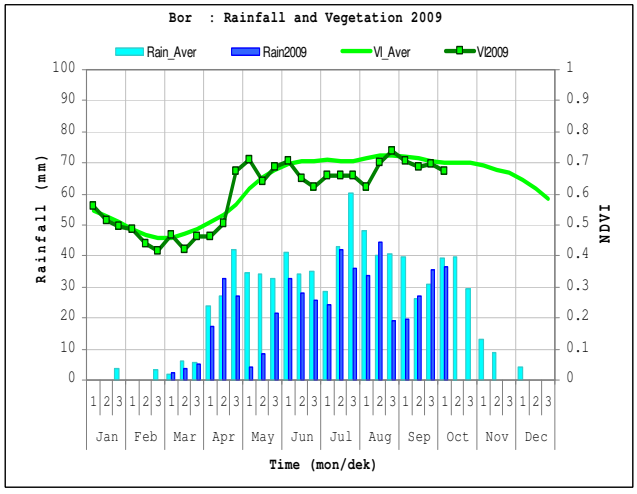


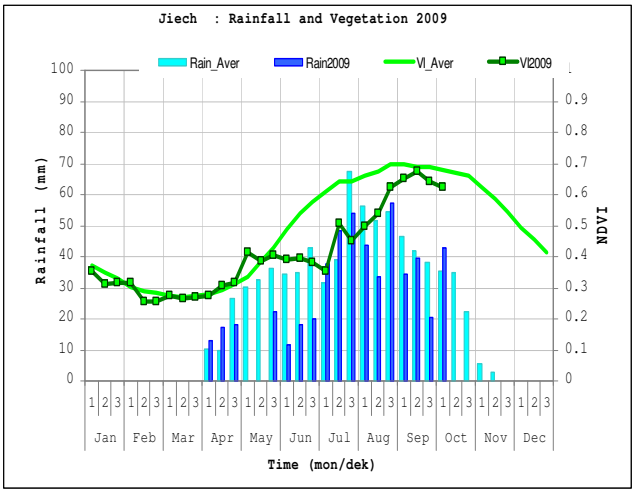



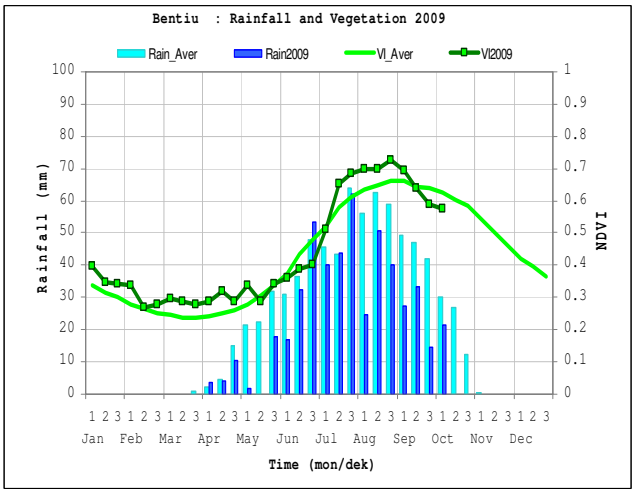

## Jonglei

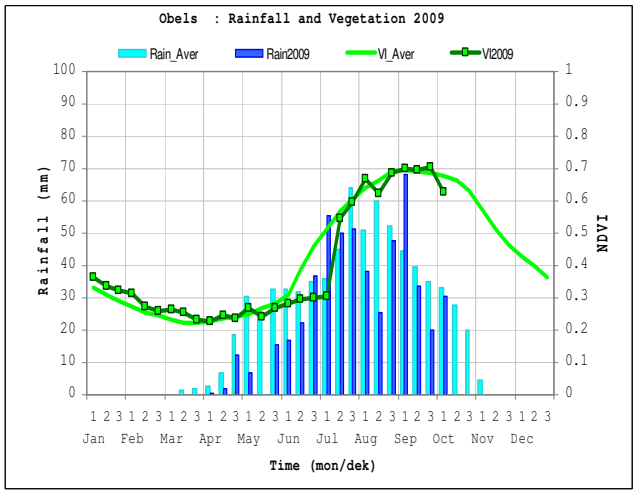


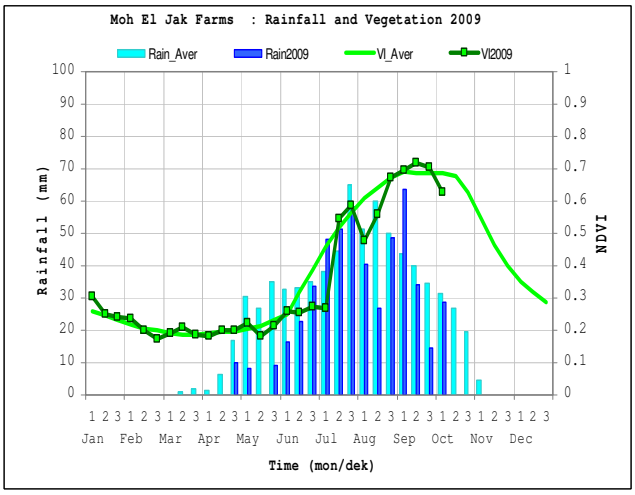



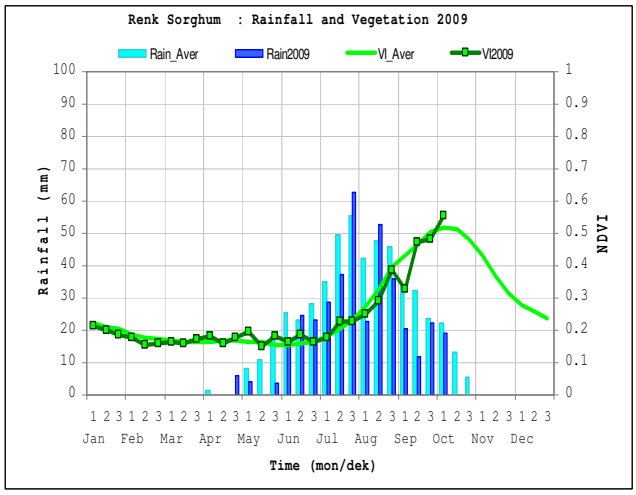



## Unity and Upper Nile




Bahr el Ghazal Region (Northern Bahr el Ghazal, Western Bahr el Ghazal, Warrap and Lakes States)

The first rains in April over most of the region looked very promising but these were followed by a long relatively dry period of up to two months. Some areas such as Aweil, Wau and Tonj West recorded almost no rain for about three weeks in May. The situation improved gradually in June and July, but in the worst affected areas, such as parts of Northern Bahr el Ghazal, the vegetation index (as indicated by satellite imagery) was not restored to its average value until late August or early September.

Equatoria Region (Western Equatoria, Central Equatoria and Eastern Equatoria States)

Much of Equatoria usually receives some rain in January and February but this year the start of the rains was delayed until March or April, often precluding double cropping. In April, rainfall amounts were generally above normal, but amounts in subsequent months were disappointing in much of the Green Belt, despite the fact that the vegetation index remained close to the long-term average throughout. In the east of Eastern Equatoria (Kapoeta), however, amounts of rainfall were very poor for most of the season; the vegetation index there dipped significantly below the average at the beginning of June and remained there for the rest of the cropping season.

Upper Nile Region (Upper Nile, Unity and Jonglei States)

Much of Jonglei started the cropping season with normal amounts of rain in April, while Upper Nile and Unity received only light rains at the end of April and the beginning of May. However, the whole region then experienced a period of about two months of prolonged dry spells between sporadic showers. Rainfall over the region generally started to increase towards the end of June, and this improvement continued into July and August. However, although the amounts received in Upper Nile and Unity during those months were close to normal, the amounts received by Jonglei were well below the long-term average.

### 3.2.3 Inputs – Traditional sector

Most farmers use seed retained from their previous year's harvest, and this is not infrequently supplemented by purchases from the market or gifts from relatives or friends. The amount of certified seed used is negligible. As in previous years, FAO, GOSS and some NGOs have provided a certain amount of seed, principally to returnees and to those farmers classified as vulnerable. Amounts however are extremely small compared with the amount required by the farming community, and many farmers complain of shortages. This year, in areas where the late rains prompted several re-plantings, the problem of seed shortages was further exacerbated. FAO has, for several years, distributed hand-tools to returnees and to a small number of those farmers classified as vulnerable (see Table 2). Virtually no synthetic fertilizer, herbicide or pesticide is used.

**Table 2 - 2009 Actual seeds & tools distribution in Southern Sudan**

| State | No. of beneficiary households | | | Total |
|---|---|---|---|---|
| | Returnees | IDPS | Host Community | |
| Lakes | 4 000 | 500 | 500 | **5 000** |
| Warrap | 8 800 | - | 2 200 | **11 000** |
| WBEG | 3 677 | - | 1 323 | **5 000** |
| NBEG | 3 400 | 2 900 | 3 300 | **19 000** |
| Jonglei | 5 750 | 3 520 | 2 730 | **12 000** |
| Upper Nile | 5 835 | 715 | 3 450 | **10 000** |
| Unity | 4 850 | 745 | 505 | **6 100** |
| West Equatoria | 4 700 | 2 000 | 300 | **7 000** |
| Central Equatoria | 4 750 | 1 100 | 1 150 | **7 000** |
| East Equatoria | 14 180 | - | 8 320 | **22 500** |
| **Grand Total** | **69 942** | **11 480** | **23 778** | **105 200** |
| **State** | **Hand tools (Pcs)** | | | |
| | **Hoes** | **Sickles** | **Pangas** | **Malodas** |
| Lakes | 480 | 480 | 480 | - |
| Warrap | 8 000 | 8 000 | 8 000 | 8 000 |
| WBEG | 4 000 | 4 000 | 4 000 | 4 000 |
| NBEG | 16 000 | 16 000 | 16 000 | 16 000 |
| Jonglei | 9 600 | 9 600 | 9 600 | 9 600 |
| Upper Nile | 8 000 | 8 000 | 8 000 | 8 000 |
| Unity | 4 800 | 4 800 | 4 800 | 4 800 |
| West Equatoria | 5 600 | 5 600 | 5 600 | - |
| Central Equatoria | 5 600 | 5 600 | 5 600 | - |
| East Equatoria | 14 400 | 14 400 | 14 400 | - |
| **Grand Total** | **76 480** | **76 480** | **76 480** | **50 400** |
| **State** | **Crop seeds (Kg)** | | | |
| | **Sorghum** | **Maize** | **Rice** | **Groundnuts** |
| Lakes | 1 800 | 2 400 | - | 3 000 |
| Warrap | 20 000 | 50 000 | - | 60 000 |
| WBEG | 10 000 | 25 000 | - | 30 000 |
| NBEG | 60 000 | 100 000 | 20 000 | 100 000 |
| Jonglei | 24 000 | 60 000 | - | 60 000 |
| Upper Nile | 20 000 | 50 000 | - | 50 000 |
| Unity | 12 000 | 30 000 | - | 30 000 |
| West Equatoria | 14 000 | 35 000 | - | 35 000 |
| Central Equatoria | 14 000 | 35 000 | - | 35 000 |
| East Equatoria | 36 000 | 90 000 | - | 90 000 |
| **Grand Total** | **211 800** | **477 400** | **20 000** | **493 000** |

Southern Sudan has been encountering shortages of essential seeds and planting materials necessary to enable farmers to produce enough food supplies and maintain their livelihoods. This has been partly as a result of the long and protracted violent conflict. Recurrent floods and drought in some places are contributing to loss of the local seed security systems. This is exacerbated by the ever increasing demand for seed by returnees, refugees and Internally Displaced Persons (IDPs) who in most cases do not have enough seeds to support their production activities.

The problems associated with inputs are not only to do with farmers' shortage of funds to purchase them. They are also to do with an absolute lack of availability, especially in the more remote areas. The development of some form of buyer cooperative serving a membership of farmers in a defined locality could alleviate this problem to some extent.

3.2.4 Pest and diseases

There were no remarkable outbreaks of crop pests or diseases this year. Birds attacked grain as usual, and were controlled in some parts of Unity and Upper Nile by aerial spraying. The incidence of grasshoppers, stem borers and sorghum midge was normal. Termites are, as usual, troublesome in many areas, as are monkey and other wild animals. Rosette and leaf spot of groundnut continue to be widespread, and cassava mosaic is ubiquitous. Sorghum smut is found in several fields, but usually at low levels. Though the levels of striga infestation have fallen compared with a few years ago when war

compelled farmers to cultivate the same plots of land repeatedly, the parasitic weed is still very common in sorghum fields and often affects yields significantly.

## 3.3 Agricultural production in 2009

Mainly as a result of poor rains, cereal production in much of Southern Sudan was lower this year than both last year and the long-term average. Worst affected areas included the east of Eastern Equatoria, much of Jonglei, parts of Upper Nile and parts of Northern Bahr el Ghazal. The rainfed mechanized sector, while producing less than last year, nevertheless fared rather better than many of the traditional areas. Standby crops such as cassava, which in many parts is the preferred staple, performed adequately but, unfortunately in a year of poor cereal production, its production was severely limited by a shortage of planting material. Groundnut performance was patchy, ranging from total loss (from late planting and early cessation of the rains) to very satisfactory.

### 3.3.1 Cereal production

#### A. Traditional sector

The traditional sector is estimated to produce 660 000 tonnes of cereal this year after the deduction of 20 percent for post-harvest and other losses, a fall of 38 percent from last year's figure. Gross and net production figures for each county are given in Table 3, along with estimates of consumption requirements (based on estimates of between 80 and 120 kg/caput/annum adjusted for each county on the basis of accumulated consumption information) and calculated surpluses and deficits. The mid-2010 population has been calculated assuming a population growth rate of 2.052 percent per annum. A cereal deficit of 225 000 tonnes is predicted for Southern Sudan for the marketing year 2010.

**Table 3: Southern Sudan - Estimated cereal area, yield, production, consumption and balance (traditional sector) in 2009/10**

| State/County | Area harvested (ha) | Yield (t/ha) | 2009 gross cereal production (tonnes) | 2009 net cereal production[1] (tonnes) | Population mid-2010 [2] | Consumption (t/year) | Surplus/ deficit (tonnes) |
|---|---|---|---|---|---|---|---|
| **Upper Nile** | **77 460** | **0.57** | **44 276** | **35 421** | **1 013 629** | **93 860** | **-58 439** |
| Returnees | 296 | 0.48 | 142 | 113 | 5 927 | 593 | -479 |
| Renk | 17 502 | 0.86 | 15 067 | 12 054 | 143 943 | 14 394 | -2 341 |
| Manyo | 4 946 | 0.55 | 2 742 | 2 194 | 39 719 | 3 972 | -1 778 |
| Fashoda | 4 565 | 0.48 | 2 183 | 1 747 | 38 160 | 3 816 | -2 069 |
| Melut | 5 531 | 0.48 | 2 667 | 2 133 | 51 455 | 5 146 | -3 012 |
| Maban | 5 072 | 0.43 | 2 166 | 1 733 | 47 272 | 3 782 | -2 049 |
| Maiwut | 5 407 | 0.48 | 2 586 | 2 069 | 83 034 | 6 643 | -4 574 |
| Luakpiny/Nasir | 14 981 | 0.48 | 7 165 | 5 732 | 219 442 | 17 555 | -11 823 |
| Longochuk | 4 272 | 0.48 | 2 043 | 1 635 | 66 005 | 5 280 | -3 646 |
| Ulang | 5 946 | 0.48 | 2 844 | 2 275 | 88 867 | 7 109 | -4 835 |
| Baliet | 3 746 | 0.48 | 1 791 | 1 433 | 50 168 | 4 013 | -2 580 |
| Malakal | 3 632 | 0.59 | 2 154 | 1 723 | 132 169 | 15 860 | -14 137 |
| Panykang | 1 563 | 0.46 | 727 | 581 | 47 469 | 5 696 | -5 115 |
| **Jonglei** | **103 558** | **0.45** | **46 809** | **37 447** | **1 443 500** | **138 541** | **-101 094** |
| Returnees | 1 549 | 0.29 | 444 | 356 | 23 827 | 2 383 | -2 027 |
| Old Pangak | 8 460 | 0.38 | 3 237 | 2 590 | 115 080 | 11 508 | -8 919 |
| Khorflus | 6 945 | 0.34 | 2 392 | 1 913 | 103 521 | 9 317 | -7 404 |
| Ayod | 9 804 | 0.34 | 3 376 | 2 701 | 145 543 | 13 099 | -10 398 |
| Duk | 5 946 | 0.46 | 2 730 | 2 184 | 68 536 | 6 168 | -3 984 |
| Wuror | 15 595 | 0.46 | 7 160 | 5 728 | 186 544 | 16 789 | -11 061 |
| Nyirol | 8 865 | 0.46 | 4 070 | 3 256 | 113 559 | 10 220 | -6 964 |
| Akobo | 9 141 | 0.69 | 6 295 | 5 036 | 142 333 | 17 080 | -12 044 |
| Pochala | 5 390 | 0.46 | 2 475 | 1 980 | 69 177 | 8 301 | -6 321 |
| Pibor | 7 335 | 0.46 | 3 368 | 2 694 | 155 149 | 13 963 | -11 269 |
| Twic East | 8 346 | 0.46 | 3 832 | 3 066 | 89 186 | 8 919 | -5 853 |
| Bor South | 16 181 | 0.46 | 7 429 | 5 943 | 231 045 | 20 794 | -14 851 |
| **Unity** | **37 084** | **0.61** | **22 543** | **18 034** | **645 465** | **57 541** | **-39 507** |
| Returnees | 2 167 | 0.48 | 1 036 | 829 | 33 332 | 3 333 | -2 504 |
| Pariang | 5 249 | 0.69 | 3 615 | 2 892 | 86 149 | 6 892 | -4 000 |
| Abiemnhom | 681 | 0.78 | 534 | 427 | 17 777 | 1 422 | -995 |
| Mayom | 5 734 | 0.42 | 2 413 | 1 930 | 126 141 | 10 091 | -8 161 |
| Rubkona | 2 371 | 0.71 | 1 678 | 1 343 | 104 742 | 13 616 | -12 274 |
| Guit | 1 853 | 0.86 | 1 595 | 1 276 | 34 488 | 2 759 | -1 483 |
| Koch | 5 132 | 0.67 | 3 436 | 2 749 | 78 228 | 6 258 | -3 509 |
| Leer | 4 039 | 0.67 | 2 704 | 2 164 | 55 405 | 4 432 | -2 269 |
| Mayendit | 4 263 | 0.67 | 2 854 | 2 283 | 56 201 | 4 496 | -2 213 |
| Paynijar | 5 597 | 0.48 | 2 677 | 2 141 | 53 003 | 4 240 | -2 099 |
| **Warrap** | **118 901** | **1.36** | **161 751** | **129 401** | **1 044 217** | **104 422** | **24 979** |
| Returnees | 1 715 | 0.96 | 1 641 | 1 313 | 27 555 | 2 756 | -1 443 |
| *Abyei* | 4 204 | 0.96 | 4 021 | 3 217 | 55 260 | 5 526 | -2 309 |
| Twic | 21 576 | 1.43 | 30 957 | 24 766 | 214 116 | 21 412 | 3 354 |
| Gogrial West | 29 481 | 1.91 | 56 398 | 45 119 | 254 886 | 25 489 | 19 630 |
| Gogrial East | 12 135 | 1.43 | 17 411 | 13 929 | 107 926 | 10 793 | 3 137 |

| State/County | Area harvested (ha) | Yield (t/ha) | 2009 gross cereal production (tonnes) | 2009 net cereal production[1] (tonnes) | Population mid-2010 [2] | Consumption (t/year) | Surplus/ deficit (tonnes) |
|---|---|---|---|---|---|---|---|
| Tonj North | 23 103 | 1.43 | 33 148 | 26 518 | 172 649 | 17 265 | 9 253 |
| Tonj East | 15 371 | 0.48 | 7 351 | 5 881 | 121 342 | 12 134 | -6 253 |
| Tonj South | 11 315 | 0.96 | 10 823 | 8 658 | 90 484 | 9 048 | -390 |
| **N Bahr el Ghazal** | **71 239** | **0.93** | **66 535** | **53 228** | **820 834** | **70 315** | **-17 087** |
| Returnees | 3 264 | 0.86 | 2 810 | 2 248 | 67 531 | 7 428 | -5 181 |
| Awiel North | 13 317 | 0.96 | 12 738 | 10 191 | 134 931 | 10 795 | -604 |
| Awiel East | 30 430 | 0.86 | 26 196 | 20 957 | 323 852 | 25 908 | -4 951 |
| Awiel South | 8 058 | 1.34 | 10 790 | 8 632 | 77 124 | 6 170 | 2 462 |
| Awiel West | 15 334 | 0.86 | 13 200 | 10 560 | 173 689 | 13 895 | -3 335 |
| Awiel Centre | 837 | 0.96 | 800 | 640 | 43 707 | 6 119 | -5 479 |
| **W Bahr el Ghazal** | **39 365** | **1.33** | **52 543** | **42 035** | **358 692** | **42 270** | **-235** |
| Returnees | 582 | 1.34 | 780 | 624 | 10 273 | 1 027 | -404 |
| Raga | 5 483 | 1.72 | 9 440 | 7 552 | 56 783 | 6 246 | 1 306 |
| Jur River | 9 570 | 1.34 | 12 816 | 10 253 | 133 514 | 16 022 | -5 769 |
| Wau | 23 730 | 1.24 | 29 508 | 23 607 | 158 122 | 18 975 | 4 632 |
| **Lakes** | **68 900** | **1.14** | **78 850** | **63 080** | **782 504** | **72 763** | **-9 683** |
| Returnees | 3 413 | 0.96 | 3 265 | 2 612 | 55 500 | 5 550 | -2 938 |
| Cuebit | 11 768 | 0.96 | 11 257 | 9 005 | 123 048 | 11 074 | -2 069 |
| Rumbek North | 3 854 | 0.48 | 1 843 | 1 475 | 45 361 | 4 083 | -2 608 |
| Rumbek Centre | 13 087 | 0.96 | 12 518 | 10 014 | 160 452 | 14 441 | -4 426 |
| Wulu | 4 438 | 0.00 | 0 | 0 | 42 373 | 3 814 | -3 814 |
| Rumbek East | 11 437 | 1.43 | 16 410 | 13 128 | 128 353 | 11 552 | 1 576 |
| Yirol West | 10 219 | 1.91 | 19 550 | 15 640 | 107 829 | 10 783 | 4 857 |
| Yirol East | 6 201 | 1.91 | 11 863 | 9 490 | 70 432 | 7 043 | 2 447 |
| Awerial | 4 481 | 0.48 | 2 143 | 1 715 | 49 156 | 4 424 | -2 709 |
| **W Equatoria** | **116 241** | **1.58** | **184 048** | **147 238** | **658 863** | **72 715** | **74 523** |
| Returnees | 450 | 1.24 | 560 | 448 | 12 008 | 1 561 | -1 113 |
| Tambura | 12 271 | 1.24 | 15 259 | 12 207 | 57 854 | 6 364 | 5 843 |
| Nagero | 1 976 | 1.24 | 2 457 | 1 965 | 10 530 | 1 158 | 807 |
| Nzara | 16 543 | 1.91 | 31 647 | 25 317 | 68 666 | 7 553 | 17 764 |
| Ezo | 15 934 | 1.24 | 19 814 | 15 851 | 84 496 | 9 295 | 6 557 |
| Yambio | 28 037 | 1.91 | 53 636 | 42 908 | 159 101 | 17 501 | 25 407 |
| Ibba | 10 622 | 1.91 | 20 319 | 16 256 | 43 751 | 4 813 | 11 443 |
| Maridi | 13 298 | 1.43 | 19 079 | 15 263 | 86 168 | 9 478 | 5 785 |
| Mvolo | 6 447 | 1.24 | 8 017 | 6 414 | 50 298 | 5 533 | 881 |
| Mundri West | 3 958 | 1.24 | 4 922 | 3 938 | 35 502 | 3 905 | 33 |
| Mundri East | 6 705 | 1.24 | 8 337 | 6 670 | 50 490 | 5 554 | 1 116 |
| **C Equatoria** | **120 797** | **0.82** | **99 119** | **79 295** | **1 193 130** | **133 510** | **-54 215** |
| Returnees | 1 664 | 0.67 | 1 114 | 891 | 39 930 | 5 191 | -4 300 |
| Terekeka | 25 439 | 0.67 | 17 033 | 13 626 | 146 707 | 17 605 | -3 978 |
| Juba | 23 935 | 0.67 | 16 026 | 12 821 | 389 153 | 42 807 | -29 986 |
| Lainya | 8 162 | 1.05 | 8 588 | 6 870 | 93 330 | 10 266 | -3 396 |
| Yei | 19 431 | 1.15 | 22 303 | 17 842 | 210 498 | 23 155 | -5 312 |
| Morobo | 9 168 | 0.82 | 7 542 | 6 034 | 108 260 | 11 909 | -5 875 |
| Kajo Keji | 32 998 | 0.80 | 26 513 | 21 211 | 205 251 | 22 578 | -1 367 |
| **E Equatoria** | **98 028** | **0.70** | **68 848** | **55 078** | **962 719** | **99 401** | **-44 323** |

| State/County | Area harvested (ha) | Yield (t/ha) | 2009 gross cereal production (tonnes) | 2009 net cereal production[1] (tonnes) | Population mid-2010 [2] | Consumption (t/year) | Surplus/ deficit (tonnes) |
|---|---|---|---|---|---|---|---|
| Returnees | 1 221 | 0.67 | 818 | 654 | 15 862 | 2 062 | -1 408 |
| Torit | 12 767 | 0.86 | 10 990 | 8 792 | 104 223 | 10 422 | -1 630 |
| Lopa/Lafon | 11 226 | 0.86 | 9 664 | 7 731 | 110 933 | 11 093 | -3 362 |
| Kapoeta North | 7 769 | 0.43 | 3 344 | 2 675 | 107 718 | 10 772 | -8 096 |
| Kapoeta East | 14 319 | 0.43 | 6 164 | 4 931 | 171 369 | 17 137 | -12 206 |
| Kapoeta South | 5 763 | 0.43 | 2 481 | 1 984 | 83 042 | 8 304 | -6 320 |
| Budi | 11 129 | 0.48 | 5 323 | 4 258 | 103 658 | 10 366 | -6 108 |
| Ikotos | 14 464 | 0.67 | 9 684 | 7 747 | 88 454 | 11 499 | -3 752 |
| Magwi | 19 370 | 1.05 | 20 381 | 16 305 | 177 460 | 17 746 | -1 441 |
| **Total** | **851 573** | **0.97** | **825 321** | **660 257** | **8 923 554** | **885 338** | **-225 081** |

1/ Assuming a 20 percent post-harvest loss.
2/ Assuming a population growth rate of 2.052 percent per annum.

## B. Mechanized sector

The rainfed mechanized sector, which is confined mostly to Upper Nile but also includes some relatively small areas in Unity States, did reasonably well this year compared with the traditional sector. Only Malakal in Upper Nile failed to produce, because of an on-going tribal conflict. Elsewhere, sorghum, maize, bulrush millet, groundnut and sesame gave acceptable yields, the result of financial support from GOSS MAF, improved access to credit facilities through the Bank of Sudan and the Ivory Bank, an increase in the number of operational tractors, and adequate rainfall during the months of August and September. In total it is estimated that about 277 500 hectares will be harvested, mostly in Upper Nile with some also in Unity and Northern Bahr el Ghazal. Sorghum yields are expected to be best at Melut at 1.1 t/ha, while elsewhere they generally range between 0.32 and 0.86 t/ha. Renk is by far the largest producing area with about 167 000 hectares under sorghum, both short-season 'Feterita' and long-season 'Agono'. With an average yield of 0.43 t/ha Renk is expected to produce a total of 75 000 tonnes. At an estimated 148 000 tonnes, overall production from the sector will be 10 percent lower than that of last year, and 20 percent below the average of 185 000 tonnes for the previous five years. Since most of the production from the mechanized sector is destined for northern Sudan, it has been omitted from calculations of levels of satisfaction of consumption requirement for Southern Sudan.

**Table 4: Southern Sudan - Mechanized cereal production estimates for 2009**

| | Sorghum | | | Maize | | | Bulrush millet | | | All cereals | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | 000 ha | t/ha | 000 t | 000 ha | t/ha | 000 t | 000 ha | t/ha | 000 t | 000 ha | t/ha | 000 t |
| Renk | 166.7 | 0.43 | 71.7 | | | | 9.2 | 0.32 | 2.9 | 175.8 | 0.42 | 74.6 |
| Malakal | | | | | | | | | | | | |
| Manyo | 62.5 | 0.65 | 40.6 | | | | | | | 62.5 | 0.65 | 40.6 |
| Maban | 3.3 | 0.86 | 2.9 | 2.5 | 0.65 | 1.6 | | | | 5.8 | 0.77 | 4.5 |
| Melut | 18.8 | 1.1 | 20.6 | | | | | | | 18.8 | 1.1 | 20.6 |
| Guit | | | | 1.5 | 1.7 | 2.5 | | | | 1.5 | 1.7 | 2.5 |
| Rubkona | | | | 0.83 | 1.1 | 0.92 | | | | 0.83 | 1.1 | 0.92 |
| Mayom | | | | 0.83 | 0.22 | 0.18 | | | | 0.83 | 0.22 | 0.18 |
| Ruweng | 1.5 | 0.65 | 0.95 | | | | | | | 1.5 | 0.65 | 0.9 |
| N Bahr el Ghazal | 10.0 | 0.32 | 3.15 | | | | | | | 10.0 | 0.32 | 3.2 |
| **Total** | 262.7 | 0.53 | 139.9 | 5.6 | 0.93 | 5.2 | 9.2 | 0.32 | 2.9 | 277.5 | 0.53 | 148.0 |

## C. Time series of cereal production

Table 5 shows the time series for cereal production in the traditional sector in Southern Sudan over the six-year period 2004-2009. Since production estimates are based partly on population figures, the estimates for the years 2004-2008 recorded in previous CFSAMs have had to be adjusted in light of the

census data obtained in April 2008. This year's production can be seen to be not very different from that of three of the previous years, 2005-2007. It is significantly less (38 percent) than that of 2008, but significantly greater than that of 2004. Compared with the average of the last five years (733 000 tonnes), this year's production is down by 10 percent.

**Table 5: Southern Sudan - Time series 2004 - 2009, cereal production in traditional sector** 1/

| Zones | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Area 000 ha | Prodn. 000 t | Area 000 ha | Prodn. 000 t | Area 000 ha | Prodn. 000 t | Area 000 ha | Prodn. 000 t | Area 000 ha | Prodn. 000 t | Area 000 ha | Prodn. 000 t |
| **Upper Nile** | **173** | **101** | **248** | **203** | **274** | **230** | **172** | **149** | **237** | **235** | **218** | **91** |
| Upper Nile | 122 | 66 | 81 | 66 | 92 | 84 | 55 | 48 | 79 | 67 | 77 | 35 |
| Unity | 28 | 20 | 37 | 32 | 44 | 35 | 27 | 25 | 43 | 42 | 37 | 18 |
| Jonglei | 23 | 15 | 130 | 105 | 139 | 111 | 90 | 76 | 115 | 126 | 104 | 37 |
| **Bahr el Ghazal** | **273** | **186** | **262** | **229** | **266** | **220** | **270** | **258** | **292** | **342** | **298** | **288** |
| Northern | 156 | 103 | 50 | 30 | 55 | 38 | 50 | 37 | 59 | 44 | 71 | 53 |
| Western | 28 | 20 | 32 | 29 | 35 | 32 | 32 | 39 | 34 | 52 | 39 | 42 |
| Lakes | 88 | 63 | 82 | 76 | 82 | 70 | 77 | 79 | 84 | 101 | 69 | 63 |
| Warrap | 0 | 0 | 98 | 94 | 94 | 80 | 112 | 103 | 116 | 145 | 119 | 129 |
| **Equatoria** | **232** | **203** | **241** | **257** | **247** | **259** | **263** | **304** | **323** | **490** | **335** | **282** |
| Central | 120 | 100 | 114 | 117 | 108 | 119 | 106 | 112 | 131 | 201 | 121 | 79 |
| Eastern | 35 | 22 | 40 | 28 | 49 | 31 | 66 | 55 | 85 | 94 | 98 | 55 |
| Western | 77 | 81 | 87 | 112 | 91 | 109 | 91 | 136 | 107 | 196 | 116 | 147 |
| **Southern Sudan** | **677** | **490** | **751** | **689** | **788** | **709** | **705** | **711** | **853** | **1068** | **852** | **660** |

1/ Figures for the years 2005-2008 have been taken from previous CFSAMs and adjusted according to population figures for each state recorded in the April 2008 census.

### 3.3.2 Other crops

Despite the ubiquity of mosaic virus, cassava continues to perform well. The problem reported in many areas is a shortage of planting material, which is still attributed to the after-effects of the civil war. Short- and long-maturation varieties and sweet and bitter varieties are grown, and in those areas where planting material is available, the crop acts not only as a staple in its own right but also as a very valuable safety net in times of cereal shortage and as a tradable commodity in the form of chips and flour. In the Green Belt, Lakes and Western Bahr el Ghazal it is common for farms to have a cycle of three years of cassava coming on stream. Sweet potato is also widely grown but on a much smaller scale.

The area under groundnut appears to have continued its increase this year as the crop was also planted as a substitute by farmers who, because of delayed rains, considered that it was too late to plant sorghum. In areas that received reasonable rainfall after planting the crop was generally good (1-2 tonnes/ha), but in areas where the rains stopped early pod-filling was very poor, and in some extreme cases pegging is reported to have failed. The performance of sesame was similarly patchy, with good production following timely planting and adequate late rainfall, and poor production or occasionally total crop failure where planting was late and the rains stopped early.

Cowpea, pigeon pea and okra are often grown in small plots near houses and have done reasonably well this year. Further promotion of these crops could help alleviate the effects of food shortages in years of poor cereal harvest.

### 3.3.3 Livestock

Livestock condition was poor at the beginning of the rainy season due to limited availability of pasture. The situation improved, however, after the rains stabilised in July/August.

The year 2009 was characterized by what the Ministry of Animal Resources and Fisheries has described as 'unprecedented' levels of armed cattle raiding. Raiding has been both internal and cross-border, especially from Kenya. There was also competition for scarce pasture at the beginning of the rainy season, with many cattle remaining in the lowlands in July when, in a year of better rainfall, they would normally have migrated to the highlands. Now, at the end of the year, migration in the opposite direction,

from highland to lowland, has started one to two months earlier than usual in response to the generally reduced amounts of rainfall received this year. This is expected to lead to further conflict over pasture during the coming months.

Prior to CPA, cattle were being exported to Uganda from as far away as Bahr el Ghazal, a trip that could take up to two months. Now, with other sources of income available, and the relatively low cost of importing cattle, that trade has reversed. Cattle are now being imported from Uganda for slaughter in Juba and Torit. The consequent reduction in take-off from the national herd has inevitably added to the already high pressure on grazing lands. With the increase in numbers of salaried workers in urban centres the demand for meat has risen.

Estimated cattle numbers by state have been provided by the Ministry of Animal Resources and Fisheries (Table 6). Apart from 2004, when the estimates were done by FAO, the figures show a total population consistently above ten million, but with very little annual variation. Given the extreme difficulty of estimating cattle numbers in an entity such as Southern Sudan, the figures in Table 6 should be regarded as no more than indicative.

**Table 6: Southern Sudan - Cattle numbers (thousands) by state (2003-2009)**

| State | 2003 | 2004[1/] | 2005 | 2006 | 2007 | 2008 | 2009[1/] |
|---|---|---|---|---|---|---|---|
| Central Equatoria | 893 | 881 | 895 | 908 | 922 | 926 | 878 |
| Eastern Equatoria | 881 | 893 | 883 | 896 | 910 | 913 | 888 |
| Western Equatoria | 678 | 100 | 680 | 690 | 701 | 703 | 675 |
| Jonglei | 1 472 | 1 857 | 1 475 | 1 497 | 1 521 | 1 526 | 1 465 |
| Upper Nile | 988 | 494 | 990 | 1 005 | 1 021 | 1 024 | 983 |
| Unity | 1 186 | 594 | 1 189 | 1 207 | 1 226 | 1 230 | 1 180 |
| Lakes | | 1 510 | | | | | 1 311 |
| Warrap | 1 535 | 921 | 1 539 | 1 562 | 1 586 | 1 592 | 1 528 |
| West Bahr el Ghazal | 1 254 | 546 | 1 256 | 1 275 | 1 295 | 1 300 | 1 248 |
| North Bahr el Ghazal | 1 587 | 750 | 1 590 | 1 615 | 1 640 | 1 646 | 1 579 |
| **All states except Lakes** | **10 474** | **7 036** | **10 497** | **10 655** | **10 822** | **10 860** | **10 424** |

Source: Ministry of Animal Resources and Fisheries.
1/ FAO Livestock Population Estimates 2004 and 2009.

Trypanosomiasis was responsible for significant cattle losses in Northern Bahr el Ghazal at the end of 2008 and the beginning of 2009. The disease was also reported in Western Equatoria. Rift Valley Fever has occurred locally this year but has always been contained. East Coast Fever, however, has been reported in Jonglei State, and is thought to have been introduced from Uganda following the increased importation of cattle from that country. An outbreak of foot-and-mouth disease was reported from Unity State, with a consequent substantial reduction in milk production. Contagious bovine pleuropneumonia (CBPP) continues to cause cattle losses in most parts of the country. In 2008 Southern Sudan was certified as being rinderpest-free. Contagious caprine pleuropneumonia (CCPP) is said to have caused higher rates of goat mortality than usual this year, and Newcastle disease continues to be a scourge of poultry.

2009 has seen an abnormally high level of cattle sales amongst pastoralist communities who normally regard their herds as social rather than commercial assets. This, and the fact that the terms of trade vis-à-vis grain and livestock have recently become heavily weighted in favour of grain, are seen as reliable indications that grain is expected to be in short supply in the coming months. Combined with the reported increase in cattle imports from Uganda, these sales also point to an increase in the consumption of meat, a dietary change largely triggered by the increasing amount of cash in circulation.

Fish are a seasonally important source of food in many parts of the country, and throughout the year in the vicinity of the Sudd. During times of flooding, most families living near bodies of water seize the opportunity to catch fish. In the Sudd it is estimated (by the Fisheries Department) that about 60 percent of the catch is lost because of the absence of preservation facilities. This year has been an exceptionally good year for fish in parts of Jonglei such as Bor, but poorer catches have been reported from some upstream sections of tributaries where water levels are lower following this year's relatively poor rains.

### 3.4 Security

Sparked by cattle rusting, ethnic clashes, notably between the Dinka Bor of Jonglei and the Mundari of Central Equatoria at the border of the two states, are fuelling revenge attacks. This has caused the closing of Juba–Bor road, the lifeline, along with the Nile, of the capital of Jonglei.

Besides the many victims and casualties reported, these incidents have caused massive population displacements [10] and at the same time have severely constrained households' and livestock movement. A chilling sense of insecurity pervades the countryside; fears of attacks and killing, and of kidnapping of children and women are hindering access to grazing land, wild foods, grass and firewood as a source of income to enhance food security.

The traditional inter-tribal clashes over land, other natural resources and cattle are now feared to be fuelled by the political violence that looms in the run-up to the general elections slated for April 2010 and the referendum on Southern Sudan self-determination in 2011.

## 4. CEREAL SUPPLY/DEMAND SITUATION

### 4.1 Cereal balance

Table 3 shows an estimated national cereal consumption requirement of approximately 885 000 tonnes. With an estimated net cereal production of approximately 660 000 tonnes, a shortfall of about 225 000 tonnes needs to be made up for through commercial and/or food aid imports. Table 7 summarises the estimated cereal supply situation for each state in 2010. Only two states - Western Equatoria and Warrap - are calculated to be in surplus. Jonglei is calculated to have the largest shortfall at more than 100 000 tonnes.

**Table 7: Southern Sudan - Estimated cereal surplus/deficit by state in 2010**

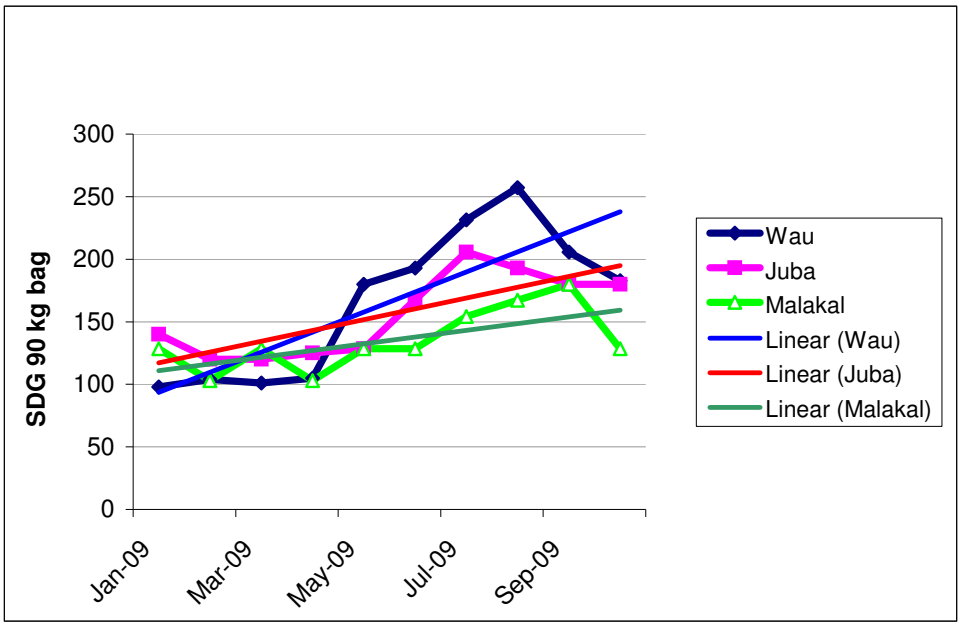
| State | Surplus/deficit (tonnes) |
|---|---|
| Upper Nile | -58 439 |
| Jonglei | -101 094 |
| Unity | -39 507 |
| Warrap | 24 979 |
| Northern Bahr el Ghazal | -17 087 |
| Western Bahr el Ghazal | -235 |
| Lakes | -9 683 |
| Western Equatoria | 74 523 |
| Central Equatoria | -54 215 |
| Eastern Equatoria | -44 323 |

### 4.2 Cereal and livestock prices

As evidenced in Figure 3 below, sorghum prices have been erratic while following a markedly upward trend over the January-October 2009 period in the main cities of Juba, Wau and Malakal. In particular, the most dramatic changes have been noted in Wau where moving from SDG 98 per 90 kg in January 2009, sorghum prices culminated at about SDG 257 per 90 kg in August before easing down to around SDG 183 per 90 kg in October. The erratic price behaviour could be the result of a succession of gluts and scarcity attributable to the availability or absence of food aid on the market, disruptions in the precarious transport system particularly during the rainy season, and crop failure caused by poor rainfall as explained in Section 3.2 above.

[10] According to UNHCR (Factsheet dated 27 October 2009), at least 75 people (including 44 civilians, and 29 security officers) have been killed in armed attacks in Jonglei state from March to October 2009. During the same period, 120 women and 250 children were abducted, and 111,569 persons displaced.

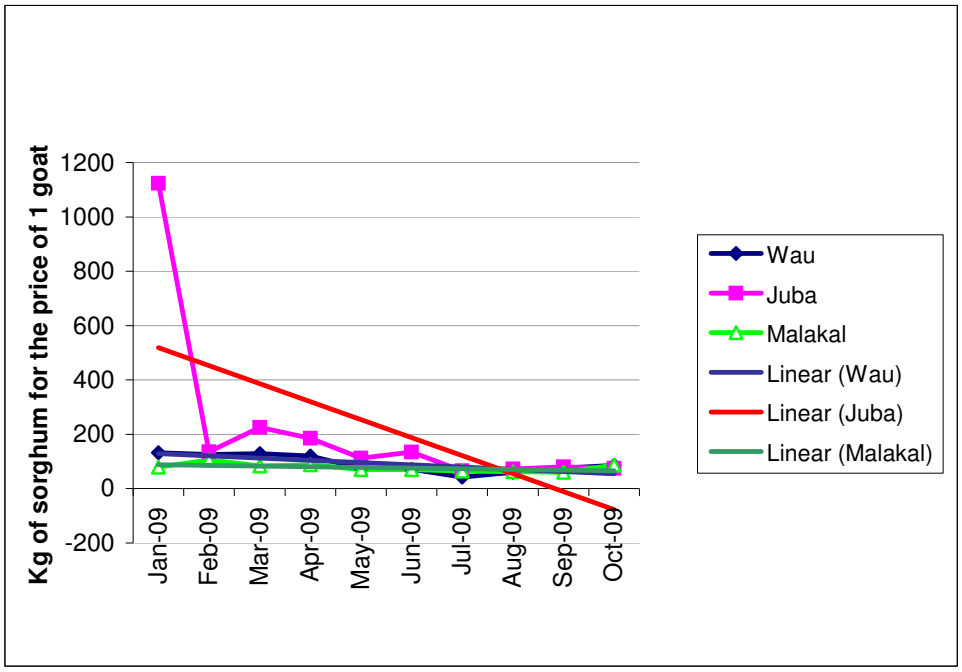
**Figure 3: Southern Sudan - Retail sorghum prices in selected Southern Sudan markets**




Household economic access to food has thus been worsening and is likely to reach a crisis stage in 2010 considering the widespread crop failure observed and the quasi inexistence of food reserves at the household or Government levels. It is acknowledged that GoSS, through its Ministry of Finance and Economic Planning has, as from the first quarter of 2009, large quantities of grain, principally maize, intended to be distributed to the local traders and sold at subsidised prices with a view to stabilizing the grain market. But most of the grain appears not to have reached the consumer, having been spoiled by poor handling and storage conditions. The Mission was shown such spoiled grain in Bor Town (Jonglei State) and Lainya (Central Equatoria State). However, the Mission could not obtain information on the actual quantities of maize the Government received and whether there remained any stock thereof.

As for livestock prices –specifically goats- prices have at best increased moderately (as in Wau), and for the most part have remained relatively stable (as in Malakal) or significantly decreased (as in Juba) over the January-October 2009 period. Overall, the terms of trade favour grain producers to the detriment of pastoralists as is shown in Figure 4. The looming grain scarcity attributable to the exceptionally poor 2009 cropping season will likely prompt further livestock sales by herders eager to meet their families' cereals needs. This could accelerate livestock price decline and worsen the terms of trade for pastoralists in coming months.

**Figure 4: Southern Sudan - Sorghum-livestock (goat) terms of trade in selected markets**




## 4.3 Input prices

At the moment, there appears to be no input market to speak of, particularly where seeds and hand tools are concerned. Such inputs, essentially unavailable on local markets, have until now been delivered free of charge by the donor community to select groups of farmers, notably the most vulnerable among IDPs, returnees and refugees. Farmers met however stated that the lack of these inputs was a major constraint to their farming activities, in large part responsible for reduced yields and reductions in area cultivated. Save for inconclusive attempts in a farmer's cooperative in Central Equatorial State, blacksmithing for tool-making remains generally unknown. However, blacksmithing initiatives continue to be promoted by FAO and partners in Warrap, Western Bahr el Ghazal and Northern Bahr el Ghazal states, especially for the production of malodas and ox-plough parts.

As for agricultural labour, the standard daily wage was SDG30 in most of the States. Increasing rural – urban migration was contributing to the scarcity of labour, thereby exerting upward pressure on wages. With the exception of Upper Nile and Unity State which have a significant mechanized farming sector, ox plough and tractor hire were uncommon. The Government is in the process of delivering some 300 tractors to select farmers' associations in the 10 states at subsidised prices. But all the conditions for such delivery have not yet been spelt out.

## 4.4 Market-related infrastructure and services

It is widely acknowledged that, despite commendable efforts at rehabilitating trunk roads, the poor state or the non existence of feeder roads remains a major impediment to trade and to the development of agriculture and the broader economy in Southern Sudan. It fosters market segmentation and associated high prices for basic commodities, and causes entire communities to live in quasi-autarchic conditions, relying mostly on subsistence agriculture. In Jonglei State for instance, communities such as Pochalla with over 63 000 inhabitants have almost no road connection to the outer world. The nearest market, Pinyido in neighbouring Ethiopia is six hours away by bicycle. Air connexion with other towns in Southern Sudan consists essentially of infrequent UN humanitarian flights. Only during the dry season (January–March) is Pochalla connected by a makeshift road to Pibor.

Likewise, the 415 km-long rough road between Boma and the Kenyan border town of Lokichoggio is only passable between October and May during the dry season. Still, a truck ride takes two days, and merchants are charged an average of USD150 per tonne of rice, maize of wheat flour transported.

Transport problems are compounded by a complex, cumbersome tax system which lack coherence at different levels of Government and between states. Rates at decided on an ad hoc basis, and unauthorized revenue collections are frequent. For instance the so-called development tax, which transporters and traders have to pay at every checkpoint, may vary from 2 percent to 10 percent of the assessed value of a merchandize. Interstate trade is thus hampered at consumer's expense.

When the different border and sales taxes are factored in, a 50 kg bag of rice bought at USD35 in Lokichoggio in Kenya will normally be resold for around USD75–USD80 in Boma, leaving only a slim margin, traders said.

Farmers met complained about the lack of adequate processing and storage facilities, which they said caused 20-40 percent post-harvest losses.

A glimpse of the food situation facing most rural households in Southern Sudan in 2009-2010 is provided in Table 8 below which relates to the way select communities in Southern Sudan assess their own poverty situation.

**Table 8: Southern Sudan - Rural Communities' Own Perception of Poverty in Bor, Boma and Pochalla**

| Poverty scale | Criteria (Bags 50 kg of sorghum expected at harvest) | Bor | Pochalla | Boma |
|---|---|---|---|---|
| | | Community households (%) | Community households (%) | Community households (%) |
| Poor | 2 bags or less | 55 | 55 | 20 |
| Middle class | 3 – 5 bags | 29 | 30 | 35 |
| Well to do | More than 5 bags | 16 | 15 | 35 |

Source: Mission interviews.

On the premise that a family of seven would consume 50 kg of grain in 2.5 weeks, it is adduced from the above table that the vast majority of households in the communities visited, specifically those expecting less than 5 bags of grain form the incoming harvest (i.e., 84 percent in Bor, 85 percent in Pochalla and 55 percent in Boma), will hardly be in a position to feed themselves with their own production for more than three months. In Bor and Pochalla, 55 percent of the households in the communities concerned will not be able to meet their grain needs with their own production for more than three weeks. Many farmers stated they would be getting no grain production of their own during the season ending in December 2009. All of this underscores the seriousness of the looming food crisis in Southern Sudan in 2010 for states such as Jonglei, Unity, Upper Nile, Eastern Equatoria and parts of Central Equatoria where cereal production in 2009 will be way below normal (ranging from 0.47 tonnes/ha in Jonglei to 0.9 in Central Equatoria), according to Mission's estimates.

Affected households are already resorting to coping strategies, such as the reduction of meals form three to one per day, the sale of livestock to supplement income and purchase food, the use of forest resources including wild foods and firewood for sale. These coping strategies are, by and large, not sustainable over time. Excessive exploitation of firewood, for instance, is acknowledged to exact a considerable toll on the environment.

### 4.5 Some recommendations

- Instead of repeatedly providing small farmers with hand-tools, train, establish, provision and support blacksmiths in agricultural market centres until such time that they become financially self-supporting.
- Instead of repeatedly providing vulnerable farmers with seed from outside the country, train strategically placed, willing farmers to produce clean cereal seed; subsidize their activity until they become financially self-supporting. (The seed production unit established recently in Yei appears to be defunct, or at least moribund. The reason for this apparent failure should be identified and addressed.).
- Train strategically placed, willing farmers to produce acceptably clean cassava planting material, and assist them in marketing their product.
- Follow up the GOSS distribution of tractors with a comprehensive training programme for operators and mechanics. Selected farmers should be trained in basic tractor operations, including the mounting and setting of implements. Fully equipped workshops should be established in state

centres, with trained mechanics employed to maintain, service and repair both GOSS and privately owned tractors. Trained tractor-drivers and mechanics should then be trained to train others.
- Ensure that access to GOSS tractors is equitable.
- Draw up practical plans for the establishment of a functioning agricultural extension service, taking, in particular, the following into account:

    - initial and regular refresher training of field staff
    - housing, housing maintenance and utilities
    - office facilities
    - transport, vehicle maintenance and servicing, spare parts.

- Step up the programme for the development of fisheries in the Sudd - processing, storage, transport and marketing - initially as a means of reducing the current unacceptably high levels of loss of catch.
- Continue the improvement and opening-up of rural trunk roads, and embark on a programme of improvement of feeder roads.
- More resources should be channelled to the agricultural sector in line with GoSS commitment to substantially increase the share of non-oil sources in its budget, and enhance food security.
- GoSS/MAF should prepare and implement an appropriate agricultural policy framework as soon as possible with the aim to:

    - Define and implement viable/efficient mechanism for provision of inputs (with the Agricultural Bank or similar structure in the lead role)
    - introduce/promote appropriate post-harvest technology
    - define and implement a policy for the maintenance and extension of feeder road networks)
    - introduce/promote conservation agriculture in view of the relatively fragile ecosystem of Southern Sudan
    - step up efforts at diversification of agricultural production
    - upgrade/expand extension services

- Such a policy framework or programme should be grounded on a comprehensive agriculture sector analysis, which should be carried out as soon as possible by Government assisted by the donor community.

## 5. HOUSEHOLD FOOD SECURITY SITUATION

### 5.1 Methodology

#### 5.1.1 Tools and process

The mission relied heavily on the data and analysis undertaken for the 2009 Annual Needs and Livelihoods Assessment (ANLA) which was in the finalization phase while the mission was in Southern Sudan. The findings of ANLA were based on 2080 household and 140 community focus group interviews in 70 villages across seven of the ten States in South Sudan.[11] While the household interviews provided mostly quantitative information, the focus group discussions were useful in getting a better qualitative understanding of the food security and livelihoods situation across South Sudan.

The ANLA analysis used to determine the household food security status had three main components: 1) Food Consumption Score derived from the frequency and variety of diet consumed by the household; 2) Food Access calculated as a proportion of household expenditures on purchasing food basket; and 3) Coping Strategies index derived from the frequency and severity of different coping strategies employed by households. These factors were then aggregated to classify households by State into three categories: severely food insecure, moderately food insecure and food secure.[12]

The mission also consulted relevant national authorities, key food security partners, including donors and NGOs, both at the national and State level. The extensive field visits undertaken by the mission were informed by a thorough secondary data review. The mission used a detailed food security checklist

[11] ANLA was not conducted in Western and Central Equatoria, and Unity State. Unity State was in the assessment plan but poor security conditions prevented its implementation. However, just recently teams were allowed to carryout a food security assessment in Unity State.

[12] Complete technical and methodological details and their limitations can be found in South Sudan: Annual Needs and Livelihood Assessment 2009. The mission found the overall methodology acceptable and its application appropriate for assessing the food security situation in South Sudan.

during extensive field visits to get firsthand information from communities about their current food security situation and outlook for 2010. These observations were then used to crosscheck the findings of the ANLA. The mission also had the opportunity to interview the ANLA State team leaders to clarify any ambiguities in the interpretation of the analysis as well as any differences between the mission's observations and ANLA analysis.

## 5.2 Household food security and livelihood context

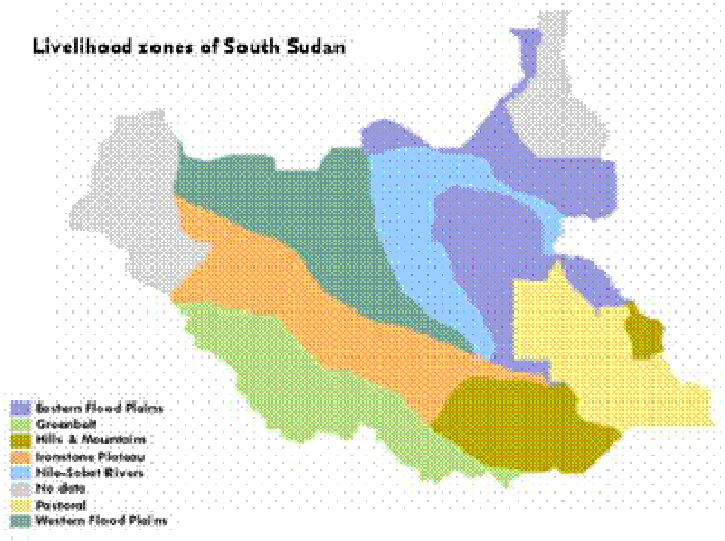
People in South Sudan typically employ multiple livelihood strategies combining cattle rearing, crop production, fishing, wild food collection and trade. The exact combination is determined by the agro-ecological conditions as well as culture and traditions of tribes who live in a given region.

In the far south-east corner of South Sudan the arid conditions make cattle rearing the most viable livelihood option and therefore majority of the people there are pastoralist. The greenbelt area, however, is mostly inhabited by agriculturalist, whose main livelihood activity is selling surplus agricultural production. Cattle rearing is rare due to the presence of tsetse fly, and during dry years they mostly rely on root crops and trade. Mountains and hills livelihood zone is home to both agriculturists and agro-pastoralists. In difficult years they usually depend on cattle, trade and root crops. In the Western flood plains, households supplement their agricultural production with fish and wild food. Eastern flood plains are similar to Western flood plains with an added advantage of game hunting. In Iron Stone Plateau people depend on crop production and trade in surplus production from the green belt. People in the Nile and Sobat zone depend on wild foods and fish in addition to their crops and livestock.

Still for most households in South Sudan cattle rearing is the preferred option as it is a fundamental basis for wealth and status. Crop production is considered an inferior activity more because of cultural rather than agro-ecological reasons. Nevertheless, producing crops does play an important complementary role and pure crop producers can also be found across the area. Fish and wild foods also play an important role, especially in the areas along the Nile River and its tributaries.

Access to food is seasonal and location-specific, and traditionally livelihoods in South Sudan move around to exploit these seasonal patterns. This is true for fish and wild foods, but also livestock that depend on regular migrations in search of pasture. This mobility is also crucial to most of the trade that takes place in South Sudan, as households constantly exchange labour and cattle for crops and other local products as they move around. The most serious food insecurity situations arise when conflicts constrain this mobility.

**Figure 3: Southern Sudan – Livelihood zones of South Sudan**

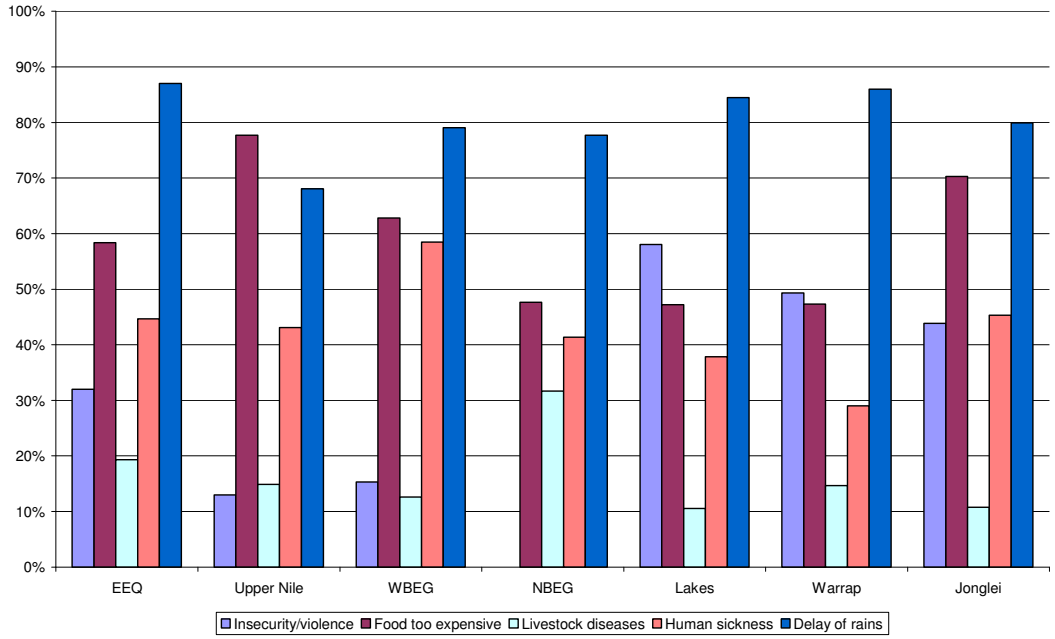



## 5.3 Current food security situation

Overall the food security situation in South Sudan is likely to sharply worsen in 2010. The three main contributors are: 1) drought or below average and erratic rainfall, worst in the last five years which is also a regional concern; 2) increased incidences of insecurity including tribal fighting exacerbated by early livestock migration due to shortage of water and pasture; 3) unseasonably high staple food prices and 4) the uncertainty about the up coming elections and its perceived aftermath.

ANLA analysis confirms that poor rainfall is by far the biggest constraint to household food security in 2010 (Figure 4). Between 60 to 80 percent of the households in all surveyed States considered poor rainfall as a major shock. High food prices were also a key concern across the board, particularly in Jonglei where about 70 percent of the households reported it as a serious shock. Insecurity and violence was reported by more than 30 percent of households in Lakes, Warrap, Jonglei and Eastern Equatoria States. The other serious shocks were human sickness, particularly in Western Bahr-el-Ghazal and livestock diseases in Northern Bahr-el-Ghazal.

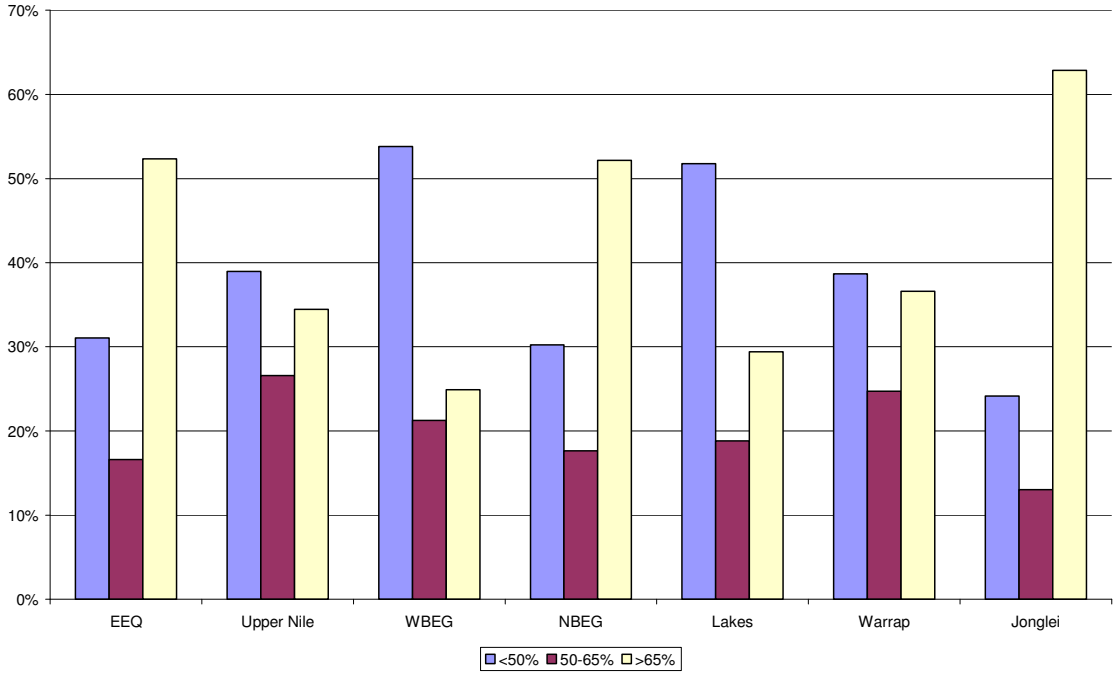
**Figure 4: Southern Sudan: Major food security shocks by State (%of households)**




Source: Data analysis ANLA South Sudan 2009

The highest proportion of total expenditures spent on food was reported in Jonglei, Eastern Equatoria and Northern Bahr-el-Ghazal, where more than 50 percent of the interviewed households stated that two-thirds of their total expenditure is on food (Figure 5). In contrast, less than a third of households in Western Bahr-el-Ghazal and Lakes reported spending over 65 percent of their total expenditures on food.

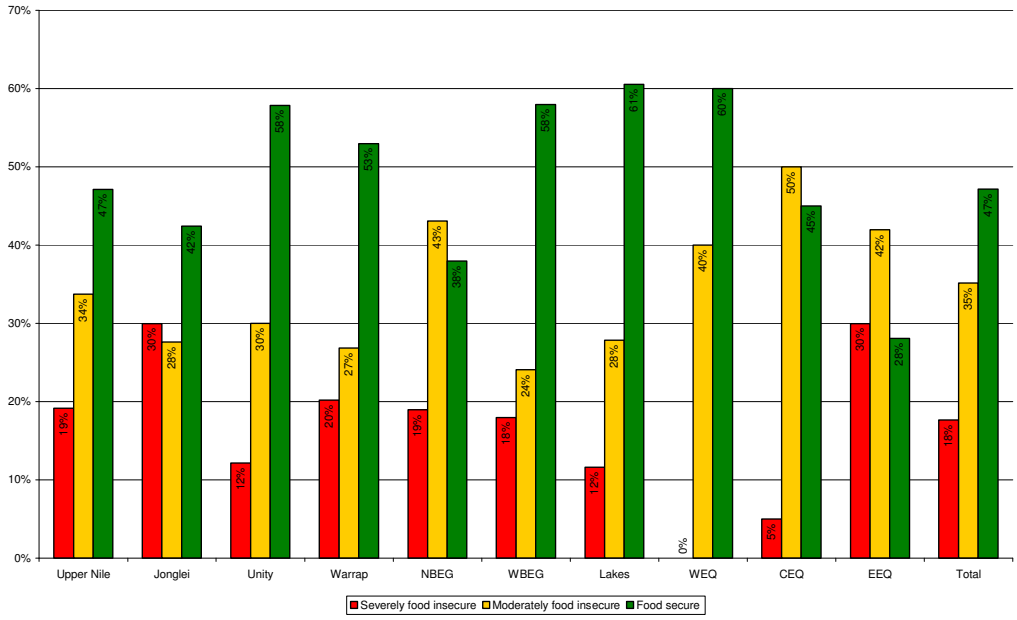
**Figure 5: Southern Sudan: Percent of household expenditures spent on food by State**




Source: Data analysis ANLA South Sudan 2009

A review of the ANLA data and its findings shows that almost 1.6 million people (18 percent) in South Sudan are severely food insecure while an additional 3.1 million people (35 percent) are moderately food insecure. The remaining 47 percent are expected to be food secure during 2010. The food security profiles by State are presented in Figure 6.

**Figure 6: Southern Sudan: Food security status by State (percent of households)**




Source: Data analysis ANLA South Sudan 2009

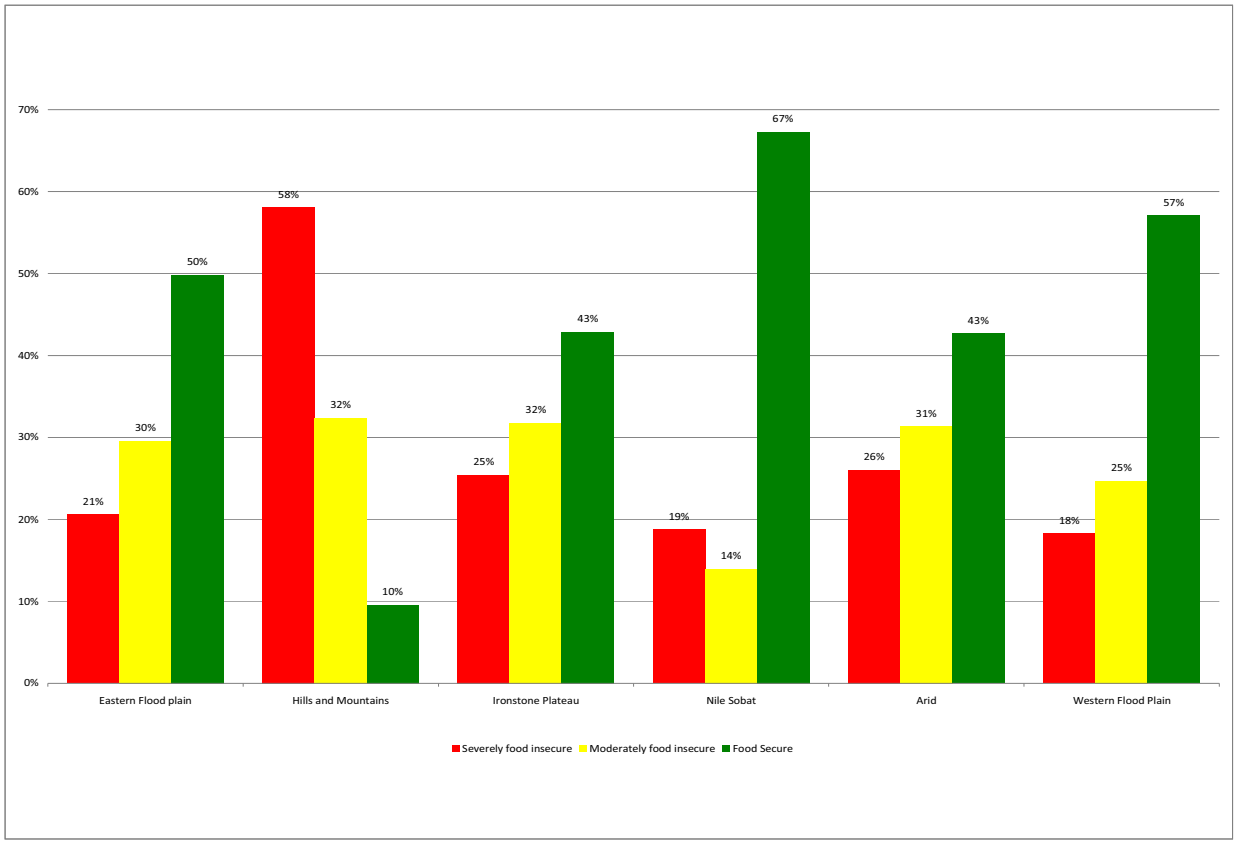
States like Jonglei, Eastern Equatoria, Northern Bahr-el-Ghazal and Upper Nile are worst affected with less than 50 percent of their respective population estimated to be food secure and as much as 30 percent falling into the severely food insecure category. Complete failure of the first agricultural season and sharply below average performance of the second season, high food commodity prices especially of

cereals which has the greatest impact on the poorest households and increased incidence and intensity of the tribal conflicts are the main factors attributing to food insecurity within these States.

In contrast States like Western and Central Equatoria and Western Bahr-el-Ghazal tend to fair relatively better given the diversity of food stuff that is produced despite the variations in the rainfall. In Western and Central Equatoria less than five percent of population is reported to be severely food insecure. The major food security concern is the people from the Zande tribe who were recently displaced by the LRA activities and now reside in makeshift camps throughout Western Equatoria.

Figure 7 shows the food security profiles by livelihood zones. The agriculturists followed by the agro-pastoralists in the hill and mountains zones are the worst affected. Agriculturists do not rear livestock and solely rely on crop production which makes them extremely vulnerable to crop failures. The agro-pastoralists fair somewhat better but the sharply declining livestock prices compared to increasing cereal prices have also jeopardized their food security situation.

**Figure 7: Southern Sudan: Food Security Status by livelihood zones (percent of households)**




Source: Data analysis ANLA South Sudan 2009

The pastoralists in the arid and semi-arid zones are the next affected. Heightened competition for scarce pasture and water coupled with earlier than usual migration of livestock is fuelling further conflict, particularly in Unity, Warrap and Lakes States.

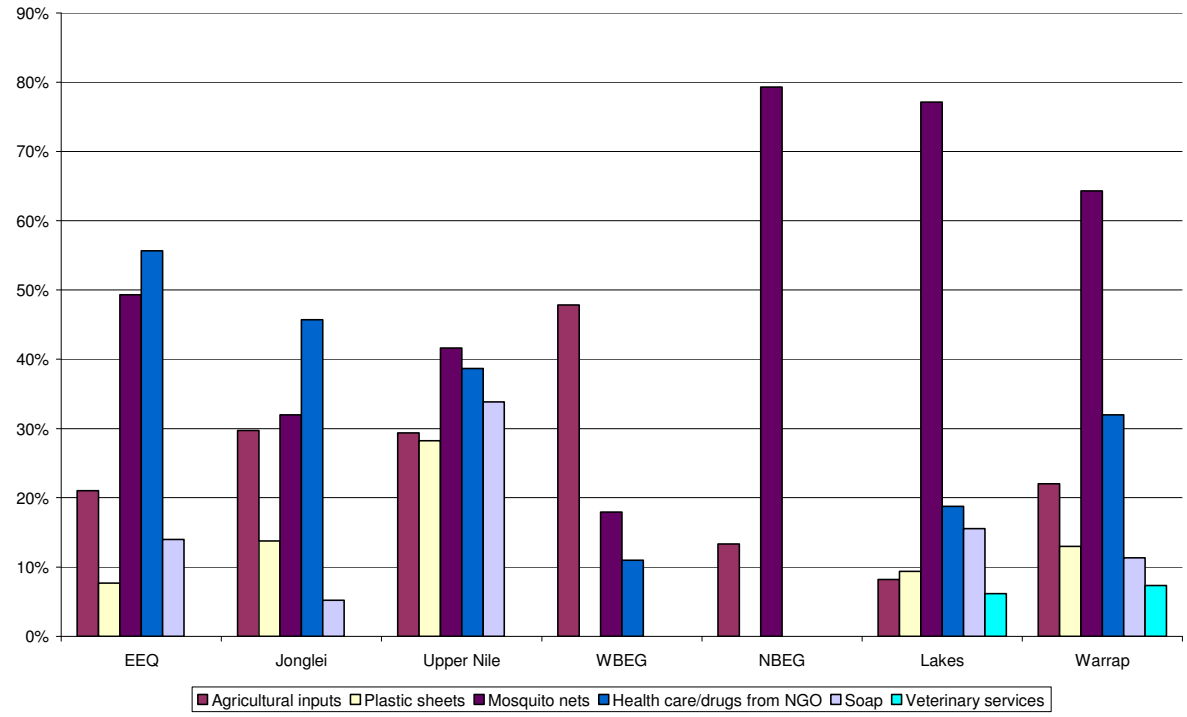
The most common coping mechanisms employed by the households include sale of livestock—even by the Dinka, Nuhr and Shilluk who traditionally do not sell livestock; reliance on natural resources—firewood, charcoal, wild foods; casual labour and migrating to urban towns and some back to Kenya or Uganda. The lack of sustainability of some of these strategies is a serious concern, particularly when everybody is employing the same strategies. For instance, heavy migration to urban towns, particularly by youth, with few jobs is resulting in increased incidence of insecurity. Similarly, the environmental impact of heavy reliance on forests for production of charcoal and firewood is becoming significant.

The main priorities for assistance of households vary by livelihood zones. For instance, in the hills and mountains and arid zones, the first and foremost priority of households was food followed by drinking water and health services. In the green belt, drinking water, health services—medical drugs and staff; education and seeds and tools for returnees were the main priorities.

The coverage of social services in South Sudan continues to lag given the lack of physical infrastructure and relatively low accessibility, particularly during the rainy season. For instance, the mission observed few functioning dispensaries and schools in its field visits. Even where the infrastructure exists, neither staff nor supplies were available. The issue of non-payment of salaries of State government staff, sometimes for several months, was raised as a major reason by the communities.

The ANLA data suggests that the provision of non-food assistance for certain commodities is improving. For example, provision of mosquito-nets and improved household access to NGO operated medical facilities was reported by significant number of households in most States (Figure 8). However, access to agricultural inputs is still low—ranged from less than 10 percent in Lakes to about 30 percent in Jonglei. The provision of veterinary services was only reported by less than 10 percent of households in only two States, Lakes and Warrap.

**Figure 8: Southern Sudan: Percent of households with access to non-food assistance by State**




Source: Data analysis ANLA South Sudan 2009

## 5.4 Estimated food aid requirements in 2010

A careful examination of seasonality as well as the likelihood of further deterioration in the food security situation in 2010 means that in addition to assisting severely food insecure households—who will receive the bulk of the food assistance—many moderately food insecure households will also require assistance at least during the critical lean months to ensure that they do not fall into the severely food insecure category.

The total food aid requirements for 2010 are estimated at 155 000 tonnes for an average monthly caseload of 1.8 million beneficiaries. The beneficiaries include severely and moderately food insecure residents, IDPs, Returnees and Refugees.

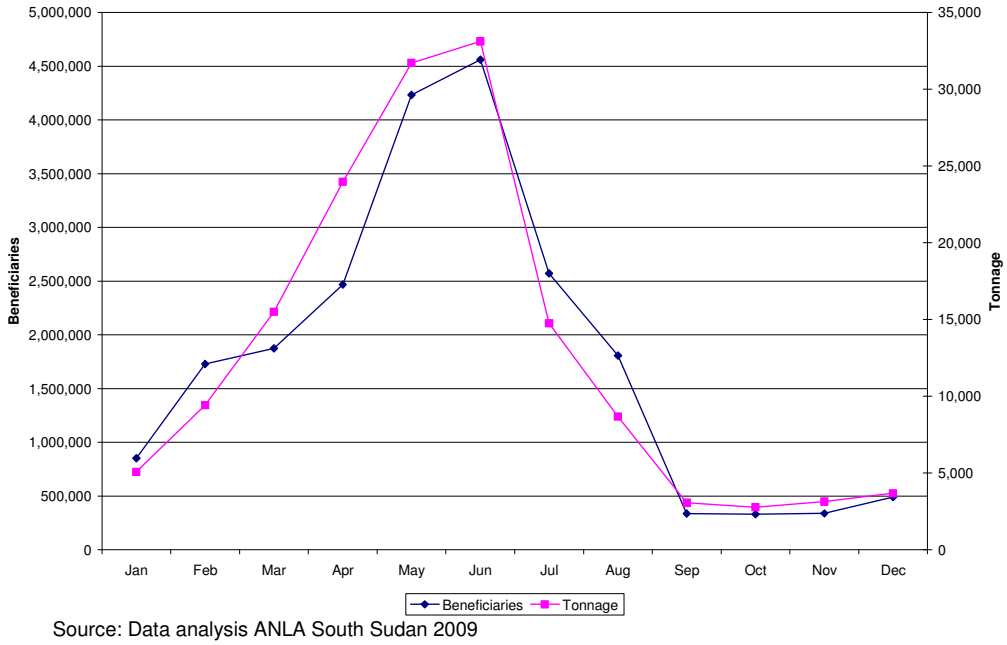
Approximately 305 000 IDPs, majority residing in Jonglei and Western and Central Equatoria, will require on average three months of food assistance. An estimated 175 000 returnees, mostly arriving in Northern Bahr-el-Ghazal, Lakes and Unity States, should each receive a one time distribution of three month ration. Finally, 27 000 refugees, currently in camps in Jonglei and Western and Central Equatoria will be supported with full monthly ration.

**Table 10: Southern Sudan - Estimated Food Assistance Requirement in 2010**

| State | Average Beneficiaries (Monthly) | Total Food Assistance (Tonnes) |
|---|---|---|
| Upper Nile | 203 000 | 17 000 |
| Jonglei | 396 000 | 34 000 |
| Unity | 82 000 | 7 000 |
| Warrap | 186 000 | 16 000 |
| NBEG | 169 000 | 17 000 |
| WBEG | 56 000 | 5 000 |
| Lakes | 140 000 | 11 000 |
| WEQ | 94 000 | 9 000 |
| CEQ | 172 000 | 12 000 |
| EEQ | 302 000 | 26 000 |
| **Total** | **1 799 000** | **155 000** |

Figure 9 shows number of beneficiaries and their food assistance requirements by month. The beneficiary caseload and monthly food requirements will begin to rise gradually from the start of the year, peaking in May and June, before starting to decline in July. The steep spike anticipated—reaching over four million vulnerable people—during May and June is commensurate with the height of the lean season where providing partial food assistance to moderately food insecure households will also be critical so as to ensure that their food security situation does not further deteriorate. The beneficiary caseload is expected to fall below half a million from September onwards depending on the performance of 2010 agricultural season.

**Figure 9: Southern Sudan – Monthly beneficiary caseload and food assistance requirement in 2010**

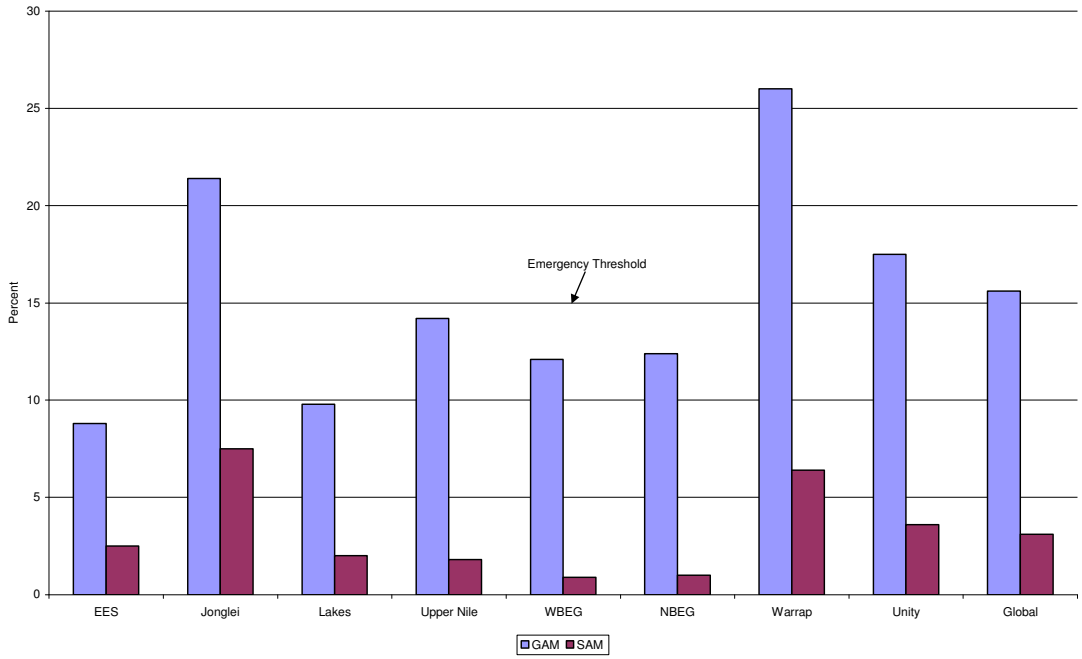



Source: Data analysis ANLA South Sudan 2009

Careful and close monitoring of the food security conditions is recommended to ensure that vulnerable households get appropriate and timely assistance including non-food assistance such as livelihood support from FAO and other UN/NGO agencies.

According to the 2008 ANLA survey, the Global Acute Malnutrition (GAM) rates for South Sudan were 15.6 percent and Severe Acute Malnutrition (SAM) 3.1 percent—above the emergency threshold level. Warrap, Jonglei and Unity State were of particular concern where the GAM rates were well above the emergency threshold level. The situation in Upper Nile and Northern and Western Bahr-el-Ghazal was not much better. Only Lakes and Eastern Equatoria State had GAM rates below 10 percent. (Figure 10)

**Figure 10: Southern Sudan: Global acute and severe malnutrition rates (2008)**




The poor nutritional status, particularly of women and children, in a deteriorating food security environment does not bode well for many in 2010. The mission recommends close monitoring of the nutritional status of women and children through regular surveys to be followed by appropriate interventions that adequately address the nutritional requirements of the vulnerable in 2010.

## 5.5 Food security recommendations

In order to mitigate the effects of high cereal prices even in the latter half of 2009 GOSS had to implement a cereals subsidy program that would lower or at least stabilize market prices. Yet, despite this commendable effort, the success of this program was questionable. This project was funded by the Ministry of Finance and implemented by the Cooperatives Department of the Ministry of the Agriculture. However, there was not much consultation or coordination with other relevant actors such as the South Sudan Relief and Rehabilitation Commission, particularly at the State level. Consequently food arrived at many locations with improper storage and distribution facilities resulting in extremely high losses. Given the sensitivity of the program and an ongoing investigation, not much information was forth coming about its total size and scope. Information gathered through field visits indicates that the program was well in excess of 50 000 tonnes, largely imported from Uganda and Kenya.

The mission recommends that it may be prudent for GOSS to consult and seek assistance of agencies and institutions that are experienced in implementing such large scale food assistance programs in order to minimize losses and improve the overall efficiency of any such future interventions.

On a positive note the socio-economic impact of many trunk roads and mine clearing projects currently being implemented is clearly evident. There is substantially more trade between South Sudan and Uganda as well as Kenya even when compared to only a couple of years ago. Traders are moving across borders with relative ease and major markets are well stocked with both food and non-food commodities. A key issue raised by the traders was that they would like to see more transparency in terms of taxes and duties that are being levied on the traded commodities.

However, the issue of feeder roads is still a major challenge throughout South Sudan. Many farmers even in the high agricultural production areas such as the green belt are intentionally not producing more given the difficulties in getting their produce to the markets. Any meaningful improvement in agricultural production will be difficult unless the issue of market access through the development of feeder roads is addressed.

The mission recommends that in addition to continuing the development of the trunk roads more national and international resources should be made available to improve the feeder road network in South Sudan.

In the absence of a comprehensive food security policy for South Sudan, GoSS has had to rely more on relevant sector specific policies—agricultural policy, land policy, etc.—to address national food security concerns. The lack of a comprehensive food security policy has resulted in a significant disconnect between the GoSS vision of food security and how it is being interpreted and implemented by the State Governments. The main issue is that State authorities consider current policies to be very broad and not directly relevant to the food security issues that they face on the ground.

To address this disconnect, and assist in the on going development of a comprehensive food security policy, the mission recommends that the State level findings of the recently concluded ANLA should also be formally and widely shared with the relevant food security actors in each State. Then a response options plan could be jointly developed to ensure State relevance and ownership. The Central government should then ensure that the new national food security policy and its implementation plan are robust enough to address the food security concerns of the respective States.

## ANNEX 1

## THE CENSUS OF 2008

Southern Sudan's first national census was conducted in April 2008, but its results were not published until after the conclusion of the 2008 CFSAM. The census figures give Southern Sudan a total population of 8.3 million, 13 percent less than the 9.4 million used by the CFSAM for mid-2008 (Table A1). There is an even greater discrepancy, both up and down, for some of the constituent states, varying between a reduction of 47 percent in both Warrap and Northern Bahr el Ghazal and an increase of 52 percent in Central Equatoria. In terms of absolute numbers, Warrap is reported by the census to have almost 900 000 fewer inhabitants than was estimated by the CFSAM. These changes have enormous implications for the final production figure for each state since the calculation of production is based on numbers of farm households and their average cereal areas. It has no effect, however, on the calculation of the food balance, since consumption requirements are also calculated on the basis of population numbers; increases and decreases in population estimates result in equivalent increases and decreases in both production and consumption estimates.

**Table A1: Southern Sudan - State population comparisons between 2008 census and 2008 CFSAM**

| State | 2008 Census (a) | 2008 CFSAM (b) | Change from CFSAM (a – b) | % change from CFSAM |
|---|---|---|---|---|
| Upper Nile | 964 353 | 705 352 | 259 001 | 37 |
| Jonglei | 1 358 602 | 1 088 693 | 269 909 | 25 |
| Unity | 585 801 | 644 592 | -58 791 | -9 |
| Warrap | 972 928 | 1 842 830 | -869 902 | -47 |
| Northern Bahr el Ghazal | 720 898 | 1 360 098 | -639 200 | -47 |
| Western Bahr el Ghazal | 338 431 | 442 121 | -103 690 | -23 |
| Lakes | 695 730 | 943 119 | -247 389 | -26 |
| West Equatoria | 619 029 | 854 817 | -235 788 | -28 |
| Central Equatoria | 1 103 592 | 725 798 | 377 794 | 52 |
| East Equatoria | 906 126 | 840 496 | 65 630 | 8 |
| **Southern Sudan** | **8 265 490** | **9 447 916** | **-1 182 426** | **-13** |

A further concern is that, although the census uses the same ten states and state boundaries as the CFSAM, many of the counties within the states are different both in name and in terms of boundaries to those used by the CFSAM. Since, as mentioned above, the methodology used for estimating the area under cereals relies on estimates of the numbers of farming households in each county and the average cereal area for each household, it was essential to seek as close a correspondence as possible between the two sets of counties. The result is Table A2, which was drawn up in consultation with a number of people in development who have a long familiarity with Southern Sudan, its administrative boundaries and its agro-ecological zones. Some of the census entities are subdivisions of the CFSAM entities, while others are aggregations of them; more confusingly, there appear to be some census entities that incorporate parts but not all of different CFSAM entities, and vice versa. The main weakness of the table is that it omits many of the county names that are included in the 2008 CFSAM. However, the table does provide a means of assigning household cereal areas to each of the census counties based on the areas attributed by previous CFSAMs over the course of several years; and this, when used in conjunction with current county yield estimates, provides a means of estimating cereal production.

**Table A2: Southern Sudan - Approximate correspondence between current county names (census of 2008) and previous county names (as used in 2008 CFSAM report) for the purpose of estimating the percentage of farming households**

| Current | Previous |
|---|---|
| **Upper Nile** | |
| Renk | Renk |
| Manyo | Fashoda |
| Fashoda | Fashoda |
| Melut | Renk |
| Maban | Latjor |
| Maiwut | Latjor |
| Luakpiny/Nasir | Latjor |
| Longochuk | Latjor |
| Ulang | Latjor |
| Baliet | Latjor |
| Malakal | Malakal |
| Panykang | Malakal |
| **Jonglei** | |
| Old Pangak | Old Fangak |
| Khorflus | Old Fangak |
| Ayod | Ayod |
| Duk | Waat |
| Wuror | Wuror |
| Nyirol | Nyirol |
| Akobo | Akobo |
| Pochala | Pochala |
| Pibor | Pibor |
| Twic East | Twic East |
| Bor South | Bor South |
| **Unity** | |
| Pariang | Ruweng |
| Abiemnhom | Mayom |
| Mayom | Mayom |
| Rubkona | Rubkona |
| Guit | Guit |
| Koch | Koch |
| Leer | Leer |
| Mayendit | Koch |
| Paynijar | Paynijar |

| Current | Previous |
|---|---|
| **Warrap** | |
| Abyei | *Abyei*[1/] |
| Twic | Twic |
| Gogrial West | Gogrial |
| Gogrial East | Gogrial |
| Tonj North | Tonj |
| Tonj East | Tonj |
| Tonj South | Tonj |
| **North Bahr el Ghazal** | |
| Awiel North | Awiel North |
| Awiel East | Awiel East |
| Awiel South | Awiel South |
| Awiel West | Awiel West |
| Awiel Centre | Awiel Town |
| **West Bahr el Ghazal** | |
| Raja | Raja & Raja Town |
| Jur River | Wau & Wau Town |
| Wau | Wau |
| **Lakes** | |
| Cuebit | Cuebit |
| Rumbek North | Rumbek |
| Rumbek Centre | Rumbek |
| Wulu | Cuebit |
| Rumbek East | Rumbek |
| Yirol West | Yirol |
| Yirol East | Yirol |
| Awerial | Awerial |

| Current | Previous |
|---|---|
| **Western Equatoria** | |
| Tambura | Tambura |
| Nagero | Tambura |
| Nzara | Yambio |
| Ezo | Ezo |
| Yambio | Yambio |
| Ibba | Maridi |
| Maridi | Maridi |
| Mvolo | Mundri |
| Mundri West | Mundri |
| Mundri East | Mundri |
| **Central Equatoria** | |
| Terekeka | Terekeka |
| Juba | Juba & Juba Town |
| Lainya | Yei |
| Yei | Yei |
| Morobo | Yei |
| Kajo Keji | Kajo Keji |
| **Eastern Equatoria** | |
| Torit | Torit |
| Lopa/Lafon | Torit |
| Kapoeta North | Kapoeta |
| Kapoeta East | Kapoeta |
| Kapoeta South | Kapoeta |
| Budi | Budi |
| Ikotos | Ikotos |
| Magwi | Magwi |

1/ Abyei, in Warrap State, has been a disputed county between north and south, and was consequently not included in previous CFSAM reports.

## ANNEX 2

## AGRICULTURAL SITUATION BY ZONE/REGION

### Upper Nile Region: Upper Nile, Unity and Jonglei States

Upper Nile Region was adversely affected by the prolonged dry spells and sporadic showers that characterized the beginning of the season. Jonglei continued to suffer with the subsequent below-average rainfall received in July, August and September, whereas parts of the other two states fared rather better in the second half of the season when rainfall assumed a more normal pattern in August and September.

Upper Nile and Unity States form a transition zone between the rainfed mechanized farms of north Sudan and the traditional hand-cultivated farming systems of the south. This year all mechanized farming operations in Malakal were curtailed because of ongoing conflict and insecurity there, with the result that no production is expected. However, the situation was better in other mechanized areas of the two states, where the combination of improved access to credit, support from GOSS MAF, greater numbers of operational tractors, and an improvement in rainfall during the months of August and September led to expectations of a relatively good cereal harvest from almost 270 000 hectares. This is similar to the total mechanized area planted last year. Sorghum yields at Renk, which is by the far the largest producer, are estimated to be in the region of 430 kg/ha, while those at Manyo, Maban and Melut are expected to be higher, at up to 1.1 tonne/ha. The sesame harvest from more than 80 000 hectares is also expected to be satisfactory.

In the traditional sector, FAO supported 10 000 households (mainly IDPs and vulnerable households) in Upper Nile with maize, sorghum, groundnut and sesame seed (38, 30, 50 and 10 tonnes respectively), and 30 000 hand-tools. Nearly all farmers postponed planting by about one month because of the poor rains at the beginning of the season. Maize and short-season sorghum suffered at first with the continuing sub-optimal moisture conditions but revived to a certain extent with the better rains received in August and September. Nevertheless, yields in the east of Upper Nile are estimated to be poor. In Unity, where the planted area is estimated to have increased this year, the most productive counties were the central ones of Guit and Rubkona. Further north and further south suffered from prolonged dry spells.

Jonglei, Southern Sudan's largest state, where farming is exclusively traditional, was generally much more adversely affected by the season's poor rainfall than the other two states in the region. A promising start to the rains in April was followed by a long dry spell from May to July, and many farmers re-planted several times. Although FAO had provided about 83 tonnes of cereal seed (a small amount in a state with more than 160 000 farming households), seed eventually came to be in short supply, with the result that the final planted area was considerably reduced compared with that of last year. The south and the east were worst affected by the poor ensuing rains, with some farmers experiencing virtually complete crop failure.

East Coast Fever, apparently new to Jonglei and possibly imported with cattle from Uganda, is reported to have caused high mortality this year. Contagious bovine and caprine pleuropneumonia continue to be prevalent amongst cattle and goats respectively. As a result of the dry conditions experienced this year, cattle began to migrate to the lowlands several weeks earlier than usual in search of pasture. With cattle raiding already at an all-time high in 2009, this movement to scarce pasture is expected to exacerbate inter-tribal conflict.

### Bahr el Ghazal Region: Northern Bahr el Ghazal, Western Bahr el Ghazal, Warrap and Lakes States

The rains appeared to start normally in April and early May over most of Bahr el Ghazal Region, but this was followed by a long period of up to two months when rainfall was, at best, sporadic. Rainfall returned to a semblance of normality in July and in some areas was fairly satisfactory for the rest of the season. Other areas, however, especially in the north of the region, experienced an early cessation of the rains.

In Northern Bahr el Ghazal, where serious flooding occurred in 2008 spoiling much of the crop in the field, farmers tended this year to plant less on low ground and more on high ground in anticipation of a possible repeat of last year's flooding. However, with this year's reduced rainfall, low-lying areas did much better than the higher areas which often suffered from moisture deficit. In the west of Western Bahr el Ghazal (Raja), sorghum production was generally better than last year when the crop was adversely affected by excessively heavy rains. Given the late start to the rains over the region, time of planting was

critical. Short-season sorghum planted in early July mostly gave satisfactory yields when harvested in early October, but later plantings did poorly. Likewise, long-season sorghum planted before the end of June is set to give acceptable yields in December even if there is no further rainfall. In contrast, long-season sorghum planted later than mid-July was, by mid-November, still at the point of heading and required continuing rainfall if it was to be productive. Much of the higher land in Northern Bahr el Ghazal did poorly in terms of groundnut and sesame as well as cereal production. The long-planned rice scheme near Aweil appears eventually to be on the point of realisation with the assistance of the German consultancy GTZ 4 600 ha have been surveyed, of which 1 250 have already been developed (levelling, infrastructure, canals etc.). More than 100 ha have been planted for seed for next year, and it is hoped that the full 4 600 ha will be in production within five years. Yields are expected to be in the order of 2 tonne/ha. For many years about 200 ha of rice have been grown annually by smallholders outside the scheme.

The area under cassava is said to have reduced in some parts of the region this year as a result of a shortage of planting material. Yields, however, are generally satisfactory, in the range of 10-30 tonne/ha (fresh weight).

Civil insecurity was an issue in three areas in particular. In Wulu county in Lakes, tribal conflict caused the mass movement of farmers out of the area with the result that the county recorded no cereal production; in Mapel in Western Bahr el Ghazal, a similar movement away from farms and into safe camps was occasioned by repeated raids by armed groups said to be from Lakes; and in Twic county in Warrap, cattle raiding caused significant community displacement.

Cattle in Northern Bahr el Ghazal have recovered this year after last year's serious outbreak of trypanosomiasis, but numbers are still said to be down. Anthrax was also reported but was contained, while goat mortality from PPR (peste des petits ruminants) appears to have increased this year. Livestock condition in the region is currently good, but pasture is expected to deteriorate rapidly in the coming months as the result of this year's reduced rainfall. This, and the pockets of civil insecurity, are likely to increase the pressure on available grazing lands and consequently the possibility of further outbreaks of violence and conflict.

**Equatoria: Western Equatoria, Central Equatoria and Eastern Equatoria**

Much of Equatoria lies within the Green Belt which benefits from a weakly bimodal rainfall pattern. In a year of normal rainfall, it is possible to produce two cereal crops, the first between March and July, and the second between August and December. This year most parts of Equatoria received their first rains at the normal time of March-April, but this was followed in many areas by long periods of sporadic rainfall between May and the end of July. The central area of Western Equatoria, however, having had better rainfall than elsewhere during that period, then experienced an uncharacteristically dry spell in August. The drier areas of the region included the eastern and western extremities of Western Equatoria, the north of Central Equatoria, and the east of Eastern Equatoria.

The poor first half of the season, which saw a substantial amount of replanting using scarce seed, resulted in very little crop production, and a significant amount of total crop failure. The second half of the season was better with respect to rainfall, but unfortunately many of the relatively more favoured areas were subject to increased insecurity this year from both cattle raiders and incursions of the Lord's Resistance Army from across the border in Uganda. This insecurity discouraged farmers from planting far from their homes and reduced the amount of time that farmers would normally spend tending their fields and weeding. Migration of youth from the countryside to the fast-growing towns posed a further problem to many farming communities; farm labour became either more costly or simply not available. As might be expected from its relatively easy access to Juba, Central Equatoria was worst affected by this development, which, combined with a shortage of seed and threats of insecurity, conspired to reduce the area planted this year. Yields too were down on last year as a result of the often poor rains and the insecurity which led to poor crop maintenance. In Eastern Equatoria there's was an increase in the area cultivated per household, but unfortunately yields from this increased area were low because of the poor rains.

Farmers mostly use their own seed retained from the previous harvest, although some buy from the market. In Western Equatoria this year FAO provided maize, sorghum, groundnut and sesame seed, and GOSS provided about 38 tonnes of cereal seed, comprising sorghum, maize and rice. In the uplands of Eastern Equatoria, SMOA, FAO and CRS have been trying to increase the availability of cassava planting material.

Levels of crop pests and disease in the region have been normal this year. Principal among these are elegant grasshopper, termites, striga, and rosette virus of groundnut. Grain losses to birds are reported to have fallen slightly this year.

In the better, central, part of Western Equatoria, average maize yields were estimated to be between 1.8 and 2.0 tonne/ha this year, and sorghum yields about 1.2 tonne/ha. In a relatively good year yields of 2.5 to 3.0 tonne/ha for maize, and about 1.5 tonne/ha for sorghum are expected.

Livestock condition is currently satisfactory over most of the region. However, in the pastoralist east of the region near Kapoeta, which received especially poor rainfall this year, cattle have been kept in the lowlands throughout instead of being transferred to highland pasture during the rainy season. A strong indicator of the impending problems of livestock in this area, as well as of the relative shortage of grain, is the low price they now fetch compared with grain; terms of trade are currently weighted heavily in favour of grain. The incidence of CCPP, worms and mange remains normal throughout the region, but there have been reports of trypanosomiasis in Western Equatoria.