Food and Agriculture Organization
of the United Nations

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

FAO CROP AND FOOD SUPPLY ASSESSMENT MISSION TO THE SUDAN

14 March 2019

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Mario Zappacosta
Senior Economist, EST-GIEWS
Trade and Markets Division, FAO
E-mail:*giews1@fao.org*

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Acronyms and abbreviations

ABS	Agricultural Bank of Sudan
ASI	Agricultural Stress Index
CBS	Central Bureau of Statistics
CBOS	Central Bank of Sudan
EBA	Everything But Arms
FAO	Food and Agriculture Organization of the United Nations
FSTS	Food Security Technical Secretariat
GDP	Gross Domestic Product
GIEWS	Global Information and Early Warning System on Food and Agriculture
GMO	Genetically Modified Organism
HAC	Humanitarian Aid Commission
ha	hectares
IDPs	Internally displaced persons
ILO	International Labour Organization
LTA	Long-Term Average
mm	millimetres
MoAF	Ministry of Agriculture and Forestry
MoAR	Ministry of Animal Resources
NGOs	Non-Governmental Organizations
SDG	Sudanese Pound
SRC	Strategic Reserve Corporation
t	tonnes
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
USAID	United States Agency for International Development
USD	United States Dollar
WFP	World Food Programme

Mission Highlights

- National cereal production in 2018 is estimated at a well above-average level of 8.2 million tonnes, an increase of 58 percent from last year, mostly reflecting an expansion in the area planted.
- Sorghum production rebounded in 2018 to an above-average level of 4.9 million tonnes and millet production was estimated at a record high of 2.6 million tonnes.
- The large increase in millet production reflects higher yields following favourable weather conditions and an expansion in plantings, due to security improvements and the return of Internally Displaced People (IDPs) in Darfur Region.
- The significantly higher cereal production in 2018 resulted in above-average domestic supplies, estimated to exceed national utilization requirements. Consequently, the country is expected to build up substantial stocks and a small increase in exports is also foreseen.
- Wheat import requirements are forecast at below-average levels, stemming from favourable domestic production prospects of crops to be harvested in March 2019.
- Production of cotton and sesame is estimated to have increased in 2018 to an above-average level, on account of enlarged plantings prompted by higher year-on-year market prices.
- Constraints on the availability of, and accessibility to, inputs such as machinery, seeds and fertilizers, were reported as a result of high and increasing inflation.
- Reduced liquidity caused delay in harvesting, as labour payments were hindered, and is preventing farmers from selling harvested crops to markets, sustaining high prices.
- Fuel shortages reduced the application of herbicides, pesticides and fertilizers and delayed harvesting operations, particularly in irrigated and semi-mechanized areas.
- Incidences of crop pests and diseases were minimal due to effective preventive measures. The widespread growth of weeds was triggered by the abundant rainfall, coupled with limited control measures.
- Favourable rains and improved security situations increased the availability of, and access to, pastures and water for livestock.
- Despite a generalized shortage of vaccines, livestock were in good condition and no major disease outbreaks were reported.
- Cereal prices surged in 2018 and were, as of January 2019, between 100 and 250 percent higher year-on-year, driven by a sharp depreciation of the currency (Sudanese Pound).

OVERVIEW

Between 26 November and 14 December 2018, 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 the crop production and the food supply situation throughout the 18 states of the country. The Mission consisted of six core teams comprising members from the MoAF, the Food Security Technical Secretariat (FSTS) of the MoAF, the Ministry of Animal Resources (MoAR), the Humanitarian Aid Commission (HAC), the Strategic Reserve Corporation (SRC), FAO, FEWS NET, WFP and USAID.

The teams' visits were designed to collect data and information from State ministries, irrigation schemes, enterprises and to audit such data and information through observational transects, field observations, farmer interviews and independent key informant interviews. The combined quantitative and qualitative information, from both primary and secondary sources, allowed the teams to assess the 2018/19 season's cereal (sorghum and millet) and other field crop production and to forecast wheat production to be harvested by March 2019. Returning from the field, the 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, rainfed mechanized and rainfed traditional) to give the overall area and production estimates. Using these data, a national cereal balance sheet was drawn up comparing the total cereal requirement for the coming marketing year (January-December) with the 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 the full cooperation of the relevant State authorities. Discussions on the factors affecting crop and livestock conditions were held with the 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 subject matter specialists from State ministries and irrigation schemes, who also provided the latest information on all aspects of the production within their domains, including the provision of follow-up data, where required. Where possible, the 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. If compared to previous years, the civil insecurity has generally improved and was less of a constraint to field observation and farmer interviews.

At the 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 the main crops and livestock. Periodic food security reports were perused and the 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 obtained from the Sudan Meteorological Authority and from other sources in the field. Satellite imagery was used to review the evolution of vegetation cover over the course of the year.

The overall performance of the 2018/19 summer cropping season was better than last year and above the five-year average. The 2018 cumulative main season rainfall between June and August 2018 was above average across the country characterized by an early onset and good distribution of rains. However, in some regions, intense precipitations in July-August caused localized flooding, water logging and some damage to crops and infrastructures.

The incidence of crop pests and diseases was very low, with satisfactory aerial and ground preventive measures against the migratory pests such as locusts, grasshoppers, but with some minor damages by *Quelea quelea* and other birds. However, widespread growth of weeds was triggered by the abundant rainfall, coupled with limited control measures.

Reduced liquidity was reported by interviewers as one of the main problems that adversely affected agricultural operations during this agricultural season, due to delays in payments to labourers and input suppliers. After the completion of the harvest, farmers were reluctant to sell all of their harvested crops, on account of the liquidity shortages. Although farmers opted to sell the output and receive a cheque, banks were not able to cash the cheque due to limited liquidity. As a result, this also contributed to maintain the prices high, as markets are not sufficiently supplied.

Some constraints on the availability and accessibility of inputs, such as machinery, seeds and fertilizers, were reported, as a result of high and increasing inflation. Also, fuel shortages reduced the application of herbicides, pesticides and fertilizers and delayed harvesting operations, particularly in irrigated and semi-mechanized areas. Some farmers had to resort to the parallel market to purchase the needed fuel which, in turn, increased production costs.

The production of sorghum and millet in 2018/19 is estimated at 4.9 and 2.6 million tonnes, respectively, above the levels of last year and the five-year average. Wheat production, to be harvested in March 2019, is forecast at an above-average level of about 595 000 tonnes. The more-than-tripled millet production is associated with the significant expansion in area planted in Darfur Region following the improved security situation, favourable rainfall and high numbers of returnees.

Favourable rains and improved security situations increased the availability of and access to pastures and water for livestock. Animals were in good condition and no major disease outbreaks were observed during the field visits although the availability of vaccines was reported to be lower than in 2017.

Using the population projections for mid-2019 by the Central Bureau of Statistics to estimate the food use during the marketing year January-December 2019, the cereal balance sheet provided in this report shows that the 2018/19 sorghum and millet production is well above the country's utilization needs and it allows a substantial building up of stocks, leaving a significant surplus for export as well as to be, in part, retained as strategic reserve in the country. The structural deficit between production and consumption for wheat and rice is expected to be covered by the normal levels of commercial imports.

The prices of locally-produced sorghum and millet in most markets have been characterized by an upsurge during the last 12 months, essentially due to the high costs of production and transportation, depreciation of the local currency and increasing inflation. In November 2018, prices of sorghum and millet were from 100 to 250 percent higher than their levels of one year before.

SOCIO-ECONOMIC CONTEXT

General

The country has been facing macro-economic challenges since the secession of South Sudan in 2011, which took with it three-quarters of the oil output and, therefore, two-thirds of foreign exchange earnings. In an effort to boost non-oil tax revenue, the Government has fostered the mining sector development and promoted agricultural exports since 2011. Economic conditions were exacerbated since late 2017 by the devaluation of the local currency that followed an upsurge in demand for imports and consequently for US dollars. As a result, higher import prices put upward pressures on inflation and production costs and contributed to fuel and supply shortages. The economic uncertainty has deterred consumption and foreign investment with a significant negative effect on economic growth.

The Ministry of Finance and Economic Planning estimates the country's GDP in 2018 at about SDG 855 billion, to which the agricultural sector contributed about 28 percent, the industrial and the services sector, 20 and 52 percent, respectively. In real terms, the GDP is expected to grow by 4 percent in 2018 compared to 4.5 percent in 2017, according to the Ministry.

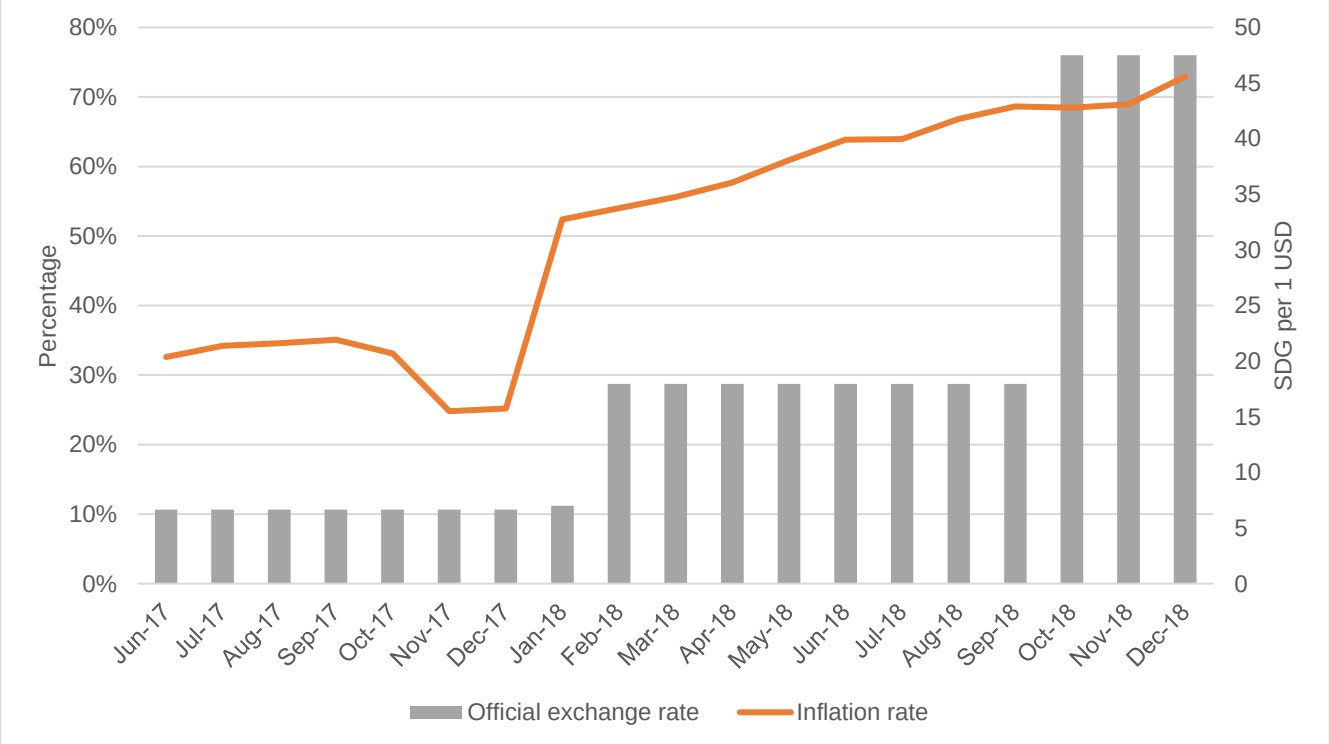
During the third quarter of 2018, the trade balance recorded a deficit of about USD 2.8 billion, about 56 percent of last year's deficit. Compared to the same period in 2017, exports of crude oil increased by 42 percent, in value terms, due to higher year-on-year prices. With regard to agricultural commodities, exports of cotton, gum arabic and groundnuts slightly declined in value terms compared to the first nine months of 2017. Exports of sorghum contracted by about 70 percent despite a good harvest in 2018, mainly due to high domestic prices that instigated domestic selling. By contrast, during the same period, exports of sesame and melon seeds increased significantly by 48 and 109 percent in value terms, respectively. The international demand for Sudanese sesame seeds was particularly sustained in 2018, mainly driven by the low production obtained in India, one of the main world producer. Imports of wheat grain and sugar increased in the first three quarters of 2018 by 20 and 71 percent, respectively, compared to the same period one year earlier as a consequence of the increasing local demand.

Following the lifting of international sanctions in October 2017, importers' demand for US dollars increased in the parallel market, spiralling the gap between the official and the parallel exchange rates. In an effort to narrow this gap, the Government devaluated the Sudanese Pound (SDG) against the US dollar twice in 2018: in January from SDG 7 to SDG 18 per USD and in October to SDG 47.5 per USD. Despite the official devaluation, the exchange rate in the parallel market weakened to SDG 70 per USD in early December. The weakening of the Sudanese Pound consequently reduced the ability to import and put upward pressures on prices and inflation.

According to the Central Bureau of Statistics, high and increasing inflation has been recorded in 2018, reaching 72.94 percent in December, compared to 25.2 percent in the corresponding month a year earlier (Figure 1). Food and beverage and transportation sectors contributed most to the upward trend of inflation by 60 and 10 percent, respectively, reflecting higher prices of inputs such as fuel and imported goods. High inflationary pressures have contributed to diminishing the purchasing power, resulting in lower access to agricultural inputs as well as to food.

Liquidity shortages were one of the main constraints in economic activity, including agricultural operations in 2018. Escalating inflation has risen demand for cash and the Central Bank of Sudan (CBOS)'s daily withdrawal limit, in an effort to address this issue, instigated the public to keep money out of the banking system, exacerbating the lack of liquidity. Also, limited hard currency in the country (persistent since the secession of South Sudan in 2011), coupled with the weakening of the Sudanese Pound, instigated people to resort to the parallel market and also lowered the ability to pay for imported goods, disrupting the fuel and supply provision and decreasing the availability of agricultural inputs. Due to the lack of cash, payment to labourers was problematic during the harvesting period, delaying harvesting operations in some cases. NGOs also reported difficulties to pay their suppliers (of seed and fertilizers) and thus properly implement agricultural projects. If payment is not made within the due time, suppliers had to resort to increase prices following the soaring inflation.

Figure 1: The Sudan - Inflation rate (percent) and official exchange rate (SDG for USD 1)



Source: Central Bureau of Statistics (for inflation rate) and Central Bank of Sudan (for exchange rate).

In 2018, the Government of the Sudan performed a series of reforms in an attempt to curb the high inflation and to stabilize the exchange rate. In October 2018, the Government announced a 15-month emergency reform plan, which includes austerity measures such as slashing tax exemptions except for materials needed for production and limiting Government expenses. In the 2019 budget, the Government envisages economic growth of 5.1 percent by reducing inflation to 27 percent from the current 73 percent and increasing exports by one-third. Further, the Government ruled out tax increases or the removal of subsidies on items including wheat and cooking gas in order to curb the increase in prices and the consequent public discontent. The Government had decided to

remove the wheat import subsidies in January 2018, which resulted in a sharp increase in prices of wheat and other cereals as its substitutes.

The country has an agreement with South Sudan under which the country receives transit fees between USD 9 and USD 11 per barrel in exchange for the South Sudanese oil to be exported via the Sudan. In January 2019, the Government of the Sudan informed that the country received USD 24 million in transit fees and the resumption of other oil fields is expected in the near future, hoping that oil revenues would contribute to stability in both countries.

Population

The last Population and Housing Census was carried out in 2008 and, since then, the Central Bureau of Statistics (CBS) extrapolates the country's population size using specific growth rates at State level. By mid-2019, the total population in the country is officially estimated at 44.3 million. The most populated states are Khartoum (17 percent of the total population), Gezira (11 percent) and South Darfur (9 percent). With the armed confrontation in Darfur subsiding, there has been a steady trend of IDP returns over the past years. This figure includes the UNHCR's estimated number of refugees and asylum-seekers residing in the country at about 921 000, among which 762 000 are from South Sudan, as of August 2018.

Agriculture

The economy of the Sudan is highly dependent on agriculture, which occupies an estimated 53 percent of its labour force (ILO estimates of 2018) and accounts for about 30 percent of its GDP. Its crop portfolio is quite diversified, including cereals (such as sorghum, millet, wheat, rice and maize), oilseeds (mainly sesame, groundnuts and sunflowers), industrial crops (cotton and sugarcane), fodder crops (alfalfa, fodder sorghum and Rhodes grass), pulses (broad beans and pigeon peas) and horticultural crops (okra, onions, tomatoes, citrus, mango, etc.).

Moreover, land in the Sudan is suitable for animal husbandry, with an estimated total livestock population in 2018 of 109 million heads of cattle, sheep, goats, camels and others.

Crop production in the Sudan is practiced under three main patterns:

1. Irrigated agriculture, which includes:
    - Large national irrigation schemes (Gezira, Suki, New Halfa and Rahad) using river flow from the Nile and its tributaries.
    - Large spate irrigation schemes (Gash and Tokar) using seasonal floods.
    - Small scale irrigation along the banks of the Nile and its tributaries.
2. Semi-mechanized rainfed agriculture.
3. Traditional rainfed agriculture.

Crop production in the rainfed sectors exhibits very wide annual fluctuations as a result of unreliable rainfall amounts and distribution, which can result in late sowing, long dry spells, flooding from intense downpours, the necessity to re-sow and, not uncommonly, complete crop failure. The situation in the irrigated sector, however, is much more predictable. Nevertheless, viewed globally, yields are generally low in all sectors for various reasons as well as rainfall. These include, *inter alia*, a shortage of efficient, well-maintained farm machinery, a shortage of credit and working capital, the use of low yielding crop varieties with scarce availability of improved seeds, inadequate maintenance of irrigation canals, inefficient irrigation pumps and poor agricultural practices such as weed and pest control.

Regarding commercial crops, the country is the third major producer of sugarcane in Africa, after Egypt and South Africa, with a total planted area of around 82 000 hectares. The country has also become a very significant importer of sugar, especially from India and Thailand. Unlike India and Thailand and other major sugar producers such as Brazil, the Sudan is allowed, as part of the Everything But Arms (EBA) agreement, to export unlimited amounts of its own sugar production to the European Union without paying taxes. The EBA is a component of the European Union's Generalized Scheme of Preferences devised to assist the economies of the Least Developed Countries. The difference between the Sudan's annual domestic sugar requirement and the sum of its production and imports allows the country to export substantial amounts.

Until the 1980s, the Sudan was a major cotton producer, frequently exporting more than 1 million bales (227 kg) per year. Cotton production has declined dramatically since then as a consequence of a greatly reduced area and fewer than 100 000 bales exported in 2014. However, in 2016 and 2017, high international prices and very productive GMO varieties, provided a new impetus to the sector that is now facing a renewed growth. Table 1 shows the amounts and values of the Sudan's main crop exports for the first nine months of 2018 compared to the same period and to the entire year in 2017.

Table 1: The Sudan - Exports of crop products, 2017 and 2018

Crop/product	2017		2017[1/]		2018[1/]	
	Weight (tonnes)	Value ('000 USD)	Weight (tonnes)	Value ('000 USD)	Weight (tonnes)	Value ('000 USD)
Sesame seeds	550 496	412 715	332 162	249 855	396 239	370 692
Groundnuts	106 133	80 421	73 564	56 878	59 620	43 532
Gum Arabic	80 005	114 700	56 661	83 654	55 939	81 543
Cotton (lint)	107 682	139 054	88 775	112 295	77 892	111 859
Sorghum	567 319	103 225	393 553	72 631	118 979	23 159
Hibiscus sepals (karkadé)	9 384	10 651	7 252	8 126	9 626	11 993
Watermelon seeds	48 477	32 835	34 897	23 513	74 149	49 355

Source: Central Bank of Sudan.
1/ 1 January-30 September.

Irrigated agriculture

The area under irrigation in the Sudan is estimated at about 1.68 million hectares (4 million feddans). Of this, large scale mechanized federal schemes account for about 1.26 million hectares (3 million feddans), including the Gezira Scheme which, at approximately 1 million hectares (2.38 million feddans), is one of the largest irrigation schemes in the world. Because of its more reliable yield expectations, the irrigated sector is the principal user of the country's imported agricultural inputs. Nonetheless, crop yields in the federal irrigated schemes remain low by world standards, largely owing to the poor maintenance and silting up of canals, a shortage of efficient modern pumps and poor agricultural practices.

Irrigation is mainly from the River Nile and its tributaries by means of gravity or pumps, or from spate flow from the seasonal rivers at Gash and Tokar deltas. The principal crops of the irrigated sector include sugarcane, cotton, sorghum, groundnuts, wheat, vegetables, fruits and green fodders. According to the season, the sector takes advantage of the rains, especially during the establishment of summer crops. For example, rain is estimated to provide about 40 percent of the water requirements of crops on the Suki Irrigation Scheme. Rain is especially important for reducing the production costs on privately-owned irrigated smallholdings along the banks of the Nile and its tributaries that depend on diesel-powered pumps.

In recent years, several large private enterprises have emerged, producing fodder crops such as alfalfa and Rhodes grass for export, mainly to the Gulf countries. These enterprises are usually highly mechanized, use efficient irrigation systems such as centre pivots and other forms of sprinkler irrigation and generally achieve high yields of good quality fodder.

Semi-mechanized rainfed agriculture

Semi-mechanized rainfed agriculture is so called because mechanization is usually limited to land preparation and seeding. Other field operations, including harvesting, are usually carried out manually, although combined harvesting is becoming less rare. Semi-mechanized rainfed agriculture is practiced in a broad belt of 6.7 million hectares and receives, on average, more than 500 mm of rainfall annually. It runs through Kassala, Gadarif, Blue Nile, Sennar, White Nile and South Kordofan states. This belt is effectively the granary of the country, with sorghum accounting for about 80 percent of the cultivated land and usually producing about 45 percent of the country's requirements. Other crops include sesame, sunflowers, millet and cotton.

Farms in the semi-mechanized sector are frequently very large with some covering 50 000 hectares or more. Given the unpredictable nature of the rainfall and, therefore, the possibility that yields will be very low or even that there may be a complete crop failure, the system may be described as opportunistic. Operations are, therefore, carried out as economically as possible. Standard crop varieties are sown using wide disc seeders with up to 30 discs and no fertilizer is applied. If the rains are favourable, yields of up to 1 tonne/hectare can be achieved, otherwise crops may be sold off as a standing crop to pastoralists for grazing.

Traditional rainfed agriculture

The traditional rainfed sector covers about 9 million hectares and occupies the largest number of farmers. The sector is made up of small family units farming from 2 to 50 hectares for both income and subsistence. On the larger units, there may be a modicum of mechanization in the form of land preparation, but most operations are carried out manually. The traditional sector predominates in the west of the country, in Darfur and in much of Kordofan State, where the main cereal crops are millet and sorghum. Input levels are low and yields are especially vulnerable to unfavourable rainfall. Other important crops in this sector include groundnuts, sesame, hibiscus (karkadé), watermelon and gum arabic.

Livestock

Livestock is raised in almost all parts of the Sudan and is owned primarily by nomadic tribes. In 2018, the livestock population was estimated to comprise about 31 million cattle, 40 million sheep, 31 million goats and 4.8 million camels (Table 2). Because the pastoral livestock system is very well adapted to the Sudan's climate, it shows a relatively higher economic potential than any other form of livestock production. Pastoralists in the Sudan use natural resources more intensively than any other system of animal farming, moving herds around the country in response to weather conditions and resulting available forage. The major problem facing pastoralism today is the loss of rangeland to mechanized dryland and irrigated farming. The tradition of farmers' allowing herds to graze crop residues, because the animals simultaneously fertilize the land, is in decline, as farmers increasingly sell their residues for cash. Clashes between pastoralists and farmers are now more common than ever before, especially in years of poor rainfall.

Table 2: The Sudan - Estimates of livestock population, 2018

Livestock	Quantity ('000 heads)
Cattle	31 223
Sheep	40 846
Goats	31 837
Camels	4 872
Total	**108 778**

Source: Ministry of Animal Wealth, Pasture and Fisheries.

Livestock accounts for about 61 percent of the Sudan's agricultural GDP. Exports of sheep, mainly to Saudi Arabia, are reported at about 1.3 million heads in the first nine months of 2018. In the same period, about 178 000 goats and 142 000 camels were exported, the latter mainly to Egypt. Compared with live animal exports, meat exports were relatively modest at 12 113 tonnes for a total value of about USD 50 million (Table 3). The country exports also considerable quantities of animal hides. In the first nine months of 2018, a total of 6 410 tonnes of fresh hides were exported with a value of about USD 12 million.

Table 3: The Sudan - Exports of live animals and hides and skins, 2017 and 2018

Livestock	January-September 2017		January-September 2018	
	Quantity (heads)	Value ('000 USD)	Quantity (heads)	Value ('000 USD)
Sheep	2 928 133	366 213	1 288 930	337 258
Goats	245 350	16 439	178 237	13 151
Camels	188 382	223 806	141 902	156 707
Hides and skins (tonnes)	9 923	18 257	6 410	12 349

Source: Ministry of Finance.

AGRICULTURAL PRODUCTION IN 2018/19

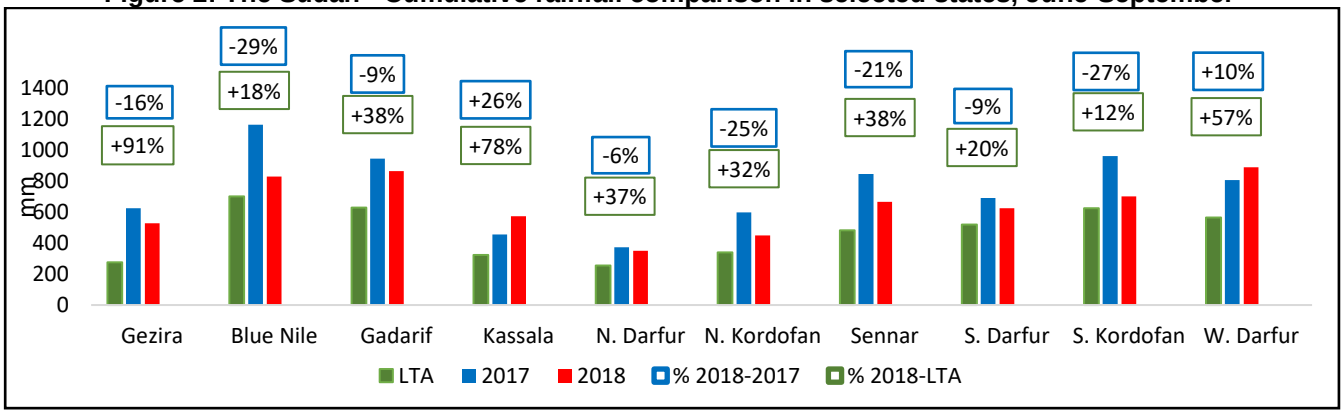
Main factors affecting cereal production in 2018/19

Rainfall

Abundant and well-distributed seasonal rainfall is the most important driver of national food crop production as the rainfed sector accounts for about 90 percent of the area under cultivation in the Sudan. Precipitations represent a key element in the irrigated sector as well, supplementing irrigation water and supporting crop establishment and development.

In most cropping areas, cumulative June-September rainfall amounts were between 50 and 100 percent above the Long-Term Average (LTA). Compared to the 2017 season, rainfall volumes were about 25 percent higher in Kassala, similar in Gadarif, West and North Darfur, while they were 15-25 percent lower in other states. Overall, rains in 2018 had a better spatial and temporal distribution.

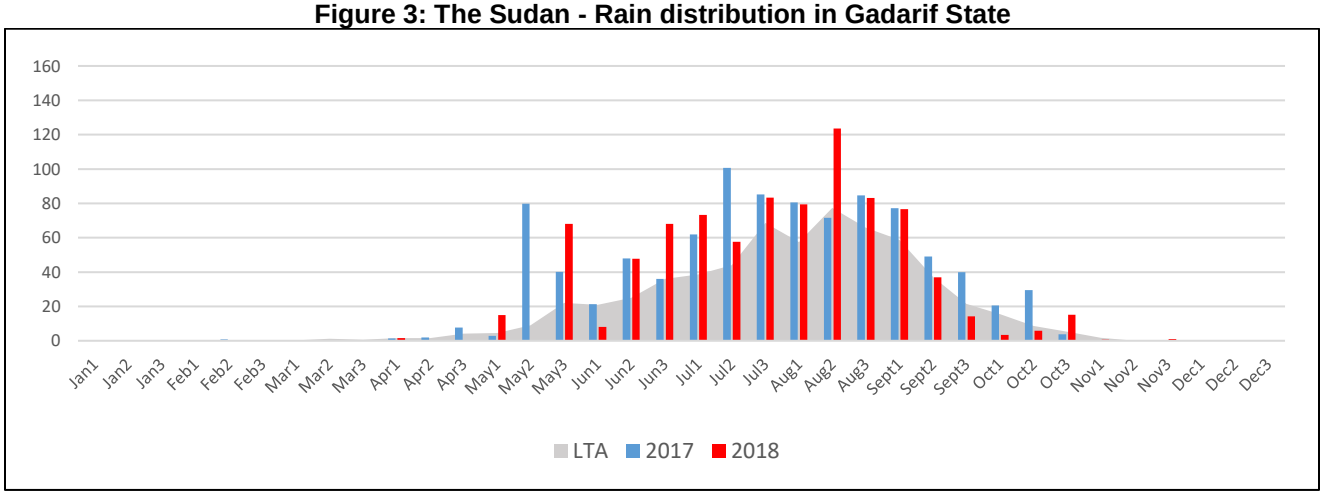
Figure 2: The Sudan - Cumulative rainfall comparison in selected states, June-September



Source: FAO/GIEWS.

The rainy season was characterized by an early onset, in mid-May, over some of the most important cropping areas of Blue Nile, Gezira, Kordofan, South, East Darfur (Figure 2) and Gadarif (Figure 3).

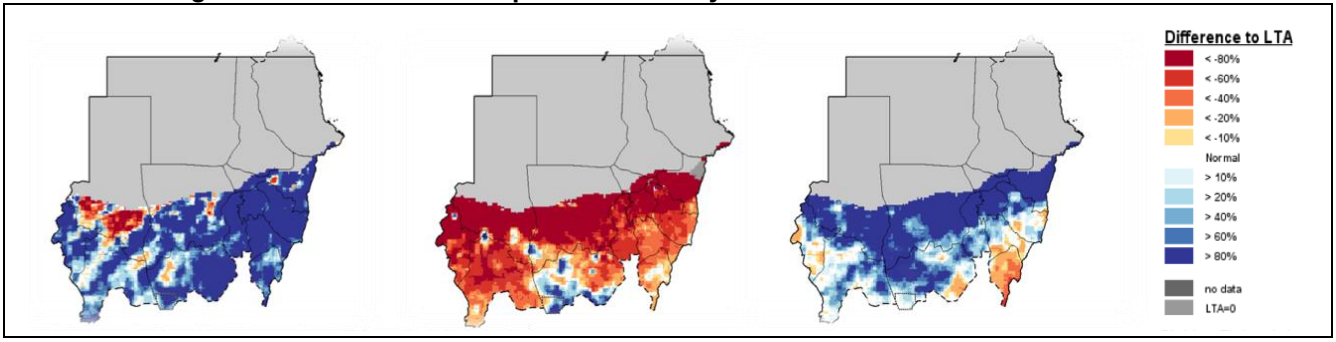
Figure 3: The Sudan - Rain distribution in Gadarif State



Source: FAO/GIEWS.

In the rest of the country, below-average rains in the first dekad of June (Figure 4 centre) were followed by well above-average rains for the remainder of the cropping season until September and October.

Figure 4: The Sudan - Precipitation anomaly: Relative difference to LTA dekads



Source: FAO/GIEWS.

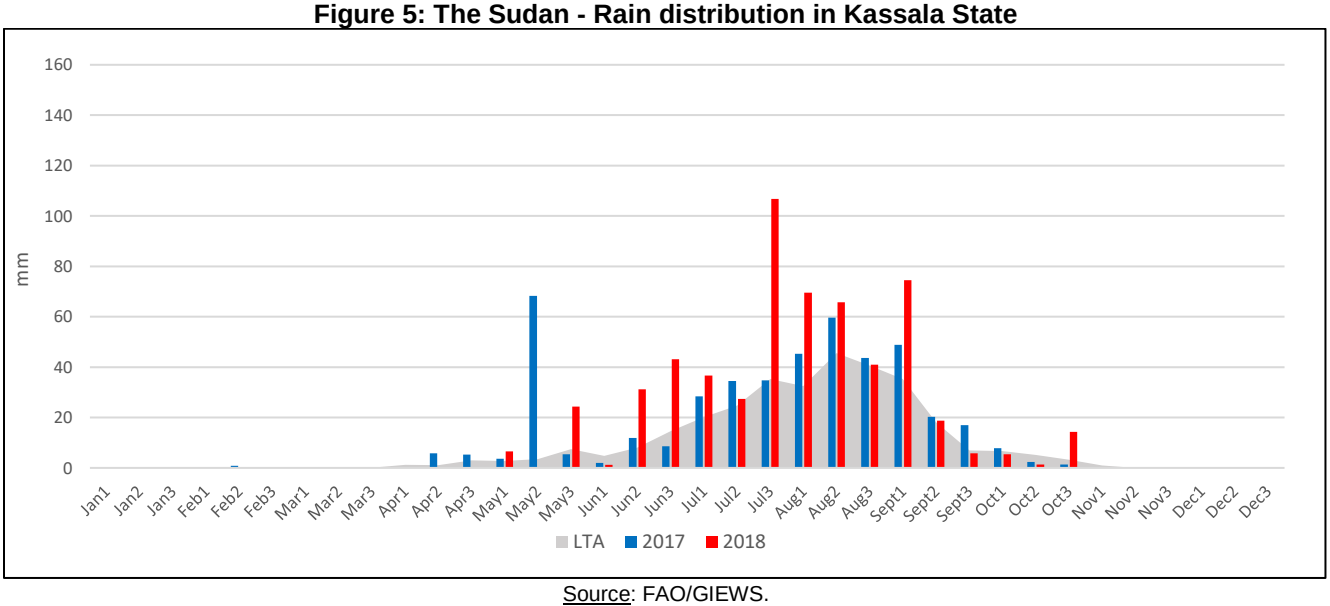
Disclaimer: The boundaries and names shown and the designations used on these maps do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dashed lines on the maps represent approximate border lines for which there may not yet be full agreement. Final boundary between the Republic of the Sudan and the Republic of South Sudan has not yet been determined.

A few localized dry spells were reported in South Darfur, North Darfur and in Gadarif, but with more serious implications in some areas of White Nile and West Kordofan were 30 rainless days across July and August forced farmers to replace their failed sorghum and millet with short cycle crops such as watermelon and sesame.

Rains were exceptionally intense between mid-July and mid-August (Figure 4 right). In Blue Nile, Kassala (Figure 5) and Gezira, remote sensing data and analysis indicate that about 100 mm of rains were received in the third dekad of July alone, representing about 20 percent of the total seasonal precipitation amount.

The torrential mid-season rains triggered floods in 14 of the country's 18 states, causing loss of life and damage to key infrastructures. Problems to crops occurred in localized areas of West Kordofan, Kassala and Darfur states where some crops were washed away and replanting was needed.

Figure 5: The Sudan - Rain distribution in Kassala State



Source: FAO/GIEWS.

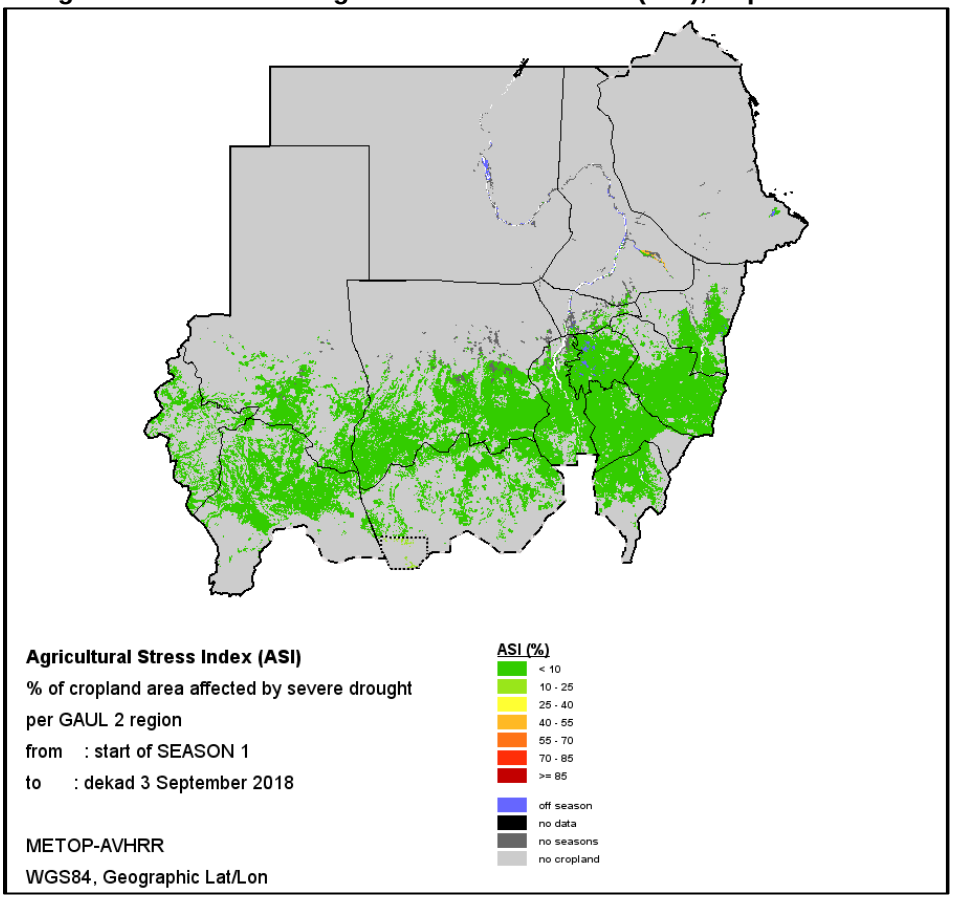
In the southern part of Gadarif, about 30 percent of the cropped area was affected by floods, while in Rahad Scheme water logging involved about 16 percent of the total area. In Blue Nile, coupled with overflowing seasonal rivers and poor drainage capacity of soils, heavy rains resulted in prolonged water logging and severe yield losses. In Sennar, the torrential rains of August, following a late start of seasonal rainfall and the rather poor precipitations of July, caused yield losses to flood-sensitive crops like cotton and sesame.

The seasonal rains, despite having hindered agricultural operations in some areas and having resulted in localized flood-induced losses, were largely beneficial for most of 2018 summer crops and for the development of good

pastures and water points for livestock. According to the FAO's Agricultural Stress Index System, in September, vegetation conditions were very good across all cropping areas (Figure 6). In Darfur Region, the early onset and the balanced distribution of rains, together with an improved security situation and the gradual return of IDPs, encouraged many farmers to plant crops and favoured high yields and production.

In the areas where crops were badly damaged by flooding following the August rains, some farmers, thanks to the late cessation of precipitations, were able to partly restore production using short cycle crops.

Figure 6: The Sudan - Agricultural Stress Index (ASI), September 2018



Source: FAO/GIEWS.

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Despite a long-standing inadequacy of infrastructures, the performance of the irrigated sector in 2018 was better than in 2017 mainly on account of the timely and well-distributed rains. During the current season, canal cleaning was disrupted and delayed in New Halfa and Gash schemes owing to fuel shortages, while in some areas of Sennar Irrigated Scheme, desilting operations were reported to interfere with the irrigation process. In Rahad Scheme, most of the irrigation pumps decayed and some of them were not properly functioning. Also, the drainage system was poor, causing water logging and damage to crops. In Gezira, Rahad and New Halfa schemes, the heavy rains in August triggered floods and water logging with yield losses for cotton and sorghum. In Gash Scheme, some canals and terraces were destroyed due to the very high water flow from the river.

Agricultural finance and credit

The provision of short-term agricultural credit through the Agricultural Bank of Sudan (ABS) is a regular operation procedure in both the irrigated and the rainfed sectors, but most particularly in the entrepreneurial semi-

mechanized rainfed sector. Loans for cereal production are usually accessed by entrepreneurs who have strong business connections with the ABS and other banks, while most farmers in the traditional sector are either unable to raise the collateral required to obtain a loan or are not prepared to take one. Farmers with poor repayment histories, those without sufficient collateral and loan defaulters from the previous year are excluded by the banks. In addition, most commercial banks prefer to finance harvest operations, especially for sesame, while few banks offer finance for land preparation and planting operations, thus constraining an increase in plantings. This year some farmers lamented delays in the outflow of funds with subsequent delays in agricultural operations.

Micro-credit is generally available for small traditional farmers through livelihood support programmes, particularly in Darfur Region. In other states, short term seasonal loans to eligible farmers are made through the interest-free *salam* system. Under *salam*, bank charges are levied in kind, at a value fixed jointly at planting time by the Ministry of Finance, the SRC, the ABS and Farmers' associations. However, this year the *salam* fixed price was considered discouraging by farmers due to increasing market prices. In Gadarif, the total number of beneficiaries was about 6 600, compared to 14 500 in 2017. At the time of the harvest, prices of cereals on the market were up to three times higher than the *salam* fixed price. In Suki and Gezira schemes, cotton growers were provided with all the agricultural inputs by private contracting companies with a pre-set selling price for the final production.

The total sum of agricultural finance provided to the agricultural sector in the 14 states visited at the time of the assessment amounted to SDG 3 143 million, 36 percent more compared to 2017 (Table 4). The number of beneficiaries was about 37 000, which is around the same level of 2018. The area financed exceeds 2.7 million hectares of which 92 percent in the semi-mechanized rainfed sector and just 2 percent in both the irrigated and the traditional rainfed sectors (Table 5).

Table 4: The Sudan - Finance to agriculture by the ABS and number of beneficiaries, 2017 and 2018

State/Scheme	2017		2018	
	Total (million SDG)	Beneficiaries	Total (million SDG)	Beneficiaries
Eastern regions	1 021	18 032	1 681	6 668
Sennar and Blue Nile	499	3 773	645	3 756
White Nile	154	963	173	950
North Kordofan	46	2 314	41	11 447
South Kordofan	96	2 393	66	1 214
Gezira	266	10 277	367	12 322
Darfur	22	268	2	405
Northern	27	143	0.4	
River Nile	20	166	4	n.a.
Khartoum	3	9	0.4	n.a.
Main Branch	164	14	162	25
Red Sea	-	-	-	-
Total	**2 316**	**38 352**	**3 143**	**36 787**

Source: CFSAM.

Table 5: The Sudan - Area financed for summer cropping, 2016, 2017 and 2018

	Area ('000 hectares)			Area financed in 2018 (percent)
	2016	2017	2018	
Semi-mechanized rainfed sector	1 970	2 478	2 524	92
Traditional rainfed sector	62	56	55	2
Irrigated sector	91	76	229	8
Cotton	n.a.	37	62	2
Horticulture	12	10	26	1
Other	508	172	71	3
Total	**2 642**	**2 829**	**2 753**	**100**

Source: CFSAM.

Agricultural inputs

Fuel, seeds, fertilizers, herbicides, labour and agricultural machinery are the major inputs required by farmers. The findings of the Mission indicate that, with the exception of contracted cotton growers, which were provided with all necessary inputs, the supply of most agricultural inputs was generally lower compared to the previous year due to higher prices resulting in a constrained access to inputs.

Despite the Government's efforts to meet the needs of the agricultural sector, fuel shortages were reported in several areas of the country. The shortages were exacerbated in many key regions, due to an increase in fuel requirements for land preparation and planting, as farmers increased their planted area, following good early rains. Overall, at national level, just about half of the fuel required for land preparation and planting was received by farmers.

Farm operations were affected, particularly in Gadarif State, a key crop-producing area, where 64 percent of the required amount of fuel was distributed to the farmers. In South Kordofan, about 59 percent of the fuel needs were met and the late provision of fuel resulted in planting delays, which forced farmers to plant lower yielding short-cycle varieties of sorghum.

Similarly, in Kassala State, the fuel received did not exceed 60 percent of the requirements and, in some areas, planting needed to be carried out using traditional manual techniques. Severe shortages were also reported in Blue Nile and White Nile states, where the fuel supplied for land preparation and planting did not exceed 37 and 39 percent of requirements, respectively. In West Kordofan State, only 9 percent of the fuel requirements had been fulfilled by mid-August.

Table 6: The Sudan - Fuel required/received for land preparation and planting, mid-August 2018 ('000 gallons)[1/]

State	Required fuel for land preparation and planting	Received fuel quantity	Received quantity on requirements (%)
Gezira	637	600	87
Sennar	4 600	4 000	87
Blue Nile	6 000	2 200	37
White Nile	4 359	1 689	39
North Kordofan	793	785	99
West Kordofan	4 958	448	9
South Kordofan	2 278	1 335	59
North Darfur	320	271	72
West Darfur	173	173	100
South Darfur	1 500	437	29
Central Darfur	169	169	100
East Darfur	630	470	75
Gadarif	5 544	3 564	64
Kassala	1 313	791	60
Total	**33 303**	**17 221**	**52**

Source: State Ministries of Agriculture.
1/ Irrigated schemes have different arrangements and are not included.

In contrast, at the beginning of the agricultural campaign, fuel supplies were reported as adequate in Gezira State (in both the Irrigation Scheme and rainfed areas), in North Kordofan and in the New Halfa and Rahad schemes. Fuel availability for land preparation was also adequate in most cropping areas of the Darfur Region, where traditional agricultural practices prevail and fuel requirements are lower (Table 6).

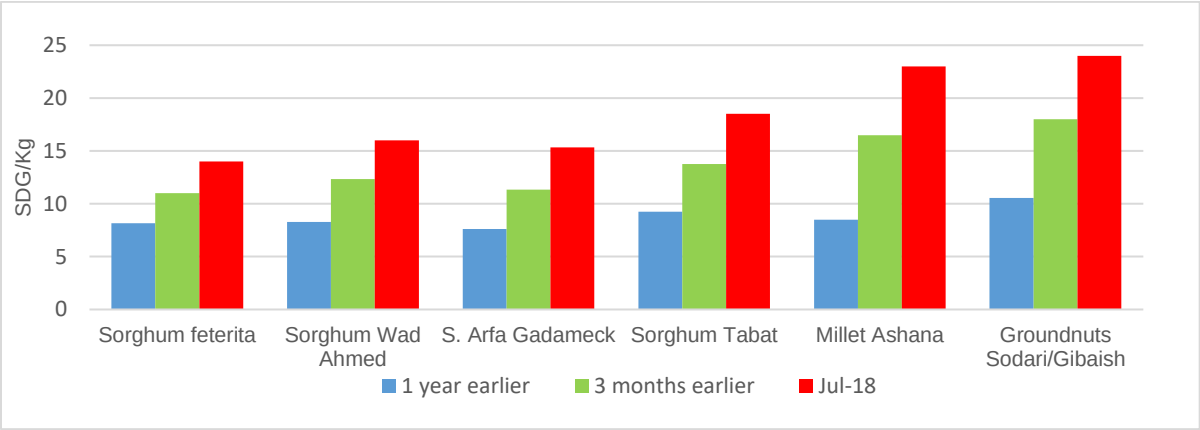
In some of the areas most affected by fuel shortages, the lack of fuel for farm machinery delayed or reduced applications of herbicides, pesticides and fertilizers. Farmers in Sennar and Suki were forced to buy more expensive fuel on the parallel market, with a consequent increase in production costs, while other farmers resorted to using costly manual labour, where available. The lack of an effective chemical control, combined with good seasonal rainfalls, led to widespread weed infestations, particularly in West, South and North Kordofan states, with negative effects on crop yields. In the New Halfa Scheme, it was reported that the lack of fuel disrupted the aerial application of pesticides.

At the time of the assessment, harvesting operations were underway throughout the country. Owing to fuel shortages, delays in harvesting were reported in East and South Darfur, where fuel supplies covered about 50 percent of requirements and in the Kordofan State and in Blue Nile, where harvest losses of sorghum and cotton were expected for the delays. However, the harvest proceeded normally in River Nile, Rahad, Gash and Gezira schemes.

The majority of the farmers use the seeds retained from the previous year or purchased locally from the market. The purity of the seeds is often low and the productivity of the traditional varieties is decreasing every year. Improved seeds are used mostly on the irrigation schemes and by some farmers in the semi-mechanized rainfed sector, while their adoption in the traditional rainfed sector remains still negligible.

Prices of seeds at the beginning of the season were at very high levels. In Khartoum, the prices of seeds of most common varieties of sorghum (Feterita, Wad Ahmed, Arfa Gadameck and Tabat) in July ranged between SDG 14 and SDG 19 per kg, about twice their year-earlier levels. Millet seeds (Ashana variety) were traded at about SDG 23 per kg, almost three times their levels of July 2017, while seeds of groundnuts (Sodari and Gibaish varieties) were sold at SDG 24 per kg, more than twice their year-earlier levels (Figure 7). In Rahad Scheme, sorghum and groundnut seeds were also traded in early August at about twice their levels of the previous year. Prices of seeds of sesame, cotton and vegetables are also at very high levels. For example, sesame seeds were traded in July in Khartoum at SDG 60 per kg, 135 percent more than 12 months earlier, while tomato seeds were sold at about twice their year-earlier prices. In Rahad Scheme, prices of cotton seeds in early August were up to SDG 150 per kg, three times their levels of August 2017.

Figure 7: The Sudan - Prices of seeds of selected staple crops, Khartoum



Source: GIEWS Update: The Sudan (2018, FAO).

The total quantity of seeds delivered by MoAF to the 14 states amounted to 3 032 tonnes, of which 2 598 tonnes (about 86 percent) were sorghum seeds, about 263.3 tonnes groundnut seeds (about 9 percent), 91 tonnes sesame seeds (3 percent) and 80 tonnes millet seeds (2 percent). The sorghum varieties distributed are Arfa Gadameck (61 percent), Wad Ahmed (29 percent), Butana (5 percent), Tabat (3 percent) and Ingaz (2 percent). Compared to the previous season, the total quantity of seeds distributed was 45 percent lower. In Kassala, many farmers had to resort to the local market, while no certified seeds were distributed in Red Sea State (Table 7).

Table 7: The Sudan - Quantities of seeds distributed by MoAF, 2018 (tonnes)

State	Sorghum	Millet	Sesame	Groundnuts	Total
Gezira	85	-	-	-	85
Sennar	150	-	2	3	152
White Nile	145	-	2	3	150
Blue Nile	260	-	10	-	270
Gedaref	175	-	2	5	182
Kassala	93	-	1	-	94
North Kordofan	240	-	10	30	280
West Kordofan	200	-	10	50	260
South Kordofan	220	-	10	15	245
North Darfur	225	18	10	25	278
West Darfur	210	15	8	25	258
South Darfur	230	18	10	45	303
Central Darfur	215	15	8	20	258
East Darfur	150	15	8	45	218
Total	**2 598**	**80**	**91**	**263**	**3 032**

Source: Ministry of Agriculture and Forestry.

In 2018, FAO distributed crop and vegetable seeds to smallholder farmers, agricultural tools and other inputs. The total quantity of crop seeds distributed was 183 tonnes. In addition, 96 663 kg of vegetable seeds and 67 440 pieces of hand tools were distributed. In addition, NGOs distributed 114 tonnes of different seeds in North Darfur State, 50 tonnes of groundnut seeds in Central Darfur State, 104 tonnes of different seeds in Blue Nile State, for a total of 266 tonnes.

Table 8: The Sudan - Agricultural inputs provided by FAO, 2018

Item	Unit	Quantity
Crop seeds	tonne	183
Vegetable seeds	kg	96 663
Fodder seeds	kg	6 967
Hand tools	piece	67 440
Donkey carts	piece	285
Livestock concentrates and licks	tonne	3 510
Vaccines	dose	19 254 360
Live animals	head	1 985

Source: FAO Sudan.

While no particular problems were reported regarding the availability of agricultural machinery, its use was constrained in some cases by fuel shortages.

Fertilizers and herbicides were generally available, but at very high prices. In Khartoum and Gadarif, average prices of the most common fertilizers, including NPK, urea, DAP (Diammonium Phosphate) and superphosphate, ranged between SDG 570 and SDG 790 per 50 kg, between 82 and 143 percent up from 12 months earlier. In Rahad and Gezira schemes, DAP was traded in early August at SDG 820 and SDG 950 per 50 kg, respectively, almost double the level of one year earlier. In Gadarif, the price of 50 kg DAP and urea in November reached SDG 680. Similarly, prices of common pesticides and herbicides were on average between 55 and 70 percent higher year-on-year. In Gadarif, the price of herbicides was reported to have almost doubled over the last 12 months.

The costs of agricultural labour were also at very high levels. The expansion in area planted, the shortages of fuel and the reduced availability of other inputs increased the demand for manual operations. In addition, labourers were requesting higher wages to protect their purchasing power, following high inflation rates. At the time of harvest, work force was generally available but at twice or even three times the cost of last year in Gezira and Sennar. In Kassala, both in rainfed areas and in Gash Scheme, the daily agricultural labour wage in August ranged between SDG 120 and SDG 150, two times the rate of SDG 60 and SDG 75 recorded in the previous year. The presence of South Sudanese refugees assured ample supply of labour at stable prices in White Nile. Seasonal workers from Ethiopia were concentrated in Gadarif, where they earned an average farm wage of SDG 300 per day, three times higher than last year. A massive demand for labour in the rainfed sector of Gadarif, driven by good rainfall and the consequent increase in cropped area, resulted in labour shortages in New Halfa and Kassala. In the Rahad Scheme, management was forced to use costly herbicides to reduce labour requirements.

Some labour shortages were reported in West Darfur, in South and North Kordofan and in Blue Nile, for the first picking of cotton. Shortages were also reported in River Nile, in Northern State and in South Darfur where work force is traditionally absorbed by the gold mining sector. In Gash Scheme and Red Sea State, as small farms mainly rely on family labour, no problems were reported and labour costs remained stable.

The difficulties created by higher production and labour costs have been exacerbated by the national financial crisis and by the decision of the Central Bank of Sudan to set limits on cash withdrawals. Reduced liquidity was reported by interviewers as one of the main problems to adversely affect agricultural operations during this agricultural season, due to delay in payment to labourers and input suppliers. Farmers were often forced to sell limited part of their production on a daily basis in order to generate enough cash to pay labourers, instead of selling all of the harvested crops.

Crop pests and diseases

In the 2018/19 cropping season, crop health was generally good over the vast majority of the country's farming areas. At the same time, heavy seasonal rains favoured localized outbreaks of pests and the widespread growth of weeds, given the limited use of herbicides. Increased infestations of Striga and Sudangrass were reported in

many semi-mechanized rainfed areas and yield losses to sorghum and cotton were observed in New Halfa and Rahad schemes.

Thanks to the efforts of the Central Crop Protection Administration and the close collaboration with the State ministries of Agriculture, pest and disease control products were made available when needed and control operations began early in the growing season (Table 9). Successful preventive treatments have been conducted during the summer to control locusts at breeding stage, although some losses to crops were reported in Red Sea, South Kordofan and Blue Nile. Localized damages by grasshoppers were also observed in Gadarif, Sennar, Kassala and Blue Nile, but the infestation was successfully controlled. To prevent migration and major problems to crops, precautionary actions were also taken against the sorghum bug during the hibernation period.

At the same time, despite the continuous monitoring and the control measures put in place, birds' attacks were reported in Gezira, Blue Nile, Sennar, North Kordofan, South Kordofan, White Nile, South Darfur, River Nile and in Northern states. The most severe damage was caused by the red-billed quelea (*Quelea quelea*), who's wide range, very large populations and fecundity make control extremely difficult. The worst affected areas were those surrounded by trees, where the birds nest and roost. In this regard, the uncontrolled growth of Mesquite trees (*Prosopis chilensis* and *Prosopis juliflora*) in Red Sea and specifically in the Gash and Tokar deltas was also reported to affect agricultural production, as they provide shelter for birds and significantly reduce the area of agricultural land and disrupting irrigation channels.

Jassids (*Amrasca devastans*), thrips and aphids were reported causing limited damage on cotton in Gezira, Suki and Rahad schemes. Attacks by watermelon bugs were observed on vegetables in Tokar and North Kordofan.

The Fall Armyworm (*Spodoptera frugiperda*), after destroying about 500 hectares of maize last year, was detected over a few areas in Sennar and Blue Nile with no major damages.

Table 9: The Sudan - Crop pests and control during summer cropping season, end-October 2018

Pest	Area surveyed (hectares)	Area affected (hectares)	Area treated (hectares)
Weaver Birds (*Quelea quelea*)	127 852	56 367	56 367
Tree Locusts	52 090	24 187	21 944
Grasshoppers	88 953	39 412	37 607
Fruit Flies	-	-	1 709
Migrating African Locusts	2 970	2 090	2 092
Other Locusts	33 257	9 790	8 589

Source: Ministry of Agriculture and Forestry.

Area planted and harvested in 2018/19

The area planted to sorghum in 2018/19 is estimated at 9.8 million hectares, about 12 percent above the previous year's level. The total increase was a result of an expansion of 17 percent in the irrigated sector, 8 percent in the mechanized rainfed sector and 16 percent in the traditional rainfed sector. The early start of seasonal rains and the expectation of good market prices were the main reasons for the overall increase in area planted. In some areas, the total area cultivated exceeded planting intentions. With the exception of some decreases in South Kordofan and in Gadarif, where farmers preferred sesame and groundnuts to sorghum, significant increases were reported almost everywhere in the country. In Kassala and White Nile, farmers planted two and six times more, respectively, sorghum than in the previous year. In Gezira, in the traditional rainfed sector, the increase was around 58 percent and 23 percent in Blue Nile, on account of a reduction in security measures, which had restricted farmers' access to their fields.

However, the most important and substantial changes were observed in Darfur State where thousands of IDPs returned to their villages. The improved security situation and the favourable weather conditions, together with the gradual reduction in food assistance by WFP, encouraged returned farmers to plant fields that have been abandoned in the past, including those located in the areas with restricted access. As a consequence, the area planted to sorghum more than doubled in North Darfur and was 70 percent higher in West Darfur. Yet, the major increases were reported in millet, the mainly produced cereal in Darfur and the staple food of local people. At the national level, the area planted to millet increased by 39 percent year-on-year from 3.4 to 4.8 million hectares. In the five states of Darfur, planted area with millet in 2018 is estimated at about 1.2 million hectares, about 65 percent

larger compared to 2017. A significant increase was recorded also in South Kordofan, where the millet area increased by about 60 percent.

The total harvested area of sorghum in 2018 is estimated at a slightly above-average level of 7.1 million hectares, 12 percent greater than in the previous year. Regarding millet, 3.7 million hectares have been harvested, about 50 percent more than the previous year and 61 percent more than the average. In some states with high levels of mechanization (Gadarif, Kassala), where harvesting was still in progress at the time of the Mission, the area harvested might not achieve the forecast level due to fuel shortages and costlier labourers.

Planting of the 2018/19 wheat crop began at the time of the Mission and the total planted area was anticipated to be about 235 000 hectares, compared to 173 000 hectares in previous year and the five-year average of 218 000 hectares. The increase is expected to take place across the irrigated sector and, in particular, in the large Gezira Scheme where farmers are expecting higher profits from wheat compared to other winter crops. However, fuel shortages could negatively affect the ongoing planting operations.

Table 10: The Sudan - Cereal area harvested by State/Scheme and sector ('000 hectares)

	Sorghum					Millet					Wheat				
	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average
Irrigated															
Northern	2	1	1	67	53						36	42	50	120	140
River Nile	10	4	8	200	74						14	15	27	182	195
Khartoum			2												
Gezira Scheme	161	117	120	103	74						109	84	113	135	104
Suki	14	11	9	81	68										
Sennar	26	19	22	118	85										
White Nile	44	43	43	100	97						20	15	14	94	71
Blue Nile															
Rahad	32	22	23	106	73										
New Halfa	31	23	21	89	67						27	17	20	118	73
Gash	25	15	29	194	117										
Kassala	2	1	1	100											
Tokar	8	2	11	625	136	8	3	4	125	52					
North Kordofan	2	2	4	200	250										
Total	**355**	**260**	**293**	**113**	**83**	**8**	**3**	**4**	**125**	**52**	**206**	**173**	**225**	**130**	**109**
Semi-Mechanized															
Sennar	621	619	599	97	96	76	149								
White Nile	343	347	284	82	83	27	16	16	100	60					
Blue Nile	355	299	244	82	69	31	46								
Gadarif	1 828	1389	1 688	122	92	80	97	101	104	126					
Kassala	337	153	609	397	181										
North Kordofan	13	17	16	93	121										
West Kordofan	62	142	87	61	140										
South Kordofan	455	578	346	60	76	10	7	15	219	141					
Total	**4 014**	**3 544**	**3 873**	**109**	**96**	**225**	**315**	**132**	**42**	**59**					
Traditional Rainfed															
River Nile	32	19	50	267	157										
Khartoum	41	4	21	500	51										
Gezira	249	182	382	210	153	2	4	27	640	1143					
Sennar	189	250	220	88	117	8		75		957					
White Nile	121	129	189	147	156	14	2	17	1000	123					
Blue Nile	66		88		134	3		48		1554					
Kassala	65	20		0	0	6	8	6	74	104					
Red Sea	11	9	24	255	215	7	16	3	21	48					
North Kordofan	220	210	289	138	131	451	435	570	131	126					
West Kordofan	175	116	105	91	60	401	469	341	73	85					
South Kordofan	240	194	158	81	66	41	26	42	162	102					
North Darfur	83	84	235	280	284	330	378	794	210	241					
West Darfur	147	143	260	182	177	218	231	561	243	257	2	1	1	100	68
South Darfur	360	429	483	113	134	335	308	563	183	168	2	2			
Central Darfur	111	108	185	172	166	135	147	276	187	204					
East Darfur	336	670	252	38	75	141	171	294	172	208					
Total	**2 447**	**2 567**	**2 941**	**115**	**120**	**2 091**	**2 194**	**3 616**	**165**	**173**	**4**	**3**	**1**	**43**	**33**
Grand total	**6 816**	**6 371**	**7 108**	**112**	**104**	**2 324**	**2 512**	**3 753**	**149**	**161**	**210**	**176**	**226**	**129**	**108**

Source: CFSAM.

Crop yields

The average sorghum yield in 2018 is estimated at a slightly above-average level of 0.74 tonnes per hectare, 15 percent above the yield obtained in 2017. The greatest increase was observed in the traditional rainfed sector, where the average yield of 0.74 tonnes per hectare was about 45 percent higher than both that of 2017 and the five-year average. In the irrigated sector, an average yield of 2.14 tonnes per hectare was achieved, almost 7 percent less than the previous year. This decrease is mostly due to the torrential rains and floods of mid-July/mid-August that resulted in water logging and yield losses.

The average millet yield is estimated at 0.71 tonnes per hectare, twice the level of the previous year and the five-year average. The increase was mainly registered in the traditional rainfed sector due to the good distribution of seasonal rains and the recovery of fertility in Darfur Region as the land was left uncropped for several years due to security reasons. In East and South Darfur, expected yields were four and six times higher, respectively, than the extremely low ones of recent years.

The wheat crops, apart from the small rainfed area on the Jebel Marra in South and Central Darfur states, are grown under irrigation and, therefore, the average yields vary little on an annual basis.

Table 11: The Sudan - Cereal yields by State/Scheme and sector (tonnes/hectares)

	Sorghum					Millet					Wheat				
	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average
Irrigated															
Northern	2.03	1.59	2.38	150	117						2.47	3.43	2.86	83	116
River Nile	2.23	1.85	2.12	114	95						2.21	2.33	2.86	122	129
Khartoum			1.19												
Gezira Scheme	2.01	2.62	2.38	91	119						2.18	2.55	2.62	103	120
Suki	2.14	2.38	2.81	118	131										
Sennar	1.67	1.80	1.44	80	86										
White Nile	2.01	1.89	1.89	100	94						1.55	1.85	1.89		122
Blue Nile															
Rahad	2.20	2.24	2.86	127	130										
New Halfa	2.29	2.47	1.80	73	79						1.30	2.26	2.38	105	184
Gash	1.93	1.79	1.94	109	101										
Kassala	1.73	1.59	1.59	100											
Tokar	1.53	1.19	1.62	136	106	0.79	1.00	1.00	100	126					
North Kordofan	0.60	0.48	0.95	200	160										
Total	**2.01**	**2.29**	**2.14**	**93**	**106**	**0.79**	**1.00**	**1.00**	**100**	**126**	**2.06**	**2.65**	**2.63**	**99**	**128**
Semi-Mechanized															
Sennar	0.67	0.90	0.53	58	79	0.48	0.54								
White Nile	0.52	0.62	0.62	100	118	0.37	0.49	0.49	100	134					
Blue Nile	0.62	0.39	0.50	128	80	0.38	0.46								
Gadarif	0.60	0.49	0.56	115	93	0.34	0.28	0.32	114	94					
Kassala	0.52	0.25	0.59	240	115										
North Kordofan	0.51	0.48	0.45	95	89										
West Kordofan	0.27	0.28	0.33	118	121										
South Kordofan	0.51	0.52	0.53	102	105	0.29	0.30	0.54	183	190					
Total	**0.58**	**0.55**	**0.55**	**100**	**95**	**0.39**	**0.44**	**0.36**	**83**	**92**					
Traditional Rainfed															
River Nile	0.98	0.53	0.60	113	61										
Khartoum	0.48	1.19	0.48	40	99										
Gezira	0.50	0.38	0.64	167	129	0.26	0.24	0.60	250	233					
Sennar	0.59	0.63	0.53	84	89	0.46		0.36		78					
White Nile	0.33	0.24	0.43	178	130	0.29	0.60	0.42	70	142					
Blue Nile	0.69		0.50		72	0.39		0.27		70					
Kassala	0.59	0.20				0.39	0.25	0.34	136	87					
Red Sea	0.42	0.43	0.64	147	151	0.29	0.19	0.30	158	104					
North Kordofan	0.26	0.21	0.22	108	85	0.17	0.12	0.17	137	98					
West Kordofan	0.37	0.43	0.34	79	93	0.28	0.28	0.43	153	151					
South Kordofan	0.62	0.68	0.69	101	111	0.35	0.27	0.34	123	96					
North Darfur	0.38	0.19	0.64	337	169	0.32	0.12	0.71	600	223					
West Darfur	0.92	1.29	1.50	116	163	0.78	1.01	1.31	129	169	1.41	1.59	1.59	100	113
South Darfur	0.63	0.75	0.95	127	152	0.39	0.23	0.83	367	216	1.24	1.19			
Central Darfur	0.98	1.19	1.50	126	153	0.78	1.14	1.19	104	153					
East Darfur	0.26	0.24	0.64	273	250	0.21	0.13	0.60	441	282					
Total	**0.52**	**0.51**	**0.74**	**145**	**143**	**0.36**	**0.34**	**0.72**	**213**	**198**	**1.32**	**1.36**	**1.59**	**117**	**120**
Grand total	**0.63**	**0.61**	**0.70**	**115**	**110**	**0.37**	**0.35**	**0.71**	**202**	**192**	**2.04**	**2.63**	**2.63**	**100**	**129**

Source: CFSAM.

Cereal production forecast

Following the increase in area harvested and yields, the production of sorghum and millet in 2018/19 is expected at 7.6 million tonnes, well above the previous five-year average.

Sorghum production is estimated at about 4.9 million tonnes, 28 percent higher than the level of the previous year and 14 percent higher than the five-year average. In the eastern regions, the increase in output was mainly the result of an expansion in area planted, while higher yields were not achieved owing to flood-induced losses and the impact of localized fuel shortages and higher labour costs. In Darfur State, a steep increase in the cultivated area was accompanied by a balanced distribution of rainfall and the improved fertility of fields that had been left uncropped for several years. In addition, the availability of labour mitigated the negative effects of fuel shortages.

A considerable increase in production of millet was also sustained by favourable rainfall and the improved security in Darfur Region. The national millet production is, therefore, estimated at a record high of 2.6 million tonnes, three times higher than the production of the previous five-year average.

Wheat production is forecast, based on planting intentions, at 590 000 tonnes, about 30 percent higher than the previous year.

Table 12: The Sudan - Cereal production by State/Scheme and sector ('000 tonnes)

	Sorghum					Millet					Wheat				
	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average	5-yr av. 2013/14-2017/18	2017/18	2018/19	2018/19 as % 2017/18	2018/19 as % 5-yr average
Irrigated															
Northern	3	2	2	100	62						89	144	144	100	162
River Nile	23	7	16	229	71						31	35	78	223	252
Khartoum			2												
Gezira Scheme	322	306	285	93	88						238	214	297	139	125
Suki	29	27	26	96	90										
Sennar	44	34	32	94	73										
White Nile	88	81	81	100	92						31	28	27		87
Blue Nile															
Rahad	70	49	66	135	95										
New Halfa	70	57	37	65	53						35	38	47	124	134
Gash	48	27	57	211	118										
Kassala	4	2	2	100											
Tokar	12	2	17	850	144	6	3	4	125	66					
North Kordofan	1	1	4	400	400										
Total	**714**	**595**	**627**	**105**	**88**	**6**	**3**	**4**	**125**	**66**	**424**	**459**	**593**	**129**	**140**
Semi-Mechanized															
Sennar	413	558	315	56	76	37	80								
White Nile	180	216	176	81	98	10	8	8	100	80					
Blue Nile	220	116	121	104	55	12	21								
Gadarif	1 097	675	941	139	86	27	27	32	119	119					
Kassala	174	38	362	953	209										
North Kordofan	7	8	7	88	108										
West Kordofan	17	40	29	73	171										
South Kordofan	231	303	184	61	80	3	2	8	400	267					
Total	**2 338**	**1 954**	**2 135**	**109**	**91**	**89**	**138**	**48**	**35**	**54**					
Traditional Rainfed															
River Nile	31	10	30	300	96										
Khartoum	20	5	10	200	51										
Gezira	124	70	245	350	198	1	1	16	1 600						
Sennar	111	157	116			4		27							
White Nile	40	31	81	261	203	4	1	7	700	175					
Blue Nile	46		44			1		13							
Kassala	38	4		0	0	2	2	2	100						
Red Sea	5	4	15	375	326	2	3	1	33	50					
North Kordofan	57	43	64	149	111	77	53	95	179	124					
West Kordofan	64	50	36	72	56	114	131	146	111	128					
South Kordofan	149	132	109	83	73	14	7	14	200	97					
North Darfur	31	16	151	944	481	106	45	567	1 260	537					
West Darfur	135	184	390	212	288	169	234	734	314	434	3	2	2	100	77
South Darfur	226	322	460	143	204	129	70	469	670	362	2	2			
Central Darfur	109	128	278	217	255	105	168	329	196	313					
East Darfur	86	158	162	103	188	30	23	175	761	587					
Total	**1 273**	**1 314**	**2 191**	**167**	**172**	**758**	**738**	**2 595**	**352**	**342**	**5**	**4**	**2**	**50**	**40**
Grand total	**4 326**	**3 863**	**4 953**	**128**	**114**	**853**	**879**	**2 647**	**301**	**310**	**429**	**463**	**595**	**129**	**139**

Source: CFSAM.

Table 13: The Sudan - Cereal production by sector ('000 tonnes)

	Sorghum			Millet			Wheat		
	Five-year average[1/]	2017/18	2018/19 (forecast)	Five-year average[1/]	2017/18	2018/19 (forecast)	Five-year average[1/]	2017/18	2018/19 (forecast)
Irrigated	714	595	627	6	3	4	424	459	593
Semi-Mechanized Rainfed	2 338	1 954	2 135	89	138	48			
Traditional Rainfed	1 273	1 314	2 191	758	738	2 595	5	4	2
Total	**4 236**	**3 863**	**4 953**	**853**	**879**	**2 647**	**429**	**463**	**595**

Source: CFSAM.
1/ 2013/14-2017/18 average.

Table 14: The Sudan - Sorghum production by sector

	Five-year average[1/]			2017/18			2018/19		
	Area (000 ha)	Production (000 t)	Yield (t/ha)	Area (000 ha)	Production (000 t)	Yield (t/ha)	Area (000 ha)	Production (000 t)	Yield (t/ha)
Irrigated	355	714	2.01	260	595	2.29	293	627	2.14
Semi-Mechanized Rainfed	4 014	2 338	0.58	3 544	1 954	0.55	3 873	2 135	0.55
Traditional Rainfed	2 447	1 273	0.52	2 567	1 314	0.51	2 941	2 191	0.74
Total	**6 816**	**4 326**	**0.63**	**6 371**	**3 863**	**0.61**	**7 108**	**4 953**	**0.70**

Source: CFSAM.
1/ 2013/14-2017/18 average.

Table 15: The Sudan - Millet production by sector

	Five-year average[1/]			2017/18			2018/19		
	Area (000 ha)	Production (000 t)	Yield (t/ha)	Area (000 ha)	Production (000 t)	Yield (t/ha)	Area (000 ha)	Production (000 t)	Yield (t/ha)
Irrigated	8	6	0.79	3	3	1.00	4	4	1.00
Semi-Mechanized Rainfed	225	89	0.39	315	138	0.44	132	48	0.36
Traditional Rainfed	2 091	758	0.36	2 194	738	0.34	3 616	2 595	0.72
Total	**2 324**	**853**	**0.37**	**2 324**	**879**	**0.35**	**3 753**	**2 647**	**0.71**

Source: CFSAM.
1/ 2013/14-2017/18 average.

Table 16: The Sudan - Wheat production by sector

	Five-year average[1/]			2017/18			2018/19 (forecast)		
	Area (000 ha)	Production (000 t)	Yield (t/ha)	Area (000 ha)	Production (000 t)	Yield (t/ha)	Area (000 ha)	Production (000 t)	Yield (t/ha)
Irrigated	206	424	2.06	173	459	2.65	225	593	2.63
Semi-Mechanized Rainfed									
Traditional Rainfed	4	5	1.32	3	4	1.36	1	2	1.59
Total	**210**	**429**	**2.04**	**176**	**463**	**2.63**	**226**	**595**	**2.63**

Source: CFSAM.
1/ 2013/14-2017/18 average.

Other crops

Sesame

Production of sesame is estimated at 981 000 tonnes, 26 percent higher than in 2017. The increase is mainly due to a 29 percent increase in the area harvested, driven by farmers' expectations of high market prices and the early start of seasonal rains. In Sennar rainfed areas, the increase in sesame plantings was also due to a lack of finance in other crops such as sunflower and cotton. The average yield of 0.31 tonnes per hectare is slightly below that of last year (Table 17), due to heavy rains and floods in August and some localized delays in harvesting (sesame is very sensitive to water logging and shattering). At the time of the Mission, the harvest was almost completed, while in a few areas threshing operations were delayed owing to fuel shortages.

Table 17: The Sudan - Sesame production, 2017/18 and 2018/19

State/Scheme	2017/18				2018/19			
	Planted ('000 ha)	Harvested ('000 ha)	Production ('000 t)	Yields (t/ha)	Planted ('000 ha)	Harvested ('000 ha)	Production ('000 t)	Yields (t/ha)
Mechanized Rainfed								
Sennar	484	474	216	0.46	861	717	225	0.31
White Nile	231	220	57	0.26	294	179	58	0.32
Blue Nile	252	222	62	0.28	336	218	65	0.30
Gadarif	381	347	104	0.30	508	451	145	0.32
Kassala	13	11	2	0.19	147	102	31	0.30
South Kordofan	251	219	70	0.32	256	218	68	0.31
Total	**1 359**	**1 270**	**449**	0.35	**2 402**	**1 885**	**592**	**0.31**
Traditional Rainfed								
Gezira	11	5	1	0.18	51	46	15	0.32
White Nile	112	107	28	0.26	126	88	22	0.25
North Kordofan	933	588	81	0.14	1 159	785	127	0.16
West Kordofan	118	106	16	0.15	135	127	27	0.21
South Kordofan	150	135	45	0.33	136	102	27	0.26
North Darfur	63	36	4	0.11	88	75	8	0.11
West Darfur	91	81	23	0.28	100	96	46	0.48
South Darfur	99	88	28	0.32	191	172	74	0.43
Central Darfur	51	49	41	0.84	98	95	41	0.43
Eastern Darfur	21	18	3	0.17	12	8	2	0.26
Total	**1 902**	**1 434**	**332**	0.23	**2 097**	**1 594**	**389**	**0.24**
Grand Total	**3 261**	**2 704**	**781**	0.29	**4 500**	**3 480**	**981**	**0.28**

Source: CFSAM.

Groundnuts

The national production of groundnuts in 2018 is estimated at 3.9 million tonnes, 75 percent higher than the already good production of 2017. In the traditional rainfed sector, production was 90 percent higher, year-on-year, mostly due to larger plantings in the Darfur Region and West Kordofan where climate and improved security conditions favoured high yields. In the irrigated sector, the output is 8 percent lower, as the flooded crop was replaced by short cycle sorghum in Rahad Scheme and farmers preferred to cultivate cotton in Gezira.

Table 18: The Sudan - Groundnuts production, 2017/18 and 2018/19

State/Scheme	2017/18				2018/19			
	Planted ('000 ha)	Area ('000 ha)	Production ('000 t)	Yields (t/ha)	Planted ('000 ha)	Area ('000 ha)	Production ('000 t)	Yields (t/ha)
Irrigated								
Gezira	83	78	156	2.00	72	68	143	2.09
Rahad	16	14	37	2.67	13	11	26	2.29
New Halfa	22	21	69	3.22	22	22	73	3.34
Total	**121**	**113**	**262**	**2.31**	**108**	**102**	**242**	**2.38**
Rainfed								
White Nile	34	25	9	0.36	44	25	9	0.36
Blue Nile	3	3	1	0.40	3	2	1	0.48
Gadarif	11	10	5	0.50	55	47	35	0.75
North Kordofan	72	60	21	0.35	84	67	29	0.43
South Kordofan	57	51	38	0.74	63	38	22	0.58
West Kordofan	799	621	359	0.58	946	899	602	0.67
North Darfur	231	210	68	0.32	315	223	95	0.43
South Darfur	496	440	330	0.75	739	664	640	0.96
West Darfur	145	125	141	1.13	177	164	194	1.18
Central Darfur	93	88	84	0.95	118	108	82	0.76
Eastern Darfur	520	468	330	0.71	907	726	933	1.29
Total	**2 460**	**2 101**	**1 386**	**0.66**	**3 450**	**2 963**	**2 642**	**0.89**
Grand Total	**2 580**	**2 215**	**1 648**	**0.74**	**3 558**	**3 065**	**2 884**	**0.94**

Source: CFSAM.

Sunflowers

Sunflowers are grown both under irrigated and rainfed conditions in the semi-mechanized sector. Although market prices are high and the Sudan has ideal growing conditions for sunflower, production in 2018 is expected to be 63 percent lower than last year owing to a marked decrease in the area planted and the lower yields achieved. The year-on-year fluctuations in area and productivity are caused by shortages of hybrid seeds and their high

costs. Further, the lack of clear marketing strategies hinders the selling of the crop, which makes farmers' decision on planting uncertain.

Table 19: The Sudan - Sunflower production, 2017/18 and 2018/19

State/Scheme	2017/18				2018/19			
	Planted ('000 ha)	Harvested ('000 ha)	Production ('000 t)	Yields (t/ha)	Planted ('000 ha)	Harvested ('000 ha)	Production ('000 t)	Yields (t/ha)
Irrigated								
Sennar					**1**	**1**	**1**	**0.79**
Suki	2	2	2	1.19	2	2	2	0.95
Rahad	4	3	5	1.49	3	3	4	1.36
New Halfa	4	4	6	1.43	0.4	0.4	1	2.38
Total	**10**	**9**	**13**	**1.41**	**7**	**7**	**8**	**1.19**
Rainfed								
Blue Nile	147	120	71	0.59	131	117	56	0.48
Sennar	25	23	22	0.97	13	11	8	0.71
Gedaref	55	50	47	0.95	84	72	36	0.50
Total	**227**	**192**	**140**	**0.73**	**110**	**95**	**100**	**0.52**
Grand Total	**237**	**202**	**153**	**0.76**	**117**	**102**	**108**	**0.56**

Source: CFSAM.

Pigeon peas

Traditionally, pigeon peas provide a food security safety net due to its high tolerance to drought and are planted primarily as a border crop, providing an efficient windshield for cash crop, especially cotton. The recent increase in cultivation as a sole crop under irrigation has been prompted by increasing international demand for the grain, especially from India where it is used to prepare dal. After the high production of 165 000 tonnes in 2017, market prices have fallen and farmers have shifted to other crops, mainly chickpeas. Consequently, production in 2018 is estimated to be about 50 percent lower than the previous year.

Table 20: The Sudan - Pigeon peas and beans area planted ('000 hectares), harvested ('000 hectares) and production ('000 tonnes)

	2017/18			2018/19		
	Planted	Harvested	Production	Planted	Harvested	Production
Gezira	21	20	29	7	6	12
Rahad	6	4	4	3	2	2
New Halfa	11	11	15	3	3	4
North Kordofan	61	47	18	55	43	16
South Kordofan	36	25	8	26	19	9
West Kordofan	53	53	14	21	17	2
Total	**188**	**159**	**88**	**115**	**90**	**45**

Source: CFSAM.

Sugar

Sugar is produced by the Kenana Sugar Company, the White Nile Sugar Company and the Sudanese Sugar Company, which has four estates and factories in Guneid, New Halfa, Sennar and Asalaya. According to preliminary estimates, there was a national decrease in both area harvested and production compared to the previous year. This was primarily due to the expected low production by the White Nile Sugar Company (Table 21). The overall refined sugar production is 10 percent lower than the previous year.

Table 21: The Sudan - Sugar production, 2015/16, 2016/17, 2017/18 and 2018/19

Company	Year	Area harvested ('000 ha)	Sugarcane production ('000 t)	Sugar production ('000 t)	Sugar yields (t/ha)
Sudanese Sugar Co.	2015/16	34.1	2 314	228	6.69
	2016/17	33.5	2 439	233	6.96
	2017/18	34.3	2 569	251	7.32
	2018/19	35.2	2 484	248	7.05
Kenana Sugar Co.	2015/16	35.3	2 911	299	8.47
	2016/17	35.4	3 009	301	8.50
	2017/18	34.5	3 500	350	10.14
	2018/19	34.4	3 500	328	9.53
White Nile Sugar Co.	2015/16	13.3	455	47	3.52
	2016/17	13.3	412	42	3.19
	2017/18	13.4	413	43	3.17
	2018/19	3.2	100	10	3.12
Total	**2015/16**	**82.7**	**5 680**	**574**	**6.94**
	2016/17	**82.2**	**5 860**	**576**	**7.01**
	2017/18	**82.2**	**6 482**	**644**	**7.83**
	2018/19	**72.8**	**6 084**	**586**	**8.04**

Source: Sugar producing companies.

Cotton

The harvested area and production of cotton were both 11 percent higher compared with those of 2017, with the average yield remaining near the year-earlier level.

The expansion of the cotton production area in recent years is largely due to high market prices and to the adoption of high-yielding, genetically-modified varieties. Many private companies operate under contract farming, providing inputs and technical assistance and assuring the purchase at pre-set prices.

Higher production was expected in 2018 especially in Gezira Scheme where the area of cotton increased by 34 percent and the yield is forecast to improve to about 4.4 tonnes per hectare.

In general, pest control was effective in 2018, with some minor exceptions where heavy seasonal rains in August caused water logging and thus growing of weeds. Further, localized shortages of labour caused some delays in harvesting and reduced the total number of pickings.

Table 22: The Sudan - Cotton production, 2017/18 and 2018/19

State/Scheme	2017/18				2018/19			
	Planted ('000 ha)	Area ('000 ha)	Production ('000 t)	Yields (t/ha)	Planted ('000 ha)	Area ('000 ha)	Production ('000 t)	Yields (t/ha)
Irrigated								
Gezira	49	45	176	3.92	66	59	263	4.44
Suki	11	10	34	3.37	10	8	25	2.98
Sennar	17	16	34	2.13	12	12	30	2.55
White Nile	7	5	3	0.55	6	5	6	1.10
Blue Nile					25	23	41	1.81
Rahad	29	28	93	3.35	28	19	44	2.33
New Halfa	13	12	51	4.23	16	15	41	2.79
Tokar	1	1	1	0.79	0.84	0.42	,,,	
N. Kordofan	3	3	1	0.34				
Total	**129**	**120**	**393**	**3.26**	**163**	**142**	**450**	**3.18**
Rainfed								
Sennar	3	3	2	0.79				
Blue Nile	13	11	22	2.10				
Gadarif	41	40	81	2.03	63	50	101	2.02
Total	**57**	**53**	**105**	**1.98**	**63**	**50**	**101**	**2.02**
Grand Total	**186**	**173**	**498**	**2.87**	**226**	**192**	**551**	**2.88**

Source: CFSAM.

Livestock

Following the long and favourable rainy season, water availability was outstanding and grazing land was in excellent condition in 2018. In Gezira, West Darfur and Blue Nile, nutrient-rich species were sown and training to local animal owners was conducted to preserve and enrich pastures. In Central and West Darfur, some pastoralists were reported to start growing their own forage.

With the security situation largely improved, the Government's restrictions on the movement of livestock were removed, allowing herders to move freely and select the best areas for grazing. As a result, very few conflicts with farmers were reported. Since livestock did not threaten crop production, farmers were under less pressure to harvest early and were able to cope better with the delays caused by fuel and labour shortages. Crop residues are also normally available.

Given the good pasture and water availability, livestock conditions at the time of the Mission were very good and no major disease outbreaks were observed. The annual vaccination campaign was affected by shortages of vaccines and medicines, particularly in Gadarif, Blue Nile, Rahad and Red Sea states, where the total number of vaccinated animals was much lower than in 2017. This is due to a general lack of mostly imported vaccines, exacerbated by the economic crisis and the weakness of the Sudanese currency. Vaccination priority was given to those animals intended for export as foreign markets have more stringent health standards. No particular problems were reported in Central Darfur, West Kordofan, North Kordofan and Gezira states, where disease prevention this year has been better compared to last year, but total demand for vaccinations remains still higher than availability.

As herders from Chad usually cross the border in North and West Darfur, an efficient veterinary service is required to ensure good surveillance and prevent the uncontrolled spread of diseases.

CEREAL SUPPLY/DEMAND SITUATION

Crop and livestock markets

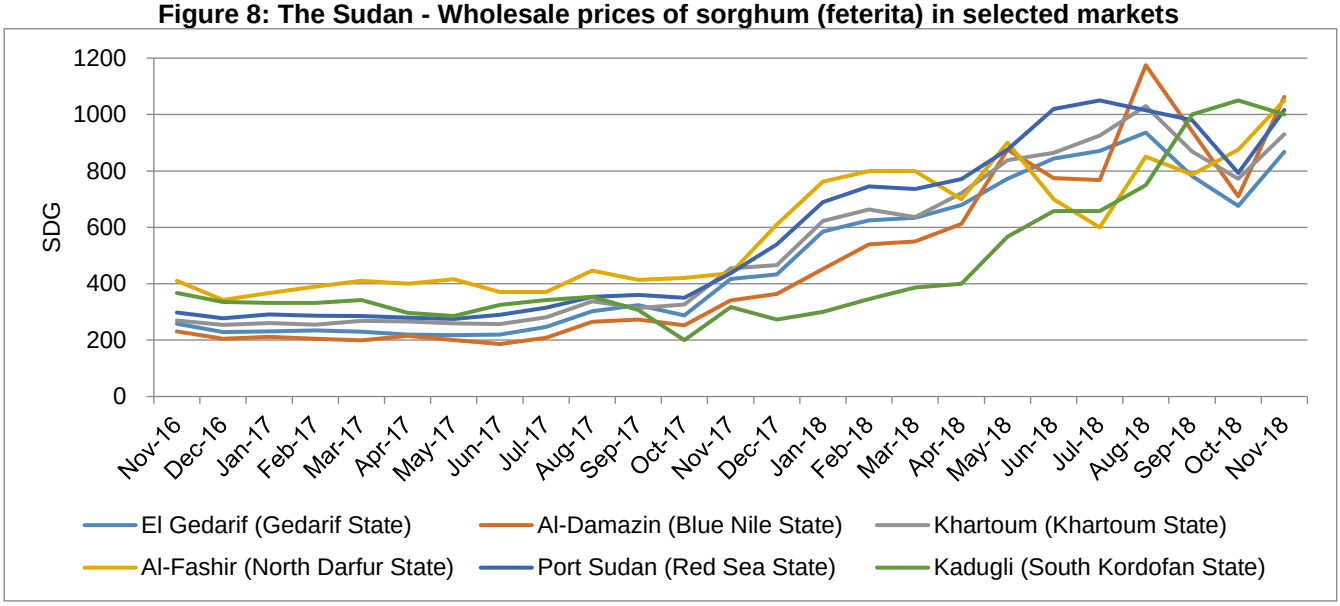
Prices of locally produced sorghum and millet generally show seasonal declines in October/November with the start of the main harvest and remain generally stable through March, before rising in August/September. However, prices of sorghum (feterita) and millet began to rise from late 2017 and continued to increase sharply and unseasonably in 2018, reaching record highs, in spite of a good 2018 harvest. The surge in prices was driven by several factors. The sharp depreciation of the local currency and a significant growth in the general inflation rates contributed to an increase in the prices of imported agricultural inputs. Further, the Government's austerity measures such as the elimination of wheat subsidies in January 2018 increased the demand for sorghum and millet as substitutes for wheat, exerting further upward pressure.

Prices of cereals declined slightly in September and October, with exception of South Kordofan, with the start of the main summer season harvest and the release of stocks from the last season by traders. However, they unseasonably increased in November, as big farmers are selling the harvest in small quantities due to lack of liquidity. Due to high production and transportation costs, prices are anticipated to continue exerting sustained upward pressure. However, if market supplies improve, prices of cereals could stabilize or start to decline.

Otherwise, the surge in prices of main cereals and meat would have serious implications to net food consumers with low coping strategies, as market purchase is the main source of cereals and meat, fish and eggs for 73 and 97 percent of the households of the Sudan, according to WFP's Comprehensive Food Security Assessment Report in 2017. If the local currency continues to depreciate, making imports costlier, producers' affordability of inputs could become a concern in the next season, which would particularly affect smallholder producers. The increasing production costs would, in turn, put further upward pressures on food prices.

As illustrated in Figure 8, nominal wholesale prices of sorghum reached record high levels in most markets in November 2018, ranging from SDG 868 to SDG 1 050 per 90 kg sack. In the observed markets, the year-on-year increase in prices ranged from 104 to 216 percent. Prices started to escalate since the beginning of 2018 when the Government announced the removal of wheat subsidies, which put upward pressure on the prices of sorghum and millet as wheat substitute. Despite the above-average sorghum production in 2018, the increasing inflation and sharp devaluation of the local currency contributed to the surge of prices throughout the country over 2018.

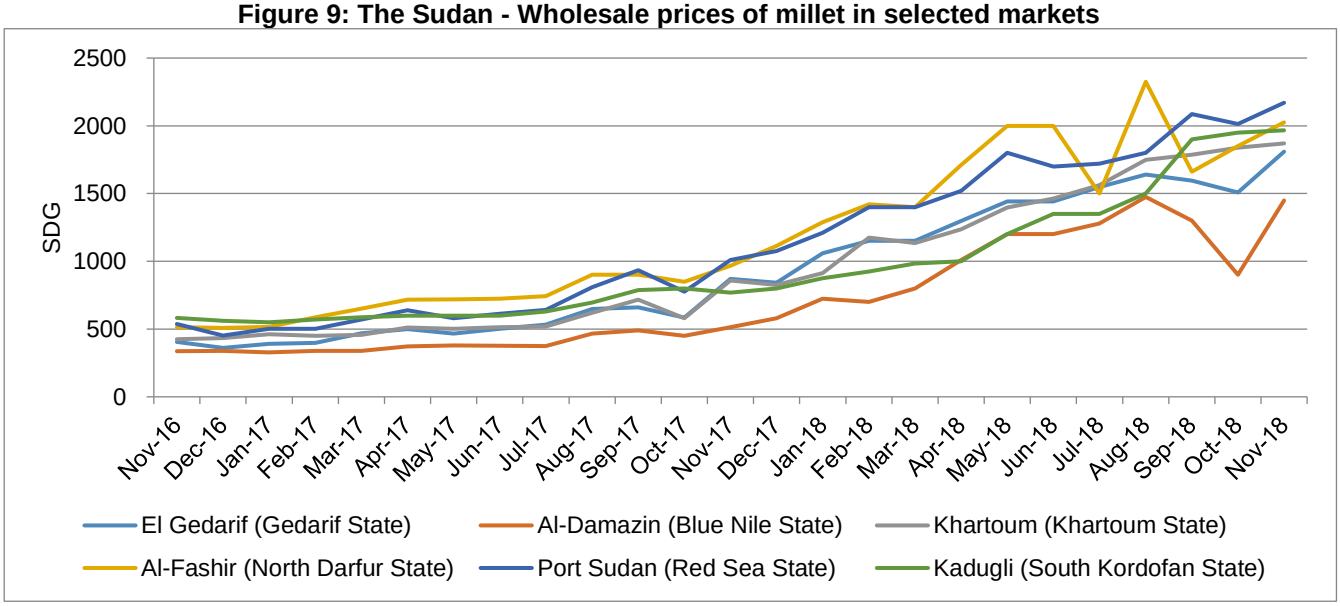
Figure 8: The Sudan - Wholesale prices of sorghum (feterita) in selected markets



Source: Food and Agriculture Real Time Messaging and Reporting System.

Wholesale prices of millet, mainly grown and consumed in Darfur Region, followed a similar increasing trend during 2018. With the start of harvesting of early maturing crops, prices declined in October. However, they increased again in November and reached record levels in most markets as a result of increased production costs and the sharp inflation, despite a record level of production. In November 2018, prices were SDG 2 025 per 90 kg sack, compared to SDG 968 per sack one year earlier, in the main millet producing North Darfur State.

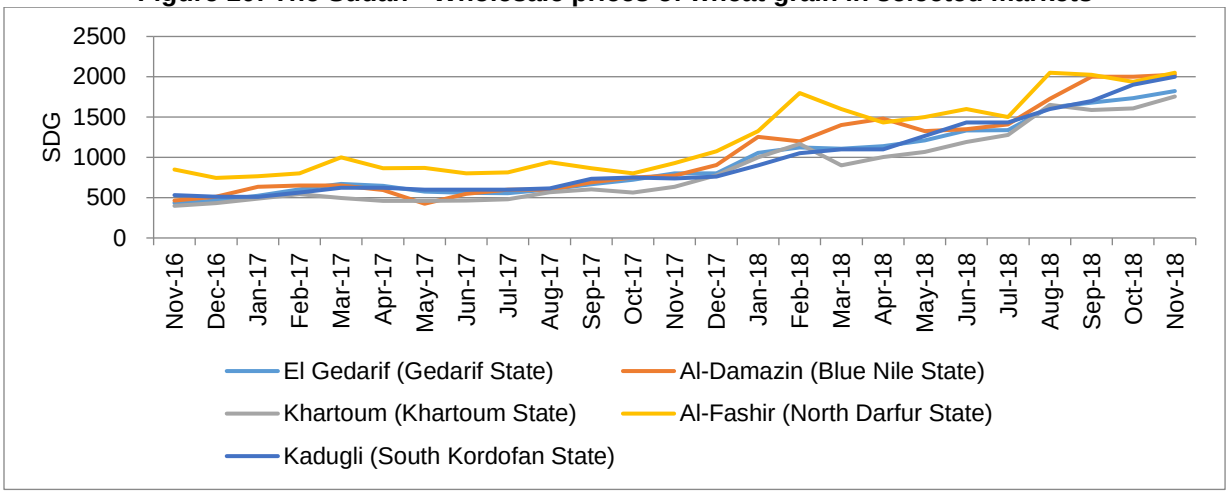
Figure 9: The Sudan - Wholesale prices of millet in selected markets



Source: Food and Agriculture Real Time Messaging and Reporting System.

Prices of wheat grain, mostly consumed in urban areas, continued to rise during 2018, supported by the overall currency depreciation and associated price inflation together with increased production costs. In November 2018, wheat grain was traded at about SDG 1 755 per 90 kg sack in Khartoum, about 176 percent above the level of a year earlier. Given the increasing wheat grain prices, the Government announced the increase in the price of a loaf of bread from SDG 1 to SDG 3 in late December 2018, which triggered the countrywide protests.

Figure 10: The Sudan - Wholesale prices of wheat grain in selected markets



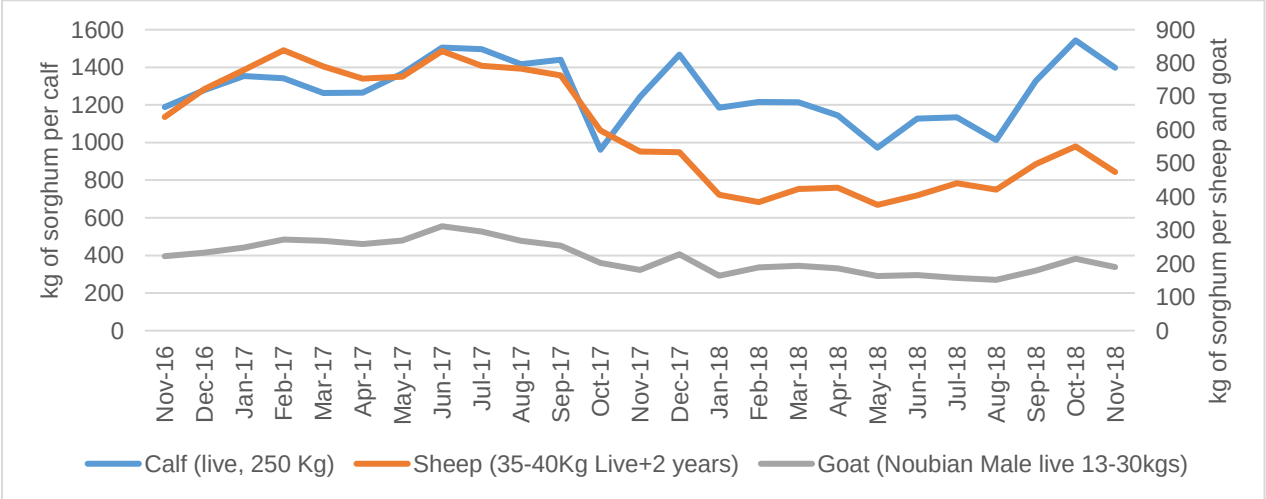
Source: Food and Agriculture Real Time Messaging and Reporting System.

In El Gedaref market, in the main sesame-producing areas, wholesale prices of sesame increased from SDG 1 161 per kantar in November 2017 to SDG 3 814 per kantar in November 2018, despite a 23 percent year-on-year increase in local production. International sesame prices were high in 2017, instigating larger plantings in 2018, and continue to be high. However, less sesame has been supplied to markets, as the shortage of liquidity discouraged producers' selling, despite ample availabilities and completion of harvesting, contributing to upward pressure on domestic prices.

Prices of livestock followed an increasing trend over 2018 and, in November, they were higher than their values a year earlier. In November 2018, sheep and calves were traded in the El Obeid wholesale livestock market (North Kordofan State) at SDG 5 000 and SDG 14 750 per head, respectively. Prices of sheep and calves increased by between 80 and 120 percent over the year as a result of high inflation rates and transportation costs, coupled with sustained export demand. Prices of goats more than doubled, reaching SDG 2 000 in November 2018. Moreover, livestock body conditions were reported to be better than the previous year, which in turn supported prices.

The terms of trade for pastoralists were mostly stable throughout 2018 due to soaring prices of both sorghum and animals, driven by the macro-economic conditions. The terms of trade increased in September and October 2018, as prices of sorghum decreased with the start of the harvest. After a rebound of sorghum prices in the subsequent month, the terms of trade for pastoralists decreased in November 2018 and were similar to their year-earlier levels (Figure 11).

Figure 11: The Sudan – Terms of trade in El Obeid market (North Kordofan State)



Source: Food and Agriculture Real Time Messaging and Reporting System.

Cereal supply/demand balance (January-December 2019)

The national cereal supply/demand balance for marketing year January-December 2019 is summarized in Table 23, with a breakdown by sorghum, millet, maize, wheat and rice. The balance is based on the Mission's production estimates (including the forecast for the winter wheat crop to be harvested by early 2019) and the latest information on consumption, feed use, trade and stocks availability. The following assumptions were used:

- Total cereal production is estimated at 8.3 million tonnes, including a forecast of 595 000 tonnes of wheat.
- Opening stocks of cereals for marketing year 2018/19 are estimated at an average level of 650 000 tonnes, including 170 000 tonnes of sorghum stocks held by the Strategic Reserve Corporation. The amounts of grain stored by private and community in underground stores in the central and eastern clay plains is expected at average levels, given last year's above-average harvest and inflation-driven high cereal prices.
- Food use is estimated at 6.7 million tonnes, using an estimated population of 44.3 million people in 2019. Per capita average consumption is set at 152 kg of cereals per year, which includes 75 kg of sorghum, 58 kg of wheat, 16 kg of millet, 2 kg of rice and 1 kg of maize.
- Feed use is forecast at 382 000 tonnes. In the absence of any survey data, based on discussions with farmers and extension officers, it is estimated that about 5 percent of the sorghum and millet produced is going to be used as feed for livestock and poultry, as pasture conditions in most parts of the country is average to above average due to good rainfalls.
- Seed requirements for 2019 planting are estimated at about 123 000 tonnes on the basis of average planted areas during the latest three years and the recommended seed rate in the Sudan. The following seed rates have been used: 7.5 kg per hectare for sorghum, 4 kg per hectare for millet, 20 kg per hectare for maize, 120 kg per hectare for wheat and 75 kg per hectare for rice.
- Post-harvest losses and other uses are estimated at 1.2 million tonnes, with a rate of 15 percent of production.
- Closing stocks of wheat are expected at an above-average level of 600 000 tonnes, as the Government tries to expand the stocks for a food security purpose against increasing prices of import goods such as wheat. Closing stocks of sorghum and millet, which include exportable surpluses, are estimated at high levels of 910 000 and 1.5 million tonnes, respectively, reflecting the surplus production of 2018.
- The structural deficits between production and consumption for wheat, maize and rice are expected to be covered by normal levels of commercial imports.

Table 23: The Sudan - National cereal supply/demand balance, January-December 2019 ('000 tonnes)

	Sorghum	Millet	Maize	Wheat	Rice	Total
Availability	**5 303**	**2 797**	**45**	**745**	**30**	**8 920**
Opening stocks	350	150	0	150	0	650
Production	4 953	2 647	45	595	30	8 270
Food aid	0	0	0	0	0	0
Total utilization	5 303	2 797	54	3 289	94	11 536
Food	3 326	709	44	2 572	89	6 740
Feed	248	132	2	0	0	382
Seed	77	17	0.7	28	0.6	123
Post-harvested losses	743	397	7	89	5	1 241
Closing stocks	910	1 541	0	600	0	3 051
Estimated import requirements	**0**	**0**	**9**	**2 544**	**64**	**2 616**
Anticipated commercial imports	**0**	**0**	**9**	**2 544**	**64**	**2 616**
Estimated gap	**0**	**0**	**0**	**0**	**0**	**0**

Source: CFSAM.

RECOMMENDATIONS

The following recommendations are put forward with the objective to strengthen domestic production, food security and the functioning of the markets:

- The Government's support to farm mechanization should be increased, with a focus on tractor and machinery maintenance.
- The availability of certified seeds should be increased, with timely delivery by farmers.
- Irrigation schemes need both routine and special maintenance work to restore satisfactory efficiency.
- Agriculture extension services should be reinforced to promote the adoption of new technology to farmers.
- An efficient strategy to control mesquite trees should be put in place to prevent further expansion and damage to agriculture.
- Capacity strengthening support needs to be provided to farmers and agricultural institutions, such as post-harvest management, to enhance productivity and resilience.
- Gum arabic production should be encouraged, with a focus on the areas with high refugees' returns, to provide alternative sustainable livelihoods for rural people. Maintaining food security as a key objective, activities should support women's organizations and promote gender equality.
- A new agriculture and livestock census needs to be conducted to provide a more realistic and updated picture of the importance of the sector in the economy of the Sudan.
- Financial institutions should provide simplified credit lines to smallholders using alternative collaterals, such as part of forward contracting to allow investments in agricultural assets and farm machinery.
- To expand agricultural finance services, formalization of IDs for farmers should be promoted.
- Agri-processing industry should be highly promoted for cotton, groundnut, sesame and sunflowers, seeking value-added products.
- Given the surplus production of 2018 and the limited capacity of storage, effective agri-export promotion strategies should be developed, taking advantage of the weakening of the country's currency, which has increased the country's competitiveness in international markets.
- Export marketing of millet should be promoted by identifying potential importers and their regulations regarding taiffs, food safety, etc., as the crop used to be domestically consumed, unlike sorghum that was exported in 2017 about 600 000 tonnes.
- In times of high prices, strategic reserves could be used to maintain the levels of consumption of the vulnerable population and net food consumers.
- Vulnerable populations should be assisted with food distributions, cash-based transfers, nutrition and livelihood support to meet their basic food and nutrition needs, as food access is a major concern.
- If further devaluations of the currency take place, more upward pressures will be exerted on the prices of imported goods, including inputs such as fuel, fertilizers and insecticides as well as vaccines for livestock. Under this circumstance, some inputs could be supplied through international aid.
- Due to the currency instability, it is advisable that development projects be financed in USD and not in SDG.