

# **SPECIAL REPORT**

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

**8 February 2012**



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



**WORLD FOOD PROGRAMME, ROME**

*This report has been prepared by Swithun Goodbody and Jonathan Pound (FAO) and Rogerio Bonifacio (WFP) 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.*

Shukri Ahmed  
Senior Economist, EST-GIEWS  
Trade and Markets Division, FAO  
Fax: 0039-06-5705-4495  
E-mail: [giews1@fao.org](mailto:giews1@fao.org)

Stanlake Samkange  
Regional Director  
WFP-ODN  
Fax: 0027-11-517-1642  
E-mail: [stanlake.samkange@wfp.org](mailto:stanlake.samkange@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](http://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](mailto: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**

	<b><u>Page</u></b>
<b>Acronyms and Abbreviations</b> .....	4
<b>Mission Highlights</b> .....	5
<b>1. <u>OVERVIEW</u></b> .....	5
<b>2. <u>SOCIO-ECONOMIC CONTEXT</u></b> .....	7
2.1 General .....	7
2.2 Economy .....	7
2.2.1 Economic growth and national budget .....	7
2.2.2 Inflation and exchange rate .....	8
2.3 Agriculture .....	9
<b>3. <u>CEREAL PRODUCTION IN 2011</u></b> .....	10
3.1 Cereal harvested area estimates .....	10
3.2 Factors affecting yields .....	14
3.2.1 Rainfall .....	15
3.2.2 Inputs in the traditional sector .....	15
3.2.3 Pests, diseases and weeds .....	17
3.3 Agricultural production in 2011 .....	17
3.3.1 Cereal production .....	17
3.3.2 Cassava .....	22
3.3.3 Livestock .....	22
3.4 Security .....	23
<b>4. <u>CEREAL SUPPLY/DEMAND SITUATION</u></b> .....	25
4.1 Cereal balance .....	25
4.2 Household food consumption patterns .....	26
4.3 Cereal markets .....	27
4.4 Livestock prices .....	30
<b>5. <u>HOUSEHOLD FOOD SECURITY SITUATION</u></b> .....	32
5.1 Methodology .....	32
5.2 Food security status for 2011-2012 in South Sudan .....	33
5.3 Current food security situation .....	35
5.3.1 Changes in household food sources .....	37
5.3.2 Changes in income sources and livelihood options .....	37
5.3.3 Changes in food expenditure patterns .....	38
5.3.4 Changes in food consumption and coping strategies .....	39
5.4 Nutrition situation .....	41
5.5 Summary of findings for food security and nutrition .....	42
5.6 Estimated food assistance requirements in 2012 .....	43
5.6.1 Scenarios .....	43
5.6.2 Food assistance requirements .....	43
<b>ANNEX I: COUNTIES VISITED BY THE MISSION</b> .....	45
<b>ANNEX II: NDVI AND RAINFALL ESTIMATES, 2011</b> .....	46
<b>ANNEX III: SEASONAL CALENDAR</b> .....	50
<b>ANNEX IV: SITUATION BY STATE</b> .....	51

**Acronyms and Abbreviations**

<b>ANLA</b>	Annual Needs and Livelihoods Analysis
<b>BOSS</b>	Bank of South Sudan
<b>CFSAM</b>	Crop and Food Security Assessment Mission
<b>CMD</b>	Cassava mosaic disease
<b>CPA</b>	Comprehensive Peace Agreement
<b>CPI</b>	Consumer Price Index
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organization
<b>FSMS</b>	Food Security Monitoring System
<b>GDP</b>	Gross Domestic Product
<b>GFD</b>	General Food Distribution
<b>GOSS</b>	Government of South Sudan
<b>ha</b>	hectare (0.42 hectares = 1 feddan)
<b>hh</b>	household
<b>JRC</b>	Joint Research Centre (European Commission)
<b>MAF</b>	Ministry of Agriculture and Forestry
<b>MARF</b>	Ministry of Animal Resources and Fisheries
<b>MCI</b>	Ministry of Industry and Commerce
<b>mm</b>	millimetres
<b>NBHS</b>	National Baseline Household Survey
<b>NBS</b>	National Bureau of Statistics
<b>NPA</b>	Norwegian People's Aid
<b>OCHA</b>	Office for the Coordination of Humanitarian Affairs
<b>SDG</b>	Sudanese Pound (superseded by SSP in July 2011)
<b>SIFSIA</b>	Food Security Information for Action (EC/FAO)
<b>SSP</b>	South Sudanese Pound
<b>SSRRC</b>	South Sudan Relief and Rehabilitation Commission
<b>t</b>	tonne
<b>ToT</b>	Terms of trade
<b>USAID</b>	United States Agency for International Development
<b>USD</b>	United States Dollar
<b>WFP</b>	World Food Programme

### **Mission Highlights**

- National cereal production in 2011, estimated at 562 600 tonnes, is about 19 and 25 percent below the previous year's output and the average of the last five years respectively.
- Despite early favourable rains, a dry period set in from June, which was protracted over most of the northern states of the country. Rainfall resumed a more normal pattern towards the end of July.
- Reflecting 2011's seasonal rainfall patterns, much of the north and north-east parts of the country has seen significant output reduction whereas production in the south, and particularly in the south-west, has been similar to, or better than in, 2010.
- Given the large influx of returnees in 2011, natural population growth and a reduced harvest, the country is left with a national cereal deficit of approximately 473 700 tonnes, about 180 000 tonnes larger than in 2010.
- Livestock and pasture conditions are generally satisfactory.
- Grain prices rose steeply in 2011 and remained higher than levels of the previous year, though modest declines were observed since October 2011. Livestock prices have also increased but at a slower pace than cereal prices since mid-2011 leading to a deterioration of the terms of trade (ToT) for pastoralists. However, the weakening of cereal prices in October and the continued increase in livestock prices have resulted in slight improvement of the ToT in favour of pastoralists.
- The depreciation of the South Sudanese Pound and rising fuel costs have contributed to a general escalation of food and commodity prices in general during 2011.
- Trade restrictions between South Sudan and Sudan have significantly reduced the availability of food commodities, especially for communities in border States.
- Civil insecurity, in the form of armed cattle rustling, inter and intra-communal conflict and militia attacks, continue to hamper the country's production capacity, particularly limiting the potential expansion of cropped area in many parts of the country, as well as hindering access to markets for farming inputs and food commodities.
- The lower than usual household food stocks, continuing insecurity and higher market prices experienced in 2011 combined to impede food access and availability, and aggravated food security conditions in 2011. The situation is anticipated to deteriorate further starting from the first quarter of 2012, particularly in the states of Upper Nile, Northern and Western Bahr el Ghazal and Eastern Equatoria.
- An estimated 4.7 million people will be food insecure during 2012 in South Sudan, of which 1 million severely food insecure. This compares to 3.3 million people in 2011, of which 900 000 were severely food insecure.
- It is estimated that up to 185 000 tonnes of food will be required to assist the most food insecure rural households, vulnerable children, IDPs, refugees and returnees.

## **1. OVERVIEW**

An FAO/WFP Crop and Food Security Assessment Mission (CFSAM) visited South Sudan from 16 October to 10 November 2011 to estimate cereal production and assess the overall food-security situation. The mission was requested following the findings of the Rapid Crop Assessment (RCA) conducted by the Ministry of Agriculture and Forestry (MAF) in August in collaboration with FAO, WFP, FEWSNet and Norwegian People's Aid (NPA). Based on the RCA scenario analysis, cereal production in 2011 was forecast to decline by between 30 and 60 percent relative to 2010, if the prevailing conditions at the time of the assessment persisted.

As well as FAO, WFP and MAF, the Mission included representatives from the National Bureau of Statistics (NBS), the South Sudan Relief and Rehabilitation Commission (SSRRC), NPA, the United States Agency for International Development (USAID) and a European Union (EU) observer from the European Commission Joint Research Centre (EC/JRC). The Mission held meetings with officials of MAF, the Ministry of Animal Resources and Fisheries (MARF), the Ministry of Commerce and Industry (MCI), the SSRRC, the Bank of South Sudan (BOSS), the World Bank, the UN Office for the Coordination of Humanitarian Affairs (OCHA), and the NBS, as well as with resident staff of FAO and WFP.

The Mission, comprising five teams, visited 41 counties in all ten states of South Sudan (see Annex I). Location-specific information was obtained from relevant state and local authorities, including the SSRRC, the State Ministries of Agriculture (SMoA), as well as from NGOs and international agencies based in the field. This information, along with information obtained from farmers, rural households, herders, fishermen, merchants, market traders and health workers was triangulated with field observations during visits to rural communities and individual farms. Rainfall estimates and normalized difference vegetation index (NDVI) data provided by EC/JRC for 2011 were compared with local rain-gauge data and accounts of rainfall provided by farmers and other informants. The Mission observed market supplies and prices in the main centres, in addition to analysing WFP's market price data. Invaluable support, both technical and logistical, was provided by the EC/FAO Food Security Information for Action (SIFSA) programme and from WFP's Vulnerability Analysis and Mapping (VAM) Unit.

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

- I. estimates of the numbers of farm households in each county, based on the 2008 census figures and adjusted according to the officially accepted population growth rate of 2.052 percent per annum;
- II. standard estimates of the average area per farm household under cereals for each county, adjusted according to Mission observations made during field visits; and
- III. estimates of average cereal yield for each county based on field observation and inspection, and on interviews with farmers, extension officers, NGOs, local SMoA staff and community representatives.

The product of these three variables gives a cereal production estimate for each county, these are then summed to provide production figures for each state and for South Sudan as a whole.

In 2011, there was a substantial geographical variation in crop growing conditions between States. Despite early favourable rains, a prolonged dry spell set in from June, particularly impacting Upper Nile, Unity, Warrap, Northern Bahr el Ghazal and parts of Jonglei, with many areas receiving negligible rainfall over periods as long as two months (June and July). This resulted in frequent re-plantings, a general reduction in the planted area compared with 2010 and suppressed yields. The rains returned to a more normal pattern at the end of July across the country, though erratic precipitation continued in some northern areas.

Other biological factors such as crop pest and disease levels were mostly normal this year. However, insecurity remains a major constraint to optimising the country's agriculture potential. Incidents of armed cattle rustling, inter and intra-communal conflict and the activities of militia groups continue to inhibit farmers in affected areas from expanding the cultivated area. In 2011 (January-November), OCHA reported approximately 456 incidents of conflict, occurring mostly during the months of May, June and July, corresponding to the peak months of agricultural activities.

Compared with 2010, the cereal area harvested in the traditional sector is estimated to have fallen by approximately 7 percent from 921 000 hectares to about 860 000 hectares; the average national net cereal yield by 13 percent from 0.75 t/ha to 0.65 t/ha; and the country's total net cereal production by almost 19 percent from 695 000 tonnes to about 562 600 tonnes. This implies a national cereal deficit of approximately 473 700 tonnes for 2012, compared to 291 000 tonnes in 2010, taking into account natural population growth and an influx of almost 350 000 returnees from Sudan over the previous 12 months.

The imposition of trade restrictions between Sudan and South Sudan since July 2011 has had adverse consequences on food availability in the country, particularly affecting communities in northern states that are heavily reliant on supplies from Sudan. The resulting effect, in addition to a rise in fuel prices and a depreciated currency, has led to a general increase in inflation rates during 2011 and a sharp rise in grain prices since mid-2011. Terms of trade (ToT), despite strengthening in favour of livestock in recent months, fell earlier in 2011 in most areas due to an accelerated rise in grain prices, relative to livestock prices.

The food security situation deteriorated in 2011 compared to 2010, and present conditions are expected to worsen further starting from the first quarter of 2012, with the States of Upper Nile, North and Western Bahr el Ghazal and Eastern Equatoria worst affected. In total, an estimated 1 million persons (11 percent of the population) are categorised as severely food insecure and an additional 3.7 million (37 percent) are considered to be moderately food insecure. This compares unfavourably with 2010, when 900 000 (10 percent) and 2.4 million (26 percent) people who were severely and moderately food insecure, respectively.

The current negative trend in food insecurity conditions results from the combination of a decrease in cereal production, continuing insecurity and high prices. These factors are reflected in the Food Security Monitoring System (FSMS) data that indicates a sharp increase in the importance of markets as a source of food, a larger number of households with high food expenditure and an increased adoption of coping strategies that involve a reduction in food consumption, compared with the same period in the previous year.

In the best-case scenario, the Mission estimates food assistance requirements at 152 243 tonnes to assist 2.7 million unique beneficiaries. The population targeted for assistance includes the severely food insecure population living in rural areas (870 000 people) plus the proportion of the moderately food insecure households in rural areas that are already showing poor food consumption (364 000 people) and who need assistance to face up to the effect of high and rising food prices. Additional assistance will be provided to conflict affected population (refugees, returnees, IDPs and displaced residents from Abyei), for school meals, to programmes to tackle malnutrition and institutional feeding programmes.

In the contingency scenario (extremely high food prices and continuing conflict), food assistance requirements are estimated at 184 803 tonnes (an additional 32 560 tonnes) for just over 3 300 000 unique beneficiaries. Here, the best case scenario is increased with the addition of 27 percent of the moderately food insecure people who have borderline food consumption; assistance is needed to prevent them from slipping into severe food insecurity during the hunger season.

## **2. SOCIO-ECONOMIC CONTEXT**

### **2.1 General**

Following the referendum held at the beginning of 2011, South Sudan became an independent nation on July 9, marking the conclusion of the Comprehensive Peace Agreement (CPA) that had been in place since 2005. Despite significant improvements since the inception of the CPA and continuing efforts to unify and stabilise the country, insecurity is still prevalent, particularly in the northern border regions with Sudan and areas affected by inter and intra-communal conflict. However, the country has significant potential to gain from its richly endowed natural resources, encompassing an area of approximately 640 000 square km. Nonetheless, sufficient and well-targeted investment is essential if the country's agriculture potential is to be fulfilled. The 2008 Population and Housing Census of Sudan estimated the population at 8.26 million, with more than 50 percent below the age of 20. Given the implicit annual increment of 2.052 percent, and including returnees between October 2010 and October 2011, the population for mid-2012 is estimated at 9.6 million. While the population has increased, population density still remains one of the lowest in sub-tropical countries, with the highest concentration situated in Northern Bahr el Ghazal, Warrap and Central Equatoria.

### **2.2 Economy**

#### **2.2.1 Economic growth and national budget**

Gross domestic product (GDP) for South Sudan has only recently been computed and in 2010 was estimated at 30 billion Sudanese Pounds, the equivalent of USD 13.22 billion. Given the comparatively low population, GDP per capita remains one of the highest in the subregion. The economy is almost entirely dependent on oil revenues, which accounted for 71 percent of total GDP in 2010 and will continue to constitute a significant proportion in the near future. Similarly, the government's income is dominated by oil revenue, representing approximately 98 percent in 2010 and estimated at a comparable level in 2011. Economic growth of 6 percent is estimated for 2011 and a similar rate of growth is forecast for the subsequent year, provided oil production and prices are

maintained at their current levels. However, annual oil production is expected to reach a plateau in 2012 and forecast to halve by 2020<sup>1</sup>, with ensuing negative impacts on the government's principal revenue source as well as having a large bearing on future economic growth.

The imposition of trade restrictions between Sudan and South Sudan, from mid-2011, has severely hindered the inflow of goods to the detriment of economic activity. However, there were indications of increased trade with the countries bordering southern South Sudan, particularly Kenya and Uganda. Nonetheless, this is unlikely to fully compensate the diminished trade with Sudan, particular in northern states, which receive limited imported goods from the south due to the poor infrastructure network. However, on 18 September, the governments of Sudan and South Sudan signed an agreement designating 10 border points to be re-opened allowing for the free movements of goods. Based on the field visit there was no clear indication of a significant increase in trade following the agreement, although small amounts of food items had reportedly been brought into the country from Sudan during October and November.

Total government expenditure for 2011 is estimated at about SDG 7.7 billion (Table 1), up slightly from the 2010 budget, including SDG 5.7 billion by the approved the Government of South Sudan (GOSS) budget and about SDG 1.9 billion by donor organizations' funding<sup>2</sup>. Priority spending by the government is focused on security, public administration and infrastructure (mainly roads). The allocated budget for agriculture amounted to SDG 62.3 million marking an increase of 23 percent over the previous year's allocation. The principal components of the Ministry of Agriculture's activities focus on enhancing the technical capacity of the relevant institutions. In addition, there was also a substantial increase in the animal and fisheries budget in 2011, by 40 percent over the previous year's outturn.

**Table 1: South Sudan – 2011 expenditure by funding sources and by sectors (million SDG 1/)**

Sector	GOSS budget	Donors' funds	Total	Proportion of total budget (%)
Accountability	196.84	74.78	271.62	3.5
Economic functions	206.26	34.14	240.40	3.1
Education	429.05	177.55	606.60	7.9
Health	223.98	298.70	522.69	6.8
Infrastructure	618.77	359.46	978.23	12.7
Natural resources	275.75	118.01	393.75	5.1
Public administration	771.39	95.69	867.09	11.3
Rule of law	561.38	3.91	565.29	7.4
Security	1 627.21	82.03	1 709.24	22.3
Social & humanitarian	128.52	668.62	797.14	10.4
Transfers to states	727.97		727.97	9.5
<b>Total</b>	<b>5 767.11</b>	<b>1 912.90</b>	<b>7 680.01</b>	<b>100</b>

1/ Figures based on 2011 National Budget using SDG currency.

### 2.2.2 Inflation and exchange rate

The South Sudanese pound (SSP) was introduced following independence and operates under a managed float; the lower and upper band limits were set at SSP 2.9 and 3.3 per USD, while the SSP was initially established at parity with the Sudanese pound (SDG). Since the introduction of the SSP the currency experienced a rapid depreciation, attributed to the country's tight foreign reserves; the black market exchange rate surpassed SSP 4 per USD in October 2011. Consequently this has intensified inflationary pressure during 2011, given the country's high exposure to imported inflation.

<sup>1</sup> *Regional Economic Outlook: Middle East and Central Asia*, October 2011. IMF

<sup>2</sup> GOSS, Ministry of Finance & Economic Planning, Approved Budget 2010.



However, policies implemented by the Bank of South Sudan (BOSS) aimed at mitigating the depreciation had helped to strengthen the SSP's value to under SSP 4 per USD by the beginning of November 2011. The measures instigated by the BOSS focused on increasing foreign currency supplies in the main urban markets; transfers to banks and foreign exchange bureaus increased to USD 4 million and USD 400 000 per week, respectively. Furthermore, under this scheme, the supplementary USD supplies are targeted to help facilitate the importation of five designated strategic commodities, including food and fuel. Constrained foreign currency supplies however, will continue to play a part in sustaining high black rates in many areas not supplied with adequate levels of USD.

Inflation rates have increased substantially since November 2010. According to the consumer price index (CPI) released by the National Bureau of Statistics, year-on-year inflation reached 79 percent in November 2011, aided by a significant and rapid increase in food prices. Over this period, monthly inflation rates have also fluctuated significantly, ranging from -6.5 to 15 percent, illustrating the volatility of prices during 2011.

### **2.3 Agriculture**

South Sudan experiences both unimodal and bimodal rainfall regimes. The bimodal areas cover much of Greater Equatoria (Western, Central and Eastern Equatoria) while the rest of the country has a unimodal regime. This results in a range of growing seasons from 280 to 300 days in the southern parts of South Sudan to 130-150 days per annum in the northern parts. Agricultural performance consequently varies considerably depending primarily on latitude, with the possibility of two harvests per annum in Greater Equatoria, particularly between Tambura and Kajo-Keji, and a single harvest in the unimodal areas further north.

With almost all of South Sudan's agricultural production being rain-fed, rainfall variability is a major factor in determining crop performance. There can be considerable variation in rainfall from year to year and also from location to location within the same year. In many lowland areas, flooding is a common occurrence, while many areas, especially those towards the north of the country, are susceptible to prolonged dry periods.

Most crop production is carried out on small, hand-cultivated areas. Despite the abundant availability of land, the area cultivated by households is severely limited by labour shortages, and in many areas frequent incidents of insecurity induce farmers to only cultivate land close to their home. Nationally, the average size of cropped area per household is estimated at about 0.75 hectares in 2011. Farmers commonly use their own seed saved from the previous year's harvest, and virtually no commercial fertilizers, pesticides or herbicides are used.

Sorghum is the main crop cultivated in South Sudan; there is a very large number of local landraces and varieties ranging from short-season to very long-season (more than 220 days) and from short stature to very tall (more than 5 metres). It is the main staple food in all states except for the three Equatorias where the local diet also includes maize flour (largely imported from Uganda) and cassava (mainly produced in the Green Belt). In Northern and Western Bahr el Ghazal, Warrap and Lakes, sorghum is often intercropped with sesame and millet. Maize is normally cultivated in limited areas close to homesteads and is often consumed green. In some locations such as in Upper Nile, where birds are particularly troublesome, maize is often cultivated instead of sorghum in order to avoid grain loss. Minor cereal crops such as bulrush millet, finger millet and upland rice are also cultivated in certain locations. Groundnut is cultivated on sandy soils in most locations and makes an important contribution to household diet; it is the main cash crop contributing to farming households' income at certain periods of the year. In parts of Central and Western Equatoria, sweet potato, yam, coffee, mango and papaya are commonly grown. Okra, cowpea, green-gram, pumpkin, bambara nut and tobacco are also widely grown around homesteads. Vegetables such as onions or tomatoes are not commonly grown in rural areas, but are increasingly cultivated near cities to supply urban markets.

Rainfed mechanized cereal production is practised mainly in the Upper Nile counties of Renk and Melut, and to a limited extent in Malakal and Bentiu in Unity State. Mechanization applies only to land preparation; all other operations from sowing to harvesting are done manually. Until this year when South Sudan became fully independent, *Quelea* birds near the mechanized areas were routinely controlled by aerial spraying of nesting sites.

The MAF, FAO and some NGOs have promoted animal traction on a small scale in Central Equatoria, Eastern Equatoria, Lakes, Warrap and Bahr el Ghazal States in order to facilitate an increase in the area cultivated by each household. The main constraints to its adoption are social and cultural barriers, lack of spare parts and skills to maintain mould-board ploughs, the difficulty of identifying available plough types that are suitable for local soil conditions, and low levels of operator skill. The MAF also has a limited number of tractors in each state available for hire at concessionary rates by local farmers; not all are fully utilised because spare parts and fuel are not always available, and some states find it difficult to find adequately qualified drivers to operate them.

Livestock is hugely important in many parts of the country, the main species being cattle, goats and sheep. Since most cattle are kept for societal reasons and as a traditional form of wealth and status, a relatively small proportion enters the market.

### **3. CEREAL PRODUCTION IN 2011**

In the absence (because of as-yet poor infrastructure) of nationally generated crop-yield forecasts and accurate data of cropped land disaggregated by crop, cereal production has been assessed using estimates of the following three variables:

1. The numbers of farm households in each county, based on total county population figures and the proportion of rural to urban dwellers;
2. the average area per farm household under cereals for each county, adjusted according to Mission observations made during field visits; and
3. average cereal yield for each county, based on Mission observations and calculations, interviews with farmers and rural communities, and information obtained from SMoA, NGOs and others involved in agriculture.

The product of these three factors gives a cereal production figure for each county. These county figures are then summed to provide cereal production figures for each of the ten states and for South Sudan as a whole. The number of assumptions incorporated into this methodology means that the final production figures should not be regarded as necessarily exact, but rather as best estimates under the prevailing circumstances. The Mission stresses the need for a rigorous agricultural survey in order to establish a more accurate baseline with regard to cropped areas. Table 2 shows the estimated settled population, the number of farming households and the area of cereal harvested in 2011.

FAO and the EU have recently produced two documents (Land Cover Atlas of South Sudan and GMFS (Global Monitoring for Food Security) South Sudan CFSAM Support Kit) as a step towards improved quantification of arable areas and weather patterns. While both have contributed significantly to supporting the assessment, they are not yet at a stage where they could be considered sufficiently reliable or detailed to be used as the principal base from which to predict crop production.

#### **3.1 Cereal harvested area estimates**

The numbers of farming households in each county are estimated from the 2008 census data, which include numbers of households (both rural and urban) per county. Census figures have been adjusted for mid-2012 on the assumption of a population growth rate of 2.052 percent per annum. Numbers of returnees (IDPs and refugees) per state have been updated from 2010 figures based on information provided by OCHA. The numbers of 2010 returnees were available to the Mission only on a per-state rather than on a per-county basis, so they have been included as a separate group in the state totals in Table 2; numbers of returnees for 2011 have, however, been available on a per-county basis and have therefore been included in the county totals for 2011. The figures used for the proportion of farming households in each county have been developed over the past several years by FAO, WFP and others on the basis of extensive observations and interviews. Likewise, the average harvested area under cereals per farming household in each county has been developed over several years and is adjusted each year on the basis of information gathered through field observations, measurements and interviews.

The Mission estimates that the total area of cereal harvested in the traditional sector in 2011 was 859 622 hectares, which is about 7 percent below the 921 000 hectares estimated in 2010. This reduction

is mostly accounted for by the northern states which were affected by the prolonged dry spell at the beginning of the season. In some areas, fear of insecurity played a part in reducing cultivated area. On the positive side, Eastern and Western Equatoria and Western Bahr el Ghazal saw some increases in harvested area (see Table 2).

Greater accuracy in assessing cropped area may be possible in the not-too-distant future. The South Sudan Land Cover Database has been developed through the "Sudan Institutional Capacity Programme: Food Security Information for Action" (SIFSIA). The SIFSIA is a GOSS programme funded by the EU and implemented by FAO. The database provides information on the land-cover distribution at state, county and sub-basin level, using the FAO/GLCN (Global Land Cover Network) methodology and tools. Main data sources include satellite imagery from SPOT and Global Land Survey (GLS) Landsat, existing Africover land cover database and ancillary data. The legend was prepared using the Land Cover Classification System (LCCS) which uses a set of independent diagnostic criteria that allows correlation with existing classifications and legends. Satellite images of South Sudan were segmented into homogeneous polygons and they were interpreted according to the FAO/GLCN methodology for the production of a detailed land-cover dataset for the whole country. Field verifications, covering 49 sample areas, were conducted by national experts who received customized training on methodology and tools. The final land-cover product has around 100 000 polygons, classified into 43 different classes and aggregated into seven major classes for ease of analysis and display.

The Land Cover Database maps depict agricultural areas as single aggregations of 'Agriculture in terrestrial and aquatic/regularly flooded land'. Since these are areas of anthropogenic vegetation, they include not only all cropped areas but also all areas of abandoned and fallow agricultural land. As might be expected, therefore, the area of agricultural land according to the Land Cover Database is much larger than the actual area that will be harvested, and larger again than the actual area under cereals (the main focus of the CFSAM). According to the Land Cover Database South Sudan's total agricultural land is equal to 2 760 131 hectares, compared to the current CFSAM estimates, which only includes the area under cereals, of 859 622 hectares. The higher figure suggests that each household cultivates an average of 2.4 hectares (or 5.8 feddans), exceeding estimates that had been observed during the current and previous Missions. Given that the data is not yet disaggregated by crop type, for the purposes of the Mission, the data can only be used as a corroborative tool.

**Table 2: South Sudan – Estimated settled population, farming households and cereal harvested area in 2011**

STATE/COUNTY	Population mid-2011	Total households mid-2011	Farming households mid-2011 (%)	Farming households mid-2011	Average cereal area (ha/hh)	Total cereal area harvested (ha)
<b>Central Equatoria</b>	<b>1 224 424</b>	<b>198 883</b>	<b>66</b>	<b>130 777</b>	<b>0.94</b>	<b>122 525</b>
Returnees of 2010	46 478	7 747	50	3 873	0.48	1 859
Juba	397 504	62 376	50	31 188	0.80	24 950
Kajo Keji	209 656	34 746	90	31 271	1.00	31 271
Lainya	95 333	14 926	60	8 956	1.00	8 956
Morobo	110 583	16 767	60	10 060	1.00	10 060
Terekeka	149 855	26 786	90	24 107	1.00	24 107
Yei	215 015	35 535	60	21 321	1.00	21 321
<b>Eastern Equatoria</b>	<b>985 637</b>	<b>167 294</b>	<b>74</b>	<b>123 740</b>	<b>0.93</b>	<b>114 730</b>
Returnees of 2010	18 461	3 077	77	2 369	0.70	1 659
Budi	105 883	17 903	90	16 113	0.85	13 696
Ikotos	90 352	17 634	90	15 871	1.00	15 871
Kapoeta East	175 046	31 425	50	15 712	1.00	15 712
Kapoeta North	110 029	17 050	50	8 525	1.00	8 525
Kapoeta South	84 824	12 647	50	6 324	1.00	6 324
Lafon	113 314	18 356	85	15 603	0.90	14 042
Magwi	181 268	28 044	90	25 240	0.90	22 716
Torit	106 460	21 157	85	17 984	0.90	16 185
<b>Jonglei</b>	<b>1 477 874</b>	<b>210 011</b>	<b>82</b>	<b>172 393</b>	<b>0.74</b>	<b>128 394</b>
Returnees of 2010	27 736	4 623	78	3 606	0.50	1 803
Akobo	145 387	18 906	80	15 125	0.75	11 344
Ayod	148 666	18 023	90	16 221	0.75	12 166
Bor South	236 003	33 467	80	26 773	0.75	20 080
Duk	70 007	10 932	90	9 839	0.75	7 379
Fangak	117 550	15 554	90	13 998	0.75	10 499
Khorflus/Pigi /Canal	105 743	12 769	90	11 492	0.75	8 619
Nyirrol	115 996	16 299	90	14 669	0.75	11 002
Pibor	158 479	24 273	50	12 137	0.75	9 102
Pochalla	70 661	11 149	80	8 919	0.75	6 689
Twic East	91 099	15 344	90	13 810	0.75	10 357
Uror	190 547	28 672	90	25 804	0.75	19 353
<b>Lakes</b>	<b>807 203</b>	<b>109 309</b>	<b>87</b>	<b>94 807</b>	<b>0.74</b>	<b>70 260</b>
Returnees of 2010	64 598	10 767	82	8 829	0.45	3 973
Awerial	50 210	7 984	90	7 186	0.63	4 527
Cueibet	125 689	18 448	95	17 526	0.68	11 917
Rumbek Centre	163 896	17 950	80	14 360	0.90	12 924
Rumbek East	131 108	16 559	80	13 247	0.90	11 922
Rumbek North	46 335	5 286	80	4 229	0.90	3 806
Wulu	43 282	6 956	95	6 608	0.72	4 758
Yirol East	71 943	9 576	90	8 619	0.72	6 206
Yirol West	110 142	15 782	90	14 204	0.72	10 227
<b>N Bahr el Ghazal</b>	<b>848 066</b>	<b>155 661</b>	<b>86</b>	<b>134 481</b>	<b>0.50</b>	<b>67 618</b>
Returnees of 2010	78 597	13 099	58	7 598	0.40	3 039
Aweil Centre	44 645	9 693	30	2 908	0.50	1 454
Aweil East	330 802	60 709	95	57 673	0.50	28 837
Aweil North	137 827	26 569	95	25 241	0.45	11 358
Aweil South	78 779	14 999	80	11 999	0.70	8 399
Aweil West	177 416	30 592	95	29 062	0.50	14 531
<b>Unity</b>	<b>664 067</b>	<b>82 319</b>	<b>77</b>	<b>63 025</b>	<b>0.54</b>	<b>34 022</b>
Returnees of 2010	38 798	6 466	65	4 203	0.45	1 891
Abiemnhom	18 158	1 928	80	1 542	0.50	771
Guit	35 228	3 449	80	2 760	0.60	1 656
Koch	79 907	8 491	90	7 642	0.45	3 439

STATE/COUNTY	Population mid-2011	Total households mid-2011	Farming households mid-2011 (%)	Farming households mid-2011	Average cereal area (ha/hh)	Total cereal area harvested (ha)
Leer	56 594	7 518	80	6 015	0.50	3 007
Mayendit	57 407	7 053	90	6 348	0.50	3 174
Mayom	128 848	16 242	80	12 993	0.63	8 186
Panyijar	54 140	9 260	90	8 334	0.45	3 750
Pariang	87 998	11 166	70	7 816	0.63	4 924
Rubkona	106 989	10 747	50	5 374	0.60	3 224
<b>Upper Nile</b>	<b>1 036 229</b>	<b>153 185</b>	<b>67</b>	<b>102 624</b>	<b>0.66</b>	<b>67 958</b>
Returnees of 2010	6 901	1 150	60	690	0.45	310
Baliet	51 245	7 747	80	6 197	0.60	3 718
Fashoda	38 978	6 294	90	5 665	0.70	3 965
Longochuk	67 422	8 836	80	7 069	0.50	3 534
Luakpiny/Nasir	224 151	30 986	80	24 789	0.45	11 155
Maban	48 286	10 491	80	8 393	0.50	4 196
Maiwut	84 816	11 183	80	8 946	0.50	4 473
Malakal	135 005	18 031	50	9 015	0.45	4 057
Manyo	40 571	6 819	90	6 137	0.70	4 296
Melut	52 560	7 587	38	2 883	1.70	4 901
Panyikang	48 488	7 758	50	3 879	0.50	1 939
Renk	147 032	24 007	38	9 123	1.70	15 508
Ulang	90 774	12 297	80	9 838	0.60	5 903
<b>W Bahr el Ghazal</b>	<b>367 536</b>	<b>64 587</b>	<b>79</b>	<b>50 903</b>	<b>0.80</b>	<b>40 745</b>
Returnees of 2010	11 336	1 889	68	1 285	0.50	642
Jur River	136 496	22 188	60	13 313	0.80	10 650
Raga	58 051	10 895	75	8 171	0.85	6 946
Wau	161 653	29 615	95	28 134	0.80	22 507
<b>Warrap</b>	<b>1 014 941</b>	<b>177 991</b>	<b>89</b>	<b>158 274</b>	<b>0.53</b>	<b>84 278</b>
Returnees of 2010	32 071	5 346	83	4 437	0.30	1 331
Gogrial East	110 336	19 783	80	15 826	0.60	9 496
Gogrial West	260 577	48 059	80	38 448	0.60	23 069
Tonj East	124 051	21 100	95	20 045	0.53	10 624
Tonj North	176 504	31 716	95	30 130	0.50	15 065
Tonj South	92 505	15 533	95	14 757	0.50	7 378
Twic	218 897	36 454	95	34 631	0.50	17 316
<b>Western Equatoria</b>	<b>675 275</b>	<b>126 608</b>	<b>88</b>	<b>111 156</b>	<b>1.16</b>	<b>129 092</b>
Returnees of 2010	13 975	2 329	50	1 164	0.50	582
Ezo	86 383	19 444	90	17 500	1.20	21 000
Ibba	44 728	11 193	90	10 074	1.20	12 088
Maridi	88 092	14 014	90	12 613	1.15	14 504
Mundri East	51 617	7 287	80	5 829	1.20	6 995
Mundri West	36 295	4 302	80	3 441	1.20	4 129
Mvolo	51 421	7 007	80	5 606	1.20	6 727
Nagero	10 765	2 290	90	2 061	1.20	2 473
Nzara	70 199	17 433	90	15 690	1.10	17 259
Tambura	59 146	14 225	90	12 803	1.10	14 083
Yambio	162 654	27 085	90	24 376	1.20	29 251
<b>SOUTH SUDAN</b>	<b>9 101 252</b>	<b>1 445 847</b>	<b>79</b>	<b>1 142 179</b>	<b>0.75</b>	<b>859 622</b>

## **3.2 Factors affecting yields**

### **3.2.1 Rainfall**

The rains started slightly later than usual over most of South Sudan but were, at first, promising. However, this reasonably satisfactory start was quickly followed by a spell of below-normal and poorly distributed rainfall which was most prolonged in the northern and north-eastern states, especially Northern Bahr el Ghazal, Warrap, Unity and Upper Nile. The more southerly and south-westerly states also experienced a reduction in rainfall near the beginning of the season but only for a relatively short period, and in most of Greater Ecuatoria it was considered to have minimal effect on crop performance. Parts of Jonglei and parts of Lakes were somewhat affected by the dry spell, whereas most of Western Bahr el Ghazal was relatively unaffected (see Annex II for further details).

The EU's GMFS (Global Monitoring for Food Security) has produced monthly estimated rainfall maps for South Sudan mainly based on data from SPOT VGT, ENVISAT and METEO SAT (Annex II). These maps give a slightly (though not altogether) different picture to the one that was reported in the field and frequently supported by rain-gauge data. Part of the explanation for any differences may be that monthly totals can mask variations of relatively long duration. For example, at the Rice Scheme in Aweil, Northern Bahr el Ghazal, only 74 mm of rain were registered during the 44 days between 12 June and 27 July; these 44 days included one period of 15 days and two of 10 days when there was no rain. However, because rainfall before and after the 44-day period was relatively normal, a total of 240 mm was registered at the same rain-gauge over the course of the two months in question, which corresponds comparatively closely to the GMFS portrayal of the situation.

Data generated specifically by METEO SAT include dekadal rainfall figures for the various states as well as long-term dekadal averages. Calculation of the cumulative annual rainfall, dekad by dekad from the beginning of the year, allows a comparison to be made for each state between the cumulative rainfall for 2011 and the cumulative average rainfall for that state. The differences between these two sets of figures (Table 3) illustrate both the delay in rainfall at the beginning of the season and the eventual recovery to approximately average annual rainfall amounts by the end of the season. An anomaly is Upper Nile State where early rainfall was reported as being very poor but where the METEO SAT data indicate a recovery to normal cumulative rainfall amounts before all other states by the second dekad of June.

**Table 3: South Sudan - Dekadal deviation (%) of 2011 cumulative rainfall from long-term average cumulative rainfall 1/**

Month	Dekad	Central Equatoria	Eastern Equatoria	Jonglei	N Bahr el Ghazal	Unity	Upper Nile	Warrap	W Bahr el Ghazal	Western Equatoria
April	1	-61	-29	-65	-94	-73	-55	-84	-71	-46
	2	-58	-40	-58	-81	-85	-65	-84	-55	-49
	3	-54	-35	-59	-71	-74	-46	-72	-48	-43
May	1	-49	-26	-51	-59	-57	-42	-61	-44	-45
	2	-43	-22	-44	-45	-47	-43	-46	-33	-41
	3	-30	-10	-36	-28	-21	-16	-35	-24	-34
June	1	-30	-10	-32	-21	-10	-20	-13	-15	-25
	2	-29	-7	-24	-23	-5	23	-14	-14	-24
	3	-28	-5	-12	-13	-12	18	-18	-15	-25
July	1	-28	-8	-14	-8	-17	10	-17	-9	-22
	2	-27	-9	-16	-13	-15	6	-20	-14	-21
	3	-23	-7	-14	-12	-13	5	-20	-12	-17
Aug	1	-22	-7	-16	-12	-10	-0	-14	-8	-12
	2	-21	-6	-18	-13	-9	3	-13	-11	-12
	3	-14	-1	-17	-12	-6	4	-10	-11	-9
Sept	1	-5	4	-13	-6	-1	5	-3	-7	-6
	2	-5	5	-13	-8	-1	4	-5	-9	-6
	3	-4	8	-12	-5	1	4	4	-6	-3
Oct	1	-3	8	-10	-2	-1	6	5	-5	-2
	2	3	11	-8	4	2	8	12	-1	3
	3	5	13	-4	1	4	10	11	-3	5
Nov	1	6	16	-5	-1	2	7	9	-5	2

Source: METEO SAT data.

1/ Data for Lakes State not available.

### 3.2.2 Inputs in the traditional sector

Most farmers in the traditional sector use their own sorghum seed retained from the previous year's harvest<sup>3</sup>, while others purchase seed in the market, barter, or borrow from neighbours. Seed supplies were considered to be generally adequate, enabling some replanting following the prolonged dry spell, partly as a result of the relatively good harvest of 2010. A certain amount of seed is also provided by Government, NGOs and FAO to selected groups, especially returnees. Hand tools have also been provided by Government, FAO, World Bank and others to substantial numbers of farming households in recent years.

#### *FAO input support*

FAO and partners provided seeds and tools to 165 000 households for the 2011 agricultural season, through direct distribution and inputs trade fairs, enabling recipients to re-enter the production cycle. In total 2 386 tonnes of seeds and 327 500 pieces of hand tools, sourced both locally (45 percent) and internationally (55 percent), were distributed to beneficiaries. A supplementary programme to promote an improvement in households' nutrition and diet diversification, included the distribution of 5.43 tonnes of assorted vegetable seeds. Approximately 70 percent of the beneficiaries were returnees and IDPs. Tables 4 and 5 summarise the number of households that were targeted for input support through FAO's programme.

<sup>3</sup> Farmers' own stocks supply approximately 40-45 percent of total seed sown, while local markets provide an additional 20-25 percent. Social networks (including kin, neighbours and friends) are the third most important source, particularly for planting material of the vegetative-propagated crops. See *Seed System Security Assessment*, December 2010, for further details.

**Table 4: South Sudan – Number of households targeted for seed input support in 2011 (tonnes)**

State	Delivery hub	Households	Sorghum	Maize	Sesame	Groundnuts	Cowpea	Beans	Total
N Bahr al Ghazal	Aweil	28 000	112	56	28	125	56	0	377
Warrap	Kuajok	24 000	96	48	24	120	48	0	336
Upper Nile	Malakal	17 000	51	68	17	68	34	0	238
Jonglei	Bor	23 000	69	83	23	115	30	0	320
Eastern Equatoria	Torit	20 000	63	80	20	100	40	20	323
Central Equatoria	Yei	10 000	20	40	10	50	20	20	160
W Bahr al Ghazal	Wau	6 000	24	12	6	30	12	6	90
Western Equatoria	Yambio	8 000	16	40	8	40	16	16	136
Unity	Bentiu	21 000	84	84	21	63	42	0	294
Lakes	Rumbek	8 000	32	16	8	40	16	0	112
<b>TOTAL</b>		<b>165 000</b>	<b>567</b>	<b>527</b>	<b>165</b>	<b>751</b>	<b>314</b>	<b>62</b>	<b>2 386</b>

**Table 5: South Sudan – Number of households targeted for tool input support in 2011 (pieces)**

State	Delivery point	Households	Maloda	Sickles	Hoes	Pangas	Total
N Bahr al Ghazal	Aweil	28 000	19 600	19 600	19 600	-	58 800
Warrap	Kuajok	24 000	16 800	17 971	16 800	-	51 571
Upper Nile	Malakal	17 000	10 200	10 200	10 200	-	30 600
Jonglei	Bor	23 000	13 800	13 800	13 800	-	41 400
Eastern Equatoria	Torit	20 000	-	12 000	12 829	12 250	37 079
Central Equatoria	Yei	10 000	-	6 050	6 000	6 000	18 050
W Bahr al Ghazal	Wau	6 000	3 600	3 600	3 600	-	10 800
Western Equatoria	Yambio	8 000	-	4 800	4 800	4 800	14 400
Unity	Bentiu	21 000	16 800	16 800	16 800	-	50 400
Lakes	Rumbek	8 000	4 800	4 800	4 800	-	14 400
<b>TOTAL</b>		<b>165 000</b>	<b>85 600</b>	<b>109 621</b>	<b>109 229</b>	<b>23 050</b>	<b>327 500</b>

Fertilizers are rarely applied in South Sudan and soil fertility is maintained by applying manure or leaving land fallow for some years. Manure is an important factor of productivity in Northern Bahrel Ghazal, Warrap and Lakes States. In these areas, after the harvest, wealthier farming households pay livestock owners to camp their livestock at night on their agricultural land in order to improve soil fertility. Slash-and-burn cultivation is also practised in counties with lower population density, where the opportunity exists for land to be left for a sufficiently long period for its fertility to be fully restored; in other areas, though, where population pressure is greater, farmers may return to fields that have not been fallowed long enough and consequently have low fertility; in such cases there is a danger that fallow periods become progressively shorter as available land becomes scarcer.

Cassava is an extremely important safety-net food crop for much of the country but growers often cite the difficulty in obtaining planting material. There was however, evidence of increased use of cassava



cuttings resistant to cassava mosaic disease (CMD). An expansion in small enterprises providing CMD free cuttings would serve the needs of a potentially very important aspect of food security.

### 3.2.3 Pests, diseases and weeds

The incidence of crop pests and diseases has been normal over most of the country this year, with some exceptions in the north, especially in the three states where the dry spell at the beginning of the season was most prolonged. In Northern Bahr el Ghazal the level of mealy bug and grasshopper infestation was reported as being worse than in 2010, while in Upper Nile and Unity an increased incidence of birds, rodents, grasshoppers and, in some areas, elephants were reported. With the lack of aerial spraying of nesting sites to control populations of *quelea* birds, which has in the past been carried out by the Sudanese authorities, relatively high levels of grain losses to birds are expected in the rainfed mechanized areas prior to harvest.

Several other occurrences of pests and diseases were cited in 2011 but at levels similar to those of previous years. Most important among these are stemborers, sorghum smut, cassava mosaic virus and pests of stored grain. Weeding is often very poorly done and many sorghum fields are seriously infested with *striga*, severely suppressing productivity in the affected areas.

## 3.3 Agricultural production in 2011

### 3.3.1 Cereal production

#### A. *Traditional sector*

Estimates of South Sudan's cereal production in the traditional sector are presented by county in Table 6. National gross cereal production in 2011 is estimated at 703 303 tonnes. Post-harvest losses and retention of seed for sowing in 2012 are assumed to account for 20 percent of this total, leaving a net amount of 562 642 tonnes available consumption during the 12-month period 1 December 2011 - 30 November 2012. This represents a drop of almost 19 percent compared with the production of 2010, and is similar to the poor production of 2009. Table 6 also shows the cereal requirement of each county based on population figures and historic annual per-caput rates of cereal consumption, and the consequent cereal balance by county and state. Western Equatoria is seen to be the only state this year producing an amount of cereal surplus to its population's requirements. Elsewhere, only three counties, Raga in Western Bahr el Ghazal, and Ikotos and Torit in Eastern Equatoria, are estimated to have produced a surplus.

Cereal production data by zone and state for the five years 2007 - 2011 are given in Table 7 and presented graphically in Figure 1.

**Table 6: South Sudan - Estimated cereal harvested area, yield, production, consumption and balance (traditional sector) in 2012**

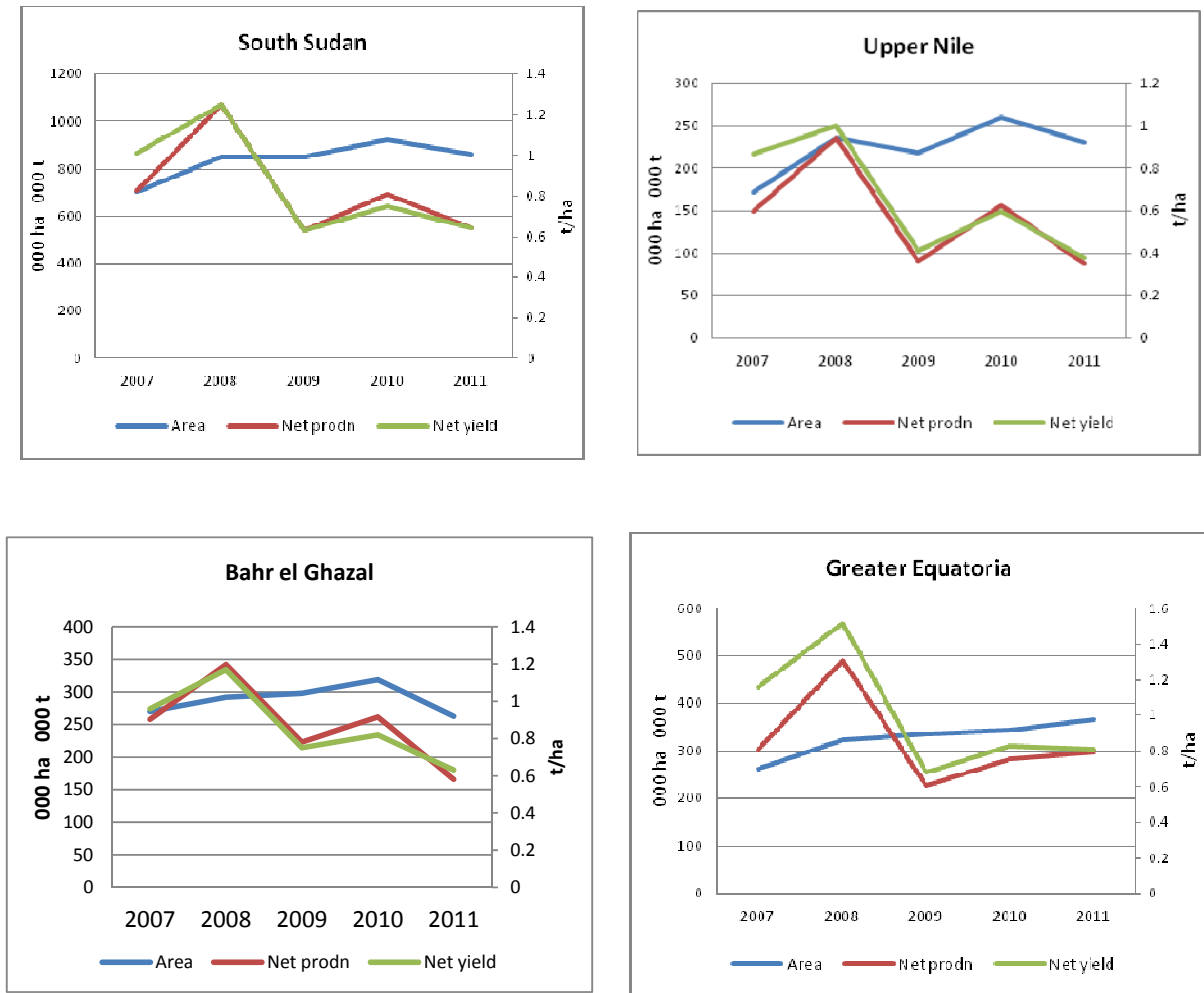
STATE/COUNTY	Cereal area 2011 (ha)	2011 gross yield (t/ha)	2011 gross cereal production (t)	2011 net cereal production (t)	Population mid-2012	2012 cereal reqt. (t)	2012 surplus/deficit (t)
<b>Central Equatoria</b>	<b>122 525</b>	<b>0.79</b>	<b>97 214</b>	<b>77 771</b>	<b>1 286 994</b>	<b>164 632</b>	<b>- 86 861</b>
Returnees of 2010	1 859	0.65	1 209	967	47 432	6 404	- 5 437
Juba	24 950	0.70	17 465	13 972	418 439	58 582	- 44 610
Kajo Keji	31 271	0.70	21 890	17 512	215 517	25 862	- 8 351
Lainya	8 956	0.71	6 359	5 087	102 713	12 326	- 7 239
Morobo	10 060	0.90	9 054	7 243	124 421	14 931	- 7 687
Terekeka	24 107	0.95	22 902	18 321	156 321	18 759	- 438
Yei	21 321	0.86	18 336	14 669	222 151	27 769	- 13 100
<b>Eastern Equatoria</b>	<b>114 730</b>	<b>1.08</b>	<b>124 096</b>	<b>99 277</b>	<b>1 016 166</b>	<b>125 977</b>	<b>- 26 701</b>
Returnees of 2010	1 659	0.75	1 244	995	18 840	2 355	- 1 360
Budi	13 696	0.90	12 326	9 861	108 069	12 968	- 3 107
Ikotos	15 871	1.10	17 458	13 966	95 443	11 930	2 036
Kapoeta East	15 712	1.20	18 855	15 084	178 638	22 330	- 7 246
Kapoeta North	8 525	1.20	10 230	8 184	112 287	14 036	- 5 852
Kapoeta South	6 324	1.20	7 588	6 071	86 690	11 270	- 5 199
Lafon	14 042	0.90	12 638	10 111	116 289	13 955	- 3 844
Magwi	22 716	1.00	22 716	18 172	185 585	22 270	- 4 098
Torit	16 185	1.30	21 041	16 833	114 327	14 863	1 970
<b>Jonglei</b>	<b>128 394</b>	<b>0.63</b>	<b>81 290</b>	<b>65 032</b>	<b>1 528 037</b>	<b>163 519</b>	<b>- 98 487</b>
Returnees of 2010	1 803	0.45	811	649	28 305	3 114	- 2 465
Akobo	11 344	0.70	7 941	6 352	150 108	16 512	- 10 160
Ayod	12 166	0.65	7 908	6 326	151 736	15 932	- 9 606
Bor South	20 080	0.50	10 040	8 032	245 248	28 203	- 20 171
Duk	7 379	0.50	3 690	2 952	71 514	7 509	- 4 558
Fangak	10 499	0.60	6 299	5 039	126 237	13 255	- 8 216
Khorflus/Pigi /Canal	8 619	0.60	5 171	4 137	112 572	11 820	- 7 683
Nyirrol	11 002	0.60	6 601	5 281	119 349	13 129	- 7 848
Pibor	9 102	0.95	8 647	6 918	162 059	17 016	- 10 098
Pochalla	6 689	0.95	6 355	5 084	72 130	7 213	- 2 129
Twic East	10 357	0.60	6 214	4 972	93 686	10 306	- 5 334
Uror	19 353	0.60	11 612	9 290	195 093	19 510	- 10 220
<b>Lakes</b>	<b>70 260</b>	<b>0.81</b>	<b>56 833</b>	<b>45 467</b>	<b>841 099</b>	<b>87 754</b>	<b>- 42 288</b>
Returnees of 2010	3 973	0.50	1 986	1 589	65 924	6 593	- 5 003
Awerial	4 527	0.81	3 667	2 934	51 249	5 125	- 2 191
Cueibet	11 917	0.53	6 316	5 053	129 890	12 989	- 7 936
Rumbek Centre	12 924	0.63	8 142	6 514	169 752	18 673	- 12 160
Rumbek East	11 922	1.04	12 399	9 919	137 719	13 772	- 3 853
Rumbek North	3 806	0.54	2 055	1 644	47 289	4 728	- 3 084
Wulu	4 758	0.95	4 520	3 616	44 661	4 466	- 850
Yirol East	6 206	1.08	6 702	5 362	78 317	8 615	- 3 254
Yirol West	10 227	1.08	11 045	8 836	116 297	12 793	- 3 957
<b>N Bahr el Ghazal</b>	<b>67 618</b>	<b>0.73</b>	<b>49 696</b>	<b>39 757</b>	<b>931 625</b>	<b>96 161</b>	<b>- 56 404</b>
Returnees of 2010	3 039	0.50	1 520	1 216	80 210	8 823	- 7 608
Aweil Centre	1 454	0.80	1 163	931	76 790	8 447	- 7 516
Aweil East	28 837	0.75	21 627	17 302	353 351	38 868	- 21 566
Aweil North	11 358	0.60	6 815	5 452	153 787	14 610	- 9 158
Aweil South	8 399	1.00	8 399	6 719	80 766	7 673	- 953
Aweil West	14 531	0.70	10 172	8 137	186 722	17 739	- 9 602

STATE/COUNTY	Cereal area 2011 (ha)	2011 gross yield (t/ha)	2011 gross cereal production (t)	2011 net cereal production (t)	Population mid-2012	2012 cereal reqt. (t)	2012 surplus/deficit (t)
<b>Unity</b>	<b>34 022</b>	<b>0.30</b>	<b>10 244</b>	<b>8 195</b>	<b>763 294</b>	<b>66 356</b>	<b>- 58 161</b>
Returnees of 2010	1 891	0.15	284	227	39 594	3 564	- 3 337
Abiemnhom	771	0.32	243	194	27 436	2 331	- 2 137
Guit	1 656	0.32	522	417	38 525	3 274	- 2 857
Koch	3 439	0.36	1 238	990	89 472	7 605	- 6 615
Leer	3 007	0.21	632	505	72 390	6 154	- 5 649
Mayendit	3 174	0.29	905	724	73 761	6 270	- 5 547
Mayom	8 186	0.24	1 965	1 572	143 349	12 185	- 10 613
Panyijar	3 750	0.21	788	630	58 183	4 946	- 4 316
Pariang	4 924	0.48	2 364	1 891	92 848	7 892	- 6 001
Rubkona	3 224	0.41	1 306	1 045	127 736	12 135	- 11 090
<b>Upper Nile</b>	<b>67 958</b>	<b>0.48</b>	<b>32 458</b>	<b>25 966</b>	<b>1 114 474</b>	<b>93 138</b>	<b>- 67 172</b>
Returnees of 2010	310	0.32	98	78	7 043	599	- 521
Baliet	3 718	0.32	1 171	937	54 809	4 385	- 3 448
Fashoda	3 965	0.65	2 558	2 046	44 404	3 552	- 1 506
Longochuk	3 534	0.48	1 696	1 357	75 587	6 047	- 4 690
Luakpiny/Nasir	11 155	0.48	5 354	4 284	233 960	18 717	- 14 433
Maban	4 196	0.48	2 014	1 611	49 515	3 961	- 2 350
Maiwut	4 473	0.65	2 885	2 308	86 667	6 933	- 4 625
Malakal	4 057	0.32	1 278	1 022	157 763	14 987	- 13 965
Manyo	4 296	0.32	1 353	1 083	44 549	3 564	- 2 482
Melut	4 901	0.65	3 161	2 529	54 339	4 347	- 1 818
Panyikang	1 939	0.32	611	489	51 776	4 142	- 3 653
Renk	15 508	0.48	7 444	5 955	157 794	14 202	- 8 246
Ulang	5 903	0.48	2 833	2 267	96 270	7 702	- 5 435
<b>W Bahr el Ghazal</b>	<b>40 745</b>	<b>1.07</b>	<b>43 603</b>	<b>34 883</b>	<b>394 360</b>	<b>44 602</b>	<b>- 9 719</b>
Returnees of 2010	642	0.90	578	462	11 569	1 273	- 810
Jur River	10 650	0.90	9 585	7 668	141 114	15 523	- 7 855
Raga	6 946	1.25	8 682	6 946	59 719	5 972	974
Wau	22 507	1.10	24 758	19 806	181 958	21 835	- 2 028
<b>Warrap</b>	<b>84 278</b>	<b>0.68</b>	<b>57 541</b>	<b>46 033</b>	<b>1 067 883</b>	<b>104 273</b>	<b>- 58 241</b>
Returnees of 2010	1 331	0.45	599	479	32 729	3 274	- 2 795
Gogrial East	9 496	0.75	7 122	5 697	112 929	10 728	- 5 031
Gogrial West	23 069	0.77	17 763	14 210	280 022	29 403	- 15 193
Tonj East	10 624	0.45	4 781	3 825	126 721	12 672	- 8 847
Tonj North	15 065	0.65	9 792	7 834	180 376	18 037	- 10 203
Tonj South	7 378	0.68	5 017	4 014	95 185	8 566	- 4 552
Twic	17 316	0.72	12 467	9 974	239 921	21 593	- 11 619
<b>Western Equatoria</b>	<b>129 092</b>	<b>1.16</b>	<b>150 327</b>	<b>120 262</b>	<b>690 466</b>	<b>89 882</b>	<b>30 380</b>
Returnees of 2010	582	1.15	670	536	14 262	1 854	- 1 319
Ezo	21 000	1.30	27 299	21 839	88 170	11 462	10 377
Ibba	12 088	1.20	14 506	11 605	45 663	5 937	5 668
Maridi	14 504	1.00	14 504	11 604	90 045	11 706	- 1 102
Mundri East	6 995	1.00	6 995	5 596	52 741	6 593	- 996
Mundri West	4 129	1.00	4 129	3 304	37 200	4 650	- 1 347
Mvolo	6 727	1.25	8 408	6 727	52 569	6 572	155
Nagero	2 473	1.10	2 720	2 176	10 986	1 428	749
Nzara	17 259	1.10	18 985	15 188	71 644	9 314	5 874
Tambura	14 083	1.00	14 083	11 266	60 524	7 868	3 398
Yambio	29 251	1.30	38 027	30 422	166 663	22 499	7 922
<b>SOUTH SUDAN</b>	<b>859 622</b>	<b>0.82</b>	<b>703 303</b>	<b>562 642</b>	<b>9 634 398</b>	<b>1 036 295</b>	<b>- 473 653</b>

**Table 7: South Sudan - Cereal harvested area and net production in the traditional sector in 2007-2011**

ZONE/STATES	2007			2008			2009			2010			2011 forecast		
	Area 000 (ha)	Net prodn 000 (t)	Yield (t/ha)	Area 000 (ha)	Net prodn 000 (t)	Yield (t/ha)	Area 000 (ha)	Net prodn 000 (t)	Yield (t/ha)	Area 000 (ha)	Net prodn 000 (t)	Yield (t/ha)	Area 000 (ha)	Net prodn 000 (t)	Yield (t/ha)
<b>UPPER NILE</b>	<b>172</b>	<b>149</b>	<b>0.87</b>	<b>237</b>	<b>237</b>	<b>1.00</b>	<b>218</b>	<b>90</b>	<b>0.41</b>	<b>261</b>	<b>156</b>	<b>0.60</b>	<b>230</b>	<b>99</b>	<b>0.43</b>
Upper Nile	55	48	0.87	79	67	0.85	77	34	0.44	78	49	0.63	68	26	0.38
Unity	27	25	0.93	43	42	0.98	37	18	0.49	40	24	0.60	34	8	0.24
Jonglei	90	76	0.84	115	126	1.10	104	38	0.37	143	84	0.59	128	65	0.51
<b>BAHR EL GHAZAL</b>	<b>270</b>	<b>258</b>	<b>0.96</b>	<b>292</b>	<b>342</b>	<b>1.17</b>	<b>298</b>	<b>223</b>	<b>0.75</b>	<b>319</b>	<b>254</b>	<b>0.82</b>	<b>263</b>	<b>166</b>	<b>0.63</b>
N Bahr el Ghazal	50	37	0.74	59	44	0.75	71	49	0.69	79	60	0.76	68	40	0.59
W Bahr el Ghazal	32	39	1.22	34	52	1.53	39	30	0.77	37	34	0.92	41	35	0.86
Lakes	77	79	1.03	84	101	1.20	69	53	0.77	76	66	0.87	70	45	0.65
Warrap	112	103	0.92	116	145	1.25	119	90	0.76	126	94	0.75	84	46	0.55
<b>GREATER EQUATORIA</b>	<b>263</b>	<b>304</b>	<b>1.16</b>	<b>323</b>	<b>490</b>	<b>1.52</b>	<b>335</b>	<b>228</b>	<b>0.68</b>	<b>343</b>	<b>284</b>	<b>0.83</b>	<b>366</b>	<b>297</b>	<b>0.81</b>
Central Equatoria	106	112	1.06	131	201	1.53	121	72	0.60	127	93	0.73	123	78	0.63
Eastern Equatoria	66	55	0.83	85	94	1.11	98	53	0.54	103	79	0.77	115	99	0.87
Western Equatoria	91	136	1.49	107	196	1.83	116	102	0.88	112	112	1.00	129	120	0.93
<b>SOUTH SUDAN</b>	<b>705</b>	<b>711</b>	<b>1.01</b>	<b>853</b>	<b>1 068</b>	<b>1.25</b>	<b>852</b>	<b>541</b>	<b>0.63</b>	<b>921</b>	<b>695</b>	<b>0.75</b>	<b>860</b>	<b>563</b>	<b>0.65</b>

Figure 1: South Sudan – Area and yield for South Sudan and for selected regions in 2007-2011



**B. Mechanized sector**

South Sudan's rainfed mechanized sector is mostly confined to Upper Nile State, but also includes some relatively small areas in Unity State. Mechanization is limited to land preparation, all other operations from sowing to harvesting being carried out by hand. Individual farms can cover several thousands of hectares, and the crops grown are mainly sorghum, millet, maize, sesame and sunflower. Harvesting is opportunistic in the sense that at the end of the season the farmer will assess which parts of his crop to harvest and which parts, if any, to neglect, taking into consideration the cost of manual harvesting, the estimated yield and the prevailing market price. In preceding years, most of the produce went north to Kosti in Sudan for onward distribution to other major markets such as El Obeid and Omdurman.

This year the area to be cropped in Upper Nile is expected to be approximately 210 000 hectares. About 75 percent of this is sorghum with the remaining 25 percent made up of, in order of importance, sunflower, sesame and millet. These 210 000 hectares represent a reduction of almost 30 percent on the previous year's estimated 290 000 hectares; this reduction is attributable not only to the dry spell at the beginning of the season but also to the closure of the border with Sudan which has resulted in a shortage of seed, diesel and tractor spare parts, most of which would normally have been sourced in Sudan. However, the Agricultural Bank managed to support some 45 farmers with credit of two million SSP for fuel; in addition, it procured a number of tractors for farmers who will pay for them in instalments. Unity State's area of mechanized farming was only about 650 hectares this year, which is

also a reduction on that of 2010; it consisted of approximately 55 percent sorghum and 45 percent maize.

A factor that is expected to have a negative impact this year on the yield of sorghum from the mechanized areas is the lack of aerial spraying of the nesting sites of *Quelea quelea* birds. This was formerly carried out by the Sudanese authorities as a means of controlling population growth of *quelea*, which can devastate sorghum crops shortly before harvest.

At the time of the Mission's visit, it was uncertain where the production from the Upper Nile and Unity mechanized farms would go. However, assuming a cereal yield of 0.4 tonnes/hectare (slightly lower than average because of this year's constraints), cereal production from the rainfed mechanized sector in Upper Nile and Unity States is likely to be about 65 000 tonnes. In Northern Bahr el Ghazal, the Aweil Rice Scheme covers about 800 hectares; yields this year are expected to be between 1 and 2 t/ha, adding a further 1 400 tonnes or so to the cereal balance. There is also a small area of rice production (about 100 hectares) in Unity State. Summing all these amounts gives a total of approximately 66 500 tonnes gross of cereal, or an extra 53 000 tonnes net. If this remains in the northern states most affected by the poor start to the season - Upper Nile, Unity, Warrap and Northern Bahr el Ghazal - it has the potential to partly alleviate the poor prospective of the current food availability situation.

### 3.3.2 Cassava

Cassava represents an important food safety net throughout much of the country. Its importance increases towards the south and west, with the highest concentration in the Green Belt in Greater Equatoria and in parts of Lakes and Western Bahr el Ghazal. Its use as a food safety net which is not always required, is frequently evidenced by areas of overgrown abandoned crop. Cassava is also traded in local markets in the form of tuberous roots, dried cassava chips and cassava flour. In Rumbek, the crop is planted around plot and household boundaries. In Wau and Raja, it is planted either as a sole crop or intercropped with sorghum and sesame. In Western and Central Equatoria, it is intercropped with a wide range of crops including cereals, sesame, groundnuts and beans during the first year of its development. Both sweet and bitter cassava varieties are grown as are varieties of different maturation periods ranging from 12 to 36 months; these different varieties are often grown in a mixture in order to enhance the crop's food-security aspect. Yields vary significantly with plant density in single and intercropped fields.

This year's cassava production is expected to be similar to that of previous years. The main constraint to production is usually reported to be a shortage of planting material, and the main limiting factor to improved productivity is the widespread prevalence of CMD.

### 3.3.3 Livestock

Livestock are hugely important in South Sudan for both economic and social reasons. The most recent documented estimate of cattle numbers was made by FAO in 2009. The annual trend for the whole country shows an average cattle population growth rate of 2.95 percent per annum, which is slightly higher than the average human population growth rate of 2.05 percent per annum. However, the cattle numbers do not include those of Lakes prior to 2009 (Table 8). Were these figures to be included, the annual growth rate of the cattle population would be closer to that of the human population. Assuming an annual cattle population growth rate of 2.05 percent (the same as that for humans), South Sudan's cattle population may now exceed 12.2 million in 2011. This is very similar to the current population estimates for goats and sheep of 12.4 and 12.1 million respectively.

**Table 8: South Sudan – Cattle numbers (thousands) by state (2005-2011)**

STATE	2005	2006	2007	2008	2009	2010 <sup>1/</sup>	2011 <sup>1/</sup>
Central Equatoria	895	908	922	926	878	896	914
Eastern Equatoria	883	896	910	913	888	906	925
Western Equatoria	680	690	701	703	675	689	703
Jonglei	1 475	1 497	1 521	1 526	1 465	1 495	1 526
Upper Nile	990	1 005	1 021	1 024	983	1 003	1 024
Unity	1 189	1 207	1 226	1 230	1 180	1 204	1 229
Lakes	n.a.	n.a.	n.a.	n.a.	1 311	1 338	1 365
Warrap	1 539	1 562	1 586	1 592	1 528	1 559	1 591
Western Bahr el Ghazal	1 256	1 275	1 295	1 300	1 248	1 274	1 300
Northern Bahr el Ghazal	1 590	1 615	1 640	1 646	1 579	1 611	1 644
South Sudan	10 497	10 655	10 822	10 860	11 735	11 976	12 221

Source: Ministry of Animal Resources and Fisheries for 2005-2008; FAO livestock population estimate for 2009-2011.

<sup>1/</sup> Data for 2010-2011 are approximations, based on population growth outlined in section 3.3.3.

East Coast Fever, endemic for a long time in Greater Equatoria, has recently become much more prevalent in Jonglei. The Mission was informed that mortality rates have slightly declined in Jonglei in 2011 compared to 2010, but they are still considered to be higher than they have been in previous years. To combat further spread of the disease, MARF is conducting training of paravets in the use of acaricides. Foot-and-mouth disease is present in all states in South Sudan, but its incidence has been higher this year in Unity State. Anthrax has been reported in Northern Bahr el Ghazal and Warrap, and lumpy-skin disease in Unity, Upper Nile and Eastern Equatoria. Ovine rinderpest or PPR (peste des petits ruminants) has been prevalent among sheep and goats in Eastern Equatoria, Jonglei and Unity States.

MARF considers that only about 20 percent of South Sudan's commercial livestock potential is being exploited. The main constraints are poor pasture management and relatively unproductive breeds, both consequences of the fact that cattle are kept more for social than for directly commercial reasons and that numbers are therefore more important than quality.

Fishing is also considered to have a significant, as-yet-unrealised, potential. Nationally, the annual catch is estimated to be between 40 000 and 45 000 tonnes, but about 60 percent of this is thought to be lost without being consumed. The catch this year is expected to be good in most Nile tributaries, and MARF claims to have removed the checkpoints, used illegally to confiscate, under the guise of a tax, portions of fishermen's catch as they returned from fishing.

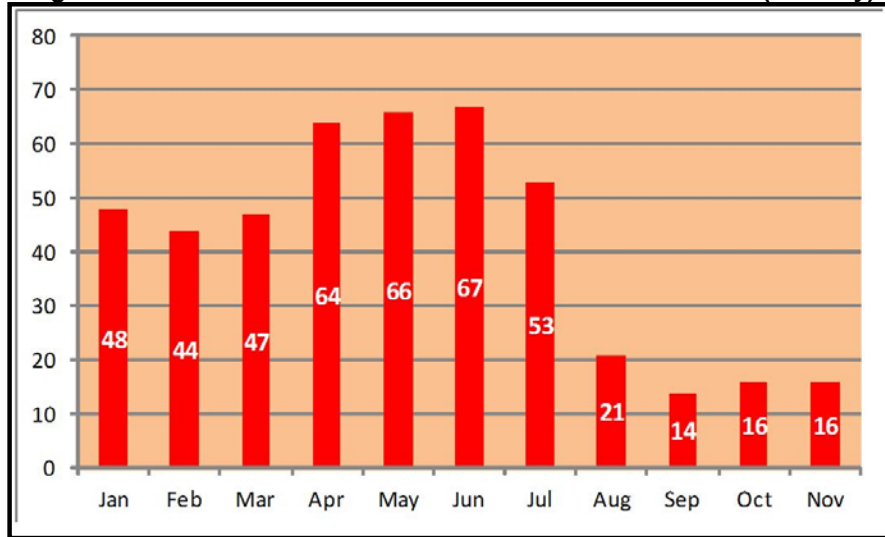
This year has seen more meat and poultry in the market in Juba. Small local commercial poultry production has increased; the main constraint is the limited availability of feed and day-old chicks.

### **3.4 Security**

According to figures released by OCHA there has been a decreasing trend in the number of reported conflicts since July 2011 (Figure 2). However, armed cattle rustling, the frequency of which has increased, continues to be a serious problem in the country and persuaded a number of cattle owners to sell off their stock in order to remove the potential threat. Incidents of cattle raiding in Jonglei State, for instance, resulted in the death of 600 people in August 2011 alone. More recently, an estimated 40 000 persons were displaced in December 2011 followed a conflict in Jonglei. In order to mitigate the potential of further attacks, there has also been an increase in the concentration of livestock in areas in close proximity to urban centres. This pattern of livestock movement however, intensifies demand on pasture, increasing the potential for the continuation of conflicts over grazing rights. Agricultural production has, in addition, been hindered as a result of inter and intra-communal conflicts, which triggered a contraction in the area cultivated in some counties, notably in Jonglei State with farmers opting to only cultivate land immediately adjacent to their homesteads. Furthermore, there has been heightened insecurity as a consequence of militia attacks. During October, an attack in Mayom, Unity State, reportedly by a rebel militia group called South Sudan Liberation Army/Movement (SSLA/M)

caused the death of 65 people. Furthermore, the on-going conflict in Southern Kordofan, Sudan, has led to the displacement of approximately 23 000 people by mid-November 2011, who have relocated to Unity State, while displaced populations from Blue Nile, Sudan, moved into Upper Nile in late 2011. The large number of refugees, in addition to the returnees, places greater pressure on local food supplies. Insecurity also often limits access to diversified food sources such as fishing, wild food gathering and hunting, as well as restricting the mobility of people and livestock, and thus hindering access to markets. The Mission did note however, improved security conditions in parts of Greater Equatoria, which enabled some farmers to expand the area cultivated relative to the previous year. In 2011 (January-November), OCHA reported approximately 456 incidents of conflict (Map 1); most of these conflicts occurred in the months of May, June and July. The highest numbers of incidents were reported in Jonglei, Lakes and Unity with 185, 70 and 68 incidents respectively. T

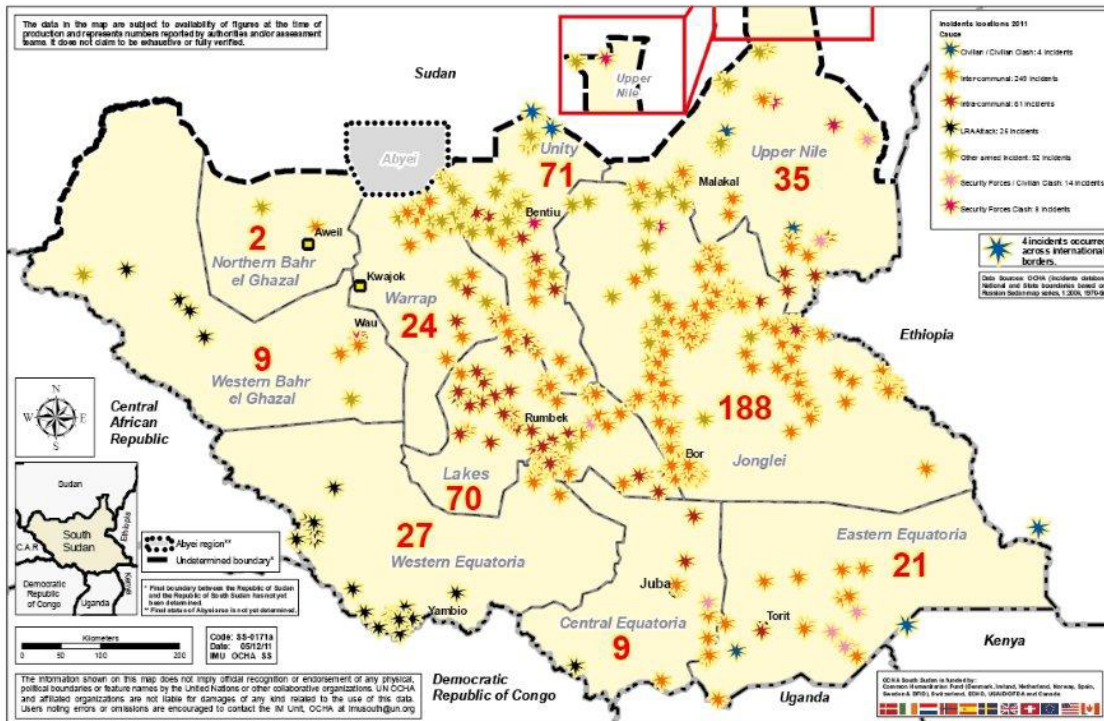
**Figure 2: South Sudan – Number of conflict incidents in 2011 (monthly)**



Source: OCHA



**Map 1: South Sudan – Cumulative figures of conflict incidents in 2011 (as of 30 November 2011)**



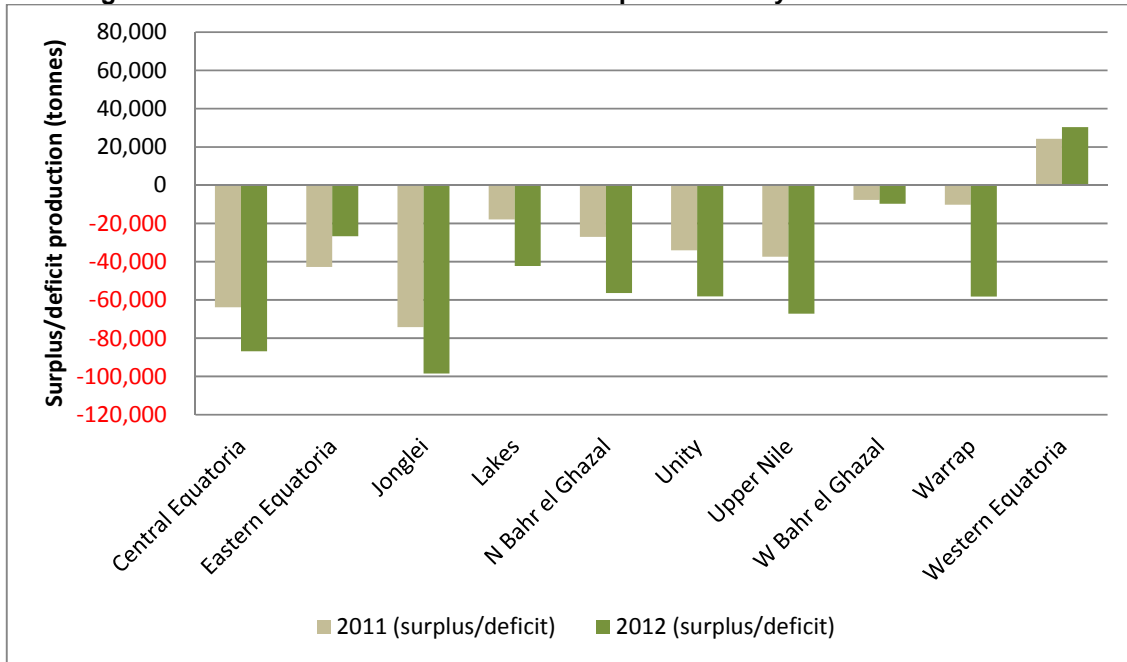
Source: OCHA

#### 4. CEREAL SUPPLY/DEMAND SITUATION

##### 4.1 Cereal balance

As already presented in Table 6, total cereal consumption in 2012 is estimated at about 1.04 million tonnes, using a projected 2012 mid-year population of about 9.6 million people and an average per capita consumption of 108 kg of cereals per year. Estimates of cereal per capita consumption are based on information provided by the 2009 National Baseline Household Survey (NBHS) at state level and adjusted at county level to take into account differences between urban and rural areas and the relative importance of crops and livestock in local diets. Given these parameters a national shortfall of about 473 653 tonnes needs to be covered through commercial and/or food aid imports. The estimated contraction in cereal production and the enlarged population, following the influx of returnees this year, contributed to widening the cereal gap for 2012. Figure 3 illustrates the estimated cereal supply situation for each state in 2012. Only Western Equatoria is calculated to be in surplus, while Jonglei records the largest shortfall at just under 100 000 tonnes.

**Figure 3: South Sudan – Estimated cereal surplus/deficit by state in 2011 and 2012**



Source: CFSAM 2010 and 2011.

#### 4.2 Household food consumption patterns

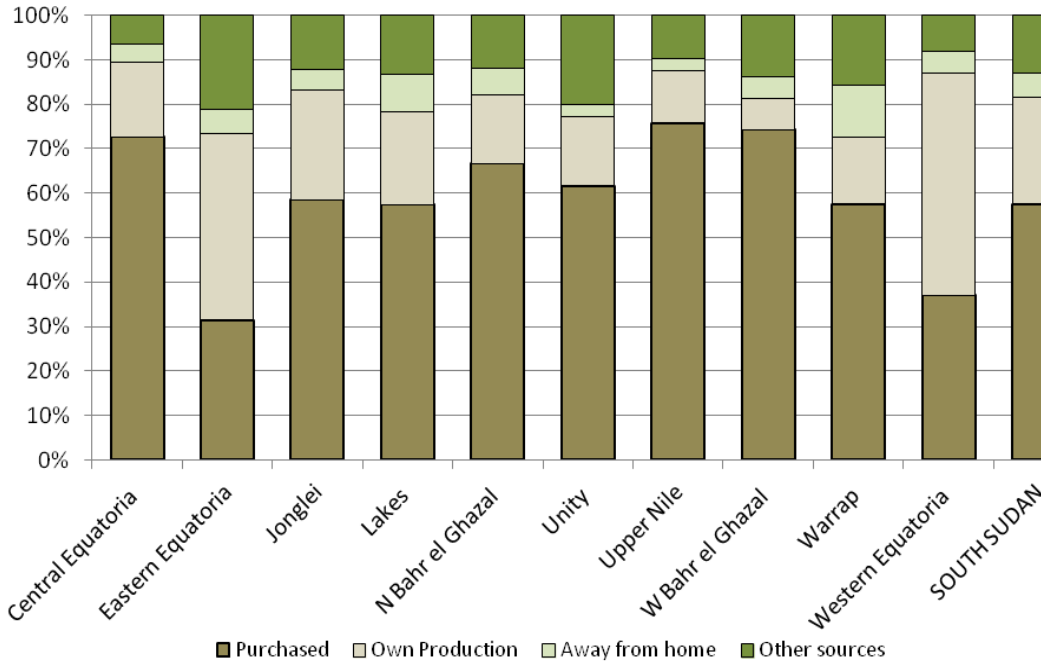
According to the 2009 National Household Baseline Survey (NHBS) market purchases are the primary source of food for South Sudanese households, supplying about 58 percent of total dietary energy consumption requirements. It should be noted that the survey was conducted during the annual lean period (April-May) when supplies from own production are generally at low levels or have been exhausted completely, and consequently market purchases tend to be at elevated levels relative to other periods of the year. Based on WFP's FSMS surveys however, carried out at three different points throughout the year, market purchases account for, on average, over 50 percent of households' staple crop supplies. Furthermore, food purchases also represent a substantial portion of households' total expenditure, accounting for 79 percent at the national level<sup>4</sup>. Disaggregated by food commodities, cereals and breads constitute the bulk of households' food expenditure<sup>5</sup>. At the state level there exist distinct variations, where market sources are of lesser significance in the large cereal producing state of Western Equatoria, providing less than 40 percent of households' food supply. By contrast in Central Equatoria, Upper Nile and Western Bahr el Ghazal households demonstrate high levels of market purchases, exceeding 70 percent<sup>6</sup>. The composition of households' food supplies by state are presented in the Figure 4.

<sup>4</sup> Source: NBHS 2009

<sup>5</sup> Calculation based on caloric intake of bottom 60 percent of population, ranked by real per capita consumption. Source: NBHS 2009.

<sup>6</sup> The survey was conducted in a year (2009) when Eastern Equatoria recorded a large increase in cereal production relative to its average and therefore, normal market purchases may not be accurately reflected in these figures for this state. In regard to the other states, annual production was at comparable levels to their averages.

**Figure 4: South Sudan – Share of household food sources**



Source: NBHS 2009

Given the importance of markets and the allocation of income to food purchases, food inflation, particularly cereals, will have a significant and detrimental effect on the food security conditions of net-purchasing households. Therefore, adequate supplies and efficient functioning markets will be vital to stabilise and improve the food security situation, considering the projected decline in households' own production this year. Concurrently, higher prices also offer the potential to benefit households' selling cereal produce; however, FSMS data indicates that only 16 percent of households derive their main income through cereal sales, while an additional 7 percent of households' principal income is generated through sales of other food crops.

### 4.3 Cereal markets

Prices of sorghum (white), the main food staple of the country, normally decline in September/October following the start of the main harvest (which stretches to February) and remain generally stable through to March, before rising and peaking in August/September. As illustrated in Figure 5, nominal retail prices of sorghum have risen sharply, above normal seasonal increases, since mid-2011, and as of November<sup>7</sup> exceeded those of 2010 by one third to almost three times the level. Prices in Bor and Malakal, for example, were approximately 80 percent higher in November 2011, compared with one year earlier. However, following the start of the main harvest in September, prices have fallen in some markets, benefiting from increased supplies and diminished demand owing to households' increased consumption of own production.

The price differentials that exist between markets serves to illustrate the lack of spatial market integration, primarily attributed to high transfer costs, given the large distances between major markets and poor transport infrastructure. Given this high degree of market segmentation any cessation of established trade routes will severely constrain local supplies, particularly for sorghum<sup>8</sup>,

<sup>7</sup> Price for November 2011 refers to the first three weeks of the month.

<sup>8</sup> Source: *Structure, conduct and performance of commodity Markets in Southern Sudan: linkages food security*, 2008. FEWS NET

as was experienced in northern markets following the imposition of trade restriction with Sudan in 2011. Furthermore, potential opportunities to market surpluses are also minimal, due to unusable feeder roads, which continue to be an obstacle to farmers' access to food and farming inputs, as well as a serious disincentive to expand crop production. Poor road conditions deteriorate further during the main rainy season (May-October), and often become impassable at a time when market demand peaks, which is particularly notably in parts of Jonglei. In the short to medium term however, rehabilitation of the national road networks is a key priority for the GOSS and this will help address one obstacle impeding efficient market functions; expenditure on infrastructure, primarily allocated to the improvement of road conditions, represents about 8 percent of the total 2011 national budget. The benefits resulting from de-mining, clearance and grading of many of the major trunk roads, since the inception of the CPA in 2005, are already evident.

The impact of the border restrictions with Sudan, during the latter half of 2011, on market supplies and prices has been considerable. Field visits to northern areas indicate generally low market supplies, particularly in comparison with the previous year. Based on market visits in Wau (Western Bahr el Ghazal), for instance, supplies of sorghum from Sudan were not available; however, the reduction in Sudanese imports was, to some extent, compensated by imports of maize meal from Uganda. Nonetheless increasing prices recorded in Uganda, high transportation costs and the depreciation of the SSP combined to maintain elevated price levels. Furthermore, significant monthly price variations were observed in Aweil (Northern Bahr el Ghazal) and Wau (Western Bahr el Ghazal) markets<sup>9</sup> during 2011, partly attributed to the imposition of border restrictions with Sudan and subsequent discontinuation of normal supplies. The lack of adequate storage facilities and public stocks also negates the potential to stabilise prices and cushion price spikes following supply shocks, such as those mentioned above. Commercially, about two thirds of retailers and wholesalers retain stocks of about two weeks and three months, respectively<sup>10</sup>. Overall, Mission observations indicate that imports from southern bordering countries, mainly Uganda and Kenya, has expanded in 2011; however, limited quantities of food products will arrive in the most northern counties, due to the poor road conditions and high costs involved.

In addition, rising fuel costs further contributed to the escalation of prices during 2011. The price of petrol has approximately doubled in most markets between January and November 2011<sup>11</sup>; in Juba, petrol rose by 71 percent to SSP 6 per litre over this period. Given that transportation expenses account for 15 - 50 percent of marketing costs for procuring food<sup>12</sup>, increased fuel costs will add a considerable amount on to the final retail price. The depreciation of the SSP, as mentioned in section 2.2.2, also added to inflationary pressure during 2011, in consideration of the large quantity of imported goods consumed in South Sudan. However, measures undertaken by the BOSS to help strengthen the SSP will assist to stabilise imported inflation to some extent.

A further factor affecting efficient market functions and higher prices experienced in 2011 are the multiple unauthorised road blocks and check points, adding to overall costs and delivery times. However, the GOSS is undertaking measures to eliminate unofficial check points, with many unauthorised road blocks already closed. A survey undertaken by the NBS in December 2010, revealed that a check point was present every 25 km. On average, every 100 km a payment in excess of SDG 200 was made, while approximately two hours was added to the total journey time.

---

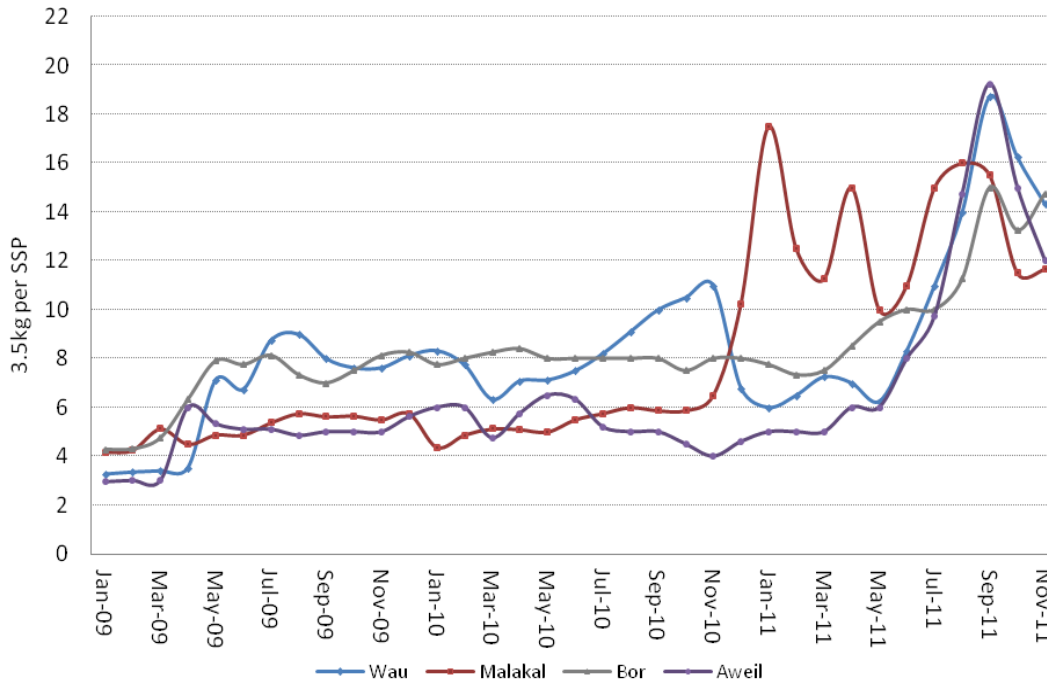
<sup>9</sup> Coefficient of variation (sorghum (white) prices): Aweil 0.52 and Wau 0.45 during 2011 (January-November), compared to values of below 0.3 in the preceding two years

<sup>10</sup> Source: *Structure, conduct and performance of commodity Markets in Southern Sudan: linkages food security*, 2008. FEWS NET

<sup>11</sup> Source: WFP VAM Unit

<sup>12</sup> Source: *Structure, conduct and performance of commodity Markets in Southern Sudan: linkages food security*, 2008. Margaret Ngigi

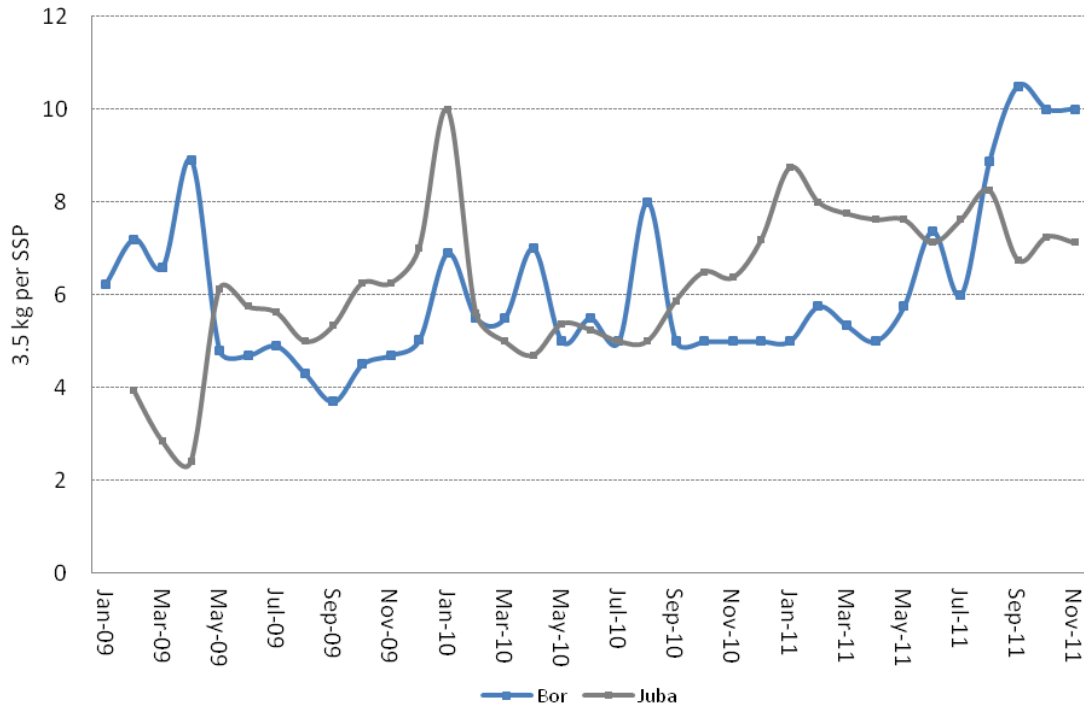
Figure 5: South Sudan – Retail prices of sorghum (white) in selected markets



Source: WFP VAM Unit

Regarding maize, the Mission observed that prices are generally at higher levels than a year ago (Figure 6), but the variation is not as great compared to sorghum. A substantial bulk of maize products sold in South Sudan is sourced from Uganda, and high prices experienced in Uganda during 2011 have contributed to the elevated prices in South Sudan. In the Equatoria states, where maize is one of the main food staples, prices are marginally higher than 2010, having peaked in September 2011, but gradually weakened in October and November reflecting improved supplies from the new harvest. In Bor, Jonglei State however, high prices persist and at the beginning of November were twice the level compared to price in November 2010.

**Figure 6: South Sudan – Retail prices of maize (white) in selected markets**

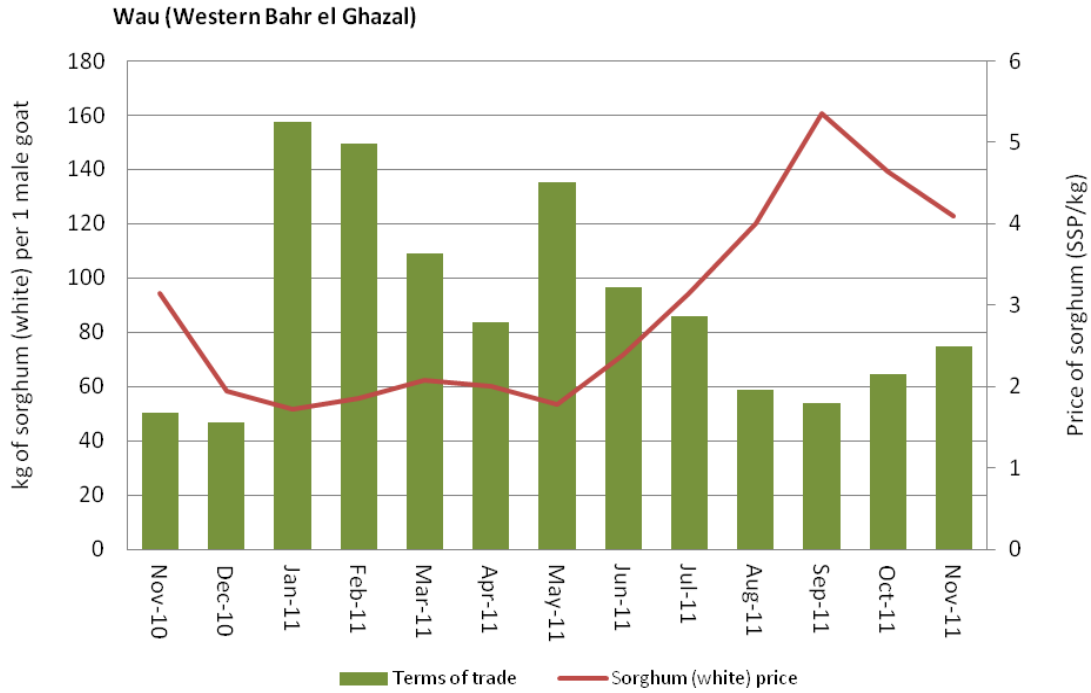


Source: WFP VAM Unit

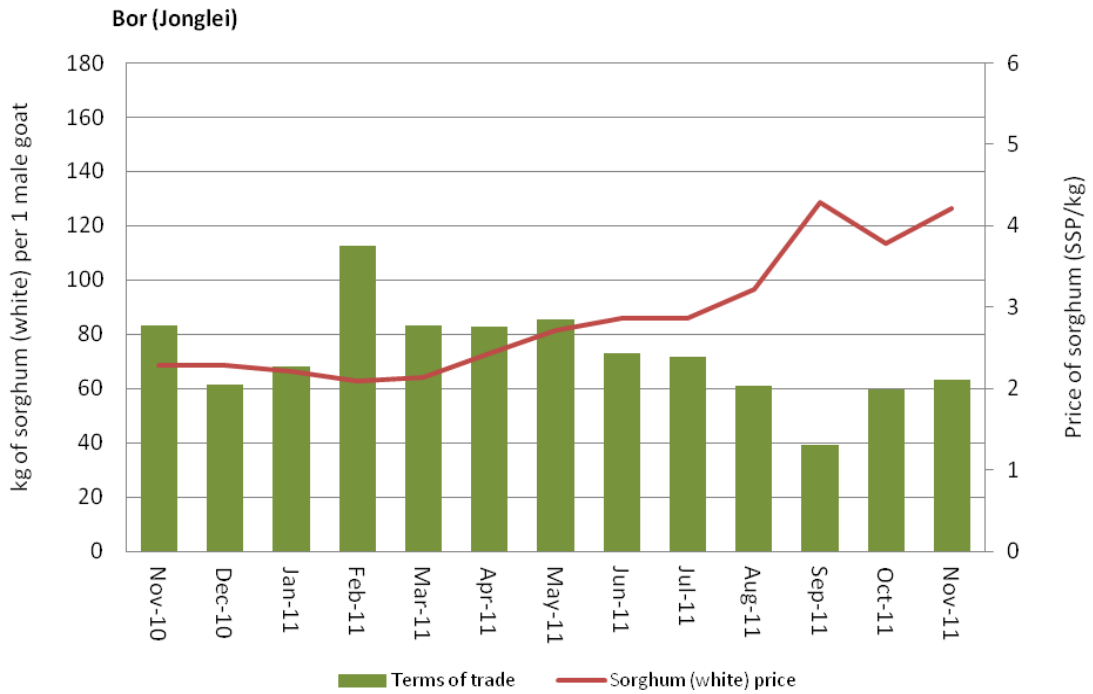
#### 4.4 Livestock prices

Livestock forms an integral part of South Sudanese livelihood systems, particular for pastoralists and sales of small ruminants represents a principal source of income that largely determine pastoralists' capacity to purchase food items. During 2011, goat prices (male medium size), although erratic, have displayed an increasing trend and are generally at higher levels than in the previous year across the country; according to WFP's market data the highest goat price was recorded in Malakal (Upper Nile) at an average of SSP 375 during the beginning of November. Similarly, prices of cattle exceed levels in 2010, reaching highs of SSP 2 775 in Juba (for a medium bull) nearly a third higher than the previous year's price. However, an accelerated rise in grain prices during 2011, particularly from May onwards, has more than offset the potential gains in pastoralists' purchasing power, consequently leading to a deterioration in ToT, depicted in Figure 7. In October and November however, ToT have improved as a result of the continued rise in goat prices in combination with a slight weakening in grain prices. In the far northern town of Malakal (Upper Nile), a steep rise in goat prices beginning in August 2011, which coincided with a decline in the price of sorghum, helped to strengthen ToT in favour of pastoralists to levels above those observed in November 2010, with a similar situation prevailing in Wau. However, despite some improvements, ToT are lower in Bor compared to the same month in 2010.

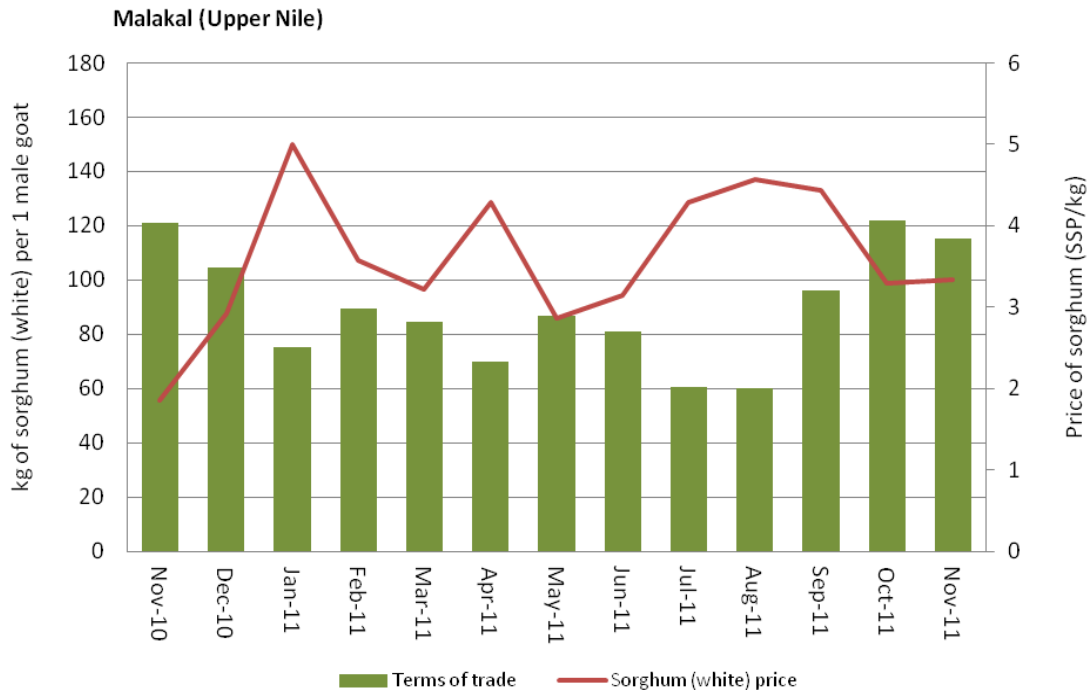
**Figure 7: South Sudan – Terms of trade: sorghum (white)/medium male goat in selected markets**



Source: WFP VAM Unit



Source: WFP VAM Unit



Source: WFP VAM Unit

In conclusion, under the prevailing conditions the Mission expects that food prices will persist at high levels relative to the previous year. The effect of the large influx of returnees, particularly concentrated in state capitals, will heighten and sustain demand for food commodities, and in combination with generally low availability of food items, are expected to maintain upward pressure on prices. The elevated prices will severely constrain access of the most vulnerable households, especially in urban areas that have limited or no agriculture production capacity. However, in the immediate post-harvest period prices may stabilise and weaken moderately supported by augmented market and household stocks. Further detailed explanations on the current and projected food security situation are outlined in the sections below.

## 5. HOUSEHOLD FOOD SECURITY SITUATION

### 5.1 Methodology

The Mission undertook extensive field visits throughout the 10 states covering all livelihood zones to assess underlying dynamics and trends of food security in South Sudan. Consultations were held with food security partners and authorities at national, state and county level. In addition, focus group discussions at the community level were conducted, as well as interviews with traders, representatives of traders associations and households.

The FSMS run by WFP and partners (FSTS, UNICEF, FAO, MOAF), initiated in 2010, is now a key source of information providing regular data on the food security situation in South Sudan three times per year. By October 2011, five rounds of the FSMS had taken place with the latest round being held on 1-15 October before the CFSAM field work was conducted (see Table 9). The next FSMS round is planned for February 2012.

The 2011 FSMS rounds covered all 10 states (except Unity in June due to insecurity at the time of the assessment). In each state, 10 sentinel sites were purposively selected through a consultative process at the state-level, taking into account the representation of various livelihood zones and administrative areas within each state. The same sentinel sites are revisited in each round (unless there are severe access constraints). In each site, 25 households are interviewed, resulting in a total of 2 424 households in Round 5.



The food security analysis in this section is based on a consolidated dataset consisting of Annual Needs and Livelihood Assessments<sup>13</sup> (ANLA) of late 2008 and 2009 and four rounds of FSMS conducted between October 2010 and October 2011, as well as being supplemented by information gathered from the CFSAM field work.

**Table 9: South Sudan – List of datasets used for food security analysis**

SURVEY	DATE	COVERAGE
ANLA 2008/2009	October 2008	
ANLA 2009/2010	October 2009	EES, NBS, WBS, Upper Nile, Unity, Lakes, Warrap, Jonglei
FSMS 2	October 2010	EES, NBS, WBS, Upper Nile, Unity, Lakes, Warrap, Jonglei
FSMS 3	February 2011	CES, WES, EES, NBS, WBS, Upper Nile, Unity, Lakes, Warrap, Jonglei
FSMS 4	June 2011	CES, WES, EES, NBS, WBS, Upper Nile, Lakes, Warrap, Jonglei
FSMS 5	October 2011	CES, WES, EES, NBS, WBS, Upper Nile, Unity, Lakes, Warrap, Jonglei

(CES - Central Equatoria State, EES – Eastern Equatoria State, NBS – Northern Bahr el Ghazal State, WBS – Western Bahr el Ghazal State)

## 5.2 Food security status for 2011-2012 in South Sudan

### *Determining factors*

The factors that will drive the general food security situation for South Sudan in 2011-2012 are the poor rainfall pattern during the 2011 cropping season and the radical changes in trade flow patterns resulting from the restrictions on transportation of commodities between Sudan and South Sudan. Additional issues arise from inter-communal and inter-communal conflicts, the large influx of returnees from the Sudan and displaced residents from Abyei.

### *Rainfall patterns in 2011*

As outlined in section 3.2.1, rainfall during 2011 was generally delayed across South Sudan and the first rains were followed by an extended dry spell lasting until end of July in some areas. Once established, rainfall was irregular in many locations with localized episodes of very intense rains. This rainfall pattern led to a generalized decrease in area planted and lower yields throughout the country, resulting in the lower than average crop production for 2012 (see Section 3.3).

### *Sudan border closure*

In the wake of the referendum and subsequent independence the major roads linking the new country to Sudan were closed, halting the usual supply of goods. Although the resulting trade gap was quickly filled with goods from Uganda, the large distances involved, the extremely expensive fuel, unfavourable exchange rates, taxes both official and unofficial, led to market prices reaching very high (if not record) levels. This impacted the northern states more severely given their higher dependency on Sudanese goods and the large distance from Uganda (see Section 4.2).

### *Conflict, returnees and IDPs*

The incidents of inter-communal conflict in 2011 (see Section 3.4) led to loss of life and assets (livestock in particular) with the added effect of disrupting crop production. In 2011 considerable numbers of returnees from Sudan settled in South Sudan. They represent additional demand as many settled in urban or peri-urban areas and those in rural areas had little access to land. IDPs from the Abyei conflict (over 100 000) also depend on the host community and on humanitarian assistance.

<sup>13</sup> Until 2009 ANLA was an actual assessment, but from 2010 it is an analysis of available secondary information much of it arising from the FSMS outputs

The factors above determine the food security situation in 2012 in South Sudan, affecting food availability and access at the household level:

- The lower than average crop production translates into lower household food stocks which implies households having to access markets for food purchases much earlier (and for longer) than usual.
- The changes in trade flow patterns, poor infrastructure, unfavourable exchange rates and enhanced demand from returnee populations translate into higher (if not record) market prices.
- The earlier/longer household dependency on markets, in combination with high and rising food prices offers poor perspectives for the food security status of the population of South Sudan during 2012.

The impacts will vary across South Sudan and two major regions can be identified:

- **Group I:** The belt of northernmost states extending from Northern Bahr el Ghazal across Warrap, Unity up to Upper Nile, some areas of Lakes (northwest) and Jonglei (north) and also including Eastern Equatoria.
- **Group II:** The remaining south-western and southern most states from Western Bahr el Ghazal across Western and Central Equatoria and including southern areas of Lakes and Jonglei.

Group I continues to be more affected by factors detrimental to food security: it suffered a more unfavourable rainfall season, it has been much more affected by the blockade of normal trade flows, it is where most conflict situations took place and it is where the bulk of the returnees from Sudan and the displaced from Abyei have settled. Eastern Equatoria is included in this group on the basis of its food security status, though the drivers are somewhat different: although it was also affected by the prolonged dry spell in 2011, contrary to the other states in this group it had a poor season in 2010; it is not directly affected by the blockade of trade from Sudan, but suffers from high market prices due to poor/insecure road connections.

Group II was less affected, in particular by the changes in trade flow patterns – Sudan was not such a dominant supplier to the markets in this region and they are generally closer and better linked to Uganda, a customary source of food and commercial goods. The impacts of poor rainfall were also less intense or altogether not significant (as was the case in Western Equatoria).

**Figure 8: South Sudan – Proportion of households experiencing different shocks from October 2010 to October 2011**

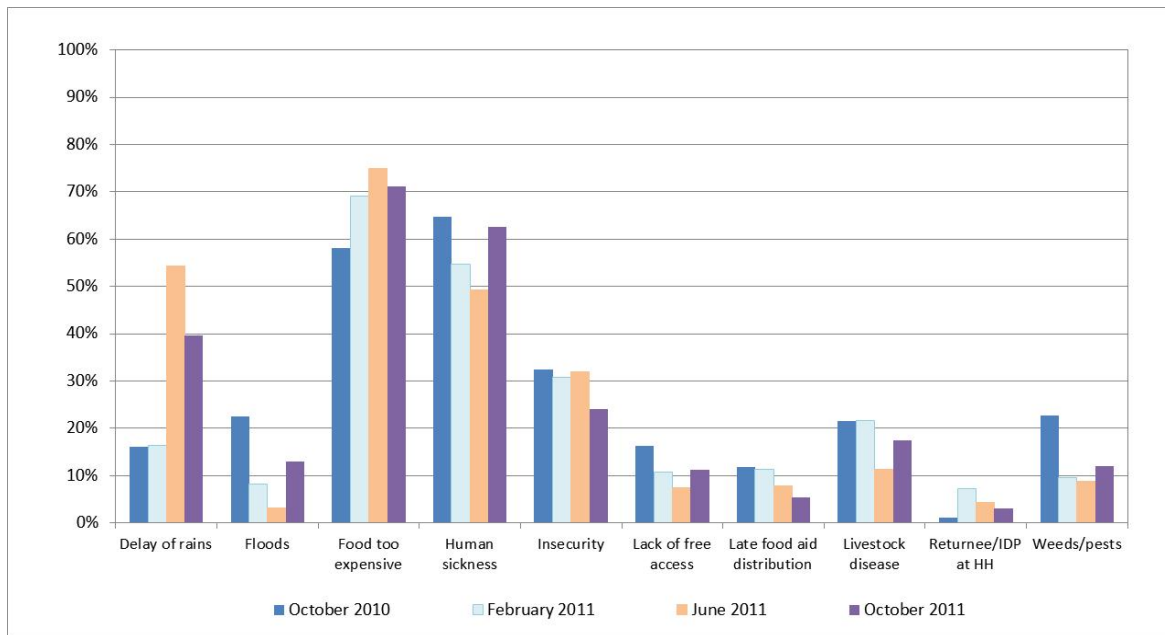


Figure 8 shows the proportion of households affected by different shocks in South Sudan between October 2010 and October 2011. The effect of high food prices, diseases, erratic rainfall and insecurity were the main shocks, in order of frequency. The effect of the poor rainfall pattern during the rainy season of 2011 is clearly captured in the June and October data, a pattern noticeable in most states. High food prices are consistently ranked higher than all other shocks across all states and human sickness also features prominently across all states. However, insecurity was quite variable with Jonglei, Lakes and Western Equatoria reporting it most strongly (conflict areas in Unity State were not visited hence the effect of conflict is not evident).

### 5.3 Current food security situation

The household food security status evaluated by the ANLA and FSMS is determined by three components:

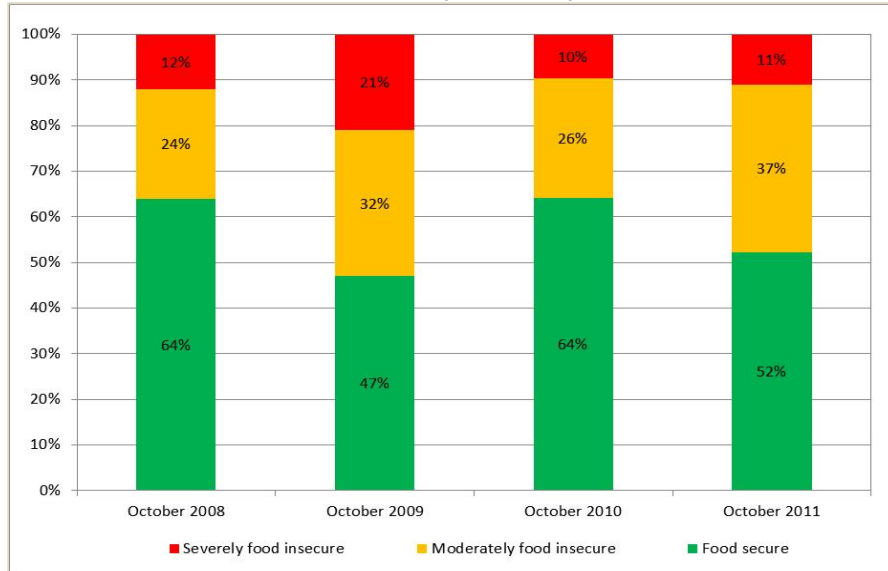
- a. food consumption, based on dietary diversity and frequency;
- b. food access, based on the share of food expenditure and the reliability and sustainability of income activities pursued by the household;
- c. coping strategies derived from the frequency and severity of different coping strategies employed by households.

Based on these factors, households are classified into three categories: severely food insecure, moderately food insecure and food secure. The food consumption component on its own is used to select for WFP targeting purposes, those households in the moderately food insecure category that are more likely to become severely food insecure under conditions of poor access to food.

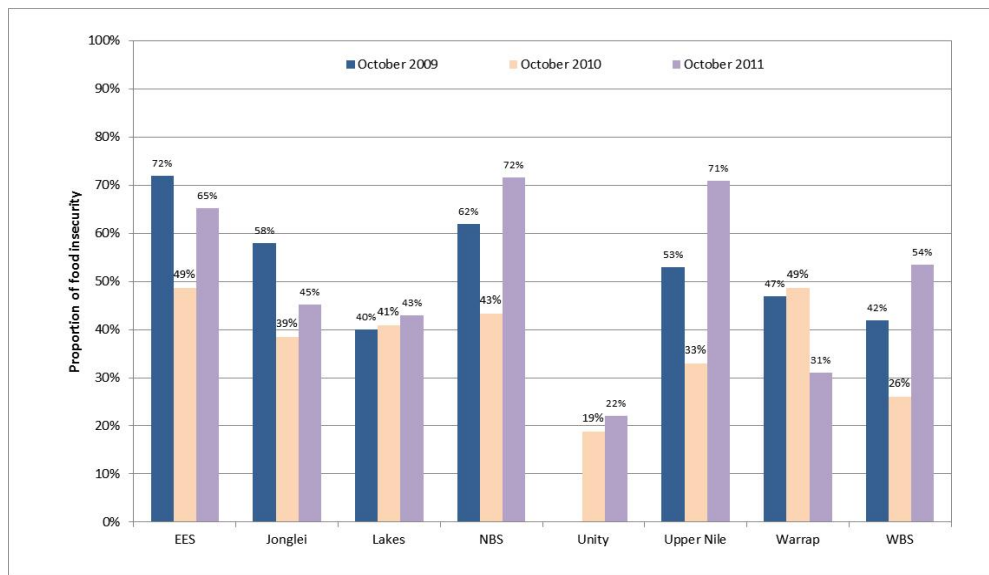
In 2011, the combination of poor rainfall and trade restrictions (among other shocks) led to low levels of crop production, high food prices and unfavourable market conditions and resulted in about 48 percent of the population of South Sudan being moderately to severely food insecure (Figure 9). This is an increase from the 36 percent registered in 2010/11 which was considered a relatively good year with an above average harvest.

The 2011 data already shows a sharp increase in the moderately food insecure households from 26 to 37 percent (Figure 9), which is the first sign of a worsening trend in food security conditions in South Sudan. The increase in the proportion of severely food insecure is more modest (11 percent against 10 percent at the same time in 2010) but will increase under the expected developments in the factors affecting food security in South Sudan.

**Figure 9: South Sudan – Distribution of food security status in South Sudan in the past four seasons (2008-2011)**



**Figure 10: South Sudan – State-level prevalence of food insecurity (severely and moderately food insecure), 2009-2011**



(EES – Eastern Equatoria State, NBS – Northern Bahr el Ghazal State, WBS – Western Bahr el Ghazal State)

Changes in the food security situation are not uniform across the country. Figure 10 shows food insecurity (as the sum of the severely plus moderately food insecure) to have increased most significantly between 2010 and 2011 in Upper Nile, Western Bahr el Ghazal, Northern Bahr el Ghazal and Eastern Equatoria.

All these states have been more subject to unfavourable food security constraints and the resulting decline in food security status is already evident in the individual household indicators of food security. Although the situation is still stable for Unity, Warrap and Lakes, it is likely to change rapidly due the prevailing factors affecting food insecurity.

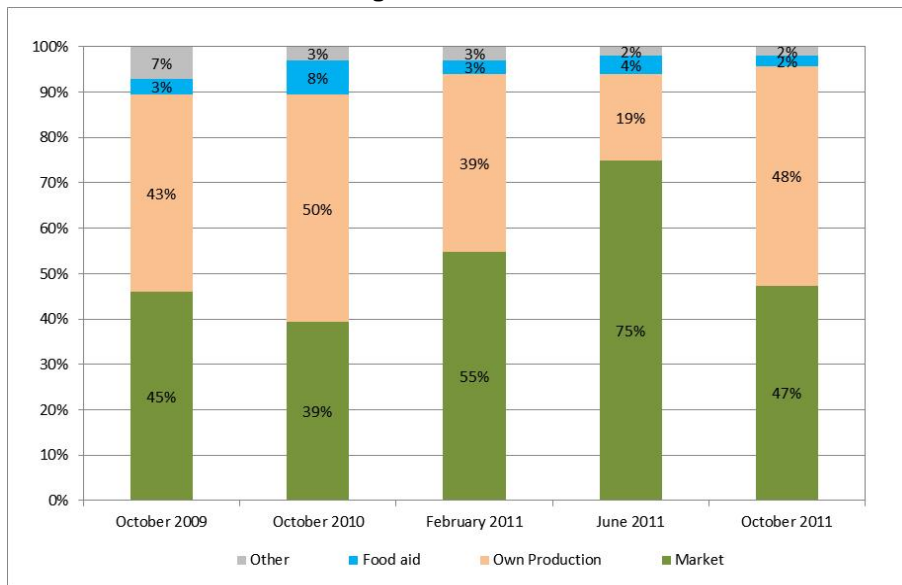
5.3.1 Changes in household food sources

Figure 11 shows households' main food sources and their seasonality. The two dominant sources of sorghum for households are markets and own production, with markets being the dominant source, accounting for at least 40-50 percent of the supply around harvest time and higher proportions during the lean period: in June 2011, markets were the main source of sorghum for 75 percent of the households.

Considering the shortfalls in household crop production arising from the poor harvest of 2011, it is expected that in 2012, households' dependence on markets will intensify earlier and reach higher proportions than in 2011. This will take place against a backdrop of high and increasing market prices, signalling a potential significant decline in food access during the lean season of 2012.

The importance of markets as a source of cereal has indeed increased from October 2010 to October 2011. In South Sudan as a whole it is now at 47 percent (up from 39 percent at the same time in 2010) with increases in Upper Nile from 65 to 92 percent, Eastern Equatoria from 59 to 71 percent and Western Bahr el Ghazal from 59 to 68 percent. Given the typical seasonal pattern, higher values will be expected during the middle of the coming year. Therefore, Upper Nile, Eastern Equatoria, Western Bahr el Ghazal and Central Equatoria are likely to be hotspots for high food prices.

**Fig 11: South Sudan – Sources of sorghum for households, October 2009 to October 2011**



5.3.2 Changes in income sources and livelihood options

*Livestock sales*

A typical recourse to obtain income for cereal purchases is by means of livestock sales (or to barter livestock directly for cereal). Livestock prices (as discussed in Section 4.4) were at record levels across South Sudan as livestock sellers/traders track cereal prices (ToT between cattle and cereal remaining stable). In spite of the problems with the early season rainfall, there was enough rainfall in its later stages to provide good pasture and reasonable water resources while drier than average weather led to slightly lower incidences of disease (see Section 3.3 for details); this is expected to change as overall below average rainfall led to reduced flooding which implies scarcity of water and pasture in the coming dry season.

As households will need to access markets earlier, it is expected that an increased number of people will resort to selling livestock earlier than normal in order to raise cash to purchase food. This should force livestock sellers to lower their prices consequently lower ToT (livestock-cereal), which would weaken livestock owners' purchasing power in the first quarter of 2012 (see Sections 4.3 and 4.4).

*Charcoal and firewood*

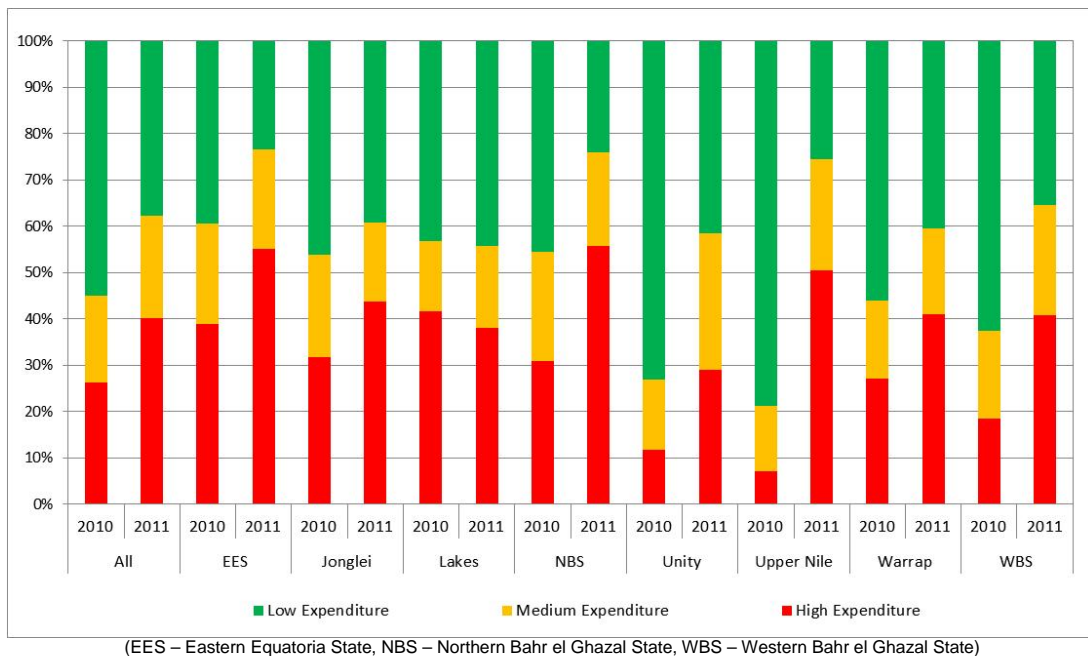
In areas where crop production was poorest, an increase in charcoal making and firewood collection might be expected. The Mission came across reports of increased numbers of charcoal sellers resulting in prices being kept lower by the enhanced competition.

5.3.3 Changes in food expenditure patterns

In South Sudan, households spend a very large proportion of their expenditures on food – data from the NBHS indicate proportions of income spent on food to be as high as 80 percent in rural areas, and 69 percent in urban areas.

In the FSMS analysis households are classified in terms of their expenditure on food into households with high, medium and low food expenditure (respectively more than 65 percent, 65 to 50 percent and less than 50 percent of expenditure allocated on food purchases). The prevalence of households in each class for South Sudan and each state and its variation between late 2010 and late 2011 is shown in Figure 12.

**Figure 12: South Sudan – Proportion of households in food expenditure class by state, 2010 and 2011**



High food prices have increased the overall proportion of households with high expenditure on food from 26 to 40 percent between October 2010 and October 2011. The level of 40 percent was reached early in 2011 and remained unchanged throughout in spite of the incoming harvest.

This is likely to increase in 2012 given the high market prices and indications that normal trade relations between South Sudan and Sudan are unlikely to be restored soon. Therefore significant

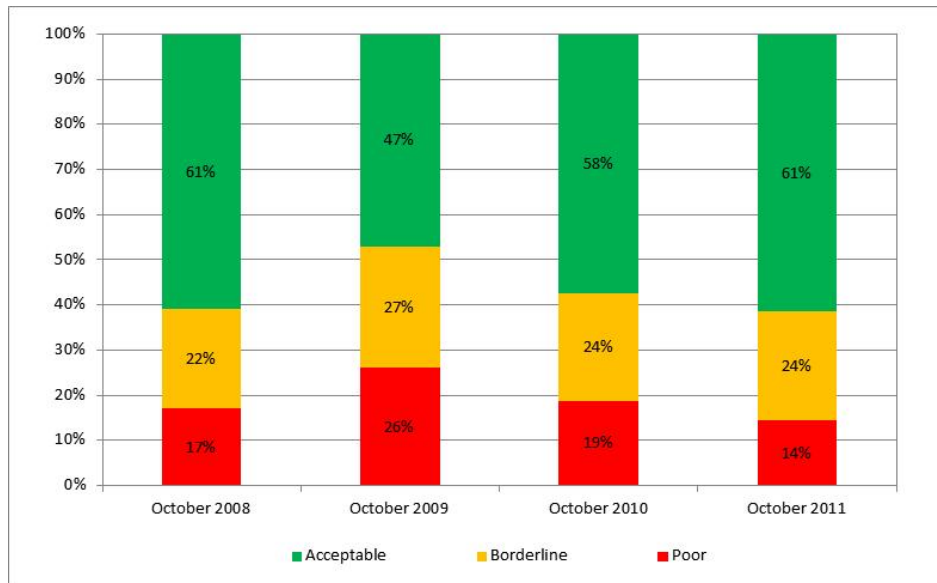
increases in household food expenditure are expected to crowd-out other expenditure crucial for well-being (for example, health and education).

The highest increases in the proportion of households with high to medium food expenditure are observed in Upper Nile (21 to 74 percent), Unity State (27 to 58 percent) and to a lesser degree in Western Bahr el Ghazal (38 to 64 percent), Northern Bahr el Ghazal (54 to 76 percent) and Warrap (44 to 60 percent). Eastern Equatoria also increased from 61 to 77 percent. Lakes, Central Equatoria and Western Equatoria (in particular) have lower shares, less variation and show an actual improvement (Figure 12).

#### 5.3.4 Changes in food consumption and coping strategies

The situation in terms of food consumption (dietary diversity and frequency of consumption) for the whole of South Sudan remains relatively unchanged compared to the past year (Figure 13). At the state-level, the worst levels of food consumption are reported in Eastern Equatoria, Western Bahr el Ghazal, Jonglei and Lakes states.

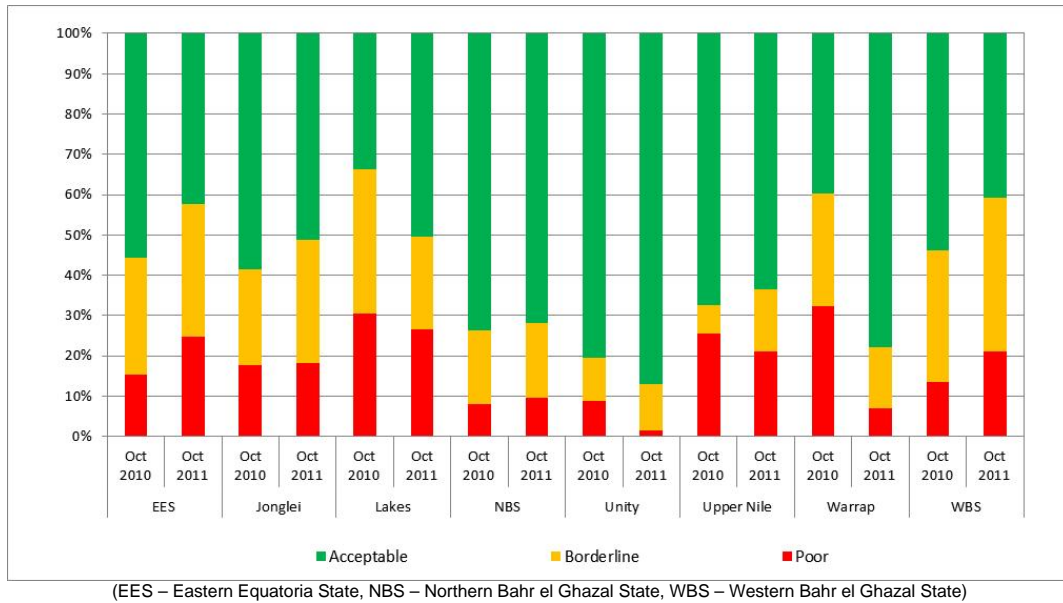
**Figure 13: South Sudan – Prevalence of Food Consumption groups, late 2008 to present**



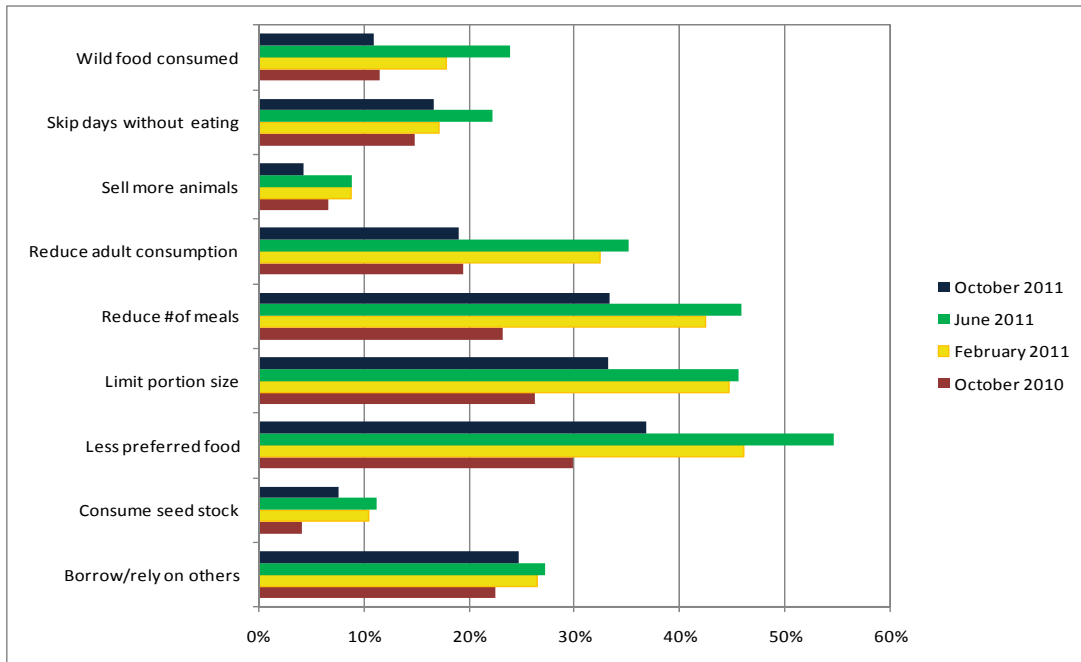
Only three states register a worsening situation from 2010 to 2011: Eastern Equatoria (44 to 58 percent, respectively severe and borderline food consumption), Jonglei (41 to 49 percent), and Western Bahr el Ghazal (46 up to 59 percent).

Food consumption for other states remained relatively unchanged because of high carryover stocks that lasted longer (confirmed by field interviews) and high livestock prices, which resulted in favourable ToT. However, this is now likely to change due to the poor crop production across most states and the low probability of the resumption of normal trade flows from Sudan.

**Figure 14: South Sudan – Prevalence of Food Consumption groups by state, 2010 and 2011**



**Figure 15: South Sudan – Prevalence of Coping Strategies in use by households across, from late 2010 to late 2011**



In terms of coping strategies, the situation is denoted by an increase in the number and frequency of coping strategies being used by the households as shown in Fig 15. There is a marked seasonal pattern in coping strategies, with an increase from October to a peak in June (due to the decrease in household food stocks and higher market prices).

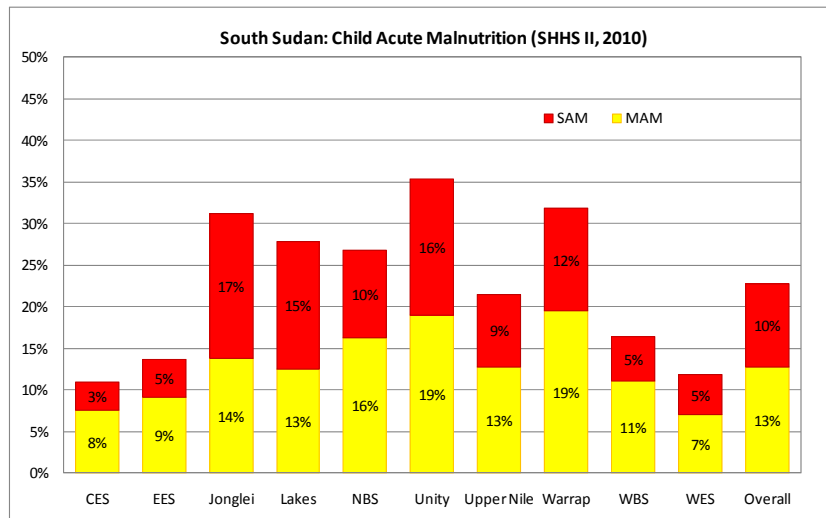


Comparing the situation between October 2010 and October 2011, the proportion of households resorting to dietary adjustments, such as consumption of less preferred food, reducing the number of meals and limiting the portion size has increased, an indication of a tightening food security situation. The largest increases were verified in Northern Bahr el Ghazal, Eastern Equatoria and to a lesser degree in Lakes and Warrap. Upper Nile and Jonglei continue to register a fairly high level of adoption of coping strategies.

#### 5.4 Nutrition situation

Current levels of malnutrition are high across South Sudan and remain a significant challenge. The most recent representative information is from the Sudan Household Health Survey (SHHS) of 2010 showing that 27.6 percent of children under 5 years are underweight, 31.1 percent are stunted and 22.7 percent are wasted. Based on the WHO cut-offs for wasting, South Sudan is considerably over the critical level of 15 percent. Compared to the SHHS of 2006, the prevalence of wasting has remained fairly stable (GAM 22 percent, SAM 4 percent).

**Figure 16: South Sudan – Prevalence of Child Acute Malnutrition by State (SHHS 2010)**



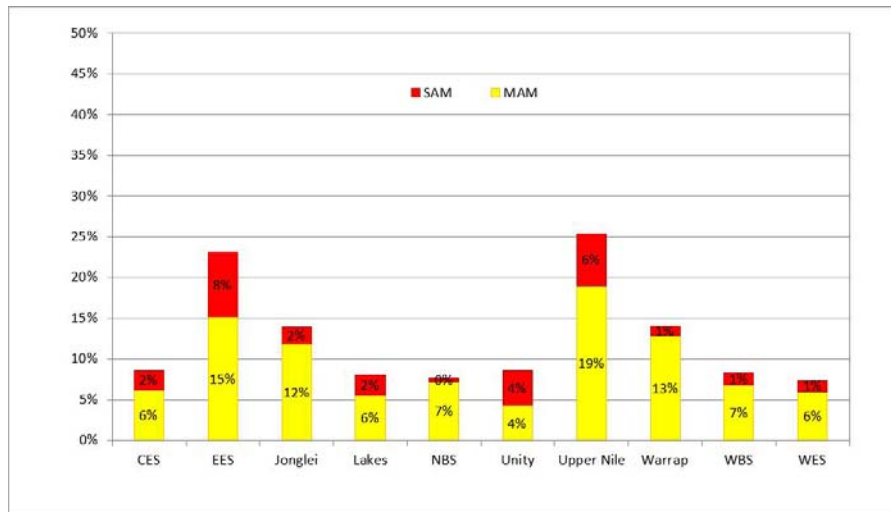
(CES – Central Equatoria State, EES – Eastern Equatoria State, NBS – Northern Bahr el Ghazal State, WBS – Western Bahr el Ghazal State)

There is considerable variation across the country with the states of Unity, Warrap and Jonglei exceeding 30 percent (35 percent, 31 percent, 31 percent), and Lakes, Northern Bahr el Ghazal and Upper Nile exceeding 20 percent (28 percent, 26 percent, 22 percent). Only three states have GAM rates below 15 percent. It should be noted that the states with highest GAM rates are also those which suffered greater impact of factors detrimental to food security in 2011 (poor crop production, disrupted market supplies and rising prices, returnees and conflict). Compared to the 2006 SHHS survey, Lakes registered large increases in GAM rates (13 to 28 percent) while significant decreases occurred in Upper Nile (30 to 22 percent) and Western Bahr el Ghazal (24 to 16 percent).

However, more recent FSMS data shows higher prevalence of malnutrition in Jonglei, Eastern Equatoria, Northern and Western Bahr el Ghazal, Upper Nile and Warrap (child malnutrition). In South Sudan, according to past nutrition surveys, malnutrition rates display a seasonal patterns with the main peak in April-June (earlier stage of the rainy season and the peak of the lean period) and a second smaller peak in August-September (the peak of the rainy season) associated with increased malaria incidence<sup>14</sup>. The MUAC data from the FSMS also supports this pattern and indicates the seasonality to be more pronounced for children younger than 24 months.

<sup>14</sup> ANLA 2012 Report, WFP

**Figure 17: South Sudan – Prevalence of Child Acute Malnutrition (MUAC) by state, FSMS October 2011**



(CES – Central Equatoria State, EES – Eastern Equatoria State, NBS – Northern Bahr el Ghazal State, WBS – Western Bahr el Ghazal State)

Causes of malnutrition are manifold, with key factors being poor food intake, disease, feeding practices, poor hygiene and sanitation and lack of access to medical care. Incidences of diarrhoea is much higher in malnourished children and this is linked to the use of unsafe drinking water: 69 percent of the population has access to improved drinking water, but only 7.4 percent use sanitation facilities (SHHS 2010). Higher malnutrition rates are associated with poorer food security status which is linked to food shortages caused by crop failure, insecurity and high prices. A more in depth analysis of the patterns and linkages of nutrition to causal factors can be found in the ANLA 2012 Report and the FSMS Report Round 5<sup>15</sup>.

### 5.5 Summary of findings for food security and nutrition

The year of 2011 was characterized by rising market prices in particular from mid-2011 onwards with the closure of trade routes the key driving factor, aggravated by the additional demand from returnees and IDPs and the longer lean season resulting from the delayed start of the rainy season. This is reflected in the results of the FSMS, showing sharp increases in the importance of markets as a source of food, in higher proportions of households with high food expenditure and the increased adoption of coping strategies involving a decrease in food consumption, compared with the same period in 2010.

In terms of overall food security, the aggregated South Sudan situation already shows the first signs of a worsening trend, with the state by state breakdown revealing a more detailed pattern of sharpest increases in food insecurity in Upper Nile, Northern and Western Bahr el Ghazal and Eastern Equatoria.

As households will access the market for food purchases 2 to 3 months earlier than usual (February rather than May) against a backdrop of high and rising market prices, it is therefore expected that the food security and nutrition situation will deteriorate further with indicators worsening from the first quarter of 2012 towards the middle of the year. States where this is likely to be more pronounced include Upper Nile, Northern and Western Bahr el Ghazal and Eastern Equatoria.

<sup>15</sup> FSMS Round 5 Report, WFP, 2011.

## **5.6 Estimated food assistance requirements in 2012**

### **5.6.1 Scenarios**

Two scenarios for 2012 are developed based on possible behaviour the following key factors:

- Market prices (trade routes, exchange rate)
- Continuing influx of returnees and IDPs (conflict with Sudan and internal)
- Early onset of lean season in 2012

The food aid requirements are estimated based on the scenarios.

#### ***Best-case scenario***

An earlier than normal onset of lean season in 2012 (from February) leads to enhanced household dependency on markets at a time when lower crop production, reduced market flows from Sudan and influx of returnees are expected to drive prices in 2012 above the already high levels experienced in 2011. The prospect of improved trade flows from Sudan are fairly slim, even if the borders were to re-open in 2012, given the very poor production from the large scale farming areas of White Nile, Sennar, Gedaref and Kassala. Increased dependence on alternative sources of food and other commercial supplies are likely to escalate food prices further given the high fuel and transportation costs. The early signs of declining food security observed in Northern Bahr el Ghazal and Eastern Equatoria are likely to become more pronounced and extend to other states bordering Sudan (Upper Nile, Warrap and Unity).

Continuing conflicts in South Kordofan and Blue Nile will cause displacements into the bordering states of Upper Nile and Unity while inter-communal and inter-communal fights are likely to intensify following the poor harvest and decreased dry season pasture and water resources in 2012.

#### ***Contingency scenario***

This scenario assumes that no countervailing action is taken to improve food supply leading to extremely high food prices. It also assumes that continuing conflicts in Kordofan and Blue Nile increase displacements beyond the levels estimated by OCHA (100 000 refugees, 435 000 IDPs and displaced Abyei residents and 260 000 returnees).

### **5.6.2 Food assistance requirements**

According to the ANLA and FSMS results for October 2011, 37 percent of the population (3.7 million people) is moderately food insecure compared to 26 percent (2.4 million people) the previous year. In addition, the severely food insecure population increased modestly from 10 percent of the population in 2010 to 11 percent in 2011. In 2011/12 this corresponds to 1 000 000 severely food insecure plus 3 700 000 moderately food insecure.

The ANLA 2012 report contains a detailed breakdown of the proportions and numbers of people in each food security class (severely food insecure, moderately food insecure and food secure) for all ten states in South Sudan.

The severely food insecure population will be assisted through a mix of unconditional and conditional food transfers. The moderately food insecure are supported through targeted non-food livelihood support as they are usually able to meet their food needs through low coping mechanism unless there is a major shock. Due to the anticipated effects of high food prices on the food access of moderately food insecure, a conditional seasonal support has been considered to prevent them from sliding into the severely food insecure category during this period.

In the **best case scenario**, planned WFP assistance will cover a total of just over 2 700 000 unique beneficiaries with total food needs of 152 000 tonnes.

WFP will assist an estimated 870 000 people; this corresponds to the proportion of the severely food

insecure population living in rural areas. Of these, 360 000 socially vulnerable people will be assisted with unconditional GFD and the remaining 510 000 will be supported through community-based recovery activities.

WFP will further assist about 364 000 of the moderately food insecure population; this corresponds to the 12 percent of moderately food insecure households in rural areas that are already showing poor food consumption. This population will be supported through food for asset activities to cushion them from the effects of high food prices. This assistance will be provided for a maximum of 150 days during the lean season from February-July.

In addition, emergency assistance will be provided to the conflict affected population consisting of 100 000 refugees, 260 000 returnees, 320 000 IDPs and 115 000 displaced residents from Abyei. IDPs and returnees will be assisted for 90 days while refugees will be supported for 360 days. A school meals programme will be implemented for about 440 000 pupils for 176 days during the school-term, blanket supplementary feeding for 200 000 children age 6-24 months for 150 days and targeted supplementary feeding for 300 000 moderately acute malnourished children and pregnant and lactating women for 60 days. An institutional feeding programme will support about 192 000 TB, HIV, Kalazar patients and their caretakers for 30 days for in-patients and 180 days for outpatients.

This leads to a total number of unique beneficiaries under planned WFP assistance of just over 2 700 000 (unique beneficiaries are calculated for the entire year 2012 by deducting overlapping beneficiaries receiving assistance from more than one activity). Table 10 shows a breakdown of tonnage and beneficiaries by state.

**Table 10: South Sudan - Estimated food assistance requirements in 2012**

State	Best case scenario		Contingency scenario	
	Beneficiaries	Tonnes	Total beneficiaries	Total (tonnes)
Jonglei	402 545	21 843	537 424	28 758
EES	287 998	15 634	423 218	22 567
WES	129 219	7 823	144 277	8 595
CES	123 654	7 687	203 786	11 795
Warrap	408 719	19 231	458 373	21 777
WBS	187 740	9 455	214 939	10 849
NBS	212 579	13 078	286 987	16 893
Lakes	244 839	12 394	289 046	14 661
Upper Nile	541 184	31 536	607 640	34 942
Unity	171 455	13 562	179 353	13 967
<b>TOTAL</b>	<b>2 709 932</b>	<b>152 243</b>	<b>3 345 044</b>	<b>184 803</b>

The **contingency scenario** requires an additional 32 560 tonnes bringing the total food requirements to 184 803 tonnes (Table 10) covering just over 3 300 000 unique beneficiaries.

This scenario increases the best case scenario with the addition of 27 percent of the moderately food insecure people who have borderline food consumption; these are people who in normal circumstances can meet their food needs but because of high food prices, their purchasing power is eroded and therefore will need to be cushioned to avoid slipping into the severely food insecure category during the hunger season.

**ANNEX I**

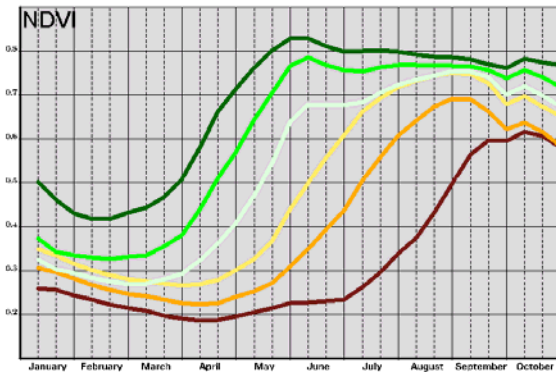
**COUNTIES VISITED BY THE MISSION**

The Mission visited the following States and counties during the field work conducted between 19 October and 4 November 2011:

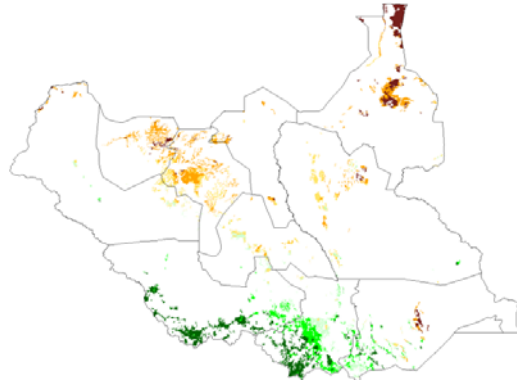
1. Northern Bahr el Ghazal: Aweil Centre, Aweil East, Aweil West, Aweil South
2. Western Bahr el Ghazal: Wau, Raja, Jur River
3. Unity: Leer, Koch, Guit, Mayandit, Pariang
4. Warrap: Gogrial West, Twic, Tonj South
5. Lakes: Rumbek East, Rumbek Centre, Cueibet, Wulu
6. Upper Nile: Malakal, Panyikang, Renk, Akoka
7. Jonglei: Bor, Pochalla, Akobo, Pibor
8. Central Equatoria: Kajo-Keji, Juba, Yei, Morobo, Lainya, Terekeka
9. Western Equatoria: Yambio, Ibba, Maridi, Nzara
10. Eastern Equatoria: Kapoeta North, Kapoeta West, Kapoeta South, Ikotos Magwi

**NDVI AND RAINFALL ESTIMATES, 2011**

The cluster analysis distributes pixels in five classes characterised by NDVI values for each decade, which are displayed into the profiles graph. The colours on the map are linked to the colour of the profiles. It gives an overview of the potential biomass production and vegetation cycle distribution over South Sudan during the period January to October 2011.

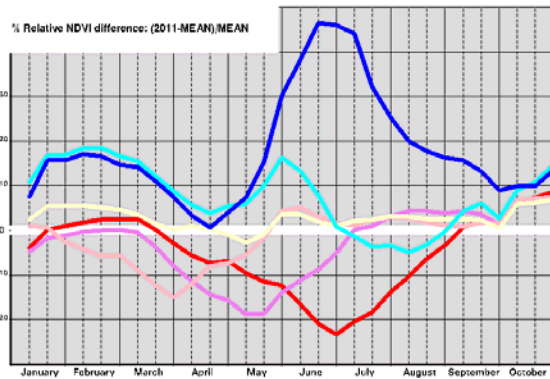


**Clusters profiles characteristics**

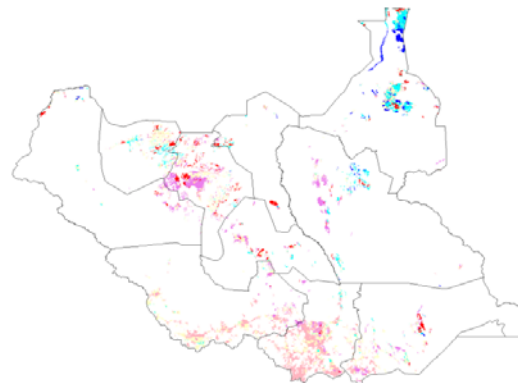


**Clusters distribution over arable land**

The cluster analysis is applied on the percentage of difference of 2011 NDVI with the NDVI LTA . The coloured clusters into the map are characterised by the corresponding colours of the profiles. The anomalies impact can be analysed according to their duration and the distance to the average (zero into the profile).

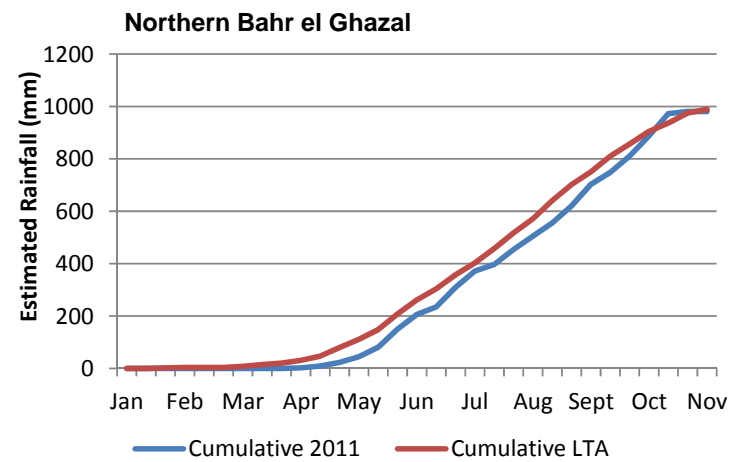
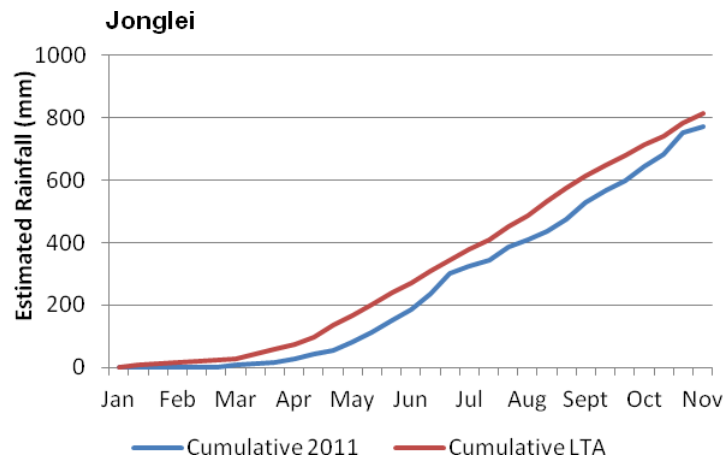
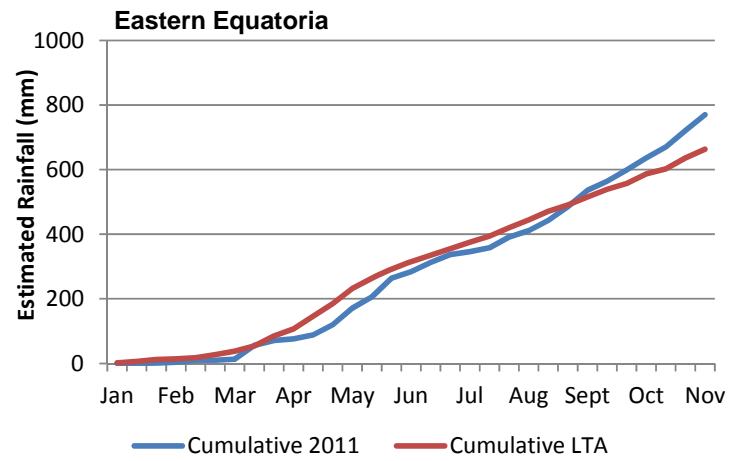
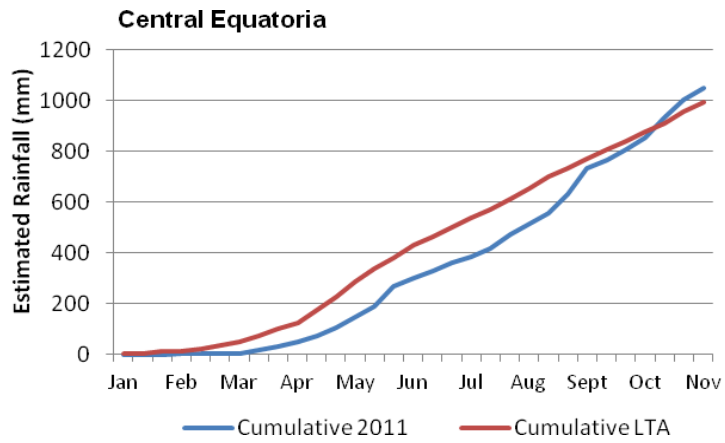


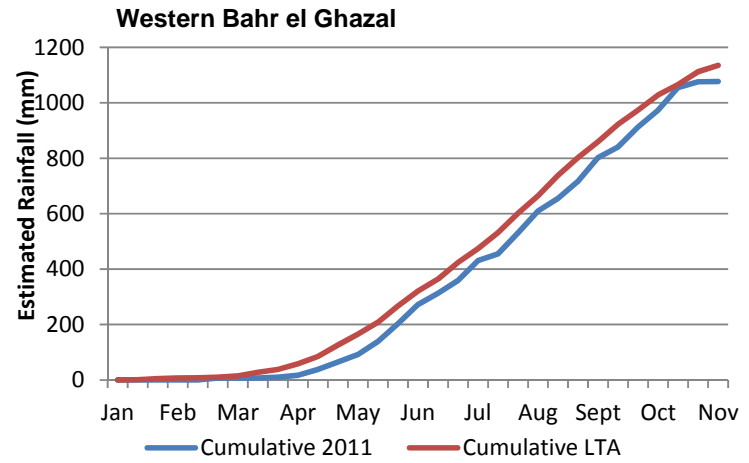
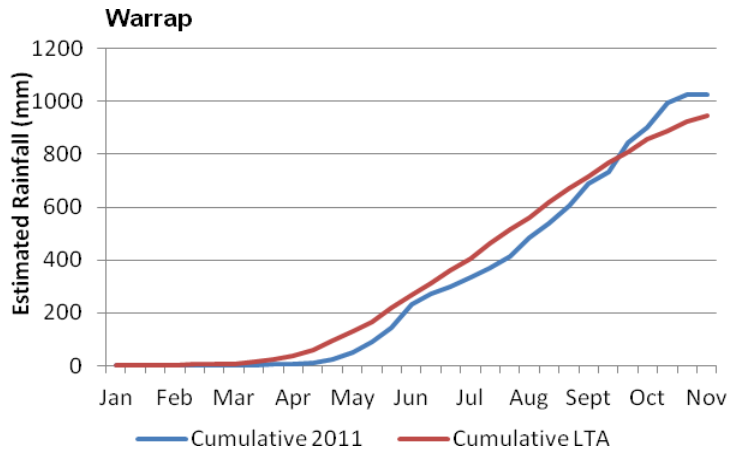
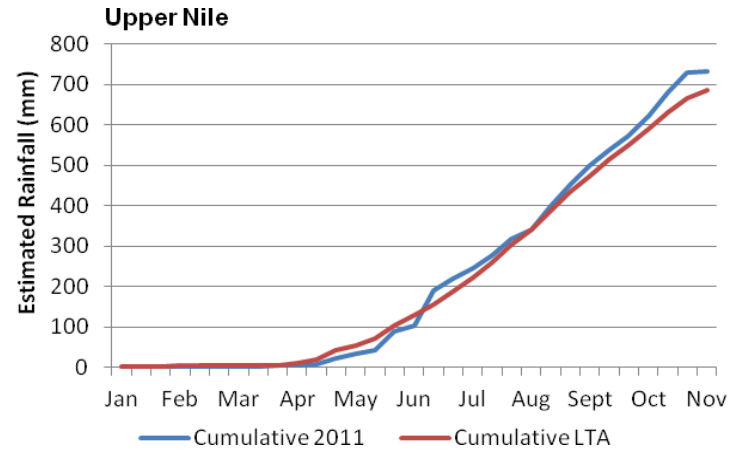
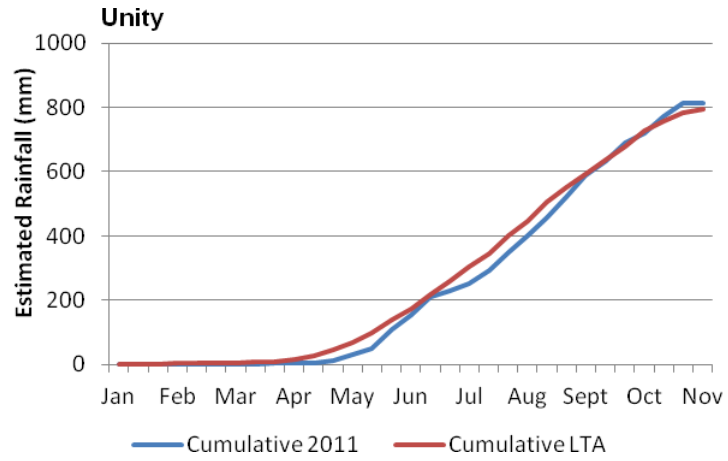
**Clusters profiles characteristics**



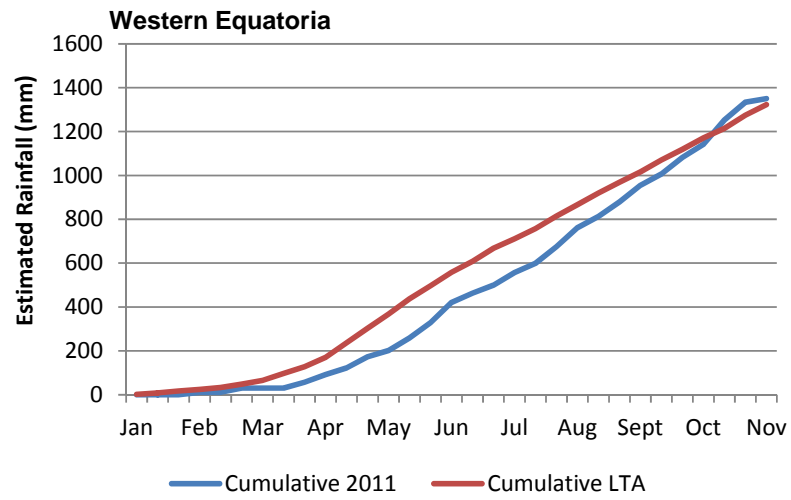
**Clusters distribution over arable land**

Source: GMFS









**Cumulative rainfall estimates (mm): 2011 and long term average**  
Source: NOAA/FEWS; FAO/SDRN-Agro-meteorology Group

**SEASONAL CALENDAR**

**South Sudan. Indicative cropping calendar**

		Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	
Unimodal rainfall zone	Rainfall	Dry season		Wet season						Dry season				
	Main crop		Land preparation and planting	Growing season			Harvest							
	Long-cycle crops			Growing season						Harvest				
Bimodal rainfall zone	Rainfall	Dry season	Wet season								Dry season			
	First crop	Land preparation and planting		Growing season			Harvest							
	Second crop						Land preparation and planting		Growing season		Harvest			

## **SITUATION BY STATE**

### **CENTRAL EQUATORIA STATE**

The rains in Central Equatoria started in March with below-average amounts falling during April, May and June. This relatively poor start to the season, especially in the northern payams, resulted in some re-seeding of maize in July when the rains began to show significant improvement. The increased rainfall in July and August caused some water-logging, affecting, in particular, beans and cowpeas in Mongalla and Terekeka; maize, sorghum and vegetables planted along the riverbanks were also damaged. Rainfall during September and October was normal.

Rural households generally reported a slight reduction in the area of land that they cultivated this year, some of this reduction being attributed to limited availability of family labour and some to increasing pressure on land in populated areas. The increased numbers and the slight reduction in area per household have generally balanced each other out with the result that the total area under cereals this year was not significantly different to that of 2010. Overall cereal yields, however, have dropped from 0.73 to 0.63 t/hectares; first-season maize performed poorly in the northern payams, due to insufficient and poorly distributed rainfall in June, while sorghum yields were compromised by late weeding and heavy rains at flowering. Limited crop rotation and over-cultivation of land are also considered to have reduced soil fertility. The satisfactory late rains are expected to result in good yields of second-season crops and late-planted sorghum in the south of the state.

Efforts have been made to encourage the use of ox-ploughing but uptake remains limited; for instance, in Kajo Keji county the area of land cultivated by oxen is estimated to be less than one percent. Some medium-sized farms hire tractors for land preparation but high fuel prices have limited their wider use. Most farmers use their own seed retained from the previous year's harvest, with some purchasing from the market; not much hybrid seed is used. A relatively small number of farmers received assistance this year with seeds and hand-tools from NGOs and FAO.

Central Equatoria has seen an increase this year in the amount of horticultural and cash-crop production (sweet potato, groundnut, sesame) especially amongst cooperative farming organizations in the vicinity of Juba. However, a disproportionately large amount of produce in the Juba markets still comes across the border from Uganda.

Crop weeds, pests and diseases have remained at normal levels this year. Most troublesome are striga, sorghum stemborer, birds, termites, grasshoppers and rodents; bananas are vulnerable to nematodes.

Livestock condition is generally good and the pasture and water prospects for the coming dry season are promising as a result of the adequate late rains. There have been cases of East Coast Fever, which is endemic in Greater Equatoria, and of Newcastle Disease, but there have been no serious outbreaks.

### **EASTERN EQUATORIA STATE**

The start of the rains in March was followed by a relatively dry four weeks up to late April which had minimal negative impact on crop production. Thereafter, rainfall amounts and distribution over most of the state were normal.

Sorghum, maize and groundnuts all performed well, with the cereals showing an expected overall increase in yield this year to 0.87 t/hectares compared with the previous year's 0.77 t/ha. There was also a slight increase in the area under cultivation this year, attributable both to improved security and to increased government support. High-production areas grow more maize, which is planted as a first-season crop in March, while low-production areas tend to concentrate on sorghum, which is sown in July. The sorghum had not yet been harvested at the time of the Mission's visit. With the increases in both area and yield, net cereal production this year is forecast to be 99 000 tonnes, up by 25 percent

on 2010. It is worth noting that Ikotos is one of only two counties outside Western Equatoria whose crop production is expected to be surplus to the demands of its population.

Most farmers either use seed retained from the previous year's harvest or purchase seed from the market. However some farmer groups received seed and hand-tools from FAO, Lutheran World Fellowship, Farm Sudan, NPA and Catholic Relief Services. The quality of the seed received was reported to be good.

Crop pest and disease levels were normal this year. Principal problems include birds, monkeys, grasshoppers, sorghum stemborer, termites, aphids, sorghum smut, maize streak and cassava mosaic.

Livestock condition is very good and, with increased security, numbers are expected to rise. With the good late rains, pasture and water availability for the coming dry season are considered to be satisfactory. Some livestock diseases have been reported this year in Budi, Torit and Ikotos including East Coast Fever and other tick-borne diseases, contagious caprine pleuropneumonia (CCPP), black quarter and trypanosomiasis; they have, however, had no significant impact on general livestock productivity.

At the beginning of November the markets were better stocked than they had been at the same time in 2010. However, reflecting the situation in much of the rest of the country, prices were higher than the previous year. This was partly due to the increased cost of fuel for transporting both local and imported produce to market.

## **JONGLEI STATE**

The rains this year were delayed by approximately one month over much of Jonglei. In most areas they started in May; the exceptions were Bor, western Pibor and Ayod where there was some rainfall in April. Rainfall amounts at the beginning of the season, however, were relatively low. Most of the state experienced a dry spell in June and in the north this dry spell extended into July, forcing many farmers to re-plant their maize. A period of heavy rainfall then followed in July and August resulting in localized flooding in riverine areas of Pochalla, Fangak, Twic, Duk and Bor with some crop loss and crop yield reduction from water-logging. Rainfall during September and October was generally well distributed, benefiting the late-planted and second-season crops, especially in those areas bordering Ethiopia.

There was a general reduction in cropped area per household in 2011 compared to 2010. This was largely caused by a series of insecurity incidents at about the time of planting that left many farmers preferring to cultivate only in the vicinity of their homesteads. Limited labour availability and financial constraints were also cited as factors contributing to the reduction in cultivated area, especially in those parts of the state where farmers fence off their crops for protection against the intrusion of livestock. Sorghum is the predominant cereal crop in most of Jonglei State; in Pochalla County, however, substantial amounts of maize are grown as a first-season crop which is then followed, in August-September by short-season sorghum. Although maize yields in Pochalla were relatively good this year, overall cereal yields for the state are down slightly on those of 2010; this, combined with the reduction in cropped area, has resulted in a forecast production of 65 000 tonnes, a drop of almost 23 percent from that of 2010.

Land preparation is almost exclusive manual; there are twelve Government tractors in the whole state but their use is severely limited by a lack of spare parts, fuel and trained operators, by poor maintenance, and by the relatively high cost of hiring them. Nearly all farmers use their own seed retained from the previous year's harvest, with only very few purchasing seed in the market. There has been some use of virus-free cassava planting material.

There has been an increase in the area under horticultural crops this year as a result of seed distributions from FAO and various NGOs. Groundnut, cowpea and cassava performance has been generally satisfactory this year. The incidence of crop pests - mainly birds and stemborers - has been similar to that of previous years.

Jonglei's transportation infrastructure is amongst the least developed in South Sudan; some counties are only accessible by road during the dry period between January and March. Many areas rely on trade from Ethiopia and Kenya but heavy rains in August often leave the access roads impassable. The closure of the border with Sudan and the uncertainty among traders concerning the value of the new South Sudanese pound has further constrained market supplies. For instance, the market in Pochalla, which lies on the border with Ethiopia, is significantly under-stocked. Some commodities were being delivered by plane from Juba, but this supply was extremely limited and costly. There is a significant lack of fuel and the limited amount that is available is brought in from Ethiopia by bicycle, a return journey taking two days. In previous years the northern part of Jonglei has been largely provisioned from Sudan via Malakal, but this year with the closure of the border these supplies have dried up. The southern part of the state is largely provisioned through Bor from the Juba and Uganda markets.

Livestock condition is generally good and there is adequate pasture and water for the coming dry season. However, continuing cattle raiding and inter-communal conflict have led to the movement of cattle closer to urban centres for security, and this has caused over-grazing and a general deterioration of pasture quality in those areas. Although this year has seen a slight reduction in cattle mortality from East Coast Fever compared with 2010, the rate is still higher than it was prior to 2010.

## **LAKES STATE**

The 2011 rainfall season in Lakes was characterized by a somewhat late arrival of the first rains (mid to late May) followed immediately by breaks in the rainfall that lasted until late June. From July the rainfall pattern was more normal, although there was significant variation across the state. Some quite heavy and intense rainfall in August and September damaged millet at flowering. Early cessation of rainfall and late dry spells were reported in Cueibet County in the west of the state.

Most land preparation is carried out manually; there is some use of ox-ploughs in Rumbek Central but not in other counties. Farmers use either seed from the previous year's harvest or seed purchased in the market.

There has been a reduction in the cropped area this year compared with 2010, largely as a consequence of the poor rains early in the season and farmers postponing their planting in anticipation of better rainfall. Unlike in neighbouring Warrap there were few reports of crop losses due to flooding later in the season.

Three broad categories of sorghum are grown in Lakes - short-season (90 days), medium-season (120 days) and long-season (180+ days). Bulrush millet is also grown extensively, while cassava is grown mainly in the south and west of the state in Wulu and Yirol counties. Intercropping is common, with all crops planted together and harvested at different times. Overall cereal yields this year are down significantly on those of 2010 as a result both of the delayed planting occasioned by the poor rains at the beginning of the season, and of the damage especially of the millet from the heavy rain in August/September. Together, the reduced yield and reduced area combine to give a forecast net cereal production for 2011 of 45 000 tonnes, which is more than 30 percent down on the 66 000 tonnes of 2010.

The incidence of crop pests and diseases was low and similar to that of previous years. Striga, however, is a perennial problem in sorghum fields.

Livestock condition is fair and the outlook for pasture and water is satisfactory. With poor crop production increased livestock sales are anticipated early in 2012.

Markets have been affected by the closure of the border with Sudan. Local sorghum was very scarce in the markets, though some food-aid (USAID) sorghum was seen for sale in Rumbek. Market prices peaked after mid-2011 and then declined but in November they were still significantly higher than they had been at the same time in 2010. Expectations are for further price rises if the trade routes remain closed. Livestock prices are also high, but may come down as households seek to raise cash to purchase food at high prices.

## **NORTHERN BAHR EL GHAZAL STATE**

The rains in Northern Bahr el Ghazal started well and on time in May this year, but this promising start was quickly followed by an extended dry period through June and July which occasioned up to three re-plantings of sorghum in some areas in the north of the state. Rainfall resumed in August with some heavy showers and continued satisfactorily through September into October. Although by the first dekad of November total rainfall had reached the annual mean value the poor start to the season had serious implications for crop production, especially in the northern two-thirds of the state.

Because of the poor rainfall early in the season there was a significant reduction in the area of harvestable crop this year; this was most evident in the northern and mid-latitude part of the state. In the south (Aweil South and parts of Aweil Central), the harvestable area was similar to that of 2010.

The short-season sorghum, which is planted in most parts of the state apart from the extreme south, suffered considerably from the poor start to the rains, with some farmers harvesting only negligible amounts of grain. However, most of the long-season sorghum in the extreme south of the state withstood the dry period of June and July and is expected to give a reasonable harvest in December-January. Bulrush millet was seen performing satisfactorily in Aweil Central. Overall net average cereal yield in the traditional sector is expected to be 0.57 t/hectares, a 25 percent drop from the previous year's net yield of 0.76 t/ha. Combined with reduced area, this gives a forecast net cereal production for the state of 39 000 tonnes, which is 35 percent down on the 60 000 tonnes of 2010.

MAF has allocated about 2 500 hectares in Tonchol, Aweil East, for mechanized sorghum production. At present, only seven farmers with access to 40 tractors are operating there on the basis of share-cropping; in 2010 they cultivated 233 hectares but this year, because of a shortage of fuel being imported from Sudan, the area has been reduced to 154 hectares. Two harvests are taken; the main harvest in November yields about 1.1 t/hectares while the ratoon harvest in February yields about 0.65 t/hectares, giving a total of 1.75 t/hectares. Total production from this area will therefore only amount to about 270 tonnes.

The Aweil Rice Scheme now covers an area of about 580 hectares, of which 125 hectares are privately owned. In addition, the scheme has provided out-growers with seed to produce a further 250 hectares bringing the total area under rice this year to approximately 830 hectares. Financial constraints limited fertilizer application to a mere 60 kg of urea per hectare. Yields of between 2.5 and 4 t/hectares are expected.

Groundnuts have often performed better this year on land that was flooded during 2010 as a result of heavy rains. Sesame has also benefited from the lack of excessive rain.

In some areas, crop infestation by mealy bugs and grasshoppers was reported to be worse than the previous year. Otherwise, crop pest and disease levels were reported to be normal.

Northern Bahr el Ghazal is reported to be the state with the largest number of cattle in South Sudan, about 1.6 million in 2010. Although there were some reports of anthrax, which was controlled, cattle condition is generally excellent, and with the good late rains, pasture and water are abundant. The condition of other livestock, goats in particular, is also good.

OCHA reports that the state has received more than 66 000 returnees from Sudan since October 2010. The state's population was registered as 831 000 in 2010, therefore this influx represents an increase of more than 8 percent within a 12 month period. This will obviously put a huge strain on food resources, especially in view of the fact that imports from Sudan are greatly reduced, food prices in the market are high, and the cereal harvest will be worse than that of 2010. Some respite will be provided by fishing this year with a good catch expected as a result of the plentiful late rains. Nevertheless, the hungry season in NBGS, which is usually expected to extend from March to August, is likely this year to start as early as January. The hungry season normally ends in August-September when summer vegetables and early sorghum are harvested; this year, the dry spell at the beginning of the season greatly reduced both these harvests. WFP already provides food aid for a substantial portion of the population.

In October 2010 a malwa of sorghum in Aweil West cost 4 - 5 SSP. By September 2011 it had reached a peak of 20 SSP but then declined to 8 SSP by the end of October 2011. ToT between cereals and livestock have not changed significantly, and livestock prices have risen more or less in tandem with those of cereals; a goat that cost 120 SSP in October 2010 cost 200 SSP in October 2011. Prices of foodstuffs imported from Sudan, such as wheat flour and sugar, peaked in September (280 and 600 SSP respectively for 50 kg bags) as a result of the closure of the border between the two countries; however, these prices have now declined slightly (to 230 and 450 SSP respectively), reportedly because of an easing of border restrictions and possibly an increase in smuggling.

## **UNITY STATE**

In Unity State the rains started late in May. This was followed by a dry spell lasting for about six weeks. Rainfall improved in August, but distribution was uneven. Total rainfall for the state was similar to the long-term average of approximately 800 mm/annum but overall distribution was poor. Low-lying counties (Leer, Panyijar and Mayom) were affected by floods in the latter half of the season, while crop production in other counties suffered from dry spells.

This year saw a reduction in cropped area in the traditional sector in response to the poor start to the season. However, this was minor compared with the dramatic reduction in net cereal yield from 0.6 t/hectares in 2010 to 0.16 t/ha this year. Together, the reduction in area and the reduction in yield are expected to result in net cereal production of only 5 000 tonnes this year; this is only marginally more than 20 percent of the previous year's production of 24 000 tonnes.

The incidence of weeds, pests and diseases was reported to be higher than usual this year; the main problems were striga, birds, rodents and, in some areas, elephants. In previous years, quelea birds have been controlled by aerial spraying of nesting sites which was carried out by the Khartoum authorities; this year, however, with independence from Sudan, no spraying was carried out, and increased grain losses to birds are expected prior to harvest in December and January. In Koch, Guit and Rubkona counties, many farmers have changed their cropping pattern from sorghum to maize in order to avoid losses to birds.

Like the traditional sector, the mechanized rainfed sector was affected by the poor start to the rains. However, it also suffered from shortages of fuel for tractors. In the past, most of the fuel came in from Sudan, but now with the border closed this supply has stopped.

A number of diseases (CBPP, FMD and lumpy skin disease) have been reported, but livestock condition is nevertheless generally good, and pasture and water are relatively plentiful. Livestock numbers are said to have fallen this year with households selling off stock to purchase food.

The markets are generally poorly stocked compared to 2010, due to the closure of the South Sudan-Sudan border, and prices are higher than at the same time in the previous year.

## **UPPER NILE STATE**

In Upper Nile State, the start of the rains in May was followed by a prolonged dry spell in June and July. A more normal pattern resumed in August but rainfall distribution remained poor.

Upper Nile is home to most of South Sudan's mechanized rainfed farming. In most years it covers a total of about 280 000 hectares comprising approximately 200 000 hectares of sorghum, 20 000 hectares of maize, 10 000 hectares of millet and about 50 000 hectares of various crops other such as sesame, groundnuts, sunflower and guar. This year, however, the total area harvested is expected to be only 200 000 hectares. The main reason for this reduction is the poor rainfall at the start of the season, but added to that is the shortage of fuel and spare parts for tractors. In the past, most of the fuel and spare parts came in from Sudan, but now with the border closed this supply has stopped. Maintenance of tractors and machinery has also been a problem since independence (for instance, the chief mechanic in Renk returned to Sudan), and there has been a shortage of qualified tractor operators. There was also a shortage of seed, much of which used to come from Sudan; and what seed there was (varieties 'Feterita', 'Afa Gadamak' and 'Qadam Hamam') was expensive. However, the Agricultural Bank of South Sudan managed to support 45 commercial farmers (individual holdings of between 200 and 1 200 hectares) with credit of SSP 2 million, 533 000 SSP of which was

earmarked for fuel from Petro-Dar. The Agricultural Bank also provided 100 tractors, some of which were destined for the SMOA and others for farmers to purchase in instalments over a period of five years.

The incidence of several crop pests and diseases has been higher than usual this year. These include rodents, grasshoppers and sorghum smut. In previous years, quelea birds have been controlled by aerial spraying of nesting sites, which was carried out by the Khartoum authorities; this year, however, with independence from Sudan, no spraying was carried out, and increased grain losses to birds are expected prior to harvest in December and January. Striga infestation was heavy this year.

Livestock condition is generally good although there have been a number of reports during the year of diseases including CBPP, lumpy skin disease, black quarter and haemorrhagic septicaemia. The prospects for pasture and water for livestock during the coming dry season are good on account of the relatively plentiful late rains. Livestock numbers are said to have fallen this year with households selling off stock to purchase food.

The markets are generally poorly stocked compared to 2010, due to the closure of the South Sudan-Sudan border, and prices are higher than at the same time in the previous year.

## **WESTERN EQUATORIA STATE**

The 2011 rains in Western Equatoria started in April and were still continuing at the time of the Mission's visit in early November; they were expected to end as usual in late November or early December. There was a slight lull in rainfall of about two weeks at the end of May and the beginning of June in some parts of the state but it had no significant effect on crop performance. In general, the season's rainfall was well distributed and better than average except in some parts of Maridi, Mundri East and Mundri West where the rains arrived later and were more erratic than in the rest of the state.

Reflecting the favourable rainfall situation, total cropped area increased by about 15 percent. This expansion was also helped by support from NGOs, international organizations and Government, and by increased security. LRA activity has repeatedly interrupted the farming cycle in recent years, especially in Ezo, Tambura, Nagero and some parts of Yambio and Nzara counties. This year, however, the level of threat has reduced slightly.

Farmers planted their first-season crops at the normal time in April. These included green gram, groundnuts, sesame, millet, maize, the harvest of which started in August 2011. Cassava is also planted in April. In September, farmers planted their second-season crops of groundnuts, maize and sorghum; these will be harvested in December or January. Other significant cash crops grown in Western Equatoria include pineapple, banana, sweet potato, yam, pumpkin and sesame.

Farmers use either their own cereal seed saved from the previous year's harvest or seed purchased from the market. This year some farmers ran short of seed because of the high price. However, FARM Africa distributed improved seed to 74 farmer-based organizations (FBO) in the three counties of Yambio, Maridi and Mundri West. For the first season 19 935 kg of maize seed and 10 348 kg of sorghum seed were distributed to 1,218 beneficiaries; and for the second season FARM Africa distributed 1 460 kg of improved maize seed, 940 kg of sorghum seed, 8 170 kg of groundnut seed and 34 440 cassava cuttings to 1 587 farmers. The state has 12 tractors but these are frequently damaged by working in newly opened fields where farmers have not completely up-rooted the entire tree stumps. Fuel and spare parts are usually in short supply and there is a shortage of trained operators. Levels of weeds and crop pests and diseases have been normal this year.

The performance of both cropping seasons has been generally good. Overall net cereal yields are expected to be slightly lower than those of 2010 at 0.93 t/ha, but with the increase in cropped area net cereal production is expected to be 7 percent higher than the previous year at 120 000 tonnes. Western Equatoria is the only state in which net cereal production is expected to be greater than the requirement of its population.



Livestock condition is generally very good and pasture and water are plentiful.

Markets in Western Equatoria are better stocked (in November) than they were at the same time in 2010, with large volumes of produce from the first-season harvest, and most prices are lower than they were twelve months ago. The number of traders has increased over the past three years due to increasing demand from a growing population. The main challenge to trade is a shortage of transport and a lack of storage facilities. The cost of hiring trucks is high, punitive taxes are levied on the roads, and road conditions are often extremely difficult.

## **WARRAP STATE**

The 2011 rainfall season in Warrap was characterized by a somewhat late arrival of the first rains (mid to late May) followed immediately by breaks in the rainfall that lasted until late June. A more normal rainfall pattern eventually established itself in early July, but there was still a lot of local variation across the state. Heavy and intense downpours in August and September caused flooding in some areas with resultant crop loss, while elsewhere dry spells were reported.

Most agricultural areas are concentrated in the northern two thirds of the state. The predominant crops are sorghum, maize, bulrush millet, groundnut, sesame, cowpea and vegetables (okra, pumpkin, etc.). Intercropping is common. Two broad categories of sorghum varieties are grown - short-cycle (3 months) and medium-cycle (4 - 5 months). Bulrush millet has a 6-month development cycle. Cassava is grown mostly in the south of the state (Tonj South County). Sesame and groundnut and medium-cycle sorghum are planted first in May; the groundnut and sesame are harvested in July/August, and the sorghum in October. Maize is planted next and is consumed green in August. Short-cycle sorghum varieties are planted last and are harvested in September.

Most land preparation is carried out manually. There is, however, some use of ox-ploughs and some indication that the adoption of this method of cultivation may be increasing in the state. FAO has distributed seed, mostly to returnee farmers. Apart from the perennial problem of striga, levels of weeds, pests and diseases have been low this year.

There has been a significant reduction in cropped area this year compared with 2010. Many farmers planted medium-cycle sorghum, groundnut and sesame with the first rains, but the prolonged dry spell that followed led to large-scale failure of these early crops. Those farmers who were obliged to replant refrained from expanding their cropped area as they might otherwise have done, while those who had not planted with the first rains also settled for a reduced total area of crops. Not only was the cropped area smaller than 2010, but the harvested area was further reduced as a result of crop loss resulting from both the early dry spell and the later heavy rainfall.

Overall cereal yields are also lower than those of the 2010. Poor rainfall early in the season resulted in a reduction in the amount of medium-cycle sorghum, which is higher-yielding than the short-cycle varieties, being grown. Uneven rainfall distribution in the latter part of the season often led to poor grain filling. The combination of low yields and reduced area leads to a very substantial drop in total cereal production for the state. The estimated net production of 48 000 tonnes is only marginally more than 50 percent of 2010's net production.

Livestock condition is good throughout the state, and pasture and water are relatively plentiful.

The stock of cereals in the markets is very low as a result of the closure of the trade roads from Sudan after independence. Supplies, mostly maize flour, now come from Uganda. Market prices have now fallen from their peak in July-August, but they are still significantly higher than they were at the same time in 2010. Livestock prices are still high but appear, at least for the time being, to be tracking cereal prices, albeit with a time lag.

## **WESTERN BAHR EL GHAZAL STATE**

The rains in Western Bahr el Ghazal started satisfactorily in May but were very soon followed by a prolonged period of poor rainfall starting in June and extending up to the end of July. Rainfall from August onwards was generally good to very good, and best in the west; there was, however,

considerable local variation in rainfall distribution. The long dry spell occasioned a certain amount of re-planting.

FAO provided seed and hand-tools for distribution to farmers through Peace Corps. Intermon Oxfam has also been active, with EU finance, in providing seed (cereals, vegetables and cassava planting material), tools, fishing gear, goats, ox ploughs and bee-keeping equipment in Wau County.

The total cropped area was slightly larger than that of 2010, with many farmers expanding their land with the favourable rainfall regime after July. Sorghum varieties in Western Bahr el Ghazal are mostly tall and of long maturation (some of >200 days). Crops that were well established during the first rains generally survived the dry spell well and should give a reasonable harvest in December and January. Later plantings from late July and early August, will probably give poor returns. The increase in cropped area and a slight reduction in overall cereal yield are estimated to almost cancel each other out and give a production of 35 000 tonnes, a modest increase on 2010's output, estimated at 34 000 tonnes.

Cassava is most plentiful in the west of the state; both bitter (up to 3 years maturation) and sweet (about one year maturation) varieties are grown, mostly in mixtures to give continuity of production. Production this year is normal. Constraints include shortage of planting material and almost ubiquitous infection with cassava mosaic. Groundnut production is satisfactory this year, especially on lighter soils; no significant disease problems were reported. There are also several small household patches of bambara nut which are doing very well. Sesame production is variable. Crops sown in June at the beginning of the dry spell have performed poorly, while those sown later at the end of July and the beginning of August are expected to give a good harvest.

Levels of crop pests and diseases are similar to those of previous years. Stemborer and smut affect sorghum, while cassava mosaic appears to be especially serious in Raja where the crop is most plentiful.

Western Bahr el Ghazal is registered as having a high ratio of cattle per head of population - 3.5, compared with 1.3 for the whole of South Sudan and 1.9 for Northern Bahr el Ghazal; however, these numbers refer to cattle brought in seasonally (from June to November) from South Darfur, Northern Bahr el Ghazal, Warrap State and the Central African Republic. The indigenous households of Western Bahr el Ghazal are not predominantly cattle-owners. The condition of cattle and goats is currently very good and pasture and water are generally plentiful. However, there was an outbreak of anthrax earlier in the year which was successfully contained. Vaccines are now reported to be in short supply.

All commodity prices are considerably higher in 2011 than at the same time in the previous year. One reason for this is the non-recognition by northern traders of the South Sudanese pound's parity with the SDG. Trades are now usually conducted at a rate of 1 SSP to 0.8 SDG. Consequently less food is coming in from the north. On the other hand prices have eased since a peak in September, indicating an easing of the border restrictions and/or more smuggling. ToT have not altered significantly, with livestock prices rising roughly in concert with crop prices. All commodity prices are substantially higher in remote Raja than they are in Wau.