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ANNUAL CROP AND FOOD SUPPLY ASSESSMENT MISSION, SUDAN (28 November – 16 December 2015)

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ABBREVIATIONS AND ACRONYMS

ABS	Agricultural Bank of Sudan
CBoS	Central Bank of Sudan
CBS	Central Bureau of Statistics
CPI	Consumer Price Index
EIU	Economist Intelligence Unit
ERCU	Emergency and Rehabilitation Coordination Unit (FAO-Sudan)
FAO	Food and Agriculture Organization of the United Nations
FARMERS	Food and Agriculture Messaging and Reporting System
FCB	Farmers Commercial Bank
FEWSNET	Famine Early Warning Systems Network
FSMS	Food Security Monitoring System
FSTS	Food Security Technical Secretariat
GDP	Gross Domestic Product
HAC	Humanitarian Aid Commission
IP	Implementing partner
MoAF	Ministry of Agriculture and Forestry
MoLFR	Ministry of Livestock, Fisheries and Rangelands
NDVI	Normalized Difference Vegetation Index
NGOs	Non-Governmental Organizations
RFE	Rainfall estimate
SDG	Sudanese Pound
SRC	Strategic Reserve Corporation
UN	United Nations
USAID	United States Agency for International Development
USD	United States Dollar
WFP	World Food Programme

MISSION HIGHLIGHTS

- The current global El Niño event, probably exacerbated by climate change, has adversely impacted the 2015 rainy season with delayed rains, below average rainfall and intermittent dry spells causing a major reduction in cereal production.
- Area planted to sorghum and millet decreased in most cropping areas, by 14 percent and 26 percent, respectively. Sorghum and millet areas harvested were 46 percent and 44 percent below the areas planted.
- Wheat areas planted and predicted yields are expected to be similar to the previous year and 25 percent above the 5-year average. Requirements for wheat and rice are forecasted at normal levels.
- Accordingly, national cereal production in 2015/16 is estimated at 3.587 million tonnes, including 2.584 million tonnes of sorghum, 0.518 million tonnes of millet and a winter wheat forecast of 0.485 million tonnes for harvest in early 2016. This is 54.4 percent below the recorded 7.873 million tons harvest of cereals from previous year, and 15.4 percent below the 4.239 million tons five-year average 2009/10 – 2013/14.
- Cereals stocks from the previous year's good harvest will ensure sufficient cereals at national level to meet demand, however, transfers of grain from surplus to deficit areas will be necessary to avoid local shortages.
- Area and production of most cash crops were reduced compared to the previous season
- The rain-fed sector, both semi-mechanized and traditional, registered major declines in cereal production, while production from the irrigated sector was not far from the five-year average.
- Most agricultural inputs were readily available, including credit disbursement by the Agricultural Bank of Sudan, which increased significantly in 2015.
- Labour availability was normal in most states, though sometimes at increased cost.
- The unfavorable rains drastically reduced pasture, crop residues and water availability for livestock across the country, which may lead to some livestock deaths, price reductions and possible conflicts with crop farmers.
- Prices of sorghum and millet were generally stable across the year and did not decline at harvest as usual, an indication of the poor harvest outlook and high carry-over stocks from the previous year's bumper harvest.
- Minimum tillage and zero-tillage technologies performed very well producing good crops, while conventionally cultivated land in the same areas produced much lower yields or none at all.
- While pests and disease outbreaks were low, some concern was expressed at the infestation of mealy bug on irrigated cotton and indications of the return of Black Arm disease in cotton.
- Historically strong El-Nino events were followed by rapid transitions to la-Nina conditions. After mid-2016 La-Nina conditions could lead to another year with significant departures from normal rainfall in many regions in the next 2016/2017 cropping season. In Sudan this might have a negative impact on Food Security. The Government needs to give this scenario serious consideration in view of the potential impact on food security.
- Consequent to this assessment, MoAF is embarking on follow up assessments including crop cutting surveys and a crop production assessment using satellite imigary.

1. OVERVIEW

Between 28 November and 16 December 2015, assisted by the Food and Agriculture Organization of the United Nations (FAO), the Ministry of Agriculture and Forestry (MoAF) carried out its annual Assessment Mission to determine crop production and food supply throughout the 18 states of the Republic of the Sudan.

The mission consisted of six core teams comprising members from the Ministry of Agriculture and Forestry (MoAF), the Food Security Technical Secretariat (FSTS) of the MoAF, the Ministry of Livestock, Fisheries and Rangelands (MoLFR), the Humanitarian Aid Commission (HAC), the Strategic Reserve Corporation (SRC), FAO, FEWSNet, WFP and USAID. Prior to departure, team members attended a preliminary orientation workshop in Khartoum to standardize the methodology to be used in the field and to prepare teams for the visits.

Team visits were designed to collect data and information from state ministries, irrigation schemes, private farm enterprises and individual farmers and to validate and audit such data and information through observational transects, field observations, in-field farmer interviews and independent key informant interviews. The combined quantitative and qualitative information from both primary and secondary sources allowed teams to assess the 2015/16 season's cereals (sorghum and millet) and other field crop production, and to forecast wheat production from areas being prepared for planting.

On their return from the field, teams prepared summaries of data and information acquired during the visits for discussion and explanation in detailed debriefings before inclusion in the final mission report. Data were compiled by state, crop and sub-sector (irrigated, rain-fed mechanized and rain-fed traditional) to give overall area and production estimates. Using these data, a national cereal balance sheet was drawn up comparing total cereal requirement for the coming marketing year (January-December 2016) with domestic cereal availability. The balance sheet gives an indication of whether the country is in surplus or deficit with regard to cereals, and hence of its import requirements.

The six mission teams received full cooperation of the relevant state authorities. Discussions on factors affecting crop and livestock conditions were held with representatives from the relevant line agencies, local Government offices, selected credit institutions, United Nations (UN) agencies and Non-Governmental Organizations (NGOs). Field visits were supported by local specialists from state ministries and irrigation schemes, who also provided the latest information on all aspects of production within their domains, including the provision of follow-up data where required. The six teams carried out their tasks to the extent possible, the main constraint being civil insecurity, although better than previous year but still limited field observation and farmer interviews in parts of Darfur, South Kordofan and Blue Nile states. Where possible, teams cross-checked the official data estimates received by conducting extensive field inspections, rapid case studies with sample farmers, and interviews with herders and traders.

At national and sub-national level, the latest available information and data were collected concerning rainfall amount and distribution, vegetation cover, crop-protection campaigns, cereal reserve stocks, prices of main crops and livestock. Periodic food-security reports were perused and main socio-economic indicators were provided by the Central Bank of Sudan, the Agricultural Bank of Sudan, the Central Bureau of Statistics and the Strategic Reserve Corporation. Rainfall data was provided by the Sudan Meteorological Authority and from several sources.

The overall performance of the 2015/16 summer cropping season has been poor in much of the semi-mechanised and traditional rain-fed areas due to the sharp decrease and uneven distribution in rainfall compared to the previous year. Many areas received half or less than half the rainfall of the previous year, with rainfall in June and July being especially lower than the long term average, as shown graphically in Section 3.1.2, below. Effective rains in most states only began in late July or early August and with pronounced dry spells mainly in September. The late rains forced a switch from sesame to sorghum in many areas, resulting in a sharp decline from the planned sesame production area.

Sorghum and millet production this year are estimated at 2.584 million tonnes and 0.518 million tonnes respectively. This is 57.5 percent below the record harvest of the previous year and 19.5 percent below the 2009/10-2013/14 five-year average. Wheat production, to be harvested by March 2016, is forecast at 0.485 million tonnes, 2.5 percent above that of the previous year and 25 percent more than the five-year average.

The lower than average rainfall amounts encouraged early planting in the irrigation sector. Relatively high yields of irrigated sorghum of 5 t/ha or more were obtained by some well financed farmers who used improved seeds and followed good and timely practices of agricultural operations. The irrigated sector production of sorghum is estimated at 0.649 million tonnes, a decrease of 0.245 million tonnes or 27.4 percent below the previous year's production and 23.6 percent below the five-year average. The area harvested was 339 000 ha, a decrease of 24 percent below the area harvested in 2014 and 17.3 percent below the five year average.

The main cash crop in the semi- mechanized sector is sesame and the late rains prevented many farmers from planting this year and they had to give up growing sesame or switch to sorghum instead. Area harvested declined from 2.66 million ha in 2014 to 1.45 million ha this year, well below the five-year average area harvested of 1.99 million ha. Sesame production is estimated at 0.329 million tonnes, compared to 0.721 million tonnes in the previous year and similar to the five year average production of 0.343 million tonnes. While there was some crop failure of sesame, many farmers reported getting better yields from this crop than sorghum. The price of sesame, however, is very low this year due to a slump in world demand and stocks of sesame from last year's production.

The sharp drop in rainfall has drastically reduced the amount of pasture and crop residues available to livestock owners. In addition, the price of crop residues has quadrupled compared to the previous year. In the irrigated sector, crop residues which were being sold to livestock owners were reported to be equivalent in value to four 90 kg sacks of sorghum. Water availability has declined sharply due to the low rainfall and hence the non-filling of ponds (hafirs) on which many livestock owners depend for watering their stock. Livestock, already emaciated from lack of fodder have to walk longer and longer distances to drink. Several farmers reported that they feared an increase in conflicts with livestock owners over grazing resources and crop residues. The Butana area, which normally provides grazing for large numbers of livestock, has little or no grazing this year.

The cereal balance sheet provided in this report estimates that total utilization of cereals will be 7.955 million tonnes. Total availability, including the wheat crop to be harvested in March 2016, is estimated at 6.115 million tonnes. Opening stocks are estimated at 2.34 million tonnes, indicating a national sorghum surplus above requirements of 0.42 million tonnes. Millet stocks will be fully utilized. While stocks from the previous year's good harvest will ensure that, nationally, there will be sufficient cereals to meet demand, some transfers of grain from surplus to deficit areas will be necessary to avoid local shortages. The structural deficit between production and consumption for wheat and rice is expected to be covered by normal levels of commercial imports.

Under normal circumstances, prices for cereals decline around harvest time (October to December). This year there has been little or no decline and this is due to the perception of a poor harvest in many parts of the country. It is expected that prices of grain will increase early in 2016 due to lower production and also to livestock owners buying grain to feed their stock in the absence of any other alternative feed.

2. Socio-Economic Context

2.1 General

The contribution to the national GDP by agriculture is estimated at 31.85 percent in 2015. The national GDP at current prices for 2015 is forecast at 589.5 billion SDG (US$914 443 772). The GDP grew by 6.1 percent at fixed prices, compared to 3.6 percent in 2014. Crops and animal wealth sectors recorded significant growth over 2014. The contribution of crops to GDP in 2015 was 12.6 percent, while livestock provided 19.6 percent. The combined contribution from fisheries and forestry was very marginal.

The Central Bureau of Statistics reported a steady decline over 2015 of the overall inflation rate which declined from 24 percent in January to 12.8 percent in November. Average income per individual in current prices rose by 31 percent to SDG16 622 in 2015 compared to the previous year.

The main exports are gold and livestock with some sesame and cotton. Exports of livestock have increased markedly over the previous few years, as indicated in Table 3, below. Oil exports are still depressed due to insecurity in the oil producing areas.

A total of 351 346 tonnes of wheat flour were imported for the 11 months to November 30th, 2015. This compares to one million tons imported during the first semester of 2014. Sesame seed exports for the year to 30th November, 2015, amounted to 233 284 tonnes compared to 250 776 tonnes in 2014. Cotton exports of 19 491 tonnes were recorded to November, 2015, compared to 18 764 tonnes in the previous year

Total fertilizer imports to end November, 2015 amounted to 188 278 tonnes, while imports for the previous year amounted to 292 040 tonnes.

Sudan does not have a large manufacturing sector and depends on imports of machinery, transport equipment and other industrial goods. Agricultural exports are also low due to low-input, low-output crop and livestock production. There is therefore a high dependence on imports of food, especially wheat, and manufactured goods and machinery such as tractors. The trade balance, as a result, is negative. China is the main trading partner followed by Italy and the United Arab Emirates.
The value of the Sudanese pound (SDG) in mid-December, 2015 was 6.4461 pounds per USD, although in the parallel market the exchange rate can be much higher than the official rate.

2.2 Population

The last population census was carried out in 2008 and the Central Bureau of Statistics now estimates the population at about 39.6 million for mid-2016, an increase of 3.03 percent over 2015.

2.3 Agriculture

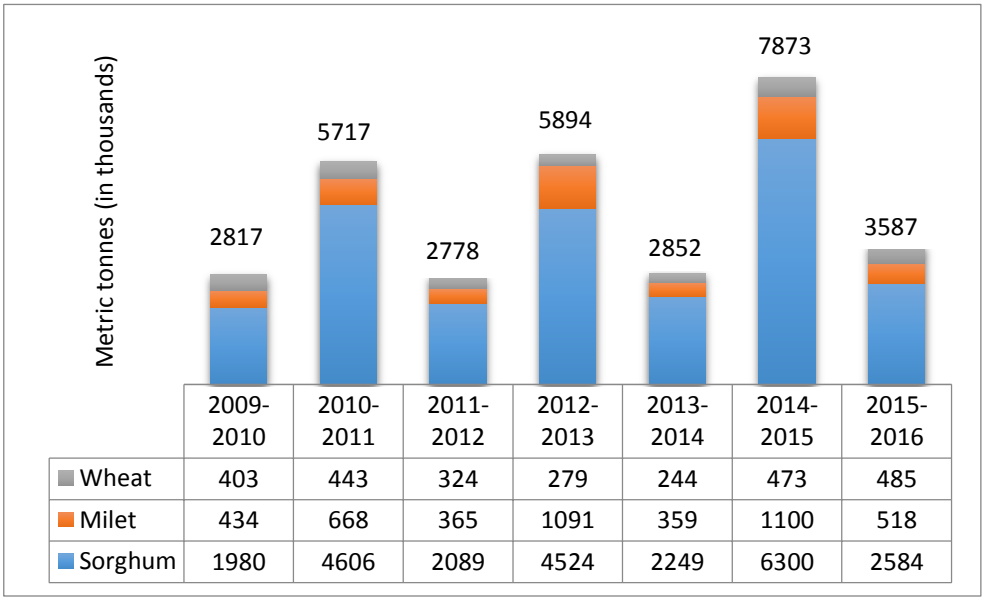
The Sudan's economy is highly dependent on agriculture, as it accounted for 31.85 percent of the GDP in 2015, and its crop portfolio includes cereals (such as sorghum, millet, wheat, rice and maize), oil-seeds mainly sesame, ground nuts and sunflower, as well as other crops like cotton, guar beans and horticultural production. Broad beans, Pigeon peas are becoming locally important in the irrigation schemes. Some plantings of soya beans were also made in Blue Nile State in 2015.

The land in the Sudan is also suitable for animal husbandry, with an estimated total livestock population of 105 million head of cattle, sheep, goats and camels.

The Sudan's irrigated agriculture is dependent on abundant supplies of water from the Nile and its two major branches. However, most production is from rainfed crops. Minimum tillage and no-tillage systems, because of their greater efficiency in rainfall utilisation, have shown great results over the past five years. Sorghum yields from no-till were reported to be three times higher than conventional cultivation systems. In this season, min-till or no-till crops seen by the Mission were far superior to crops grown using conventional tillage systems, probably due to better water infiltration and effective pre-emergence and post-emergence weed control at planting. However, this technology will need strong support from government and the banking sector if it is to expand as it should. Minimum tillage systems, when properly implemented, can reduce soil erosion by over 90 percent and this is of special interest as soil erosion is a major concern in Sudan.

Crop production in the Sudan is practiced under three main systems; irrigated agriculture which is divided into large-scale mechanised irrigation schemes such as the Gezira, Suki and Rahad Schemes and small-scale irrigation along the banks of the Nile and other rivers, semi-mechanized, rain-fed agriculture and traditional rain-fed agriculture. As a result of dependence on uncertain and erratic rainfall, cereal production in Sudan can vary greatly from year to year, as illustrated in Figure 1, below, which is based on data from CFSAM data over the past five years. Other factors such as low prices for cereals following last year's exceptionally high production, lack of working capital, lack of machinery at critical times, irrigation failures, failure to use improved crop varieties with resulting low yields are also causes of erratic cereal production.

Figure 1: Production of Sorghum, Millet and Wheat from 2009 to 2015



	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Wheat	403	443	324	279	244	473	485
Milet	434	668	365	1091	359	1100	518
Sorghum	1980	4606	2089	4524	2249	6300	2584

2.3.1 Irrigated agriculture

Irrigated area in the Sudan is estimated at some 4 million feddans (about 1.68 million hectares); of which large-scale mechanised federal schemes total 3 million feddans (1.26 million hectares) - Gezira, Rahad, Suki and New Halfa. This sector uses most of the imported agricultural inputs. Irrigation is mainly from the River Nile and its tributaries either through flow irrigation by means of gravity, pumps or by flood irrigation from Gash and Tokar seasonal rivers. Main crops of irrigated sector include sugar, cotton, sorghum, ground nuts, wheat, vegetables, fruits and green fodders. The irrigated sector also benefits from the quantities and distribution of rains especially during the establishment of crops. Rain is estimated to provide about 40 percent of the water requirements of crops in Suki Irrigation Scheme. Rain is especially important in smaller privately owned irrigation schemes which depend on diesel powered pumps.

Traditional small-scale irrigation has been practiced for millennia along the Nile and its tributaries to produce a wide variety of crops and this system has proved to be sustainable.

The bulk of the cotton crop is grown on the Gezira Scheme, situated on a fertile wedge-shaped clay plain lying between the White and Blue Niles south of Khartoum. The scheme is one of the largest irrigation projects for agriculture in the world. It covers an area of 2.38 million feddans (1 million hectares

Crop yields in the large irrigated schemes are low by world standards, due to silting up of canals, lack of modern pumps and sub-optimal agricultural practices. Conservation Agriculture techniques are not used, i.e. minimum or no-tillage, the use of suitable rotations and maintaining soil cover throughout the year.

2.3.2 Semi-Mechanized Rain-Fed Agriculture

Mechanized rain-fed agriculture constitutes about 45 percent of sorghum production and 53 percent of sesame in the Sudan. In the semi mechanized sector, the normal time of planting ranges from early July to mid-August. Cropping is highly vulnerable in that if the level and distribution of rains during this specific period is below average, this subsector will be affected by low productivity or total crop failure.

Semi-mechanised rain-fed agriculture is practiced in a broad belt running from the north eastern portion of the country to the south-southwest through Gedaref, Kassala, Blue Nile, Sennar, White Nile and South Kordofan states. This belt is the granary of the country with sorghum, sesame, sunflower and millet grown as the main crops. Sorghum is by far the main crop in this sector, accounting for an area of about 80 percent of the cultivated land, followed by sesame 16 percent, cotton, millet, sunflower and guar in small areas.

In this semi-mechanised sector, farms are often very large, with some over 50 000 ha, or more. A low-input system is used and improved seeds are not used to the optimal extent. Land is prepared using a disc harrow. No rotation of crops is practiced and no fertilizer is used. Hard pans, caused by repeated use of disc harrows is widespread, inhibiting root growth and water holding capacity and hence lowering crop yields.

In Gedaref, the mission visited a Soils Laboratory with equipment for soil testing. The laboratory was also equipped with hand-held penetrometers to test for plough pans. Detailed GIS maps, which show individual farms are also available in Gedaref, but not in other states. This is a very

useful initiative that could usefully be spread to other states. Staff training in the use of the equipment is also necessary.

Private companies, mainly in Blue Nile, are leading the way in the semi-mechanised sector in the introduction of minimum tillage or zero-tillage systems. The Ministry of Agriculture and Irrigation also has a very impressive demonstration unit for this technology in Sennar State which has tested several brands of no-till planters over the past five years. The move to minimum tillage is preceded by chisel ploughing to break any plough-pan that exists and thereafter only the no-till planter is used to plant the crop, apply P and N fertilizer and this is followed immediately by application of pre-emergence and post-emergence herbicides which have proven their effectiveness over several years. A Ministry of Agriculture and Irrigation project has also demonstrated the use of no-till planters for wheat, resulting in a tripling of wheat yields on demonstration farms. The cost of production is sharply decreased due to lower fuel and machinery usage, while the water-holding capacity of the soils is markedly increased such that crops are successful while they fail under the traditional management system.

2.3.3 Traditional Rain-Fed Agriculture

The majority of farmers in the Sudan are engaged in farming in the traditional rain-fed sector, mainly found in the Western Sudan and partially in central and limited parts in the Eastern Sudan. The area of this sector is estimated at more than 9 million hectares. This sector produces about 90 percent of millet, about 35 percent of sorghum and 100 percent of gum Arabic, besides several other crops.

Animal husbandry constitutes an important portion in this sector and this year livestock owners are facing severe shortages of forage for their stock. The cost of renting one feddan of crop residues after the grain has quadrupled this year to SDG 1000, or more in the irrigation schemes, equivalent in value to 4 x 90 kg sacks of sorghum, placing severe cost increases on livestock owners. Moreover, there are few buyers in the livestock markets as a result of the fodder shortage and this is putting downward pressure on prices.

2.3.4 Livestock

The number of livestock has increased dramatically over the past 50 years, from 28.6 million in 1961, including South Sudan then, to the current figure of approximately 105 million, comprised of 30 million cattle, 40 million sheep, 31 million goats and 4.8 million camels. The exact number of livestock is uncertain, as the total number in 2004 was estimated at 134.6 million head. An agricultural census is planned to begin shortly and this should elucidate the true numbers.

The uncontrolled increase in livestock numbers has brought with it serious levels of overgrazing. This has resulted in widespread soil degradation and erosion as soils are grazed bare and left open to the elements, particularly to wind erosion. Water erosion is also serious. This season, in Gadembaliya in Gedaref State a total of 171.5 mm fell between August 21-23rd and this level of rainfall would cause sheet and gully erosion. There is an inbuilt conflict between livestock herders and both semi-mechanised farmers and traditional farmers as they vie with each other for increasingly scarce resources of grazing, crop residues and browse.

Little or no provision is made for dry season feeding, apart from the use of crop residues and there is serious concern this year regarding both water and fodder resources for the immense livestock population. Many Sudanese households keep some livestock and each household is said to

maintain a goat for milk. Sheep, goats, cattle, donkeys and poultry are the most commonly raised animals, but camels are also locally important.

Table 1: Sudan - Estimate of animal population in 2012-2013

Type	Number (000)	
	2012	2013
Camels	4 751	4 773
Goats	30 837	30 984
Sheep	39 483	39 568
Cattle	29 840	30 010
Total	**104 911**	**105 335**

Source: Ministry of Livestock, Fisheries and Rangelands

Table 2: Exports of Meat in Tons, 2010 -2015

Year	Sheep	Goats	Cattle	Camels	Total
2010	4 126	4	991	0.5	5 417
2011	5 426	43	3 553	0.3	9 022
2012	3 899	556	2 464	0.1	6 919
2013	2 132	233	196	0.2	2 560
2014	2 990	157	534	1.8	3 683
2015	22 209	140	3.5	-	22 353

Source: Ministry of Livestock, Fisheries and Rangelands

The value of meat exports in 2015 was US$230 404 400 and the number of animals, mainly sheep, slaughtered for export was 279 881. There has been a steady increase in the export of live animals in recent years, as shown in Table 3, below.

Table 3: Exports of Live Animals: 2010 to 2014

Year	Sheep	Goats	Cattle	Camels	Total
2010	1 813 926	120 693	5 130	172 196	2 111 945
2011	2 729 134	162 149	21 056	151 208	3 063 547
2012	3 415 739	162 116	26 145	166 240	3 770 240
2013	3 757 363	197 958	11 202	129 647	4 096 170
2014	4 539 955	318 783	19 459	152 096	5 030 293
2015	5 049 614	418 176		189003	5 656 793

Source: Ministry of Livestock, Fisheries and Rangelands, Sudan, 2015.

3. Agricultural Production in 2015/16

3.1 Main Factors Affecting Cereal Production in 2015/16.

3.1.1 Agricultural Finance and Credit

There was a considerable improvement during 2015 in the flow, quantity and diversification of finance available to farmers, although it did not reach all farmers who needed it. The area financed in the current season up to August 31st amounted to 7 732 million feddans, which was an increase of 29 percent above that of the previous season. The total finance provided by the Agricultural Bank up to August is estimated at 1 232 million SDG surpassing the last season by 40 percent. More than half the agricultural finance was given to the semi mechanized sector, while the traditional sector was only little more than 1 percent. The agricultural machinery equipment share ranked second to the semi-mechanized sector, as it received 31 percent at the total finance. Finance for machinery in 2015 amounted to SDG260.3 million.

Table 4: Summary of the credit provided by the Agricultural Bank for summer crops, season 2015/2016 in comparison with season 2014/2015

	Area Financed (000) Feddans			Agric. Finance Million SDG			% Share of Finance	
	2015	2014	% change	2015	2014	% change	2015	2014
Semi mechanized Sector	6 433	5032	28	684	463.8	47	55.50	52.8
Traditional Sector	90.4	126	-28	13.3	13.3	0	1.08	1.5
Irrigated Sector	135.9	174	-22	83.9	75.1	12	6.81	8.5
Horticulture	16	18	-11	49.5	21.1	135	4.02	20.4
Agric. Mach. Equipment	1 056.6	665	59	401.6	306	31	32.59	34.8
Total	**7 731.9**	**6015**	**29**	**1 232.3**	**879.1**	**40**	**100**	**100**

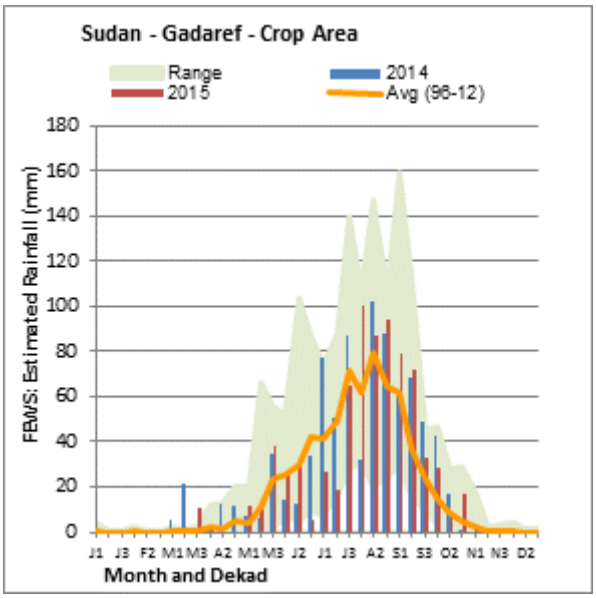
Source: Agricultural Bank of Sudan.

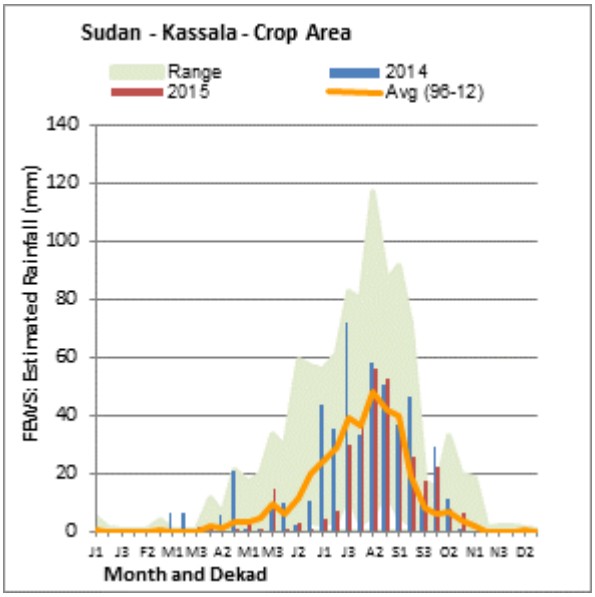
3.1.2 Rainfall

There is a growing consensus among international climate experts that the 2015 El Nino event ranks in intensity with the two strongest El Nino events in 1982 and 1996/97. The effects of El Nino in changing weather patterns is exacerbated by climate change and has resulted in later, lower than normal and poorly distributed rainfall over most of the country, but particularly in northern states. The season was also affected by 2-3 week long dry spells, interspersed with periods of very heavy rainfall, such as occurred in one station in Gedaref State which recorded 87.5 mm and 84 mm on 21st and 23rd August. This amounted to 43.3 percent of the total seasonal rainfall in that area. Several states reported similar bursts of very heavy rainfall interspersed with long dry spells which in many cases resulted in severe crop loss.

Rainfall amounts were better in southern states, but were also poorly distributed, leading to difficulties with weeding.In Gedaref State, one of the main productive areas, rains started late in August and ceased at the normal time in October.

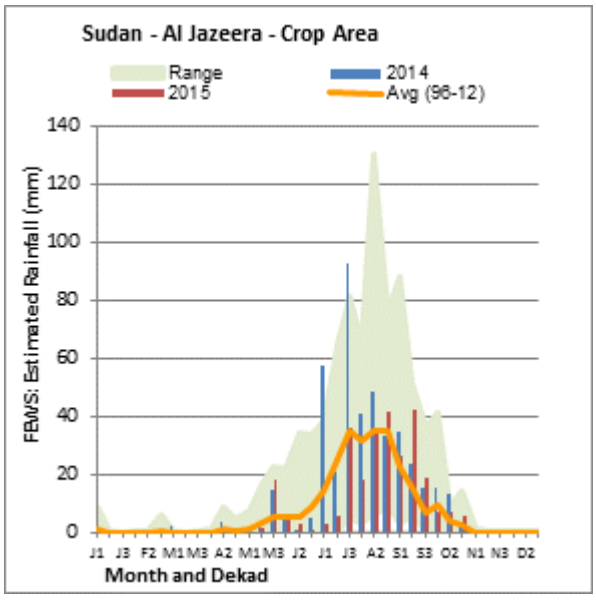
The quantity of rainfall was below average in Northern, Central and Western regions. Southern regions however received good rains and had almost normal crop yields. Dry spells occurred in Northern and Western regions. This can clearly be seen in the accompanying figures, which show the rainfall pattern in several states, compared to last year and to the long-term average.

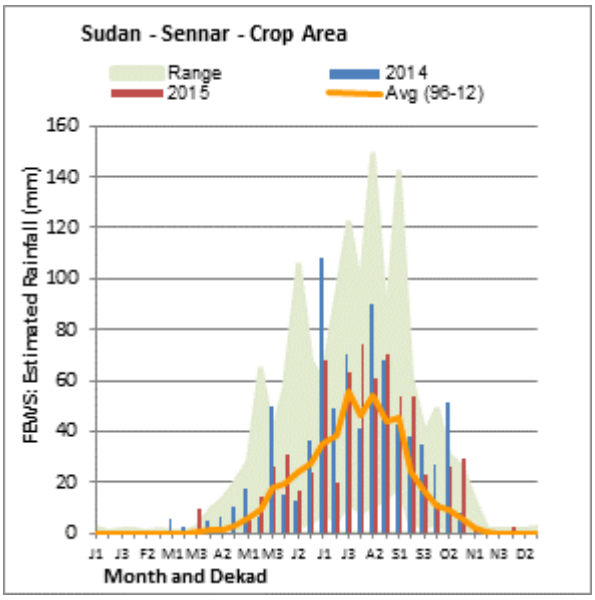




In Kassala, rain started late during August and ceased early in September with quantity well below average until August and less than last year. Duration was uneven and 2-3 weeks dry spell occurred in late August and early September. There were floods in Arabsstream and Tokar.

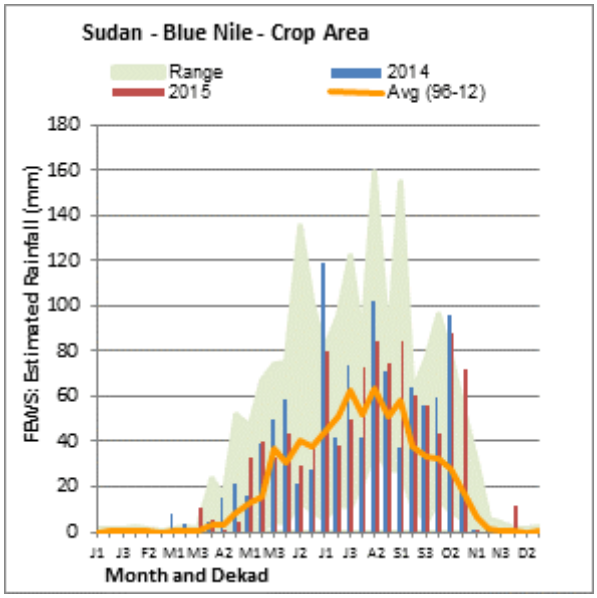
The rains of the 2015 summer season in Gezira state were the lowest for the last 10 years. The rain fed sector in Gezira State received the first showers on the third week of May and it was similar to the average over the last five years at 10 mm. The precipitation entered a decreasing trend from June up to the end of the season where the last rain was received during the fourth week of September.

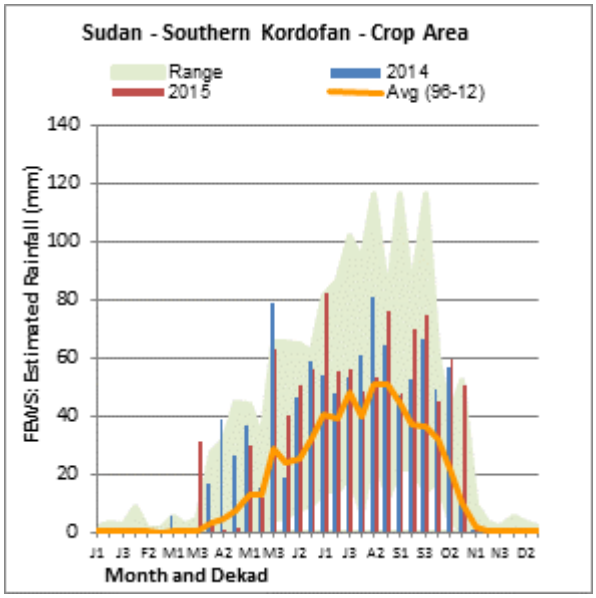




In Sennar State rainfall began with showers in June and part of July. Effective rains only occurred during August in most parts of the state.

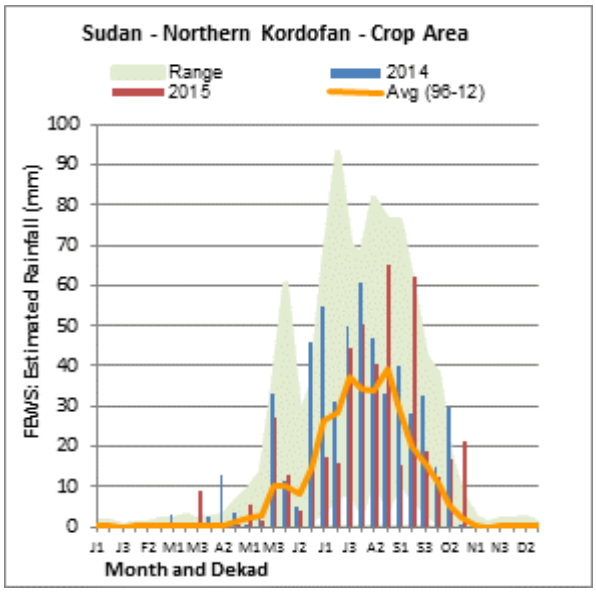
In Blue Nile State, light showers in May ranging from 0 to 68 mms in 10 stations were followed by June rains which ranged from 0 to 145 mm. July rains varied from 0 to 201 mms. August ranged from 140 to 357 mms and September 50 – 282. Rainfall was generally lower than the previous year, but normally Blue Nile State suffers from excessive rains rather than shortage of rains. Rainfall distribution was comparatively good although rains were heavy during August and early September which hindered weeding operations in some areas.

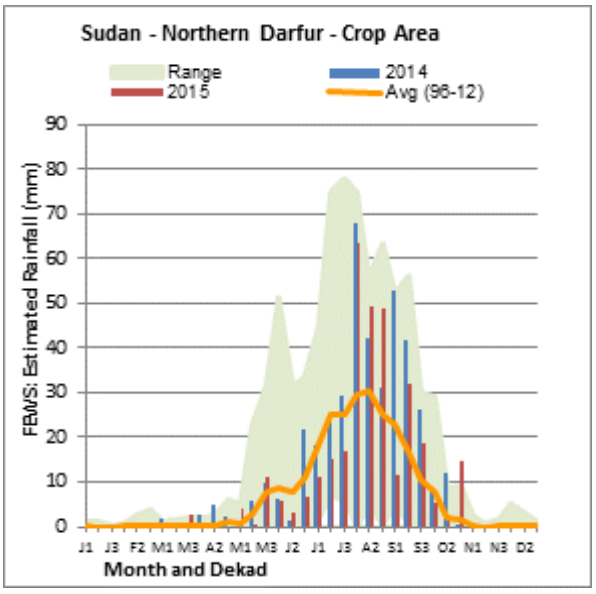




In South Kordofan rainfall onset was later than normal and amounts were less than last season, but sufficient for crops in most localities except Elgouz, Dilling and Dalami localities. The average total rainfall at state level is 554 mm the highest in Talodi (814mm) and lowest in Elgouz locality (357 mm).

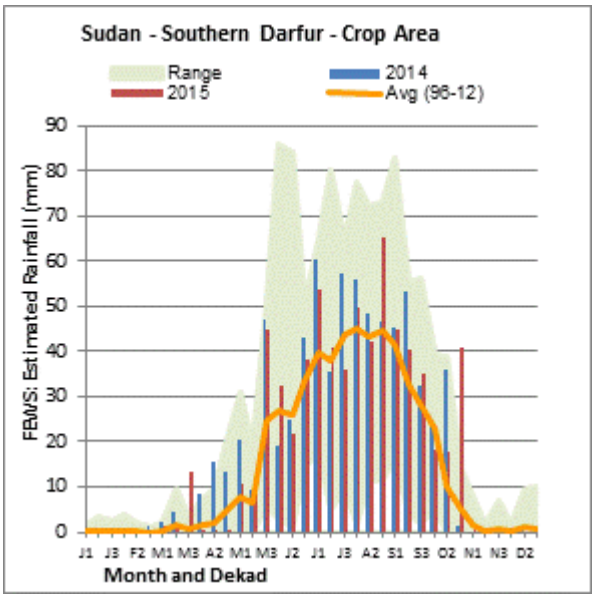
In West Kordofan, rainfall patterns varied widely from place to place. Rains began in May in southern parts of the state and in June in northern parts of the state. Effective rain for planting started in August over most parts of the state. There was a long dry spell from mid-August to September, lasting 4-6 weeks and the total rainfall was lower than last season. However, in those areas which received above average rainfall, distribution was generally poor.

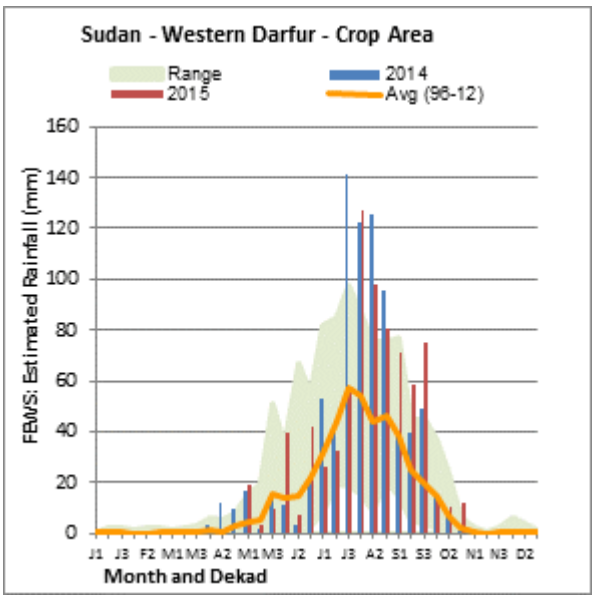




Most of North Darfur received lower rain amounts in 2015 compared to 2014 and the 5-year average. In addition to low amounts, 2015 rains also started later than normal and ended earlier, making it an abnormally short growing season in most of the State. Effective rains were received 3 – 4 weeks late (late July/early August) and ended early (early August/mid-September). No rains were recorded in October with the exception of two locations (Towaisha & A lait) they had amounts of 123 and 50 mm, respectively. Overall, growing conditions for summer crops in North Darfur were unfavourable, mainly due to short rainy season. Crop growing conditions in western, south and south-eastern localities were comparatively better than the rest of the State, but still below last year.

In Central Darfur, **r**ains started in mid-July/early August, continued below average and stopped in early October, with significant dry spells in September (three weeks) across most of the state. Effective rains for planting of most crops were on time (August) with abnormal distribution and less than the rainfall of last year and the 5 years average (2010 – 2014). Sorghum and ground nuts are more adversely affected by the unfavourable growing conditions of 2015 cropping season compared to millet. Rains ended earlier than normal in mid-October when most of crops were at flowering stage, leading to lower yields in most of the highlands. Lowlands at the banks of main water sources were somewhat better.





In West Darfur, rains started in late July and stopped earlier than usual in September with the peak rainfall recorded in August and there were dry spells recorded in September. The average amount of rainfall received all over the state was around 423 mm, which was less than last year. Two dry spells were experienced during the season; one in July for two weeks and another in September for another three weeks. Contrary to the seasonal trend, more rains fell in the northern localities compared to the southern localities and this was attributed to the effect of climate change in the area. Jabel Moon Locality in the north of the state recorded high rain fall (517 mm)

In Figure 2, the Normalised Difference Vegetation Index (NDVI) anomaly relative to the long-term average shows clearly the lower vegetation status in July and August 2015 in the important producing states of Gedaref and Sennar, in particular.

Figure 2 - NDVI anomaly- relative difference to long term average

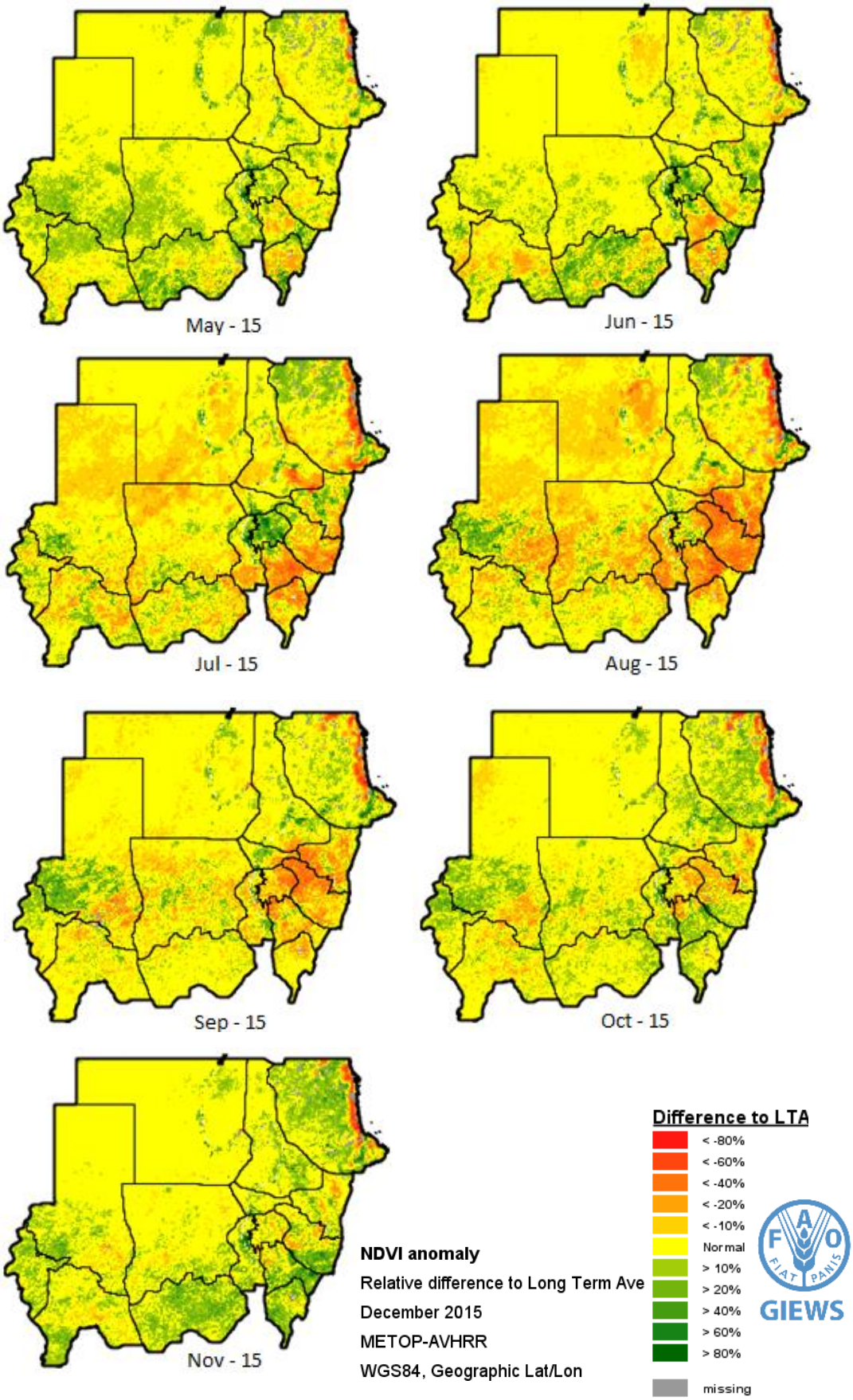
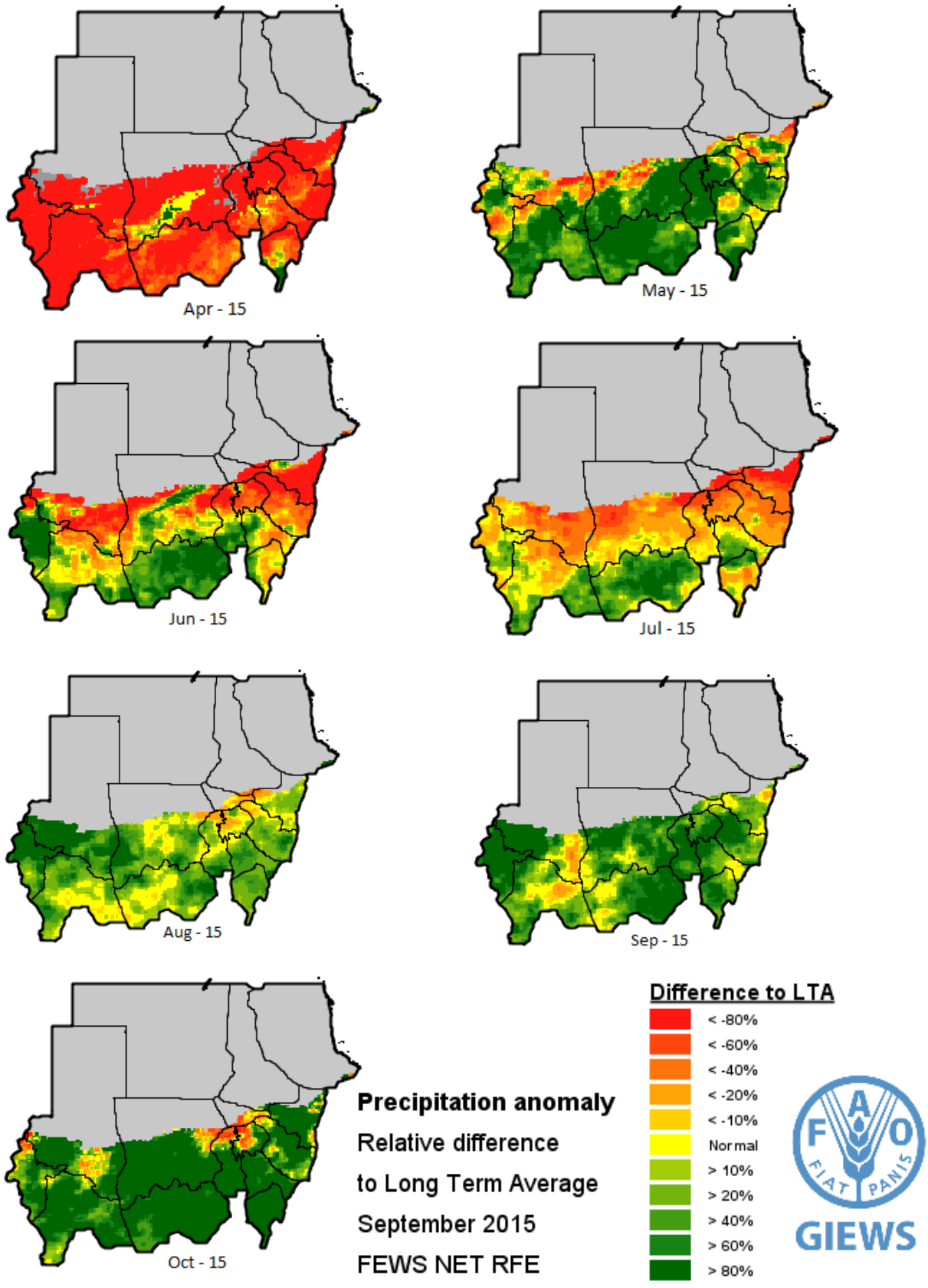


Figure 3 - Precipitation anomaly-relative difference to long term average



3.1.3 Agricultural Inputs

The major agricultural inputs include machinery, diesel oil, seed, fertilizer, herbicides, insecticides and fungicides. In general, availability of machineries was sufficient,though some traditional farmers in Sennar State, who depend on larger farmers to rent machinery to them after they have completed sowing their own farms, faced some delays in planting and, consequently, their crops missed the early rains. Temporary shortages of diesel oil were reported at the beginning of the season, but they were quickly addressed by state authorities. Most seed used is unimproved in the traditional and semi-mechanised sectors, but use of improved increased in the irrigated sector.

Table 5: Seeds and Tools Distributed by FAO, INGOs and ICRC in 2015

State	Seed of Field Crops and Vegetables (tonnes)	Hoes	Weeders	Rakes	Donkey Ploughs	Other
South Darfur	668.5	0	0	0	0	0
North Darfur	241.5	16 000	0	0	0	0
Central Darfur	351.4	4 000	0	8 000	0	0
West Darfur	193.5	1 806	0	2 448	0	0
South Kordofan	166.7	1 784	4 314	1 284	50	0
West Kordofan	27.0	0	0	0	50	0
Red Sea	39.2	0	0	0	0	0
Blue Nile	105.7	1 000	1000	0	0	0
Totals	**1 793.5**	**24 590**	**5 314**	**11 732**	**100**	**0**

Source: FAO.

The quantity of seeds distributed by the Ministry of Agriculture and Forestry and some NGOs and reported separately is set out in Table 6.

Table 6: Quantity of Seeds Distributed in Tonnes

Crop	MOAF	NGOs	Total
Sorghum	277.1	34	311.1
Millet	244.4	-	244.4
G.Nut	150	243	393
Beans	-	1.6	1.6
Sesame	-	0.4	0.4
Water melon seed	-	0.4	0.4
Vegetable	-	1.16	1.16
Total	**671.5**	**280.56**	**952**

3.1.4 Pests, diseases and weeds

No major pests or diseases in crops were reported for the 2015/16 season. A mealy bug infestation in cotton was reported at Suki, Gezira, New Halfa and Rahad Irrigation Schemes and was reported to have caused crop losses estimated at 40 percent in the relatively small areas affected. However,

as this pest is very difficult to control, its progress needs to be closely monitored so that its spread is prevented. Migratory pests were not reported to have caused much crop damage. Early infestations of rats were controlled using rodenticides.

An outbreak of Black Arm Disease (Xanthomonas spp.) from Suki and Rahad Irrigation Schemes and was reported to have caused serious crop loss in the area affected. This disease used to be controlled by the use of resistant varieties and this resistance seems to have broken down.

Striga (Striga hermonthica) is a parasitic weed of sorghum and other crops and it was widely seen in Gedaref and Sennar States. Weed control was hampered in August in several states, especially in the south, by short bursts of heavy rains.

3.1.5 Area Planted and Harvested in 2015/16

The area planted to sorghum is estimated at 8.924 million ha, 1.5 million ha less than in the previous year and near the five-year average of 9.039 million ha. Unfavourable weather was the main reason for the drop in planted area.

The millet area was 3.041 million ha, 26 percent below last year's planted area of 4.129 million ha, but above the five-year average of 2.888 million ha.

The harvested area of both sorghum and millet were much reduced due to the poor rainfall. Only 4.741 million ha of sorghum was harvested, or 47 percent of the planted area. For millet, the harvested area was 1.693 million ha, or 44 percent of the planted area. This drastic fall in the percentage of harvested area to area planted and the serious fall in yields per ha are the main reasons for the decrease in cereal production this season.

As most of the wheat area is irrigated, no major difference between the planted and harvested area is expected. The crop will be harvested in March, 2016. Wheat yield is expected to average 2.1 t/ha similar to the yield of the previous year but above the five year average of 1.68 t/ha.

3.1.6 Crop Yields

Due to the late, erratic and poorly distributed rainfall over most of the country, crop yields were reduced in 2015, especially in the semi-mechanised and traditional sectors. Sorghum yields in the irrigated sector were stable at an estimated 1.91 t/ha. In the semi-mechanised sector, sorghum yields declined from 0.7 t/ha to 0.4 t/ha, while in the traditional sector yields of harvestable crops were reduced from 0.7 t/ha to 0.5 t/ha. However, only 53 percent of the planted area produced any crop.

A similar pattern existed for millet where yields declined from 0.44 t/ha in 2014 to 0.34 t/ha in the semi-mechanised rainfed sector. In the traditional sector, yields declined from 0.38 t/ha to 0.31 t/ha, but this masked a huge drop in the percentage of planted area that could be harvested from 3.04 million ha to 1.69 million ha.

Wheat, which is almost all grown under irrigation, is expected to maintain yields at around 2.1 t/ha. Further details of yields for these and for other crops such as groundnuts, sesame, sunflower and cotton are shown in Tables 7 – 21, below.

Table 7: Sorghum Area, Yield and Production by State/Centre of Production and Sector

محصول الذرة Sorghum : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015 د مقارنة مع 2015/2014 ومتوسط الفترة (2013/2012 - 2009/2008)													
المساحة : بالألف هكتار Area (000 HA)		الإنتاجية : بالكيلو جرام/هكتار Yield Kg/HA						الإنتاج : بالألف طن /هكتار (000MT)Production					
		موسم Season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/2008)			
الولاية	مراكز الانتاج	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة
state	Centre of Production	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan
Northern الشمالية	Northern الشمالية	2,380.0	2	1	2	2,777	7	3	3	2,381	12	5	5
River Nile نهر النيل	River Nile نهر النيل	1,666.0	14	8	9	2,618	58	22	22	2,036	36	18	18
Khartoum الخرطوم	Khartoum الخرطوم	-	-	-	-	-		-	-	-	-	-	-
Gezira الجزيرة	Gezira Scheme مشروع الجزيرة	2,025.0	325	161	173	1,903	375	197	208	2,091	414	198	234
Gezira الجزيرة	Outside Rotation خارج الدورة	-	-	-	-	-		-	-	1,607	1	1	1
Sennar سنار	Suki السوكي	2,164.0	30	14	17	1,700	25	15	17	2,320	31	13	15
Sennar سنار	Sennar سنار	1,512.0	47	31	33	1,684	46	27	36	1,859	55	30	34
White Nile النيل الأبيض	White Nile النيل الأبيض	1,544.0	61	39	45	2,150	112	52	55	1,940	83	43	44
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	-	-	-	-	-		-	-	-	-	-	-
Gedaref القضارف	Rahad الرهد	2,354.0	89	38	40	2,032	70	34	36	2,109	80	38	40
Kassala كسلا	New Halfa حلفا الجديدة	2,142.0	63	29	30	2,136	70	33	34	2,211	69	31	33
Kassala كسلا	Gash القاش	952.0	14	15	17	2,380	100	42	44	2,296	60	26	27
Kassala كسلا	Kassala كسلا	-	-	-	-	-		-	-	1,429	1	0	0
Red Sea البحر الأحمر	Tokar طوكر	1,428.0	3	2	2	1,488	30	20	22	1,023	5	5	6
N. K. شمال كردفان	North Kordofan شمال كردفان	1,190.0	1	1	1	1,190	1	1	1	1,256	2	2	2
Total Irrigated Sector جملة القطاع المروي		1,914.0	649	339	369	842	894	446	478	2,072	850	410	462
Mechanized Rainfed Sector القطاع المطري الآلي													
Sennar سنار	Sennar سنار	546	257	471	924	669	555	830	976	412	246	598	992
White Nile النيل الأبيض	White Nile النيل الأبيض	342	83	243	569	596	196	329	439	426	143	337	438
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	595	215	361	469	476	157	330	462	457	119	261	361
Gedaref القضارف	Gedaref القضارف	388	457	1,179	2712	714	1952	2,733	3,037	465	694	1491	2,402
Kassala كسلا	Kassala كسلا	88	1	11	378	751	369	492	546	426	114	268	521
N. K. شمال كردفان	N. K. شمال كردفان	-	(...)	(...)	(...)	714	3	4	5	422	3	8	11
West Kordofan غرب كردفان	W. K. غرب كردفان	-	-	-	-	714	3	4	5	-	-	-	-
South Kordofan جنوب كردفان	S. K. جنوب كردفان	428	239	559	798	595	249	418	598	411	118	287	404
North Darfur شمال دارفور	N. D. شمال دارفور	-	-	-	-	-	-	-	-	-	-	-	-
West Darfur غرب دار فور	W. D. غرب دار فور	-	-	-	-	-	-	-	-	-	-	-	-
South Darfor جنوب دار فور	S. D. جنوب دار فور	-	-	-	-	-	-	-	0	-	-	-	-
Total Mechanized جملة المطري الآلي		443	1,252	2,824	5,851	678	3484	5,140	6,068	178	1438	3250	5,129

Traditional Rainfed Sector القطاع التقليدي													
River Nile نهر النيل	River Nile نهر النيل	700	5	7	9	1,071	108	101	146	486	13	27	34
Khartoum الخرطوم	Khartoum الخرطوم	-	-	-	-	571	48	83	95	-	(...)	(...)	(...)
Gezira الجزيرة	Gezira الجزيرة	595	1	2	16	557	234	420	580	354	90	254	414
Sennar سنار	Sennar سنار	544	64	118	231	669	166	249	293	458	68	149	228
White Nile النيل الأبيض	White Nile النيل الأبيض	100	5	50	111	425	65	153	204	479	77	161	228
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	639	51	80	103	-		-	-	620	34	55	79
Gedaref القضارف	Gedaref القضارف	-	-	-	-	-	-	-	-	-	-	-	-
Kassala كسلا	Kassala كسلا	-	-	1	42	852	68	80	84	411	41	100	167
Red Sea البحر الأحمر	Red Sea البحر الأحمر	132	1	8	25	238	1	4	25	476	5	10	13
North Kordofan شمال كردفان	N. K. شمال كردفان	237	39	164	366	320	78	244	287	207	84	405	564
West Kordofan غرب كردفان	W. K. غرب كردفان	322	65	202	336	321	93	290	363	-	-	-	-
South Kordofan جنوب كردفان	S. K. جنوب كردفان	644	184	286	336	643	270	420	603	583	182	312	376
North Darfur شمال دارفور	N. D. شمال دارفور	281	17	61	101	474	59	124	168	302	24	80	137
West Darfur غرب دار فور	W. D. غرب دار فور	647	56	87	108	911	163	179	224	854	101	118	192
South Darfor جنوب دار فور	S. D. جنوب دار فور	428	108	252	420	642	229	357	510	567	212	374	579
Central Darfur وسط دارفور	C. D. وسط دارفور	383	29	76	126	1,285	208	162	180	236	35	148	228
Eastern Darfur شرق دارفور	E. D. شرق دارفور	311	58	187	373	557	39	70	116	214	27	126	210
Total Traditional Rainfed جملة القطاع التقليدي		433	683	1,578	2,704	262	1,830	2,936	3,878	428	993	2,320	3,448
Total Sudan جملة السودان		545	2,584	4,741	8,924	728	6,208	8,522	10,424	547	3,281	5,980	9,039

Table 8: Millet Area Yield and Production by State/Centre of Production and Sector

الدخن Millet : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2015/2014 د مقارنة مع 2014/2013 ومتوسط الفترة (2013/2012 - 2009/2008)														
المساحة : بالألف هكتار Area (000 HA)		الإنتاجية : بالكيلو جرام/هكتار Yield Kg/HA								الإنتاج : بالألف طن / هكتار Production(000MT)				
		موسم Season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/2008)				
الولاية	مراكز الانتاج	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	
state	Centre of Production	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	
القطاع المروي Irrigated Sector														
البحر الأحمر Red Sea	البحر الأحمر Red Sea	619	13	21	23	389	7	8	8	683	4	6	6	
جملة القطاع المروي Total Irrigated Sector		619	13	21	23	389	7	8	8	683	4	6	6	
القطاع المطري الآلي Mechanized Rainfed Sector														
سنار Sennar	سنار Sennar	433	20	46	79	476	31	65.00	76	346	33	95	134	
النيل الأبيض White Nile	النيل الأبيض White Nile	132	2	15	50	431	19	44.00	55	355	11	32	43	
النيل الأزرق Blue Nile	النيل الأزرق Blue Nile	416	11	26	35	433	8	18.00	23	424	9	22	32	
القضارف Gedaref	القضارف Gedaref	176	8	45	80	426	48	113.00	125	371	25	68	89	
جنوب كردفان South Kordofan	جنوب كردفان South Kordofan	490	14	29	34	340	2	6.00	8	350	1	3	5	
جنوب دار فور South Darfor	جنوب دار فور South Darfor	-	0	0	0	-		0.00	0	-	0	0	0	
جملة المطري الآلي Total Mechanized Rainfed		340	55	162	278	439	108	246	287	363	80	220	303	
القطاع التقليدي Traditional Rainfed Sector														
الجزيرة Gezira	الجزيرة Gezira	-	0	0	0	298	1	3	3	274	1	3	5	
سنار Sennar	سنار Sennar	501	8	16	20	466	9	19	26	446	9	20	28	
النيل الأبيض White Nile	النيل الأبيض White Nile	0	0	4	13	371	12	32	34	407	11	27	36	
النيل الأزرق Blue Nile	النيل الأزرق Blue Nile	441	5	11	15	-		0	0	416	7	16	21	
البحر الأحمر Red Sea	البحر الأحمر Red Sea	-	0	0	1	357	3	8	11	411	2	5	6	
كسلا Kassala	كسلا Kassala	-	0	0	0	793	1	1	1	238	0	1	1	
جنوب كردفان South Kordofan	جنوب كردفان South Kordofan	476	24	50	63	476	28	59	66	249	56	224	313	
شمال كردفان North Kordofan	شمال كردفان North Kordofan	119	45	378	840	203	101	497	1,147	130	71	546	858	
غرب كردفان West Kordofan	غرب كردفان West Kordofan	275	90	328	504	286	150	525	618	-	0	0	0	
وسط دارفور Central Darfur	وسط دارفور Central Darfur	516	41	79	132	857	146	170	189	719	80	111	171	
جنوب دار فور South Darfor	جنوب دار فور South Darfor	321	89	277	462	321	139	433	510	260	90	345	571	
شمال دارفور North Darfur	شمال دارفور North Darfur	166	11	66	221	285	155	544	735	719	16	22	34	
غرب دار فور West Darfur	غرب دار فور West Darfur	655	114	174	218	814	170	209	261	662	113	170	282	
شرق دارفور Eastern Darfur	شرق دارفور Eastern Darfur	182	23	126	252	428	54	127	231	212	32	151	252	
جملة القطاع التقليدي Total Traditional Rainfed		298	450	1,511	2,741	369	969	2,627	3,832	296	487	1,642	2,579	
جملة السودان Total Sudan		306	518	1,694	3,042	376	1,084	2,881	4,127	305	570	1,868	2,888	

Table 9: Wheat, Area, Yield and Production by State/Centre of Production and Sector

القمـــح : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015 م مقارنة مع 2015/2014 ومتوسط الفترة (2013/2012 - 2009/2008)													
المساحة : بالألف هكتار Area (000 HA)		الإنتاجية : بالكيلو جرام/هكتار Yield Kg/HA						الإنتاج : بالألف طن Production (000M)					
		موسم Season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/2008)			
الولاية	مراكز الانتاج	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة
state	Centre of Production	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan
القطاع المروي Irrigated Sector													
Northern الشمالية	Northern الشمالية	2142	90	42	44.5	2,142	86.4	40	42	2,141.80	116.4	54.3	57
River Nile نهر النيل	River Nile نهر النيل	2023	32	16	16.8	1904	30.4	16	17	1,751.50	38.4	21.9	23
Khartoum الخرطوم	Dal دال	0	0	0	0			0	0	1,666.70	4.2	2.5	3
Khartoum الخرطوم	Khartoum الخرطوم	0	0	0	0	1785	6	3	4	1,610.60	4.6	2.9	3
Gezira الجزيرة	G.& M الجزيرة والمناقل	2142	284	132	136.6	2142	270	126	132	1,510.00	166.8	110.5	117
Gezira الجزيرة	Other أخرى	0	0	0	0			0	0	1,812.80	13.4	7.4	8
White Nile النيل الأبيض	White Nile النيل الأبيض	1904	29	15	15.5	2142	37	17	19	1,587.30	18.4	11.6	12
White Nile النيل الأبيض	Private خاص	0	0	0	0			0	0	0	0	0	0
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	0	0	0	0			0	0	0	0	0	0
Sennar سنار	Sennar سنار	0	0	0	0			0	0	1,360.50	1.6	1.2	1
Sennar سنار	Suki السوكي	0	0	0	0			0	0	1,400.60	2	1.4	2
Gedaref القضارف	Rahad الرهد	1666	1	0	0.4			0	0	1,400.60	2	1.4	2
Kassala كسلا	New Halfa حلفا الجديدة	2142	44	21	21	2147	37	17	18	1,435.60	8.2	5.7	6
Kassala كسلا	Private الخاص	0	0	0	0			0	0	0	0	0	0
Total Irrigated Sector جملة القطاع المروي		2,114.54	480	227	235	89122	467	220	232	1,702.60	376	221	234
S. Darfur ج.دار فور	S. Darfur ج.دار فور	1071	2	2	2.1	1190	2	2	2	1,190.50	6.2	5.2	6
W. Darfur غ.دار فور	W. Darfur غ.دار فور	1309	3	2	2.5	1356	4	3	3	1,212.90	5.4	4.5	5
Total Traditional Rainfedr جملة المطري التقليدي		1,250.00	5	4	5	545.45	6	5	5	1,200.80	11.6	10	11
Total Sudan جملة السودان		2,108.70	485	230	240	2,102.22	473	225	237	1,681.60	387.6	231	244

Table 10: Groundnuts- Area, Yield and Production by State/Centre of Production and Sector

الفول السوداني G.Nuts : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015 م مقارنة مع 2015/2014 ومتوسط الفترة (2013/2012 - 2009/2008)													
المساحة : بالألف هكتار Area (000 HA)		الإنتاجية : بالكيلو جرام/هكتار Yield Kg/HA								الإنتاج : بالألف طن /هكتار Production (000MT)			
		موسم Season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/2008)			
الولاية	مراكز الانتاج	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة
state	Centre of Production	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan
Irrigated Sector القطاع المروي													
River Nile نهر النيل	River Nile نهر النيل	0	0	0	0	0	0	0	0	0	0	0	0
G.& M الجزيرة والمناقل	Gezira الجزيرة	2087	192	92	97	2024	166	82	86	1640	173	105	119.3
White Nile النيل الأبيض	White Nile النيل الأبيض	0	0	0	0					0	0	0	0
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	0	0	0	0					0	0	0	0
Suki السوكي	Sennar سنار	2831	2	0.84	1.3	1538	2	1.3	1.3	1724	5	2.9	3.4
Sennar سنار	Sennar سنار	0	0	0	0					0	1	0.4	0.4
Rahad الرهد	Gedaref القضارف	2715	41	15.1	15.5	2541	31	12.2	12.6	1447	56	38.7	40.8
New Halfa حلفا الجديدة	Kassala كسلا	4057	99	24.4	24.8	3565	87	24.4	25.2	2516	78	31	32
Gash القاش	Kassala كسلا	0	0	0	0	0	0	0	0	0	0	0	0
Total Irrigated Sector جملة القطاع المروي		2,523	334	132.4	138.6	2385	286	119.9	125.1	1748	312	178.5	196
Rainfed Sector القطاع المطري													
G.& M الجزيرة والمناقل	Gezira الجزيرة	0	0	0	0	0	0	0	0	0	0	0	0
White Nile النيل الأبيض	White Nile النيل الأبيض	339	4	11.8	16	966	28	29	31.5	326	10	30.7	38.7
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	(...)	(...)	(...)	(...)	0	0	0	0	769	1	1.3	1.7
Sennar سنار	Sennar سنار	(...)	(...)	(...)	(...)	0	0	0	0	0	0	0	0
Gedaref القضارف	Gedaref القضارف	652	3	4.6	5.5	586	17	29	31	490	7	14.3	16.4
N. Kordofan ش كردفان	N. Kordofan ش كردفان	309	10	32	58.7	429	147	343	465	293	146	499	630.7
S. Kordofan ج كردفان	S. Kordofan ج كردفان	542	41	75.6	121.8	664	162	244	304	535	64	119.7	148.7
W. Kordofan غ كردفان	W. Kordofan غ كردفان	429	164	382	588	737	263	357	477	0	0	0	0
N. Darfur ش دار فور	N. Darfur ش دار فور	230	26	113	126	380	76	200	210	366	43	117.6	178.6
S. Darfur ج دار فور	S. Darfur ج دار فور	748	220	294	420	1034	443.7	429	477	429	383	893.7	1,130
W. Darfur غ دار فور	W. Darfur غ دار فور	641	50	78	98	798	95	119	149	453	66	145.8	231
Central Darfur وسط دارفور	Central Darfur وسط دارفور	655	22	33.6	55.9	1069	76.95	72	80	531	70	131.9	203
Eastern Darfur شرق دارفور	Eastern Darfur شرق دارفور	547	168	307	613	1140	276	242	347	423	265	626.5	835
Total Rain-fed جملة المطري		532	708	1,332	2,109	768	1,585	2,064	2,571	408	1054	2,581	3,413.8
Total Sudan جملة السودان		712	1,042	1,464.4	2,241.6	857	1,871	2,183.9	2,696	495	1366	2,758.6	3,609.3

Table 11: Sunflower – Area, Yield and Production by State/Centre of Production and Sector

زهرة الشمس Sunflower: المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015 م مقارنة مع 2015/2014 ومتوسط الفترة (2009/2008 - 2013/2012)													
المساحة : بالألف هكتار Area (000 HA)		الإنتاجية : بالكيلو جرام/هكتار Yield Kg/HA								الإنتاج : بالألف طن /هكتار Production(000MT)			
		موسم Season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/2008)			
الولاية	مراكز الانتاج	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة
state	Centre of Production	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan
القطاع المروي Irrigated Sector													
نهر النيل Rever Nile	نهر النيل River Nile	0	0	0	0	0	0	0	0	793.33	1	1.3	1.3
الجزيرة والمناقل G & M	الجزيرة Gezira	0	0	0	0	0	0	0	0	952.00	0.8	0.8	0.8
النيل الأبيض White Nile	النيل الأبيض White Nile	0	0	0	0	0	0	0	0	0.00	0	0	0
النيل الأزرق Blue Nile	النيل الأزرق Blue Nile	0	0	0	0	0	0	0	0	0.00	0	0	0
سنار Sennar	سنار Sennar	1428.0	3	2.1	2.1	892.5	3	3.4	3.8	833.00	7	8.4	9.2
السوكي Suki	سنار Sennar	892.5	3	3.4	3.8	1057.8	4	3.8	4.2	793.33	2	2.5	2.9
الرهد Rahad	القضارف Gedaref	1322.2	10	7.6	8.0	1133.3	10	8.8	9.2	1,403.59	23	16.4	16.4
حلفا الجديدة N.Halfa	كسلا Kassala	1785.0	15	8.4	8.4	2380	1	0	0	1,190.00	3	2.5	2.5
القاش Gash	كسلا Kassala	0.0	0	0	0	0				476.00	0.2	0.4	2.5
شمال كردفان N. Kordofan	شمال كردفان N. Kordofan	0.0	0	0	0	0				428.40	0.18	0.4	2.5
جملة القطاع المروي Total Irrigated Sector		1446.7	31	21.4	22.3	1098.5	18	16.4	17.6	1,174.55	38	32.4	34.0
القطاع المطري Rainfed Sector													
النيل الأبيض White Nile	النيل الأبيض White Nile	0	0	0	0	0	0	0	0	60.0	(...)	0.28	0
النيل الأزرق Blue Nile	النيل الأزرق Blue Nile	562.5	27	48	60	636.4	14	22	29	662.2	49	74	100
سنار Sennar	سنار Sennar	666.7	2	3	5	500.0	1	2	3	371.4	13	35	39
القضارف Gedaref	القضارف Gedaref	500.0	10	20	23	750.0	18	24	26	435.9	17	39	46
كسلا Kassala	كسلا Kassala	0.0	0	0	0	0.0	0	0	0	0.0	0	0	0
كردفان Korfofan	كردفان Kordofan	0.0	0	0	0	0.0	0	0	0	0.0	0	6	3
جملة المطري Total Rain-fed		549.3	39	71	88	687.5	33	48	58	533.8	79	148	188
جملة السودان Total Sudan		760.9	70	92	110	796.9	51	64	75	650.0	117	180	221

Table 12: Sesame – Area, Yield and Production by State/Centre of Production and Sector

السمسم Sesame : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015 م مقارنة مع 2015/2014 ومتوسط الفترة (2013/2012 - 2009/2008)													
المساحة : بالألف هكتار Area (000 HA)		الإنتاجية : بالكيلو جرام/هكتار Yield Kg/HA								الإنتاج : بالألف طن /هكتار Production (000MT)			
		موسم Season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/2008)			
الولاية	مراكز الانتاج	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة
state	Centre of Production	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan
Mechanized Rainfed Sector القطاع المطري الآلي													
Sennar سنار	Sennar سنار	393.9	39	99	185	347	78	225	284	167.88	23	137	224
White Nile النيل الأبيض	White Nile النيل الأبيض	216.7	13	60	100	323	41	127	149	226.09	26	115	138
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	378.0	31	82	107	317	40	126	155	192.31	20	104	152
Gedaref القضارف	Gedaref القضارف	214.5	62	289	330	309	145	470	516	242.14	77	318	387
Kassala كسلا	Kassala كسلا	(...)	(...)	(...)	10	321	27	84	84	250.00	5	20	24
N. Kordofan شمال كردفان	N. Kordofan شمال كردفان	0.0	0	0	0	0	0	0	0	0.00	0	0	0
S. Kordofan جنوب كردفان	S. Kordofan جنوب كردفان	211.9	32	151	252	214	46	215	269	193.37	35	181	212
Total mechanized Sector جملة القطاع المطري الالي		259.9	177	681	984	302	377	1,247	1,457	212.57	186	875	1137
Traditional Rainfed Sector القطاع التنقليدي													
Gezira الجزيرة	G.& M الجزيرة والمناقل	0.0	0	0	0	0.0	0	3	3	0.00	0	3	5
Sennar سنار	Sennar سنار	400.0	10	25	46	276.6	26	94	95	172.41	5	29	54
White Nile النيل الأبيض	White Nile النيل الأبيض	106.1	7	66	111	320.3	41	128	150	201.61	25	124	141
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	387.1	12	31	39	0.0	0	0	0	186.05	8	43	61
Kassala كسلا	Kassala كسلا	0.0	0	0	0	0.0	0	0	0	333.33	1	3	4
N. Kordofan شمال كردفان	N. Kordofan شمال كردفان	152.9	52	340	756	214.3	138	644	868	91.95	56	609	909
S. Kordofan جنوب كردفان	S. Kordofan جنوب كردفان	277.2	28	101	168	267.6	80	299	374	167.79	25	149	217
W. Kordofan غرب كردفان	W. Kordofan غرب كردفان	200.0	10	50	71	213.1	13	61	76	0.00	0	0	0
N. Darfur شمال دار فور	N. Darfur شمال دار فور	133.3	2	15	25	138.9	5	36	42	260.87	6	23	37
S. Darfor جنوب دار فور	S. Darfor جنوب دار فور	309.5	13	42	63	276.6	13	47	67	260.87	6	23	30
W. Darfur غرب دار فور	W. Darfur غرب دار فور	187.5	9	48	61	366.7	11	30	37	222.22	18	81	119
E. Darfur شرق دارفور	E. Darfur شرق دارفور	157.9	6	38	78	205.1	8	39	61	0.00	0	0	0
C. Darfur وسط دارفور	C.I Darfur وسط دارفور	230.8	3	13	22	321.4	9	28	31	269.23	7	26	41
Total Traditional Rainfed جملة القطاع التنقليدي		197.7	152	769	1,440	244.1	344	1409	1804	141.06	157	1113	1618
Total Sudan جملة السودان		226.9	329	1,450	2,424	271.5	721	2,656	3,261	172.54	343	1988	2755

Table 13: Cotton – Area, Yield and Production by State/Centre of Production and Sector

محصول القطن Cotton : المساحات المزروعة والمحصودة والإنتاج والإنتاجية لموسم 2016/2015م مقارنة مع 2015/2014 ومتوسط الفترة (2013/2012 - 2009/2008)														
المساحة : بالألف هكتار Area (000 HA)			الإنتاجية : بالكيلو جرام/هكتار Yield Kg/HA								الإنتاج : بالألف طن /هكتار Production(000MT)			
			موسم Season 2016/2015				موسم Season 2015/2014				(2013/2012 - 2009/2008)			
الولاية	مراكز الانتاج	نوع القطن	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة	الإنتاجية	الإنتاج	المحصودة	المزروعة
state	Centre of Production	Type of Cotton	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan	Yield	Prod	Harv	Plan
R. Nile نهر النيل	Zeidab الزيداب	Acala أكالا	0	0	0	0	0	0	0	0	0	0	0	0
Gezira الجزيرة	G.& M الجزيرة والمناقل	Egy مصري	0	0	0	0	0	0	0	0	1352	38	28	31
	G.& M الجزيرة والمناقل	Acala أكالا	2,696	62	23	25	3,947	75	19	20	704	20	12	13
	Genied الجنيد	Acala أكالا	0	0	0	0	0	0	0	0	939	1	(....)	(....)
Sennar سنـــار	Suki السـوكي	Egy مصري	0	0	0	0	0	0	0	0	0	0	0	0
	Suki السـوكي	Acala أكالا	2,091	23	11	13	2,167	13	6	8	1000	3	3	4
	Sennar سنـــار	Egy مصري	1,504	1	(....)	(....)	0	0	0	0	0	0	0	0
	Sennar سنـــار	Acala أكالا	2,620	4	2	2	1,400	7	5	5	1125	9	8	9
White Nile النيل الأبيض	White Nile النيل الأبيض	Egy مصري	0	0	0	0	0	0	0	0	0	0	0	0
	White Nile النيل الأبيض	Acala أكالا	1,000	1	1	1	0	0	0	0	1000	8	8	9
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	Egy مصري	0	0	0	0	0	0	0	0	0	0	0	0
	Blue Nile النيل الأزرق	Acala أكالا	0	0	0	0	0	0	0	0	0	0	0	0
Gedaref القضارف	Rahad الرهـد	Egy مصري	0	0	0	0	0	0	0	0	0	0	0	0
	Rahad الرهـد	Acala أكالا	2,889	52	18	19	2,600	26	10	11	1077	14	13	14
kasala كســلا	New Halfa حلفا الجديدة	Egy مصري	0	0	0	0					0	0	0	0
	New Halfa حلفا الجديدة	Acala أكالا	2,928	41	14	16	2,400	36	15	15	1348	31	23	24
	GASH القاش	Egy مصري	0	0	0	0	0	0	0	0	0	0	0	0
	GASH القاش	Acala أكالا	0	0	0	0	0	0	0	0	0	0	0	0
Red Sea البحر الأحمر	Tokar طوكر	Egy مصري	0	0	0	0	840	1	1	1	500	1	2	2
	Tokar طوكر	Acala أكالا	0	0	0	0	0	0	0	0	700	1	1	1
Kordofan كردفان	Abu Habil أبو حبل	Egy مصري	0	0	0	0	0	0	0	0	0	0	0	0
	Abu Habil أبو حبل	Acala أكالا	0	0	0	0	0	0	0	0	141	0	(...)	(...)
Total Irrigated Sector جملة القطاع المروي			2,667	184	69	76	2,821	158	56	60	1295	127	98	107
Rain-Fed Sector القطاع المطري														
Sennar سنار	Sennar سنار	American أمريكي	0	0	0	0	0	0	0	0	270	0	1	2
White Nile النيل الأبيض	White Nile النيل الأبيض	American أمريكي	0	0	0	0	0	0	0	0	0	0	0	0
Blue Nile النيل الأزرق	Blue Nile النيل الأزرق	American أمريكي	1,636	18	11	13	2,000	12	6	6	857	12	14	17
Gedaref القضارف	Gedaref القضارف	American أمريكي	600	3	5	5	857	6	7	8	200	1	5	6
N. Kordfan ش كردفان	N. Kordfan ش كردفان	American أمريكي	0	0	0	0	0	0	0	0	0	0	0	0
S. Kordofan ج كردفان	S. Kordofan ج كردفان	American أمريكي	0	0	0	0	0	0	0	0	500	1	2	3
W. Kordofan غ كردفان	W. Kordofan غ كردفان	American أمريكي	0	0	0	0	0	0	0	0	0	0	0	0
Total Rain Fed Sector جملة القطاع المطري			1,312	21	16	18	1,385	18	13	14	636	14	22	28
Total Sudan جملة السودان			2,412	205	85	94	2,551	176	69	74	1,175	141	120	135

3.2 Sudan Cereal Production Forecast

Production of the main cereals (sorghum, millet and wheat) in 2015/16 is estimated at 3.587 million tonnes (see Table 14). Smaller amounts of rice and maize are produced. The major factor in the decline of cereal yields was the poor rainfall which affected the semi-mechanised and traditional sectors, reducing the percentage of crops planted to crops harvested by significant amounts. For example, the area planted to sorghum nationally was 8.92 million ha, whereas only 4.74 ha were harvested, a loss of 47 percent.

Table 14: Cereal Production in '000 t. by Sector.

Sector	Sorghum			Millet			Wheat		
	5-yr average*	2014-15	2015-16	5-yr average*	2014-15	2015-16	5-yr average*	2014-15	2015-16
Irrigated	850.0	894.0	649.0	4.0	7.0	13.0	376.0	467.0	480
Rainfed semi-mechanized	1 438	3 484	1 252	80.0	108.0	55.0			
Rainfed traditional	993	1 830	683	487	969.0	450.0	12.0	6.0	5.0
Total	3 281	6 208	2 584	571	1084	518	388	473	485

* Average 2010-14

3.3 Other Crops

Production of the oilseeds, groundnuts, sesame and sunflower are set out in table 15, below.

3.3.1 Groundnut

Groundnut production was reduced this year due to uncertain and low rainfall which greatly reduced harvested area from 2.184 million ha to 1.464 million ha and yield was reduced from 0.86 t/ha to 0.71 t/ha. Area planted this year was also reduced from 2.69 million ha in 2014 to 2.24 million ha.

3.3.2 Sesame

Planted area for sesame was reduced from 3.26 million ha in 2014 and 2.75 million ha for the five-year average to 2.42 million ha this year. The late arrival of planting rains in July, the normal planting time for sesame, forced some farmers to change to other crops. Sesame prices on the world market are not favourable at present also.

3.3.3 Sunflower

Sunflower is grown on large farms in the irrigated and rainfed sectors. Production this year is expected to increase from 51 000 tons in 2014 to 70 000 tons this year. Marketing problems are hampering the further expansion of this crop.

Table 15: Oilseed Production ('000 t): 5-Year Average, Previous Year and Current Year

Sector	Ground Nuts			Sesame			Sunflower		
	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16
Irrigated	312.0	286.0	334.0				38.0	18.0	31.0
Rainfed semi-mechanized				185.0	377.0	177.0	79.0	33.0	39.0
Rainfed traditional	1 054.0	1 585.0	708.0	158.0	344.0	152.0			

Table 16: Groundnuts – Area Harvested ('000 ha), Production ('000 t) and Yield (t/ha)

Sector	Area Harvested (000 ha)			Production (000 t)			Yield (t/ha)		
	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16
Irrigated	178.6	119.7	132.8	312.0	286.0	334.0	1.7	2.4	2.5
Rainfed semi-mechanized									
Rainfed traditional	2 581	2 064.0	1 332.8	1 054.0	1 585.0	708.0	0.4	0.8	0.5

Table 17: Sesame – Area Harvested ('000 ha), Production ('000 t) and Yield (t/ha)

Sector	Area Harvested (000 ha)			Production (000 t)			Yield (t/ha)		
	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16
Irrigated									
Rainfed semi-mechanized	875.0	1 246.6	681.0	185.0	377.0	177.0	0.2	0.3	0.3
Rainfed traditional	1 113.0	1 409.0	769.0	158.0	344.0	152.0	0.1	0.2	0.2

Table 18: Sunflower – Area Harvested ('000 ha), Production ('000 t) and Yield (t/ha)

Sector	Area Harvested (000 ha)			Production (000 t)			Yield (t/ha)		
	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16
Irrigated	32.0	16.0	21.0	38.0	18.0	31.0	1.18	1.13	1.47
Rainfed semi-mechanized	148.0	48.0	71.0	79.0	33.0	39.0	0.53	0.69	0.55

3.3.4 Cotton

The area planted to cotton increased this season from 74 000 ha to 94 000 ha and yield per ha was slightly lower than last year's yield of 2.55 t/ha to 2.41 t/ha. Bt (Bacillus thuringiensis) seed is used for most of the crop, reducing the need for pesticide applications. However, two formidable threats to future yields were seen this year, infestation by Mealy Bug and by Black Arm Disease. The latter disease used to be controlled by the use of resistant varieties but this resistance seems to have broken down. While the area affected by each of these threats to production was relatively small, they will require effective preventive measures to ensure that they do not spread further. This year cotton production is very good due to better fertilization and less than usual water-logging. However, the mealy-bug infestation, reported in Suki, Gezira and Rahad Irrigation Schemes is causing concern as this is a difficult pest to control. Also,signs of Black Arm Disease was reported by staff at the Rahad Irrigation Project and Gezira and this has reduced yield where it occurred.

Table 19: Cotton – Area Harvested ('000ha), Production ('000t) and Yield (kg/ha)

Sector	Area Harvested (000 ha)			Production (000 t)			Yield (t/ha)		
	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16	5-yr average	2014-15	2015-16
Irrigated	98.0	56.0	69.0	127.0	158.0	184.0	1 295.0	2 820.0	2 664.0
Rainfed	22.3	13.0	16.0	14.0	18.0	21.0	635.0	1 385.0	1 312.0

3.3.5 Sugar

Sugar is produced by the Sudanese Sugar Company, which owns the four factories of Guneid, New Halfa, Sennar and Asalaia, and by the Kenana Sugar factory. This year's production is forecast at about 656 000 tonnes (Table 20). As the White Nile Sugar Company, which is under the supervision of Kenana Sugar Factory, has also recently entered into sugar production, it is expected that an additional 100 000 tonnes would be produced.

Table 20: Sudan – Sugar production from 2012/13 to 2015/16

Company	Year	Harvestable area (hectares)	Sugar production (000 tonnes)	Sugar yield (tonne/hectare)
Kenana Sugar Factory	2012/13	33.9	370	10.9
	2013/14	33.6	355	10.6
	2014/15	34.0	365	10.7
	2015/16	34.9	324.8	9.3
Sudanese Sugar Company	2012/13	37.0	340	9.2
	2013/14	36.2	325	9.0
	2014/15	35.2	291	8.3
	2015/16	35.0	275	10.0

4. CEREAL DEMAND/SUPPLY SITUATION

4.1 Cereal and Livestock Markets

Prices of cereals were broadly stable across 2015, a result of the large harvest produced in 2014. This was a major change from 2014, when prices rose steadily from November, 2013 to October, 2014, reflecting the poor harvest in 2013, as shown in Figures 4, 5 and 6, below. In 2015, prices did not decline during the harvest period from November 2015, as they usually do in most areas and this is due to the perception that the harvest is poor this year. In Omdurman market, sorghum prices stayed in a band from SDG 220 to SDG 280 during the year, being highest in November 2015. As an exception to this general rule, sorghum prices in El Fasher market rose to a peak of SDG 400 per 90 kg sack in June, before falling back to around SDG 250 in November. Given this year's low harvest outcome, it is expected that cereal prices will begin to rise early in 2016 due to crop failure in many areas due to the poor rainfall season.

Livestock prices, which were relatively stable, have begun to decline due to serious shortages of pasture across the country and much less than normal crop residues. Livestock owners have begun to de-stock, but there are indications of a lack of buyers in the market, a result of scarcity of fodder across the country. Water shortages have also begun to appear and tractors were being used to transport water to sheep in Sennar State, months before this normally occurs in March. The possibility of friction between crop farmers and livestock owners is real in this situation

Figure 4: Wholesale Prices of Feterita Sorghum in Selected Markets in 2012 -2015

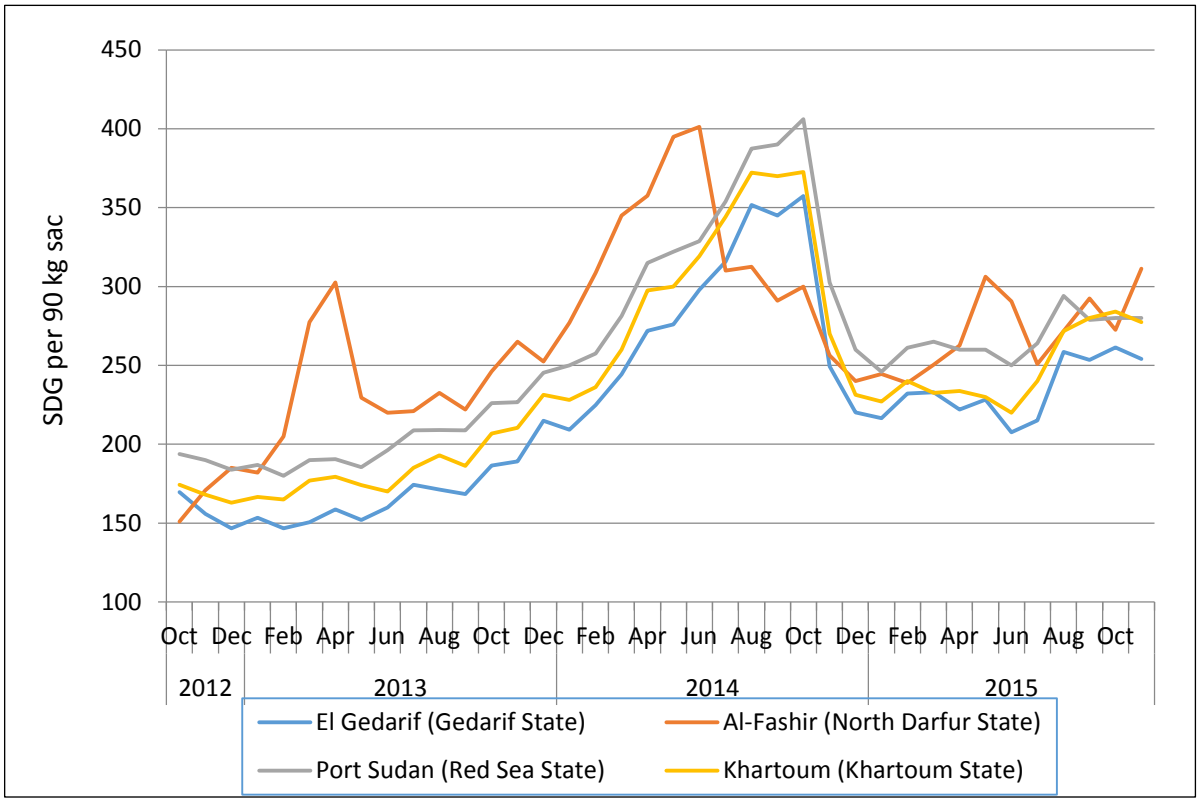


Figure 5: Retail Prices of Feterita Sorghum in 2012 - 2015 in Selected Markets

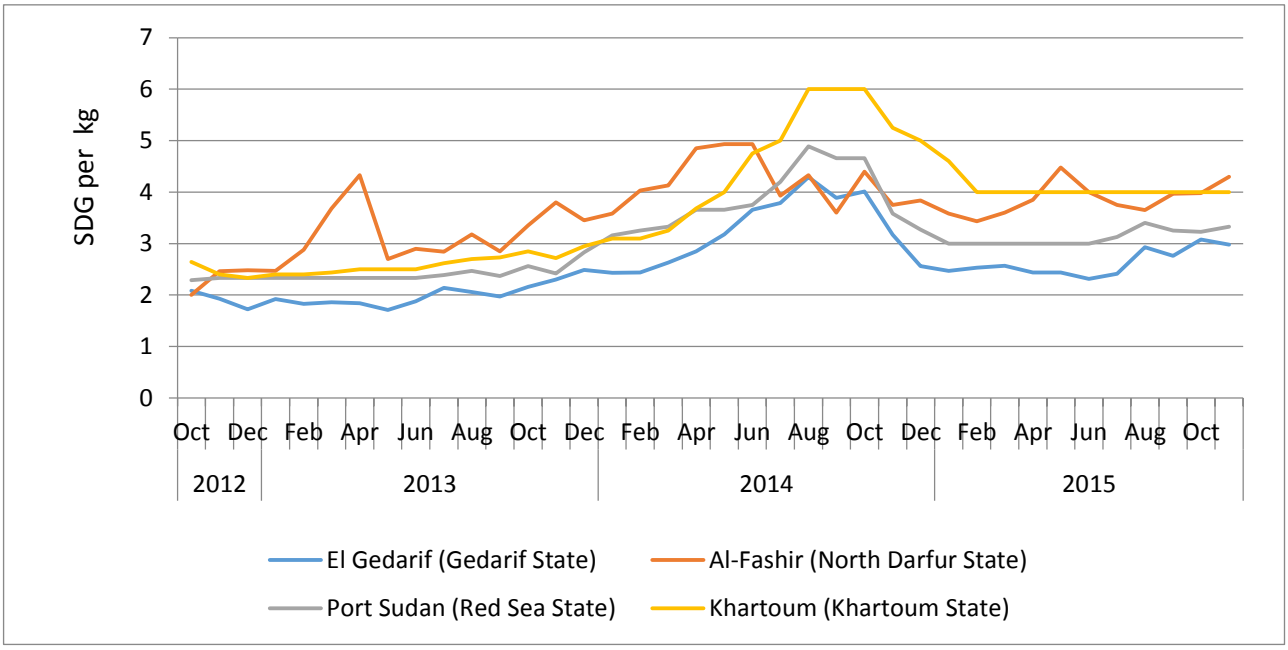


Figure 6: Retail Prices of Millet in Selected Markets

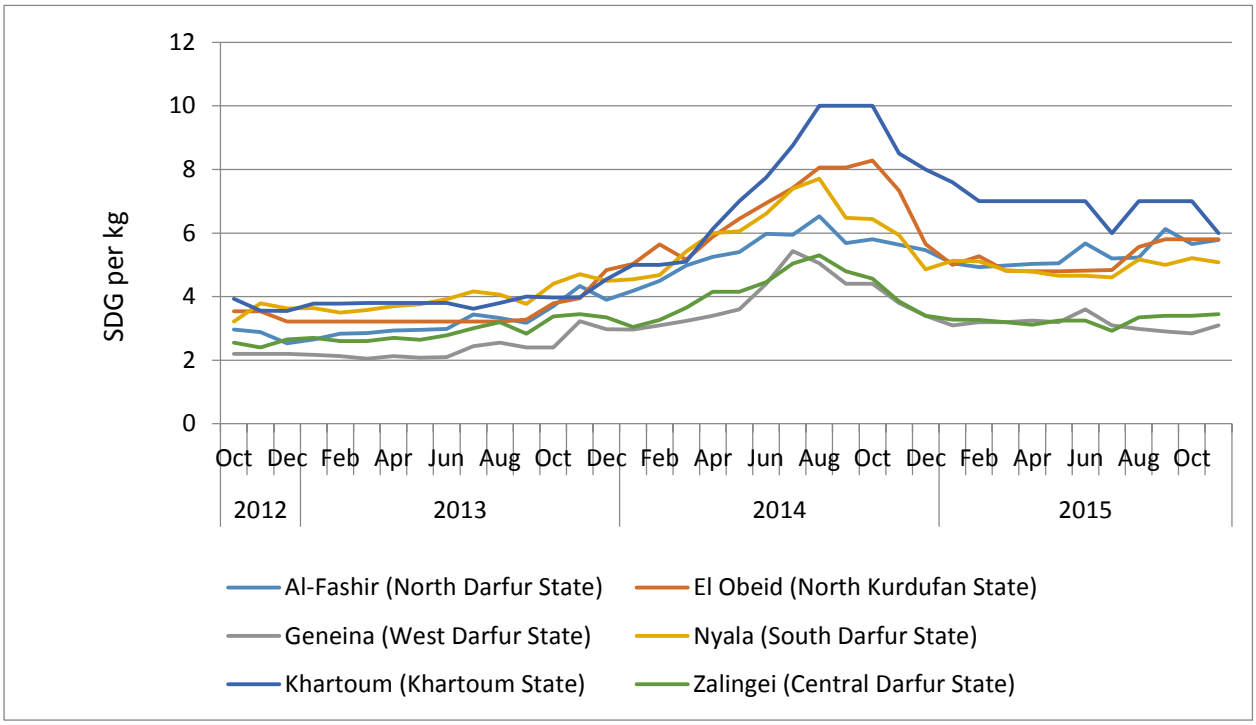


Figure 7: Sheep Prices in Selected Markets in 2015

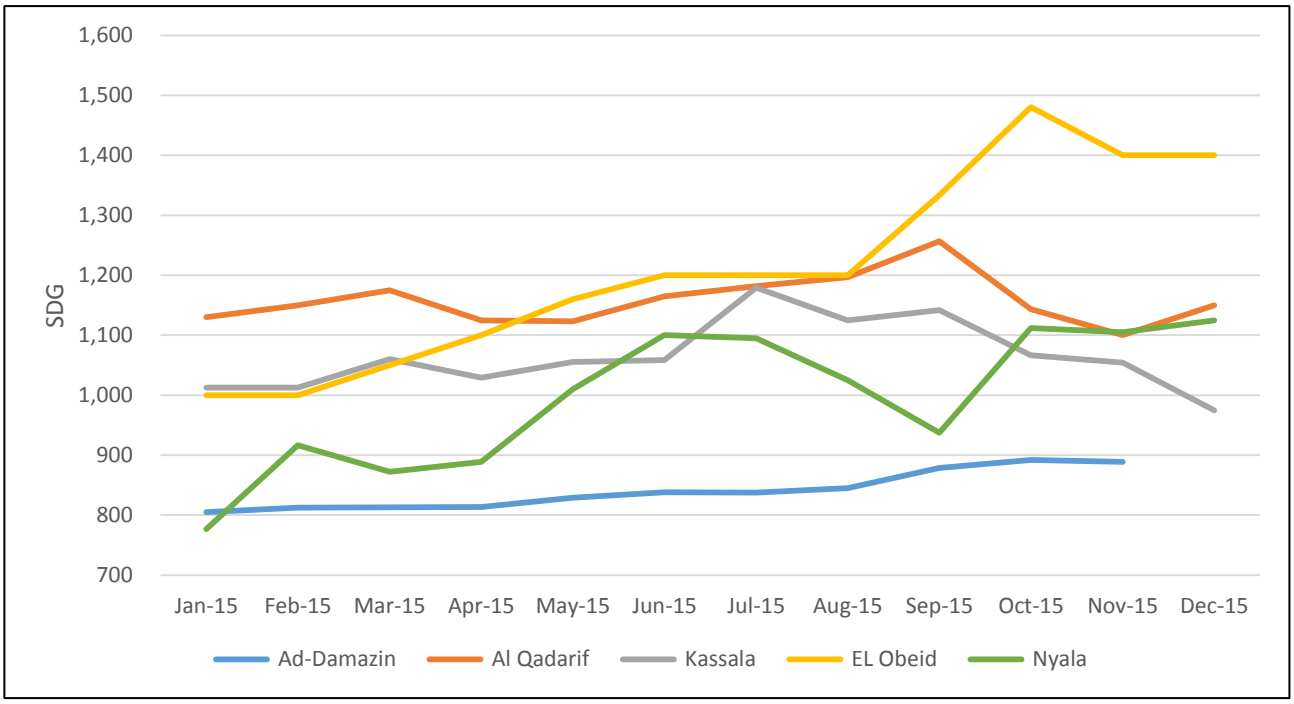


Figure 8: Calf Prices in Selected Markets During 2015

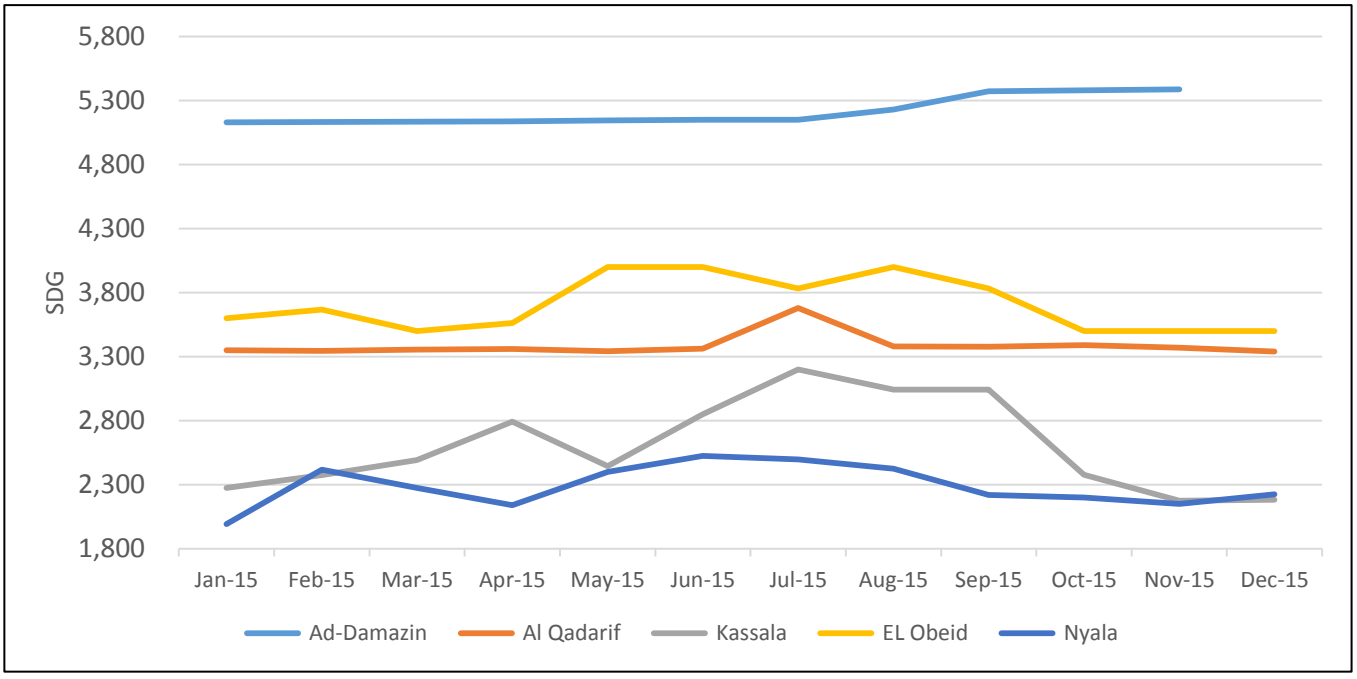
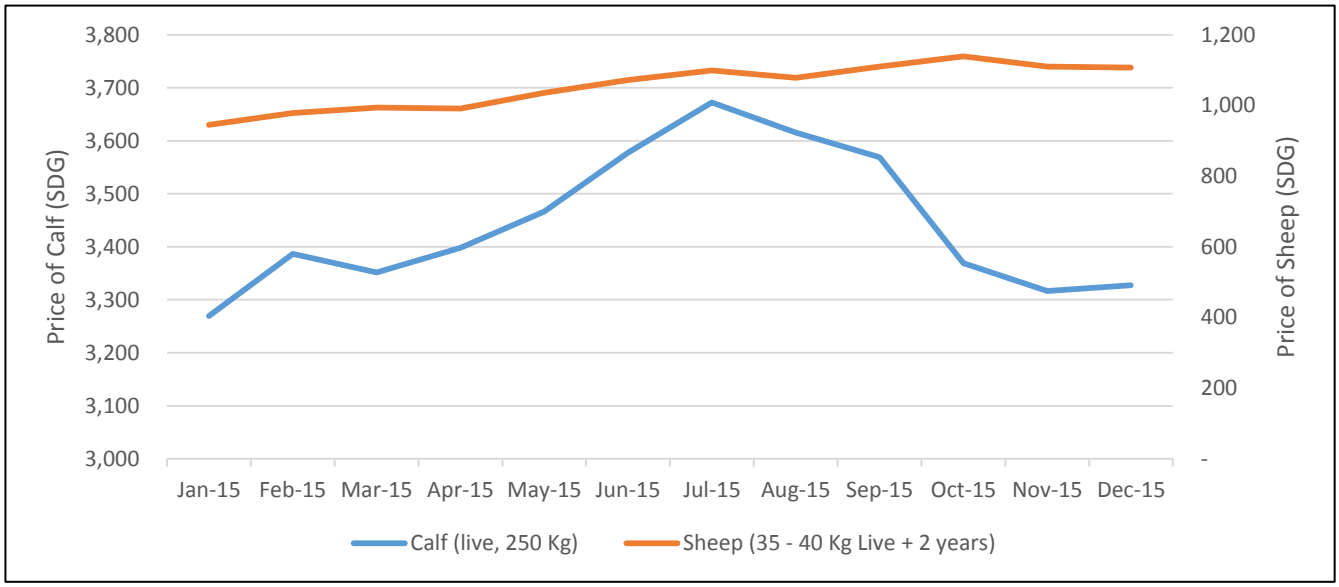


Figure 9: Relative Prices of Sheep and Calves in Selected Markets During 2015



Source: Food and Agriculture Realtime Messaging and Reporting System (FARME4.2

4.2 Cereal supply/demand balance (January-December 2016)

The national cereal supply/demand balance for marketing year January-December 2016 is summarized in Table 21, considering separately sorghum, millet, maize, wheat and rice. The balance is based on the Mission's production estimates (including the forecast for the wheat crop, to be harvested by March 2016) and the latest information on consumption, trade flows and stocks availability. In drawing up the national cereal balance, the following assumptions were made:

1. Total cereal production is estimated at about 3.587 million tonnes, including a forecast of 485 000 tonnes of wheat.

2. Opening stocks of cereals for marketing year 2015/16 are estimated at 2.325 million tonnes. They include an estimated 0.5 million tonnes of wheat, including wheat flour stocks of 74 000 tonnes, calculated as equivalent to 94 000 tonnes of wheat at a conversion ratio of 0.79, held by the main importing companies and flour mills. Opening stocks of sorghum are reported at 1.62 million tonnes, including 820 000 tonnes by the Strategic Reserve and 800 000 tonnes as private stocks. Millet opening stocks are reported at 205 000 tonnes, close to last year's closing stocks of 237 000 tonnes.

3. Feed use is forecast at about 652 000 tonnes, which compares with 684 000 tonnes in 2014. Despite the lower harvest this year, demand for feed is increased due to poor pasture and crop residue supplies.

4. Seed requirements for the next season are estimated at about 125 000 tonnes on the basis of the recommended seed rate in the Sudan and a forecast planted area of about 15 million hectares of cereals to be planted in 2016/17. The following seed rates have been used: 7.5 kg/hectare for sorghum, 4 kg/hectare for millet, 20 kg/hectare for maize, 120 kg/hectare for wheat and 75 kg/hectare for rice.

5. Post-harvest losses and other uses are estimated at 367 000 tonnes, with an average rate of 10 percent for all cereal crops.

6. Food use is estimated at about 6 million tonnes, using the CBS projected 2016 mid-year population of 39.6 million persons and a per capita average consumption of 152 kg of cereals per year. Per-capita consumption comprises 75 kg of sorghum, 58 kg of wheat, 16 kg of millet, 2 kg of rice and 1 kg of maize.

Table 21 shows a substantial decline of closing stocks for sorghum and millet in order to cover the 2015 production shortfall. Some transfers of cereals from surplus to deficit areas will be needed, but imports of sorghum or millet are unlikely to be needed. Closing stocks of wheat are estimated at normal level of 400 000 tonnes. The structural deficits between production and consumption for wheat and rice are expected to be covered by normal levels of commercial imports.

Table 21: Sudan – National cereal supply/demand balance, January-December 2016 (000 tonnes)

	Sorghum	Millet	Maize	Wheat	Rice	Total
Availability	4 327	723	48	985	32	6 115
Opening stocks	1 620	205	0	500	0	2 325
Production	2 584	518	48	485	32	3 667
Food aid in the pipeline (WFP)	123					123
Total utilization	4 327	723	48	2 774	83	7 955
Food	2 970	605	40	2 297	79	5 991
Feed	600	50	2	0	0	652
Seed	79.1	16.5	0.3	28.4	0.6	125
Post-harvest losses	258	52	5	49	3	367
Closing stocks	420	0	0	400	0	820
Estimated import requirements	0	0	0	1 789	50	1 839
Anticipated commercial imports				1 789	50	1 839
Estimated gap	0	0	0	0	0	0

Annex 1: Summary of State Reports

3. Gedaref State

Rain started late in August and ceased at the normal time in October. The quantity of rainfall was below average in Northern, Central and Western regions. Southern regions however received good rains. Dry spells occurred in Northern and western regions.

Sorghum planted area was 10 percent lower than last year due to late onset grains but 13 percent higher than the five year average. However, due to the poor rainfall, only 44 percent of the planted area is harvestable. The harvestable area of millet is 57% lower than last season and 60 percent of the five year average and production is only 8 000 tonnes, one sixth of last year's harvest. Sesame planted area was 36 percent and 15 percent, respectively lower than last year and five year average. Groundnut planted area 51 percent lower than last year and 61 percent lower than five year average. Sunflower area decreased by 11 percent but cotton cropped area increased by 35 percent compared to the previous year.

Expected sorghum production of 546 000 tons is only 25 percent and 71 percent, respectively, of last year and of five year average. Crops in the Southern regions of Simsim, Umseinat and Basonda were best, due to better rainfall there. Of the area planted to sesame, 88 percent was harvestable, but due to late rains the area planted was 39 percent lower than the previous year and production is down by 43 percent. Groundnut and Sunflower production (91% and 72%) of last year but Cotton production is higher (72%).

Pasture condition is very poor (1-2) mainly in wet season grazing area (AlBuatana). In southern regions better conditions apply. Livestock owners returned their stock to summer season grazing areas in September rather than in December. Prices of crop residues more than doubled compared to that of last year with a shortage of water in main grazing areas resulting in early return of herders. Livestock condition is estimated at from 2-3 on a 1-5 scale.

Prices of grains are stable, which is not normal at harvest time. Usually at harvest time prices decrease. The reason for price stability is low production of grains this season.

Fodder prices are shooting up and animal prices are decreasing by about 40-50%of normal prices at this time due to extreme shortage of grazing and crop residues compared to a normal year.

2. Kassala State

Rain started late during August and ceased early in September with quantity below average and less than last year. Duration was uneven and a 2-3 weeks dry spell occurred late August and early September.

Total planted area is 36% and 34% lower, respectively, than last year and the five year average. Sorghum planted area decreased (34% and 38%) compared with previous year and five year average respectively. Wheat planted area increased by 19% compared to last year due to government interest.

Total harvested area only amounts to about 12 percent of planted area. This area represents 10 percent of the previous year's harvestable area and 13 percent of the five year average. This season production represents only 13 percent and 27 percent, respectively, of last year and five year average production.

Sesame and millet areas are negligible because of late and poor rains.

Harvested area of groundnuts is the same last year because this crop is grown only in the irrigated scheme within crop rotation. Groundnut production is 14% and 27% higher, respectively, than last year and five years average.

There was no change in the area planted to cotton. Harvestable cotton area was 97% of planted area and expected production is 14% higher than last year. An infestation of mealy bug on cotton was reported from New Halfa.

Livestock condition (2-3) is average to below average. Poor pasture in main grazing areas resulted in early return of animals from New Halfa and Girba. The cost of renting a feddan of crop residue more than doubled. Pasture conditions are very poor.

Cereal prices are stable which is unusual at harvest time and is due to the expected poor harvest
Livestock prices are decreasing by 40-50 percent due to fodder shortages.

3. Red Sea State

Summer rain began late in August and ceased at the normal time in October. Winter rains came in November and may continue to January. Flooding occurred in Arabstream and recently in Tokar.

Sorghum planted area is 42 percent less than last year, but 48 percent higher than the five year average. The millet area is 24 percent higher than last year due to unexpected rains in Tokar area.

Total harvested area for sorghum amounts to 60 percent of the planted area. Almost all sorghum area is in milky stage or still at vegetative growth stage. Production will not exceed 15% of last year and 45%of five year average due to very late sowing in September and floods in Arabstream and Tokar.

Only 4 000 feddans of millet were planted in the summer rains period. It is expected that 50 000feddans will be planted during winter rains during December.

Pasture condition in summer season grazing area is satisfactory and better pasture is expected in winter season grazing area due to rains in December.

Cereal prices are stable and are considered as normal during harvesting times. Cereal prices are expected to rise, while livestock prices are decreasing. Much of the Red Sea State harvest is taken in January.

4. Gezira State

The Rains of 2015 summer season in Gezira state were the lowest for the last 10 years. The rain fed sector in Gezira State received the first showers on the third week of May and it was in the range of the last five years average with 10 mm.

The total quantities of rains received in the state were, in most areas, far below crop requirements. The highest quantity was received in Kamleen locality (165 mm) but normally it receives the lowest rains and has low agricultural activities, followed by Um Algora and South Gezira localities, with 118 and 105.9 mm, respectively.

The lowest rains were in Hassaisa, East Geizra and Managil Localities with 64.4, 71.6 and 77.6 mm respectively.

The long dry spells and the extremely low rainfall were the major adverse weather conditions of this season in Gezira State and the rainfall received was not enough to complete the cycle of the crop even if it were evenly distributed. The area planted in Gezira State declined by 97 percent in 2015 summer season (39 515 Feddans) compared to 2014 (1.3 million feddans). The productive area in 2015 was 3 410 feddans (i.e. only 5 percent of the total planted area).

Although the targeted area for cropping was about one million feddans only 39 000 feddans were actually planted, of which 4 000 feddans were harvested, producing minimal yield. The major reason for this significant decline of planted area was the very low rainfall, leading some of the farmers not to grow a crop while for those who did plant, the crop did not survive beyond the germination stage. Most of the productive area received at a later stage supplementary irrigation from the nearby canals of Gezira scheme.

The livestock herd is estimated at 10 million head in Gezira state. As pasture is almost nil in the normal grazing areas (AlButtana), this has affected the normal movement of livestock due to lack of pasture and drinking water. Those farmers who have better financial resources tended to buy fodder bales from fodder farms nearby in Khartoum and to transport drinking water from the nearby villages in barrels.

The good production of sorghum in 2014 summer season assisted in providing supplementary animal feeds as the prices are not yet high; however, the situation is expected to get more serious as the time passes towards the lean season. The small livestock holders are obliged to sell their animals with the prevailing prices, which are now decreasing, as they cannot afford to buy the fodder bales (around 80 SDG / bale).

The localities in Gezira state are encouraging farmers to grow fodder in the irrigated sector and to make use of the sugar industry by-products such as molasses and bagasse, as well as the crop residues of Gezira and Rahad Schemes which will be another source of animal feed. This will be an expensive alternative (the cost of grazing one feddan of sorghum stover ranges between 1000 – 1500 SDG depending, on the availability of water at the site).

Sorghum prices are, so far, little affected by the adverse rainy season due to the good production of last year and the availability of stocks in the local markets; but they are expected to rise after harvest time by January onwards.

GEZIRA SCHEME

The start of rains was later than normal and was far less than last year and below average; although important for establishment of crops, yet farmers found room to weed their crops. No serious problems with irrigation were reported except in limited areas mainly in Managil. The sorghum crop received, on average, 7 to 8 irrigations.

Sorghum planted area was 412 000 feddans and yield was 1.94t/ha. Some 30 000 feddans were adversely affected by lack of irrigation during the season. Groundnut area planted was 230 000 feddans, yielding 2.08 t/ha. The planned area for wheat was 500 000 feddans, of which 272 000 feddans had been planted by early December. Vegetables, pigeon peas and chickpeas are also grown and help improve the rotation of crops.

Most crops were planted at the normal time, starting with groundnuts in some areas during late May and continued till end of June. Cotton and Sorghum were sown mainly in July, while wheat sowing started in October with the bulk of the crop sown in November.

Wheat planting is still going on in some areas and expected to stop by the end of the first week of December, which is beyond the recommended sowing date. The delay in planting was due to the delay in supplying DAP fertilizer as well as the constraints that faced farmers with collateral demanded by the financing agencies.

Over 90 percent of the area is planted to improved seeds mainly Tabat, Wad Ahmed and Indian varieties, but the sources of supply are not restricted to specialized seed companies.

Stationary harvesters are available, but still cutting and collection of heads is done by labour which is available but expensive.

Due to the in adequate rains and shortage of pasture, the revenue of farmers from the sorghum stover and other residues ranges from 1000 – 2000 SDG per feddan depending on the location, timing and quality. Of the planted area of 230,000 feddans of groundnut, about 10,000 feddans were affected by irrigation problems.

All cotton area was planted to genetically modified varieties except 646 feddans were planted by Barakat long staple variety. Out of the 59 000 feddans, 3 000 were damaged severely by irrigation problems and over 500 feddans were completely damaged by Mealy Bug infestation. The average yield was 2.69t/ha.

The mealy bug infestation of cotton is increasing from one year to the other; and especially so in this season and an effective intervention is needed to prevent the spread of this pest. It was also observed that a new strain of Black Arm Disease of cotton appeared in very limited areas of southern groups.

The crop residues in Gezira Scheme are an important source of fodder for those farmers who own livestock. Livestock owners are expected to come from outside the scheme to buy crop residues, either sorghum stover or groundnut straw. Precautions have to be taken to avoid damage to standing crops. There are no natural pasture areas inside Gezira Scheme.

Sorghum prices are more or less stable but there is an expectation that prices will increase after harvest time. The prevailing prices are: Wad Ahmad 280 – 300 SDG per sack and Tabat at 340-350 per sack.

5. Sennar State

Rains in the irrigated sector helps in establishment of crops. There was a late start to the rains, and effective rains only began in August. Sorghum sowing was delayed in some schemes due to delay in land preparation and the non-availability of credit for purchasing fuel as the irrigation schemes had bad debts from previous years to the agricultural bank.

Irrigation was normal, except in two locations due to shortage in electricity for the pumps.

In Suki Irrigation Scheme, the rains started late, but there were effective and comparative high rains during August, which caused the flooding of about 6 000 feddans. Irrigation performance was satisfactory, although about 2 000 feddans suffered from temporary unavailability of water.

The targeted area was 46 000 feddans, while planted area was 40 000 feddans. The productive area is estimated at 33 000 feddans as 5000 feddans were flooded. Sorghum yield is estimated at 2.14 t/ha and production at 325 000 tonnes, a drop of 50 000 tonnes below the 2014 harvest.

Urea fertilizer was applied on 50% of the area, and a limited area was treated with herbicides. New hybrid varieties were introduced (PHC 50).

The targeted area for cotton was 30 000 feddans, with 30 000 planted. The productive area was 27 000 feddans. Average yield is estimated at 2.06 t/ha. More than 2 000 feddans were affected by mealy-bug (Planococcus citri) and about 2 400 feddans were affected by thrips.

In the rainfed areas of East Sennar, Dinder, Mazmoum there was some rain showers in June and part of July. Effective rains only occurred during August in most parts of the state. Rainfall records ranged between 186 and 515 mm, less than last year levels and below the average for Sennar East, Sennar and Singa localities. The distribution was uneven in Soki locality. Quantities of rains in July were minimal and high in August in most of the localities. Crops failed completely in Sennar east and to a lesser extent in Sennar due to low rainfall.

The planted area in the current season is 20 to 25% less than the planted area in the previous season due to lower and late rainfall, but similar to the 5 years average. Planting was delayed until effective rains fell in August. The seasonal rainfall in some localities ranged between 210 to 330 mm, insufficient for normal crop production.

Livestock condition is average so far with no contagious diseases reported. Vaccination is in progress.

Low rainfall affected pasture in some parts of the state, but areas in Dali and Mazmoum, Dinder, Soki localities are in good shape, with good availability of crop residues. The only danger is the possibility of livestock coming from other states such as Gezira State which has little or no fodder. At present there are no shortages of drinking water as many hafirs have water in them which can support livestock for 3-4 months plus the availability of water in canals and seasonal streams.

The prices of sorghum Feterita are in the range of 200 – 220 SDG per sack; but farmers are claiming that this price is not enough to cover the expenses for those with an average crop. Selling of standing crops to cattle owners was observed and with prices much higher than last year, it may be more profitable to sell the standing crop for livestock feed rather than incur the cost of harvesting a poor crop.

There is a problem in marketing of Sunflower and even some farmers have delayed harvest.

The total amount of credit disbursed to semi mechanized farmers up to 30 November 2015 amounted to 117 million SDG; including Salam finance for sorghum about 90 percent, sesame and sunflower (7 %). 84 percent of the finance was in cash and 16 percent in kind. The area financed is estimated at 1.615 million feddans and the number of beneficiaries is 3 469. The credit provided in this season (2015/16) is 2.7 times of that of last season. The agricultural Bank of Sudan provided farmers with agricultural machinery in credit costing nearly 26 million SDG.

The pest and disease situation of crops was generally good, with no major problems reported. A few incidents of attacks of birds were reported and effective control measures were taken.

6. Blue Nile State

Rainfall in Blue Nile State was generally lower than the previous year, but normally this state suffers from excessive rains rather than shortage of rains. The distribution was comparatively even although rains were heavy during August and this hindered weeding operations. As the rains were late, sowing was late and many farmers did not or could not carry out proper weeding, so in many locations, the weeds are reducing crop yields.

Sorghum production is estimated at 263 000 tonnes with an average yield of 0.6t/ha. Millet production is estimated at 41 000 tonnes, with an average yield of 0.37t/ha. Sunflower is harvested by combine harvesters and this work is in progress, with production estimated at 27 000 tonnes at a yield of 0.57t/ha.

Crop production is above the average on big company farms and on well financed private farms. Weeds are widespread and will reduce production in many areas of western and south western sectors.

400 feddans of soyabeans were planted in the Integration Company expecting a yield of 595kg/ha.

Most farmers depend on seeds from last year production, except companies and some big farmers buy improved seeds from seed companies.

Some of the seeds provided by the Federal Ministry of Agriculture to be distributed to small holders were not all pure and included Sudan Grass, a serious weed which cross-pollinates with sorghum.

Body condition of livestock is average to above average. No contagious diseases are reported. The total number of livestock is estimated at 15 million head, of which over 50 percent are sheep, 38 percent cattle, 10 percent goats and 2 percent camels.

No problems were reported regarding pasture and drinking water except in a very limited area, but the rush of animals from different states in search of pasture and residues of crops may lead to over grazing and friction. Some widening of animal tracks was carried out and this lessened friction but there are still complaints in this respect.

The campaign to control Sorghum bug (Antad) started in mid-January. The area surveyed is 115 510 ha and trees inspected are estimated at 95 140 trees. The area treated reached 53 550 ha and 46 550 trees.

Birds: As rains were not very heavy, the accumulation of water that assists in collection and breeding of birds was minimum. Total area surveyed is estimated at 900 ha and this area was sprayed by aircraft.
Tree locust
The campaign to control flying locust started in April and May. During August and September, control measures were taken in all locations of multiplication of the pest. The area treated is around 90 000 ha and the area controlled is around 4000 ha.

The area surveyed for rat infestation is estimated at 13 000 ha and the area treated is about 6 000 ha. The infested area was concentrated in Agadi, Saudi Scheme and Roru. The agricultural credit disbursed by the Agricultural bank and other banks was the highest in the history of the state at SDG184 million.

The targeted area to be insured by the Sheikan Insurance Company was estimated at 500 000 feddans, but the area actually insured was 340 000 feddans. The insurance is intended to protect against crop damage by floods, droughts, pests and diseases. Whenever claims are made to the insurance company, a committee is formed to inspect the area and estimate the damage.

7. White Nile

Most of the localities received early rains during June. The second half of August witnessed an improvement in rainfall. The rains ranged between 619 mm in Eltiboon to 159 mm in Tandalti. Rains were inadequately distributed in terms of quantities, geographical coverage and timing, with significant dry spells report during July. Effective rains started mid-August, late sowing dates of crops were recorded for sesame and sorghum. Rainfall at Kosti was 341 mm as against 515 mm in 2014.

The late onset of the rains and the White Nile low level led to late sowing of summer crops. Also the delayed access to funding for rehabilitating the irrigation units and canals augmented the problem. The lower than normal level of the Nile forced delayed the start of the irrigation processes. The late onset of effective rains and the low level of White Nile led to late sowing by 2 – 6 weeks both in irrigated and rain-fed.

Sorghum production in the irrigated area is estimated at 61 000 tonnes, 46 percent below last year's production and below the five year average of 83 000 tonnes. In the semi-mechanised rain-fed areas production is estimated at 83 000 tonnes, which is very low compared to 196 000 tonnes in the previous year and 143 000 tonnes for the five-year average. The production in the traditional rain-fed sector is estimated at only 5 000 tonnes from a harvested area of 119 000 feddans. This is due to late starting or rains and the long dry spell and below average rainfall and poor distribution.
Millet production in the semi-mechanised sector is only 2 000 tonnes, compared to 19 000 tonnes in 2014 and 11 000 tonnes over the five year average.

Pastures are poor especially in the northern side of the state (Getaina and Eduiem). The expansion of mechanised farming onto the natural grazing areas in the state resulted in the blocking of the normal animal migration routes. The water hafirs are full and will keep animals for at least 3 -5 months. However the pressure of animals from the northern parts of the state on pastures and water is expected during the summer months.

Crop prices were expected to decline reasonably during the harvest time, but are still stable around the last year average prices due to the below average harvest.

The milking animal's prices are increasing while the slaughter animals has stable to declining prices due to selling of animals to face the situation of poor pastures. Given the poor pasture situation, some irrigated land should be allocated to fodder crop production.

8. North Kordofan

Rainfall started in May in the southern parts of the state but effective rains were reported in late July and early August. Total rainfall was 30 percent lower than the last season and included a long dry spell extending for up to 4 weeks in August and September. Sandy winds in May affected early planted millet in Bara and part of Umdam, Western Bara, Sodary and Jabret Elsheikh. Abnormally high rainfall in October benefited late planted crops to enable them to complete ripening. However considerable areas of crops dried out before complete ripening.

Most crops were planted in late July /early August which late by almost four weeks. Replanting was also reported in many areas due to dry spell during July. Sorghum production was low at 39 000 tonnes, exactly half the previous year's production of 78 000 tonnes and below the five year average production of 84 000 tonnes.

The millet yield is dramatically low at only 0.119t/ha, with production at 45 000tonnes, compared to 101 000 tonnes in 2014 and five-year average production of 71 000 tonnes. Yields were worst in northern parts of the state, some farmers produced zero, while farmers in southern parts of the state produced better but lower than the average yields.

Pasture conditions are very poor in North Kordofan State. Currently sheep and camels are grazing in the northern part of the state. However the available pastures will not be sufficient and the animals are likely to move south earlier than normal. Cattle herders are starting to reduce their herd size.
Water supplies are sufficient in some parts of the state for now, but will not be sufficient for long.
Sorghum and millet prices either stable or starting to increase in some markets. This is mainly due to the above average carry-over stock from the previous year and also because crop production this year is below average.

9. South Kordofan

Rainfall was later than normal and lower than last season but sufficient for crops in most localities except Elgouz, Dilling and Dalami localities. The average total rainfall at state level is 554 mm the highest in Talodi (814mm) and lowest in Elgouz locality (357.2mm).

Planting in traditional sector started in early June but in the mechanized sector it started in August which is a bit later than normal. Sorghum production in the traditional sector is estimated at 184 000 tonnes at an average yield of 0.64t/ha. This compares with 2014 production of 270 000 tonnes and 245 000 tonnes for the five-year average. The semi-mechanised sector produced 239 000 tonnes at a yield 0.43t/ha, which compares with the 249 000 tonnes in 2014 and 118 000 tonnes for the five-year average.

Millet production is estimated at 24 000 tonnes at a yield of 0.48t/ha. This compares with 28 000 tonnes last year and 56 000 tonnes for the five-year average.

The pasture in the northern parts of the state is not sufficient and most of the herders did not reach their normal areas in the north and spent the rainy season in the southern parts of the state. This led

to over grazing in the area. In southern parts of the state the pasture was good but insecurity restricted the pastoralists' movement. Drinking water may be sufficient up to February, Thereafter, cattle herders have no option other than to migrate to South Sudan.

Crops prices are still stable and the crops supply in the market is big and this is mainly due to the carrying over stock from the last season. Labour supply is not a problem but labour cost is high. A demand for more improved seeds and herbicides was reported.

10. West Kordofan

Rainfall was highly variable in the state. It started in May in the south and in June in northern parts of the state. Effective rain for planting fell in August over most parts of the state. There was a long dry spell from mid-August to September, lasting 4 - 6 weeks and the total rainfall was lower than last season. In those areas which received above average rainfall, its distribution was poor.
Most of planting occurred during early July and early August which is about 3 – 4 weeks later than normal.

Low yields were observed in all the state this season especially in Wadbanda locality and Gebaish.
Only 32% of pasture area is in the state is reported to be in good condition and some of herders sold off half of their herds in view of poor pasture availability. The long dry spell led to drying out of the pastures.

There is relative stability in cereal prices with some increase in cash crop prices due to carrying over of the last season harvest. Livestock prices have begun to decrease due to the low capacity of pastures. Requests were made to increase the production of improved seeds and to provide more agricultural machinery and agricultural credit facilities in time.

11. Northern State

Irrigation system in the Northern state is fully dependent upon the River Nile and underground water. This season, none of the state's localities had any floods, except for North Half, where the Nile river inundated of its arable lands.

This season, the harvested area under sorghum was less than the previous one by 64 percent, while the harvested area under maize was less than the previous season by 41 percent. This was generally attributed to: 1) expansion of the horticultural area into cereals area, 2) lack of fuel and decreased number of operational pumps for irrigation, 3) instability and fluctuation in electricity supply, and 4) hazard from local birds to summer crops, especially sorghum.

Crop sowing usually takes place from April to July. This agricultural season, most of the sowings took place in June. Sowing dates were generally normal compared to last season and no replanting occurred.

Though winter is the main season for crops production in the Northern state, some crops -such as sorghum and maize – are still cultivable in the summer season. By the time of the visit, harvest of both sorghum and maize has already completed. Most of the produced sorghum is used as a fodder.

Wheat and broad bean are the main winter crops in the state and the wheat and bean crops are now at the vegetative stage. Livestock system in the northern state is sedentary. Livestock depends

upon irrigated fodders so there was no shortage of fodder reported. Livestock were reported to be in good condition with no major disease or pest outbreaks, but livestock prices have decreased due to the increase in the price of fodder.

This season, prices for the date crop have dropped down remarkably. This was resulted from high supply (production) versus low demand. The area under broad bean has increased at the expense of the area under wheat. Of the 63 000 feddans of flooded area in Halfa locality, only 8,000 feddans are cultivable, due to lack of agricultural roads, poor availability of agricultural machinery and high flood hazard.

12. River Nile State

Irrigated sector: The irrigation system in River Nile state mainly depends upon River Nile and underground water and this year the performance of the Irrigated sector was generally stable.
The state saw no floods this year, which had an adverse impact in the total area planted annually. Lack of floods of River Nile and River Atbara resulted in the reduction of the total area planted under flood /spate irrigation. This year, rainfall was below average. The performance of the cropping season was generally poor compared to last year. There was a significant shortfall in both quantity and distribution of the rains received.

This year's rainy season was characterized with its very short duration; it began in mid to late August with long dry spells in some locations and ended early in September; with the exception of Butana locality, where rains lasted longer, ending in mid- November.

At the time of the visit, wheat planting was still continuing and 15 750 feddans were planted up to the end of November. The total planted area under sorghum has decreased from 294,000 feddans in 2014 to 39,527 feddans in 2015. This was less by 86.5% compared to last year's area. The significant decrease was mainly a result of a shortage of rain and lack of river flooding.

Sorghum sowing dates usually take place in May to November. This agricultural season, most of the sowings took place in August. Sowing dates were generally late compared to last season and no replanting was done. Due to below average rains and floods this season, the production of sorghum in the irrigated sector is down to 14 000 tonnes from 58 300 tonnes last year and 36 000 tonnes on average. In the traditional rainfed sector only 5 000 tons is expected, compared to 108 000 tons last year and 13 000 tons for the five year average.

Livestock production in River Nile State includes both sedentary and nomadic systems. Livestock depend on rainfed pasture and irrigated fodders. The rain-fed pasture condition was poor and livestock condition was poorer than last year and livestock prices have begun to decline because of the shortage of fodder. No livestock disease problems were reported.

As winter is the main agricultural season in the state, carrying out of separate assessment is necessary to estimate the production of winter crops.

As Dates and Beans are the main food and cash crops in the state that have a direct impact on people's food security situation, the assessment should include them too.

13. Khartoum State

The irrigation system in Khartoum state relies on the River Nile, underground water and rains.

This year the rainy season started in late August and ended as usual in November, was generally below average. It was characterized by poor quantity and distribution, and long dry spells, resulting in no sorghum crop being planted. Last season, 95 000 ha were planted producing 47 200 tonnes. Planting of fodder crops increased from 42 000 ha to 47 010 ha. The production area under vegetables was halved to 4 987 ha.

Normally, vegetables, fodder crops and fruits are the main crops produced under irrigation, while sorghum and some fodders produced under rain -fed areas.

The livestock system in the state is a combination of sedentary and nomadic. The latter depends on rainfall for pasture and water. Fodders were available but at high cost to livestock owners. Poor pasture and a serious shortage of water were noticed in all locations visited in the state and livestock prices have declined as a result of the pasture and fodder scarcity.

Access to food was generally good but prices of staple food tended higher compared to same time last year.

The stoppage of the work of broadcasting of pasture seeds for two consecutive years has resulted in poor pasture conditions. To support livestock sector, government should agree with producers of fodder for export purposes to increase their contribution to local markets especially during years with poor rains.

14. North Darfur State

Most of North Darfur had lower rains in 2015 compared to 2014 and the 5-year average. In addition to low amounts, 2015 rains also started later than normal and ended earlier, making it an abnormally short growing season in most the State. According to the rainfall there were three categories of localities:

West areas (Kabkabia, Saraf Omra and Elsiraif Localities) in addition to ALait and Towaisha Localities in south east. The rains started late July and ended early October, rainfall was in the state in average 447.5 mm.

Elfasher northern areas (Kutum, Millit and part of Kalimnido localities). The rains started late July ended in early September, rain fall was 162 mm in El Fasher, compared to 281 mm in the previous year.

Eastern areas (umKaddada, Elkuma), North area (Elmalha), Dar Elssalam, Taweila and part of Kalimnido Locality) there was poor rainfall this season. Umm kaddada locality recorded 62 mm this season. , rain fall was in the state on average was 88.3 mm.

Effective rains were actually received 3 – 4 weeks late (late July/ early August) and ended early (early August - Mid-September). No rains were recorded in October with the exception of two locations (Towaisha &A lait) they had amounts of123 and 50 mm, respectively, of rains at the beginning of October.

Overall, growing conditions for summer crops in North Darfur were unfavourable, mainly due to short rainy season. Crop growing conditions in western, south and south-eastern localities were comparatively better than the rest of the State, but still below last year.

Due to late start of rains, planting of millet and sorghum, ground nuts, sesame and other summer crops were significantly delayed. As mentioned above, most of the planting took place in late July/early August, which is 3 – 4 weeks later than normal.

Planted areas of cereals in 2015 are estimated to be 55% and 65% lower than last year for sorghum and millet, respectively. Harvestable areas for the same crops are further reduced by about 45% due to early cessation of rains. For example planted areas of millet in 2015 are estimated at 0.71 ha per household, while harvestable area is estimated at 0.4 ha only.

Due to the same reasons, planted and harvestable areas of cash crops (groundnut and sesame) are also expected to be lower than last year, though with less reduction compared to cereals. Reductions in groundnut and sesame areas are estimated to be around 10% less than last year.

Total planted area with all summer crops in 2015 is estimated at 0.86 million hectares, which is 17% lower than those of 2014 areas. In comparison to 2014, when 78% of planted area was harvested, in 2015 only 50% of the planted area is estimated to be harvestable. This is due to poor rains, pest infestation and new displacement following the Jebel Amir Crisis.

The main crops grown in 2015 are pearl millet, sorghum, groundnuts, and sesame and water melon seeds. Other minor crops include Kerkrade (hibiscus) and okra, but in small amounts and areas. Cereals (millet and sorghum) accounts for over 70% of the total planted area, followed by oil crops (ground nuts and sesame) (16%) and watermelon seeds (11%).

Most of the summer crops have matured and harvesting started and/or completed in most locations. According to the State Ministry of Agriculture (SMoA), prospects of production for cereals for the whole state are expected to be 50% below 2014. Production of groundnut and sesame are estimated to be about 10% lower than last year.

Watermelon seed, which follows cereals and oil crops in order of importance, is estimated to be higher than last year's production due to increase in acreage and yields.

Areas which are severely affected by low production include Umm Kedada, Mallit, El Fasher, Malha, Kutum, and Dar Zaghawa localities in the east and northern parts of the State. Other localities in the far west and south-eastern and eastern parts are considered to be relatively better, but still below last year.

SMoA and other food security stakeholders have completed arrangements for conducting 2015 post-harvest assessment for the entire State.

Despite the short growing season, sustained rains during most of August generated good pastures and adequate drinking water in most parts of the State. As a consequence animal conditions are generally good and expected to remain so for several months in most of the State. However, there are reports that Dar Zaghawa pastures are severely affected by inadequate pastures due to lower rains.

According to the Ministry of Animal Resources, livestock health condition is generally good at this time and no reports of serious animal diseases. However, most of animals are concentrating in the

central areas of North Darfur due to security risks in accessing pastures in the far north or closer to Jebel Mara areas. High concentration of animals in the central areas is likely to lead to deterioration of their health as dry season progresses and available pastures are exhausted or over-grazed.

Millet prices in North Darfur markets have increased by 60% in November 2015 as compared to September prices. November prices for a sack of millet (100 kg) were 400 and 350 SDG in El Fasher and Saraf Omra, respectively

While it was 250 and 210 SDG in September for the same locations. Similar trend have been reported in other North Darfur markets. Sorghum prices have also increased similarly.

Current cereal prices in North Darfur are unusually high during this harvest time, which runs from Oct – Dec. This is mainly attributed to lower cereal supplies into the markets due to poor harvest of 2015 cropping season. Other reasons include restricted movement of grain supplies within/into the State due to insecurity and increased demand for cereals from traders in an anticipation of expansion of new strategic plans of WFP-sponsored food voucher program. The general price increase induced by lifting of fuel subsidies and illegal taxes on roads are also considered as contributing factors.

Cash crop prices vary according to seasonality, last year's harvest and other demand and supply factors. Groundnut prices are still low following last year's good harvest and lack of demand from traders outside Darfur due to quality issues. Tumbac (local tobacco) prices started to raise in an anticipation of reopening border trade with Southern Sudan.

Livestock prices varied according to animal type. Goat and sheep prices during November 2015 have decreased by an average of 20% as compared to October 2015 prices. Cattle prices in November decreased by 21% as compared October prices, while camel prices has decreased compared to previous month. Changes in camel prices are dependent on flow of exports to Egypt. The general expectation is that livestock prices will decrease as dry season progresses and livestock owners move further looking for water and pasture. In general, cereals prices are escalating while livestock prices are mostly in decline. These trends are expected to continue due to poor harvest and increase of livestock supply into markets. A request was made to increase the stock of cereals at State level. Access to micro-credit was reported to have declined sharply due to poor repayment of previous loans. Some farmers were reported to have adopted the firewood and logging trade as a coping mechanism and this will have a very bad effect on the environment in the Umm Kadada locality.

15. Central Darfur

Rains started (mid July – early August), continued below average and stopped in early October, with significant dry spells in September (three weeks) across most of the state. Effective rains for planting of most crops were on time (August) with abnormal distribution and less than the rainfall of last year and the 5 year average (2010 – 2014).

Rains ended earlier than normal in Mid-October when most of crops were at flowering stage, leading to lower yields in most of the highlands. Lowlands at the banks of main water sources are comparatively better. Sorghum and ground nuts are more adversely affected by the unfavourable growing conditions of 2015 cropping season as compared to millet.

Average rainfall ranged from 775.1 mm in Bendesi in the south west to 421.3.4 mm in Zalingei Locality. Overall, 2015 rains in Central Darfur were less than last year in all rainfall monitoring locations.

The distribution of rain fall was not good in terms of timing and location. Rain fell in June but preparations of farmers were not in time and the rainfall in October caused more damage to crops than benefit. Rainfall for 2014 and 2015 are compared below:

A total of 791.64 tons of various seeds were distributed this season in Central Darfur and this covered 40 percent of the needs of the State. Seed quality was criticized as not being up to standard.

Planting of cereal (millet and sorghum), groundnut, sesame and other summer crops was undertaken late (late July – early August), with no replanting. This was due to short time of rains received. Total planted areas to millet and sorghum are 132 000 and126 000 ha, respectively, but harvested areas are reduced to 79 000 ha and 75 000 ha, respectively. Production of millet and sorghum is estimated at 41 000 t and 29 000 t, respectively. This represents a 73 percent decline on last year's harvest outcome.

Accurate crop yields and production figures were not possible to calculate as the mission was not able to conduct field visits outside El Fasher town due to security risks, transport constraints and unavailability of escort.
Pasture availability and animal health condition are generally good at this time. However, there is a concern that pasture may not be adequate throughout the dry season due to the early cessation of rains. Water availability during dry season is confined along seasonal water courses where winter cropping takes place and this leads to problems between animal owners and farmers.

The number of livestock in Central Darfur is very large, totalling 8.5 million head and grazing pressure is very high as the state has to support migratory animals from neighboring states.
There are three main transhumance routes running across the State. However, due to tribal conflicts these routes are not adequately utilized. Some pastoralist groups can no longer use these routes due conflict with other rival groups.

As a result of tribal conflict the survival of livestock is in danger because of the difficulty of access to natural pastures. Herds are migrating from North Darfur to inside the borders of the state, as well as animal migration from Chad and the Central African Republic.The demarcation of some routes was done, but there was no commitment to use them from the farmers and pastoralists. In the Mukjar and Bendisi and Umm Dukhun localities, some pastures were burned for fear of concentration of the animals in these areas.

16. West Darfur State

The main food and cash crops cultivated in the state are millet/sorghum and groundnut/sesame respectively. Other important crops of economic importance are okra, tomato and watermelon. Rains started in late July and stopped earlier than usual in September with the peak rainfall recorded in August and there were dry spells recorded in September. The average amount of rainfall received all over the state was around 423.6 mm, which was less than last year.Two dry spells were experienced during the season; one in July for two weeks and another in September for another three weeks.

Contrary to the seasonal trend, more rains fell in the northern localities compared to the southern localities, attributed to the effect of climate change in the area. Jabel moon Locality in the north of the state recorded high rain fall (517.4 mm).
Sufficient seed was secured on time and distributed in June and July in most parts of the state. A total of 511.7 MT of millet, sorghum, groundnuts and sesame seed was obtained, equivalent to 80% of the total need.

More areas were targeted in the beginning of the season to plant with millet, sorghum, groundnut, sesame, cowpeas and watermelon. As the result of shorter rains, the actual areas planted and harvested were significantly lower than last year. Millet and sorghum were planted late in July. Groundnuts and sesame were late in August/July.

Crop pests such as birds (Quelea quelea), tree locust and grasshoppers were effectively controlled in time with no serious damage to the crops.

The main staple crops grown in the state are pearl millet and sorghum and the main cash crops are groundnuts and sesame. Production of millet is estimated at 114 000 tons and sorghum 56 000 tons. This compares with 170 000 tons of millet and 163 000 tons of sorghum in the previous year, a decrease of 51 percent.

The overall production of groundnut and sesame is lower compared to last year. However, the groundnut harvest was relatively better in the high producing localities of Beida and part of Kreinik and Geneina, estimated at 20% lower compared to last year.
Groundnut total production was 50 000 mt at an average productivity of 270kg per feddan. Sesame yield is estimated at 75kg per feddan.

The northern localities of Sirba, Kreinik, Seleia, and Jebel Moon recorded high produce of all crops grown in the area compared to poor production in the southern localities of Forbaranga and Habila.

Adequate supplies and services for the livestock were obtained, e.g., vaccines and training of CAHWs. The general condition of the livestock is good and free of diseases. Sufficient stocks of vaccines and medicines are available to respond to disease outbreak.

The pasture condition is good but of poor quality compared to last year. It is likely to deteriorate within the coming months leading to competition for the limited grazing areas and conflicts among the pastoralists. A number of hafirs are in need of maintenance and renovation as they only captured rainfall for animal watering for a shorter period of time.

With the limited pasture availability and drinking water, the seasonal movement of animals to the south has started earlier compared to last year leading to crop destruction. The northern localities of Kulbus, Kreinik and Sirba are mostly affected by the animal destruction to the standing crops.

Contrary to the seasonal trend at the harvest time, the prices of the staples (millet and sorghum) are lower in the case of millet than in the previous year, while sorghum prices are slightly higher. The prices of both staple crops are expected increase throughout 2016. The main cause of high prices is the poor harvest in North Darfur and Chad

The price of groundnut is relatively higher in Geneina market compared to last year. However, the prices of groundnut in the state, especially in the high production localities of Beida and Kreinik localities are lower by 40% to 50% compared to the same prices last year. The main reasons behind

the low prices are the low purchasing power of potential buyers and lack of oil processing enterprises in the state.

The prices of livestock are stable or decreasing compared to the previous months and to last year. This is attributed to cessation of exports, limited purchasing power due to inflation, rising cereal prices and competition over limited pasture and water. The price trend of livestock is downwards or remaining stable.

A state level Agricultural Season Protection Committee (ASPC) was formed comprised of the state government, UN agencies and NGOs to avail funding to the ASPCs at the localities level to address the conflicts arising among nomads and farmers. Jebel Moon and Kulbus are good examples of active ASPCs.

Chadian communities and refugees along the border rely on cereals grown in West Darfur state. Cereals are frequently smuggled outside the state resulting in further depletion of food stocks in the state.

17. South Darfur

Effective rainfall began late in mid-July, 2015. Rainfall amount was lower than the previous year and the distribution was not even. Effective dry spell were reported in July, August (2 -3weeks) and September (2weeks) or even longer in some localities and rainfall ended earlier than usual. There was no flooding during the season.

The high rainfall amount was reported in Jebel Marra (1787 mm); most other areas (200-600 mm); northern parts of the state (El Wuhda, Mirshing, Niteiga and partly Kass) received the lowest amount of rain (120-140).

Rainfall in Kass was 265 mm in 2015, 537 mm in 2014 and 613mm in 2013.

Land preparation for the summer crops started in March 2015, but due to the late onset of effective rains planting of all crops was late compared to last year. The total amount of seeds distributed during the season were 842 tons; however, the total amount required by the state was 35 375 tons. Compared to last year, the planted area decreased due to late start of rainfall and its erratic nature, the limited amount of distributed seeds, the high cost of agricultural inputs and tools AND limited access to credit. Most farming activities were done in the traditional way with hand tools and animal-drawn ploughs.

The main food and cash crops in South Darfur state include millet, sorghum, groundnuts and sesame. The other crops include krekede (Hibiscus), watermelon seeds, and cowpea. The harvest of all the crops is poor compared to previous year, for example the harvestable area in Kass is estimated by the office of Agriculture in Kass as 35% of the planted area. A poor harvest of millet and sorghum is expected in El Wuhda, Mirshing, Niteiga and Kass localities. Sesame and groundnuts are expected to have a poor harvest in Niteiga locality.

The expected production of Sorghum 108 000tons, a reducton 53 percent below the 2014 harvest. Millet production is estimated at 89 000 tons, a steep reduction from 139 200 tons produced last year.

The health of livestock is generally good and the vaccination programme is going on. Despite the limited number of equipped vehicles to reach the remote areas, the livestock is free of any epidemic disease. As well, the current livestock body condition and performance are good but both are expected to decrease during late summer when pasture runs short. Diseases of malnutrition are expected to appear then and some livestock are expected to die from lack of fodder.

Due the late onset and low amount of rainfall pasture is poor in both quantity and quality compared to last year. Some pasture areas are negatively affected by the spread of invasive poor quality plants, a result of overgrazing. Despite pasture amount is considered as good in some areas, but availability of drinking water remains a major limiting factor if livestock are to graze such areas.

The return movement of livestock occurred early this year. Nonetheless, overgrazing and overcrowding of livestock in some pastures is expected to happen. Pressure on pasture is expected on El Salam, Tulus, Dimso, Idd El Firsan, Kateela and Riheid El Birdi localities where water is available. Overcrowding and overgrazing are also expected in Bahr El Arab and the southern parts of the state. Some livestock are already grazing some pastures earlier than normal.

Prices of cereal and cash crops are stable since the last three months and the new harvest is already in the market. Prices are expected to escalate during late summer season.

The price of food aid wheat in Nyala market is considerably lower by approximate 36 percent compared to last September.

In Nyala, livestock prices are relatively stable or sometimes showing a slight increase, but as pastoralists continue to go far from the markets the price will increase. However, during late summer when the pasture runs short prices are expected to decrease.

The stable security situation encouraged IDPs to practice planting of cereal and cash crops.

No pests were reported other than Quelea quelea, local birds and grass hoppers. Quelea quelea was aerially controlled in 8 450 ha in four localities. All pests were controlled so their effect on crops was mild.

The SMOA reported some destruction of crops by livestock. Seeds distributed amounted to less than 1 percent of the demand and credit facilities were also limiting.

18. East Darfur

Rainfall in 2015 was less in quantity, distribution and duration than last year; however some localities, such as Daein locality received higher amounts of rainfall compared to 2014.

Effective rains started late June/ July all over the state compared to 2014 when the early showers of rain started in last week of May and June. Despite the rainy season continuing to October in 2015, the quantities received this year were exceptionally lower in most localities compared to last year.

The SMoA reported significant dry spells that affected the planted crops at different stages of growth; however the interviewed farmers stated that the dry spells were experienced in August (2-3 weeks), September (2 weeks) and in some areas the dry spells continued for longer periods through August and September. No floods were reported during the rainy season and the overall average rainfall in East Darfur (433.2 mm) was less than last year (524.4 mm).

Land preparation for the summer crops started as usual, but due to the late onset of effective rains, planting of all crops were started late in end of June and continued into July.
A total of 1 020 tonnes of crop seeds were distributed but the seed was reported to have reached the SMoA late and the quantity was less than 1% of the total amount of seeds required by the state for this year.

The overall picture of the total area under all summer crops is significantly decreased compared to last year due to the late start and erratic rainfall, late seed distribution and the high cost of inputs. The displacement of some households in Adeela and Abu Karinka localities has, also, contributed to the decrease in the planted area.

The shortage of labour and the high cost of labour led to increased cost of farming activities compared to last year. Both staple and cash crops (millet, sorghum, groundnuts and sesame) were planted late this season (late June/July) due to the late start of rains. The ministry also planned to grow winter crops especially vegetables and a considerable area is already planted.

As per the SMoA the total area planted by summer crops and the harvestable area in 2015 were both less than last year and 5-year average (2009/010 – 2014/015) estimates.

The main grown food and cash crops in East Darfur state in the current year include millet, sorghum, groundnuts, sesame, Krekede and Cow pea. Sorghum production is estimated at 58 000 tonnes and millet production was 23 000 tonnes. The five year average production for sorghum and millet is 27 000 tons and 32 000 tons, respectively.

The condition of livestock is generally good and the livestock is free of disease, but the condition and performance are expected to decrease in late summer. However, there are tick infestations in some areas of the state. Pasture availability and drinking water for animals are both poor compared to last year. Also, pasture quality is affected by spread of some invasive poor quality grasses, a result of overgrazing. In the northern parts of the state (Shaeiria, Yaseen, Adeela and Abu Karinka localities), pasture is good however, availability of drinking water is the limiting factor for livestock to graze these areas.

This year, southwards mobility of livestock occurred 2-3 weeks earlier than normal, an indicator of pasture and fodder scarcity. There was pressure on some pasture areas during the rainy season hence the SMLR collected pasture seeds to be distributed during the coming rainy season.
Because of the limited opening of fire-lines (75 Km), fire may break out on pasture. Due to the conflict in South Sudan, the movement of livestock to South Sudan may not be easy.

Due to the expected low harvest, market prices of both staple and cash crops showed no decline since last September and the current prices are higher than last year during the harvest. Prices of staple foods are expected to increase during late summer.
Livestock prices are generally stable or showed a slightly decrease, but prices are expected to decrease further during late summer in line with the expected increase in prices agricultural by-products, fodder and stable food crops especially cereals. However, as pastoralists spend the summer season far away from Daein, prices of livestock and meat in Daein market are not expected to decrease.