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2021 FAO/WFP CROP AND FOOD SECURITY
ASSESSMENT MISSION (CFSAM) TO
THE REPUBLIC OF SOUTH SUDAN

9 June 2022

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ABBREVIATIONS AND ACRONYMS

AEA	agriculture extension assistant
AFI	IPC Acute Food Insecurity
AFIS	Agriculture and Food Information System
BCS	body condition scoring
BSS	Bank of South Sudan
COVID-19	coronavirus disease 2019
BQ	black quarter
CBPP	contagious bovine pleuropneumonia
CBT	cash-based transfers
CCPP	contagious caprine pleuropneumonia
CCMC	County Crop Monitoring Committee
CFSAM	Crop and Food Security Assessment Mission
ECF	East Coast fever
FAO	Food and Agriculture Organization of the United Nations
FAW	fall armyworm
FCS	food consumption score
FES	food expenditure share
FMD	foot-and-mouth disease
FSNMS+	Food Security and Nutrition Monitoring System - Plus
FY	fiscal year
GDP	gross domestic product
GIEWS	Global Information and Early Warning System on Food and Agriculture
HFA	humanitarian food assistance
HNO	humanitarian needs overview
IDP	internally displaced person
INGO	international non-governmental organization
IMF	International Monetary Fund
IPC	Integrated Food Security Phase Classification
JMMI	Joint Market Monitoring Initiative
LCSI	livelihood-based coping strategy index
MoA	Ministry of Agriculture
MoAFS	Ministry of Agriculture and Food Security
NBS	National Bureau of Statistics
NDVI	Normalized Difference Vegetation Index
NGO	non-governmental organization
OCHA	United Nations Office for the Coordination of Humanitarian Affairs

PET	Pictorial Evaluation Tool (Crop yield and livestock condition photo indicators)
POC	protection of civilians
PPR	<i>peste des petits ruminants</i>
QQU	<i>Quelea quelea</i> birds
rCSI	reduced coping strategy index
RFE	rainfall estimate
SMoA	State Ministry of Agriculture
SSP	South Sudanese pound
UNMISS	United Nations Mission in South Sudan
US/EIA	United States/Energy Information Administration
VAM	Vulnerability Analysis and Mapping
WFP	World Food Programme

HIGHLIGHTS

- The 2021 net cereal production (after standardized deduction of post-harvest losses and seed use) in the traditional smallholder sector is estimated at about 839 500 tonnes, 4 percent below the 2020 output and well below the pre-conflict levels. The year-on-year decrease in cereal production is mainly driven by reduced yields due to prolonged dry spells and widespread floods, which had offset a slight increase in harvested area. Significant flood-induced crop production shortfalls occurred in Warrap and Jonglei states, where cereal production in 2020 was already at very low levels.
 - The harvested area in 2021 is estimated at about 995 000 hectares, slightly up from 2020 and 8 percent above the 2016–2020 average, but still below pre-conflict levels. Security improvements in some areas prompted returns of displaced households and encouraged farmers to expand plantings in fields far from homesteads.
 - With a projected population of about 12.5 million in mid-2022, the overall cereal production deficit in the 2022 marketing year (January/December) is estimated at around 541 000 tonnes, about 16 percent above the deficit estimated for 2021.
 - In 2021, the intensity of the national conflict remained at low levels, as the ceasefire that was agreed in September 2018 continued to hold, but episodes of organized violence at subnational level have been increasing since 2020, threatening the stability and the food security of the country.
 - Excessive rains and river overflows, particularly in the areas along the River Nile and its tributaries, triggered floods in Warrap, Northern Bahr-el-Ghazal, Jonglei, Upper Nile, Lakes, Unity and Central Equatoria states, affecting about 835 000 people and resulting in significant crop losses and livestock mortality.
- 
- Localized crop losses due to fall armyworm (FAW) occurred during the first season in southern bimodal areas as pest proliferation was favoured by below-average rains in May and June. However, heavy seasonal rains in July and August largely neutralized the pest.
 - Widespread weed infestations affected crops in flooded areas, as water constrained access to fields and impeded weeding activities.
 - Availabilities of pasture and water for livestock were generally adequate. However, in most flooded areas, tens of thousands of animals died due to drowning, starvation and diseases caused by pasture inundation.
 - Prices of sorghum, maize and wheat generally declined in 2021, mainly as a result of the appreciation of the national currency on the parallel market. In late 2021, prices were lower on a yearly basis, but remained at exceptionally high levels, constraining food access for large segments of the population.
 - In December 2021, the number of internally displaced persons (IDPs) in the country stood at 1.62 million and the number of South Sudanese

refugees in neighbouring countries was estimated at about 2.19 million.

- Under the 2021 Emergency Livelihood Response Programme (ELRP), FAO plans to support 1 million severely food insecure farming, fishing and agropastoral households with emergency livelihood support, by giving priority to the most vulnerable people, including women-headed households, IDPs, returnees and host communities.
- According to the Integrated Food Security Phase Classification (IPC)¹ analysis conducted in March 2022, around 7.74 million people (62.7 percent of the population) are projected to face IPC Phase 3 (Crisis) or higher levels of acute food insecurity during the lean season, between April and July 2022. Over the same period, an estimated 87 000 people are expected to be in IPC Phase 5 (Catastrophe), while 2.9 million people are expected to be in IPC Phase 4 (Emergency) acute food insecurity.
- Eight counties are projected to have populations in IPC Phase 5 (Catastrophe) levels of acute

food insecurity during the lean season between April and July, including Fangak, Canal/Pigi and Ayod counties in Jonglei State, Pibor County in Greater Pibor Administrative Area, Cueibet and Rumbek North counties in Lakes State and Leer and Mayendit counties in Unity State. Tonj East in Warrap State could not be assessed, but it is also likely to be in a critical situation.

- Fifty-two counties, primarily in Jonglei, Unity, Warrap, Northern Bahr-el-Ghazal, Upper Nile and Lakes states, are projected to be in IPC Phase 4 (Emergency) acute food insecurity during the lean season.
- Acute food insecurity continues to be driven by multiple, often overlapping, shocks, including climate-related shocks (floods, dry spells and droughts), insecurity (subnational and localized violence), population displacement (internal displacement, refugees) and macroeconomic shocks (inflation, exchange rate fluctuations). Limited access to basic services and the cumulative effects of prolonged years of asset depletion continue to erode households' coping capacities.

OVERVIEW

The annual FAO/WFP Crop and Food Security Assessment Mission (CFSAM) was conducted from 7 to 17 December 2021 to estimate the cereal production in South Sudan during 2021 and assess the overall food security situation in the country. The CFSAM reviewed the findings of several crop assessment missions conducted at planting and harvest time from June to December 2021 in different agroecological zones of the country. All missions were carried out by an agricultural Task Force Team that comprised staff from the Ministry of Agriculture and Food Security (MoAFS), the National Bureau of Statistics (NBS), the Food and Agriculture Organization of the United Nations (FAO) and the respective State Ministry of Agriculture (SMoA), abiding to health protocols for the protection from the COVID-19 pandemic. Task Force Team members have been trained during the past years to conduct rapid assessments using established CFSAM instruments, protocols and techniques, including walking transects, scoring standing crops according to the Pictorial Evaluation Tool (PET)¹, yield levels and livestock body condition, performing key informant interviews and farmer case studies.

Since 2016, 64 County Crop Monitoring Committees (CCMCs) have been established¹ with the aim to improve the local capacity to collect reliable and accurate data. In addition, FAO has recruited and deployed to FAO's suboffices 34 Agricultural Extension Assistants (AEAs) to work closely with the CCMCs and strengthen the presence at the field level to ensure the timely provision of information on the progress of the season. The European Union, through the FAO Representation in South Sudan, has financially supported all assessments and training activities.



As in previous years, the 2021 CFSAM followed a year-long roadmap. Insecurity, still prevailing in some areas, has constrained the full execution of the initial plan and field work activities were carried out only in accessible areas of the ten states. As in the past years, in parts of Unity, Jonglei, Central, Eastern and Western Equatoria states, access by Task Force teams has been precluded. In all visited areas, concerns over security precluded to conduct driving transects and yield assessments were mainly performed through walking transects and crop cutting (sampling) accomplished by both the Task Force teams and CCMCs. Overall, 36 planting and harvest assessment missions were conducted, visiting 43 counties and conducting 4 157 interviews (4 025 farming household case studies and 132 interviews with key informants) between June and December 2021.

Using standard CFSAM procedures, the Task Force teams reviewed secondary sources of information regarding the main factors that affected crop performance during the 2021 agricultural season,

¹ In the framework of the concluded FAO/AFIS Project and the ongoing FAO-European Union Project "Strengthening the resilience of pastoral and agropastoral communities in South Sudan's cross-border areas with the Sudan, Ethiopia, Kenya and Uganda" (OSRO/SSD/703/EU).

estimated the aggregate national cereal production and assessed the overall food security situation. Where risks to team safety due to insecurity were considered too severe to allow access at crucial times, telephone interviews with key informants were used to derive the estimates. Information collected by CCMCs operating in insecure areas, not accessible by the Task Force teams, were sent to the crop assessment team in Juba through various means, including hand delivery of reports.

Following improvements in security, about 270 000 refugees returned to the country in 2021 and the population sheltering inside the United Nations Mission in South Sudan (UNMISS) protection of civilians (POC) sites declined from 125 000 at end-2020 to 34 000 at end-2021. However, floods in Warrap, Northern Bahr-el-Ghazal, Jonglei, Upper Nile, Lakes, Unity and Central Equatoria states and episodes of intercommunal violence in Jonglei, Lakes, Unity, Upper Nile, Warrap and Western Equatoria states caused significant new displacements.

The aggregate cereal harvested area in the traditional farming sector in 2021 is estimated at about 995 000 hectares, about 1 percent up from 2020 and 8 percent above the 2016–2020 average. The slight year-on-year increase is mainly due to security improvements in some areas that prompted returns of displaced households and encouraged farmers to plant crops also in fields far from the homesteads, leading to a 3.3 percent increase in the number of farming households. However, this increase was mostly offset by a 2.4 percent decrease in the average area cultivated per household due to localized intercommunal violence disrupting agricultural operations and by localized production losses in some flooded areas. The harvested area was higher than the average of the previous five years, but it remained well below the pre-conflict level due to persisting constraints to access to fields and high input prices. Despite the increasing trend between 2018 and 2021, the cultivated area is still low in most key producing areas of the Greenbelt (Central and Western Equatoria states) and Western Bahr-el-Ghazal State due to large-scale displacements, which occurred in late 2016 and 2017.

The 2021 net cereal production from the traditional sector, after deduction of post-harvest losses and seed use, is estimated at about 840 000 tonnes, 4 percent below the 2020 output, 4.2 percent above the average of the previous five years, but still well below the pre-conflict levels. The year-on-year decrease in production is attributed to a 4.7 percent decline in the average yield, mainly caused by erratic rains and flood damage affecting crops in several areas, which offset the minimal increase in harvested area.

Excessive rains and river overflows, particularly in the areas along the River Nile and its tributaries, triggered widespread floods in Warrap, Northern Bahr-el-Ghazal, Jonglei, Upper Nile, Lakes, Unity and Central Equatoria states, which affected about 835 000 people and resulted in significant crop losses and livestock mortality. In areas not affected by floods, prolonged dry spells in late May and June affected crop germination and establishment. Improved rains since July lifted crop prospects, but some damage was irreversible, resulting in yield and output reductions. In addition, second season crops in bimodal rainfall areas were affected in some areas by below-average rainfall from October to December, further constraining yields.

In some states, significant crop production shortfalls were caused by floods. In Warrap State, where about 28 500 hectares have been damaged, production declined in 2021 by more than 20 percent compared to 2020, reaching the lowest level on record since 2014. In Lakes, Upper Nile and Unity states, the cereal output in 2021 was 10.5, 12 and 15 percent lower than in 2020, respectively. In Jonglei State, cereal production has been very poor as in 2020, when yields were also severely affected by floods, leading to the lowest output on record since 2016. A minimal output decline was observed in Western Equatoria State (-2 percent), mainly on account of erratic rains. By contrast, increases in the 2021 cereal production compared to 2020 were recorded in Western Bahr-el-Ghazal (+12.4 percent), Northern Bahr-el-Ghazal (+2.9 percent), in Central Equatoria (+4.1 percent) and Eastern Equatoria (+2.5 percent) states, mainly on account of expanded plantings, while yields were stagnant or, in the case of Eastern Equatoria State, lower than in the previous year due to prolonged dry spells.

Pest damage was within the normal range. Localized crop losses due to FAW occurred during the first season in southern bimodal areas as below-average rainfall amounts in May and June created a conducive environment for insect proliferation. Subsequently, heavy seasonal rains in July and August largely neutralized the pest. Widespread weed infestations affected crops in flooded areas as the water constrained access to fields, hampering weeding activities.

With a mid-2022 projected population of about 12.5 million, consuming on average about 110 kg of cereals/capita/year, the cereal requirement in 2022 is estimated at about 1.38 million tonnes. Accordingly, an overall rounded deficit of about 541 000 tonnes of cereals is estimated in the traditional sector during the 2022 marketing year (January/December), about 16 and 17 percent above the deficit estimated for 2021 and the 2017–2021 average, respectively.

The gross domestic product (GDP) is forecast to slightly increase by 1.2 percent in fiscal year (FY) 2021/22, driven by a recovery of the non-oil sector, after having contracted by 5.4 percent in FY 2020/21 as a result of the negative impact of the COVID-19 pandemic, mainly on oil revenues.

Following the liberalization of the official exchange rate in April 2021, the exchange rate appreciated on the parallel market from SSP 620/USD in March 2021 to SSP 418/USD in November 2021

and the spread between official and parallel market exchange rates was virtually eliminated.

Following a sustained increasing trend since 2015 on account of the depreciation of the national currency, the general economic downturn and widespread insecurity, prices of sorghum, maize and wheat declined in several markets, including the capital, Juba, in 2021, mainly as a result of the appreciation of the national currency on the parallel market. In late 2021, prices were lower on a yearly basis, but remained at exceptionally high levels, constraining food access for large segments of the population.

According to the March 2022 IPC analysisⁱⁱⁱ, food security is expected to deteriorate during the lean season, between April and July 2022, reaching to 7.74 million people (62.7 percent of the population) in IPC Phase 3 (Crisis) or higher levels of acute food insecurity. In counties already affected by floods in 2021, food security is expected to worsen due to forecasts predicting widespread floods during the 2022 rainy season, limiting physical access to markets and livelihood opportunities. This is of particular concern as some counties have already pockets of populations in famine likely situation, namely Fangak, Canal/Pigi and Ayod counties in Jonglei State, Pibor County in Greater Pibor Administrative Area, Cueibet and Rumbek North counties in Lakes State and Leer and Mayendit counties in Unity State. Tonj East in Warrap State could not be assessed, but is also likely to be in a critical situation.



SOCIOECONOMIC CONTEXT

Population and population movements

Since the conflict started in December 2013, population size and geographical distribution have significantly changed. According to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA)^{iv}, as of December 2021, 3.81 million people had been forced to flee their homes due to insecurity, including 1.62 million IDPs and 2.19 million people that fled into neighbouring countries (Uganda, the Sudan, the Democratic Republic of the Congo, Ethiopia and Kenya).

The overall security situation improved since late 2018, after the signing of the Revitalized Agreement on the Resolution of the Conflict in the Republic of South Sudan (R-ARCSS). According to the United Nations High Commissioner for Refugees (UNHCR)^v, since the signing of the R-ARCSS, about 505 000 refugees have returned to South Sudan in a self-organized manner from Uganda, the Sudan, Ethiopia and Kenya. Of them, an estimated 267 760 refugees were reported as having returned in 2021, mainly in Jonglei, Unity, Upper Nile, Western Bahr-el-Ghazal, Northern Bahr-el-Ghazal, Central, Eastern and Western Equatoria states. Concurrently, the number of internally displaced people declined, with the population sheltering inside the UNMISS POC sites declining from about 200 000 as of end-2018, to 125 000 as of end-2020 and to 34 000 as of end-2021.

However, organized violence at subnational level, which substantially increased in 2020, continued to result in localized insecurity, which in 2021 was reported mainly in Jonglei, Lakes, Unity, Upper Nile, Warrap (particularly Greater Tonj Region) and Western Equatoria (mainly Tambura) states, and drove new displacements, with 88 000 South Sudanese forced to leave the country in 2021. In



addition, severe floods since May affected 835 000 individuals, causing large-scale displacement of people and livestock, with floodwaters having not receded in several areas as of end-2021.

Economy

Economic growth and national budget

Oil production plays an important role in the economy of South Sudan, contributing to slightly more than half of the GDP, 95 percent of exports, 90 percent of government revenues and a significant share of private sector employment. The domestic oil sector remains closely linked to the Sudan, where processing facilities, pipelines, export terminals and refineries are located. Since independence in 2011, oil production has steadily declined and has experienced frequent disruptions due to disputes with the Sudan and to the civil war. Estimated at 350 000 barrels/day before independence, oil extraction was interrupted in January 2012, due to a dispute with the Sudan over transit fees and transfers. Production resumed in April 2013, but it never fully recovered and in 2017 it was estimated at about 110 000 barrels/day. With the improvement of the security situation after the signing of the R-ARCSS, the output increased to about 180 000 barrels/day in late 2019. Subsequently,

Figure 1: South Sudan - Crude oil - Europe Brent monthly spot prices, f.o.b.



Source: United States of America Energy Information Administration (EIA), 2022.

in FY 2020/21 (July/June), the economy of the country faced significant negative factors, mainly the COVID-19 pandemic which constrained new investments to replace exhausted wells and declining oil prices. As a result, the daily production decreased to 160 000 barrels. According to national authorities, oil production is projected to continue to decline to 156 000 barrels/day in FY 2021/22, due to the exhaustion of other oil wells and the impact of floods.

According to the World Bank^{vi}, the GDP, after having contracted by 5.4 percent in FY 2020/21, is forecast to slightly recover by 1.2 percent in FY 2021/22. The slight increase of the GDP is driven by a recovery of the non-oil sector, which, after having contracted by 5 percent in FY 2020/21, is expected to increase by 3.5 percent in FY 2021/22. By contrast, the output of the oil sector, after having contracted by almost 6 percent in FY 2020/21, will continue to decrease, declining by 2.5 percent in FY 2021/22. Oil prices, after having sharply declined in early 2020, decreasing by more than 70 percent between December 2019 and April 2020 due to the negative impact on demand of the COVID-19 pandemic, doubled between April 2020 and December 2021 as a result of the recovery of the global economy. Prices further increased in early 2022, surging by 20 percent between February and March 2022, due to the conflict in Ukraine.

However, these price increases may be short lived and, in addition, the country cannot profit from them, since most oil fields are mature and their output cannot increase. Substantial investments in enhanced oil recovery techniques are needed to increase the oil output, but the fragile political and economic context constrains foreign investments. As a result, only the diversification of the economy and the expansion of the non-oil sector can allow a stable growth.

The draft FY 2021/22 national budget was presented in parliament on February 2022 with the following macroeconomic objectives:

- Achieve economic growth of at least 1 percent.
- Reduce inflation to no more than 20 percent.
- No borrowing from the Bank of South Sudan (BSS).

The budget is estimated at SSP 851.32 billion, with mandatory transfers, including debt service amounting to SSP 564.29 billion, leaving SSP 287.04 billion to the spending agencies budget. The budget will be financed with SSP 647.38 billion of revenues and SSP 647.38 of financing, leaving a financing gap of SSP 125.54 billion.

The main transfers are those to the Sudan for oil transportation and transit fees, allocations to meet

debt service obligations, including repayment of oil advances, transfers to the Ministry of Petroleum and road projects. Mandatory or direct transfers absorb large shares of revenue (close to two-thirds) and consume a large proportion of the budget, severely limiting the resources available for expenditure on critical service delivery and human development needs. Their disproportionately high amount is due to the fact that a high proportion of them consists of oil advances and commercial debts collateralized with oil revenues,² characterized by terms and conditions that make debt service very costly. In this regard, government authorities have declared that they will avoid any further oil advance or commercial debts of this type unless a very limited set of conditions is met.

With the limited remaining available resources, in the FY 2021/22 national budget a number of sectors have been allocated increased resources, including education (10.9 percent of total expenditure), public administration (7.6 percent) and security (7.1 percent). By contrast, the resources for a number of other sectors have been reduced, including health (4.4 percent of total expenditure), agriculture, natural resources and rural development (1.4 percent) and infrastructure, except the “oil-for-road” projects³ (1.6 percent). While capital spending is expected to account for 10.3 percent of budgetary expenditure, the country continues to underinvest in sectors that would have the largest impact on poverty reduction, building resilience and human capital development, all of which are vitally necessary to create conducive conditions for long-term growth.

Exchange rate and inflation

In April 2021, the BSS implemented a gradual liberalization of the official exchange rate. This policy, which involved an auction-based gradual adjustment toward a market-determined exchange rate, is a component of a wider reform process intended to facilitate macroeconomic stabilization and to improve public financial management. On the parallel market, the exchange rate appreciated

to SSP 418/USD in November 2021, up from SSP 620/USD in March. At the same time, the official exchange rate depreciated to SSP 413/USD in November 2021 from SSP 186/USD in March. As a result of these reforms, the spread between the parallel and the official exchange rates was virtually eliminated in November, when it was estimated at about 1 percent, compared to about 233 percent in March 2021.

Inflation substantially declined in 2021, reflecting exchange rate stability and improved monetary and fiscal discipline. According to official data, the year-on-year inflation rate declined from 46.8 percent in January 2021 to 5.8 percent in October 2021. The decline in the cost of non-food items has been the largest contributor to reduced inflation, being estimated at negative levels between January and September 2021. Nevertheless, also food inflation substantially declined, decreasing from 67.5 percent in January to 11.3 percent in August. With inflation, a major concern for both formal and informal businesses, the reduced price pressures may help to stimulate a recovery in market activity.

Agriculture

The country is endowed with a diverse ecology providing a growing season ranging from 280 to 300 days per annum in southwestern cropping areas, known as Greenbelt, and from 130 to 150 days per annum in northern states. Bimodal rainfall areas cover most of Greater Equatoria Region (Western, Central and parts of Eastern Equatoria), while the rest of the country has a unimodal rainfall regime. Agricultural performance varies markedly depending on latitude and longitude, with the possibility of two or three harvests per annum from the same plots in Greater Equatoria Region and a single harvest in the unimodal rainfall areas further north.

The country’s agriculture is almost entirely dependent on rainfall and hence the rainfall variability in terms of amount and distribution is usually the major

² Debt is collateralized when the creditor has rights over an asset or revenue stream in cases where the borrower defaults on payment obligations.

³ With the “oil-for-roads” projects, the Government of the Republic of South Sudan agreed in 2019 to allocate 10 000 barrels of its crude oil per day to Chinese firms to build roads in the country.

factor in determining crop production. Rainfall generally increases from northeast to southwest, culminating in Greenbelt along the border with the Central African Republic, the Democratic Republic of the Congo and Uganda. However, there are usually considerable variations in rainfall from year to year and from location to location within the same year. In low-lying areas, flooding and water-logging are a common occurrence, while prolonged dry periods are frequent in southeastern areas and along the border with the Sudan.

Crop production is mainly conducted by smallholder farmers on small plots of land cultivated manually using hand tools. The average family size is five to seven persons that belong to larger family aggregations. Despite an abundance of arable land throughout the country, the extent of the cultivated area is limited mainly by (a) the size of the household labour force and/or the ability of the households to provide in-kind payment (essentially food/local beer) for the mobilization of traditional working groups (*nafeer*); (b) the limited availability of efficient tools and power for land clearing and ploughing and (c) a limited security of access to land, including difficulty of cultivating fields far from living areas.

Throughout the country and particularly in Lakes and parts of Warrap and Northern Bahr-el-Ghazal states, farmers have high interest to expand their farm sizes in both the near-by and far fields through increased adoption of animal traction. However, after the escalation of the conflict in 2016, farm sizes in insecure areas have either decreased or remained stagnant due to the fear of accessing far fields. During the past 20 years, animal traction has been promoted by FAO and several non-governmental organizations (NGOs) in Central and Eastern Equatoria, Lakes, Warrap and Western and Northern Bahr-el-Ghazal states in attempts to facilitate an increase in the area cultivated by each household. However, the high cost of mould-board ploughs and the lack of spare parts and skills to maintain and operate them, coupled with the low availability of raw materials for local blacksmiths and high prices of hand tools, still limit area expansion.

Despite improvements of the security situation starting from 2018, the secure access to land, both near homesteads and the far fields, has been a critical issue, mainly in Greater Upper Nile Region and its bordering areas, the epicentre of the conflict, as well as in most areas of Greater Equatoria Region, where the civil war spread in 2016, resulting in the displacement of several farming households. In 2021, the security situation slightly improved in Upper Nile and parts of Central Equatoria, but deteriorated in Tambura County, one of the most productive of Western Equatoria State, affecting both the first and second cropping seasons.

Large-scale mechanized cereal production is practised only in some areas of Upper Nile, particularly in Renk and Melut counties, following the patterns of land use established before the independence by traders/farmers from both South Sudan and the Sudan. Small activities of commercial farming are also practiced in Northern Bahr-el-Ghazal State, including the Aweil Rice Scheme and some private commercial farming, mainly producing sorghum. The term “mechanization” applies only to a one-pass ploughing and a second sowing pass with a seed drill positioned over the ubiquitous disc harrows, while most other operations are performed manually. Elsewhere, limited numbers of both private and government-owned tractors provide ploughing services to individuals and farmer groups. However, tractor service faces major problems related to the supply and high cost of fuel and spare parts, operator skills and maintenance, and repair capabilities persist, severely limiting the efficiency of the tractor service. This has increased the tractor hire rate making it unaffordable for small farmers. In general, only one-fourth of the tractors purchased over the last 15 years is functional.

Sorghum is the main cereal crop cultivated in both the smallholder and mechanized sector, comprising about 70 percent of the area sown to cereals. The preferred sorghum seeds are found among many local landraces with lengths to maturity fitting agroecological niches⁴ ranging from short-season (<90 days) to very long-season (>220 days) types.

⁴ Short-season landraces provide an early harvest in August/September, while long-season landraces, able to withstand both dry spells and waterlogging, are harvested in December/January.

There are also several improved, short-cycle varieties of sorghum from the Sudan that have become well established in both large-scale mechanized farms and traditional smallholder farming areas, with cross-border access to the Sudan.⁵

Maize is the second dominant cereal covering in 2021 an estimated 21 percent of the total cereal area in the traditional sector. However, this percentage varies from year to year and hides some regional differences. Maize is the most popular cereal in Greenbelt, where *Longi* varieties (especially *Longi-5*) from Uganda are grown in series in two crops per year on the same land (200 percent occupancy). It is also the main cereal crop in southern and central parts of Unity State, along the Sobat River in Upper Nile State and in eastern counties of Jonglei State near the Ethiopian border, where mixed *Longi* varieties, local landraces and Ethiopian varieties are noted. Elsewhere, maize is only cultivated in very limited areas close to homesteads, where it is consumed green with the first early sorghums in August-September.

Other cereals, namely bulrush millet, finger millet and rice, were estimated in 2021 to account for the remaining 9 percent of the cereal area in the traditional sector. In Northern and Western Bahr-el-Ghazal, Warrap and Lakes states, sorghum is intercropped with bulrush millet, while finger millet and upland rice are mainly found in Greater Equatoria Region. In recent years, the cultivation of rice in Western Equatoria State has been expanding with rice planted as a sole crop or intercropped with maize, groundnuts and cassava. Other crops of major importance to food security include groundnuts and cassava, sweet potatoes and yams. Groundnuts and cassava are estimated in 2021 to account for 21 and 7 percent, respectively, of all crops grown in the country. Cassava is estimated to account for almost 17 percent of the planted area in Western Equatoria State, 11 percent in Eastern Equatoria State and about 13 percent in Western Bahr-el-Ghazal and Central Equatoria states. While groundnuts are grown in all states, the percentage of cultivated area varies: 36 percent in Lakes, 30 percent in Western Bahr-el-Ghazal,

27 percent in Northern Bahr-el-Ghazal, 23 percent in Central Equatoria, 20 percent in Warrap and 16 percent in Western Equatoria. Groundnuts, mainly Red Beauty and Mr Lake varieties, are usually cultivated on sandier soils and, after cereals, they represent the most important contribution to the households' diets in these areas, where they are also the main cash crop. Sesame is grown in almost all states, especially in Greater Bahr-el-Ghazal State, traditionally intercropped with sorghum. At the national level, sesame accounts for about 5 percent of the crop output. Recently, the crop's popularity is increasing in northern areas, especially in the commercial farming areas of Upper Nile, where it is sold at high, profitable prices to traders from the Sudan. Other main sesame growing areas include Warrap, Western Bahr-el-Ghazal, Northern Bahr-el-Ghazal and Western Equatoria states.

Okra, cowpea, green-gram, pumpkin, Bambara nut and tobacco are also widely grown around homesteads throughout the country. Vegetables, including onions and tomatoes, are increasingly cultivated near the cities to supply urban markets. In the absence of reliable farmers' shops, vegetable kits distributed by various NGOs have been the main sources of seeds.

Most farmers use their own seed retained from the previous year's harvest or local seeds purchased from the markets or borrowed from relatives. However, farmers close to the borders with the Sudan or Uganda and vulnerable households have been receiving seeds from FAO and NGOs.

Modern inputs, including chemical fertilizers, pesticides or herbicides, are not used by smallholder farmers on field crops. However, some use of herbicides has been reported in large-scale mechanized farms in Upper Nile State, with access to supplies from bordering areas of the Sudan (mainly White Nile State). In 2021, the crop assessment Task Force teams have reported the use of pesticides in commercial farms of Upper Nile State on sesame and in few medium-scale vegetable farms in Central Equatoria State. Regarding pest control campaigns,

⁵ *Arfa Gadameck*, Wad Ahmed, Gaddam el Hamam.

before South Sudan's independence, migratory *Quelea quelea* (QQU) bird populations near the mechanized areas were routinely controlled by aerial spraying of nesting sites. Although the practice was resumed in 2013, with some aerial spraying conducted by the Desert Locust Control Organization for Eastern Africa (DLCO-EA), no actions have been taken since then as the concerned areas were located in conflict-affected states, leaving the sorghum crops to be harvested in January in Upper Nile State vulnerable to bird attacks. In the 2021 cropping season, there were no reports of serious damage on sorghum by migratory pests, including QQU, FAW and desert locusts in Upper Nile, especially Renk and Melut counties. However, the presence of common pests,

including local birds, has caused mild to moderate damage to crops, with sesame more affected by pests than sorghum.

Livestock is a very important asset throughout the country, with about 60 percent of the population dependant on it. It has a significant socioeconomic importance in addition to its role in food security and income generation. The main species include cattle, goats and sheep, raised extensively under transhumant management systems. The sale of livestock, especially small ruminants, provides a significant contribution to incomes of the households and, therefore, to the food security of both transhumant pastoralists and sedentary livestock rearers.

CEREAL PRODUCTION IN 2021

Cereal harvested area and yield estimates

In the absence of any nationally-generated, crop-yield estimates and empirical data from annual cropped land surveys disaggregated by crop, cereal production for the smallholder subsector is assessed by the CFSAM using estimates of the following variables: (1) estimates of the number of households actively farming in each county, based on: (a) total county population figures (NBS data adjusted with OCHA figures for population movements, notably refugees, IDPs, returnees) and (b) average household size and estimated proportion of households farming per county reflecting the proportion of rural to urban dwellers and access to land; (2) standard estimates of the average area per farming household under cereals for each county, adjusted according to Global Positioning System (GPS) measurement results performed during the field visits; (3) estimates of average cereal yield for each county, based on: (a) farming households' case studies by the Task Force teams, (b) crop-cut samples by the Task Force teams and CCMCs, (c) Mission transect observations made using PET photo indicators and associated protocols, and (d) information from semi-structured interviews with key informants from SMOA, NGOs and other stakeholders involved in agriculture.

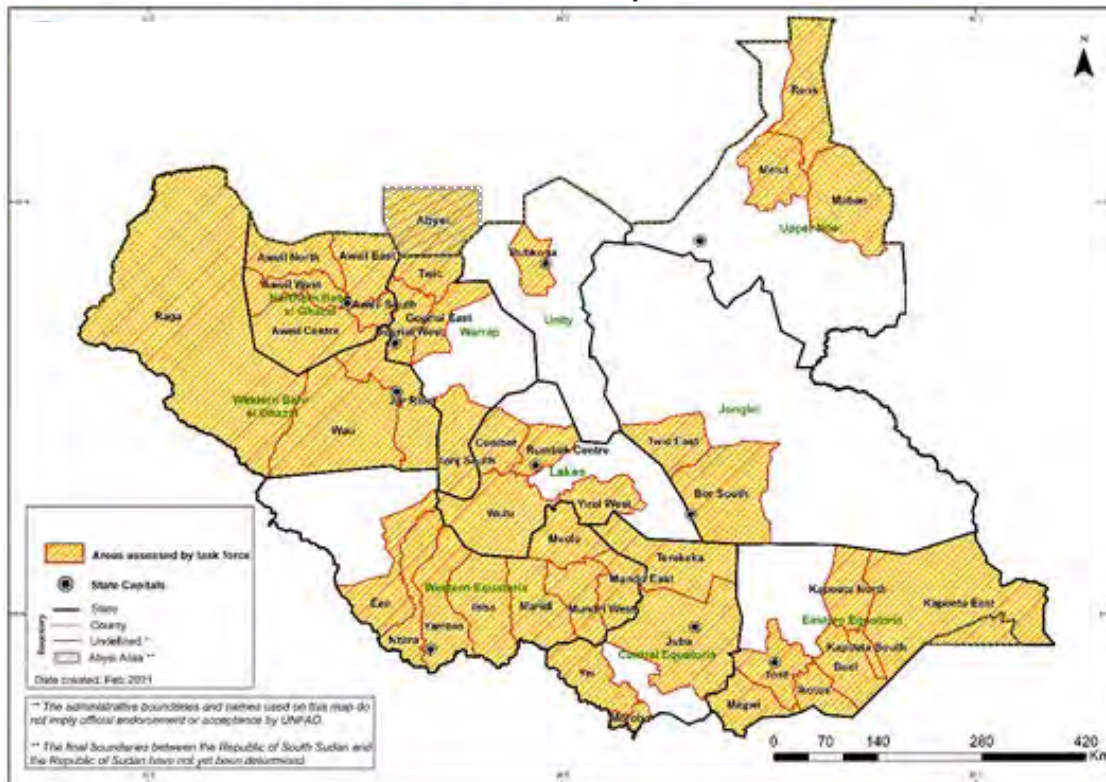
The annual cereal production estimates for each county is derived by combining the data and information from these four sources. The county figures are then added to provide the cereal production figures for each of the ten states and for the country as a whole. The number of assumptions incorporated into this methodology implies that the final production figures should not be regarded as necessarily exact, but rather as the best estimates under the prevailing circumstances.

Until 2013, the production estimates were essentially undertaken by a team of international



specialists during a six-week mission to the country in November–December, working with staff from MOAFS, NBS and FAO national staff. Starting in 2014, in a departure from the usual one-off CFSAM exercise at harvest time, several teams led by the members of a Task Force of selected specialists from MOAFS, NBS and FAO national staff conducted a series of intermediate missions at planting and harvesting time. Since 2015, the FAO South Sudan office employed an international agronomist as Crop Assessment Supervisor/Trainer to support the capacity building efforts and year-round assessment of the main crops from planting up to harvesting. As a result, all missions were scheduled to match the pertinent agricultural activities that occur at different times of the year in different cropping areas and agroecological zones. The effect of the change in approach was noticeable in terms of broader coverage, including a continuous monitoring of the cropping season and a more accurate assessment of crop production of both the first and second season harvests in bimodal rainfall areas. Therefore, the current approach, with continuous monitoring activities from planting to harvesting, has greatly improved the quality of the CFSAM estimates, providing more accurate agricultural data to enable well-informed decisions by national and international institutions.

Figure 2: South Sudan - Counties assessed by Task Force teams at harvest time, 2021



Source: FAO South Sudan, modified to comply with UN map, 2021.

Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

In order to improve participation of local line agencies and to increase the area covered by the assessment, the former Agriculture and Food Information System (AFIS) Project of FAO set up 39 CCMCs in 2016 and 2017, whose members are extension workers of the MoAFS and staff of NGOs. Members of CCMCs were trained to monitor and report the progress of the cropping season and to assess the performance of crops using a standard form designed to capture qualitative and quantitative information. This approach has continued widening the coverage, increasing the number of CCMCs to 54 in 2018 and to 64 in 2019, when they were present in all states, with the support of the new project “Strengthening the resilience of pastoral and agropastoral communities in South Sudan’s cross-border areas with the Sudan, Ethiopia, Kenya and Uganda (OSRO/SSD/703/EU)”, funded by the European Union. The location of CCMCs is shown in Figure 3. Therefore, from 2017 to date, the annual crop assessment exercise in South Sudan is based on two

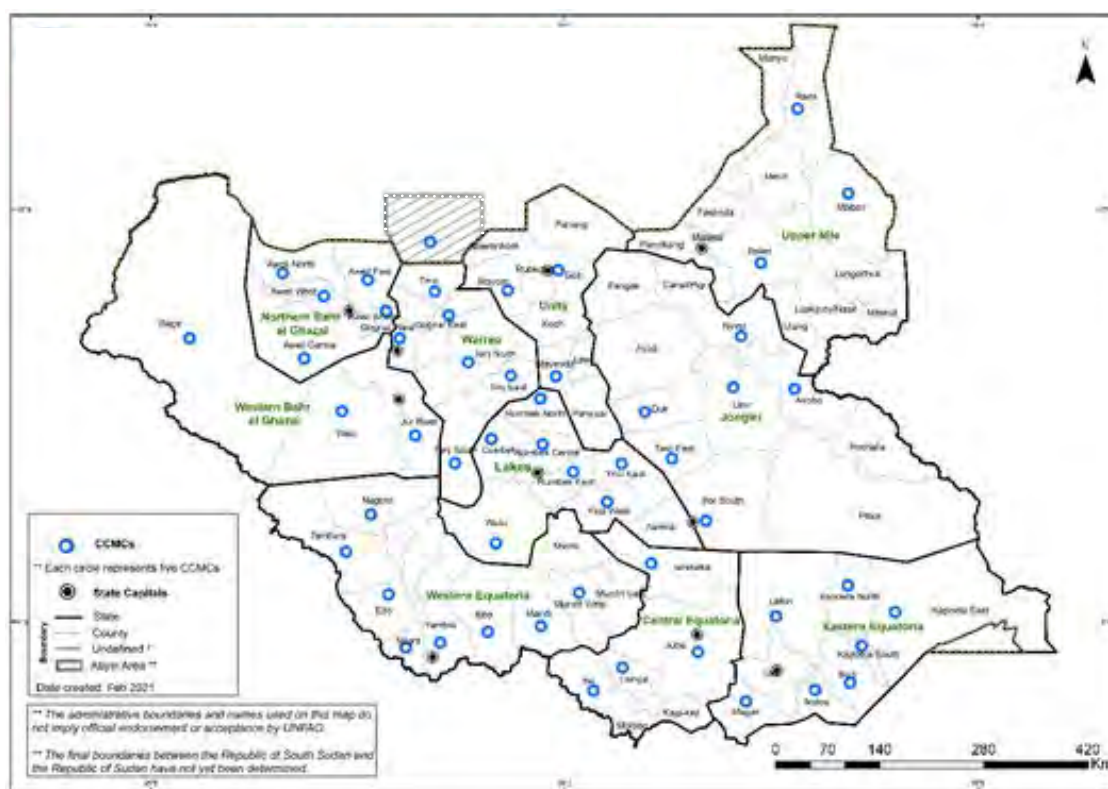
main pillars: the Task Force Team-led approach and the work by CCMCs.

In addition, FAO in 2021 has recruited 34 AEA working in various counties in various FAO sub-offices County Agriculture departments, who are also engaged in crop, flood and migratory pest assessments and provision of seasonal updates. This, together with the participation of monitoring and evaluation assistants at state level, have contributed to broaden the geographic coverage and the quality of crop assessment data during the 2021 cropping season.

In 2021, during all the assessment missions carried out by the Task Force teams at harvesting time, security-related access constraints required the field work to be conducted only in pre-selected locations that were reachable by air or by main roads where at least two vehicles were required to drive in-tandem. Since 2015, walking⁶ transects in specific locations

⁶ Team members independently walk through crop fields, scoring yields in every plot/field passed by colour code according to “close-up level” of PET photo indicators for each major crop. Scores made are then converted from colour codes into tonnes/hectares and weighted averages calculated for each transect walked.

Figure 3: South Sudan - Location of County Crop Monitoring Committees (CCMCs), December 2021



Source: FAO South Sudan, modified to comply with UN map, 2021.

Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

were mostly used rather than long-distance driving transects to estimate yields. In recent years, with the increased coverage of the cropping areas assessed by the Task Force teams and CCMCs and the scheduling of missions at harvest time in the diverse agroecological zones, there has been more reliance on crop-cuttings (sampling) rather than on PET-based transects to estimate yields, which were mostly used in areas where crops were not fully mature or not ready for harvest at the time of the Task Force teams' visits, in which case taking samples of immature crops would have been misleading in yield estimations due to the high moisture content of the grains. In the 2021 cropping season, the Task Force teams applied also relevant protocols and guidelines related to the COVID-19 pandemic and its containment measures.

In 2021, the Task Force teams conducted 35 planting and harvest assessment missions, visiting 43 counties. These assessments were conducted between June and December 2021 in all the ten states, including the Abyei Administrative Area. The Task Force teams completed a total of 4 157 interviews (4 025 household case studies

and 132 interviews with key informants) during the planting and harvest assessment missions. The key informants included senior staff of SMoA, county officials and staff of NGOs and international agencies based in the field.

In addition, reports from functioning CCMCs offered qualitative and quantitative information on crop performance in their respective areas. Growing conditions reported in the case studies and interviews were then compared with remote sensing data and information from FAO's Global Information and Early Warning System on Food and Agriculture (GIEWS) and WFP's Vulnerability Analysis and Mapping (VAM), including Normalized Difference Vegetation Indices (NDVIs) data and rainfall anomaly estimates, along with rainfall data collected locally using manual rain gauges. Furthermore, in the areas where the risk to the teams' safety was too severe, "remote assessment" procedures have been used, through e-mail and telephone conversations with key informants, as appropriate. The contribution of CCMC networks across the country was significant when COVID-19-related travel restrictions were

in place, especially by providing seasonal and crop performance updates, and pest infestations information through telephone calls and communications by internet.

The aggregate cereal harvested area in the traditional farming sector in 2021 is estimated at about 995 000 hectares, about 1 percent up from 2020 and 8 percent above the 2016–2020 average. The slight year-on-year increase is mainly attributed to security improvements in localized areas that prompted returns of displaced households and encouraged farmers to expand plantings to fields far from the homesteads, mainly in Greater Equatoria Region and in Western Bahr-el-Ghazal State, with an ensuing 3.3 percent increase in the number of farming households. However, this was partly offset by a 2.4 percent decrease in the average area cultivated per household due to localized intercommunal violence disrupting agricultural operations and by total harvest failures in some flooded areas. Harvested area, despite being higher than the average of the previous

five years, remained well below the pre-conflict level due to the lingering impact of the prolonged conflict which continues to affect agricultural activities constraining access to fields and causing a sharp increase in input prices. Notably, despite the increasing trend in 2018–2021, the cultivated area is still low in the most productive lands of Greenbelt (Central and Western Equatoria states) and Western Bahr-el-Ghazal State due to the large-scale displacements which occurred in late 2016 and 2017.

At state level, compared to the previous year, the harvested area increased in Western Bahr-el-Ghazal (+10.9 percent), Eastern Equatoria (+4.9 percent), Central Equatoria (+4 percent), Western Equatoria (+3.2 percent) and Northern Bahr-el-Ghazal (+2 percent) states. By contrast, the harvested area decreased in Unity (-13.1 percent), Jonglei (-4.1 percent), Upper Nile (-4 percent) and Lakes (-2.1 percent) states. Table 1 shows the breakdown of the harvested area at county and state level as well as all variables used for its calculation.

Table 1: South Sudan - Estimated settled population, farming households and harvested cereal area, 2021

State/County	Population (mid-2020)	Households (mid-2020)	Farming households (percent)	Farming households (mid-2020)	Average cereal area (hectare/household)	Total cereal area (hectares)
Central Equatoria	1 167 160	188 717	46	87 740	0.90	78 847
Juba	432 129	67 809	35	23 733	0.95	22 547
Kajo Keji ^{1/}	116 456	19 300	50	9 650	0.90	8 685
Lainya ^{1/}	110 379	17 282	43	7 431	0.90	6 688
Morobo ^{1/}	151 780	23 013	38	8 745	0.90	7 871
Terekeka	178 663	31 935	80	25 548	0.75	19 161
Yei ^{1/}	177 754	29 377	43	12 632	1.10	13 895
Eastern Equatoria	1 094 498	188 720	71	134 189	0.98	131 192
Budi	102 960	17 409	85	14 798	1.25	18 497
Ikotos	136 012	26 546	80	21 237	1.05	22 299
Kapoeta East	179 870	32 291	54	17 437	0.70	12 206
Kapoeta North	113 951	17 658	56	9 888	1.00	9 888
Kapoeta South	74 537	11 113	56	6 224	0.65	4 045
Lafon	112 857	18 282	85	15 540	0.90	13 986
Magwi ^{1/}	203 696	31 514	75	23 635	1.32	31 199
Torit	170 612	33 907	75	25 430	0.75	19 073

Table 1: South Sudan - Estimated settled population, farming households and harvested cereal area, 2021 (Cont.)

State/County	Population (mid-2020)	Households (mid-2020)	Farming households (percent)	Farming households (mid-2020)	Average cereal area (hectare/household)	Total cereal area (hectares)
Jonglei	1 920 485	272 797	37	99 792	0.58	58 086
Akobo	201 648	26 222	55	14 422	0.55	7 932
Ayod	188 610	22 866	10	2 287	0.40	915
Bor South	263 467	37 361	50	18 681	0.70	13 076
Duk	127 477	19 906	38	7 564	0.45	3 404
Fangak	189 802	25 114	15	3 767	0.42	1 582
Khorflus/Pigi/Canal	108 588	13 112	10	1 311	0.50	656
Nyirol	192 192	27 005	35	9 452	0.40	3 781
Pibor	210 570	32 252	40	12 901	0.60	7 740
Pochalla	89 745	14 160	65	9 204	0.80	7 363
Twic East	132 262	22 278	25	5 569	0.25	1 392
Uror	216 126	32 520	45	14 634	0.70	10 244
Lakes	1 349 446	181 233	74	134 338	1.04	139 135
Awerial	161 683	25 711	65	16 712	1.00	16 712
Cueibet	206 250	30 272	88	26 640	1.10	29 303
Rumbek Centre	285 952	31 318	60	18 791	1.00	18 791
Rumbek East	232 900	29 415	80	23 532	0.85	20 002
Rumbek North	67 345	7 683	70	5 378	0.70	3 765
Wulu	82 091	13 193	80	10 554	1.30	13 721
Yirol East	121 955	16 234	75	12 175	1.00	12 175
Yirol West	191 269	27 407	75	20 555	1.20	24 666
Northern Bahr-el-Ghazal	1 543 413	287 505	75	216 430	0.79	170 714
Aweil Centre	121 048	26 281	60	15 769	0.84	13 246
Aweil East	606 546	111 313	78	86 824	0.75	65 118
Aweil North	308 563	59 482	80	47 586	0.85	40 448
Aweil South	164 967	31 408	70	21 985	0.75	16 489
Aweil West	342 289	59 021	75	44 266	0.80	35 413
Unity	940 270	117 079	35	40 561	0.50	20 190
Abiemnhom	31 899	3 387	65	2 201	0.55	1 211
Guit	42 405	4 152	40	1 661	0.55	913
Koch	135 458	14 393	45	6 477	0.50	3 239
Leer	116 697	15 503	35	5 426	0.45	2 442
Mayendit	95 006	11 672	35	4 085	0.55	2 247
Mayom	188 173	23 720	45	10 674	0.55	5 871
Panyijar	101 428	17 348	0	0	0.00	0
Pariang	146 790	18 625	45	8 381	0.45	3 772
Rubkona	82 413	8 278	20	1 656	0.30	497
Upper Nile	1 096 694	162 572	46	75 209	0.57	42 915
Baliet	54 266	8 204	50	4 102	0.50	2 051
Fashoda ^{1/}	52 082	8 410	30	2 523	0.50	1 262
Longochuk	81 987	10 745	70	7 521	0.40	3 008

Table 1: South Sudan - Estimated settled population, farming households and harvested cereal area, 2021 (Cont.)

State/County	Population (mid-2021)	Households (mid-2021)	Farming households (percent)	Farming households (mid-2021)	Average cereal area (hectare/household)	Total cereal area (hectares)
Luakpiny/Nasir	327 368	45 255	50	22 627	0.40	9 051
Maban	64 683	14 054	45	6 324	0.60	3 794
Maiwut	45 688	6 024	65	3 916	0.38	1 488
Malakal	81 590	10 897	15	1 635	0.30	490
Manyo	30 581	5 140	50	2 570	0.50	1 285
Melut	82 895	11 965	50	5 983	0.85	5 085
Panyikang	26 942	4 311	35	1 509	0.50	754
Renk	139 890	22 840	40	9 136	1.20	10 963
Ulang	108 720	14 728	50	7 364	0.50	3 682
Western Bahr-el-Ghazal	596 741	106 210	67	70 690	0.80	56 750
Jur River	174 220	28 320	78	22 090	0.80	17 672
Raga	108 087	20 286	55	11 157	0.65	7 252
Wau	314 434	57 604	65	37 442	0.85	31 826
Warrap	1 617 211	280 623	68	191 538	0.81	156 028
Abyei	86 308	12 887	65	8 377	1.20	10 052
Gogrial East	150 993	27 073	70	18 951	0.63	11 939
Gogrial West	375 353	69 228	80	55 382	0.84	46 521
Tonj East	128 694	21 890	60	13 134	0.80	10 507
Tonj North	264 990	47 616	65	30 950	0.85	26 308
Tonj South	142 400	23 912	75	17 934	1.00	17 934
Twic	468 473	78 017	60	46 810	0.70	32 767
Western Equatoria	838 884	154 253	73	112 320	1.26	141 068
Ezo ^{1/}	116 058	26 124	65	16 980	1.20	20 376
Ibba ^{1/}	43 408	10 863	80	8 690	1.50	13 035
Maridi ^{1/}	84 293	13 410	70	9 387	1.40	13 141
Mundri East ^{1/}	65 067	9 185	60	5 511	1.15	6 338
Mundri West ^{1/}	59 802	7 087	70	4 961	1.00	4 961
Mvolo	93 965	12 804	70	8 963	0.85	7 618
Nagero	15 781	3 357	55	1 846	0.80	1 477
Nzara ^{1/}	65 234	16 200	85	13 770	1.45	19 967
Tambura ^{1/}	81 825	19 680	70	13 776	1.00	13 776
Yambio ^{1/}	213 452	35 543	80	28 435	1.42	40 377
Total	12 164 802	1 939 708	59.9	1 162 806	0.86	994 925

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

^{1/} First and second harvested areas combined.

The tentative estimated areas by cereal crops in each state in 2021 are shown in Table 2. These are based on the proportions of all cereal crops collected and recorded by CCMCs from each county and cross-checked by the Task Force teams at state and national levels. Reportedly, the cultivation of

sorghum is declining due to its vulnerability to pests, including stock borers, *Striga*, sucking insects and FAWs, to its lower market value compared to cash crops, including sesame and groundnuts, and to its exposure to dry spells because of its long growing period.

Table 2: South Sudan - Tentative estimates of 2021 cultivated areas by cereal crops, hectares

State	Sorghum	Maize	Rice	Finger millet	Pearl millet	Total cereals
Central Equatoria	43 505	28 571	805	776	5 190	78 847
Eastern Equatoria	90 886	36 564	557	913	2 272	131 192
Jonglei	46 566	11 520	-	-	-	58 086
Lakes	107 669	7 612	-	-	23 854	139 135
Northern Bahr-el-Ghazal	161 789	3 163	3 375	-	2 386	170 714
Unity	8 723	11 162	-	-	306	20 190
Upper Nile	25 720	16 999	-	-	196	42 915
Western Bahr-el-Ghazal	46 135	7 697	-	884	2 034	56 750
Warrap	138 857	9 838	-	-	7 333	156 028
Western Equatoria	30 191	74 588	25 981	9 908	399	141 068
TOTAL	700 041	207 714	30 718	12 481	43 971	994 925
National percentage	70.4	20.9	3.1	1.3	4.4	100

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

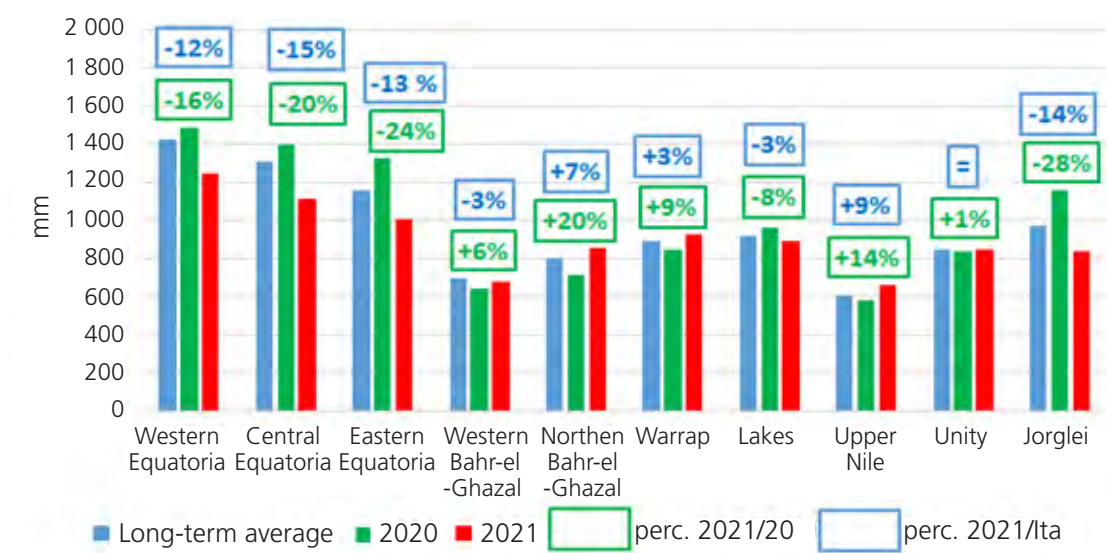
Factors affecting yields

Rainfall

Rainfall is the main driver and limiting factor of crop production in the country. The rainfall analysis is based on data provided by FAO and WFP on rainfall estimates (RFEs) and NDVIs as well as rain gauge data and farmers' observations compiled by the Task Force teams and monthly reports of CCMCs. The 2021 cropping season was characterized by unfavourable growing conditions, with crops affected by delayed precipitation, an erratic temporal and spatial distribution of rains

and by weather extremes, including prolonged dry spells and widespread floods. According to satellite estimates (Figure 4), the seasonal cumulative rainfall amounts were below the long-term average and lower than in the previous year in southern bimodal rainfall areas of Greater Equatoria Region. In central and northern unimodal rainfall areas, cumulative rainfall amounts compared to the average were mixed, with above-average seasonal rains received in Northern Bahr-el-Ghazal, Warrap and Upper Nile states and below-average to average amounts received in Western Bahr-el-Ghazal, Lakes, Unity and Jonglei states.

Figure 4: South Sudan - Cumulative seasonal rains in 2021 compared to 2020 and to long-term average, March–November



Source: FAO/GIEWS calculations on WFP data, 2021.

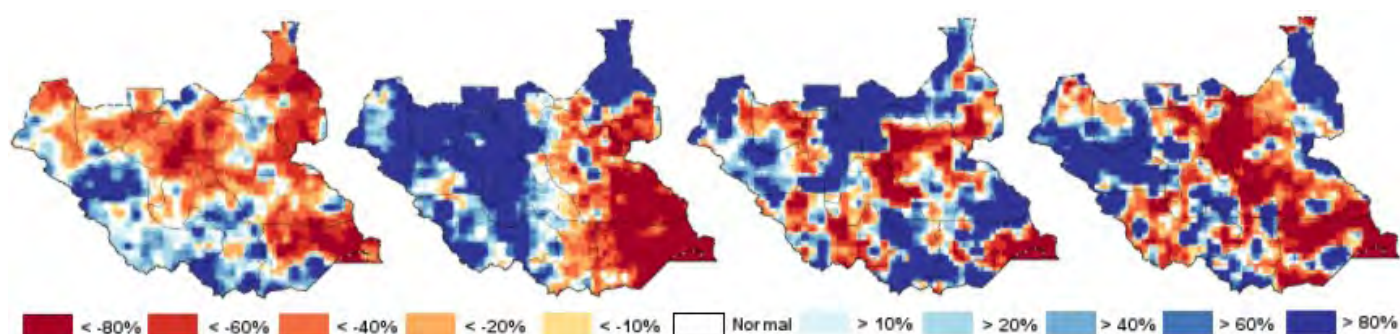
In southern bimodal rainfall areas, where rains normally start in March, they began in April. In central and northern unimodal rainfall areas, where rains normally start in early May, they began during the third week of the month. Rains were below average in May and June, with widespread and prolonged dry spells lasting up to two/three weeks (Figure 5) affecting crop planting, germination and establishment. The impact of these dry spells was particularly serious in Kapoeta County in Eastern Equatoria State, in Terekeka County of Central Equatoria State and in Mvolo, Nzara and Mundri West counties in Western Equatoria State, where it resulted in wilting of sorghum crops during the vegetative stage.

Subsequently, improved rains since July allowed for recovery of water-stressed crops or replanting both in central and northern unimodal rainfall areas and in southern bimodal rainfall areas. Here, the

improved rains lifted prospects for first season crops and benefited planting and germination of second season crops. However, some damage to crops was irreversible and, in addition, second season crops in bimodal rainfall areas were affected in some areas by below-average rainfall from October to December, resulting in localized moisture stress on crops and affecting yields.

For the third consecutive year, the country was affected by widespread floods mainly in central and northern areas between April and November (Table 3), due to river overflows and the above-average rains since July, which in central and northern areas continued until the end of the rainy season. This year, water overflows were so severe that in some instances floodwaters originated from the neighbouring Ethiopian Highlands. Reportedly, as of end-2021, in some areas floodwaters had yet to recede.

Figure 5: South Sudan - Rainfall anomalies (difference between 2021 and long-term average), 3rd dekad of May, 1st, 2nd, 3rd dekad of June



Source: FAO/GIEWS, modified to comply with UN map, 2021.

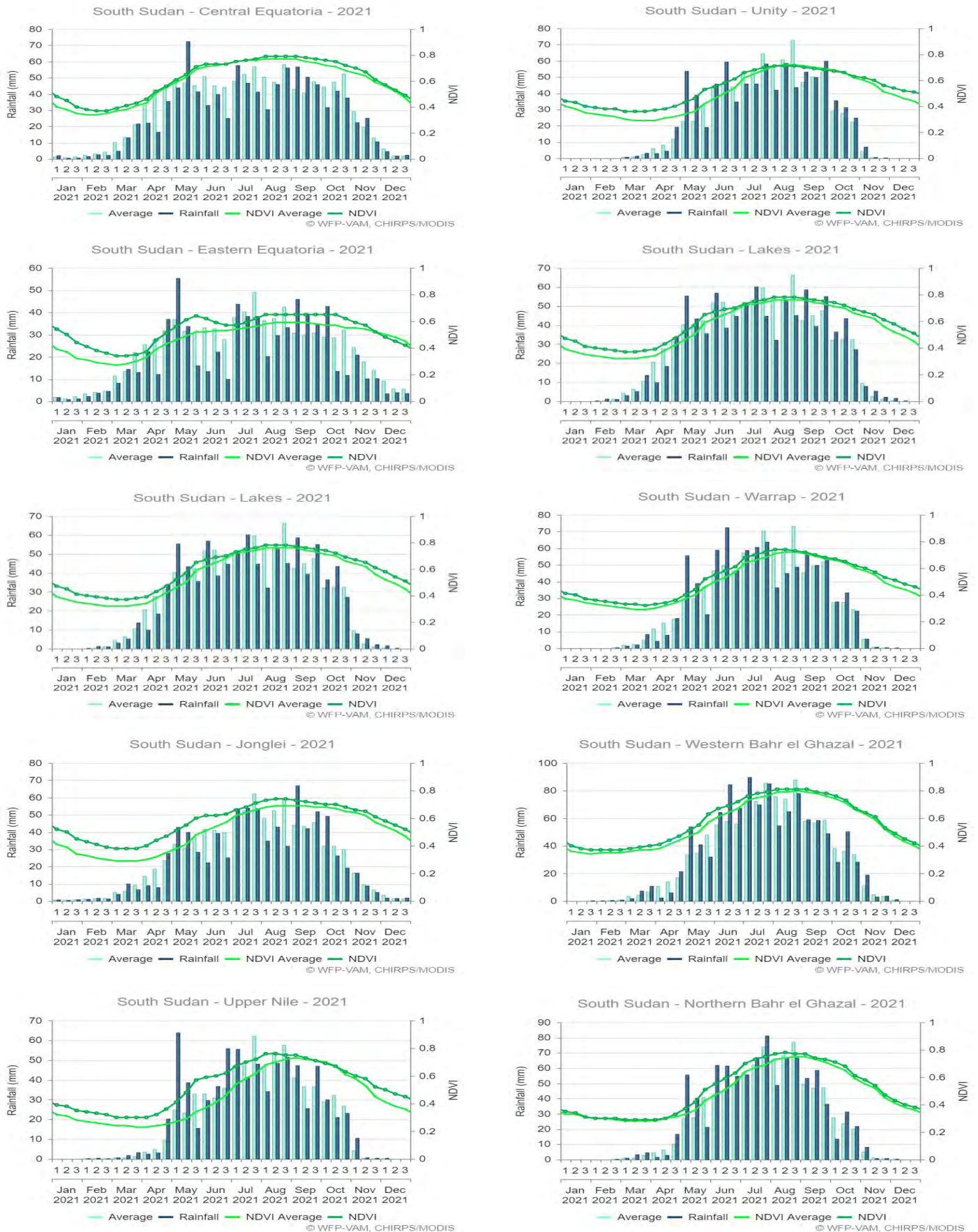
Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Table 3: South Sudan – States affected by flooding, sources of floodwaters and time of flooding

State	Source of flood water	Time of flooding
Warrap	First flooding due to heavy rains Second flooding due to overflow of rivers	Mid-April 2021 September 2021
Northern Bahr-el-Ghazal	Heavy rains and overflow of rivers	July–August 2021
Jonglei	Overflow of Nile, Sobat, Akobo, Khorflus, Ater and Nyading rivers	August–October 2021
Central Equatoria	Overflow of River Nile and heavy rains	Third week of September 2021
Upper Nile	Overflow of River Nile	October 2021
Lakes	Overflow of Nile and Gel rivers Heavy rains	Mid-August–November 2021 Mid-September–October 2021
Unity	Overflow of River Nile	June–September 2021 October–November 2021

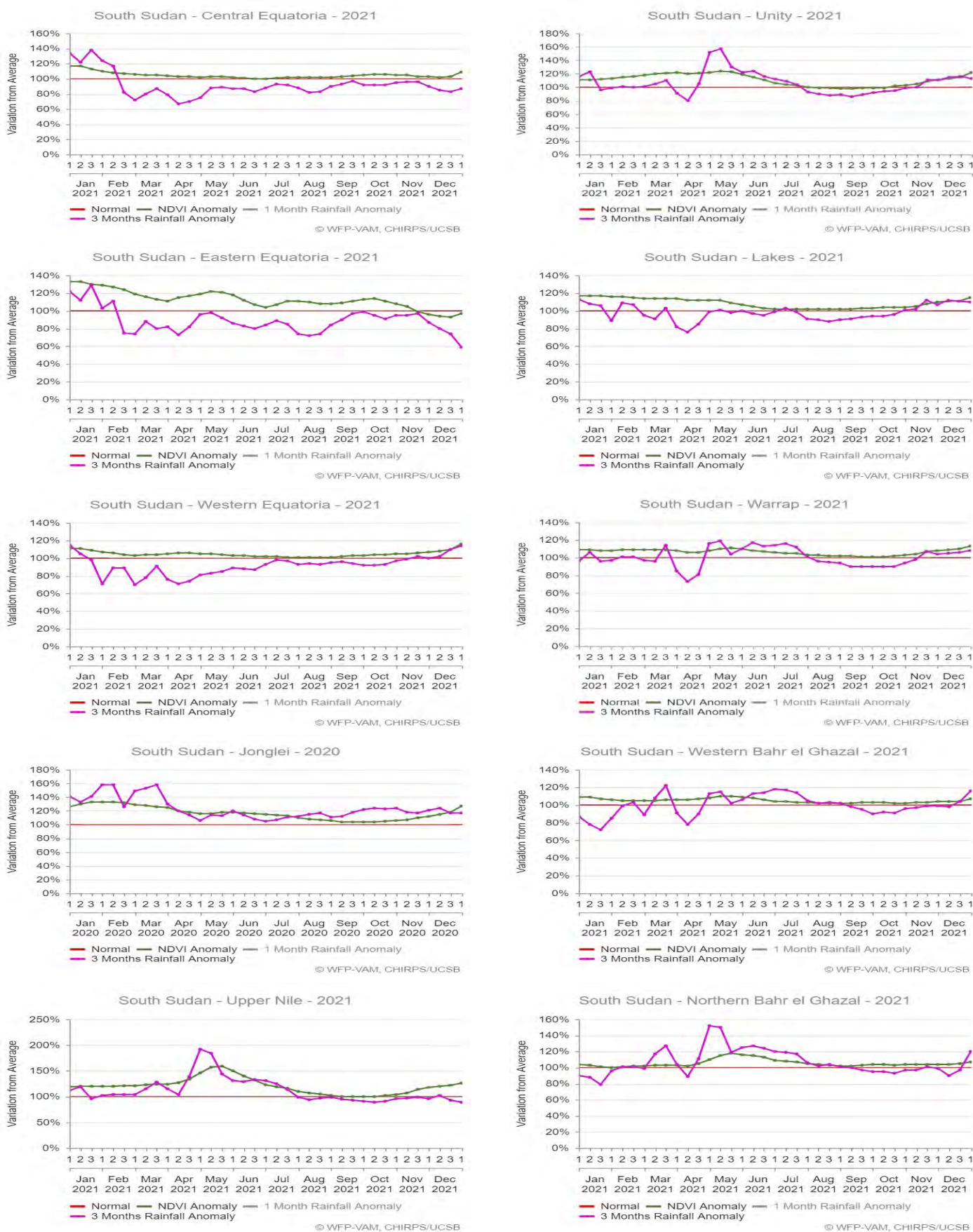
Source: FAO/GIEWS, 2021.

Figure 6: South Sudan - Rainfall amounts, rainfall estimates and Normalized Difference Vegetation Indexes (NDVIs), 2021



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

Figure 7: South Sudan - Rainfall anomalies, 2021



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

These floods affected about 835 000 individuals and resulted in substantial crop losses in the flood-prone, low-lying areas of Warrap, Northern Bahr-el-Ghazal, Jonglei, Central Equatoria, Upper Nile, Lakes and Unity states. According to the results of a flood impact analysis, 65 177 hectares of cultivated land was damaged by floods in 34 counties, including Panyijar County in Unity State, where no planting was carried out as all cropland was submerged.

The most affected states were Warrap, where 28 491 hectares were damaged, followed by Northern Bahr-el-Ghazal (17 691 hectares) and Jonglei (14 513 hectares). In the other states affected, the damage to cultivated areas was lower, with Central Equatoria, Upper Nile, Lakes and Unity states together accounting for the remaining 4 482 hectares of damaged cropland.

In Jonglei State, one of the areas most affected by floods, 7 out of the 11 counties were flooded due to the overflow of Nile, Akobo, Sobat and Agwi rivers. After below-average rains until June, rains intensified in July and August, remaining at above-average levels for the remainder of the cropping season and exacerbating the floods. Several areas of the state are situated in the lowlands along the Nile basin, making it one of the most flood prone areas in the country, also due to the heavy clay soils, which, due to their small particles and very tiny pore space, absorb water at an extremely slow rate. As a result, in some low-lying areas of Twic and Bor counties, the floodwater from the floods occurred in 2019 and 2020 did not recede and no planting was undertaken, forcing the community to plant on higher grounds.

Inputs in the traditional smallholder sector

The two main inputs in the traditional sector are manual labour and local planting material (seeds and cuttings), with farmers relying on shifting cultivation and fallowing to maintain soil fertility. In Northern Bahr-el-Ghazal State, the use of animal manure, with its application largely performed by keeping large herds of cattle over crop fields for a certain number of days, is gradually increasing, mainly on sorghum, maize and vegetable crops. This is practiced through the negotiation of prices

between farmers and cattle keepers. However, it is usually too expensive for poor farmers.

Regarding cultivation practices, availability of hand tools and labour are the most significant limiting factors for smallholder farmers. For the majority of the households, farm size is limited to the area of land that they can clear, cultivate and weed with the traditional flat-bladed, long-handled hoe (called *maloda*), the local short-handled, bent hoe (called *toriah*) or the East African hoe or *jembe*.

The use of draft animals, especially ox and donkey ploughs is also gradually expanding. Animal traction is reported to be used especially in Lakes and in parts of Warrap and Central Equatoria states, where the high demand is reflected by the high hiring rates of oxen cultivation. In Lakes State, despite the high cost of plough boards, several households decided to buy or hire oxen for cultivation. As a result, the area cultivated using ox ploughs has increased noticeably due to the high crop prices, and currently two-thirds of the farmers in the state use ox ploughs while one-third still use the traditional hand tools. In 2021, the hire rate for ox ploughing in Rumbek Centre, Wulu and Cueibet counties was about SSP 10 000/*feddan* (0.42 hectares) while the cost in Yirol County was SSP 5 000/*feddan*, compared to SSP 7 000/*feddan* and SSP 4 000/*feddan* in 2021, respectively.

Hand tools, including hoes, malodas, axes, pangas and rakes are usually purchased from the local markets or provided by NGOs, particularly through FAO partners. In 2021, the prices of hand tools continued the increasing trend of the previous six years, mainly due to the economic crisis and the devaluation of South Sudanese pound. For example, in Aweil North County in Northern Bahr-el-Ghazal State, the price of one maloda in 2021 was SSP 600 and one hoe costed SSP 1 000, compared to the previous year's prices of SSP 300 for malodas and SSP 700 for hoes. Similarly, in Eastern Equatoria State, prices of hand tools were at high levels. The price of one hoe in 2021 was SSP 1 500 compared to SSP 1 000 in 2020, an axe was sold at SSP 1 000 compared to SSP 800 in 2020 and a panga was sold at SSP 1 000 in 2021 compared to SSP 800 in 2020.

Although there are tens of thousands of tractors in the country, the majority of them are non-functional. In most states, 50 percent or less of available tractors are functional. A higher proportion of functional tractors (74 percent) is reported in Warrap State and neighbouring Abyei Administrative Area, where 48 of the available 65 tractors are functional. Also the cost of a tractor hire in 2021 was higher than in 2020, mainly due to high inflation. For example, the cost in some counties, including Tonj South in 2021 was SSP 50 000/*feddan* for ploughing and harrowing operations plus SSP 30 000 for 40 litres of fuel, for a total of SSP 80 000/*feddan*, compared with a tractor hire rate of SSP 35 000 plus 15 000 for fuel, amounting to a total of SSP 50 000/*feddan* in 2020. In Eastern Equatoria State, there are about 20 government-owned tractors, but all of them are non-functional. There is a limited number of private tractors in the state and the average hire rate in 2021 was SSP 15 000/*feddan* compared to SSP 10 000/*feddan* in 2020. Overall, the efficient utilization of tractors has been constrained by shortages and high prices of fuel and unavailability of spare parts.

Regarding labour, most of the labour force required for farming activities is sourced from family members, with labour hired only by better-off farmers for digging and weeding. The cost of hired labour followed the increasing trend of other inputs and the cost for weeding in 2021 was SSP 1 000 per 1 cata (10 x 10 metres) compared to SSP 500 in 2020.

Due to the absence of chemical fertilizers, soil fertility maintenance practices are limited to shifting cultivation and fallowing, while the use of animal manure is reported mainly in Northern Bahr-el-Ghazal, Warrap, Western Bahr-el-Ghazal and Lakes states. Whereas in most locations the manure is sourced from the farmers' own livestock, in Northern Bahr-el-Ghazal State, where opportunities for shifting to new land are limited, contract dunging by pastoralists' herds and flocks on private farming land is increasing from year to year. Such actions are practiced only by better-off farmers and payment can be performed in different modalities, including cash, grain/sorghum, supplying herders with drinks and meals or goats. While most farmers are aware of the importance of animal dung to increase

yields and to control *Striga* weed, the practice of hiring herds of cattle to stay in their farms is only affordable for better-off farmers.

Agrochemicals are not used by smallholder farmers on field crops, with some herbicides used only by a few large-scale mechanized farms in Upper Nile State with access to supplies from the Sudan. Fertilizers are currently used only on vegetables in locations near the border with Uganda by better-off farmers. However, over the past five years displacement and insecurity along the border areas of Central Equatoria suggest that purchases of fertilizers became increasingly difficult.

Throughout the country, farmers mainly use their own seeds retained from the previous harvest or borrowed from extended family members and neighbours. Some farmers also purchase seeds from markets, including improved varieties of maize (*Longi-5*) and groundnut (*Red Beauty*). In addition, FAO through various emergency projects, has provided seeds and planting materials through direct distribution by NGOs and organizing seed fairs.

Pests, diseases and weeds

Every year numerous types of pests, diseases and weeds infest crops and cause significant yield reductions. Despite the damage caused by insect pests and diseases, these remain untreated with farmers accepting the losses as inevitable as chemical treatments are not carried out due to their very limited supply and the lack of financial resources among farmers. Bird scaring and protection of crop fields from wild animals and domestic livestock is usually practiced using family labour.

Pests

The most common pests include green grasshoppers, caterpillars, millipedes, termites, aphids, stalk (stem) borers, sorghum cinch bug, local birds, wild rats, monkeys, rodents, wild pigs, porcupines, domestic livestock and migratory pests, including QQU. In 2021, the prevalence of these pests in both the bimodal and unimodal rainfall areas has been within the normal range, causing mild damages in most areas.

Desert locusts were reported in April 2020 just for some days in some counties of Eastern Equatoria

State and did not damage crops as planting has not yet been carried out. In 2021, desert locusts were not reported. However, contingency planning and treatment preparations were carried out at country and regional level.

By contrast, localized but significant damage to maize and sorghum crops due to FAWs was reported, mainly in Greater Equatoria Region. Most of the damage to crops occurred during the first season, as the below-average rainfall and the prolonged dry spells in May and June created a conducive environment for crop damage and FAW reproduction. Crop damage during the second season was considerably lower, as heavy rains in July and August washed away the insects and significantly constrained its multiplication and damaging capacity. No control measures were taken, except for few farmers using ashes to kill the insects. However, some communities in Juba County have used Fawligen, a bio-pesticide which is being tested by FAO's Plant Production and Protection Unit.

In 2021, snails continued to affect crops in parts of Western and Central Equatoria states, particularly in Tambura, Yambio, Ezo, Mundri, Yei, Lainya and Morobo counties, causing mild damage on crops. In the absence of chemical control measures, farmers used the traditional method of collecting and burying the snails in order to minimize the damage.

Diseases

The most common diseases include sorghum head smut, cassava mosaic virus, groundnut rosette virus and leaf spot of groundnuts. In 2021, the prevalence of these diseases in both bimodal and unimodal rainfall areas has been within the normal range, causing mild damages in most areas. However storage pests, particularly weevils, rats and moulds, continued to cause severe damage on harvested crops throughout the country. Farmers in most parts of the country use traditional practices to protect stored crops and do not have access to improved crop storage practices and facilities.

In addition, in 2021, cases of cassava tuber rot (*Phytophthora palmivora*) have been reported in some cassava fields, especially in Greater Equatoria

Region, causing damage on two to three year-old cassava tubers that were ready to be harvested. The disease was reported for the first time in 2020, mainly affecting the *Bgobgorogi* cassava variety that was introduced in Western Equatoria State from the Democratic Republic of the Congo and planted in the counties bordering the Democratic Republic of the Congo. It has now become a significant threat to cassava production due to its rapid spread to key cassava growing areas.

Weeds

The 2021 cropping season was characterized by mild to average weed infestation levels over most areas, except in flooded areas, where the environment was conducive for significant weed infestation levels, thus requiring frequent weeding. However, water impeded the access to the fields to perform weeding and other cultural practices, including inter-row/inter-plant cultivations. As a result, crops planted in low-lying areas were observed to be more infested by weeds, stunted and with yellow leaves due to waterlogging, while the condition of crops grown on higher grounds was better.

In the traditional sector, weeding of crop fields is carried out manually. Sorghum is weeded only once during the growing period, while groundnuts and maize are usually weeded twice. The continued cultivation of land for several consecutive years, compounded with inadequate weeding, has resulted in a build-up of weeds in most of the assessed areas. In this regard, *Striga* weed remains a major problem for sorghum cultivation in most growing areas, with farmers who have no access to new plots and continue to dig or plough the same exhausted plots reported to be severely affected. The impact of *Striga* weed on sorghum crops has been serious and increasing over time. In the main sorghum growing areas, including Northern Bahr-el-Ghazal, Warrap, Western Bahr-el-Ghazal, Lakes, Jonglei and Upper Nile states, the damage on sorghum crops in the 2021 season ranged from mild to average. The problem may be addressed by using crop rotation (with leguminous crops, including groundnuts) and manure or by transplanting three to four-week old seedlings from nurseries or from *Striga* weed-free fields. Other methods, including intercropping of *Desmodium* (leguminous fodder crop)⁷ with cereals can also be used to effectively control *Striga* weed

through training of farmers and extension workers and the provision of well-designed extension packages on appropriate control measures. However, it is advisable to adopt a comprehensive strategy for controlling *Striga* together with other cultural practices to improve sorghum productivity. Since sorghum is the most widely grown staple crop across the country, piloting a project on *Striga* control and sorghum yield improvement (to be extended to other areas) could be a viable strategy.

In recent years, infestation by a broadleaf weed locally known as *Babashiro* (*Chromolaena odorata*), reportedly from the Democratic Republic of the Congo, was reported in Greenbelt areas of Western and Central Equatoria states. *Babashiro* is an invasive weed of field crops and fallow lands and has become one of the most problematic weed dominating crop areas during shifting cultivation.

In addition, an invasive weed known as *Parthenium* (*Parthenium hysterophorus*) has been rapidly spreading in Greater Kapoeta Region (Kapoeta East, South and North counties of Eastern Equatoria State) over the past five years. *Parthenium* is a dominant weed found on road sides, grazing lands, gardens and croplands, and has become an issue of great concern for farmers and pastoralists.

Agricultural production in 2021

Cereal production

A. Cereal production

Cereal production in the traditional smallholder sector is determined by multiplying yield per unit area by the disaggregated area estimates derived from secondary data, as described in section: Cereal harvested area and yield estimates.

In 2021, the Task Force Team-led estimates of cereal production in each state were compiled from county-level disaggregated data. This information was gained from historical time-series data adjusted with the findings from a series of missions conducted

by the Task Force teams at planting and harvest time and during the growing period, which included (a) 4 250 detailed farming household interviews, 280 on-farm case studies with sample farmers and key informant interviews with staff from state ministries, NBS, NGOs and projects; (b) empirical data obtained from a large number of localities using, where possible, the updated South Sudan's PET manual. In these transects, PET-based scores of crop yields are cross-checked by weighing crop-cut samples taken during the case studies. In addition, yield estimates made by the CCMCs in 64 counties through crop-cuttings and PET manuals were used as supplementary information to further improve the quality of the yield estimates.

The empirical data obtained was finally reviewed using secondary data from reports provided by FAO, WFP, Famine Early Warning Systems Network (FEWS NET), NBS and various NGOs, plus remote sensing data and information on vegetation conditions and precipitation amounts, and anomalies as well as rainfall data collected at county level by FAO-trained operators, supported by the European Union-funded project "Strengthening the resilience of pastoral and agropastoral communities in South Sudan's cross border areas with the Sudan, Ethiopia, Kenya and Uganda" (OSRO/SSD/703/EU) and other European Union supported projects. The missions conducted in 2021 by the Task Force teams are listed below:

- In June 2021, a mid-season mission to assess the performance and yields of first season maize (*Longi-5* variety) and other cereals, cassava and groundnuts took place in Western Equatoria State, covering Nzara, Ezo, Yambio, Ibba, Mvolo, Mundri West and Maridi counties. It was followed by another mission in September to assess the yields of the first season crops in Mundri East, Mundri West, Maridi and Ibba counties. A third assessment mission in Western Equatoria State took place in November to assess the performance of second season crops in Nzara, Ezo, Mvolo, Mundri West, Maridi, Ibba and Yambio counties.
- In June and July, the Task Force teams travelled to Eastern Equatoria State and conducted a planting

⁷ Planting *Desmodium* between rows of cereal crops can effectively reverse declining crop yields by controlling *Striga* and improving soil fertility, at the same time providing farmers with a year-round supply of fodder.

- assessment in Magwi, Torit, Kapoeta East, Kapoeta South and Kapoeta North counties. It was followed by a harvest-time mission in September to assess first season crops (mainly maize) in Ikotos, Magwi, Kapoeta East, Kapoeta South and Kapoeta North counties. The second season harvest assessment was carried out in November in Magwi, Ikotos, Budi, Kapoeta East, Kapoeta South and Kapoeta North counties to assess long cycle crops.
- In Central Equatoria State, Task Force teams missions in late June performed mid-season assessments in Yei, Morobo, Juba and Terekeka counties to assess the performance of maize, sorghum, groundnuts and cassava crops. In September, a harvest-time mission was conducted to assess yields of first season cereals (maize and sorghum), groundnuts and cassava covering Juba, Yei, Terekeka and Morobo counties, followed by a second season harvest-time assessment in November covering Juba, Terekeka, Yei and Morobo counties. In 2021, a Task Force Team managed to assess Morobo County for the third consecutive year, after the escalation of conflict in 2016 rendered the county inaccessible due to security concerns.
 - In August, a mission in Northern Bahr-el-Ghazal State covering Aweil West, Aweil South, Aweil Centre, Aweil North and Aweil East counties to assess yields of cereal crops, including rice, was followed by a mission in September to the same counties. In late November a mission assessed yields of rice and sorghum in semi-mechanized commercial farming schemes.
 - In Western Bahr-el-Ghazal State (Raja, Jur River and Wau counties) two missions in July and September carried out planting and harvesting assessments, respectively.
 - Similarly, Task Force teams conducted planting and harvesting assessments in Warrap State (Gogrial and Twic counties and Abyei Administrative Area) and in Lakes State (Rumbek Centre, Cueibet, Wulu, Yirol West counties). The crops assessed included short and medium-cycle sorghum landraces as well as improved *Feterita*-type sorghums from the Sudan, groundnuts (*Red Beauty and Mr Lake*) and small areas cultivated with maize areas in the vicinity of the homesteads.
 - In Jonglei State, a post planting assessment in Twic East County, another post planting and post harvest assessment to Bor South County were conducted.
 - In Upper Nile State, a planting assessment mission took place in October in Renk, Maban and Melut counties to assess yields of local landraces of sorghum (*Leuwarding and Agono*), maize in the smallholder sector and improved *Feterita*-type sorghums from the Sudan (*Arfa Gadameck, Wad Ahmed, Gaddam el Hamam*) in both the traditional and semi-mechanized farming areas. It was followed by a harvest assessment mission in early December, which visited a number of commercial farms growing sorghum and sesame, and other crops, including groundnuts, bulrush millet and sunflower.
 - In 2021, a Task Force Team was able to visit for the first time since 2016 Unity State due to recent security improvements and assessments were carried out in Rubkona and Guit counties. Risks to the teams' safety were still considered too severe to allow access to other areas in the state. However, information from insecure counties was provided by the CCMC leaders that participated in the analysis workshop organized in Juba in December. Furthermore, telephone interviews with the state directors of agriculture and NGOs extension workers in Unity State and by members of the CCMCs from inaccessible areas located also in other states were used as additional sources of information.
- As shown in Table 3, the 2021 national gross cereal production from the traditional smallholder sector is estimated at 1 049 368 tonnes, exceeding the threshold of 1 million tonnes for the third consecutive time since 2016. Post-harvest losses and seed use for the 2022 planting season are assumed, as in previous assessments, to account for 20 percent of the total production, leaving a net amount of 839 494 tonnes available for local consumption. This result is about 4 percent below the 2020 output but 4.2 percent above the average of the previous five years. The decrease in production is attributed to a 4.7 percent decline in average yields, mainly caused by the unfavourable weather, with dry spells and flood damage affecting crops in several areas, which offset

Table 4: South Sudan - Estimated (traditional sector) cereal harvested area, yield, production, consumption and balance, 2021 and 2022

State/County	2021				2022		
	Cereal area (hectares)	Gross yield (tonnes/hectare)	Gross cereal production (tonnes)	Net cereal production (tonnes)	Population (mid-2022)	Cereal requirement (tonnes)	Surplus/deficit (tonnes)
Central Equatoria	78 847	1.28	101 053	80 843	1 202 175	154 080	-73 237
Juba	22 547	1.20	27 056	21 645	445 093	62 313	-40 669
Kajo Keji ^{1/}	8 685	1.40	12 159	9 727	119 950	14 394	-4 667
Lainya ^{1/}	6 688	1.20	8 026	6 421	113 690	13 643	-7 222
Morobo ^{1/}	7 871	1.80	14 167	11 334	156 333	18 760	-7 426
Terekeka	19 161	0.80	15 329	12 263	184 023	22 083	-9 820
Yei ^{1/}	13 895	1.75	24 317	19 454	183 086	22 886	-3 432
Eastern Equatoria	131 192	1.19	155 873	124 698	1 127 333	140 020	-15 322
Budi	18 497	1.20	22 196	17 757	106 049	12 726	5 031
Ikotos	22 299	1.15	25 644	20 515	140 093	17 512	3 003
Kapoeta East	12 206	0.85	10 375	8 300	185 267	23 159	-14 859
Kapoeta North	9 888	0.80	7 911	6 328	117 370	14 672	-8 343
Kapoeta South	4 045	0.92	3 722	2 977	76 773	9 980	-7 003
Lafon	13 986	1.00	13 986	11 189	116 243	13 950	-2 761
Magwi ^{1/}	31 199	1.82	56 781	45 425	209 807	25 177	20 249
Torit	19 073	0.80	15 258	12 206	175 731	22 845	-10 639
Jonglei	58 086	0.70	40 441	32 353	1 978 100	222 042	-189 689
Akobo	7 932	0.95	7 536	6 028	207 697	22 847	-16 819
Ayod	915	0.30	274	220	194 268	21 370	-21 150
Bor South	13 076	0.70	9 154	7 323	271 371	31 207	-23 884
Duk	3 404	0.50	1 702	1 362	131 301	14 443	-13 082
Fangak	1 582	0.50	791	633	195 496	21 505	-20 872
Khorflus/Pigi/Canal	656	0.60	393	315	111 846	12 303	-11 988
Nyirrol	3 781	0.45	1 701	1 361	197 958	21 776	-20 415
Pibor	7 740	0.85	6 579	5 263	216 887	26 026	-20 763
Pochalla	7 363	0.85	6 259	5 007	92 437	11 092	-6 085
Twic East	1 392	0.30	418	334	136 229	14 985	-14 651
Uror	10 244	0.55	5 634	4 507	222 609	24 487	-19 980
Lakes	139 135	1.09	151 682	121 346	1 389 929	152 894	-31 549
Awerial	16 712	0.80	13 370	10 696	166 534	18 319	-7 623
Cueibet	29 303	1.10	32 234	25 787	212 438	23 368	2 419
Rumbek Centre	18 791	0.90	16 912	13 529	294 531	32 399	-18 870
Rumbek East	20 002	1.10	22 003	17 602	239 887	26 388	-8 786
Rumbek North	3 765	0.70	2 635	2 108	69 366	7 630	-5 522
Wulu	13 721	1.30	17 837	14 269	84 554	9 301	4 968
Yirol East	12 175	1.10	13 393	10 714	125 613	13 818	-3 104
Yirol West	24 666	1.35	33 299	26 639	197 007	21 671	4 968

Table 4: South Sudan - Estimated (traditional sector) cereal harvested area, yield, production, consumption and balance, 2021 and 2022 (Cont.)

State/County	2021				2022		
	Cereal area (hectares)	Gross yield (tonnes/hectare)	Gross cereal production (tonnes)	Net cereal production (tonnes)	Population (mid-2022)	Cereal requirement (tonnes)	Surplus/deficit (tonnes)
Northern Bahr-el-Ghazal	170 714	0.90	152 938	122 350	1 589 716	174 868	-52 518
Aweil Centre	13 246	0.90	11 921	9 537	124 679	13 715	-4 178
Aweil East	65 118	0.80	52 094	41 676	624 742	68 721	-27 046
Aweil North	40 448	0.95	38 426	30 740	317 820	34 960	-4 220
Aweil South	16 489	0.70	11 542	9 234	169 916	18 691	-9 457
Aweil West	35 413	1.10	38 954	31 163	352 558	38 781	-7 618
Unity	20 190	0.73	14 729	11 783	968 478	83 170	-71 387
Abiemnhom	1 211	0.75	908	726	32 856	2 792	-2 066
Guit	913	0.55	502	402	43 677	3 712	-3 310
Koch	3 239	0.85	2 753	2 202	139 521	11 859	-9 657
Leer	2 442	0.60	1 465	1 172	120 198	10 218	-9 046
Mayendit	2 247	0.60	1 348	1 079	97 857	8 318	-7 240
Mayom	5 871	0.70	4 109	3 288	193 818	16 474	-13 187
Panyijar	-	0.00	-	-	104 471	8 880	-8 880
Pariang	3 772	0.90	3 394	2 716	151 194	12 852	-10 136
Rubkona	497	0.50	248	199	84 886	8 064	-7 866
Upper Nile	42 915	0.65	27 804	22 243	1 129 595	97 576	-75 333
Baliet	2 051	0.60	1 231	984	55 894	4 751	-3 767
Fashoda ^{1/}	1 262	0.50	631	505	53 644	4 560	-4 055
Longochuk	3 008	0.50	1 504	1 203	84 447	7 178	-5 975
Luakpiny/Nasir	9 051	0.60	5 431	4 344	337 189	28 661	-24 317
Maban	3 794	0.60	2 277	1 821	66 624	5 663	-3 842
Maiwut	1 488	0.50	744	595	47 059	4 000	-3 405
Malakal	490	0.60	294	235	84 038	7 983	-7 748
Manyo	1 285	0.80	1 028	822	31 499	2 677	-1 855
Melut	5 085	0.75	3 814	3 051	85 382	7 257	-4 206
Panyikang	754	0.80	603	483	27 750	2 359	-1 876
Renk	10 963	0.75	8 223	6 578	144 086	12 968	-6 390
Ulang	3 682	0.55	2 025	1 620	111 982	9 518	-7 898
Western Bahr-el-Ghazal	56 750	1.28	65 479	52 383	596 741	67 705	-15 322
Jur River	1.30	73 600	58 880	614 643	69 736	-10 856	-2 775
Raga	7 252	1.30	9 428	7 542	111 330	11 133	-3 590
Wau	31 826	1.35	42 965	34 372	323 867	38 863	-4 491
Warrap	156 028	0.85	133 298	106 638	1 665 728	160 546	-53 908
Abyei	10 052	0.75	7 539	6 031	88 897	8 000	-1 969
Gogrial East	11 939	0.75	8 954	7 163	155 523	14 775	-7 611
Gogrial West	46 521	0.96	44 660	35 728	386 614	40 595	-4 867
Tonj East	10 507	0.60	6 304	5 043	132 555	13 255	-8 212
Tonj North	26 308	0.70	18 415	14 732	272 940	27 293	-12 561
Tonj South	17 934	1.00	17 934	14 347	146 672	13 200	1 147
Twic	32 767	0.90	29 491	23 592	482 527	43 428	-19 836

Table 4: South Sudan - Estimated (traditional sector) cereal harvested area, yield, production, consumption and balance, 2021 and 2022 (Cont.)

State/County	2021				2022		
	Cereal area (hectares)	Gross yield (tonnes/hectare)	Gross cereal production (tonnes)	Net cereal production (tonnes)	Population (mid-2022)	Cereal requirement (tonnes)	Surplus/deficit (tonnes)
Western Equatoria	141 068	1.40	197 951	158 361	864 051	125 287	33 073
Ezo ^{1/}	20 376	1.70	34 640	27 712	119 540	17 333	10 379
Ibba ^{1/}	13 035	1.55	20 205	16 164	44 710	6 483	9 681
Maridi ^{1/}	13 141	1.60	21 026	16 821	86 822	12 589	4 232
Mundri East ^{1/}	6 338	1.15	7 288	5 831	67 019	9 718	-3 887
Mundri West ^{1/}	4 961	1.10	5 457	4 366	61 596	8 931	-4 566
Mvolo	7 618	0.95	7 238	5 790	96 784	14 034	-8 244
Nagero	1 477	1.10	1 625	1 300	16 254	2 357	-1 057
Nzara ^{1/}	19 967	1.75	34 942	27 954	67 191	9 743	18 211
Tambura ^{1/}	13 776	0.80	11 021	8 817	84 280	12 221	-3 404
Yambio ^{1/}	40 377	1.35	54 509	43 608	219 856	31 879	11 728
Total	994 925	1.05	1 049 368	839 494	12 529 746	1 380 220	-540 726

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

^{1/} First and second harvested areas combined.

the modest increase (+0.75 percent) in harvested area due to security improvements which allowed internally displaced and returnees from abroad to gradually return to their places of origin and engage in agricultural activities.

In the states most affected by floods, significant crop production shortfalls were recorded. In Warrap State, where the most widespread damage to crops occurred (about 28 500 hectares), production declined in 2021 by more than 20 percent from 2020 and it was the lowest on record since 2014. In Lakes, Upper Nile and Unity states, the cereal output in 2021 was 10.5, 12 and 15 percent lower than in 2020, respectively. Cereal production declined also in Jonglei State by 1.35 percent from the very poor output obtained in 2020, when yields were also severely constrained by widespread floods, and it was the lowest on record since 2016. An output decline was also observed in Western Equatoria State (-2 percent), mainly on account of erratic rains. By contrast, increases in the 2021 cereal production compared to 2020 were recorded in Western Bahr-el-Ghazal (+12.4 percent), Northern Bahr-el-Ghazal (+2.9 percent), Central Equatoria (+4.1 percent) and Eastern Equatoria (+2.5 percent) states, mainly on account of expanded plantings, while yields were stagnant or, in the case of Eastern

Equatoria State, lower than in the previous year due to prolonged dry spells.

In 2021, the average gross cereal yield from the traditional smallholder sector is estimated at 1.05 tonnes per hectare, which is slightly lower than last year's 1.1 tonnes. The yield level reflects the unfavourable growing conditions in most areas, including dry spells and floods, while the damage caused on crops by FAWs and other common pests was localized. Following the CFSAM standard procedure since 2014, conservative yield values have been used for the counties not visited by the Task Force teams at harvest time, where no independent assessments have been conducted and no CCMC reports were available.

B. Mechanized sector

Almost all of the country's largest mechanized rainfed agricultural schemes are located in Upper Nile State. The rainfed mechanized sector in the state includes demarcated, large-scale farms with multiple aggregations of 500 *feddans* (about 200 hectares) units known as *mushroom*, mainly located between Renk and Malakal counties, and un-demarcated traditional farms, where farmers cultivate units of up to 50 *feddans* (20 hectares) alongside large-scale farms, hiring tractors and equipment used by their farmers.

Table 5: South Sudan - Cereal harvested area and net production (rounded) in the traditional sector, 2017–2021

Region/State	2017			2018			2019			2020			2021		
	Area ('000 hectares)	Net Prod. ('000 tonnes)	Net Yields (tonnes/hectare)	Area ('000 hectares)	Net Prod. ('000 tonnes)	Net Yields (tonnes/hectare)	Area ('000 hectares)	Net Prod. ('000 tonnes)	Net Yields (tonnes/hectare)	Area ('000 hectares)	Net Prod. ('000 tonnes)	Net Yields (tonnes/hectare)	Area ('000 hectares)	Net Prod. ('000 tonnes)	Net Yields (tonnes/hectare)
Greater Upper Nile	124	82	0.65	125	118	73	0.62	81	0.65	124	73	0.59	121	66	0.55
Upper Nile	53	35	0.65	52	48	30	0.63	32	0.61	45	24	0.53	43	22	0.52
Unity	18	10	0.54	17	16	9	0.56	9	0.56	20	11	0.58	20	12	0.58
Jonglei	54	37	0.68	57	54	34	0.63	40	0.70	60	38	0.63	58	32	0.56
Greater Bahr-el-Ghazal	470	417	0.89	480	480	416	0.87	410	0.85	489	405	0.83	523	409	0.78
Northern Bahr-el-Ghazal	153	129	0.85	157	157	124	0.79	134	0.86	152	105	0.70	171	122	0.72
Western Bahr-el-Ghazal	37	33	0.89	37	51	45	0.88	31	0.84	43	41	0.94	57	59	1.04
Lakes	125	112	0.9	129	117	106	0.91	116	0.90	133	130	0.98	139	121	0.87
Warrap	156	143	0.92	157	155	141	0.91	129	0.82	162	129	0.79	156	107	0.68
Greater Equatoria	268	266	0.99	278	346	336	0.97	254	0.91	316	341	1.08	351	364	1.04
Central Equatoria	60	62	1.04	57	117	120	1.03	49	0.87	65	68	1.05	79	81	1.03
Eastern Equatoria	107	94	0.87	112	116	99	0.85	91	0.82	123	123	1.01	131	125	0.95
Western Equatoria	101	110	1.09	110	113	117	1.04	114	1.04	129	149	1.16	141	158	1.12
TOTAL	863	764	0.89	883	940	826	0.88	745	0.84	930	818	0.88	995	839	0.84

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

The other mechanized agricultural schemes are located in Northern Bahr-el-Ghazal State and include the Aweil Rice Scheme located on the southern bank of the Lol River in Aweil Centre County, where water from the surrounding flood plains is used for irrigation and a mechanized sorghum farming area in Ton Chol in Aweil East County. In addition, there are some mechanized farms in other states, particularly in Greater Equatoria Region and some emerging commercial farms in Greater Bahr-el-Ghazal Region, expanding using labour gangs, digging fields by hand or using animal traction.

In Upper Nile State, where the largest mechanized farms are located, mechanization is limited to land preparation and sowing using seed boxes placed over disc harrows, with most of the other operations, including weeding and harvesting carried out manually using sickles and hoes. However, only sesame harvesting is mechanized due to shortages of combine harvesters in these areas.

In the mechanized areas of Upper Nile State, sorghum and sesame are the two dominant crops, grown in medium to large-scale farms ranging from 500 to 1 600 *feddans* (from 210 to 630 hectares). Other crops grown to a smaller extent include sunflower, pearl millet and groundnuts. Groundnuts are mostly grown by smallholder farmers both for selling and family consumption.

Almost all agricultural inputs, including fuel, spare parts, hand tools and seeds are obtained from the Sudan through informal cross-border trade. Hand tools, including hoes and sickles, are used for weeding and harvesting. Their prices in 2021 were SSP 2 000 and SSP 1 500, respectively, while the price of an empty bag was SSP 1 500. The price of storage services provided by commercial banks was SSP 60 per bag per year. Spare parts were reported to be scarce. The price of an empty bag in 2021 was SSP 1 500. Labour availability was limited during the cropping season due to reduced movement of labour force from southern Blue Nile State of the Sudan as a result of anticipated low yields and reduced harvested area of sesame. Market oriented farmers in both Renk and Melut counties used improved seeds, while smallholder farmers used local varieties in addition to sorghum

and maize seeds distributed by FAO. In 2021, there were 510 tractors in Renk, including ten government-owned tractors, which were all functional. The number of private tractors was high as Sudanese farmers came to Renk with their tractors and implement to hire land for cultivation and provide tractor hire service. The tractor hire rate for ploughing, harrowing and planting was SSP 30 000/5 *feddans* (*Hawasha* or *Jada*) plus 20 litres of fuel, that costed SSP 15 000 at planting time. For weed control, in some large farms the use of herbicides was reported, a practice mainly used by farmers coming from the Sudan (*Jallaba*). Threshers were used in all large farms for threshing sorghum. In Melut County, there were 54 privately owned tractors, all in good condition, and four tractors owned by the government. All the privately owned tractors and the spare parts were sourced from the Sudan.

In 2021, the Task Force teams visited large-scale farms in Renk, Melut and Aweil counties. According to the teams' findings, mechanized farming in Upper Nile State was undertaken extensively, with large areas cultivated by Sudanese and local farmers. In the commercial farming areas of Renk and Melut counties in Upper Nile State, rains had an early start in late May and the seasonal cumulative rainfall amounts were higher than last year and the long-term average in both counties, despite some dry spells in September in Melut County.

Despite the favourable weather conditions, sesame production in 2021 is estimated at 25 650 tonnes, 58 percent lower than in 2020. The output contraction reflects a reduction in harvested area and yields (0.3 tonnes/hectare in 2021 compared to 0.36 tonnes/hectare in 2020), due to damage by pests, including leaf roller moth (*Antigastra catalaunalis*) and Sesame Gall Midge, coming from the surrounding Sudanese farms. Chemical pesticides were used, but several farmers reported that the pesticides brought from the Sudan were not effective. As in the past, the sesame output is entirely sold to Sudanese traders, not only due to the high prices they offer, but also due to the poor state of the road network linking Upper Nile State with the capital, Juba, and to insecurity still affecting some trade routes.

Most farmers that lost their sesame crops due to pests replanted their fields with sorghum. Due to increased plantings and favourable growing conditions benefiting yields (1.1 tonnes/hectare in 2021 compared to 0.8 tonnes/hectare in 2020), sorghum production is estimated at 111 619 tonnes, 20 percent up from the previous year.

In the Aweil Rice Scheme (Northern Bahr-el-Ghazal State), five tractors were used in 2021, compared to seven in 2020. Land preparation was affected by lack of cash to purchase spare parts and lack of disc ploughs that are required to break the hard soil in the area. Due to these constraints, planted area in 2021 was significantly lower than in 2020. In addition, in early August, heavy rains and the overflow of the Lol River triggered heavy flooding, which severely affected rice crops. As a result of these negative factors, rice production in 2021, estimated at 266 tonnes, was 40 percent lower than the output obtained in 2020.

In the Ayai-Danga Semi Mechanized Scheme, located partly in Aweil East County and partly in Aweil South County in Northern Bahr-el-Ghazal State, the main crop grown is sorghum. In 2021, there were 15 private tractors and one government-owned tractor. The tractor hire rate was SSP 7 000 per operation with additional SSP 5 000 required for fuel. Conflicts between the communities of the two adjacent counties over land property and cultivation rights were resolved through the mediation of the local governors. The two communities agreed to share the land and

250 commercial farmers cultivated an average area of 40 *feddans* each and 400 smallholder farmers cultivated 3 *feddans* each, for a total of 11 200 *feddans* (4 700 hectares). A late onset of seasonal rains in late June delayed planting. Subsequently, torrential rains in July triggered floods which submerged several sorghum fields during the crop's early vegetative stage. River overflows in August destroyed the crops that were not damaged in July, thus resulting in total crop failure, compared to 1803 tonnes of sorghum harvested in 2020. Some farmers resorted to cultivating groundnuts on non-flooded high grounds, partly compensating for the total sorghum loss. The overall cereal production estimates in the mechanized subsector are shown in Table 6, with a contribution of 112 217 tonnes to the 2021 national cereal harvest.

Other crops

Groundnuts and cassava are the two major non-cereal crops grown in the country. Groundnuts, with a short growing season and the possibility to be used as both staple and cash crops, are an important safety net crop for farming households in the northern states where cassava does not grow. Groundnuts is also a major cash crop for farmers, especially in southern cropping areas where the longer rainy season allows for two harvests per year. However, cassava is the major safety net and the preferred staple crop in Greenbelt and southern areas of Ironstone Plateau. In Western Bahr-el-Ghazal State, a two-year cassava is planted either as a sole crop or intercropped with groundnuts, sorghum and sesame. Similarly, in Greater Equatoria Region, a two-year cassava is intercropped

Table 6: South Sudan - Cereal area and production estimates of the mechanized subsector, 2021

Location	Number of tractors	Harvested area (hectares)	Yields (tonnes/hectares)	Production (tonnes)	Remarks
Upper Nile (Renk and Melut)	554	101 472	1.1	111 619	
Ton Chol	1	185	1.1	198	
Aweil-Danga	16	0	-	-	Zero harvest despite the 4 704 hectares planted
Aweil Rice	5	397	0.7	266	
Udhum	3	210	0.6	134	
TOTAL (all cereals)	579	102 264	1.1	112 217	

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

with a wide range of crops, including cereals, sesame, groundnuts, pigeon peas and beans during the first year of its development. In the second year, it is usually left unweeded until harvesting. Cassava is usually the last crop in a rotation, as it may be left for a third year depending on the needs of the owners for sale or family consumption. While the one-year varieties of cassava are planted for home use and sale as fresh tubers, most farms in the main cassava-growing areas follow the two-year cycle, harvesting tubers 18–24 months from planting, which are traded locally in the form of tubers for processing and farther afield from the farms as dried cassava chips or cassava flour. Cassava yields vary significantly with the local agroecology and, based on the PET photo-indicators (plant densities, crown sizes and canopies) and occasional cross-check sample weighings, yields in 2021 are estimated to range from 10 to 17 tonnes of fresh tubers per hectare in the major growing areas of the country.

During the past four years, the increased numbers and wider geographical coverage of CCMCs at field level have improved the accuracy of the estimates on the planted area and the output of cassava and

groundnuts. The aggregate outputs in 2021 are estimated at about 1.5 million tonnes of cassava and about 190 000 tonnes of groundnuts (Table 7). Production of cassava and groundnuts in 2021 increased by about 5 and 11 percent from 2020, respectively. Despite the output increase, cassava output was constrained by the spread of a cassava disease known as cassava root rot in the key growing areas of the country, especially in Tambura, Ezo, Nzara and Yambio counties of Western Equatoria State. The disease affected cassava seriously, especially older plants, nearer to harvest time. Affected plants show shedding and/or shrinkage of leaves and drying of stems. The most affected cassava varieties are *Adagude gigara* (*Banat sena de*) and Tiara, especially when intercropped with the *Baworoworo* variety. Intercropping is an essential practice by farmers to avoid serious damage by wild pigs as the *Baworoworo* variety has a bitter taste and repels the pigs.

Information on other field crops grown at household level, particularly oilseeds (sesame, safflower and sunflower) is insufficient for deriving accurate production figures.

Table 7: South Sudan - Cassava and groundnuts indicative area, yields and production estimates, 2021

State	Cassava			Groundnuts		
	Area (hectares)	Yields (tonnes/hectare)	Production (tonnes)	Area (hectares)	Yields (tonnes/hectare)	Production (unshelled, tonnes)
Central Equatoria	16 397	16.0	262 359	30 363	0.80	24 291
Eastern Equatoria	19 930	13.0	259 096	13 533	0.80	10 826
Western Equatoria	43 578	17.0	740 826	44 042	0.80	35 234
Jonglei	418	10.0	4 180	1 908	0.50	954
Upper Nile	-	-	-	3 032	0.50	1 516
Unity	-	-	-	563	0.60	338
Lakes	4 876	13.0	63 388	73 027	0.70	51 119
Warrap	-	-	-	34 398	0.50	17 199
Western Bahr-el-Ghazal	14 147	12.0	169 762	30 096	0.80	24 077
Northern Bahr-el-Ghazal	-	-	-	34 642	0.70	24 250
TOTAL	99 347	15.1	1 499 611	265 604	0.71	189 802

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

LIVESTOCK

In 2021, despite the erratic early season rains, pasture and water availability in the areas not affected by the floods was adequate, and animal body condition was average, with a score of 3 out of 5 for cattle and 3 to 4 out of 5 for sheep and goats. By contrast, in the flood affected areas, severe access constraints to grazing areas and consequent feed shortages were reported, with a negative impact on animal body condition. In these areas, the average body condition scoring (BCS) was assessed at 2 to 3 out of 5 for cattle and 2 for sheep and goats.

Floods affected livestock in eight states, namely Jonglei, Northern Bahr-el-Ghazal, Lakes, Warrap, Upper Nile and Unity, while a relatively minor impact is reported in Western Bahr-el-Ghazal and Eastern Equatoria states. According to a flood impact assessment, about 10 million heads of livestock were affected, of which almost 800 000 perished, with small ruminants recording the highest losses. The area where pastoralist livelihoods suffered the most severe damages was Jonglei State, where about 2.35 million livestock heads were affected, with about 251 000 animals perishing. Animals died due to drowning, feed shortages and diseases, whose spread was fostered by the overcrowding of animals on higher grounds. A threefold increase in livestock diseases compared to non-flooded areas was reported, mainly contagious bovine *pleuropneumonia* (CBPP), *peste des petits ruminants* (PPR), foot-and-mouth disease (FMD), foot rot, internal parasite, anthrax, black quarter, *Trypanosomiasis*, *hemorrhagic septicemia*, lumpy skin disease and East Coast fever (ECF).



In addition, the floods, forcing the movement of pastoralists with their livestock to higher grounds, triggered competition for settlement areas and pasture among the displaced communities.

On a positive note, floods have significantly decreased interstate cattle raiding, especially in the Wunlit triangle region (Lakes, Unity and Warrap states), as well as in Jonglei State. In addition, numbers of fish have also increased, thus helping flood-affected households to cope supplementing their diets and partly compensating for the sharp decrease in the availability of livestock products.

During the 2021 agricultural season, a total of 6 269 111 animals (cattle, sheep and goats) and a small number of poultry, donkeys and dogs were vaccinated, while over 1.94 million animals were treated against priority livestock diseases, across the country (tables 7 and 8).

Table 8: South Sudan - Number of animals vaccinated against selected diseases, 2021

State	Cattle	Sheep	Goats	Poultry	Dogs	Donkeys
Central Equatoria	258 845	140 447	66 314	5 157	85	-
Eastern Equatoria	478 793	305 508	247 459	14 776	6 668	321
Jonglei	609 083	230 131	120 419	9 774	885	35
Lakes	411 878	197 821	93 528	12 192	773	20
Unity	183 071	18 290	13 412	-	-	-
Upper Nile	774 811	216 371	279 352	15 105	1 295	244
Western Bhar-el-Ghazal	109 915	83 710	46 000	10 470	231	1 167
Warrap	434 964	108 359	86 498	4 452	28	-
Western Equatoria	4 530	4 835	3 014	3 877	-	-
Northern Bhar-el-Ghazal	650 779	50 522	40 452	-	140	260
TOTAL	3 916 669	1 355 994	996 448	75 803	10 105	2 047

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

Table 9: South Sudan - Number of animals treated against selected diseases, 2021

State	Cattle	Sheep	Goats	Poultry	Dogs	Donkeys
Central Equatoria	10 866	3 466	10 449	8 400	311	20
Eastern Equatoria	55 065	29 301	43 861	18 146	98	157
Jonglei	195 567	116 317	191 927	107 297	3 764	540
Lakes	142 594	101 643	162 501	34 645	432	23
Unity	25 256	13 583	14 646	1 673	45	21
Upper Nile	110 329	92 361	87 858	22 360	949	1 889
Western Bhar-el-Ghazal	76 732	48 378	64 676	934	35	982
Warrap	36 098	25 078	22 323	7 427	180	82
Western Equatoria	1 720	2 195	2 587	3 802	73	-
Northern Bhar-el-Ghazal	26 398	8 388	5 906	563	154	58
TOTAL	680 625	440 710	606 734	205 247	6 041	3 772

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

CEREAL SUPPLY/DEMAND SITUATION

Cereal balance

Total cereal consumption in 2022 is estimated at 1.4 million tonnes, using a projected 2022 mid-year population of 12.53 million and an average per capita consumption of about 110 kg of cereals per year. The estimates of cereal per capita consumption are based on information provided by the 2009 National Baseline Household Survey at state level and adjusted, at county level, to take into account the differences between the urban and rural areas and the relative importance in the local diets of other crops (notably cassava and groundnuts), livestock and wild foods. The estimated production of 1.5 million tonnes of fresh cassava and over 189 802 tonnes of unshelled groundnuts is expected to provide about 441 000 tonnes and 170 800 tonnes of grain equivalent, respectively, bringing the estimated average per capita consumption to about 135 kg of cereal equivalent per year, a level fairly close to the estimates for neighbouring countries.

With an estimated net cereal production from the traditional sector of about 839 500 tonnes, a cereal



deficit of about 541 000 tonnes is forecast for the 2022 marketing year, about 16 percent more than the 2021 deficit of about 465 610 tonnes, and 17 percent above the 2017–2021 average.

Table 10 summarizes the estimated cereal supply situation for each state in 2022 and compares it with the mission's estimates for the previous seven years.

Table 10: South Sudan - Estimated cereal surplus/deficit, tonnes

Region/State	2015	2016	2017	2018	2019	2020	2021	2022
Central Equatoria	25 196	14 291	-13 294	-73 528	-92 092	-76 889	-71 937	-73 237
Eastern Equatoria	6 338	-16 750	-21 355	-29 889	-37 177	-8 606	-14 284	-15 322
Western Equatoria	86 767	18 542	10 601	52	-589	31 166	40 184	33 073
Greater Equatoria	118 302	16 083	-24 048	-103 365	-129 858	-54 329	-46 038	-55 486
Jonglei	-149 738	-148 937	-159 079	-159 753	-163 559	-171 607	-182 780	-189 689
Upper Nile	-78 942	-72 429	-58 864	-56 258	-57 675	-68 347	-69 515	-75 333
Unity	-80 298	-79 264	-80 041	-73 686	-66 614	-66 903	-66 878	-71 387
Greater Upper Nile	-308 978	-300 630	-297 984	-289 697	-287 848	-306 858	-319 173	-336 409
Lakes	-30 812	-28 889	-24 600	-22 459	-24 324	-14 418	-12 854	-31 549
Warrap	-4 907	-19 459	2 132	1 027	-18 321	-22 394	-21 376	-53 908
Western Bahr-el-Ghazal	16 044	-4 350	-14 256	-28 802	-32 341	-25 095	-15 322	-10 856
Northern Bahr-el-Ghazal	-38 315	-28 006	-25 529	-25 098	-25 549	-59 410	-50 848	-52 518
Greater Bahr-el-Ghazal	-57 989	-80 704	-62 253	-75 332	-100 535	-121 317	-100 400	-148 831
TOTAL	-248 666	-365 248	-384 285	-468 395	-518 240	-482 504	-465 610	-540 726

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

The largest shortfall is forecast in Greater Upper Nile Region (Upper Nile, Unity and Jonglei states), where the aggregate cereal deficit, after having increased by 40 percent between 2014 and 2015 due to the impact of the conflict, remained firm at around 290 000 between 2016 and 2019. The deficit increased by 7 percent in 2020, by 4 percent in 2021 and is expected to further rise to 5 percent in 2022 as three consecutive cropping seasons affected by floods resulted in substantial losses, with the combined cereal output in the three states having declined by 8 percent between 2020 and 2021.

In Greater Equatoria Region (Western, Central and Eastern Equatoria states), where moderate surpluses were produced up to 2016, increasing deficits followed between 2017 and 2019, due to the spread of the conflict to the region in 2016, which resulted in massive displacements that severely disrupted agricultural operations. Subsequently, the deficit decreased by almost 60 percent in 2020 and by 15 percent in 2021 to about 46 000 tonnes in 2021, as the aggregate cereal production increased for two consecutive years due to an expansion in the harvested area following the improved security situation and higher yields due to abundant rains. In 2022, the cereal deficit is expected to increase by 20 percent to about 55 400 tonnes, as cereal production declined due to erratic weather, with prolonged dry spells affecting yields.

In Greater Bahr-el-Ghazal Region, (Lakes, Warrap, Western Bahr-el-Ghazal and Northern Bahr-el-Ghazal states, where moderate surpluses were produced until 2015, increasing deficits were recorded between 2016 and 2019 due to the conflict. Subsequently, the deficit decreased by about 22 percent in 2020 and by almost 40 percent to about 100 000 tonnes in 2021, as cereal production substantially increased both in 2019 and 2020 due to improved security and favourable weather conditions. In 2022, the cereal deficit is expected to increase by almost 50 percent to about 149 000 tonnes, mainly due to the substantial flood-induced production shortfalls in Warrap and Lakes states, where the deficit in 2022 is expected to be more than twice than in 2021.

The county with the largest food deficit is Juba County, where about 41 000 tonnes of cereals will be needed in 2022 to cover the food requirements of mostly urban households. The gap is expected to

slightly decline by 2 percent compared to 2001, as an increase in cereal production by 4 percent outpaced the population growth.

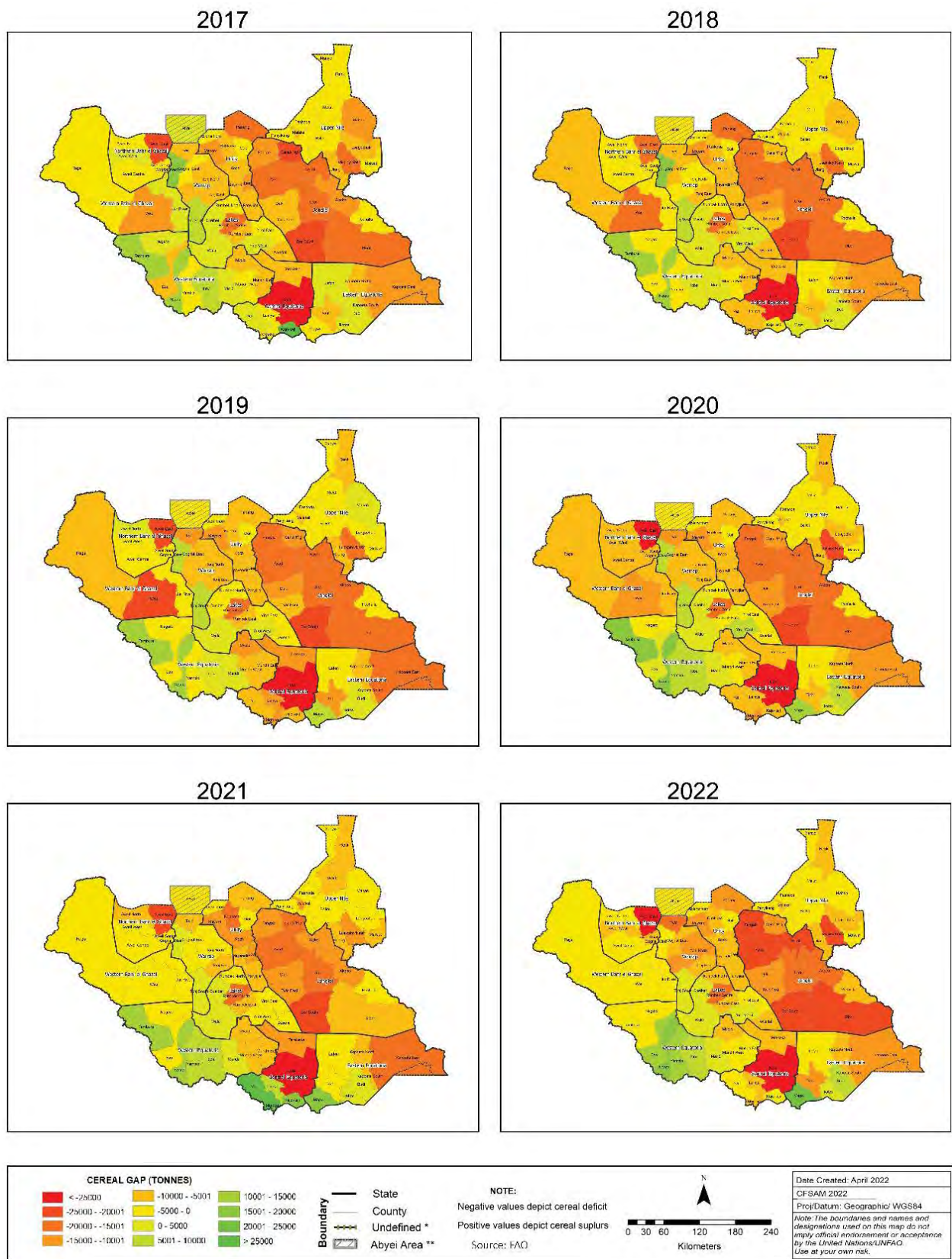
Production of cereals from the rainfed large and small mechanized sector in Upper Nile and Northern Bahr-el-Ghazal states is expected to provide an additional 112 217 tonnes of cereals, mainly sorghum grown in Upper Nile's mechanized farms. Although some sorghum is expected to be traded across the border in the Sudan, some amounts are expected to be marketed internally, depending on security conditions, transportation costs compounded by local "taxes" imposed on traders moving grains to major markets and fluctuations of exchange rates between currencies in the Sudan and South Sudan. As in past years, a portion of this production may represent an option for the local purchases by the international organizations providing food assistance in the surrounding food deficit areas. In recent years, given the high potential of the area for agriculture and availability of abundant land, the involvement of local South Sudanese investors is gradually increasing despite limited input availability, including credit. If these challenges are overcome by the government, the mechanized sector can provide a significant amount of cereal products for local consumption and for purchase by the WFP and other international humanitarian partners.

Cereal and livestock markets

In the capital, Juba, prices of cereals started to soar in mid-2015 on account of the depreciation of the national currency, the general economic downturn and widespread insecurity. In 2020, prices of sorghum, maize and imported wheat, already at high levels, surged in the first semester of the year as COVID-19 screening measures at border points in Uganda, the country's main source for cereals, disrupted commodity trade flows. After some limited declines in mid-2020, prices surged again in late 2020, reaching record highs in December, as the national currency depreciated abruptly in the parallel market in mid-October. Overall, prices of maize and sorghum tripled, while prices of imported wheat quintupled in 2020.

After having remained firm between December 2020 and March 2021, prices of cereals declined by about 20 percent between March and July, as the

Figure 8: South Sudan - Estimated 2017–2022 cereal surplus/deficit, tonnes



Source: FAO South Sudan, modified to comply with UN map, 2021.

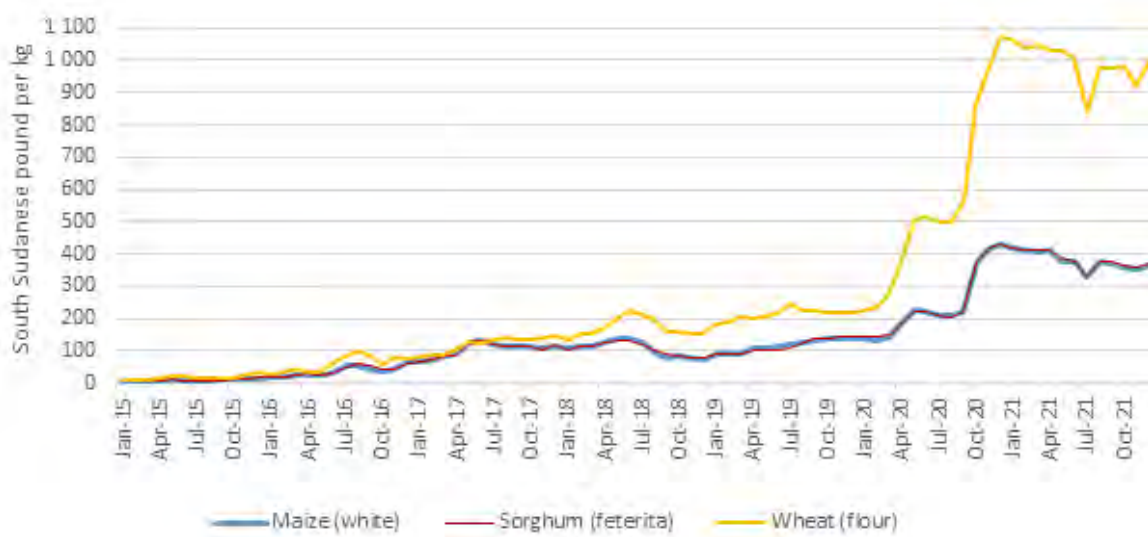
Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

liberalization of the official exchange rate resulted in a significant appreciation of the national currency vis-à-vis the United States dollar on the parallel market. Subsequently, between July and December, prices of maize, sorghum and wheat increased by about 10, 15 and 20 percent, respectively, as the exchange rate depreciated again on the parallel market. As of December 2021, prices of cereals were at exceptionally high levels. Prices of maize and sorghum were about 15 percent lower than the peak reached in December 2020 but more than 60 percent higher than two years earlier and about 50 times those in July 2015, before

the currency collapse. Underlying the high food prices are insufficient supplies, high transport costs due to high fuel prices and informal taxation, the lingering impact of the prolonged conflict and the prolonged difficult macroeconomic situation, due to low foreign currency reserves and the weak national currency.

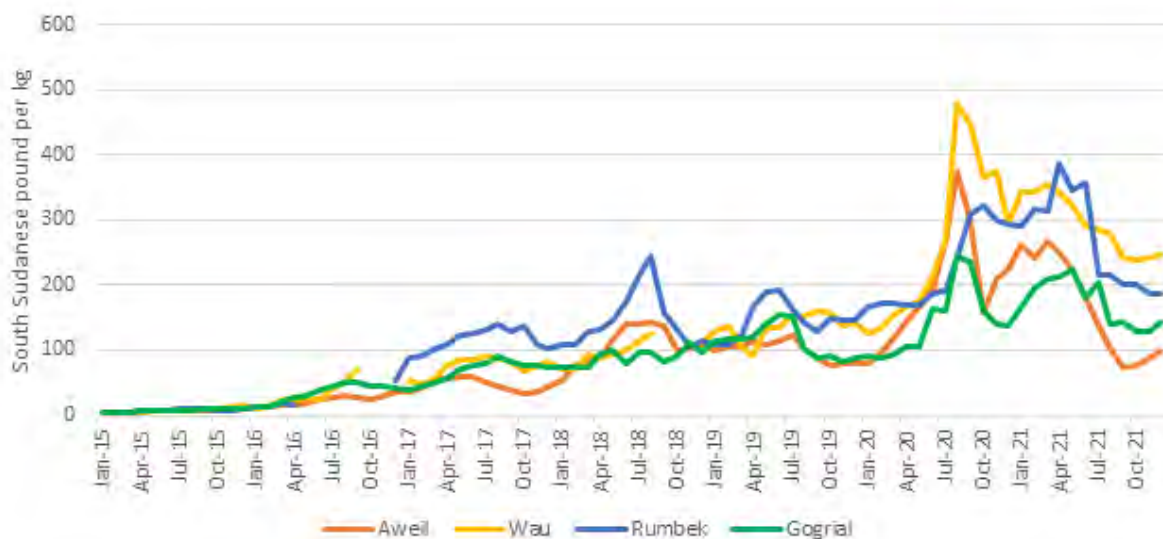
Prices of sorghum started to surge in mid-2015 also in other markets across the country (Figure 10). In 2020 prices sharply increased since April in the markets of Aweil (Northern Bahr-el-Ghazal State), Wau (Western Bahr-el-Ghazal State),

Figure 9: South Sudan (Juba) - Retail prices of selected cereals, SSP/kg



Source: FAO South Sudan Crop and Livestock Market Information System, 2021.

Figure 10: South Sudan - Retail prices of white sorghum in selected markets, SSP/kg



Source: FAO South Sudan Crop and Livestock Market Information System, 2021.

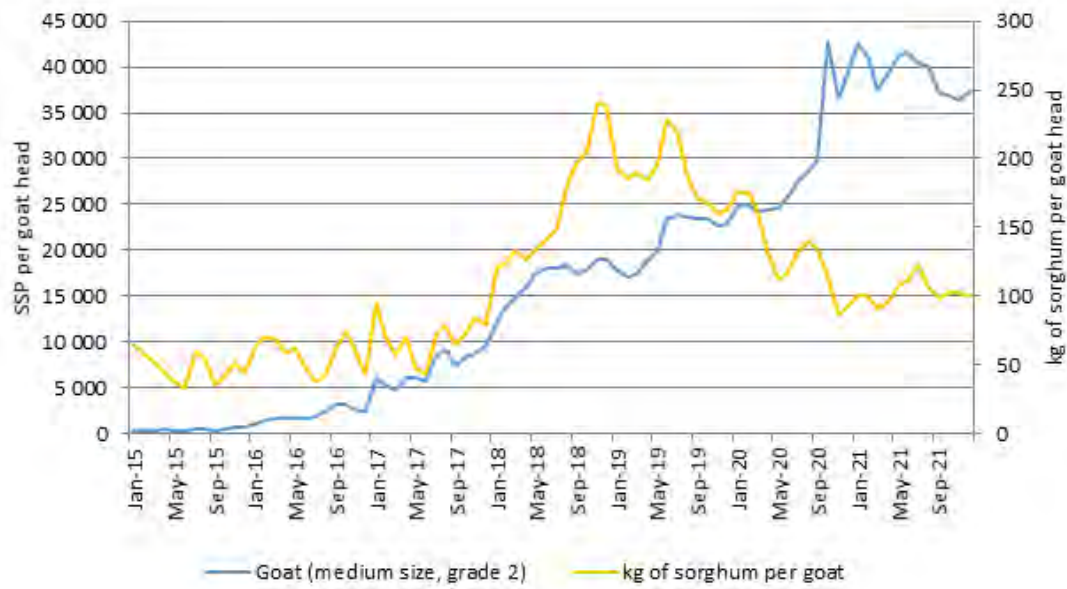
Rumbek (Lakes State) and Gogrial (Warrap State), showing a marked volatility and underpinned by currency weakness, trade disruptions related to torrential rains, floods, restrictive measures linked to curb the spread of COVID-19. After having peaked in Wau and Aweil in August 2020 and in Rumbek in April 2021, prices declined, albeit irregularly, until September–October 2021, mainly due to the positive developments on the currency exchange market, subsequently resuming their increasing trend in late 2021. Sorghum prices in December 2021, despite being 15–55 percent lower year on year, were still at exceptionally high levels across the country, up to 70 percent higher than two years earlier and about 20 times those in July 2015, before the currency collapse, severely constraining access to food for market-dependant households.

The food and livestock markets in South Sudan are characterized by a weak integration, mainly as a consequence of the poorly developed road network. The tarmac road connecting Nimule, on the Ugandan border, with Juba is virtually the only all-season trading route in the country. All other roads, including those in the western corridor connecting Juba with Rumbek to Wau up to Aweil, are subject to significant constraints during the rainy season (May–October) when they may become impassable undermining the stability of supply flows. Transportation costs are in general more than proportional to the distance from markets, due to multiple taxation (both official and unofficial), time spent at customs, check points and roadblocks. With the exception of Juba's market, which relies on a regular supply of commodities, prices record a high volatility throughout the country, as local economies are very shallow and

prices tend to quickly react to contingent and short-lived events as road blocks, the delivery of food assistance or episodes of violence. This aspect was exacerbated during the conflict by low market stocks and high turnover practiced by traders in order to minimize the losses due to looting and damage of markets. Despite the improved security situation after the signing of the R-ARCCS in 2018 and the appreciation of the national currency on the parallel market in 2021, market availability remains constrained as traders continue to adopt a strategy of high turnover in order to minimize the risk posed by the volatile security and macroeconomic situation.

Livestock is an integral part of the local livelihoods and sales of small ruminants are an important source of income that largely determine pastoralists' capacity to purchase food items. As shown in Figure 11, in Juba, prices of goats (medium size, grade 2), started following an increasing trend in early 2016 due to high inflation and insecurity-related market disruptions. Prices surged in the second semester of 2020, increasing by more than 70 percent between May and October, following a sharp depreciation of the national currency on the parallel market. In the first semester of 2021, prices were markedly volatile, subsequently declining by 10 percent between June and December, when they were traded at about SSP 37 000/head, about 5 percent lower than 12 months earlier. However, in 2021, prices of goats decreased at slower rates than the prices of sorghum, and terms of trade for pastoralists improved. In December 2021, in Juba, a goat was equivalent to about 100 kg of sorghum, about 10 percent more than the equivalent in sorghum 12 months earlier.

Figure 11: South Sudan (Juba) - Retail prices of goats and terms of trade



Source: FAO South Sudan Crop and Livestock Market Information System, 2021.

HOUSEHOLD FOOD SECURITY SITUATION

Overview

This section presents the findings of an analysis conducted on the past, current and future status of household food security in South Sudan. The main drivers for household food insecurity are identified and explained, and component elements of food security (i.e., food access, food availability, food utilization) are explored. Analysis of trends across administrative boundaries (i.e., states) are additionally presented.

Methodology

Food Security and Nutrition Monitoring System - Plus

The Food Security and Nutrition Monitoring System - Plus (FSNMS+) is a nationwide data collection exercise focused on Food Security and Nutrition and conducted annually since 2009 by WFP, FAO, United Nations Children's Fund (UNICEF) and MoAFS as well as governmental, international non-governmental organization (INGO), and NGOs members of the South Sudan Food Security Cluster.^{vii} In 2021, the FSNMS+ was re-designed to be an independent and coordinated interagency multisectoral needs assessment, formalized through a mandate by the Humanitarian Country Team (HCT). The newly expanded exercise was aptly renamed as the FSNMS+ to differentiate from previous exercises. Round 27 of FSNMS+ was designed throughout 2021 and conducted from October 2021 to January 2022. The exercise included an household-level data collection among 14 231 households across all 78 counties within the ten states and three administrative areas of South Sudan. It also included data collection within six high-priority urban areas (e.g. Juba, Wau, Malakal, Bentiu,



Yei, Rumbek) and two POC/IDPs' camps. Round 27 of FSNMS+ was timed to inform decision making for key assessment and planning exercises, including the IPC, humanitarian needs overview (HNO) and Humanitarian Response Plan (HRP).

The exercise faced some challenges with insecurity and access constraints during data collection, particularly in Western Equatoria, Upper Nile, and Warrap states, which ultimately led to a small reduction in the number of interviewed households. Nevertheless, effective sample sizes remain sufficient for accurate measurement of the primary food security and nutrition indicators at the national, state and county level at the targeted level of precision. The results of FSNMS+ are representative of the overall population at the national, state and county level with a 95 percent confidence level and 10 percent margin of error. Findings from Round 27 of the FSNMS+ serve as the primary source for analysis on the drivers and dynamics of food insecurity presented in the sections below.

Integrated food security phase classification

The IPC system is a multipartner platform supporting food security and nutrition analysis and decision-making. The main goal of the IPC system is to provide decision makers with a rigorous, evidence and consensus-based analysis of food insecurity and acute malnutrition situations, to inform emergency responses as well as medium- and long-term policy and programming.

The IPC system was originally introduced in South Sudan in 2007 through the Livelihoods Analysis Forum facilitated by the NBS and has since continued to conduct workshops to define acute food insecurity (AFI) and acute malnutrition (AMN). The IPC Technical Working Group (TWG) for South Sudan is co-chaired by the MoAFS and WFP, with FAO serving as the Secretariat for the IPC system. The most recent IPC acute food insecurity analysis exercise was conducted from 8 to 18 March, 2022 in Juba, South Sudan and attended by a multiagency and multisectoral group of more than 100 participants. By using the IPC classification and analytical approach, government, donor, United Nations agency, INGO/NGO and civil society actors work together to determine the severity and magnitude of acute and chronic food insecurity and acute malnutrition situations in a country, according to internationally recognized scientific standards. Findings from this exercise serve as the primary source for analysis on the past, present, and future status of food insecurity presented in the Household Food Insecurity section that follows.

Household food insecurity

Present status of household food insecurity

A total of 36 counties are classified in IPC Phase 4 (Emergency) acute food insecurity, 40 counties are classified in IPC Phase 3 (Crisis) acute food insecurity and only two counties are classified in IPC Phase 2

(Stressed) acute food insecurity in the current period covering February–March 2022. With the current levels of humanitarian food assistance (HFA), 0.4 percent of the population (about 55 000 people) are in IPC Phase 5 (Catastrophe) acute food insecurity, 19.2 percent of the population (about 2.37 million people) are in IPC Phase 4 (Emergency) acute food insecurity and 35.6 percent of the population (about 4.40 million people) are in IPC Phase 3 (Crisis) acute food insecurity.

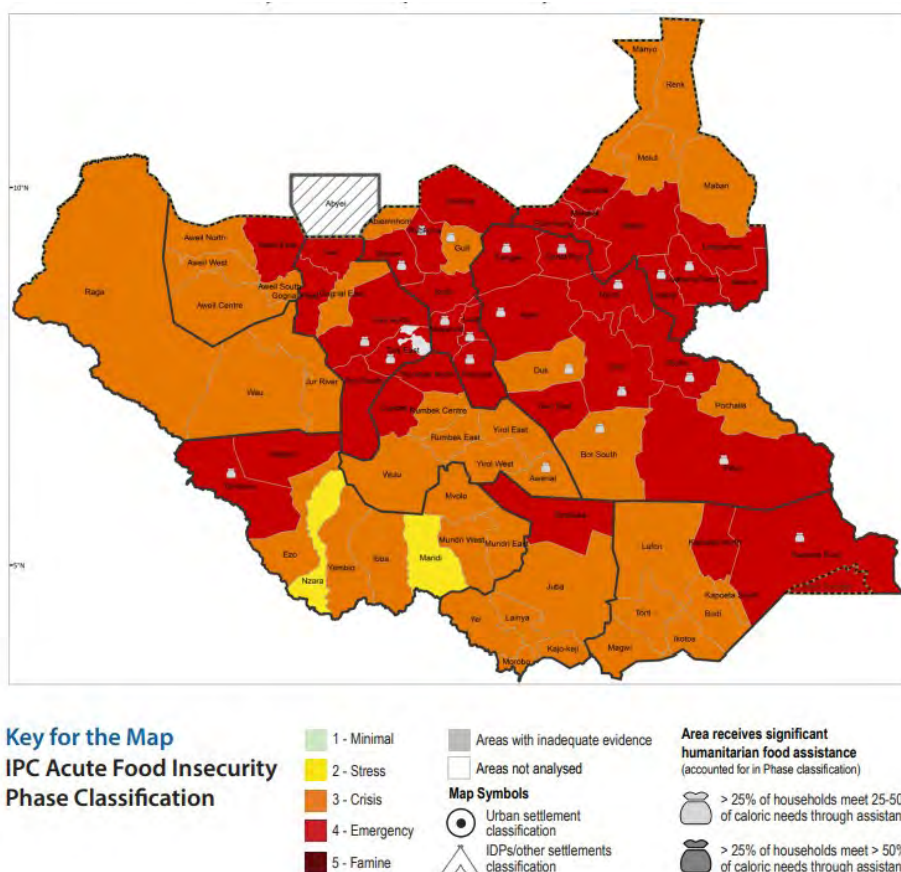
Future status of household food insecurity

A total of 52 counties are classified in IPC Phase 4 (Emergency) acute food insecurity, 23 counties are classified in IPC Phase 3 (Crisis) acute food insecurity and only three counties are classified in IPC Phase 2 (Stressed) acute food insecurity for the projected period between April and July 2022. With the planned levels of HFA, 0.7 percent of the population (about 87 000 people) will likely be in IPC Phase 5 (Catastrophe) acute food insecurity, 23.4 percent of the population (about 2.90 million people) will likely be in IPC Phase 4 (Emergency) acute food insecurity and 38.6 percent of the population (about 4.76 million people) will likely be in IPC Phase 3 (Crisis) acute food insecurity.

Longer-term trends in household food insecurity

Overall food insecurity has increased significantly in South Sudan, with roughly 6.83 million people in IPC Phase 3 (Crisis) or above between February and March 2022 compared to 5.29 million people in January 2020. The deterioration continues to stem from the cumulative effects of conflict, climate and macroeconomic shocks, including a third year of widespread and persistent flooding. Trends seem to suggest persistent levels of food insecurity across Jonglei, Upper Nile and Lakes states. Based on usual seasonal patterns, current food insecurity is expected to worsen approaching the lean season by mid-2022.

Figure 12: South Sudan - IPC acute food insecurity for current period (February-March 2022)



Source: Findings drawn from Integrated Food Security Phase Classification (IPC) – Acute Food Insecurity Classification (https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/South_Sudan_IPC_Key_Messages_February-July-2022_Report.pdf), 2022.

Note: A population in IPC Phase 3 (Crisis) or above does not necessarily reflect the full population in need of urgent action. This is because some households may be in IPC Phase 2 (Stressed) or even in IPC Phase 1 (Minimal), because of humanitarian assistance. The national population is estimated at 12 394 979; however, the total analysed and classified population is 12 348 961 because an estimated 46 018 people living in Makuac, Paliang and Paweng Payams of Tonj East were not analysed and classified due to these Payams being inaccessible during the FSNMS survey data collection exercise.

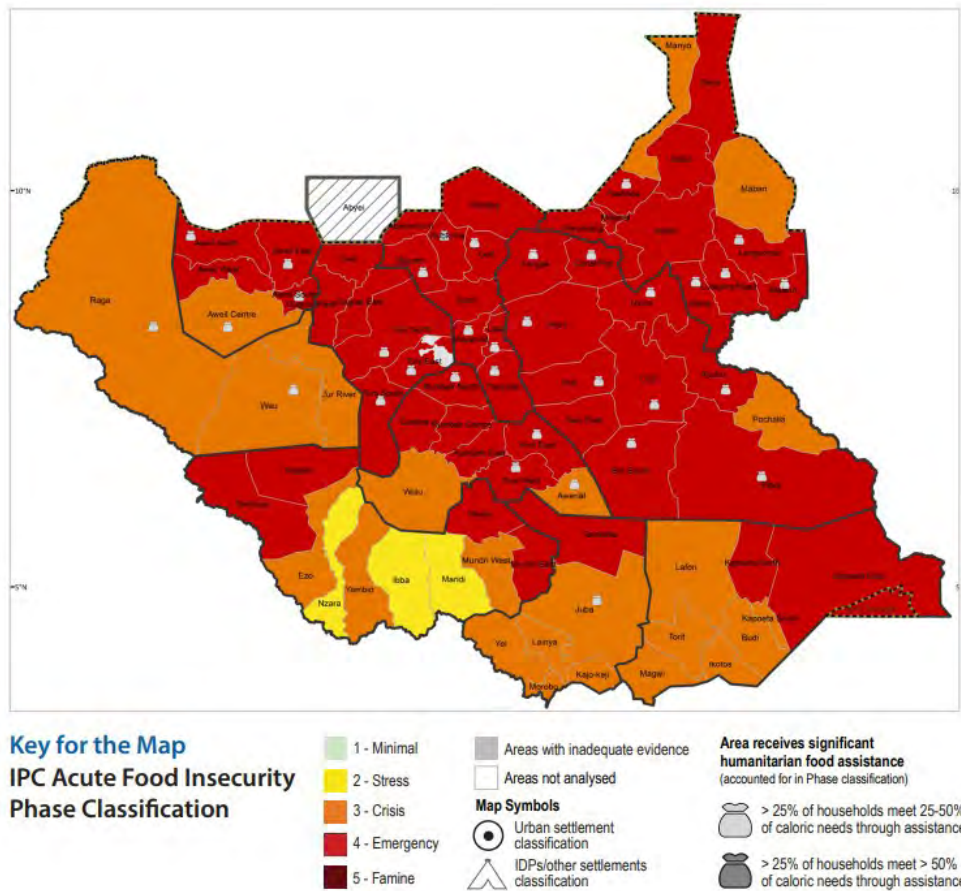
Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Table 11: South Sudan - Estimated populations for current period, February–March 2022

State	Mid-2022 Population (NBS)	Phase 1 Food Security	Phase 2 Stressed	Phase 3 Crisis	Phase 4 Emergency	Phase 5 Catastrophe
Central Equatoria	1 545 679	260 000	479 000	653 000	154 000	-
Eastern Equatoria	1 125 346	302 000	329 000	343 000	151 000	-
Jonglei	2 031 778	207 000	354 000	865 000	563 000	42 000
Lakes	1 209 754	206 000	375 000	445 000	184 000	-
Northern Bahr-el-Ghazal	935 156	152 000	252 000	377 000	154 000	-
Unity	1 123 634	93 000	271 000	463 000	289 000	7 000
Upper Nile	1 522 253	280 000	416 000	497 000	328 000	-
Warrap	1 248 033	174 000	289 000	401 000	385 000	-
Western Bahr-el-Ghazal	662 897	185 000	282 000	133 000	63 000	-
Western Equatoria	944 431	287 000	324 000	224 000	104 000	6 000
TOTAL	12 348 961	2 146 000	3 371 000	4 401 000	2 375 000	55 000

Source: Integrated Food Security Phase Classification, IPC (https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/South_Sudan_IPC_Key_Messages_February-July-2022_Report.pdf), 2022.

Figure 13: South Sudan - IPC acute food insecurity projected period, April–July 2022



Source: Findings drawn from Integrated Food Security Phase Classification (IPC) – Acute Food Insecurity Classification

(https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/South_Sudan_IPC_Key_Messages_February-July-2022_Report.pdf), 2022.

Note: A population in IPC Phase 3 (Crisis) or above does not necessarily reflect the full population in need of urgent action. This is because some households may be in IPC Phase 2 (Stressed) or even in IPC Phase 1 (Minimal), because of humanitarian assistance. The national population is estimated at 12 394 979; however, the total analysed and classified population is 12 348 961 because an estimated 46 018 people living in Makuac, Paliang and Paweng Payams of Tonj East were not analysed and classified due to these Payams being inaccessible during the FSNMS survey data collection exercise.

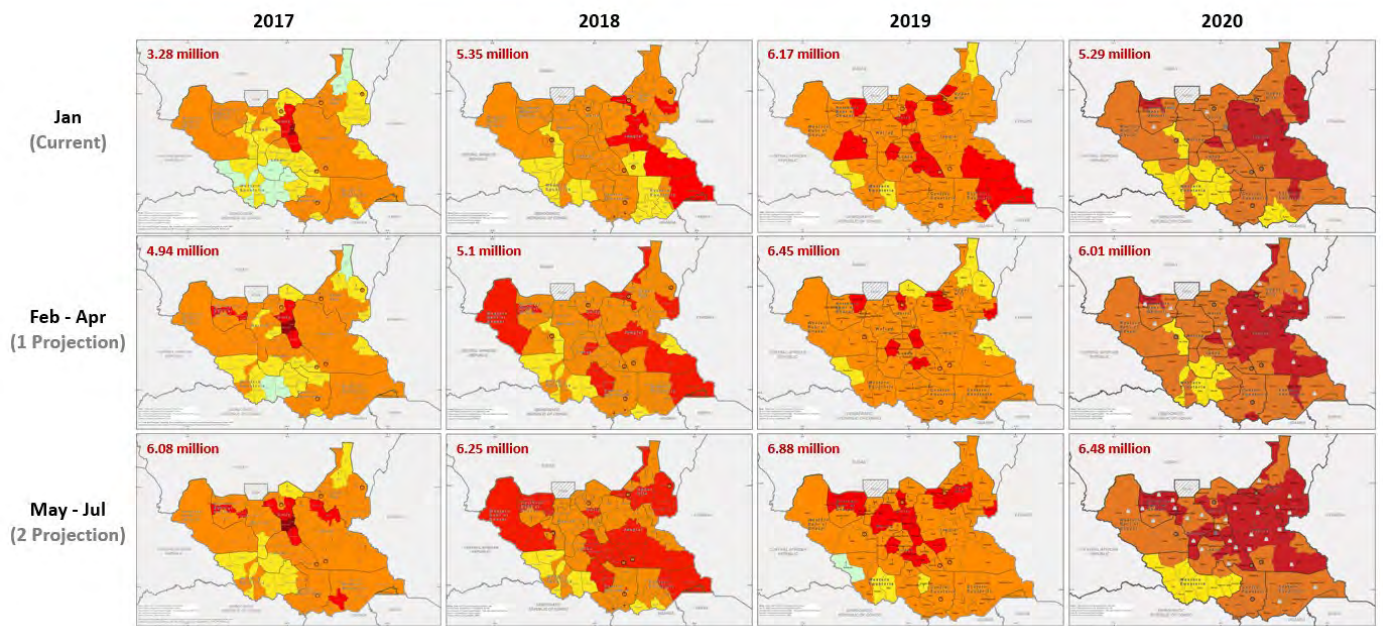
Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Table 12: South Sudan - Estimated populations for projected period, April–July 2022

State	Mid-2022 Population (NBS)	Phase 1 Food Security	Phase 2 Stressed	Phase 3 Crisis	Phase 4 Emergency	Phase 5 Catastrophe
Central Equatoria	1 545 679	236 000	466 000	665 000	178 000	-
Eastern Equatoria	1 125 346	269 000	311 000	395 000	151 000	-
Jonglei	2 031 778	144 000	290 000	875 000	655 000	000
Lakes	1 209 754	149 000	311 000	472 000	264 000	13 000
Northern Bahr-el-Ghazal	935 156	106 000	209 000	419 000	200 000	-
Unity	1 123 634	66 000	180 000	502 000	370 000	7 000
Upper Nile	1 522 253	194 000	330 000	587 000	410 000	-
Warrap	1 248 033	148 000	224 000	429 000	447 000	-
Western Bahr-el-Ghazal	662 897	152 000	249 000	166 000	96 000	-
Western Equatoria	944 431	236 000	331 000	255 000	121 000	6 000
TOTAL	12 348 961	1 700 000	2 901 000	4 765 000	2 892 000	87 000

Source: Integrated Food Security Phase Classification, IPC (https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/South_Sudan_IPC_Key_Messages_February-July-2022_Report.pdf), 2022.

Figure 14: South Sudan - IPC acute food insecurity trends, 2017–2020



Source: Time series trends draw from IPC acute food insecurity classification, for more information please refer to the source documentation: https://www.ipcinfo.org/ipc-country-analysis/en/?country_iso3=SS, 2021.

Note: A population in IPC Phase 3 (Crisis) or above does not necessarily reflect the full population in need of urgent action. This is because some households may be in IPC Phase 2 (Stressed) or even in IPC Phase 1 (Minimal), because of humanitarian assistance. The national population is estimated at 12 394 979; however, the total analysed and classified population is 12 348 961 because an estimated 46 018 people living in Makuac, Paliang and Paweng Payams of Tonj East were not analysed and classified due to these Payams being inaccessible during the FSNMS survey data collection exercise.

Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Drivers of household food insecurity

Conflict-related shocks

While large-scale political conflict remains at low levels following the ceasefire agreed in September 2018, intercommunal violence remains a threat to stability and food security in the country. Conflict negatively impacts household food security in a multitude of ways, including displacement and population movements, disruptions in crop production, market instability and market access restrictions. It can also disrupt the delivery of humanitarian support and assistance.

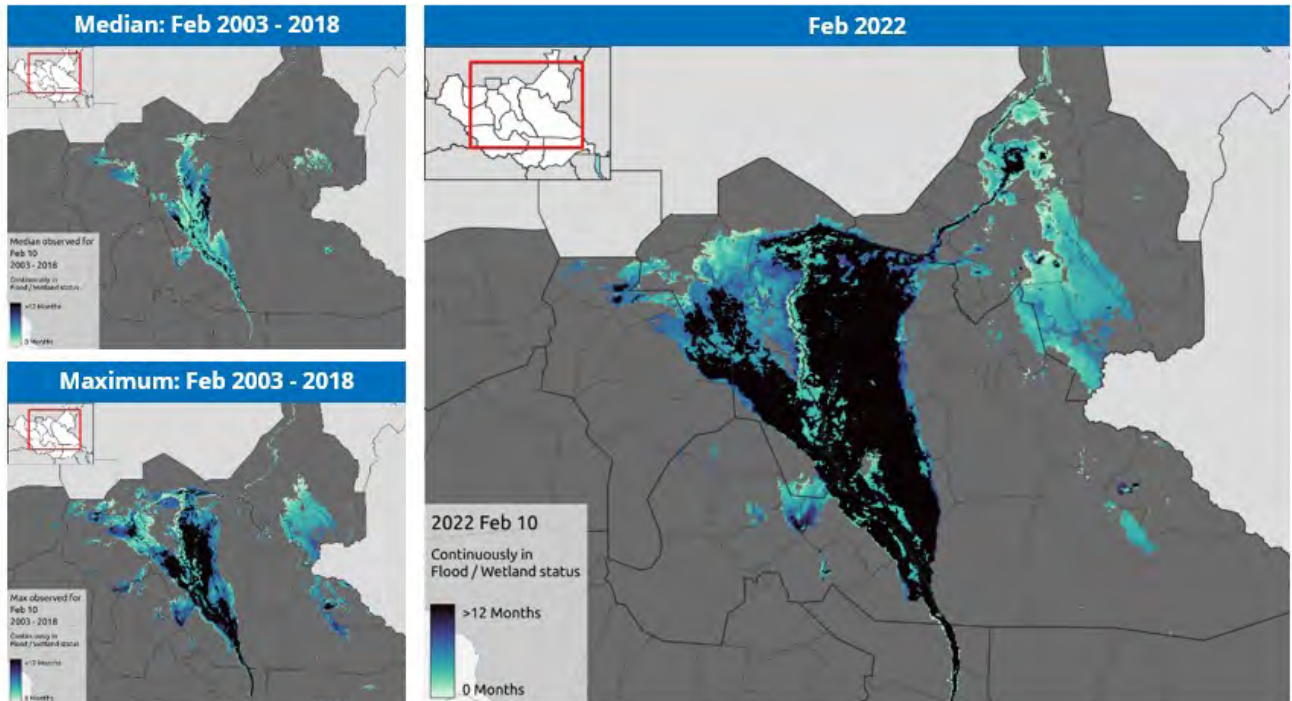
The areas most affected by intercommunal violence include Jonglei, Warrap, Upper Nile, Unity and Western Equatoria states. The expansion of conflict into the surplus production areas of Greater Equatoria have had an impact on overall cereal production and availability, reaching beyond the areas that were directly affected by conflict.

Climate-related shocks

The country was hit by three large-scale flood events in 2019, 2020 and 2021, with the extent and persistent flooding reaching record levels (Figure 15). Although some localized weather events contributed to the flooding, widespread flooding was largely a result of exceptionally high-water levels in upstream lakes, including Lake Victoria, Lake Albert and Lake Kyoga (Figure 16). Outflows from the lakes aggregated within the White Nile ultimately contributing to historically high-water levels along the river (Figure 17), causing vast flooding and wetland expansion of the Sudd. In addition, some localized flooding in Upper Nile (Melut) State was found to have originated from flooding along the Sobat River which is and more broadly connected to unusually high rainfall levels in eastern regions of South Sudan during 2019–2021.

Generally, the areas most affected by the 2019–2021 flooding include Jonglei (Ayod, Pigi, Fangak, Pibor), Upper Nile (Panyikang), Warrap (Tonj East, Tonj North), Lakes (Rumbek North) and Unity (Mayendit,

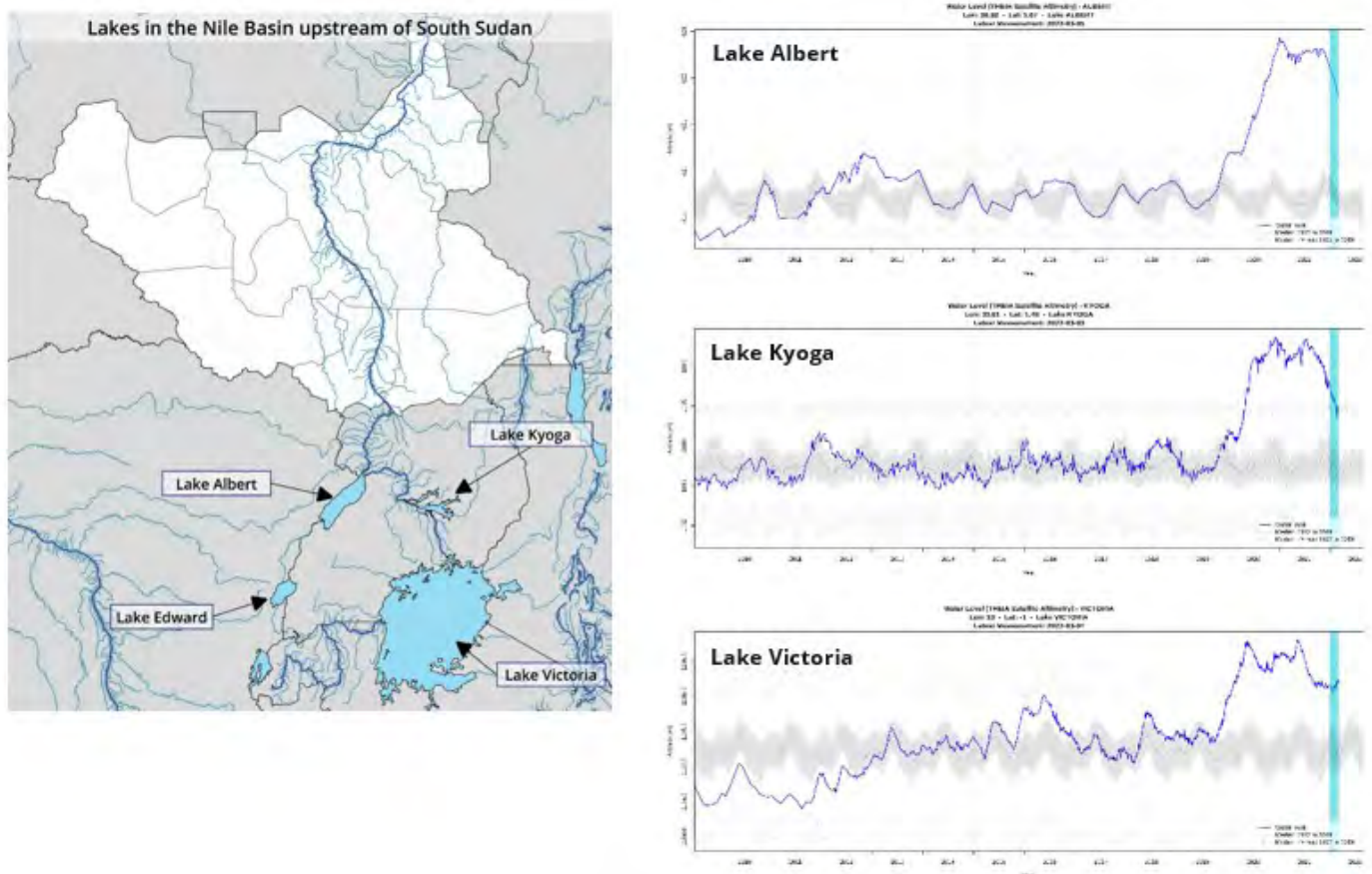
Figure 15: South Sudan - Estimated flood and wetland area, February 2022



Source: Moderate Resolution Imaging Spectroradiometer - Land Surface Temperature (MODIS LST), 2021.

Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

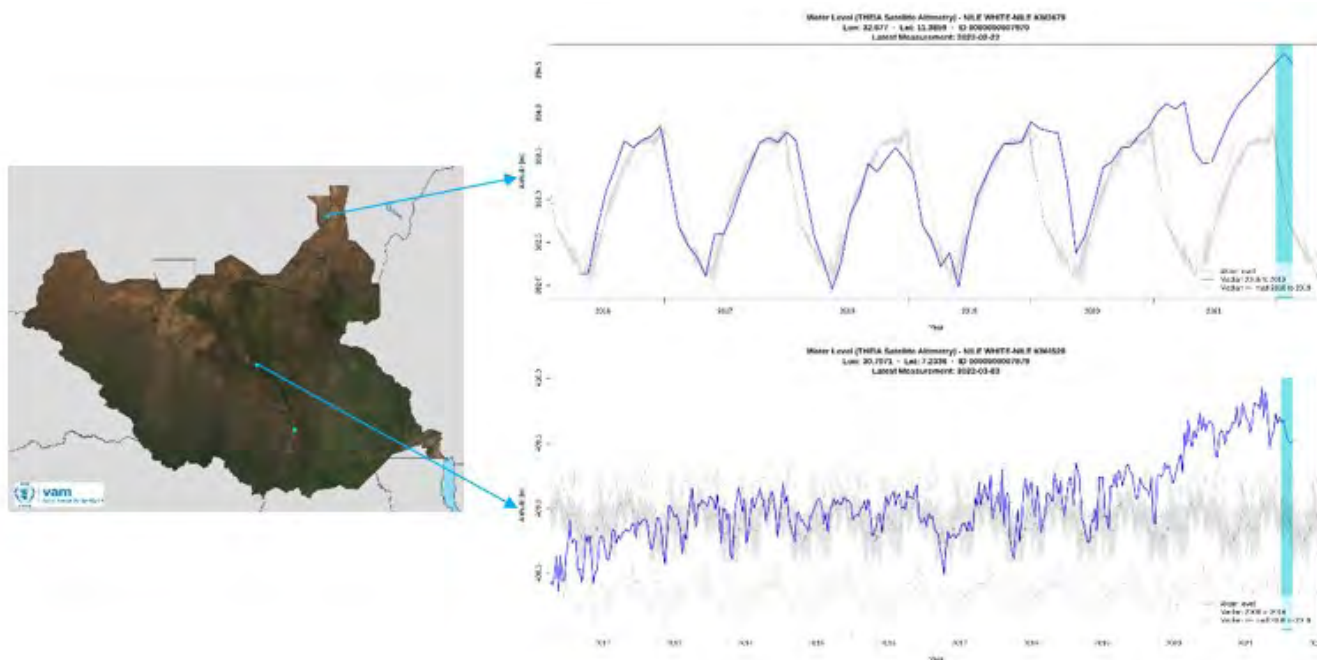
Figure 16: South Sudan - White Nile River basin upstream lake water levels



Source: Theia Hydroweb Project: <https://www.theia-land.fr/en/theia-data-and-services-center/>, <https://www.theia-land.fr/en/product/water-levels-of-rivers-and-lakes-hydroweb/>, 2021.

Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Figure 17: South Sudan - White Nile upstream and downstream river water levels



Source: Theia Hydroweb Project: <https://www.theia-land.fr/en/theia-data-and-services-center/>, <https://www.theia-land.fr/en/product/water-levels-of-rivers-and-lakes-hydroweb/>, 2021.

Disclaimer: Final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined.

Koch, Leer, Panyijar, Rubkona) states. Estimates of the impact of the flooding suggest that roughly 835 000 individuals across 33 counties have been impacted through internal displacement, disruptions in agricultural production and livestock losses tied to shortages of grazing land and localized disease outbreaks.^{viii} As this flooding is primarily related to Great Lake levels, which remain at historically high levels, most areas that are now flooded will likely remain flooded through the 2022/23 dry season and 2023 wet season.

Macroeconomic shocks

The macroeconomic environment of South Sudan was recently impacted by a series of shocks tied directly and indirectly associated with the COVID-19 pandemic. Most starkly, the significant price reductions in international oil prices associated with global travel and commercial restrictions disrupted public financing and balance of payment within governmental institutions as fiscal revenues are largely dependent on the sale of petroleum products on the international market.

In the past, the monetization of fiscal deficits resulted in high inflation and associated exchange rate depreciation, however, in 2020 and 2021, the Government of South Sudan (GoSS), in cooperation with development partners, introduced a series of reforms to strengthen fiscal discipline, stabilize foreign exchange rate markets and ensure macroeconomic stability. In support of this effort, the International Monetary Fund (IMF) approved the disbursement of USD 174.2 million to the Government of South Sudan through the Rapid Credit Facility (RCF), with financial disbursement in 2020 and 2021.^{ix} These efforts, in combination with steady increases in international oil prices, have contributed to macroeconomic stabilization.

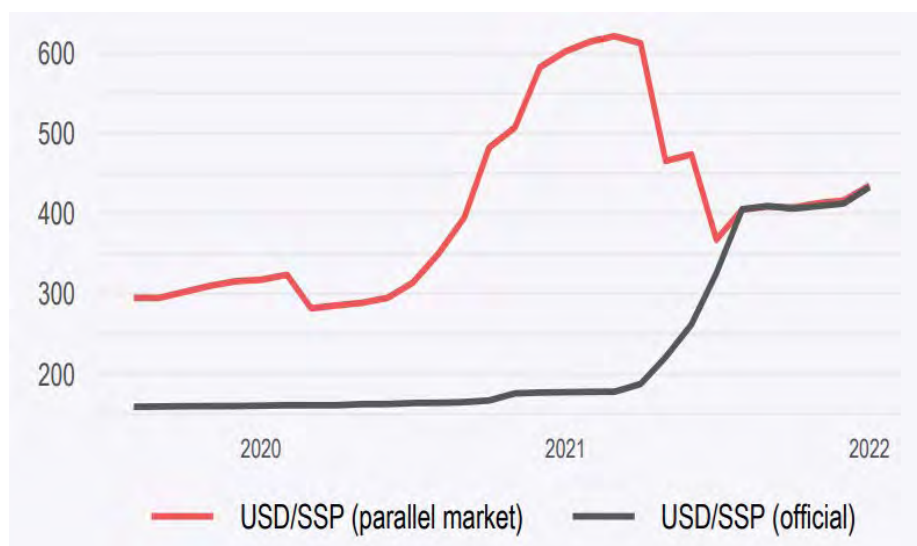
In addition, in December 2020, the Central BSS introduced auctioning of US dollars to its foreign exchange market which led to the convergence of the parallel and official exchange rates for the US dollar and South Sudanese pound. The parallel and official exchange rates fully converged in May 2021, which

has improved access to hard currency, however, the effects of the convergence on balance of payment and commodity prices require further examination (Figure 18).

Since October 2021, the combined impact of seasonal harvests, stabilized exchange rate, improved

security and improved road access have contributed to the stability and marginal drop in prices of staple food commodities (Figure 19). However, despite the recent seasonal improvement, overall staple food commodities prices remain elevated and the purchasing power of conflict and climate-affected households has continued to erode.

Figure 18: South Sudan - South Sudanese pound to US dollar exchange rate



Source: Joint Market Monitoring Initiative (JMML): https://reliefweb.int/sites/reliefweb.int/files/resources/SSD-JMML_Factsheet-January_2022.pdf, 2022.

Figure 19: South Sudan - Multisectoral survival minimum expenditure food basket price trends, August 2019-January 2022



Source: Joint Market Monitoring Initiative (JMML): https://reliefweb.int/sites/reliefweb.int/files/resources/SSD-JMML_Factsheet-January_2022.pdf, 2022.

Dynamics of household food insecurity

Household food insecurity outcomes

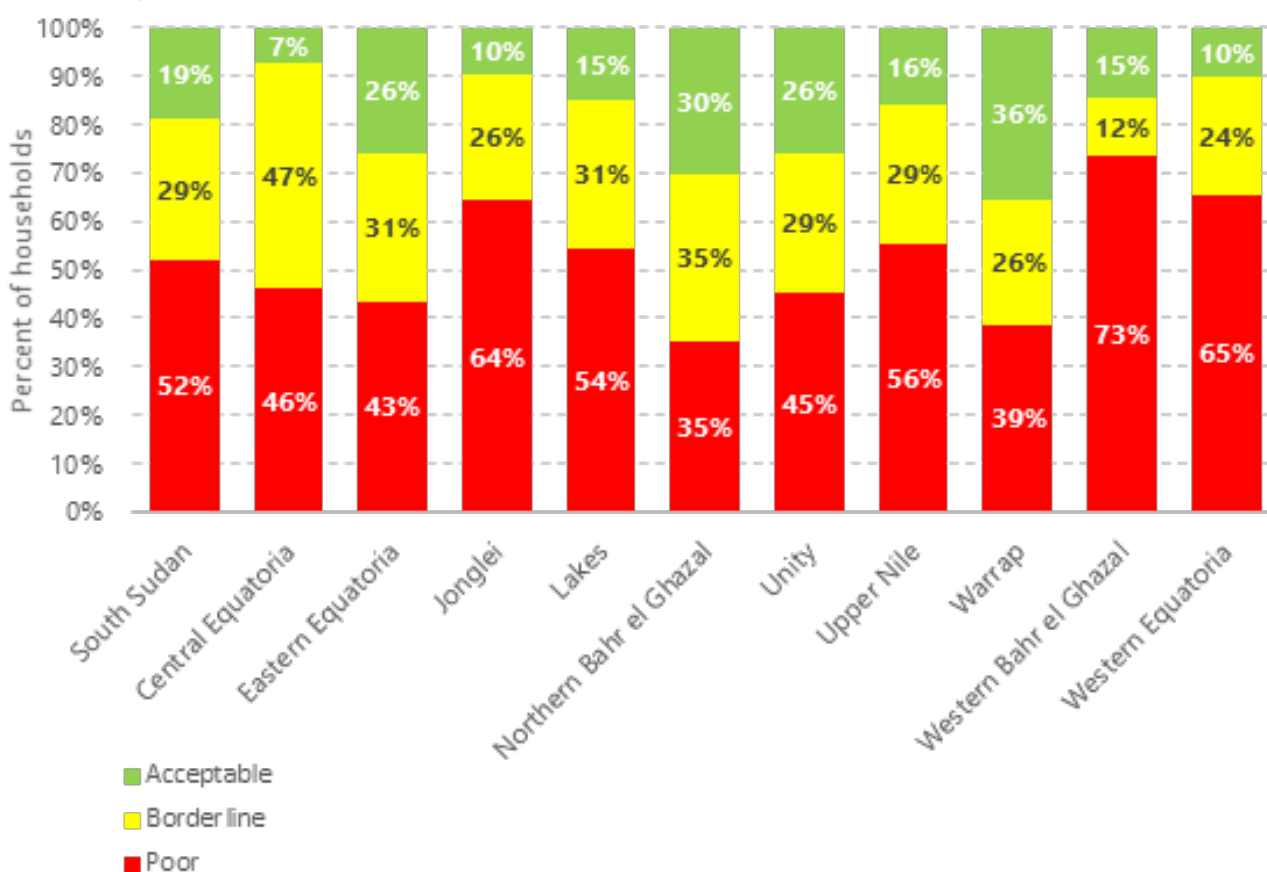
Food consumption

Household food consumption was captured and analysed using the food consumption score (FCS). The FCS is a metrix endorsed by WFP and the Food Security Cluster which measures dietary diversity, consumption frequency and relative

nutritional importance of household food consumption.

At the national level, 52 percent of the households had poor food consumption and an additional 29 percent had borderline food consumption (Figure 20). Particularly high prevalence rates of poor food consumption were found in Western Bahr-El-Ghazal (73 percent), Western Equatoria (65 percent) and Jonglei (64 percent), suggesting that roughly two-thirds to three-fourths of households in these states are consuming a diet that is providing insufficient nutritional intake.

Figure 20: South Sudan - Household food consumption score classification



Source: World Food Programme, 2021.

Food consumption is dominated by the consumption of staples foods (e.g. maize, sorghum, cassava, rice, millet, etc.) with 78 percent of the households consuming these items in the past 24 hours (Figure 21). Roughly 48 percent of the households consumed vegetables (e.g. spinach, onion, tomatoes, carrots, peppers, lettuce, okra, etc.) and 42 percent of the households consumed condiments (e.g. tea, coffee, cocoa, salt, garlic, etc.) in the past 24 hours. Fish, fruit, meat and eggs were generally consumed infrequently.

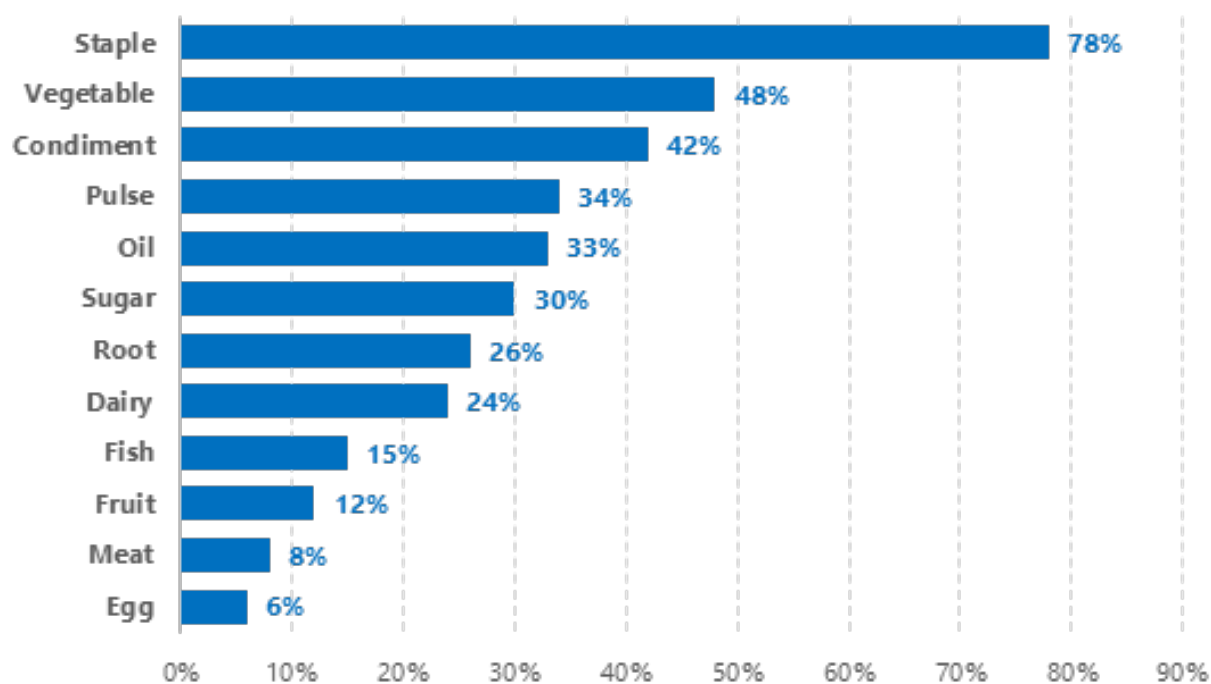
Coping strategies

In addition to household food consumption, household application of harmful coping strategies was additionally explored through two primary metrics: reduced coping strategy index (rCSI) and livelihood-based coping strategy index (LCSI). The rCSI measures the adoption of

consumption-based coping strategies frequently employed by households to reduce overall household food expenditure when faced with food shortages. Similarly, the LCSI measures the adoption of livelihoods-based coping strategies frequently employed by households to increase income and reduce expenditure when faced with food shortages.

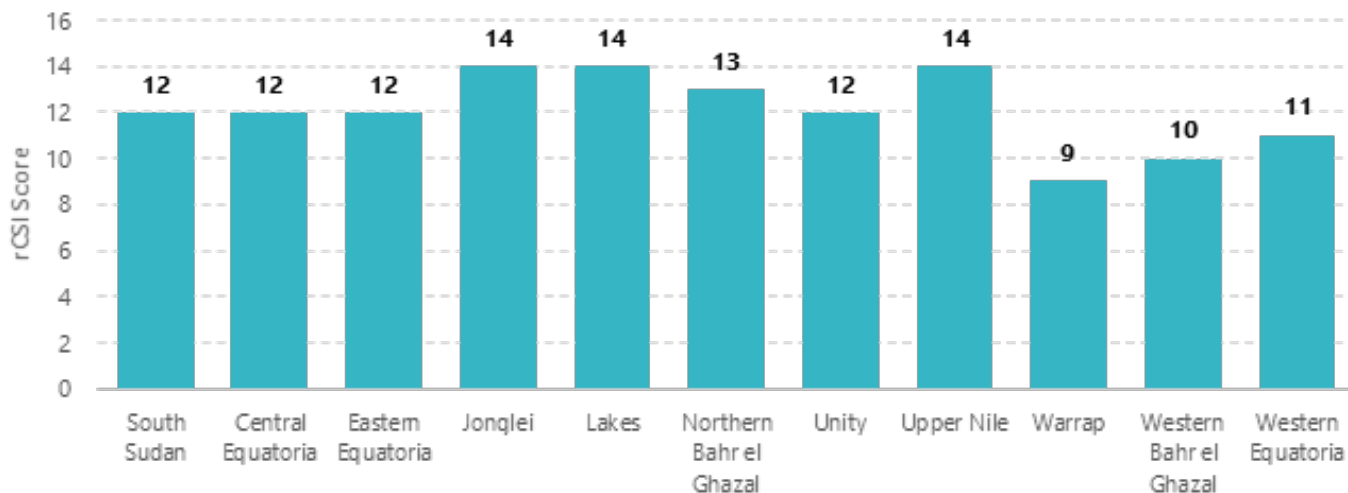
At the national level, 89 percent of the household adopted some form of consumption-based coping strategy to meet their food needs. High dependency on coping strategies were observed in Jonglei, Lakes, Upper Nile and Northern Bahr-el-Ghazal states (Figure 22). The most frequently adopted strategies included the reliance on less preferred and less expensive foods (84 percent), reduction in the portion size of meals (82 percent) and reduction in the number of meals consumed per day (79 percent) (Figure 23).

Figure 21: South Sudan - Household food consumption score classification



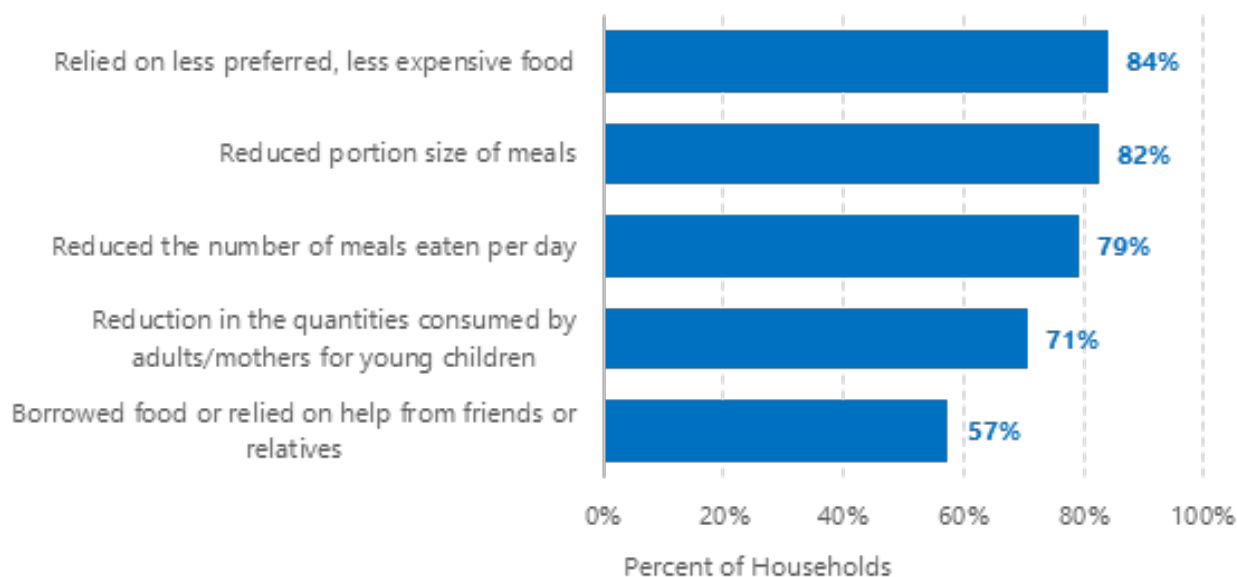
Source: World Food Programme, 2021.

Figure 22: South Sudan - Household consumption - based coping strategy index score



Source: World Food Programme, 2021.

Figure 23: South Sudan - Household adoption of consumption-based coping strategies



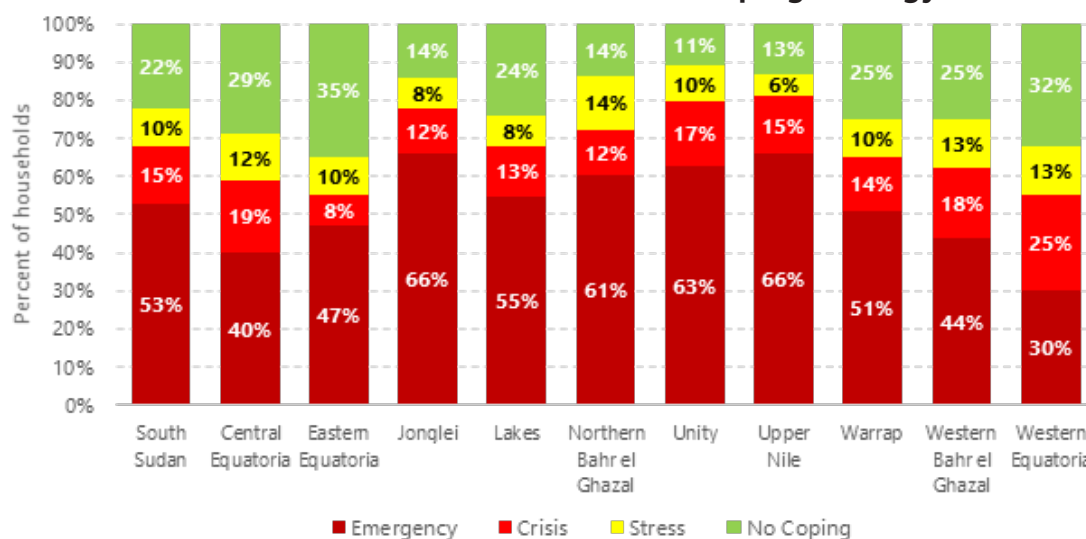
Source: World Food Programme, 2021.

At the national level, 53 percent of the households adopted emergency coping strategies and an additional 15 percent adopted crisis coping strategies (Figure 24). Particularly high rates of adoption of emergency coping strategies were found in Jonglei (66 percent), Upper Nile (66 percent), Unity (63 percent) and Northern Bahr-el-Ghazal (61 percent).

Figures 24 and 25 highlight a worrisome high adoption of harmful and potentially

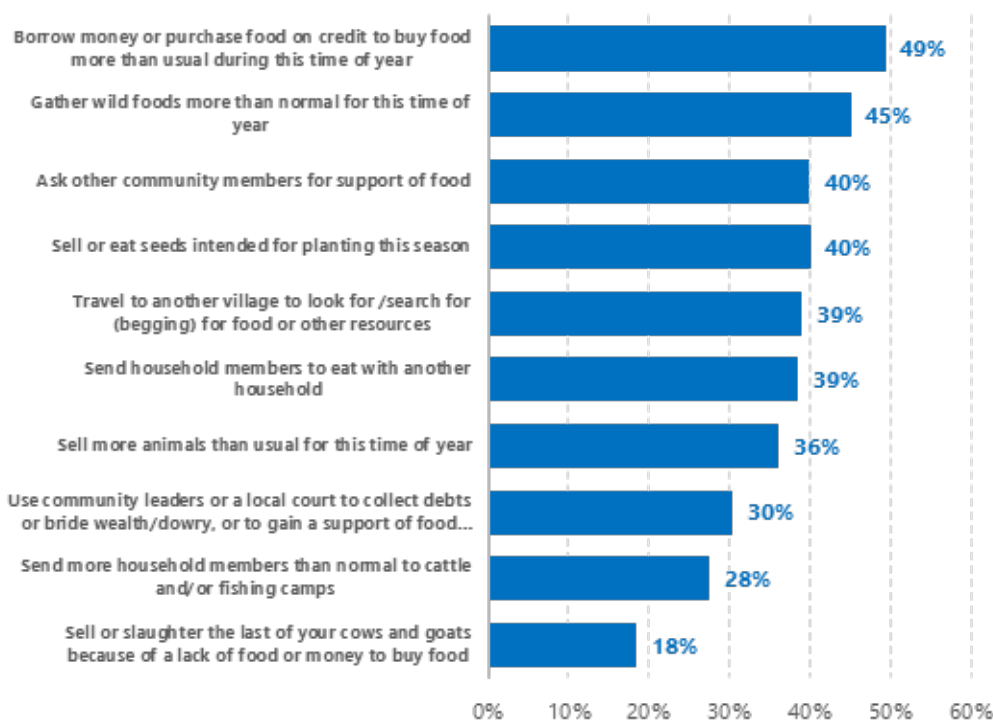
irreversible coping strategies that threaten future food security of the household. The most frequently adopted strategies included borrowing money or purchasing food on credit more than usual (49 percent), gathering wild foods more than normal (45 percent), asking other community members for support (40 percent) and selling or eating seed intended for planting (40 percent) (Figure 25).

Figure 24: South Sudan - Household livelihoods-based coping strategy index classification



Source: World Food Programme, 2021.

Figure 25: South Sudan - Household adoption of livelihoods-based coping strategies



Source: World Food Programme, 2021.

Household food insecurity dimensions

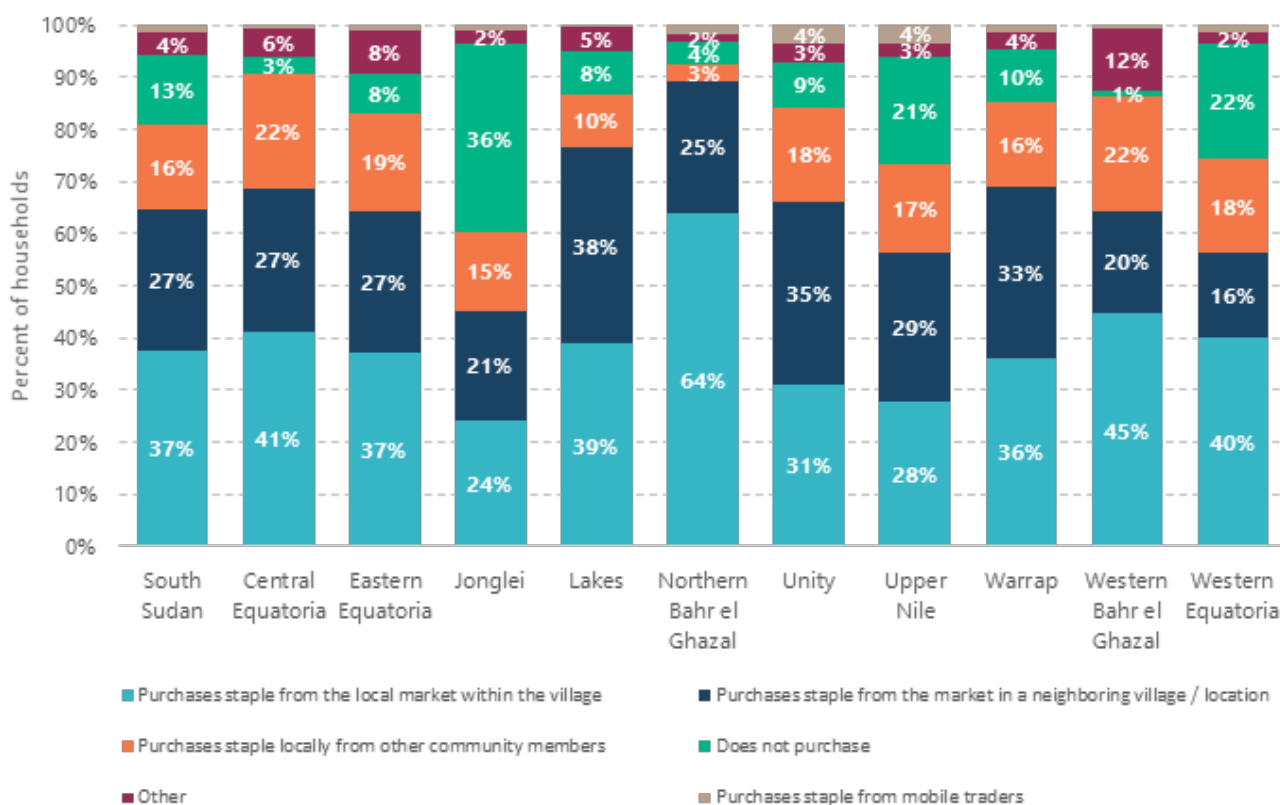
Food availability

This section focuses on understanding the key elements of household-level food availability, including household production and market access. The more households depend on markets, the more likely they are to be vulnerable to price shocks during the lean period. Given the relatively high share of imported foods in consumption, variability in the exchange rate can lead to higher and more volatile market prices.

Across South Sudan, market purchases accounted for more than one-third of the household food

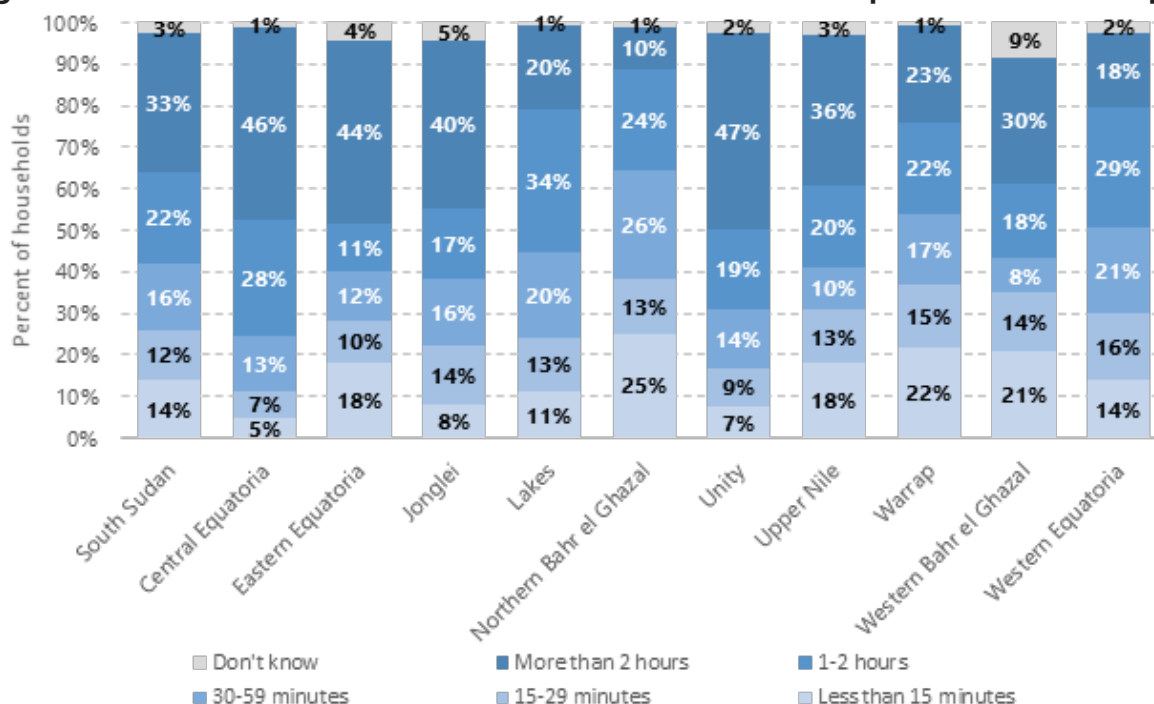
consumption of staple foods in 2021, while humanitarian assistance accounted for about one-fifth of consumption. The remainder was sourced from the own production. For households relying on markets for staple foods, purchases came from local markets within the village (37 percent), markets in a neighbouring village (27 percent), or from direct purchases with community members (16 percent), Figure 26. There were differences across states, with households in Northern Bahr-el-Ghazal (64 percent) and Western Bahr-el-Ghazal (45 percent) particularly dependent on the local markets within the village and households in Lakes (38 percent) and Unity (35 percent) states particularly dependent on markets within neighbouring villages.

Figure 26: South Sudan - Household source of staple foods purchases



Source: World Food Programme, 2021.

Figure 27: South Sudan - Household travel time to nearest operational market place



Source: World Food Programme, 2021.

The source of food purchases had significant implications in terms of the time required. Across South Sudan, 33 percent of the households required more than two hours to reach the nearest operational market and 22 percent of the households required one to two hours (Figure 27). The longest travel times were identified in Central Equatoria, Unity, Eastern Equatoria and Jonglei states. This can have a substantial impact on labour availability for other purposes, including care of children and economic activities.

Food access

This section focuses on understanding the key elements of household-level food access, including household physical and financial access. Nationally, the most important income sources in the past three months included agriculture (56 percent), food assistance (8 percent), unskilled casual labour (6 percent) and sale of firewood, charcoal, stones, etc. (6 percent), Figure 28. Agriculture as an income source was particularly important in Central Equatoria, Lakes and Western Equatoria states, and food assistance was particularly important in Jonglei, Unity and Upper Nile states.

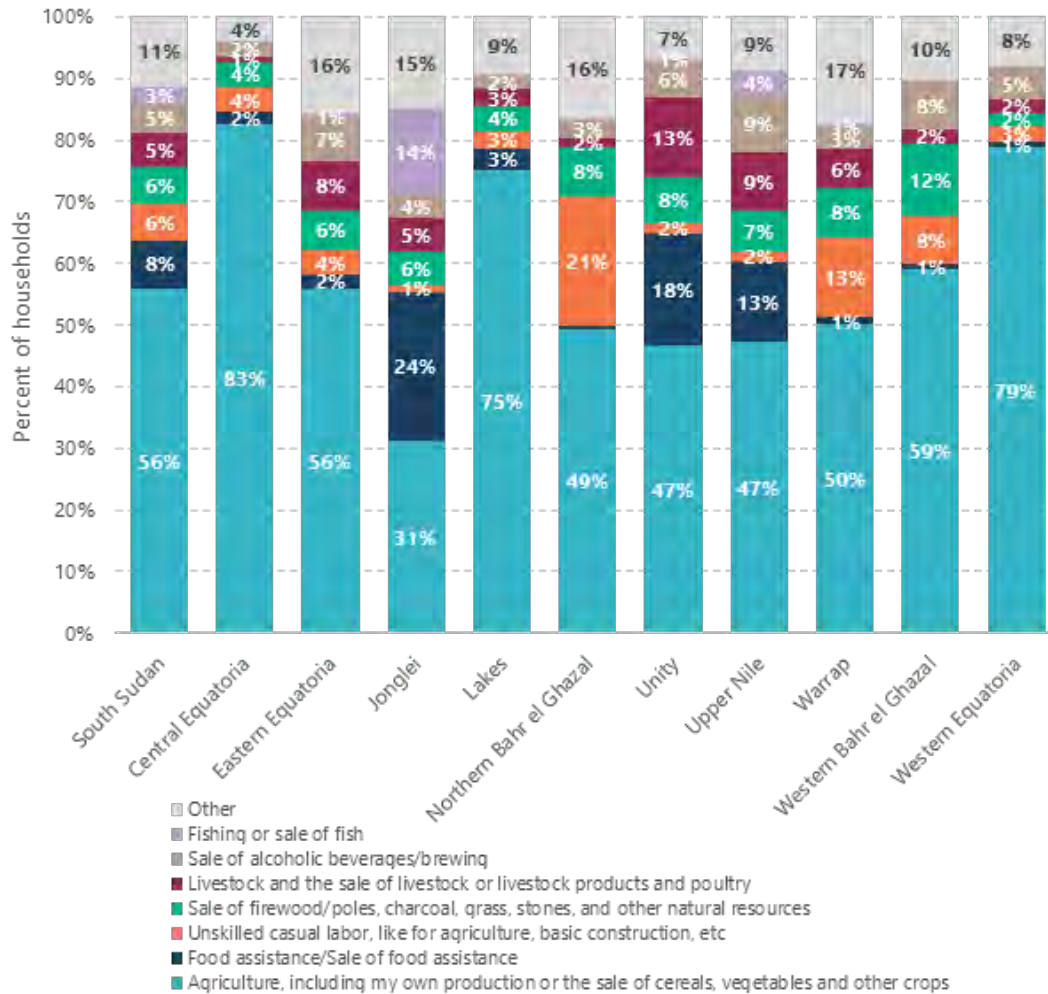
Recent income changes were additionally explored, with 27 percent of the households reporting a large decrease in income and 18 percent reporting a

small decrease in income over the past six months (Figure 29). Households in Jonglei, Lakes, Unity and Upper Nile states were particularly likely to have experienced decreases in household income.

Household expenditure was also explored through an analysis of household food expenditure share (FES). This is a proxy indicator for economic household vulnerability, as household poverty increases, the proportion of expenditure allocated to essential needs, including food, increases. In addition, households with high expenditure on food are more vulnerable to price shocks and, therefore, more likely to engage in harmful coping strategies during food inflationary periods. The thresholds for the FES are defined as follows:

- **Very High:** Over 75 percent of expenditure allocated to food.
- **High:** Between 65 percent and 75 percent of expenditure allocated to food.
- **Medium:** Between 50 percent and 65 percent of expenditure allocated to food.
- **Low:** Less than 50 percent of expenditure allocated to food.

Figure 28: South Sudan - Household most important income source in past three months



Source: World Food Programme, 2021.

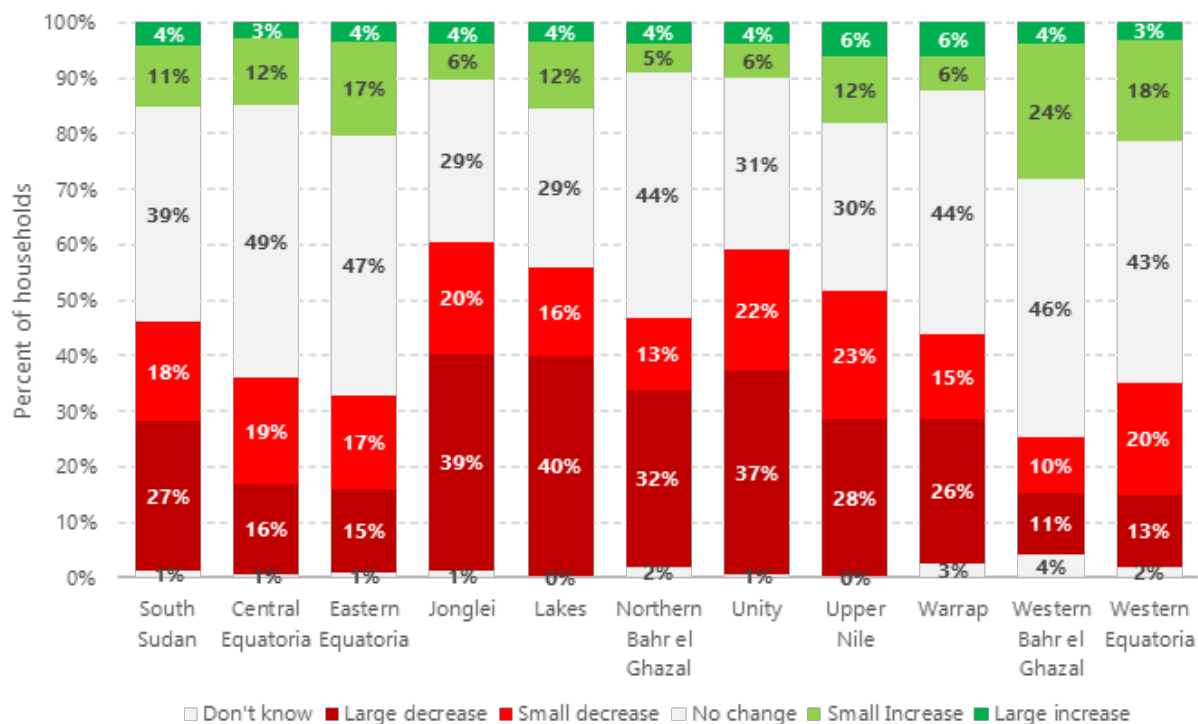
Roughly 11 percent of the households in South Sudan have very high food expenditure and 18 percent have high FES as many households are unable to meet their food needs through household crop production and, therefore, required to source staple foods from the local markets in a context of very high food prices and inflation (Figure 30).

Although the overall figures show relatively high proportion of households with low or medium food expenditure, it should be noted that the FSNMS+ data was collected during the harvest period, a time in which households are generally less dependent on market purchases for staple foods. Additionally, a relatively high proportion of the sampled households were receiving humanitarian and food assistance at the time of data collection, which may have also impacted the FES (Figure 31).

An analysis of the FES using data captured during the lean season would be expected to show a higher percentage of households with very high or high food expenditure.

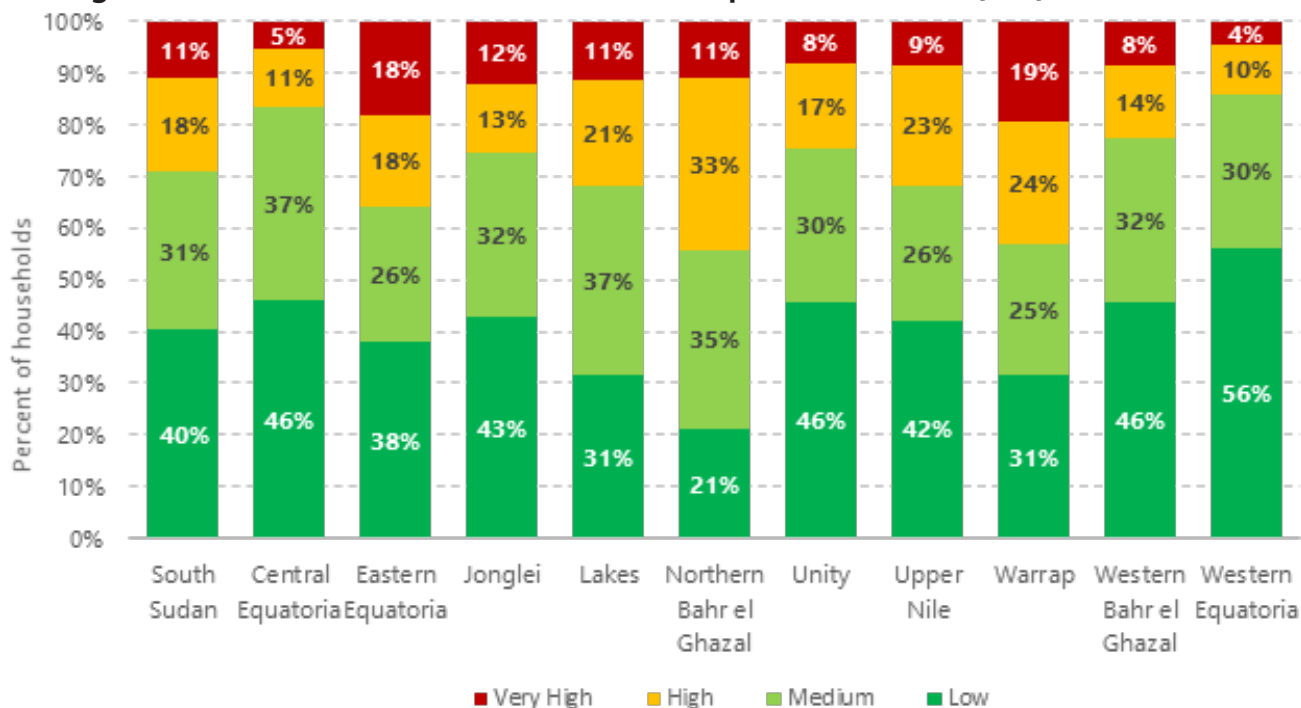
At the state level, households in Western Equatoria, Central Equatoria and Western Bahr-el-Ghazal allocated less of their expenditure on food compared to other states. Conversely, households in Northern Bahr-el-Ghazal, Warrap and Eastern Equatoria allocated a disproportionately high percent of their expenditure on food compared to other states. Eastern Equatoria has witnessed drought this year which has negatively affected crop production and seasonal movements of cattle. Prior experience suggests that households in these circumstances tend to rely more on market purchases during these periods and, therefore spend more on staple foods.

Figure 29: South Sudan - Household self-reported income change in past six months



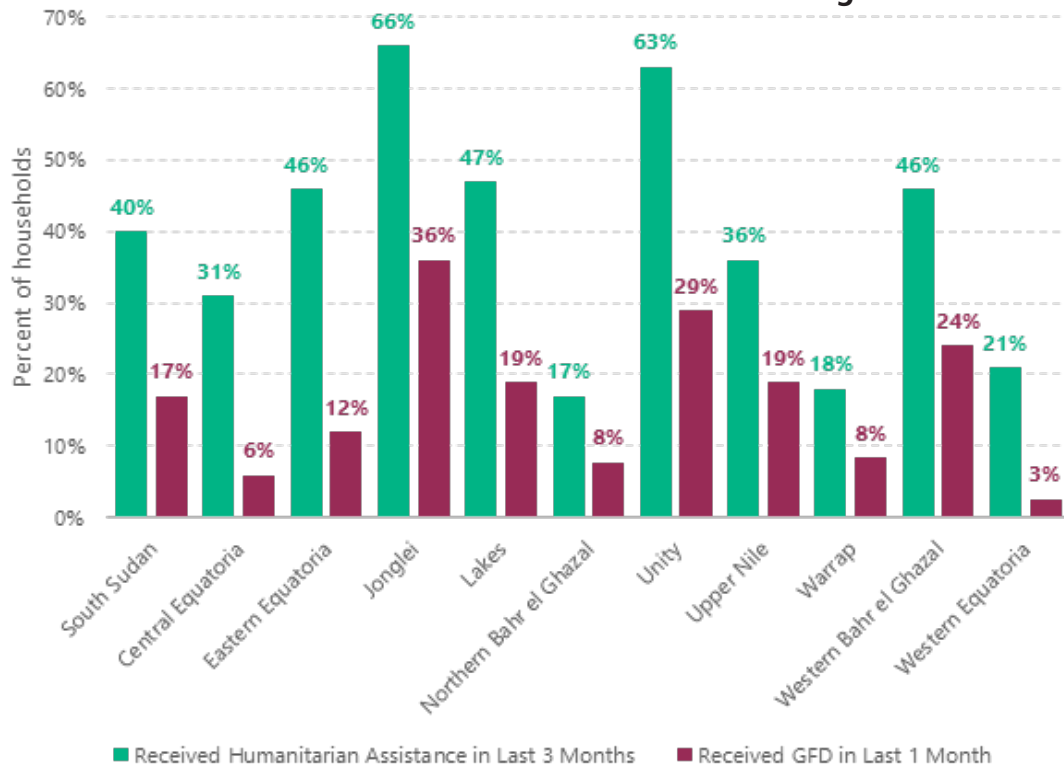
Source: World Food Programme, 2021.

Figure 30: South Sudan - Household food expenditure share (FES) classification



Source: Food Security and Nutrition Monitoring System (FSNMS), Indicator: Food Expenditure Share, 2022.

Figure 31: South Sudan - Household access to humanitarian or general food assistance



Source: World Food Programme, 2021.

Food utilization

This section focuses on understanding the key factors related to household-level food utilization, including food preparation, food safety and water access. Generally, the most common drinking water sources in South Sudan included boreholes (52 percent), rivers/streams (24 percent), unprotected/hand dug wells (9 percent) and swamp puddle/stagnant water (7 percent), Figure 32. Unprotected and unsafe drinking water sources present a challenge for food safety and preparation, opening the potential for water-borne disease transmission. Reliance on unprotected and unsafe drinking water sources was highest in Jonglei, Unity, Upper Nile and Western Equatoria states.

Similarly, the widespread reliance on open defecation raises concerns on the potential for disease transmission, particularly among children (Figure 33). Nationally, 82 percent of the households noted that children under five practiced open defecation and only 14 percent cited the use of household, shared or community latrine. The practice of open defecation was particularly high in Jonglei, Lakes, Northern Bahr-el-Ghazal, Unity, Upper Nile

and Warrap states. Roughly 60 percent of the households did not have soap within the household, with higher prevalence in Jonglei (73 percent), Northern Bahr-el-Ghazal (70 percent) and Upper Nile (66 percent), Figure 34.

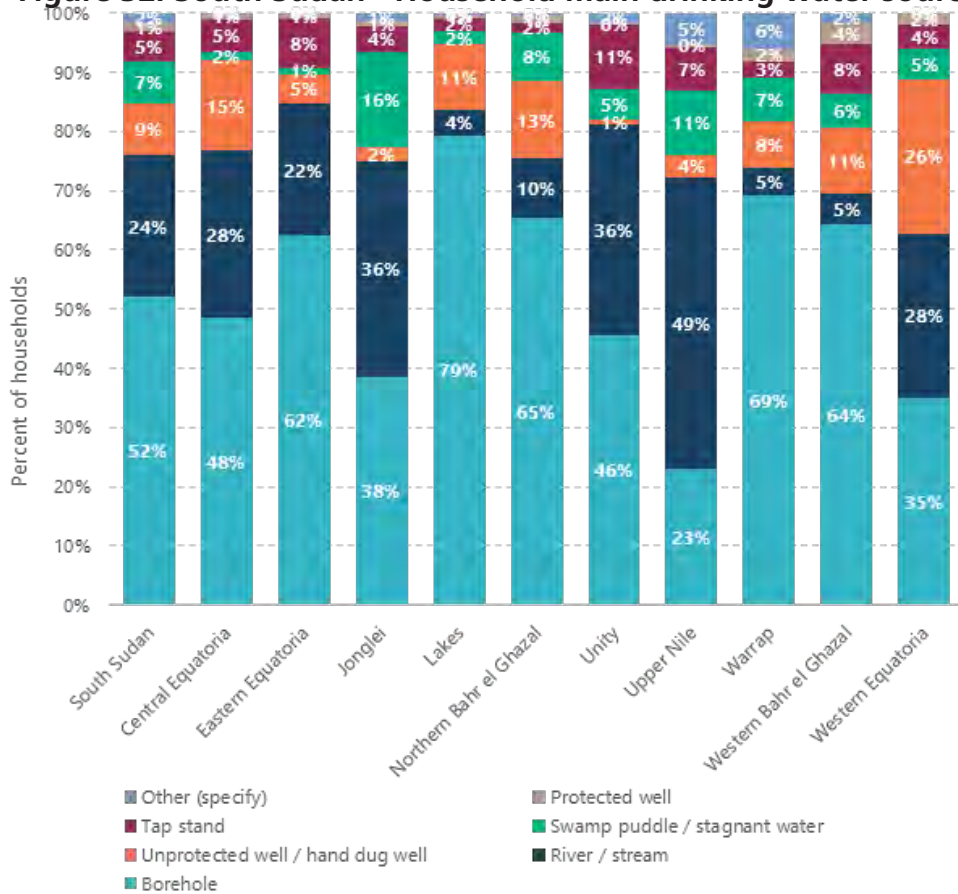
Conclusions and planned actions

WFP plans to assist just over 6 million people in South Sudan in 2022 with a combination of food and cash distribution. This operational plan falls short of the estimated requirements, due to shortfalls in expected resources and increased people facing acute food insecurity. WFP has already developed a prioritization plan based on IPC 2022 results, focusing severity and magnitude of food insecurity at county level (Phase 4 and higher). Special consideration was given to counties hosting IDPs and refugees, or the one critical IPC nutrition level.

Estimated food assistance requirements

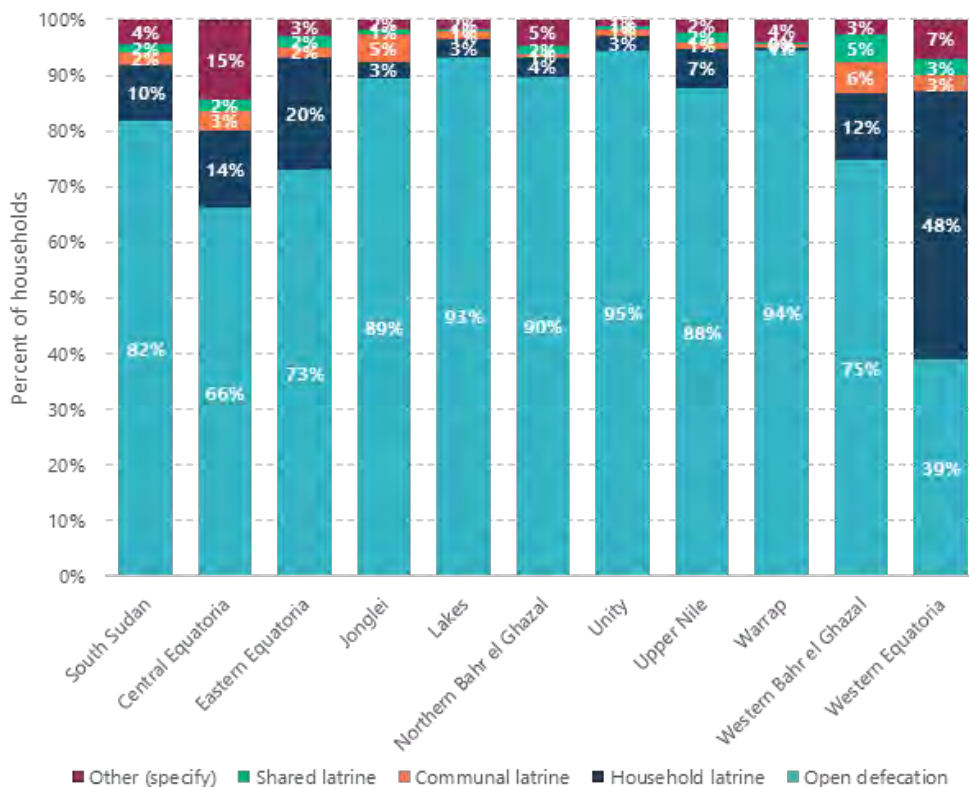
A summary of WFP’s needs-based operational planning for 2022 is presented in Table 13. Please note that these figures relate only to planned activities by WFP and exclude coverage that may be provided by other actors.

Figure 32: South Sudan - Household main drinking water source



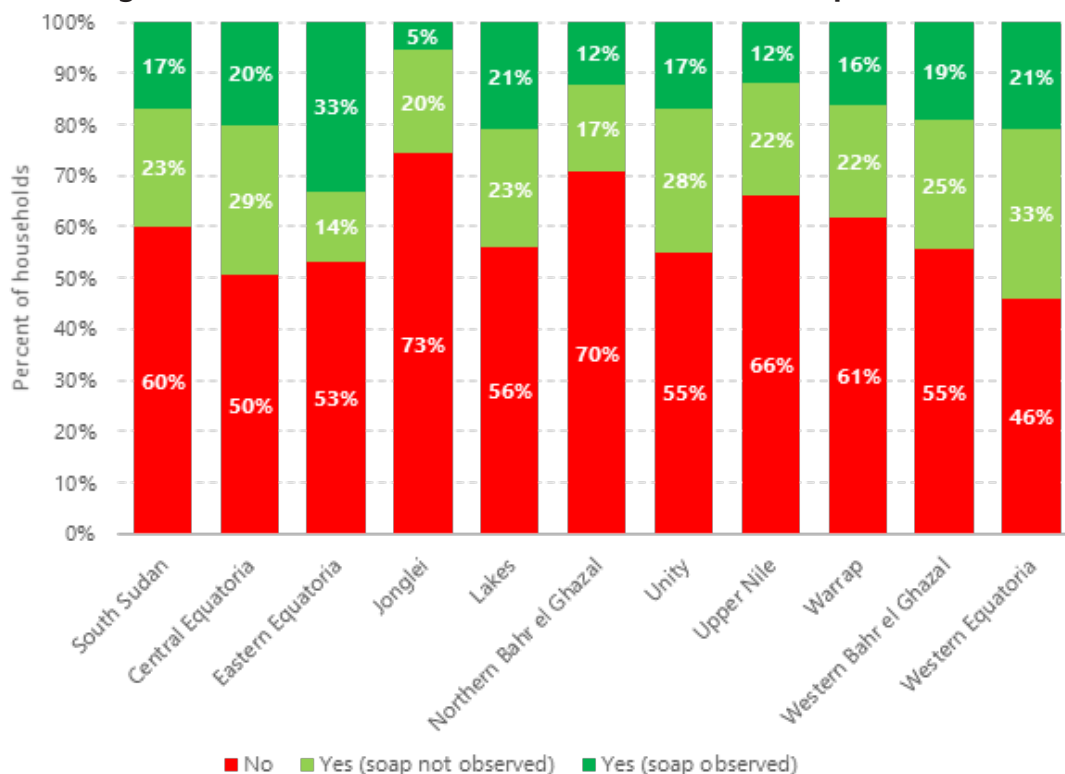
Source: World Food Programme, 2021.

Figure 33: South Sudan - Household location of defecation of children under five



Source: World Food Programme, 2021.

Figure 34: South Sudan - Household access to soap in home



Source: World Food Programme, 2021.

Table 13: South Sudan - Needs-based operational plan, 2022

State	Staple commodities (tonnes)	Cash transfers (USD)	Specialized commodities (tonnes)	Beneficiaries (individuals)
Central Equatoria	17 797	14 157 123	1 992	601 129
Eastern Equatoria	10 954	175 500	2 235	342 992
Jonglei	57 809	8 801 336	3 838	1 091 093
Lakes	18 931	8 541 129	2 153	586 928
Lakes	13 913	9 639 675	2 361	694 810
Unity	44 193	1 797 120	2 856	861 516
Upper Nile	38 714	7 841 025	2 726	747 166
Warrap	23 162	5 354 716	3 469	774 628
Western Bhar-el-Ghazal	6 470	5 194 015	1 238	251 963
Western Equatoria	2 859	6 355 040	1 452	205 590
TOTAL	234 802	67 856 680	24 321	6 157 815

Source: FAO/WFP Crop and Food Security Assessment Mission (CFSAM) to South Sudan, 2021.

These figures reflect several different scenarios with respect to the timing and duration of needs. For the areas most affected by flooding or conflict, particularly where the impacts are expected to continue through the upcoming agricultural season, assistance is required on a year-round basis. For the shock-affected households that are expected to be able to resume their normal activities in 2022, the lingering impacts of the past season are expected to lead to an early start to the lean season (in April, as opposed to June/July). For the drought-affected areas of Eastern Equatoria, the lean season had already begun at the start of 2022 and is expected to continue until several weeks after the start of the seasonal rains, when the pastures begin to green up.

Given the shortfall in resources, the planned response falls short of assessed requirements. This has led to a reprioritization of assistance to focus on populations falling in IPC Phase 4 (Emergency) or higher. In addition, the planned duration of assistance has also been shortened.

Beyond this, there is increasing evidence that suggests that increased flood coverage seen over the past three years represents a structural change rather than a series of unrelated shocks. An examination of historical patterns suggests that the increase in the area that is flooded on a year-round basis is likely to persist for several years if not longer. This in turn argues for a response that includes measures to facilitate adaptation to a changed reality, in addition to responding to current impacts and promoting resilience to future shocks.

RECOMMENDATIONS

After the signing of the Revitalized Agreement on the Resolution of the Conflict in South Sudan in September 2018, there has been a significant number of returns of displaced farming households, which contributed to the production increases. Therefore, the cessation of all hostilities and the implementation of the agreement is the primary recommendation to progress in terms of agricultural development in order to improve the country's food security situation. While understanding the complexity of the reconciliation and peace-building process, the following recommendations are made assuming that the national peace deal continues to hold, for a better future for the people of South Sudan.

Agriculture

In order to strengthen domestic food production in 2022 and reduce food import and assistance requirements in 2023, it is recommended to:

- Support the 2022 cropping season by providing seeds and tools, extension services and training on how to use specific seeds that farmers received to:
 - ◆ Increase crop production with the aim to reach the pre-conflict surplus levels in the more productive and stable states and counties.
 - ◆ Protect the livelihoods of small-scale subsistence producers in less productive pastoral/agropastoral areas and in flood-impacted areas, where crop failures did not allow farmers to retain adequate quantities of crops for seed use.
- Provide targeted support to farmers to use improved agricultural practices for land preparation, weeding, integrated pest management and soil fertility maintenance.
- Develop a strategy to minimize the impact of *Striga* weed, which severely affects yields of sorghum, including the distribution of a package for *Striga* management and control.
- Strengthen the Crop Protection Department of MoAFS to enable it to prepare and implement an action plan to minimize the impact of pests on crop productivity.
- Support crop diversification by supplying planting materials of various non-cereal crops, including roots and tubers, fruit trees and pulses, through the establishment of plant multiplication centres.
- Provide training and equipment to enable farmers to reduce storage losses of crops due to various pests.
- Provide sustainable and integrated management for FAWs, including prevention, control, knowledge sharing and action to control the spread of the pest.
- Strengthen the surveillance system for migratory pests, including QQU birds, desert locusts and



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FAWs, for a timely implementation of control measures. In particular, a continuous monitoring of desert locust swarm movement and control is necessary, in collaboration with DLCO-EA.

- Strengthen the county-based CCMCs through continuation of training programmes. The SMOAs should be involved in establishing two-way communication linkages with the counties and with the institutions at national level (MoAFS and NBS) to improve the quality of the CCMC reports before they are submitted to national institutions.
- Involve CCMCs to track population movements at county level by cross-checking population figures provided by other agencies and assessing if recent returnees are able or not to be engaged in cropping activities. This will improve the accuracy of the number of farming households that is used by the mission as an input to estimate the annual planted area.

Livestock

- Design a strategy to conduct a comprehensive livestock census covering the whole country using remote sensing methods.
- Expand animal health interventions. In particular:
 - ◆ Train new community animal health workers to replace drop outs and expand delivery of animal health services at community level.
 - ◆ Review coverage and effectiveness of the vaccination programme and adopt a risk-based approach.
 - ◆ Promote privatized/cost recovery delivery of animal health services and support access to veterinary drugs and supplies.
- Support the evolution of livestock rearing activities towards a modern, commercial-oriented livestock sector. In particular:
 - ◆ Promote activities that add value along the supply chain, including training of livestock owners in improved fodder production,

processing and conservation techniques, introduction of livestock conditioning and pen fattening, promotion of peri-urban smallholder milk production and support of backyard poultry production.

- ◆ Support community-based livestock improvement programmes through the delivery of training on improved animal husbandry practices, including animal breeding using Sudanese cattle breeds (mainly *Botana* and *Kenana*).
- ◆ Conduct a comprehensive study of the national livestock economy to provide evidence for policies.
- ◆ Carry out livestock fairs (with a premium for the quality of animals).
- Support the implementation of the “Strategic Response Plan to mitigate cattle raiding-related conflict in South Sudan (2019–2025)”.
 - Re-establish access to seasonal grazing areas and routes, which have been disrupted since the start of the conflict, by supporting a process of negotiation amongst various pastoral communities.
 - Strengthen the livestock information system to monitor key indicators, including animal production, productivity, marketing, movements and health.

Markets

- Provide market-based livelihood support by enhancing the capacity of existing marketing institutions in the country.
- Promote local purchases of seed and crops in surplus areas and facilitate their distribution to deficit areas, taking into consideration local market dynamics and trade flows along the main commercial and humanitarian corridors.
- Maintain and strengthen existing price and market monitoring activities by expanding the monitored commodities and improving cross-border market monitoring.

- Expand the use of cash-based transfers (CBT) to sustain local demand, stimulating market-oriented crop production and improving market supply stability.
- Promote livestock trade and improve access to livestock markets, including cross-border areas. This will involve the cooperation with the North Eastern Africa Livestock Council (South Sudan Chapter).

Food security

- Provide targeted HFA. Given expected resource shortfalls, HFA should be provided following a carefully considered and implemented prioritization plan based on the results of the 2022 IPC analysis, ensuring that assistance is prioritized based on the severity and magnitude of food insecurity at county level (Phase 4 and higher). Special consideration should be given to counties hosting IDPs and refugees, or having critical IPC nutrition levels. HFA should be context specific and provided using a combination of in-kind and cash-based modalities.
- Continue to support climate resilience efforts through the enhancement of climate monitoring and early warning systems, construction and rehabilitation of community assets that provide protection against climate shocks (e.g. floods, droughts, etc.) and construction, and rehabilitation of household assets to cope with previous and expected climate shocks.
- Continue to support road construction and rehabilitation, dyke rehabilitation, port improvement, river clearing and dredging, airstrips rehabilitation and bridge construction to support humanitarian operations and local communities by enabling access to markets and connecting previously-isolated communities to social services.
- Continue to support the humanitarian development-peace nexus by leveraging humanitarian and resilience programming in hotspots of hunger and organized violence, including in hard-to-reach locations, for more proactive contributions to peace. Ensure that interventions include a consistent approach focused on intentionality, long-term planning, complementarity, local focus and scale.
- Continue to support the reduction of all forms of malnutrition through the delivery of comprehensive curative and preventative nutrition interventions. Ensure that interventions include treatment of malnutrition for moderately malnourished pregnant women and girls and new mothers, and children under five years of age and elderly, and people living with HIV or Tuberculosis (PLHIV/TB). Prevention of acute malnutrition for nutritionally-vulnerable pregnant women and girls, and new mothers and children under two years of age. Nutritional recovery support for inpatients with nutritionally compromised health conditions of HIV/AIDS, TB and Kala-azar. Strengthening of governmental capacity to implement high quality and effective nutrition treatment and prevention programmes, and supporting national policy and advocacy on nutrition through the Scaling Up Nutrition (SUN) movement.
- Continue to support school feeding as an important safety net for young children of vulnerable households to increase access to education, reduce gaps in caloric and nutritional intakes, and reduce the risk of early pregnancies and marriages. School feeding should provide meals as incentives to contribute to improved education performance (enrolment, attendance and retention), social cohesion and productivity in the future. Where possible, school feeding should follow a home-grown approach, using locally produced food, especially from smallholder farmers, and increasing national and community ownership in school feeding management.
- Continue to support vulnerable households in urban areas through unconditional CBT while attending training or activities, which allow them to develop skills in areas that boost or diversify their livelihoods, including home

gardening, hygiene promotion, vocational training and income generating activities. As resources allow, ensure that households are able to participate in public work activities that help to improve access to basic services, such as road repair and drainage cleaning.

- Continue to conduct food security and nutrition monitoring, and assessment to ensure that decision makers are provided with a detailed and timely analysis of household needs, enabling them to design and implement comprehensive humanitarian response plans.

ANNEXES



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Table A1: South Sudan - Indicative seasonal cropping calendar

	March	April	May	June	July	August	September	October	November	December	January	February
Uni-modal rainfall zone found in Greater Bahr-el-Ghazal; Greater Upper Nile	Rainfall	Dry season	Wet season						Dry season			
	Main Crop		Land preparation and planting	Growing season			Harvest					
	Long-cycle crops			Growing season				Harvest				
Bi-modal rainfall zone found in Greater Equatoria	Rainfall	Dry season	Wet season							Dry season		
	First crop	Land preparation and planting		Growing season		Harvest						
	Second and third crops					Land preparation and planting		Growing season		Harvest		

Note: Recent changes are blurring the divisions.

Recommendations for strengthening Roadmap and CCMCs, 2021:

- During the travel restriction imposed by the Government in 2020 due to the COVID-19 pandemic, CCMCs have proved to be very important assets in providing grassroots-based information regarding the progress of the rainy season, the performance of the crops and the negative impacts of the floods and pests through telephone calls, e-mails, Skype and other social media like WhatsApp. Hence, it is recommended to strengthen the CCMC networks across the country and the on-line communication capacity of the CCMC members.
- The estimation of planted areas in the mechanized sector needs to be supported with satellite-based estimation due to the difficulty of measuring areas by the Task Force teams and CCMCs on the ground.
- Maintain planting assessments to spot checks on planted area only in representative sample counties.
- As soon as security allows, conduct crop assessment and yield estimation training for carefully selected SMOAs and NGOs staff in all the new states.
- Provide CFSAM guides and training, for county level CCMCs established by FAO and MAFS to the new states.
- Introduce mobile apps for use by the National Task Force teams and CCMCs that have already demonstrated willingness and capacity to assess progress of the season and timely reporting to FAO/MAFS Crop Assessment Team. The introduction could be planned during a short series of training courses early in the first season in Western and Central Equatoria states.
- Increase the range of timing of full harvest assessments to allow each main crop, in each State to be assessed.
- Continue to transfer the responsibility of conducting the field work of all assessments in a staggered manner (to accommodate harvest dates) to SMOAs, funded by FAO-European Union project, **ONLY** where suitable levels of competence and integrity have been demonstrated. This means adjusting the role of the National Task Force teams to "remote" supervisory and analytical duties only in the states where the MoA teams have exhibited sufficient competence. In the states that continue to misrepresent performance presenting hearsay as evidence, the Task Force teams should conduct independent assessments.
- CCMC membership should be re-assessed with Committee members to be selected based on their competencies.

ANNEX 2

Recommendations for strengthening roadmap and County Crop Monitoring Committees in 2022

- Strengthen the CCMC networks across the country and the online communication capacity of CCMC members.
- Provide crop assessment and yield estimation training for carefully-selected SMOAs and NGOs staff, including the newly recruited AEAs and CCMCs.
- The estimation of planted areas in the mechanized sector needs to be supported with satellite-based estimation due to the difficulty of measuring areas by Task Force teams and CCMCs on the ground.
- As soon as security allows, new states.
- Provide CFSAM guides and training, for county level CCMCs established by FAO and MoAFS to the new states.
- Introduce mobile apps for use by the National Task Force teams and CCMCs that have already demonstrated a willingness and capacity to assess progress of the season and timely reporting to FAO/MoAFS Crop Assessment Team. The introduction could be planned during a short series of training courses early in the first season in Western and Central Equatoria states.
- Increase the range of timing of full harvest assessments to allow each main crop, in each state to be assessed.
- Continue to transfer the responsibility of conducting the field work of all assessments in a staggered manner (to accommodate harvest dates) to SMOAs, funded by FAO-European Union project, only where suitable levels of competence and integrity have been demonstrated. This means adjusting the role of the National Task Force teams to “remote” supervisory and analytical duties only in the states where the MoA teams have exhibited sufficient competence. In the states that continue to misrepresent performance presenting hearsay as evidence, the Task Force teams should conduct independent assessments.
- CCMC membership should be re-assessed with Committee members to be selected based on their competencies.

ANNEX 3

Agricultural situation by state in 2021

GREATER EQUATORIA REGION

Western Equatoria State

In the 2021 agricultural season, the assessment team comprised of the Task Force, Monitoring and Evaluation Assistants and AEAs conducted a total of nine assessment missions with each team constituted of four to six members. The first season post planting assessment mission was carried out by three teams. With the first team visiting Nzara and Ezo counties, the second team visiting Maridi, Ibba and Yambio counties, while the third team visited Mundri West and Mvolo counties. All these visits took place concurrently from 26 June to 3 July 2021. This was followed by three first season post-harvest assessment missions to Nzara, Yambio, Maridi and Ibba counties from 3 to 12 September and Mundri West along with Mundri East from 10 to 17 September 2021. Three final post-harvest missions to assess the performance of the second season were conducted from 22 November to 2 December 2021 by two teams visiting Nzara and Ezo and Maridi, Ibba and Yambio counties concurrently, while the third team visited Mundri West and Mvolo counties from 4 to 11 December 2021. The Task Force-led teams were able to perform 852 farming households' interviews, 69 geo-referenced remote sensing interviews, 21 key informants' interviews, 22 case studies and 18 focus group discussions.

Seasonal rains over most cropping areas of the state started between the third week of March and the first week of April, which was considered timely. However, the rainfall amounts received were below average and the distribution of rains was erratic. Prolonged dry spells for a period of three weeks from the fourth week of May to the second week of June resulted in serious moisture stress in Ezo, Mvolo, Nzara and Mundri West counties, affecting maize and groundnut crops. From July, the rainfall amount and distribution improved across the state and continued through the second season at average to above-average levels, creating favourable

conditions for planting. In 2021, although the first season performed poorly due to effects of the dry spells, the second season performed better, leading to a slightly higher cereal production compared to that of the previous year.

There were no access problems to land in both far and nearby fields except in Tambura County, where intercommunal conflict erupted during the second season, resulting in significant population displacements. Neighbouring areas of some counties, including Ezo County, experienced security problems due to the spillover of the conflict in Tambura County, that caused access problems to far fields. Most of the respondents in all the visited counties indicated an increase in cultivated area compared to that of 2020 due to an improved security situation and high market prices encouraging farmers and town dwellers to engage in farming.

Land preparation for first season crops started in the first week of March and ended in the third week of March, while land preparation for second season crops started in July after the harvest of the first season. The main crops grown include maize, cassava, groundnuts, rice, sorghum, finger millet, sesame and a number of fruit varieties. Reports from Assessment Teams and CCMCs confirmed that the area planted with rice and cassava is increasing each year. There is also a tendency of increasing sorghum areas due to their resistance to pests and the easy handling and storage the crop requires.

Hand tools used by most farmers in the state including hoes, axes, rakes, machetes and slashers are purchased from the market with some distribution provided by the Star Trust Organization, a local NGO operating in Yambio County. There are only three functional private tractors across the state, two in Maridi and one in Nzara County. All of the government tractors are not functional due to unavailability of spare parts. The use of ox ploughs is increasing in Mvolo and Mundri East counties with at least 10 percent of the farmers using ox

ploughs in Mvolo County, which increased the cultivated area among farmers that own oxen. There is limited access to tractor service due to the limited number of functional tractors and unavailability of spare parts as well as the high cost of fuel. In 2021, the hire rate for private tractor services was about SSP 25 000/*feddan* for ploughing compared to SSP 13 500/*feddan* on average for ploughing a *feddan* (0.42 hectares) in 2020 in Maridi. Due to the limited number of tractors, farmers cultivating more than 4 *feddans* (1.68 hectares) were given priority. Most farmers used their own local seeds, while FAO and its partners distributed some improved seeds across the state. Almost all of the required agricultural labour originates from families and from the community.

The most prevalent crop pests and diseases during the 2021 agricultural season were rodents, red monkeys, birds, foxes, bush rats, snails, millipedes, green grasshoppers, local birds, FAWs, porcupines, squirrels, termites and stem borers, with damage levels ranging from mild to average, depending on locations. FAW infestations were severe in the first season but with the intensification of the rains in July, the pests were killed and damages to crops were minimum. Since chemical pesticides are not used in the state, farmers have resorted to traditional pest control measures using leaf extracts of a notorious plant species known as *Babashiro*⁸ (*Chromolaena odorata*), mixed with hot pepper and powder soap to kill FAWs, while hand collection, digging of trenches around the field and burying is used to control snails. The use of scare crows, children and old men in scaring birds and wild animals is also a common practice to minimize damage on crops. The cassava mosaic virus and groundnuts rosette virus are common diseases that have been widely reported across the state causing mild damage on cassava and groundnuts crops, respectively. *Striga* and *Babashiro* are parasitic weeds that continued to be a major concern to farmers and constrain crop production. In addition, cassava tuber rot (*Phytophthora palmivora*) disease has been expanding and the level of damage on cassava roots in 2021 was reported to be high.

Growing conditions

Figure A3-1 shows combined RFEs and vegetation index graphs for six locations selected across Western Equatoria State (Tambura, Yambio, Mundri West, Ibba, Ezo and Mundri West counties). The figures show average to above-average rainfall and NDVIs over most of the year, indicating barely adequate growing conditions for first season crops and more favourable conditions for second season crops as well as long-cycle varieties.

Cassava is grown throughout Greenbelt, covering about 17.4 percent of the total cultivated area in Western Equatoria State and serving the purpose of a safety net to the community. Groundnuts are also an important crop, covering an estimated 15.8 percent of the total crop area in the state.

Production

The annual production estimates have been based on time-series information, adjusted downwards due to insecurity. In 2021, cereal yields are estimated at an average 1.4 tonnes/hectare for all cereals and both harvests, slightly lower than the 2020 level of 1.48 tonnes/hectare. The yield decrease is due to moisture deficits and poor distribution of rainfall in the first season and constraints to agricultural operations in conflict-affected areas, including Tambura County. The total cereal harvested area in the state increased by 3.2 percent. The increase in harvested area was insufficient to offset the decline in yields, and consequently, the gross cereal production from all the harvests is estimated at about 197 951 tonnes, 2.1 percent lower than the previous year.

Cassava provides a significant contribution to households' food consumption at state level and the area covered by cassava in 2021 is estimated to be higher (+9 percent) compared to the previous year. In 2021, an estimated 217 800 tonnes of cereal equivalent (calculated using coefficients of 42 percent for dry matter and 70 percent for gross processing efficiency), are expected to be available for use. Groundnuts also add an estimated 35 234 tonnes of gross dry matter (unshelled).

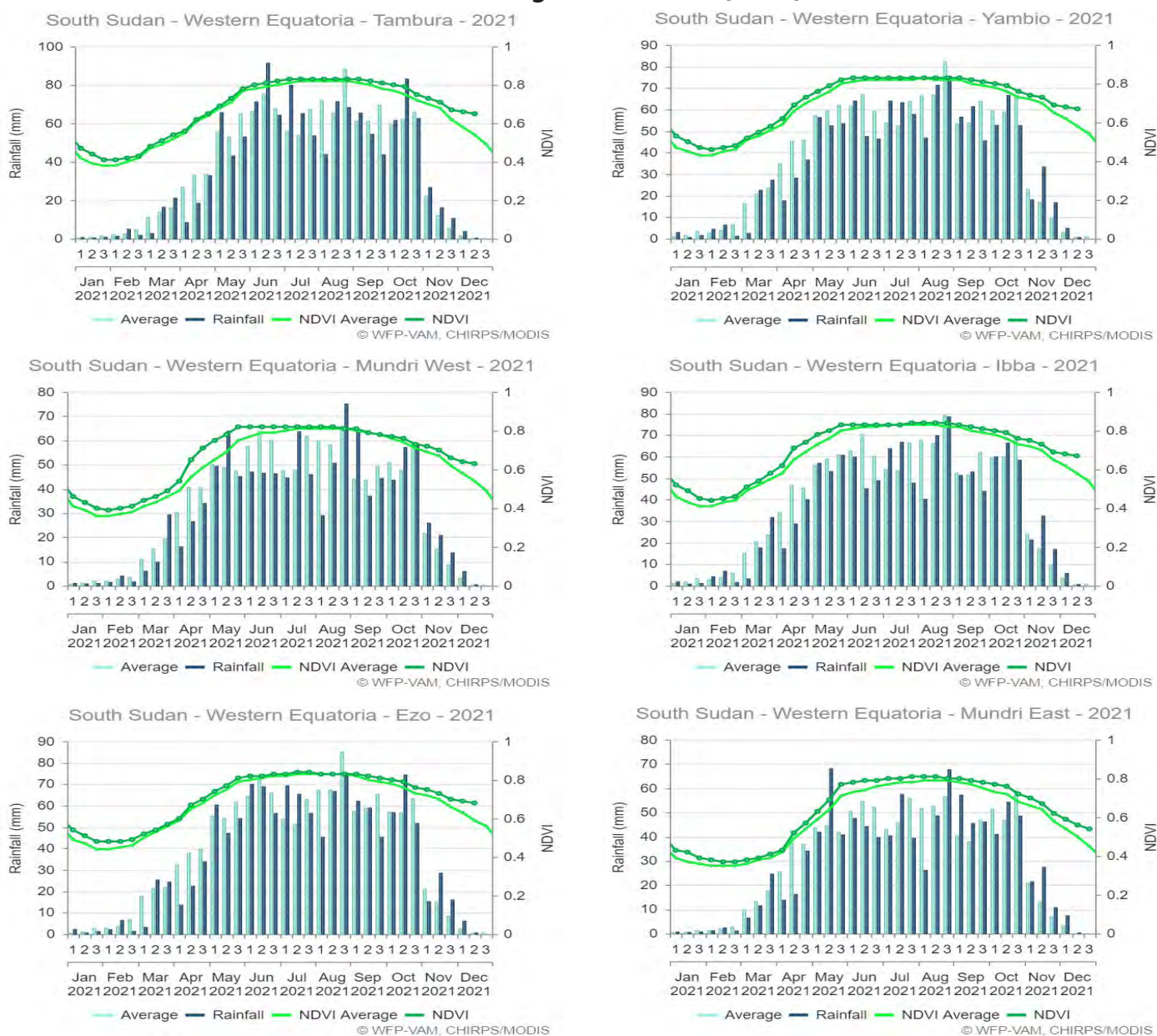
⁸ *Babashiro* is an invasive weed noted to be expanding and causing concerns to farmers in Western and Central Equatoria.

The number of livestock in the state are small compared to other states, mostly dominated by small ruminants with most families rearing five to ten animals. However, the number of small ruminants, especially sheep and goats, is reported to be increasing annually, assisted by restocking using the cash for assets programme of WFP. Despite the increase in numbers, the forested zones of the state remain uninhabited and not suitable for rearing livestock due to the presence and infestation by tsetse flies. The BCS in 2021 was reported to be favourable, standing at 4 for sheep and goats and 3 for

cattle. Transhumant *Mbororo* cattle from West Africa and cattle from the bordering counties of Terekeka, Yirol and Rumbek, continue to damage standing crops in Ezo, Mundri and Mvolo counties, respectively.

Due to adequate rains in 2021, water and pastures were abundant in most places. However, the prevalence of common endemic pests and diseases, including contagious *caprine pleuropneumonia* (CCPP), PPR, mange, external and internal parasites, diarrhoea, CBPP and ECF, were reported.

Figure A3-1: South Sudan (Western Equatoria State) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

Central Equatoria State

The assessment teams undertook six assessment missions in 2021, two post-planting missions, and four post-harvest assessments to assess the performance of both the first and the second season. The first season post-planting assessment missions to Yei and Morobo counties were conducted from 22 to 29 June 2021, and that in Juba and Terekeka counties were conducted from 24 June to 2 July 2021. The first season harvest assessment mission was conducted in Morobo and Yei counties from 9 to 13 September and in Juba and Terekeka counties from 6 to 15 September 2021. A total of 390 farming households' interviews, seven focus group discussions and four key informant interviews were conducted in the first season post planting and harvest assessment missions. Subsequently, two second season post-harvest assessment missions were conducted in Yei and Morobo counties from 9 to 25 November and to Juba and Terekeka counties from 17 to 27 November 2021. As a result, 252 farming households were interviewed and 130 geo-referenced remote sensing interviews were conducted, including five key informant interviews. Due to insecurity, the counties of Kajo Keji and Lainya were not visited by the assessment teams. However, the CCMCs based in these inaccessible counties provided the required information and data through various means. The number of interviews (642 farming households' interviews, 130 geo-referenced remote sensing interviews, nine key informant interviews and 7 focus group discussions) was higher in 2021 compared to 2020 (219 farmers' and seven key informants' interviews). An improved security situation especially along the roads enabled the Task Force to travel and conduct assessments in Morobo and Yei counties.

Growing conditions

Combined RFEs and vegetation indexes for all the six counties of Central Equatoria State (Terekeka, Lainya, Juba, Kajo Keji, Morobo and Yei) are shown in Figure A3-2. An early start of seasonal rains in March/April was followed by adequate rains in May and by a period of prolonged dry spells in June that extended to July in some locations. Improved rains from July onwards had a favourable impact on yields of second season crops.

The common pests include millipedes, snails, aphids, stalk-borers (affecting sorghum and maize), local birds, termites, green grasshoppers (locally known as *waja waja*) and rodents, causing average damage on crops. Cassava mosaic virus caused mild to moderate damage. Damage levels for FAW was reported high in the first season but reduced to minimal levels in the second season as abundant rains created unfavourable conditions for the multiplication of the pest. *Striga* (parasitic weed) has continued to be of concern to farmers in areas dominated by mono-cropping of sorghum and minimal or no crop rotation, especially in Terekeka County. Monkeys have caused mild to serious damages to crops planted in far fields. Roaming migratory cattle was also reported, mostly from Jonglei and Terekeka counties in Aru Junction, Lobonok, Rejaf, Mangalla, Jebel Ladu and Rokon in Juba County and in Lainya and Kajo Keji counties, resulting in damage to crops and source of conflict.

Production

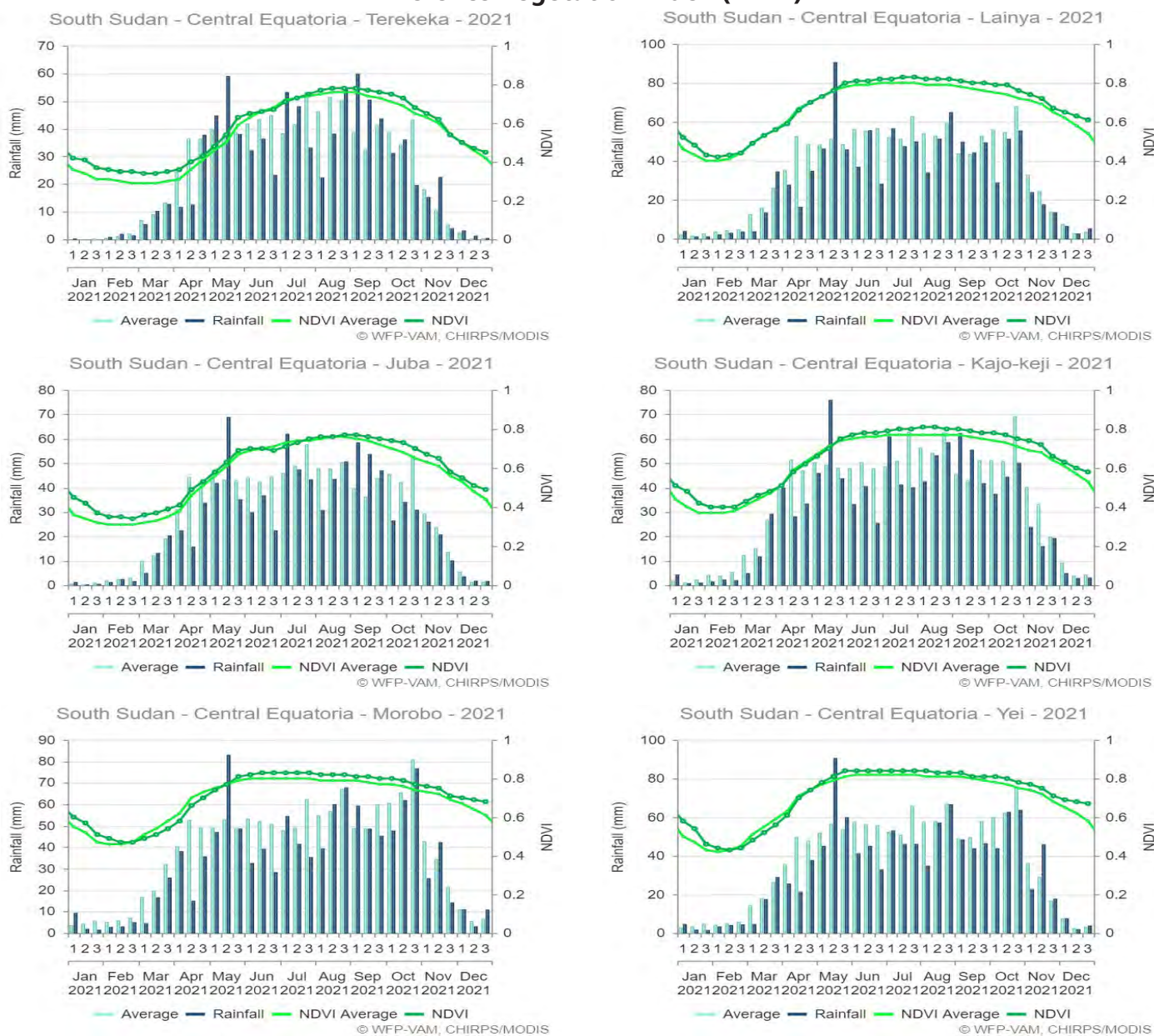
Production estimates have been performed on the basis of the case studies conducted by the assessment teams and CCMC reports (based on crop sampling), compared and cross-checked with time series data. Although the security situation improved since 2019, agricultural activities and cultivated area in 2021 remained well below the pre-conflict levels. Mainly as a result of expanded plantings due to an improved security situation, the 2021 gross cereal production, estimated at 101 053 tonnes, is 4.1 percent above the previous year's level. In addition, from the cassava harvest, about 77 134 tonnes of cereal equivalent (calculated using coefficients of 42 percent for dry matter and 70 percent for gross processing efficiency) are expected to be available for use. Groundnuts are also expected to add an estimated 24 291 tonnes of gross dry matter (unshelled).

Livestock movements in Central Equatoria State are seasonally practiced by Mundari pastoralists from Terekeka County starting from May, moving to the uplands of Juba, Lainya, Kajo Keji and Yei counties and then returning to their places of origin between September and November. The number of animals in Juba, Lainya, Yei, Morobo and Kajo Keji counties has decreased significantly in recent years mainly due to insecurity and cattle rustling. The remaining cattle in

Lainya, Yei and Kajo Keji counties have been moved to neighbouring Uganda, while those in Morobo County were moved to the Democratic Republic of the Congo. Due to average to above-average rains in the second season, pasture and water availability were reported at higher levels than in the previous

years in most areas. Hence, the average PET BCS for sheep and goats was 3–4, while it was 3 for cattle. There were no reports of disease outbreaks in the state, except the normal occurrences of endemic diseases, including CCP, FMD, PPR, CBPP, black quarter (BQ) and internal and external parasites.

Figure A3-2: South Sudan (Central Equatoria State) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

Eastern Equatoria State

The assessment teams undertook six missions at planting and at harvest time in 2021. The first planting assessment was conducted from 21 to 30 June 2021 covering Torit and Magwi counties, followed by Kapoeta, East, Kapoeta South and Kapoeta North from 22 to 29 June. The first season post-harvest assessment missions were done concurrently with the mission to Magwi and Torit from 6 to 17 September, followed by visits to Kapoeta East, Kapoeta South and Kapoeta North from 3 to 13 September 2021. The second season post-harvest assessments were conducted in Magwi and Ikotos from 22 November to 2 December 2021 followed by Budi, Kapoeta East, Kapoeta South and Kapoeta North from 23 November to 3 December 2021. In total, 783 household farmer interviews, 301 geo-referenced remote sensing interviews, 75 Key informant interviews, three case studies and 14 focus group discussions were carried out.

Growing conditions

Figure A3-3 shows the combined RFEs and vegetation index graphs for six locations selected across Eastern Equatoria State (Budi, Kapoeta North, Kapoeta East, Ikotos, Lafon and Torit counties). Remote sensing data in all six locations indicates below average to average rainfall and vegetation conditions.

Prolonged dry spells were reported across the state in June and early July, with varied effects on crops. The effect was significant on sorghum, maize and vegetables in Pageri area of Magwi County, central and western parts of Torit County, Lotukei and Kimotong payams of Budi County, Narus in Kapoeta East County and in Loppa/Lafon counties. Replanting was conducted in areas severely affected by dry spells, including Torit, Lafon and Ikotos counties. In addition, floods also occurred in flood-prone areas of Loppa/Lafon County from August to October with moderate impact on crops, while 1 400 heads of cattle were affected with 17 deaths reported.

Most farmers used local own-saved seeds carried over from the previous year or purchased from the market. Dry planting, especially of Lonyang and Lodoka landraces, is a common practice in areas where rains have a late onset. Maize (*Longi-5* variety) is mainly grown in Magwi and in some areas of Torit and Ikotos counties. Regarding other crops, cassava is grown in

the southern and western areas of the state, where high amounts of precipitations are normally received, while pearl millet is mainly grown in Ikotos County and in the eastern dry areas of the state.

Labour for cultivation is usually provided by household members either through *nafeer* (communal labour) or hired. While hand digging is the normal method of cultivation in the state, the number of tractors and ox ploughs have increased in 2021. The number of tractors, 52 in 2020, increased to 62 in 2021, of which 29 were functional. In 2021, 457 ox plough pairs were reported in the state, compared to 300 in the previous year. Hire rates for private tractors is slightly higher than that for government tractors. The average hiring rate for government tractors in 2021 was SSP 12 000/*feddan* (0.42 hectares) compared to SSP 10 000/*feddan* in 2020, while the hiring rate for private tractors was SSP 18 000/*feddan* compared to SSP 12 000/*feddan* in 2020. The average hire rate for ox ploughing in 2021 was SSP 13 000/*feddan* compared to SSP 10 000/*feddan* in 2020. The increase in the number of private tractors and ox ploughs have contributed to the expansion of cultivated area during the 2021 cropping season.

The main pests reported during the 2021 season were FAWs, green grasshoppers, *Striga*, local birds, *Parthenium* (congress weed), wild pigs and elephants. These endemic pests caused mild to average damage. FAW infestations caused some damage on crops, particularly on maize during the first season, fostered by the prolonged dry spells. Negligible damage was reported on second season crops as abundant rainfall washed away the worms. The expansion of *Parthenium* (congress weed) had a significant impact on crop yields in the Greater Kapoeta area. Other diseases, including sorghum smut, cassava mosaic virus and groundnut rosette virus, were reported in Magwi, Torit and Ikotos counties with mild effects on crops. Weeding was undertaken on average two times per season on main crops.

Production

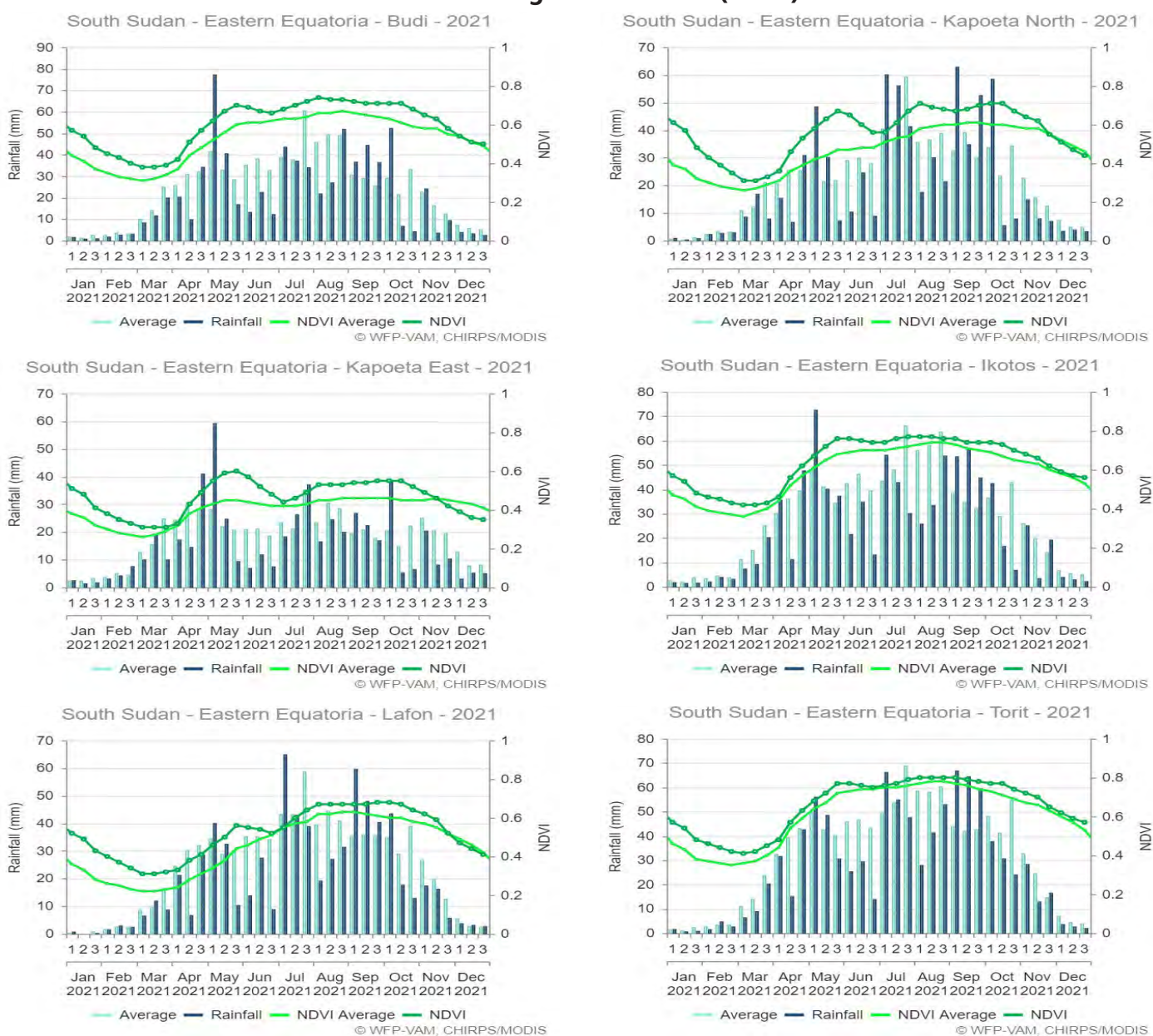
Production estimates have been based on evidence from case studies, the CCMC reports (based on crop sampling) and time series data. Crop performance in 2021 was better than the previous year, with the gross cereal production estimated at 155 873 tonnes, 2.5 percent up from 2020. An increase in planted area

of 4.5 percent, mainly due to an increase in the number of private tractors and ox ploughs, offset a decline of 2.2 percent of yields due to erratic rains until July.

At state level, the contribution of cassava to households' food consumption is significant, with an estimated 76 174 tonnes of cereal equivalent (calculated using coefficients of 42 percent for dry matter and 70 percent for gross processing efficiency) is expected to be available from the 2021 harvest. Groundnuts are expected to add a further, conservatively estimated 10 826 tonnes of gross dry matter (unshelled).

Livestock condition was assessed as generally below average in Greater Kapoeta Region, mainly as a result of an inadequate availability of pasture and water caused by the prolonged dry spells. Based on PET body condition, the average score for cattle and small ruminants (sheep and goats) was 1–2 and 2–3, respectively. The invasion of grazing lands by *Parthenium* weed has reduced the nutrient content of animal feed intake. Endemic diseases, including BQ, CBPP, HS, mange, shoat pox and foot rot, were reported, among others.

Figure A3-3: South Sudan (Eastern Equatoria State) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

GREATER BAHR-EL-GHAZAL

Northern Bahr-el-Ghazal State

The assessment team, including Task Force teams and the FAO Monitoring and Evaluation and AEAs undertook two assessment missions. The post-planting assessment mission was conducted from 15 to 26 August 2021, followed by a post-harvest assessment mission from 20 September to 1 October 2021. During both assessments, the teams carried out 475 household level interviews, 475 geo-referenced remote sensing interviews, five key informant interviews and six focus group discussions. Crop samples and walking transects were performed by the teams in most of the visited areas.

Growing conditions

Combined RFEs and vegetation index graphs for the whole state and its five counties (Aweil North, Aweil Centre, Aweil East, Aweil West and Aweil South) are shown in Figure A3-4. In all five locations, the assessment Team reports confirmed a timely onset of seasonal rains, a favourable temporal distribution with above-average precipitation amounts, especially during June and July. In early July, heavy rains and river overflows triggered widespread floods, affecting all counties of the state, with more than half of Aweil South County reportedly submerged. The floods affected most of the crops grown in low-lying areas.

Access to land in both near and far fields was generally safe, with the exception of Ton Chol semi-mechanized scheme area, where security forces were deployed to protect farmers carrying out agricultural activities. Smallholder farmers mainly use locally available hand tools, with only a few farmers using ox ploughs. The use of donkey ploughs is gradually increasing especially in Aweil West and Aweil North counties, helping users to increase the cultivated area. More than 260 pairs of ox ploughs were reported in Aweil North and South counties and the cost of hire services for ploughing 1 *feddan* (0.42 hectares) was SSP 12 000/*feddan* compared to SSP 10 000/*feddan* in 2020. Throughout the state, family labour is the main source of labour, along with some communal labour (*nafeer*) used where food and drinks usually served for the services rendered could be purchased. Across the state, apart from

33 functional tractors utilized in the agricultural schemes (Ton Chol: 7, Ayai: 16, Aweil Rice Scheme: 5 and Udhum: 5) six functional government-owned tractors and ten private functional private tractors are reported.

Sorghum is the main crop grown in the state. The main sources of seeds are farmers' own seeds of local varieties carried over from the previous harvest, known collectively as *cham*, *alep cham* and *nyanchung* or *athel*. The preferred improved sorghum seeds in the mechanized and traditional sectors are of Sudanese origin and the main varieties are *Wad Ahmed*, *Gaddam el Hamam* and *Arfa Gadameck*. Local groundnuts and sesame seeds were planted at the same time as the early sorghums, while small areas are planted with maize around homesteads for early green consumption.

To maintain soil fertility, the most common practice is shifting farming locations and grazing over farmlands by local and transhumant herds on contractual basis.

Pests and diseases have remained at low to medium level in 2021. The most common pests and diseases reported included FAWs, grasshoppers, stalk borers, groundnuts rosette virus, rodents, millipedes, wild and domestic animals, and birds. FAW was reported in all the counties but damage on crops was minimal. *Striga* weed infestation continued to be a major problem for sorghum farmers, while other weeds, such as grasses and wild rice, caused yield reduction on rice.

Production

Production estimates have been based on case studies, crop sampling, spot PET scores and time series data. The gross cereal production in 2021 has been estimated at 152 938 tonnes, about 2.9 percent up from the previous year. Despite the state was one of the most affected by floods, a 2.88 percent increase in harvested area and higher yields compared to 2020 in Aweil Centre and Aweil East counties offset the reduced yields in Aweil North and Aweil South counties and stagnant yields in Aweil West counties. Nonetheless, the estimated cereal deficit for 2022, estimated at 52 518 tonnes, is about 1 670 tonnes (+3.3 percent) higher than the deficit in 2021. Regarding the semi-mechanized schemes, in the

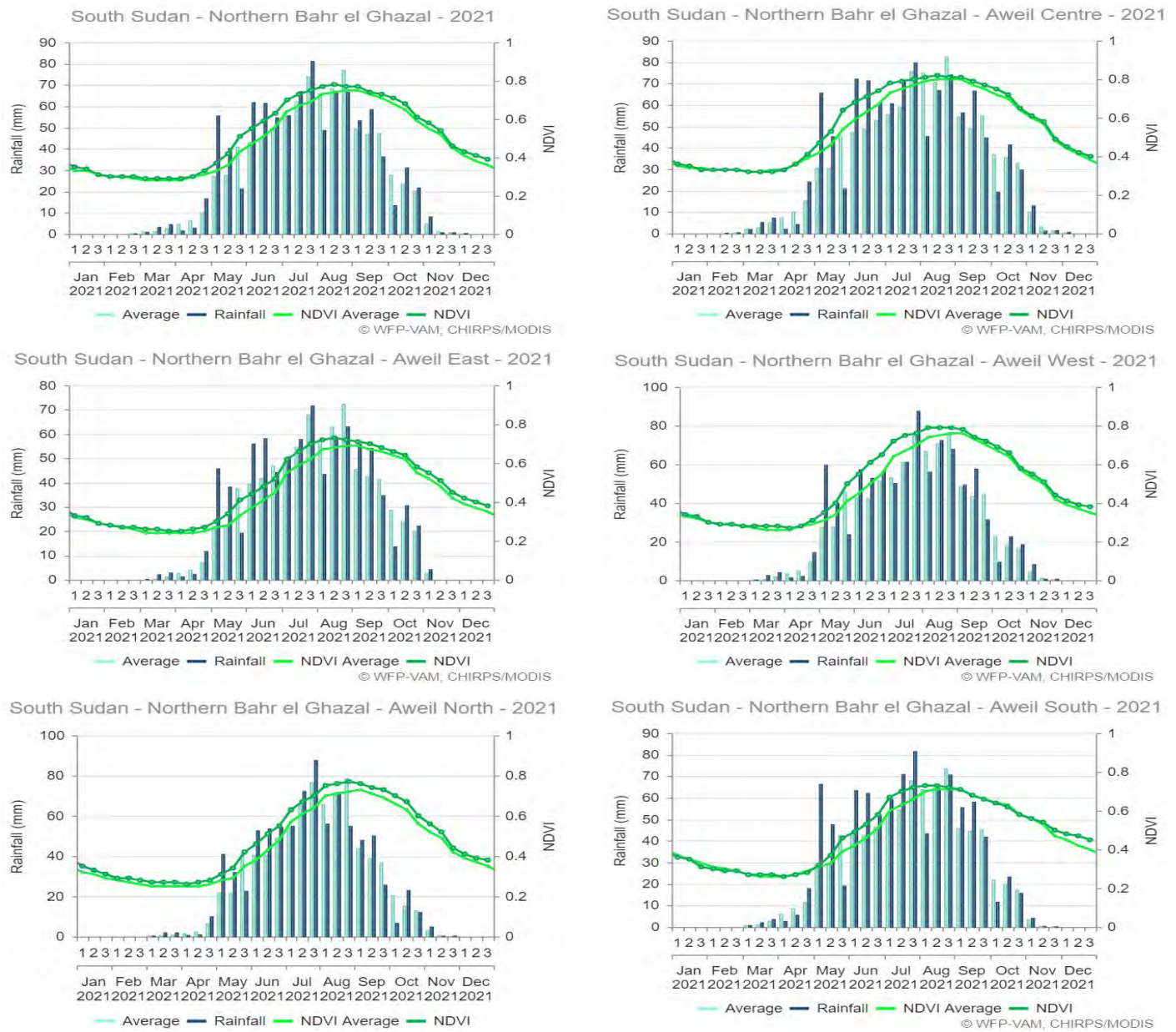
in the Aweil Rice Scheme. Land preparation was affected by lack of cash to purchase spare parts and lack of disc ploughs that are required to break the hard soil in the area. Due to these constraints, planted area in 2021 was significantly lower than in 2020. In addition, in early August, heavy rains and the overflow of the Lol River triggered heavy flooding, which severely affected rice crops. As a result of these negative factors, rice production in 2021, estimated at 266 tonnes, was 40 percent lower than the output obtained in 2020. In the Udhum Scheme, that utilizes the Aweil Rice Scheme basins, 210 hectares of sorghum were cultivated in 2021, but production, estimated at 134 tonnes, was minimal due to floods seriously affecting crops since July. In the Ayai Mechanized Scheme in Aweil South County, the area cultivated, estimated in 2021 at 4 704 hectares, increased from the previous year. However, severe floods triggered by torrential rains and by the overflow of the Kueng River in July resulted in a total crop failure, compared to 1 803 tonnes of sorghum harvested in 2020. In the Ton Chol Scheme (Aweil East County), only some farmers cultivated their land in 2021 due

to insecurity, with an estimated production of 198 tonnes of sorghum from a total planted area of 185 hectares.

The agroecology of Northern Bahr-el-Ghazal does not support a widespread growing of cassava. On the other hand, groundnuts substantially contribute to the food economy of state's households. In 2021, a production of 24 250 tonnes of unshelled product is estimated from a harvest area of 34 642 hectares.

Livestock rearing is common in all the counties of Northern Bahr-el-Ghazal State. As a result of the average to above-average rains in 2021, water and pasture were abundant in the higher areas where livestock were relocated following flooding in lowland areas. The PET-based BCS for cattle and small ruminants (sheep and goats) was assessed as 3–4. There were no livestock disease outbreaks, but endemic livestock diseases, including CBPP, CCPP, Anthrax, BQ, FMD, New Castle Disease, diarrhoea, HS, external parasites, mange on goats and tick-borne diseases, were reported.

Figure A3-4: South Sudan (Northern Bahr-el-Ghazal State) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

Western Bahr-el-Ghazal State

The assessment team, including Task Force Team members, FAO Monitoring and Evaluation assistants and AEAs, undertook a post-planting assessment in all the three counties of the state, namely, Wau, Jur River and Raja, from 17 to 27 July 2021. This was followed by a post-harvest assessment mission covering the three counties from 20 September to 2 October 2021. Overall, 399 household level, 76 geo-reference remote sensing and six key informant interviews in addition to three focus group discussions, were conducted.

Growing conditions

Combined graphs of 2021 RFEs and vegetation index for the whole state and for three counties (Raga, Jur River and Wau) are shown in Figure A3-5. Seasonal rains had an early start, followed by dry spells in pocket areas that necessitated replanting and gap filling, but had a low impact on overall crop performance. In general, the farmers' case studies and the CCMC reports indicated that the amounts of rainfall during the 2021 season were average to above average and higher than in 2020. As a result, the yields of cereals (maize and sorghum) and groundnuts in 2021 increased from the previous year.

The majority of the small holder farmers use hand tools for land preparation and the related cultural practices, along with some ox ploughs and few tractors. Hand tools usually purchased from the market include *maloda*, *axe*, *hoe*, *panga* and *rake*. Through its partners, FAO has distributed seeds and hand tools targeting poor farmers. The assessment team, including the CCMCs, have reported that the use of ox and donkey ploughs are increasing in the area. In 2021, there were about 23 government-owned tractors, but none of them were operational. In the private sector, there were only two functional private tractors in 2021, compared to eight functional private tractors in the previous year. The average hire rates for tractors in 2021 were SSP 12 000/*feddan* (0.42 hectares). However, the efficient utilization of these tractors has been constrained by shortages and high prices of fuel, and unavailability of spare parts.

Family and communal labour (*nafeer*) are normally used for weeding and harvesting, while only some

better-off farmers are able to hire daily workers for digging and weeding. The average hiring rate in 2021 was SSP 10 000/*feddan* compared to SSP 8 000/*feddan* in 2020.

Sorghum is by far the most grown and consumed cereal in the state and seed sources are mainly own seeds of local varieties carried over from the previous harvest. Due to vulnerability of the traditional long cycle landraces of Mabior or Ulela to destruction by transhumant livestock that return home before the crop is harvested, several farmers have ceased planting these varieties. Better-off farmers and those living close to pastoralists have started substituting the long cycle sorghum over the years with improved short cycle varieties that include *Sesso 2*, *Gadam el Hamam*, *Luana* and *Bene*. These varieties are harvested early together with groundnuts and are not destroyed by the returning livestock.

In order to maintain soil fertility, in the absence of chemical fertilizers, better-off farmers invite cattle owners to keep their animals in their fields for manuring. By contrast, smallholder farmers who cannot afford the cost of keeping cattle in their fields for a specified period of time, use alternative methods of manuring that include composting and shifting cultivation.

The common pests and diseases reported in 2021 include millipedes, black ants, termites, grasshoppers, sorghum midge, stalk borers, weevils, squirrels, local birds, wild rats, rosette virus (on groundnuts), wild and domestic animals and various types of weeds, including *Striga*. Infestation by *Striga* has been severe especially in Marial Bai and Agok areas and damage caused by this parasitic weed on sorghum crops was reported to be more severe than in 2020. There were few cases of FAW infestations in the state, which caused only mild damage on maize and sorghum crops.

Production

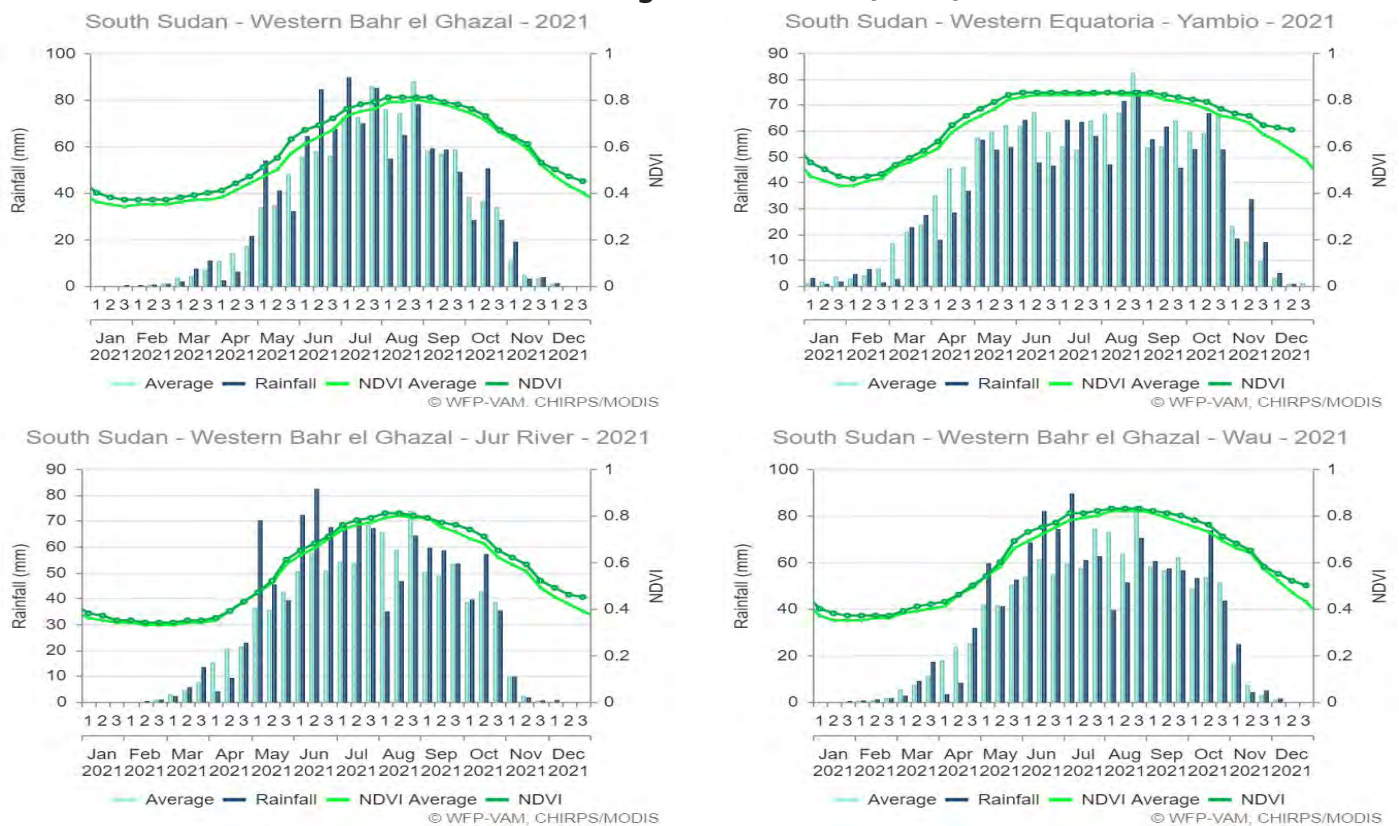
The gross cereal production in 2021 is estimated at 73 600 tonnes, about 12 percent up from 2020, as a result of a 1.3 percent increase in yields and a 11 percent increase in harvested area. Harvested area increased mainly due to security improvements that prompted returns of displaced households and encouraged farmers to expand plantings to fields far

from the homesteads. Yields of cassava in 2021 are estimated by the Task Force teams at an average level of 12 tonnes/hectare. The contribution of cassava to the 2021 food availability in the state is estimated at 49 910 tonnes of cereal equivalent (gross dry matter). Groundnuts are likely to add an estimated 24 077 tonnes of unshelled product at household level.

Most households in Western Bahr-el-Ghazal State are not large-scale livestock keepers, with most of them owning only small ruminants, particularly goats and

sheep that graze or are tethered around homesteads to prevent them from intruding into crop fields. Based on the PET manual, the average livestock BCS in 2021 for both cattle and small ruminants was 3-4, higher than in 2020 due to improved availability of pasture and water. There were no reports of disease outbreaks in 2021, apart from normal occurrences of endemic diseases, including CBPP, CCPP, Anthrax, BQ, FMD, New Castle Disease, diarrhoea, HS, internal and external parasites, mange on goats and tick-borne diseases.

Figure A3-5: South Sudan (Western Bahr-el-Ghazal State) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

Warrap State (including Abyei Administrative Area)

The assessment team, comprising of Task Force members, FAO Monitoring and Evaluation assistants and AEAs, conducted a post-planting assessment mission in Gogrial West, Twic and Abyei counties from 17 to 27 July 2021, followed by a post-harvest assessment mission to Gogrial West, Twic, Abyei and Tonj South counties from 24 September to 5 October 2021. In total, 339 household level interviews and five focus group discussions were conducted.

Growing Conditions

Combined RFEs and vegetation index graphs for six locations across the state (Gogrial West, Gogrial East, Tonj North, Tonj East, Twic and Tonj South) are shown in Figure A3-6. All six locations indicate an early or timely onset of seasonal rains between April and early May in most counties. Cumulative seasonal rains were above average and higher than in 2020, with the exception of Tonj North County, a prolonged period of dry spells was reported across the state, between June and July which, however, had a mild effect on crops. Flooding occurred in Tonj North, Gogrial West, Gogrial East, Tonj South, Tonj East and Twic counties and Abyei Administrative Area, due to heavy seasonal rains and the overflow of the Kiir River and caused significant damage to crops. Warrap was the state most affected by floods, with 28 491 hectares damaged.

The majority of farmers use hand tools sourced from markets. Some households also received hand tools from FAO and its partners. The number of tractors in the state has declined, with 51 functional tractors in 2021 compared to 61 in 2020. Most government tractors are no longer operational except in Twic County with three functional government tractors, with the dwindling number of functional government tractors caused by the high cost of spare parts, lubricants and fuel. Hire rates for private tractors in 2021 was SSP 35 000/*feddan* including fuel, compared to SSP 22 000/*feddan* in 2020. The use of ox ploughs is increasing across the state, with a total number of 1 588 ox ploughs used in 2021. The cost of ploughing using ox ploughs was SSP 15 000/*feddan* compared to SSP 10 000/*feddan* in 2020.

The main crops grown in the state include sorghum, maize, groundnuts and sesame. Sorghum is by far the main crop, and farmers use their own saved seeds of local varieties carried over from the previous harvest, with a preference for short landraces (*yaar*, *athel* and *nyanjung*) to be harvested in September. In Tonj South County, a late-maturing sorghum variety known as *kec* is also grown. Local groundnuts and sesame crops are usually planted at the same time of sorghum, in addition to small areas planted with cowpeas and maize.

The main pests reported by the assessment teams include millipedes, birds, *Striga*, grasshopper, stem borers, sorghum smut, aphids and sorghum midge, with mild damage on sorghum crop. FAW infestations were reported in Gogrial West, Tonj South and Abyei Administrative Area with mild to average effects on maize and sorghum crops.

Production

The gross cereal production in the State (including Abyei Administration Area) in 2021 is estimated at 133 298 tonnes, about 21 percent down from 2020 and the lowest on record since 2014, due to reductions in both harvested area (-3 percent) and yields (-18.6 percent) due to heavy flood damage on crops.

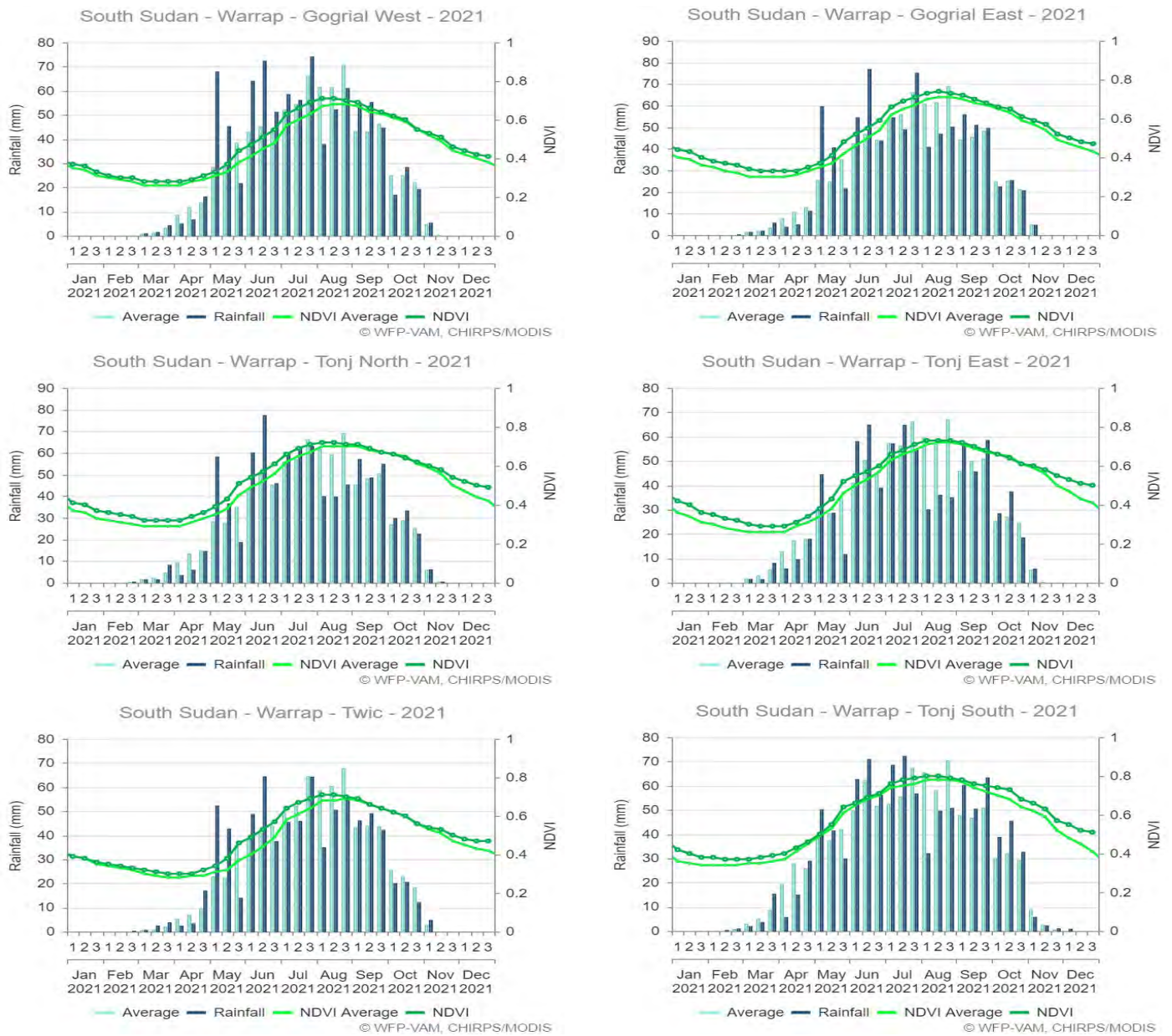
Cassava production is not common in the state, mainly due to the local agroecological characteristics that support its cultivation only around the edges of the fields and pathways. Groundnuts, however, make a more substantial contribution to the local diet and may add an estimated 17 199 tonnes of unshelled product to the households' food consumption.

Large numbers of cattle and small ruminants are reared in Warrap State. Cattle are largely transhumant, usually moving to dry season grazing areas and water points around December and January. However, in the 2021 season, cattle movement took place in January and February as floods inundated the main grazing areas. Mainly due to the conducive environment created by floods, outbreaks of livestock diseases including Anthrax, Haemorrhagic septicaemia and BQ, were reported in all the counties, except Abyei

Administrative Area. Livestock was also affected by endemic diseases, including ECF, FMD, CBPP, lumpy skin disease and CCPP. A low PET BCS of

2–3 for cattle and 3 for sheep and goats was reported, due to inadequate pasture and the impact of diseases.

Figure A3-6: South Sudan (Warrap) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Lakes State

The assessment team, comprising Task Force members, Monitoring and Evaluation Assistants and AEs, undertook a post-planting assessment mission from 22 to 29 September 2021 covering Rumbek Centre, Cueibet and Wulu counties, performing 118 household level interviews and two key informant interviews. It was followed by a post-harvest assessment covering Rumbek Centre, Cueibet, Wulu and Yirol West counties from 19 to 28 October 2021, performing 59 household level interviews, 43 geo-referenced remote sensing interviews, four key informant interviews and 40 case studies.

Growing conditions

The combined RFEs and vegetation index graphs for six counties of the state (Rumbek Centre, Rumbek East, Wulu, Cueibet, Awerial and Yirol East) are shown on Figure A3-7. The rains had a timely start in April in Awerial, Wulu and Yirol West counties, while in the rest of the counties they had a delayed onset in May, followed by prolonged (two to three weeks) dry spells in June, which delayed planting to July. Nonetheless, the cumulative rainfall amounts of rainfall was average throughout the state and higher than in 2020. Flooding occurred in the low lying areas of Awerial, Cueibet, Rumbek East, Rumbek North and Wulu counties due to excessive rains in August and September and overflow of rivers resulting in damage and reduction of yields of sorghum and groundnuts.

An increase in the use of ox ploughs compared to 2020 has been reported by the assessment team in Awerial, Cueibet, Rumbek Centre, Rumbek East, Yirol East and Yirol West counties. The main types of tools used by farmers are malodas, machetes, hoes, axes, rakes and sickles. These tools are used for performing all the required cultural practices. Most farmers in Wulu County use hand tools, with only a few ones using oxen for cultivation. The number of functional tractors declined to 20 (18 owned by government and two private), compared to 26 in 2020 across the state. In the state, 43 tractors are reported to be non-functional. The hiring rate for tractors in most of the counties was SSP 15 000–20 000/*feddan* compared to SSP 10 000–15 000/*feddan* in 2020, while the rate for ox ploughs was SSP 10 000–12 000/*feddan* compared to SSP 5 000–7 000 in the previous year.

The crops grown in the state include sorghum, groundnuts, maize, sesame, green gram and cowpeas. The main cereal grown is sorghum, with a preference for short landraces (*yaar*, *athel* and *nyangjung*) harvested in September. A late maturing sorghum variety (*kec*) sown in Tonj County was too early in its growing cycle to be effectively assessed during the mission. Groundnuts, cassava, sesame, green gram and cowpeas are usually intercropped. The main seed sources are savings from the previous harvest or market purchases. The common pests and diseases reported during the 2021 season include millipedes, porcupines, red monkeys, rodents, termites, groundnuts rosette virus, sorghum smut, stem borers, green grass hoppers, local birds and *Striga* weed. Damage levels were reported to be mild. However, weed infestation remains a serious challenge for the cultivation of all crops across the state. There were no reports of presence of FAWs except in Cueibet County where few cases of FAWs were reported, with the pest affecting maize planted in backyard gardens and sorghum with minimal damage. Mild to serious losses on harvested crops were reported due to storage pests, including weevils and rats. However, no control measures were undertaken for any of these pests by the farmers. There is no application of fertilizers in the state, except for localized use of manure (especially cow dung and goat droppings) on maize and vegetables fields around the homesteads.

Production

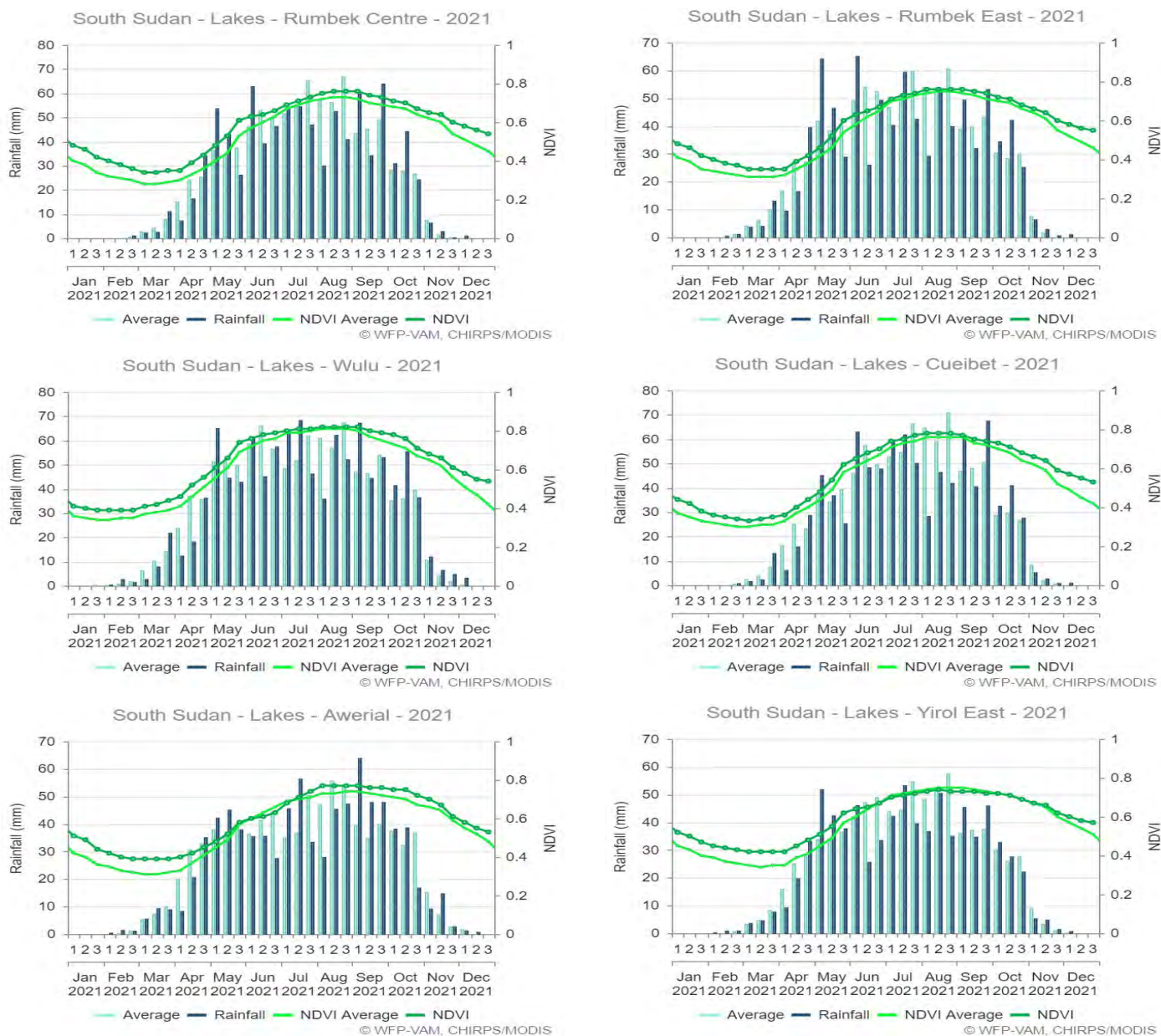
The 2021 estimates of cereal production are based on time series data adjusted with evidence from crop sampling, PET scores and case studies. The 2021 gross cereal production is estimated at about 152 000 tonnes, 10.5 percent below the 2020 levels, reflecting a reduction from 2020 of 8.6 percent and 2.1 percent of yields and harvested area, respectively, due to the impact of floods and dry spells. The groundnut output is estimated at about 51 100 tonnes of unshelled product, 7.1 percent below the 2020 level, also due to the impact of floods and waterlogging.

The agroecology of Lakes State supports the cultivation of cassava but cattle-keeping practice is preventing its expansion in all counties. The production of cassava in 2021 is estimated at about 63 390 tonnes of fresh tubers, corresponding to about 18 636 tonnes of cereal equivalent.

Livestock rearing in the state is mainly transhumant, with animals moved by pastoralists in search of water and pasture. Cattle theft incidents usually occur during these movements, especially in Rumbek North, Yirol West and East counties. In general, livestock condition was good in 2021, due

to abundant availability of water and pasture. The average PET BCS was 3–4 for cattle and 3 for shoats. No disease outbreaks were reported, with a normal incidence of endemic diseases, including CBPP, FMD, BQ, CCP, PPR, diarrhoea, internal and external parasites.

Figure A3-7: South Sudan (Lakes State) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

GREATER UPPER NILE REGION

Upper Nile State

The assessment team, comprising of Task Force members, Monitoring and Evaluation Assistants and AEAs, undertook a post-planting assessment mission from 20 to 27 October 2021 visiting Renk, Melut and Maban counties, and a post-harvest assessment from 2 to 8 December 2021, visiting Renk and Melut counties. During both missions, the team conducted a total of 73 household interviews, 20 geo-referenced remote sensing interviews, three key informant interviews and 17 case studies. In Upper Nile State, most of the large-sized semi-mechanized schemes of the country are located. Access to land was unimpeded and an expansion of commercial farming was reported by the assessment team, with increasing areas under cultivation both in the mechanized and in the traditional sectors.

Growing conditions

Combined graphs of 2021 RFEs and vegetation index graphs for six locations selected across the state (Renk, Maban, Melut, Longochuk, Baliet and Panyikang counties) are shown in Figure A3-8. In most locations, remote sensing data indicate an early onset of the rainy season in May. The cumulative seasonal rainfall amounts were above average and higher than in 2020. However, there were cases of dry spells in some pocket areas in August/September, but they did not have a significant impact on growing crops. In low lying areas, excessive rains in the State and in neighbouring Ethiopian highlands, and the overflow of the Nile and Lul rivers, triggered floods.

The 2021 agricultural season had generally a better performance compared to 2020. Although most commercial farmers in the past three years had shifted to sesame at the expense of sorghum, mainly due to its high economic return and tolerance to dry spells, the negative impact of a sesame pest, commonly known as (*corona*) leaf roller moth (*Antigastra cataunalis*), has interrupted this trend in 2021. On sesame fields, the pest damage occurred during the vegetative and flowering stages, and destroyed most of the crops. Subsequently, several farmers replanted the fields them with a short maturing *Arfa Gadameck* sorghum variety. Sorghum crops benefited by

favourable weather conditions which continued up to early November 2021. In Renk County, floods triggered by excessive rains and overflow of the Nile River occurred in September and destroyed sorghum crops at early maturity stage. In Melut County, floods occurred in October when sorghum was mature and farmers were forced to harvest the crop under flooded conditions. In other severely flooded areas, the assessment teams were not able to visit the affected areas due to access constraints.

The assessment team was informed by the Renk County Director of Agriculture that there was a decline in area cultivated in 2021 compared to 2020 due to shortages of spare parts and credit services and high fuel prices. The usual support to farmers by the national government in terms of fuel has not been provided in 2021. In Renk semi-mechanized scheme, about 85 percent of the farmers use their own tractors and only 15 percent hire tractors. Although sorghum and sesame are the main crops grown, in 2021 the area planted with pearl millet has increased significantly. In 2021, the number of functional tractors in Renk County was 500, including ten government tractors. The number of private tractors in Renk is high due to the influx of farmers from the Sudan coming with their tractors to rent and cultivate land, and provide tractor hire services. The tractor hire rate was higher in 2021 compared to 2020, costing SSP 300 000/block (120 *feddans*) plus 2 drums of diesel for ploughing and planting operations, compared to SSP 200 000/block and 2 drums of diesel in the previous year. The price of diesel has remained the same as last year, costing SSP 150 000/drum. The tractor hire rate in 2021 per season (for three months) was SSP 1 200 000–1 500 000 compared to SSP 1 000 000–1 200 000 in 2020, with the renter providing minor repairs and spare parts, while more serious malfunctioning gets repaired by the owner.

In Melut County, the number of functional tractors is reported at 58, including four tractors owned by the government and 54 privately owned. The tractor hire rate per *feddan* (0.42 hectares) was SSP 9 000. In Maban and some other counties of the state, there are no government or private functional tractors and farmers use hand tools, including malodas and hoes, for cultivation.

Generally, most of the inputs, including improved seeds of sorghum and sesame, were sourced from the Sudan through informal cross-border trade. A bag of 100 kg of sorghum (Wad Ahmed, *Arfa Gadameck* and *Gaddam Hamam*) was sold in 2021 at SSP 30 000 compared to SSP 20 000 in 2020. The assessment team confirmed that access to land in Maban was unimpeded and cultivation was performed by family members using hand tools. The main crops grown in the county were late maturing sorghum (*Agono*) varieties and early maturing maize, with seeds sourced from household stocks, markets or family members.

In the semi-mechanized schemes of Renk and Melut counties, including the surrounding areas, abundant availability of water fostered the multiplication and infestations by QQU. The damage on sorghum was reported to be mild to average, while the leaf roller moth (*Antigastra cataunalis*) had a devastating effect on sesame during vegetative and flowering stages. Other common pests reported during the 2021 season included local birds, stock borers, aphids and weeds, which caused mild damage on growing crops. The expansion of *Striga* weed has been noticeable in recent years, causing moderate damage on sorghum crops in several areas.

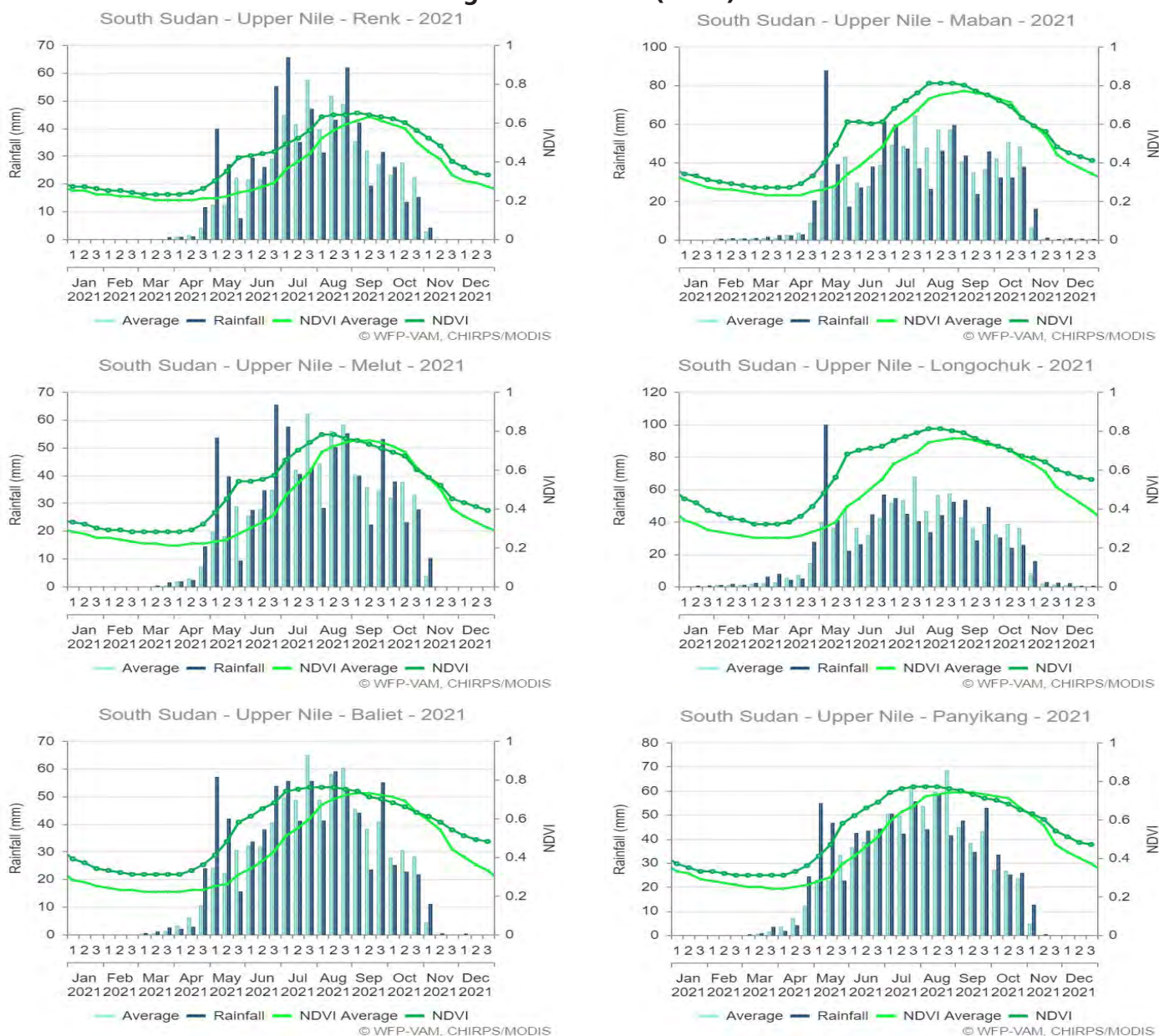
Chemical fertilizers are not commonly used in both traditional and semi-mechanized farming systems. Farmers practice shifting cultivation and crop rotation to maintain soil fertility. In the traditional farming areas, almost all fields were cultivated by hand using family labour.

Livestock body condition was assessed as good, with BCSs ranging from 3–4 for cattle and 2–3 for sheep and goats, due to adequate pasture and water availability. There were reports of outbreaks of diseases, including BQ, CBPP, CCPP, PPR, HS, FMD and internal and external parasites, due to the conducive environment created by the floods.

Production

In 2021, the gross production from the traditional sector in Upper Nile State is estimated at 27 804 tonnes of mixed cereals, 11.8 percent below the 2020 levels. The decrease in production is due to a reduction in yields of cereals (-8.1 percent) and a decrease in harvested area (-4 percent), mainly due to floods. In the mechanized sector, the Task Force teams estimated a gross production of 111 620 tonnes of cereals which is higher and 22 percent up from 2020.

Figure A3-8: South Sudan (Upper Nile State) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

Unity State

The crop assessment team, comprising of Task Force members, Monitoring and Evaluation Assistants and AEAs, visited the state for the first time since 2016 undertaking a post-harvest assessment mission from 22 to 29 September 2021 in Rubkona and Guit counties, due to security improvements. The assessment team conducted 80 household interviews and two focus group discussions. The CCMCs and SMOA staff supported the assessment team with data collected from the other counties. In addition, the CFSAM Team used telephone communication to obtain more information on the performance of the season and yields of the main crops, which were used by the CFSAM Team during the final analysis. The county level information gathering process was coordinated and performed by the State Focal Person and a member of the Task Force Team from the state.

Remote sensing analysis and information from CCMC and SMOA were the main data source used to evaluate the performance of the rainy season. The data from this source was then cross-checked and triangulated with information provided by a team of local extension workers from selected areas of Unity State that were invited to participate in the final CFSAM analysis workshop which took place from 7 to 14 December 2021 in Juba.

Growing conditions

Figure A3-9 shows the combined RFEs and vegetation index graphs for six selected locations across Unity State. Remote sensing data and information indicate

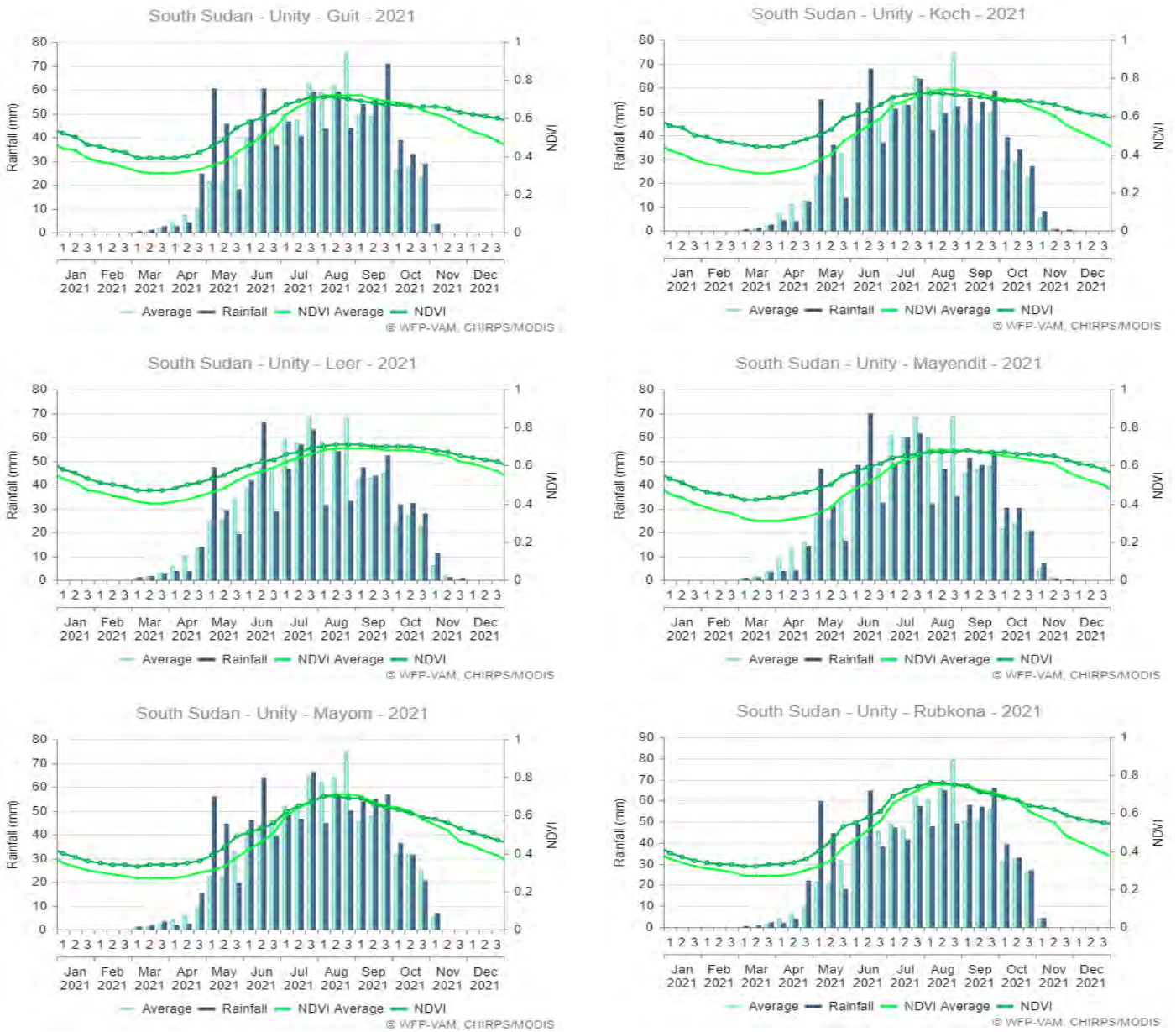
a normal onset of seasonal rains in May across the state, which established in July in most locations. The cumulative seasonal rainfall amount was average, with above-average rainfall received in June and July. The overflow of the Nile River and the above-average early season rains triggered floods that caused damage to crops, which were at early maturing stage, and deaths of livestock.

Regarding pests, FAW was reported across the state except in Leer, Panyijar and Pariang counties. The effect of the pest was reported to be mild, especially when the rains intensified in the months of June and July. Other pests, including local birds, stem borers, rodents, termites, domestic animals and *Striga* weed, were widely reported causing mild to average damage on crops. Water and pastures were more available in 2021 compared to 2020, but only in high grounds where the livestock has been moved during the floods. The most common diseases reported in 2021 included HS, BQ, FMD, PPR, ECF, diarrhoea, *Trypanosomiasis*, *Pest De Petits Ruminants* and foot rot. The PET BCS was 2–3 for cattle and 3–4 for small ruminants due to the adequate availability of pasture and water, especially in the non-flooded areas.

Production

The 2021 gross production from the traditional sector is estimated at 14 729 tonnes of mixed cereals, mainly sorghum and maize, which is about 15 percent lower than the previous year. The decrease in production was driven by a reduction both in harvested area (-13 percent) and yields (-2.2 percent), mainly due to flood-induced losses.

Figure A3-9: South Sudan (Western Equatoria) - seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM <https://dataviz.vam.wfp.org/>, 2021.

Jonglei State

Access to Jonglei State has again been limited by insecurity and only three missions were carried out, a post-planting assessment from 17–30 July 2021 in Twic East County, another post-planting assessment in Bor South County from 1–4 August 2021 and a post-harvest assessment to Bor South County from 23–30 September 2021. During the three missions, a total of 113 household interviews, two key informants' interviews and two focus group discussions were conducted. Farmers' access to nearby fields was unimpeded in most areas of the state, but cultivation of far fields was constrained by fear of insecurity, destruction of crops by wild animals, lack of resources and fear of thefts.

Growing conditions

Combined RFEs and vegetation index graphs for six locations selected across Jonglei State (Akobo, Twic East, Fangak, Pibor, Nyirol and Bor South County) are shown in Figure A3-10. According to remote sensing data, seasonal rains showed varied trends with most of the counties receiving their rain since April and May and the remaining two counties of Twic East and Pochalla receiving their rain later, since June. The cumulative seasonal rainfall amounts were below average, but exacerbated waterlogging of already saturated soils, as floods from the previous year had yet to recede in several areas, and the overflow of the Nile River and its tributaries in August/September. The resulting heavy floods affected crops at maturity stage and significantly affected livestock. Post-harvest losses were also reported, as farmers had to harvest the crops that survived in standing water. In addition, the floods also caused displacement of communities and livestock to high grounds within the county and to neighbouring counties. Dry spells in June, especially in Twic East and Pochalla counties, had a minimal impact on crops.

Land preparation is normally accomplished using hand tools by family or labour sharing groups and animal traction is not commonly used, with only few tractors reported to be functional in Bor South County. The number of tractors has significantly reduced: for example, in Bor South County, there were only four functional government tractors in

2021 compared to 13 in 2020, and eight privately owned functional tractors compared to 14 functional tractors in 2020. The tractor hire rate in 2021 was SSP 20 000 for private tractors, compared to SSP 15 000 in the previous year, while government tractors were hired at SSP 12 000 during the season, compared to SSP 10 000 in 2020, including fuel for land preparation. Farmers have to pay again for tractor service at the time of planting.

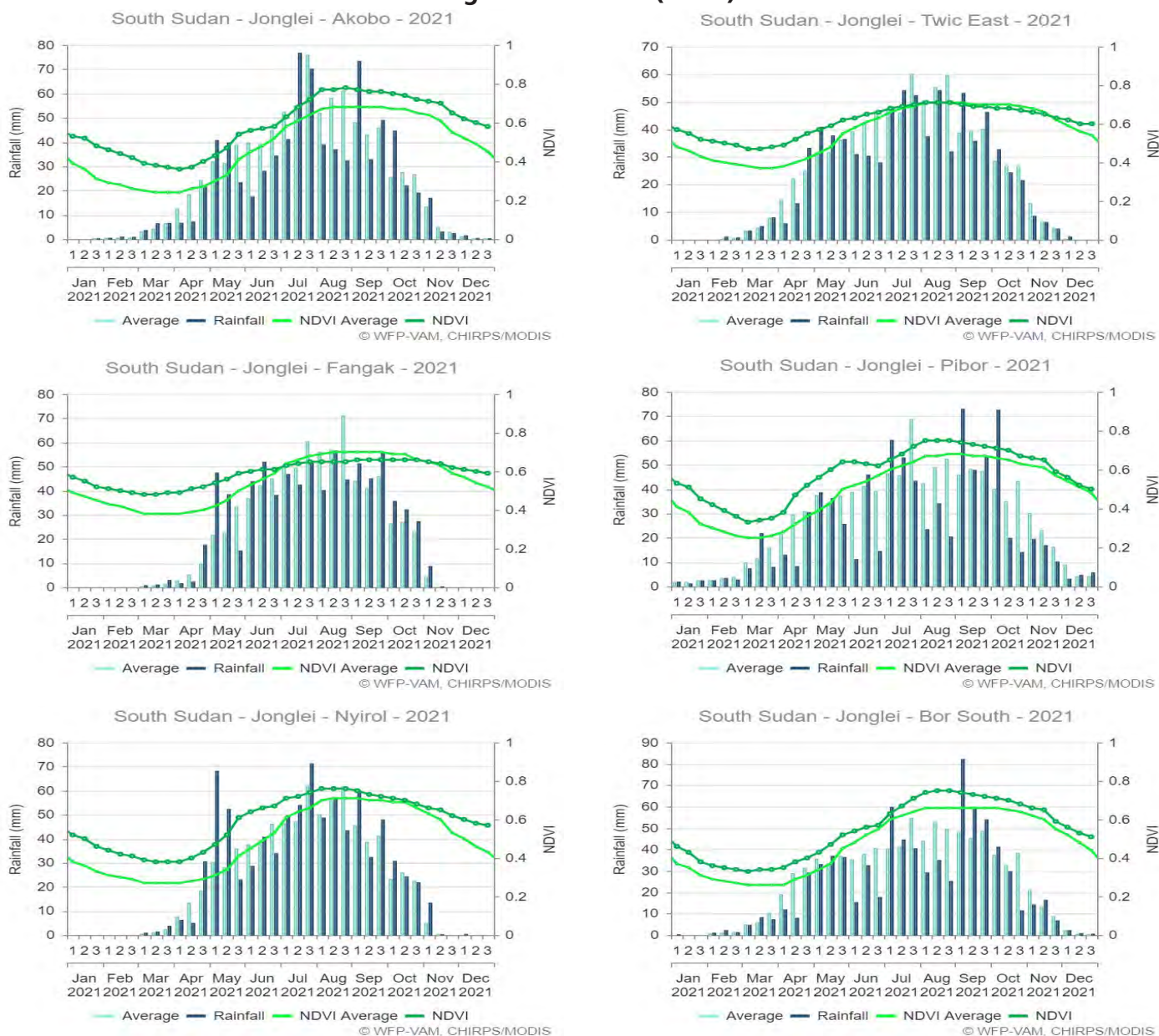
The main pests reported by the assessment team include local birds, FAWs, stock borers, green grasshoppers, monkeys, squirrels and wild pigs. FAW infestations were reported in Bor South and Duk counties, with mild to serious damage on maize. FAO provided farmers with 120 litres of Fawligen chemical to control the pest.

Production

As a result of the severe flood-induced damage, the 2021 gross cereal production from the traditional farming sector is estimated at a low 40 440 tonnes, 1.35 percent below the very poor output obtained in 2020, when yields were also severely constrained by widespread floods, and it was the lowest on record since 2016. Cassava is cultivated only in Pochalla County, where it is reported to be gradually expanding, with an estimated production of 1 229 tonnes of cereal equivalent, about 10 percent higher than in 2020. CCMCs in Bor South, Duk and Twic East counties did not report cassava production. Small-scale cultivation of groundnuts is reported in nine counties of the state and production is estimated at about 954 tonnes of unshelled product, 11 percent lower than in 2020.

Jonglei State is one of the major livestock rearing areas of the country. Livestock management is mainly based on the transhumance system. In 2021, pasture and water was available in high land areas where the livestock have been relocated due to flooding in the low lying areas. The BCS was 2–3 for cattle and 3–4 for shoats. Floods have caused the death of a large number of animals and led to the migration of households with their animals to higher grounds and to Central and Eastern Equatoria. Floods created a conducive environment for a substantial increase of endemic diseases that included BQ, CBPP, CAPP, PPR, FMD, diarrhoea and internal and external parasites.

Figure A3-10: South Sudan (Jonglei State) -seasonal rainfall and Normalized Difference Vegetation Index (NDVI)



Source: WFP/VAM: <https://dataviz.vam.wfp.org/>, 2021.

ANNEX 4

Table A4: South Sudan - Planting and harvest assessment missions and case studies, 2021

Type of assessment	Counties visited	Date of assessments	Number of case studies				
			Household level	Remote sensing	Key informant	Case studies	Focus group discussion
Western Equatoria							
Post-planting	Nzara, Ezo	26 June–3 July	45	0	1	0	2
	Mundri West, Mvolo	26 June–3 July	36	0	2	0	2
	Maridi, Ibba, Yambio	26 June–3 July	106	0	3	0	3
First season post-harvest	Nzara, Yambio	3–12 September	130	34	1	10	1
	Mundri West, Mundri East	10–17 September	78	0	1	0	2
	Maridi, Ibba	3–12 September	180	0	3	0	3
Second season post-harvest	Nzara, Ezo	22 November–2 December	117	35	3	12	2
	Maridi, Ibba, Yambio	22 November–2 December	110	0	3	0	3
	Mundri West, Mvolo	4–11 December	50	0	4	0	0
Eastern Equatoria							
Post-planting	Magwi, Torit	12–12 July	72	0	0	0	2
	Ka/East, Ka/South, Ka/North	22–29 June	28	3	63	0	3
First season post-harvest	Ikotos, Magwi	6–17 September	186	59	0	3	2
	Ka/East, Ka/South, Ka/North	3–13 September	169	169	2	0	0
Second season post-harvest	Magwi, Ikotos	22 November–2 December	150	70	7	0	4
	Budi, Ka/East, Ka/South, Ka/North	23 November–3 December	178	0	3	0	1
Central Equatoria							
Post-planting	Yei, Morobo	22–29 June	60	0	2	0	2
	Juba, Terekeka	24 June–2 July	120	0	0	0	3
First season post-harvest	Morobo, Yei River	3–13 September	105	0	2	0	0
	Juba, Terekeka	6–15 September	105	0	0	0	2
Second season post-harvest	Yei, Morobo	19–25 November	120	0	3	0	0
	Juba, Terekeka	19–28 November	132	130	2	0	0
Warrap							
Post-planting	Gogrial, Twic, Abyei	17–27 July	135	0	0	0	3
Post-harvest	Gogrial, Twic, Tonj	24 September–5 October	204	0	0	0	2
Western Bahr-el-Ghazal							
Post-planting	Wau, Jur River, Raga	17–28 July	186	0	3	0	3
Post-harvest	Wau, Jur River, Raga	20 September–2 October	213	76	3	0	0
Northern Bahr-el-Ghazal							
Post-planting	Aw/ Centre, Aw/North, Aw/South, Aw/East, Aw/West	15–26 August	171	171	0	0	3
Post-harvest	Aw/Centre, Aw/North, Aw/South, Aw/East, Aw/West	20 September–1 October	304	304	5	0	3

Table A4: South Sudan - Planting and harvest assessment missions and case studies, 2021 (Cont.)

Type of assessment	Counties visited	Date of assessments	Number of case studies				
			Household level	Remote sensing	Key informant	Case studies	Focus group discussion
Jonglei							
Post-planting	Twic East	17–30 July	18	0	1	0	1
	Bor South	1–4 August	30	0	1	0	0
Post-harvest	Bor South	23–30 September	65	0	0	0	1
Upper Nile							
Post-planting	Renk, Melut	20–27 October	30	0	2	0	0
	Maban	24–29 October	0	0	2	10	1
Post-harvest	Renk, Melut	2–8 December	43	20	3	17	0
Unity							
Post-harvest	Rubkona, Guit	22–29 September	80	0	0	0	2
Lakes							
Post-planting	Rumbek Centre, Cueibet, Wulu	19–28 July	118	0	3	0	0
Post-harvest	Rumbek Centre, Cueibet, Wulu, Yirol West	19–28 October	59	43	4	40	0
TOTAL	36		3 933	1 114	132	92	56

Source: FAO South Sudan, 2021.

ANNEX 5

Table A5: South Sudan - Number of established County Crop Monitoring Committees (CCMCs), up to December 2021

State	December 2021	Remarks
Central Equatoria	8	
Eastern Equatoria	10	Including Pageri
Jonglei	3	
Lakes	7	
Northern Bahr-el-Ghazal	5	
Unity	4	
Upper Nile	4	
Warrap	11	Including Abyei Administrative Area
Western Bahr-el-Ghazal	3	
Western Equatoria	9	
Total	64	

Source: FAO South Sudan, 2021.



NOTES

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