Comprehensive Food Security and Vulnerability Assessment (CFSVA) - Sudan

Summary Report, Q1 2023

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Contents

Introduction

The Comprehensive Food Security and Vulnerability Assessment (CFSVA) was conducted from January to March 2023 against the backdrop of ongoing economic hardships and political fragility but **prior** to the eruption of armed conflict that began on the 15th of April 2023. The assessment was conducted in all 18 states of Sudan and sought to ascertain the food security situation among the resident population, assess risk factors that contribute to food insecurity, and highlight vulnerable geographical areas. This information on food insecurity and vulnerability enables well-informed decision-making processes for WFP programme design and targeting purposes, and provides evidence for the implementation and expansion of assistance programs. The CFSVA constitutes an important part of WFP Sudan's extensive data repository, and remains a major data source for the Integrated Food Security Phase Classification (IPC)[1]; the Sudan Humanitarian Needs Overview (HNO); and the Sudan Humanitarian Response Plan (HRP).

During this food security assessment, data was collected from approximately 37,800 resident households in 183 localities located across all 18 states of Sudan. The findings are representative of households at the locality level. The questionnaire surveyed households on demographics, housing, assets, livelihoods, expenditures, food source and consumption, and food and livelihood-based coping strategies. Additional information was collected on child health, feeding and caring practices, as well as awareness of nutrition-related messages.

Executive Summary

Food insecurity in Sudan continues to remain at unprecedented levels. Although the 2022/23 agricultural season was successful,[2] which unfolded into a fall in staple food prices between November 2022 and February 2023 and an improvement in household's purchasing power, the combined effects of macroeconomic crisis, political fragility, intercommunal conflict and displacement, and climate shocks, including droughts and floods, have significantly affected peoples' access to food in Sudan. According to this assessment, **34 percent of the population in Sudan, amounting to over 16.2 million people,[3] are food insecure during the first quarter of 2023**. Food insecurity therefore remains at the same level as during the first quarter of 2022, but higher by 7 percent compared to the same time in 2021. The highest prevalence of food insecurity was observed in West Darfur (56 percent); West Kordofan (56 percent); Blue Nile (50 percent); Red Sea (49 percent); and North Darfur (47 percent). Food insecurity worsened or remained at the same level across nine states, while nine states experienced an improvement in the level of food security. Households headed by women are more food insecure than their counterparts by 10 percent, primarily due to entrenched socio-cultural norms which limits access to the labour market.

Economic vulnerability continues to play a major role in the high level of food insecurity. Even though food expenditure share decreased, with 85 percent of households spending more than 65 percent of their total expenditure on food compared to 95 percent one year ago, this has been at the expense of household's food intake, with the prevalence of inadequate food consumption increasing from 22

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[1] CFSVA figures are different from IPC figures due to different methodologies of assessing food security, in which the former covers more diverse indicators in order to profile food insecure and vulnerable households and identify root causes of hunger. This information is used for WFP programme decision-making purposes.

[2] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan

[3] Estimated total population in Sudan is 47.9 million.

to 28 percent. Food expenditure share nevertheless remains high, and even though this disproportionate amount of expenditure on food prevented a further widening of the food gap in the short run, it has placed additional risk factors to an already precarious economic situation, exposing households to future protection risks, food insecurity and degradation of their overall well-being. This is evidenced in that 57 percent adopted negative livelihood-based coping strategies, in which households are compelled to focus on their immediate food needs while depleting their assets. Households were forced to cut on their health and education expenditures and were unable to create or invest in livelihood assets. 38 percent adopted negative food-based coping mechanisms to cope with a shortfall of food, forcing households to compromise on the quality and quantity of their food intake, with the most common strategy being to rely on less preferred or less expensive food, which 32 percent resorted to.

Following the eruption of armed conflict on the 15th of April 2023 between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF), **the food security situation has dramatically deteriorated**. The escalation in violence has triggered large-scale displacement of local populations, and caused severe damage to critical infrastructure nationwide, as well as the breakdown of economic activities, cessation of trade, and erosion of livelihoods in certain areas. Food access on both the supply side and the demand side is adversely impacted due to disrupted supply chains and dysfunctional markets, prompting food prices to soar beyond the capacity of most households. Damaged value chains risk farmers being unable to secure or afford essential agricultural inputs, including fuel and fertilizer, which will jeopardize the upcoming planting season, as farmers will be forced to plant less, adopt cash-crop production, or assume alternative livelihood activities, leading to reduced yields and thereby impacting food availability during the next harvest. Moreover, vanquished domestic demand and exports will deprive Sudan of foreign currency needed to import fuel, wheat, medicine and food. Given these circumstances, all four dimensions pertinent to food security – food availability, food access, utilization and stability – are currently endangered.

Heading into the lean season, when food security normally worsens as household's food stocks are depleted and livelihood opportunities are more limited, this has grave implications on the already high levels of food insecurity. Preliminary forecasts indicate that food insecurity may rise to 39 percent of the population, amounting to 19.1 million people, in the next three to six months if the conflict continues.[4] Expected to be hit the hardest are those experiencing fighting, the urban and semi-urban populations that have high market reliance for their food purchase, such as Khartoum, and states hosting large numbers of internally displaced peoples which is putting pressure on local food stocks and resources, such as West Darfur, White Nile, River Nile and Northern, as well as states with a high level of food insecurity, including West Kordofan, Blue Nile, Red Sea, and North Darfur. While routes to and from production areas in Gadarif, Al Gazira, Blue Nile, Sinnar, and White Nile remain open, the looming rainy season, which frequently induces localized floods, will impede access to certain areas, thereby compromising food security in those states.

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[4] This is based on a WFP projection from May 2023, which used 2023 CFSVA data as a baseline and factored in projected figures for the local food basket cost to forecast food security levels in the third quarter of 2023.

Context

Food insecurity is a complex phenomenon, an ever-changing sum of many moving parts, including macroeconomic trends, conflict, displacement, climate change and agricultural production. The food security status of any household is determined by the interaction of socioeconomic, agri-environmental and biological factors,[5] the first two are considered below.

Socioeconomic context

Prior to the outbreak of clashes, the socioeconomic context in Sudan was precarious, with the country facing a protracted macroeconomic crisis, which began in 2017, marked by recession, high inflation;[6] depreciation of the Sudanese currency;[7] a substantial trade deficit;[8] smuggling of resources; rising food prices; and weak enabling systems in regards to institutions, policies and civil services. Political instability and social unrest following the military coup in October 2021 further damaged the economy, as did the ensuing suspension of international financial assistance and curtailed investment due to loss of traditional markets. Amid a proliferation of weapons, localized intercommunal violence, including in Blue Nile[9] and West Kordofan,[10] as well as clashes between herders and farmers, have triggered displacement, destroyed food stocks, damaged farms and eroded livelihoods. Outbreak of dengue fever in June 2022, which spread to 82 localities across 12 states, placed additional strain on the fragile health system. Climate shocks, including localized droughts and floods, also affected peoples' livelihood activities in certain areas of Sudan.

Following the eruption of armed clashes on the 15th of April between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF) in multiple cities across Sudan, the socioeconomic conditions in Sudan has dramatically worsened. The escalation in violence has triggered large-scale displacement of local populations, with millions displaced across all 18 states of Sudan as of mid- June 2023, and hundreds of thousands crossing into neighbouring countries, primarily Egypt, Chad, South Sudan and Ethiopia. Multiple ceasefires have been agreed and broken. The conflict has caused severe damage to critical infrastructure nationwide, as well as destruction of many household's assets, and access to food, water, cash, fuel, healthcare and other basic services has been fractured. According to the revised Humanitarian Response Plan (HRP) for 2023, 24.7 million people require humanitarian assistance, an increase of 57 percent compared to the pre-crisis HRP figure. 19.1 million people are in need of food and livelihood assistance. However, high insecurity marked by urban warfare; amplified mobilization along ethnic lines; surging criminality exploiting the vacuum of law enforcement; looting of humanitarian assets and offices; presence of unexploded ordnances and explosive remnants of war; and restrictions in movement; is compromising humanitarian access to key locations.

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[5] Technical Guidance of WFP: Consolidated Approach for Reporting Indicators of Food Security (Third Edition, December 2021)

[6] No inflation figures have been released by the Central Bank of Sudan since February 2023, in which inflation reached 63.3 percent, a decrease of 85 percent compared to the peak level in July when inflation reach 421.28 percent. Inflation is anticipated to revert to three-digits as prices in nearly all nonfunctional or imperfectly functioning markets have gone up by three-five times.

[7] Between April 2022 and April 2023, the Sudanese pound was generally stable. Since the beginning of the conflict, there has been a slight appreciation of the Sudanese pound against the dollar (in the range of 3-5% with commercial banks offering better rates), which is due to the collapse of the demand for foreign currency as imports to the country have mostly been interrupted. Nominal exchange rate depreciation is likely to follow in the coming months, based on the deteriorating economic prospects of the country.

[8] The Central Bank of Sudan stated in its annual report for 2022 that the trade balance deficit has risen to 6.7 billion USD in 10 years; in 2022, the country's imports rose to 1,2 billion while exports amounted to 4,4 billion USD.

[9] In Blue Nile, on 13 July 2022, intercommunal violence erupted in several villages in Wad Al Mahi locality and spread into Ar Rusayris locality, resulting in the displacement of 128,000 people, the loss of 359 people and the injury of 469 people (IOM, Update No. 09).

[10] In West Kordofan, intercommunal conflict led to the displacement of 85,400 people in six localities (OCHA West Kordofan State profile).

Razed and looted markets, broken transport networks and supply chains, destruction of food manufacturing sites,[11] and dysfunctional markets due to limited restocking capacity has strained food availability. Access to Khartoum, the key transit point for imported food and fuel and the center of the country's supply routes is constrained. Combined, this has caused prices of staple food, particularly processed and imported food, to soar beyond the capacity of most households. WFP's price monitoring indicates that the price of the local food basket (LFB[12]) reached 526 SDG in May 2023, an increase of 20 percent compared to March 2023.[13] Moreover, the breakdown in the banking system has caused a liquidity crisis, with the shortage of credit preventing traders from procuring new stocks once local stocks are exhausted. Prior to the conflict, 30 percent were unable to afford one WFP local food basket, and this may increase to over 36 percent if the conflict persists and food prices, coupled with severe cash unavailability, continue to increase. As food access on both the supply side and the demand side is defective, the above circumstances endanger all four dimensions pertinent to food security – food availability, food access, utilization and stability.

Agricultural context

According to the Crop and Food Supply Assessment Mission (CFSAM), the performance of the agricultural season for 2022/23 was good in the irrigated, semi-mechanized and traditional rainfed sectors. Total production of main cereal crops (sorghum,[14] millet[15] and wheat[16]) in 2022/23 is estimated to be 7.4 million metric tons, which is 45 percent above last year's production and 13 percent above the five-year average. Following the poor performance of the previous agricultural season in 2021/22, this is in line with agricultural production trends in Sudan which largely follows a zigzag movement, with one good year followed by one poor year. The significant increase in total cereal production is due to favorable weather conditions, characterized by above-average precipitation and even temporal distribution, which boosted yields, and limited damage by pests and diseases. The availability of agricultural inputs, such as seeds, fuel, fertilizer, herbicides, agricultural machineries and labour, improved compared to the previous year, although their costs have continued to increase, leading to high production costs.

Wheat production, which was harvested in March, is hampered due to reduced plantings, as farmers shifted to plant legumes and spices. The fact that an estimated 200,000 metric tons of wheat laid to waste last year after not being procured by the Government due to budgetary constraints also discouraged wheat production this year. Moreover, locally produced wheat is not competitive with imported wheat due to high domestic production costs. Consequently, the cereal import requirements for 2023 (January-December) is forecast at 3.6 million metric tons, which consists almost entirely of wheat. This will primarily be covered by commercial imports. Disruptions to international trade caused by the conflict in Ukraine may have a detrimental impact on the ability to import wheat.

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[11] Over 400 establishments operating in the food industry in Khartoum have become inoperable due to looting and vandalism of machineries, raw materials, and production stocks (BNN: https://bnn.network/conflict-defence/liquidity-crisis-hits-sudanese-population-amid-ongoing-fighting-in-khartoum/).

[12] See Annex 3 for information on the composition of WFP's local food basket.

[13] Due to the prevailing security situation in Sudan, the LFB for May 2023 is based on average prices collected from markets in five states (Kassala, Red Sea, Blue Nile, White Nile and North Darfur).

[14] Sorghum production is estimated at 5.2 million metric tons, 50 percent higher than the previous year and 20 percent above five-year average.

[15] Millet production is estimated at 1.7 million metric tons, 86 percent higher than the previous year and 12 percent above the five-year average.

[16] Wheat production is forecast at 476 thousand metric tons, 30 percent lower than both last year's output and the five-year average.

In contrast, surpluses of sorghum (484 000 tons) and millet (679 000 tons) are forecast, which will increase private stocks at both the household and traders' level.

Despite the above-average harvest, considered globally, yields in Sudan are generally low in the irrigated, semi-mechanized and traditional rainfed sectors. This is primarily due to erratic rainfall; inadequate maintenance of irrigation canals; inefficient irrigation pumps; lack of effective and well-maintained farm machinery; the use of low-yielding crop varieties; scarce availability of improved seeds, fertilizers and chemicals; and poor agricultural practices, such as inadequate weed and pest control.[17] Shortages of credit and working capital is also an obstacle; the number of beneficiaries receiving short-term agricultural credit from the Agricultural Bank of Sudan decreased by 35 percent, from 34,032 in 2021 to 22,000 in 2022, primarily due to the high inflation. The absence of regulatory policies in the agricultural sector and markets has resulted in uncertainty among farmers and traders, leading to instability in crop production patterns.
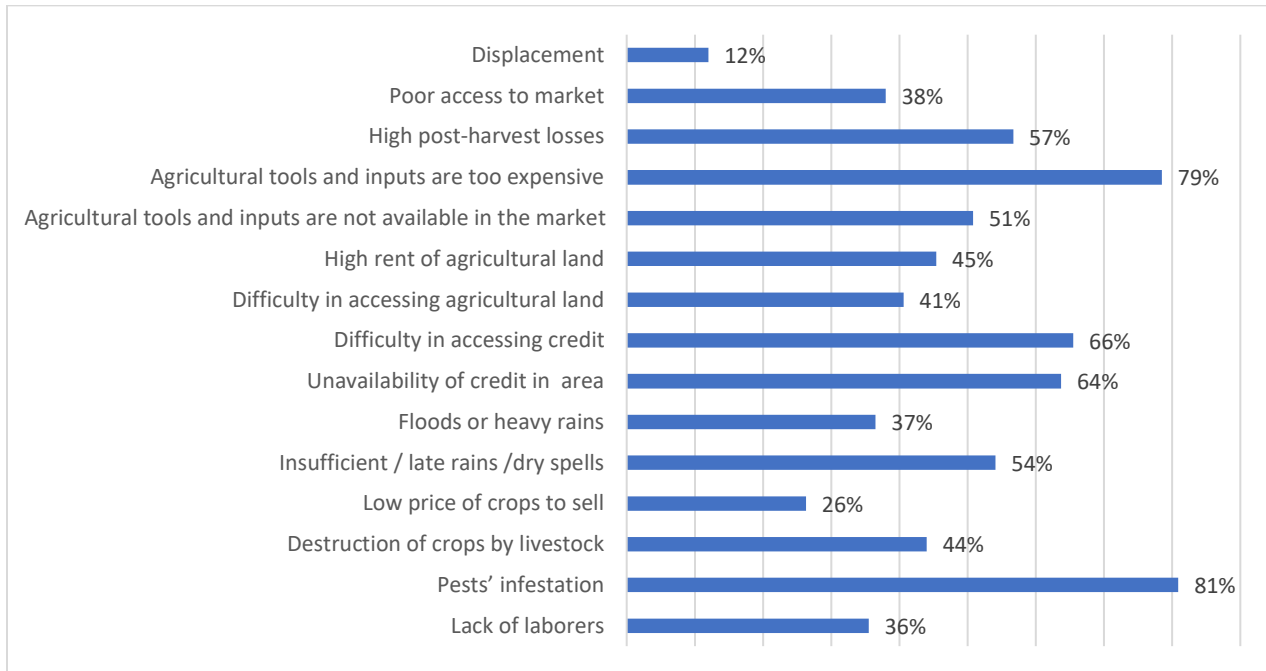
The ongoing conflict occurring in agricultural zones, such as in the Darfurs and the Kordofans, is threatening the upcoming planting season. Furthermore, damaged supply chains and routes, particularly in and around Khartoum, the main feeder market in the country, risks farmers being unable to secure critical agricultural inputs. The current liquidity crisis is preventing farmers from accessing revenues from their harvest. Unavailability or high prices of fertilizer, fuel and other inputs will negatively impact the upcoming planting season, as farmers will be unable to access or afford these crucial agricultural inputs, thereby opting to plant less, adopt cash-crop production, or assume alternative livelihood activities, leading to lower yields and thereby impacting food availability. High production costs will also unfold into high food prices during the harvest.

According to the CFSVA, 57 percent reported that they were a farmer, 92 percent of which cultivated this past season. 62 percent reported that they cultivated from their own land, 30 percent from rented land and 8 percent from sharecropping.[18] Sorghum was the main cereal cultivated (49 percent), followed by millet (36 percent). 75 percent disclosed that they noticed substantial changes in rainfall patterns between this season and the last five seasons, while 65 percent reported that they have changed their sowing dates/cultivation dates because of changes or variations in rainfall. The biggest constraints that farmers faced are pests' infestation (81 percent); too expensive agricultural tools and inputs (79 percent); and difficulty in accessing credit (66 percent). The latter two will continue to constrain farming activities amid the ongoing conflict.

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[17] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[18] Sharecropping is a system where the landlord/planter allows a tenant to use the land in exchange for a share of the crop.

Figure 1: Constraints reported by farmers

Constraint	Percentage
Displacement	12%
Poor access to market	38%
High post-harvest losses	57%
Agricultural tools and inputs are too expensive	79%
Agricultural tools and inputs are not available in the market	51%
High rent of agricultural land	45%
Difficulty in accessing agricultural land	41%
Difficulty in accessing credit	66%
Unavailability of credit in area	64%
Floods or heavy rains	37%
Insufficient / late rains /dry spells	54%
Low price of crops to sell	26%
Destruction of crops by livestock	44%
Pests' infestation	81%
Lack of laborers	36%

Food Security (CARI)

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food, which meets their dietary requirements and food preferences for an active and healthy life.[19] There are four interrelated dimensions pertinent to food security: food availability, food access, utilization, and stability.

Food availability addresses the supply side of food security and is determined by the level of food production, stock levels and net trade, as well as food aid. Food access refers to households having adequate resources to acquire appropriate food for a nutritious diet, and is determined by income, expenditure, market conditions, and prices. Utilization considers sufficient energy and nutrient intake by individuals as the result of proper care and feeding practices, food preparation, dietary diversity, and intra-household distribution of food. Stability pertains to household's stable access to food at all times, and considers the impact of climate and weather, socio-political conditions, and economic circumstances (e.g. unemployment, inflation) that may impact food security at a certain time. Taken together, these components encapsulate the food security situation of a household.[20]

Food insecurity is determined by the WFP corporate indicator, Consolidated Approach to Reporting Indicators of Food Security (CARI). The CARI assesses availability and access to food by measuring the current status of household consumption. It also evaluates the ability of a household to stabilize consumption over time by measuring coping capacity and economic vulnerability. As such, CARI combines a suite of food security indicators, including food consumption, food expenditure share, and food and livelihood-based coping strategies, into a summary composite indicator. Central to the approach is an explicit classification of households into four descriptive groups: food secure,

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[19] FAO (1996) 1996 World Food Summit – Final Report. Available at: https://www.fao.org/3/w3548e/w3548e00.htm
[20] Technical Guidance of WFP: Consolidated Approach for Reporting Indicators of Food Security (Third Edition, December 2021)

marginally food secure, moderately food insecure, and severely food insecure. These classifications provide a representative estimate of food security within the Sudanese population at the national, state and locality level.

According to the CARI console, **34 percent of resident households are classified as food insecure during the first quarter of 2023**, which amounts to over 16.2 million people. This is the same level one year ago, but an increase of 7 percent compared to the same time in 2021, and higher than the past few years (see Figure 1).

Figure 2: Prevalence of food insecurity in Sudan between 2019 and 2023
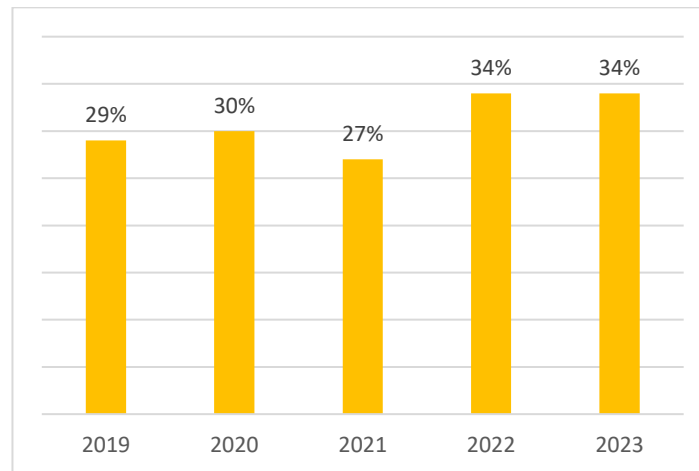
Among the food insecure, 28 percent of households are moderately food insecure and 6 percent are severely food insecure. Households that are moderately food insecure have food consumption gaps and are unable to meet required food needs without applying crisis coping strategies. Households that are severely food insecure have extreme food consumption gaps or have suffered extreme loss of livelihood assets that will eventually lead to food consumption gaps.

Figure 3: Food security classification according to CARI console by state
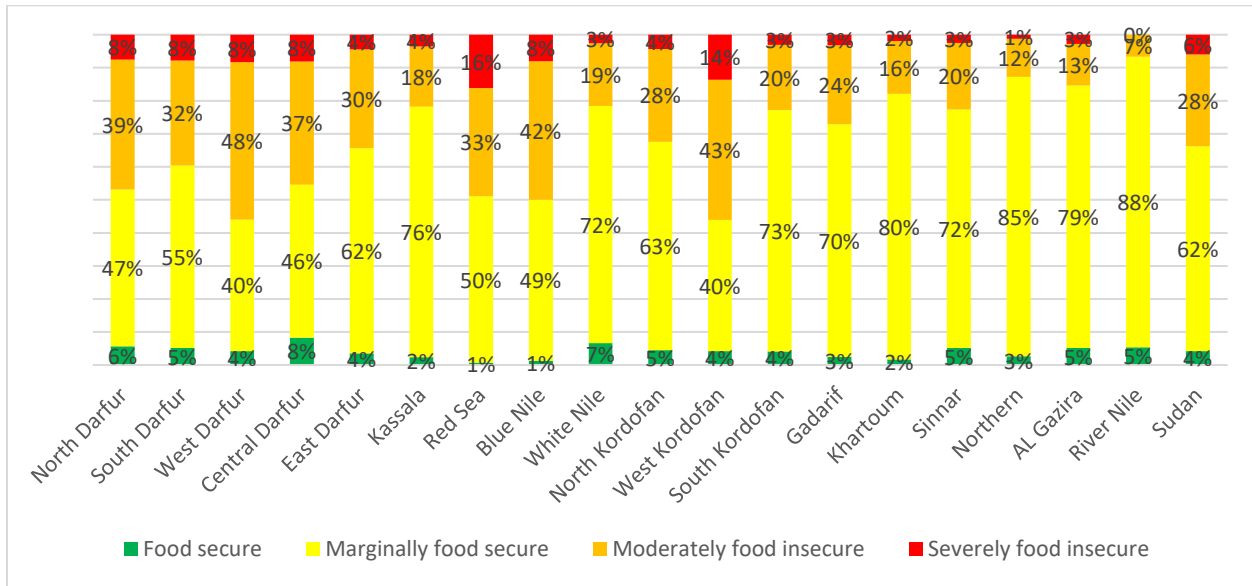
On the state level, the highest prevalence of food insecurity was observed in the Darfurs, the Kordofans, and the eastern part of Sudan. West Kordofan and West Darfur had the highest level of food insecurity at 56 percent respectively, followed by Blue Nile at 50 percent, Red Sea at 49 percent, North Darfur at 47 percent, and Central Darfur at 45 percent. River Nile had the lowest prevalence of food insecurity at 7 percent, ahead of Northern at 13 percent and Al Gazira at 15 percent. It is key to highlight the geographic difference in the structural nature of food insecurity; chronic food insecurity persists in the eastern parts of Sudan, particularly Red Sea state, while acute food insecurity prevails in the Darfurs and Kordofans.

Figure 4: Prevalence of food insecurity in Q1 2023 by state
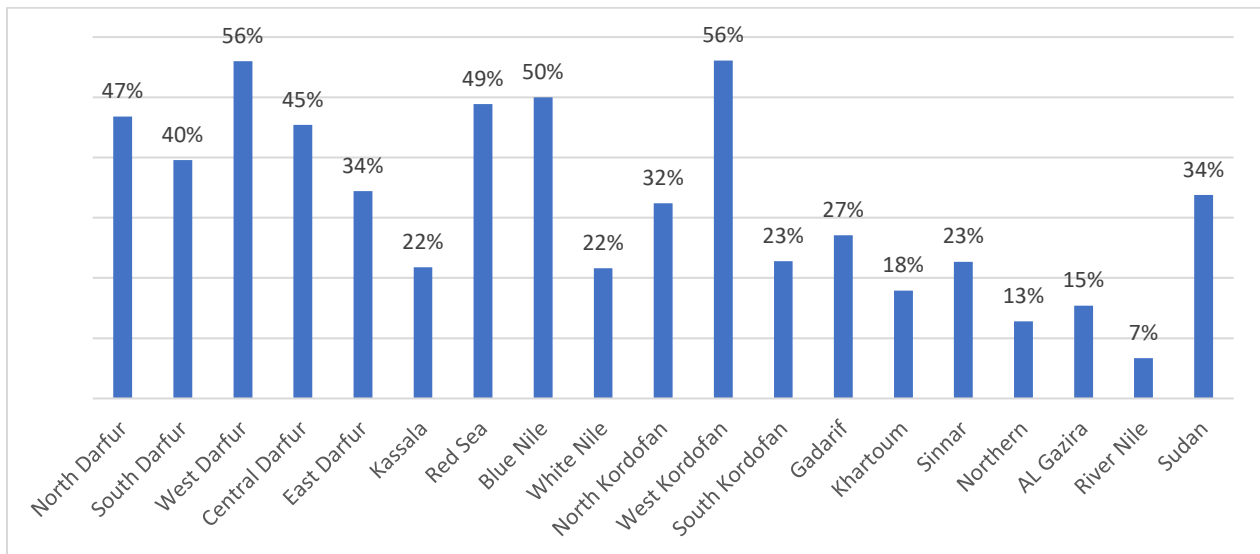
Comprehensive Food Security and Vulnerability Assessment (CFSVA) Q1, 2023

% Food insecure

No data | <15% | 15% - 30% | 30% - 45% | > 45%

International Boundaries · State Boundaries · Locality Boundaries · Red Sea · River
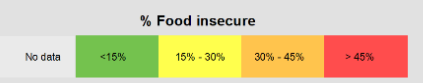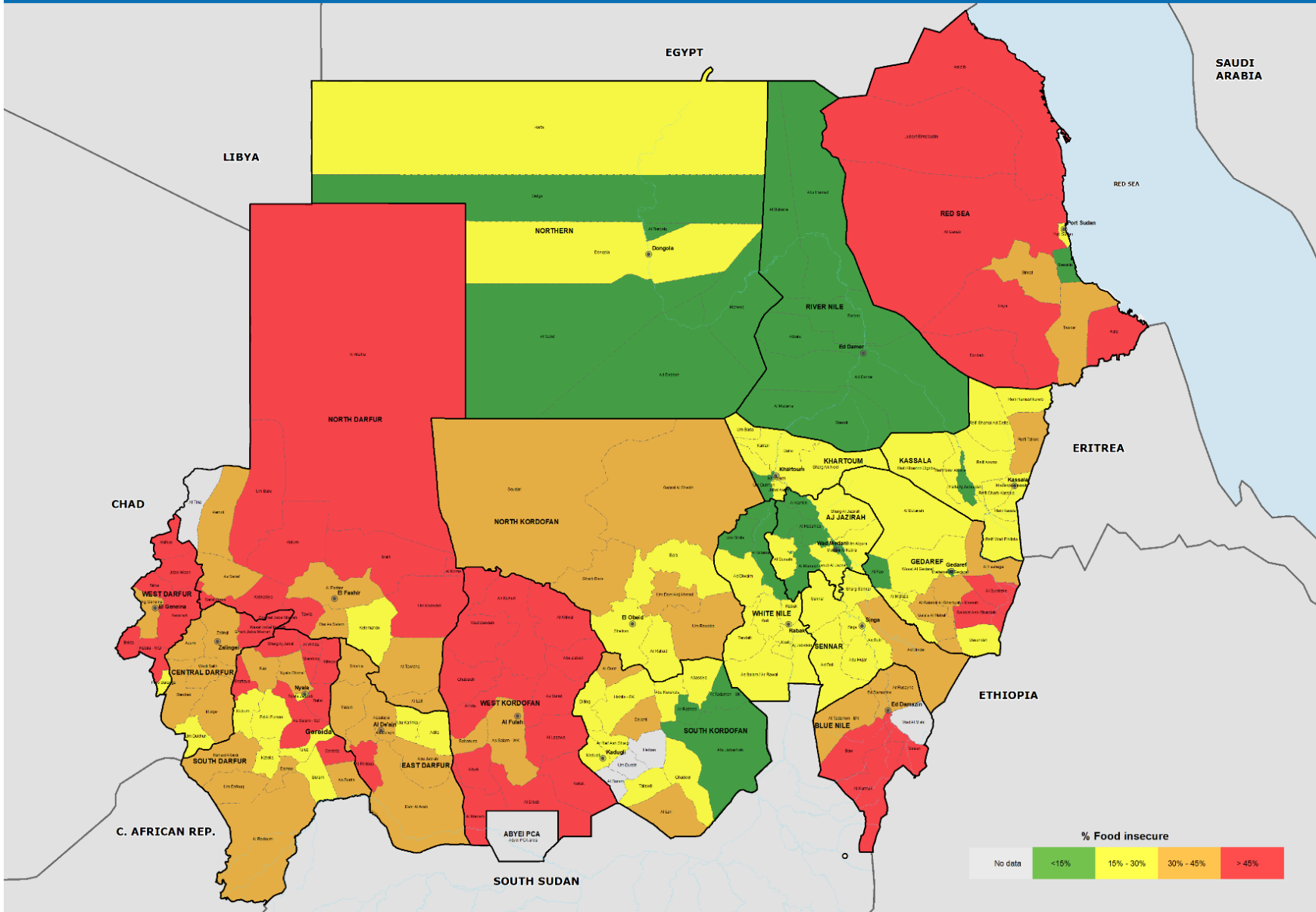
North Darfur: The level of food insecurity in North Darfur decreased by 9 percent, from 56 percent in 2022 to 47 percent in 2023. The prevalence of severe food insecurity also decreased from 14 to 8 percent. The localities with the highest prevalence of food insecurity were Kuma (70 percent); Kebkabiya (60 percent); and Tawila (60 percent). Kuma is the locality with the highest level of severe food insecurity at 24 percent. Although North Darfur, with a semi-desert climate and a geological system that is unfavourable for groundwater storage, is prone to droughts and low rainfall, agricultural production improved compared to the previous season, which nourished the reduction in food insecurity. Sorghum production in the traditional rainfed sector was 600 percent above the production level in the 2021/22 season (42,000 tons compared to 6,000 tons), but was 19 percent below the five-year average (51,700 tons).[21] The reliance on crops as main income source thus increased (from 18 percent to 39 percent), as did agricultural wage-labour (from 11 to 20 percent). The prevalence of food-based coping strategies decreased by 12 percent (from 45 to 33 percent) and livelihood-based coping strategies by 6 percent (from 72 to 66 percent), while the prevalence of inadequate food consumption remained at the same level at 39 percent.

South Darfur: The level of food insecurity in South Darfur increased by 2 percent, from 38 percent in 2022 to 40 percent in 2023. The prevalence of severe food insecurity also increased from 7 to 8 percent. The localities with the highest prevalence of food insecurity are East Jabel Marra (80 percent); Bielel (72 percent); and El Wihda (55 percent). Bielel is the locality with the highest level of severe food insecurity at 30 percent. The marginal worsening in food insecurity is a result of the below-average harvest as well as water shortages, in part due to the collapse of the Um Dafug dam, which had a negative impact on both the livestock and fishery sectors. Sorghum production in the traditional rainfed sector in the 2022/23 season was 10 percent below the production level in the 2021/22 season (302,000 tons compared to 336,000 tons) and 21 percent below the five-year average (381,770 tons).[22] As a result, reliance on crops decreased (from 23 to 16 percent), and agricultural wage-labour (from 18 to 16 percent). The prevalence of food-based coping strategies increased by 1 percent (from 22 to 23 percent) and livelihood-based coping strategies by 3 percent (from 61 to 64 percent). Food intake worsened, with the prevalence of inadequate food consumption increasing by 7 percent (from 28 to 35 percent) compared to one year ago.

West Darfur: The level of food insecurity in West Darfur decreased by 9 percent from 65 percent in 2022 to 56 percent in 2023. Despite this decrease, West Darfur is, together with West Kordofan, the state with the highest level of food insecurity in Sudan. The prevalence of severe food insecurity also decreased from 15 to 8 percent. The localities with the highest prevalence of food insecurity are Kerenik (85 percent); Sirba (83 percent); and Jebel Moon (68 percent). Kerenik also has the highest prevalence of severe food insecurity at 19 percent. The harvest in West Darfur improved substantially compared to the previous season, with sorghum production in the traditional rainfed sector in the 2022/23 season 111 percent above the 2021/22 season (186,000 tons compared to 88,000 tons) and only 3 percent below the five-year average (186,000 tons compared to 191,740 tons).[23] The successful harvest improved the food security situation, and also caused a shift in primary livelihood activities, with reliance on crops increasing (from 19 to 25 percent). The prevalence of food-based coping

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[21] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[22] i.b.
[23] i.b.

strategies increased by 4 percent (from 50 to 54 percent) but decreased for livelihood-based coping strategies by 5 percent (from 67 to 62 percent). Food intake also improved, with the prevalence of inadequate food consumption decreasing by 3 percent (from 62 to 59 percent) compared to one year ago. Given the ongoing conflict, in which West Darfur has been at the epicentre of the most severe level of conflict outside of Khartoum, the food security situation is rapidly deteriorating.

Central Darfur: The level of food insecurity in Central Darfur decreased by 13 percent, from 59 percent in 2022 to 45 percent in 2023. This was the largest improvement in food security nationwide. The prevalence of severe food insecurity also decreased from 14 to 8 percent. The localities with the highest prevalence of food insecurity are North Jabel Marra – Rokero (78 percent); Central Jabel Marra – Golo (72 percent); and West Jabel Marra (54 percent). North Jabel Marra also has the highest level of severe food insecurity at 22 percent. Despite localized river overflows and flash floods in early August, which damaged standing crops, successful replanting combined with favourable rainfall resulted in a fruitful harvest in Central Darfur. Sorghum production in the traditional rainfed sector in the 2022/23 season was 320 percent above the 2021/22 season (542,000 tons compared to 129,000 tons) and 210 percent above the five-year average (174,900 tons).[24] As a result of the good harvest, the food security situation improved. Reliance on crops increased (from 16 to 30 percent) and agricultural wage-labour (from 5 to 12 percent), while reliance on non-agriculture wage labour decreased (from 22 to 12 percent). The prevalence of food-based coping strategies decreased by 19 percent (from 59 to 40 percent) and livelihood-based coping strategies by 2 percent (from 67 to 65 percent). In addition, food intake improved, with the prevalence of inadequate food consumption decreasing by 5 percent (from 53 to 48 percent) compared to one year ago.

East Darfur: The level of food insecurity in East Darfur remained at the same level (34 percent) in 2023 compared to 2022. The prevalence of severe food insecurity decreased from 6 to 4 percent. The localities with the highest prevalence of food insecurity are El Firdos (48 percent); and Yassien and Bahar El Arab (38 percent respectively). Bahar El Arab also has the highest level of severe food insecurity at 7 percent. The harvest in East Darfur improved compared to the previous season, with sorghum production in the traditional rainfed sector in the 2022/23 season 82 percent above the previous season (324,000 tons compared to 178,400 tons) and 37 percent above the five-year average (236,240 tons).[25] Even though purchasing power improved, with 53 percent unable to afford one local food basket compared to 69 percent one year ago, the prevalence of food-based coping strategies increased by 8 percent (from 38 to 46 percent), while the prevalence of livelihood-based coping strategies increased by 6 percent (from 61 to 67 percent). Food intake also worsened, with the prevalence of inadequate food consumption increasing by 5 percent (from 21 to 26 percent) compared to one year ago. Inter-tribal conflict, protracted displacement, and land use and ownership tensions among nomads, herders and farmers, continue to foster the high level of food insecurity.

Kassala: The level of food insecurity in Kassala increased by 5 percent, from 17 percent in 2022 to 22 percent in 2023. The prevalence of severe food insecurity also increased from 1 to 4 percent. The localities with the highest levels of food insecurity are Telkok (40 percent); Hamshkoreeb (28 percent); and North Delta (26 percent). 7 percent in Telkok are severely food insecure. The northern parts of Kassala bordering Red Sea state are considered chronically food insecure. Kassala is vulnerable to

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[24] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[25] i.b.

recurrent droughts, floods as well as tribal conflicts, and hosts the third largest refugee population at over 116,000 refugees. The state is also a route for smuggling, human trafficking and migrant movement from Ethiopia and Eritrea. [26] Agricultural production in the state was mixed. Sorghum production in the semi-mechanized sector in the 2022/23 season was 87 percent above the five-year average (294,000 tons compared to 157,070 tons). The sorghum harvest in the traditional rain-fed sector was 181 percent above the previous 2021/22 season (76,000 tons compared to 27,000 tons) and 121 percent above the five-year average (34,380 tons).[27] However, this was offset by poor production in the New Halfa Scheme, located in Kassala State, which many households rely on. Heavy rains and flash floods in August resulted in waterlogging, with the areas affected representing 12 percent of the area cultivated. In addition, critical issues related to the maintenance of irrigation infrastructures and infestation of water hyacinth were reported, which combined resulted in a 48 percent decrease of sorghum production compared to the five-year average (24,000 tons compared to 46,080 tons). This contributed to the worsening food insecurity in Kassala. The prevalence of food-based coping strategies increased by 4 percent (from 46 to 50 percent), but for livelihood-based coping strategies decreased by 2 percent (from 46 to 44 percent). Food intake also worsened, with the prevalence of inadequate food consumption increasing by 8 percent (from 7 to 15 percent) compared to one year ago.

Red Sea: The level of food insecurity in Red Sea state increased by 31 percent, from 18 percent in 2022 to 49 percent in 2023. The prevalence of severe food insecurity also increased from 2 to 16 percent. The localities with the highest levels of food insecurity are Halaib (81 percent); Dourdieb (69 percent); and Gabit-Elmadien (30 percent). Halaib is the locality with the highest level of severe food insecurity in all of Sudan at 51 percent. While agricultural production in Red Sea is not extensive, with only 3 percent relying on agricultural wage labour as their primary income source, sorghum production in the traditional rainfed sector improved significantly in the 2022/23 season, with a total production of 32,000 tons, which is 520 percent above the five-year average (5,160 tons).[28] The prevalence of food-based coping strategies increased by 33 percent (from 20 to 53 percent) and livelihood-based coping strategies by 22 percent (from 36 to 58 percent). Food intake also worsened, with the prevalence of inadequate food consumption increasing by 26 percent (from 7 to 33 percent) compared to one year ago. Red Sea state is considered chronically food insecure and food intake is chronically poor due to cultural eating practises, resulting in pervasive micronutrient deficiencies and high malnutrition rates. Improvements were made in how data was collected in Red Sea for this round, such as sampling households that live further away from main roads and clarification on the questions related to food consumption. Therefore, it is likely that this year's assessment better captured the food security situation compared to the previous year's assessment.

Blue Nile: The level of food insecurity in Blue Nile state remained at the same level (50 percent) in 2023 compared to 2022. The prevalence of severe food insecurity decreased marginally from 9 to 8 percent. The localities with the highest level of food insecurity are Geissan (68 percent); Bau (59 percent); and Kurmuk (51 percent). Geissan also has the highest level of severe food insecurity at 16 percent. Sorghum production in the semi-mechanized sector in the 2022/23 season was 97 percent above the five-year average (413,100 tons compared to 209,400 tons), and in the traditional rainfed

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[26] OCHA: Kassala State Profile March 2023
[27] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[28] i.b.

sector, which many people rely on, was 285 percent above the five-year average (162,000 tons compared 42,060 tons).[29] The reliance of crops thus increased from 12 to 16 percent. The implications of the successful harvest was offset by intercommunal violence that erupted in several villages in Wad Al Mahi locality and spread into Ar Rusayris locality between 14 and 16 July 2022. 128,000 people were displaced from Geissan, Ar Rusayris, Wad Al Mahi and Ed Damazine localities within Blue Nile and to neighbouring states. Despite an agreement of a cessation of hostilities in early August, clashes renewed in Ar Rusayris and Wad Al Mahi in early September and mid-October. Consequently, the prevalence of negative food-based coping strategies increased by 19 percent (from 42 to 61 percent), while the prevalence of livelihood-based coping strategies increased by 7 percent (from 56 to 63 percent). On the other hand, food intake improved, with the prevalence of inadequate food consumption decreasing by 7 percent (from 42 to 35 percent) compared to one year ago.

White Nile: The level of food insecurity in White Nile state decreased marginally by 1 percent, from 23 percent in 2022 to 22 percent in 2023. The prevalence of severe food insecurity remained at the same level (3 percent). The three localities with the highest level of food insecurity are El Jableen, Guli and El Salam (all at 27 percent respectively). El Salam also has the highest level of severe food insecurity at 5 percent. The state hosts approximately 287,000 South Sudanese refugees,[30] the largest of any state, who are frequently employed as labour. White Nile experienced a good harvest, with sorghum production in the traditional rainfed sector in the 2022/23 season 363 percent above the previous 2021/22 season (104,200 tons compared to 22,500 tons) and 74 percent above the five-year average (59,950 tons).[31] In the semi-mechanized sector, sorghum production was 68 percent above the five-year average (305,300 tons compared to 181,710 tons). Accordingly, reliance on crop as primary income source increased from 15 to 21 percent. The successful harvest was somewhat offset by the influx of IDPs from Blue Nile State following conflict there in 2022. In addition, while access between key markets within the state and to other states is good, formal and informal exports of sorghum and sesame to South Sudan is rampant, impacting food access and availability. The prevalence of food-based coping strategies decreased marginally by 2 percent (from 45 to 43 percent) and livelihood-based coping strategies by 2 percent (from 44 to 42 percent). However, the prevalence of inadequate food intake increased (from 11 to 14 percent) compared to one year ago.

North Kordofan: The level of food insecurity in North Kordofan increased marginally by 2 percent, from 30 percent in 2022 to 32 percent in 2023. The prevalence of severe food insecurity increased from 2 to 4 percent. The localities with the highest level of food insecurity are Sodari (44 percent); Om Rwaba (39 percent); and West Bara (36 percent). 7 percent in Sodari and West Bara respectively are severely food insecure. Even though North Kordofan is a drought-prone state, with generally infertile soils and low crop production, the state experienced a good harvest with sorghum production in the traditional rainfed sector in the 2022/23 season 822 percent above the previous 2021/22 season (234,100 tons compared to 25,400 tons) and 162 percent above the five-year average (89,480 tons).[32] The reliance of crops as main income source thus increased from 29 percent in 2022 to 33 percent in 2023. Despite the positive harvest, North Kordofan was particularly affected by the outbreak of dengue fever, with 22 percent of all suspected cases and 37 percent of all deaths reported in the

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[29] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[30] OCHA: White Nile State Profile (March 2023)
[31] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[32] i.b.

state.[33] The prevalence of food-based coping strategies increased by 16 percent (from 23 to 39 percent) and livelihood-based coping strategies by 9 percent (from 49 to 57 percent). The prevalence of inadequate food intake increased from 14 to 28 percent.

West Kordofan: The level of food insecurity in West Kordofan increased by 14 percent, from 43 percent in 2022 to 56 percent in 2022. This is the second largest increase in food insecurity of all states compared to the previous round, and a stark increase compared to 2021 when 21 percent were food insecure. West Kordofan is, together with West Darfur, the state with the highest level of food insecurity. The prevalence of severe food insecurity increased from 8 to 14 percent. The localities with the highest level of food insecurity are Al Dibub (73 percent); Lagawa (68 percent); and Al Nuhod (65 percent). Al Dibub also has the highest level of severe food insecurity at 30 percent. West Kordofan has suffered from being on the front-line of ethnic and communal warfare, which has resulted in significant losses of livestock through theft and raiding, as well as destruction of livelihoods. Intercommunal conflict In June 2022 between the Misseriya and Hamar tribes led to the displacement of 20,000 people in six localities in the state. In October 2022, intercommunal tensions in Lagawa locality led to the displacement of 65,400 people within the state and into neighbouring South Kordofan. These inter-tribal conflicts occurred during cultivation and crop harvest which caused vast crop destruction. Although sorghum production in the traditional rainfed sector was 104 percent above the previous season (95,800 tons compared to 47,000 tons) and 9 percent above the five-year average (87,840 tons), in the semi-mechanized sector, production in the 2022/23 season was 28 percent below the five-year average (115,500 tons compared to 160,000 tons).[34] Combined, this resulted in that the prevalence of food-based coping strategies increased by 12 percent (from 29 to 41 percent) and livelihood-based coping strategies by 7 percent (from 57 to 64 percent). Food intake also worsened dramatically, with the prevalence of inadequate food consumption increasing by 30 percent (from 21 to 51 percent) compared to one year ago.

South Kordofan: The level of food insecurity in South Kordofan decreased by 7 percent, from 30 percent in 2022 to 23 percent in 2023. The prevalence of severe food insecurity decreased from 4 to 3 percent. The localities with the highest level of food insecurity are Dallami (36 percent); Al Liri (35 percent); and Elgoze (30 percent). Elgoze also has the highest level of severe food insecurity at 9 percent. Even though South Kordofan has been at the center of protracted civil conflict and land disputes, with 40,000 people displaced in three localities in 2022, agricultural production was generally good. Sorghum production in the traditional rain-fed sector in the 2022/23 season was 79 percent above the previous 2021/22 season (114,700 tons compared to 64,000 tons) and 43 percent above the five-year average (80,320 tons). In the semi-mechanized sector, however, sorghum production was 16 percent below the five-year average (151,200 tons compared to 179,000 tons).[35] Reliance on agricultural wage labour thus increased from 12 to 15 percent. The prevalence of food-based coping strategies increased by 4 percent (from 23 to 27 percent) and livelihood-based coping strategies by 10 percent (from 46 to 56 percent). Food intake improved, with the prevalence of inadequate food consumption decreasing by 4 percent (from 22 to 18 percent) compared to one year ago.

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[33] Republic of Sudan: Dengue Fever Sitrep – 28 July 2022-28 Feb 2023
[34] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[35] i.b.

Gadarif: The level of food insecurity in Gadarif increased by 5 percent, from 22 percent in 2022 to 27 percent in 2023. The prevalence of severe food insecurity increased from 2 to 3 percent. The localities with the highest level of food insecurity are East Galabat (49 percent); El Gerisha (48 percent); and El Fashga (41 percent). El Gerisha also has the highest level of severe food insecurity at 8 percent. Gadarif is characterized by vast agricultural land and large-scale rainfed agriculture activities. However, cumulative rains in 2022 were 9 percent lower than in 2021, and the temporal and spatial distribution of the rains was poor, especially during the second half of the season. In August, torrential rains triggered flash floods that resulted in localized crop losses and affected about 64,700 people in three localities. Subsequently, prolonged dry spells in September, especially in central parts of the state, affected crops during the critical grain-filling stage and resulted in declines in yields. As such, the harvest in Gadarif was worse than previous years, with sorghum production in the semi-mechanized sector in the 2022/23 season 26 percent below the five-year average (567,000 tons compared to 762,350 tons).[36] Combined with localized disputes and border tensions along the Ethiopia-Sudan border, the prevalence of food-based coping strategies increased by 18 percent (from 15 to 33 percent) and livelihood-based coping strategies increased by 2 percent (from 49 to 51 percent). Food intake worsened, with the prevalence of inadequate food consumption increasing by 6 percent (from 15 to 22 percent) compared to one year ago.

Khartoum: The level of food insecurity in Khartoum state increased by 2 percent, from 16 percent in 2022 to 18 percent in 2023. The prevalence of severe food insecurity remained at the same level at 2 percent. The localities with the highest level of food insecurity are Jabel Awila and Um Bada (23 percent respectively); and Khartoum (18 percent). Jabel Awila also has the highest level of severe food insecurity at 4 percent. Khartoum is at the center of supply routes in Sudan. Even though agricultural activities is limited in Khartoum compared to other states, production in the 2022/23 season was 97 percent below the previous 2021/22 season (4,000 tons compared to 14,000 tons) and 98 percent below the five-year average (19,730 tons).[37] Even though the prevalence of food-based coping strategies decreased by 7 percent (from 42 to 35 percent), the prevalence of livelihood-based coping strategies increased by 1 percent (from 58 to 59 percent). Market reliance is high in the state making people vulnerable to prices increases. Given the ongoing urban warfare taking place in Khartoum as of June 2023, it is highly likely that food insecurity has exacerbated dramatically.

Sinnar: The level of food insecurity in Sinnar decreased by 13 percent, from 35 percent in 2022 to 23 percent in 2022. The prevalence of severe food insecurity decreased from 4 to 3 percent. The localities with the highest level of food insecurity are Dinder (30 percent); Abohugar (26 percent) and Sinja (25 percent). Aldali has the highest level of severe food insecurity at 5 percent. Sinnar, a high agricultural-production state, experienced a good harvest, particularly compared to the previous season. Sorghum production in the traditional rainfed sector in the 2022/23 season was 222 percent above the previous season (87,000 tons compared to 27,000 tons) and 4 percent above the five-year average (83,540 tons). The reliance on crops as main income source thus increased from 15 percent in 2022 to 24 percent in 2023. Furthermore, sorghum production in the semi-mechanized sector was 54 percent above the five-year average (429,500 tons compared to 278,610 tons).[38] Even though the prevalence of food-based coping strategies increased by 7 percent (from 37 to 44 percent), the prevalence of

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[36] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[37] i.b.
[38] i.b.

livelihood-based coping strategies remained at the same level (57 percent). Food intake improved, with the prevalence of inadequate food consumption decreasing by 6 percent (from 19 to 13 percent) compared to one year ago.

Northern: The level of food insecurity in Northern decreased by 5 percent, from 17 percent in 2022 to 13 percent in 2023. The prevalence of severe food insecurity also stayed at the same level at 1 percent. The localities with the highest level of food insecurity are Halfa and Dongola (17 percent respectively); and Dalgoo (13 percent). Halfa has the highest level of severe food insecurity at 3 percent. Northern is the largest state in Sudan and located in a desert zone characterized by low rainfall and sparse vegetation. Wheat production in the irrigated sector was 100 percent below the previous season (116,820 tons compared to 162,040 tons) and 26 below the five-year average (156,920 tons).[39] However, workers' migration to mining areas may have cushioned the impact of the poor harvest. The prevalence of food-based coping strategies decreased by 5 percent (from 26 to 21 percent), while the prevalence of livelihood-based coping strategies remained at the same level (50 percent). Purchasing power improved, with 5 percent unable to afford the local food basket compared to 37 percent one year ago. The price of the local food basket decreased by 4 percent compared to 2022, which spurred the improvement in purchasing power.

Al Gazira: The level of food insecurity in Al Gazira decreased marginally by 1 percent, from 16 percent in 2022 to 15 percent in 2023. The prevalence of severe food insecurity increased from 2 to 3 percent. The localities with the highest level of food insecurity are East El Gezira (22 percent); Um Al Qura (20 percent); and Al Qurashi (18 percent). East El Gezira has the highest level of severe food insecurity at 7 percent. Although Al Gazira is typically a high agricultural-production state, with strong market connections that facilitate the movement of agricultural commodities, the state experienced a poor harvest. Similar to neighbouring Gadarif, heavy downpours triggered floods in August which was followed by prolonged dry spells in September, constraining yields in both the irrigated and rainfed sectors. Consequently, sorghum production in the irrigated sector in the 2022/23 season was 74 percent below the five-year average (72,500 tons compared to 274,400 tons). In the traditional rainfed sector, sorghum production was 48 below the previous 2021/22 season (152,000 tons compared to 293,000 tons) and 20 percent below the five-year average (189,450 tons). Wheat production in the irrigated sector was 32 percent below the five-year average (215,120 tons compared to 344,550 tons).[40] The reliance of crops as a main income source thus decreased from 17 percent in 2022 to 12 percent in 2023. However, workers' migration to mining areas may have cushioned the impact of the poor harvest. The prevalence of food-based coping strategies increased by 14 percent (from 27 to 41 percent) but decreased for livelihood-based coping strategies by 9 percent (from 55 to 46 percent). Food intake worsened, with the prevalence of inadequate food consumption increasing by 3 percent (from 7 to 10 percent) compared to one year ago.

River Nile: The level of food insecurity in River Nile state decreased by 2 percent, from 9 percent in 2022 to 7 percent in 2023. The prevalence of severe food insecurity stayed at the same level (0 percent). The localities with the highest level of food insecurity are Shendi and El Matamma (13 percent respectively); and Ad Damar (11 percent). No localities have a prevalence of severe food insecure. The improvement in food security is due to the good harvest. Sorghum production in the

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[39] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan
[40] i.b.

traditional rain-fed sector in the 2022/23 season was 91 percent above the previous 2021/22 season (72,600 tons compared to 38,000 tons) and 65 percent above the five-year average (44,070 tons). Sorghum production in the irrigated sector in the 2022/23 season was 62 percent above the five-year average (95,600 tons compared to 58,940 tons).[41] The prevalence of food-based coping strategies decreased by 2 percent (from 21 to 19 percent) while the prevalence of livelihood-based coping strategies decreased by 6 percent (from 41 to 35 percent). Furthermore, the price of the local food basket decreased by 2 percent between the first quarter of 2022 and the first quarter of 2023 (from 544 SDG to 532 SDG), which contributed to the significant improvement in purchasing power. Only 4 percent are unable to afford one local food basket, compared to 50 percent one year ago.

Table 1: Percentage of food insecurity by state in Q1 2022 and Q1 2023

State	Percentage of food insecure households (%)		Change compared to the previous round (%)
	Q1 2022	Q1 2023	
North Darfur	56%	47%	↓-9%
South Darfur	38%	40%	↑2%
West Darfur	65%	56%	↓-9%
Central Darfur	59%	45%	↓-13%
East Darfur	34%	34%	↑1%
Kassala	17%	22%	↑5%
Red Sea	18%	49%	↑31%
Blue Nile	50%	50%	↔0%
White Nile	23%	22%	↓-1%
North Kordofan	30%	32%	↑2%
West Kordofan	43%	56%	↑14%
South Kordofan	30%	23%	↓-7%
Gadarif	22%	27%	↑5%
Khartoum	16%	18%	↑2%
Sinnar	35%	23%	↓-13%
Northern	17%	13%	↓-5%
Al Gazira	16%	15%	↓-1%
River Nile	9%	7%	↓-3%
Sudan	34%	34%	↔0%

Table below is the list of localities with the highest prevalence of food insecurity (above 50 percent). See full table with all localities in Annex 2. 38 localities have over 50 percent food insecurity.[42]

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[41] 2022 Crop and Food Supply Assessment Mission (CFSAM) To Sudan

[42] Eleven of these localities are located in West Kordofan; six in North Darfur; five in Red Sea, South Darfur and West Darfur; and three in Blue Nile and Central Darfur.

*Table 2: Localities with above 50 percent food insecurity*

State	Locality	Food insecure	Severely food insecure
West Darfur	Kerenik	85%	19%
West Darfur	Sirba	83%	7%
Red Sea	Halaib	81%	51%
South Darfur	East Jabel Marra	80%	26%
Central Darfur	North Jabel Marra (Rokero)	78%	22%
West Kordofan	AL Dibub	73%	30%
South Darfur	Bielel	72%	30%
Central Darfur	Central Jabel Marra (Golo)	72%	12%
North Darfur	Kuma	70%	24%
Red Sea	Dourdieb	69%	13%
West Kordofan	Lagawa	68%	17%
Blue Nile	Giessan	68%	16%
West Darfur	Jebel Moon	68%	9%
West Kordofan	Al Nuhod	65%	12%
West Kordofan	Keilak	64%	25%
Red Sea	Gabit-Elmadien	63%	24%
West Kordofan	Gibeish	62%	12%
Red Sea	Haya	61%	10%
West Kordofan	Wad Banda	61%	14%
North Darfur	Kebkabiya	60%	11%
North Darfur	Tawila	60%	8%
Blue Nile	Bau	59%	10%
North Darfur	Malha	58%	22%
West Kordofan	Almayram	56%	19%
South Darfur	EL Wihda	55%	15%
West Darfur	Habila	55%	7%
Red Sea	Gunb/Awlib	54%	33%
North Darfur	Mellit	54%	6%
Central Darfur	West Jabel Marra	54%	8%
West Kordofan	Al Khowai	54%	13%
North Darfur	Umkedada	53%	12%
South Darfur	Gerida	53%	8%
West Darfur	Kulbus	53%	12%
West Kordofan	Abyei	53%	12%
West Kordofan	Abo Zabad	53%	11%
South Darfur	Netega	53%	15%
West Kordofan	Al Udayyia	51%	10%
Blue Nile	Kurmuk	51%	10%

Profile of Food Insecure Population

Gender and education

Food insecurity is gendered. Households headed by women were more food insecure than households headed by men.[43] 42 percent of the female-headed households are food insecure, as opposed to 32 percent of their counterparts. Of this, 8 percent of female-headed households are severely food insecure, while the figure stands at 6 percent for male-headed households. The states with the highest prevalence of food insecure female-headed households are West Darfur (72 percent); West Kordofan (58 percent); and Blue Nile (56 percent). The largest discrepancy in food insecurity between male-headed and female-headed households was West Darfur (22 percent); followed by Gadarif (16 percent); and South Darfur (15 percent). In Red Sea, Northern and Al Gazira, male-headed households are more food insecure than their counterparts. However, these states generally have a low prevalence of female-headed households.[44]

Figure 5: Prevalence of food insecurity of male-headed and female-headed households by state
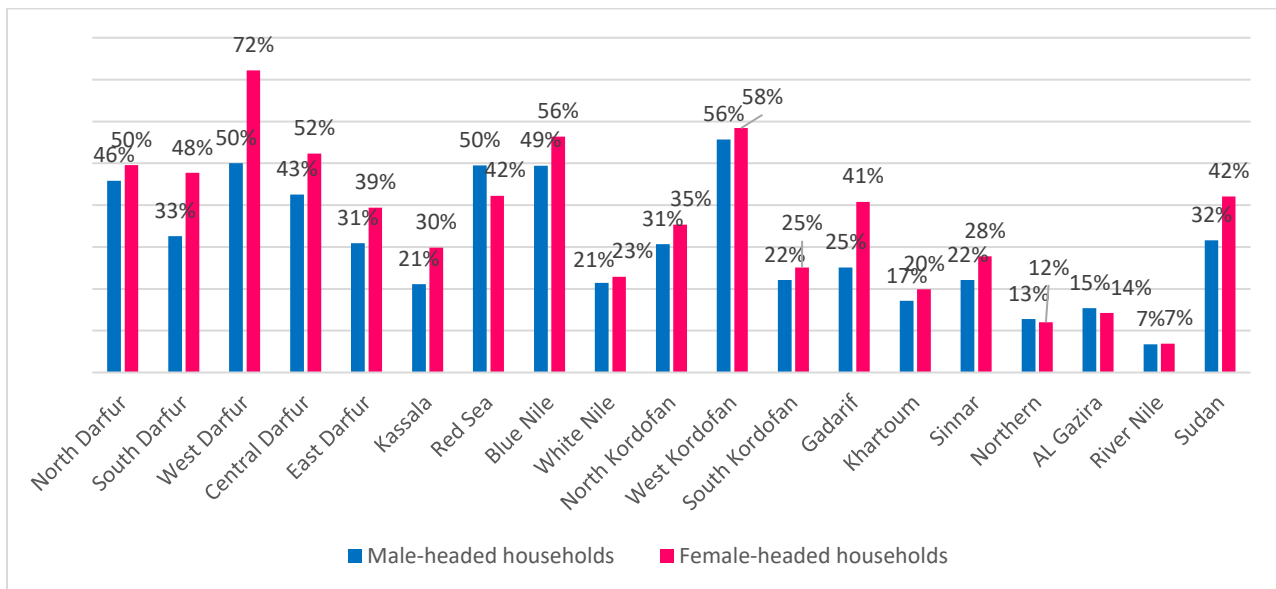
Female-headed households also have worse food intake compared to males. 37 percent of female-headed households have inadequate food consumption, while 25 percent of male-headed households have inadequate food consumption. This is a worsening compared to one year ago, when 33 percent of female-headed households and 20 percent of male-headed households had inadequate food consumption. The prevalence of poor food consumption is double the rate for female-headed households (10 percent) compared to male-headed households (5 percent). The states with the highest prevalence of female-headed households with inadequate food consumption are West Darfur (76 percent, of which 19 percent have poor food consumption); Central Darfur (58 percent, of which 14 percent have poor food consumption); and West Kordofan (53 percent, of which 14 percent have poor food consumption).

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[43] According to the CFSVA, 78 percent of households are headed by males and 22 percent are headed by females.
[44] In Red Sea, only 7 percent of households are headed by females, while the figure is 10 percent in Northern and 9 percent in Al Gazira. In West Darfur, on the other hand, 27 percent of households are headed by females, while the figure is 46 percent in South Darfur.

Overall, the main income sources for the female-headed and male-headed households vary depending on gender. Male-headed households tend to engage in longer term and higher return livelihood activities such as salaried work, mining and non-agricultural wage labor compared to females. Households that rely on these activities as their primary income source are also more food secure. In the meanwhile, female-headed households rely, to a greater extent, on informal transfers, such as remittances. 12 percent of female-headed households relied on informal transfers such as remittances, which is three times the prevalence observed in male-headed households (4 percent). Limited and less sustainable livelihood opportunities, rooted in entrenched socio-cultural norms resulting in economic and political inequality and low levels of literacy, is thus a key obstacle that women face which impedes them from meeting their food security needs.

Household heads with a lower level of education were more food insecure.[45] 44 percent of those with no education and 32 percent of those with only primary education were food insecure. Household heads that had a secondary or university education were less food insecure.

*Figure 6: Primary income source of male-headed and female-headed households*
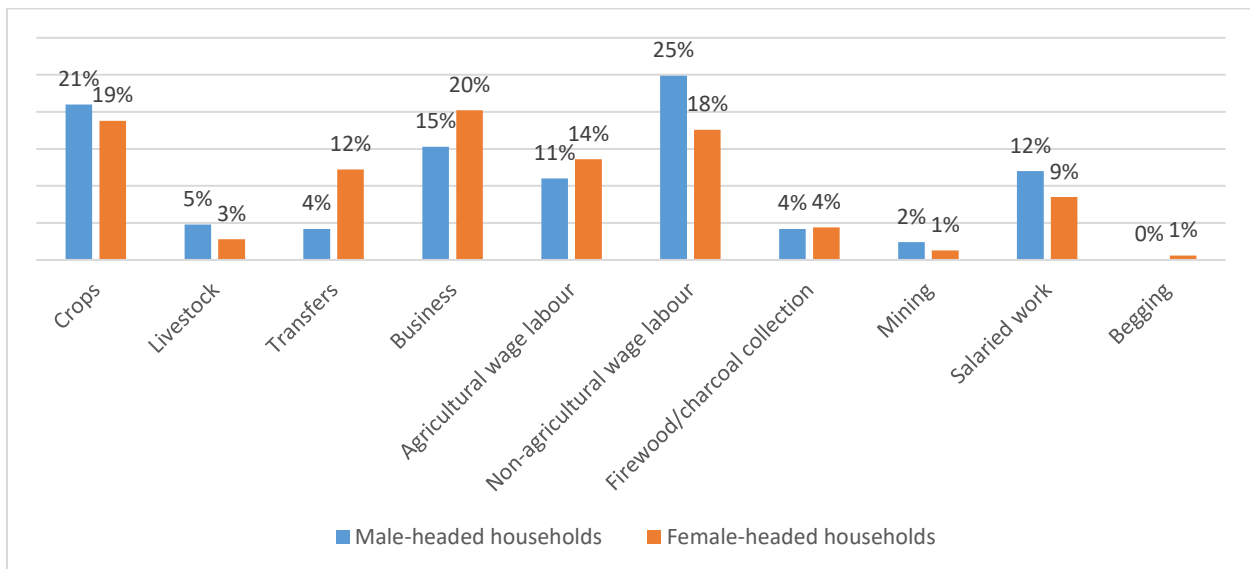
Livelihood activities and assets

The main income source was non-agricultural wage labour (which includes raksha, labour, wheelbarrow or working as porter). 23.3 percent rely on these activities as their primary income source. This is followed by crops, which 20.6 percent reported was their main livelihood activity. 16.3 percent relied on small business, which includes donkey cart work, selling water, tea, handcrafts, or petty trade. 11.6 percent relied on agricultural wage labour and 11.2 percent relied on salaried work. The reliance of income-generating activities did not change significantly compared to one year ago, but the prevalence of livelihoods in the agricultural sector increased marginally due to the good harvest.

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[45] According to the CFSVA, 32 percent of household heads have no education, 45 percent have primary education as their highest level of education, 16 percent have secondary education as their highest level of education, and 7 percent have university education as their highest level of education.

Figure 7: Primary income source
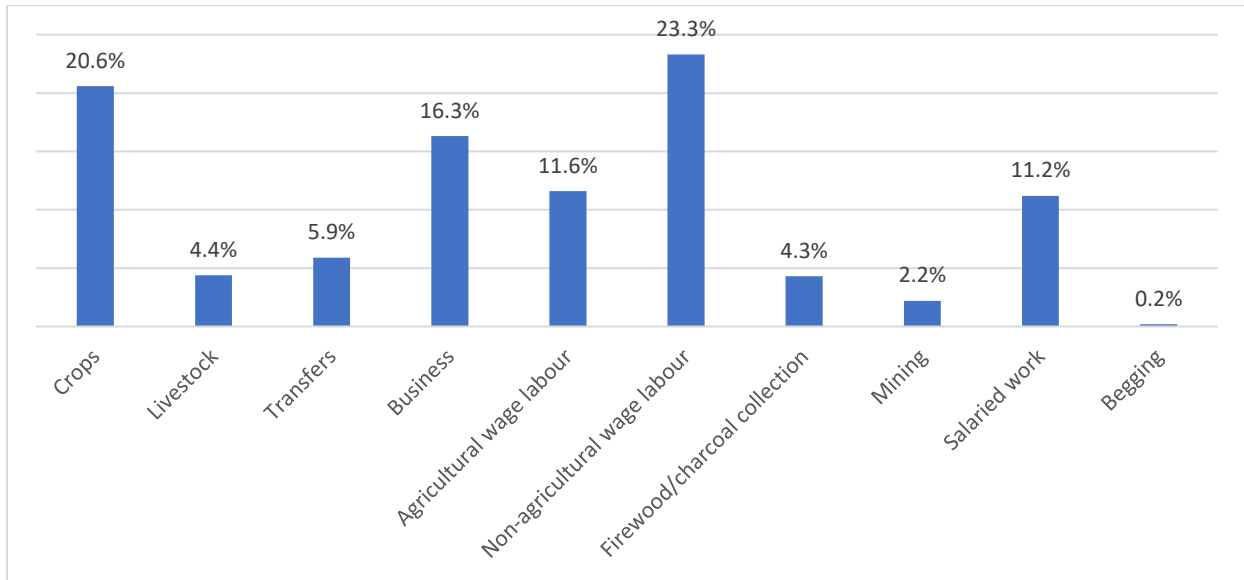
Households that engaged in more sustainable and high return livelihood activities such as salaried work, mining and small business were the most food secure. 80 percent of households with salaried work, 75 percent of households with mining and 71 percent of households with business as their main income source were food secure. Households with begging, firewood/ charcoal collection and livestock rearing as their main source of income were the most vulnerable group. 86 percent of households with begging, 54 percent of households with firewood/ charcoal collection and 45 percent of households with livestock rearing as their main income source were food insecure. Firewood and charcoal collection are also associated with negative long-term environmental implications.

Figure 8: Prevalence of food insecurity by livelihood type
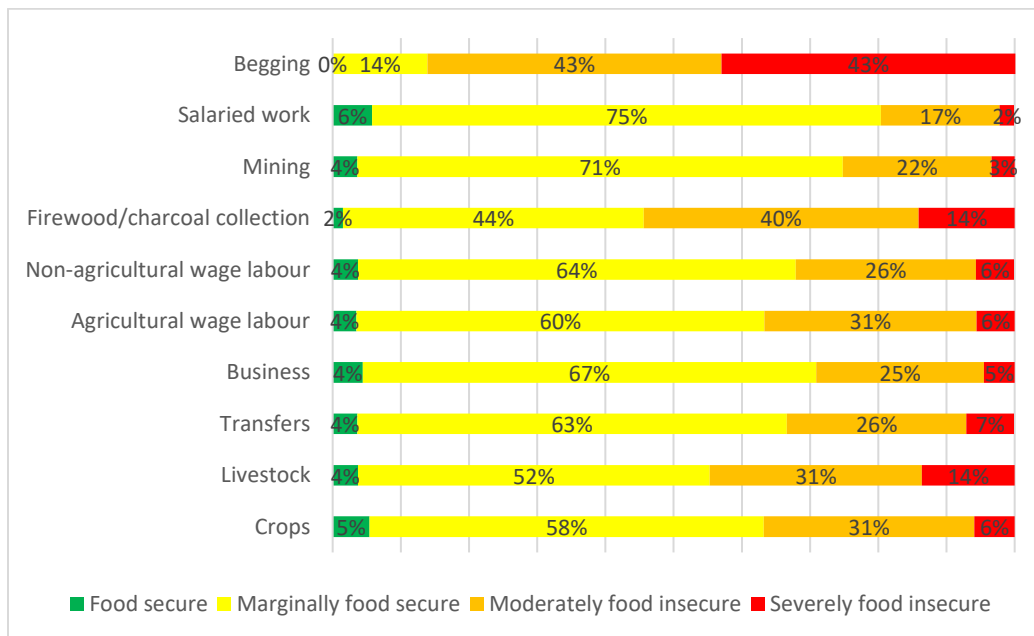
Households that owned certain physical assets, such as a cell phone, bicycle, motorcycle, car, radio, TV, and jewellery/ watch, were less food insecure compared to households that did not own them.[46]

Figure 9: Prevalence of food insecurity by asset ownership
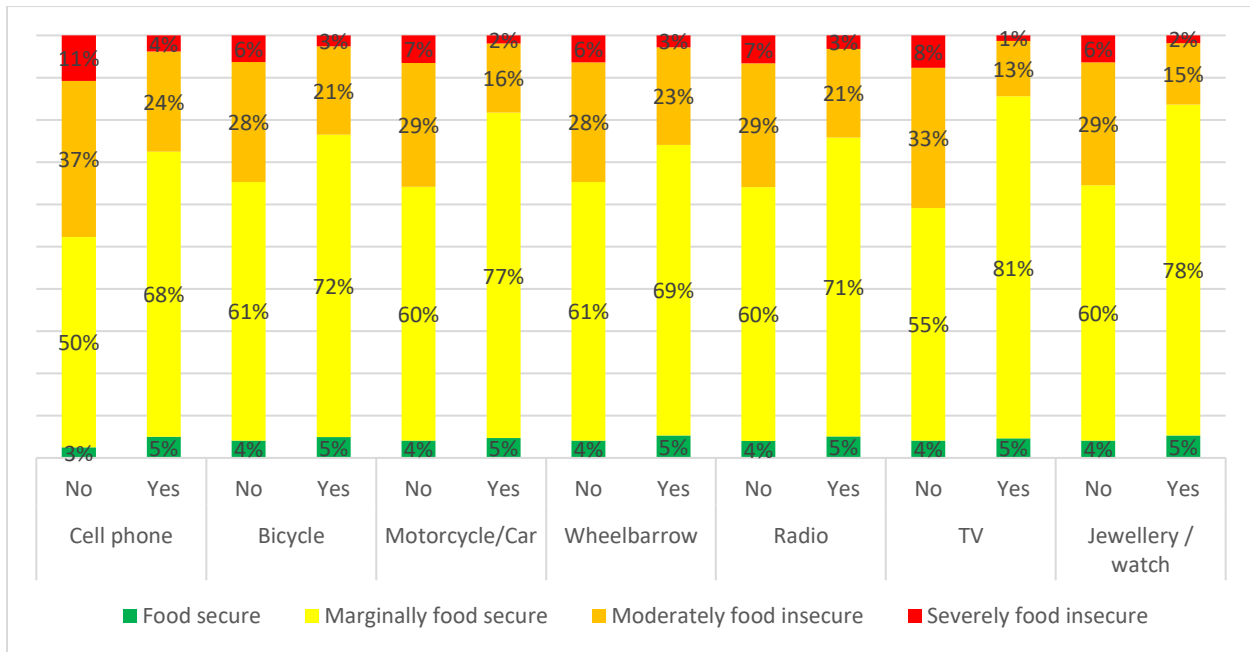
Adequacy of Food Consumption

The Food Consumption Score (FCS) is a composite indicator that considers the dietary diversity, food frequency and relative nutritional importance of different food groups consumed at the household level a week prior to the survey.[47] It is a proxy of households' food access and a core WFP indicator used to classify households into different food consumption groups (poor consumption, borderline consumption, and acceptable consumption).

In Sudan, 73 percent of resident households had acceptable food consumption. 21 percent had borderline food consumption and 7 percent had poor food consumption, which means that 28 percent had inadequate food consumption. This is a worsening in food intake by 5 percent compared to one year ago and 10 percent compared to 2021.[48] West Kordofan had the highest prevalence of households with poor food consumption (15 percent), followed by South Darfur (13 percent), and West Darfur and Central Darfur (11 percent respectively).

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[46] Data on asset ownership is frequently used in WFP's targeting and profiling exercises.
[47] Food items are grouped into eight standard food groups with a maximum value of seven days per week. The consumption frequency of each food group is multiplied by an assigned weight based on its nutrient content, and those values are then summed to deliver the food consumption score.
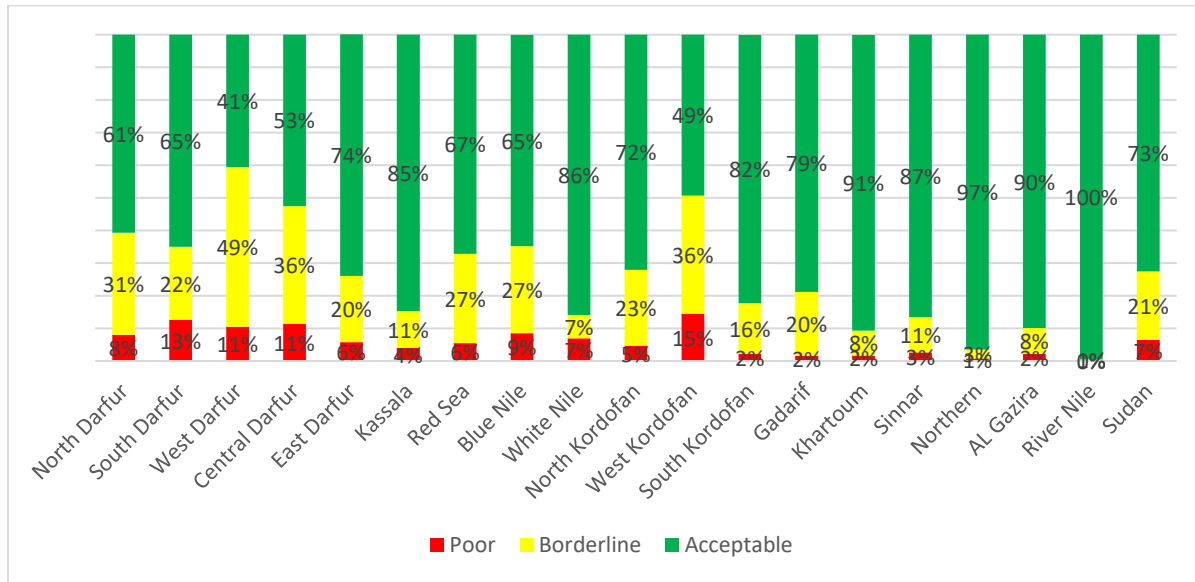[48] In 2022, 78 percent of resident households had acceptable food consumption, 16 percent had borderline food consumption and 6 percent had poor food consumption.

Figure 10: Food consumption group by state

The state that reported the largest increase in the prevalence of inadequate food consumption was West Kordofan (30 percent), followed by Red Sea (26 percent) and North Kordofan (14 percent). Blue Nile and Sinnar experienced a decrease in the prevalence of inadequate food consumption by 6 percent respectively.

Figure 11: Prevalence of inadequate food consumption in 2022 and 2023 by state
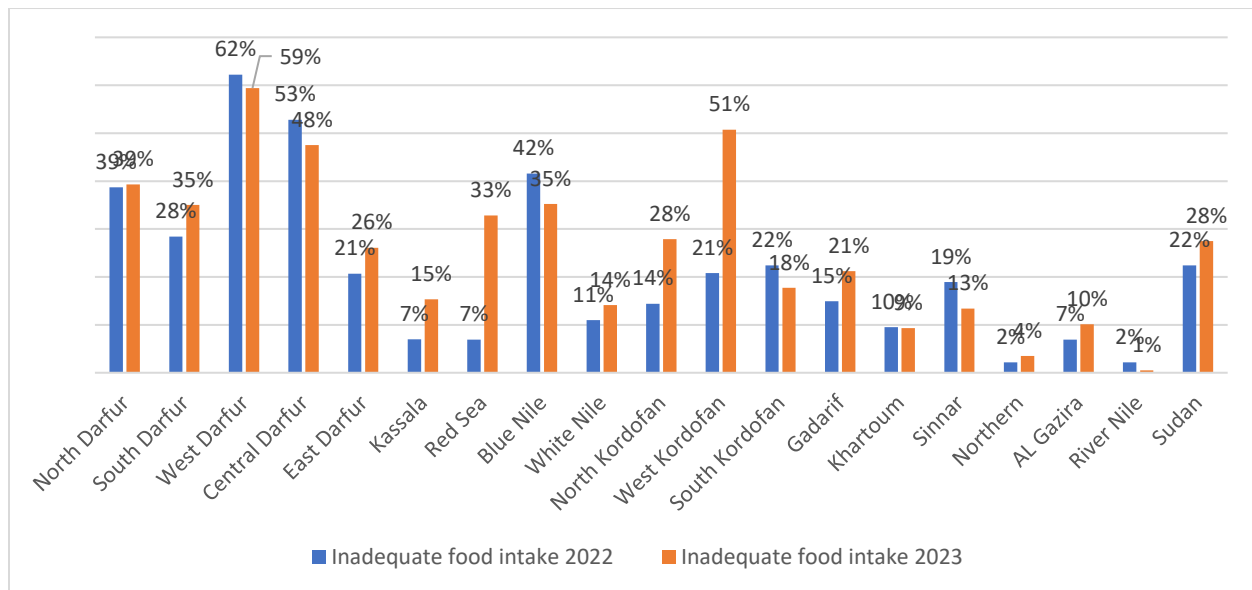
10 states experienced a decrease in the mean food consumption score, which indicates worsening food intake. The mean food consumption score decreased the most in West Kordofan (28 percent); Red Sea (20 percent); North Kordofan (16 percent) and Gadarif and Kassala (7 percent respectively).

Figure 12: Food consumption score by state
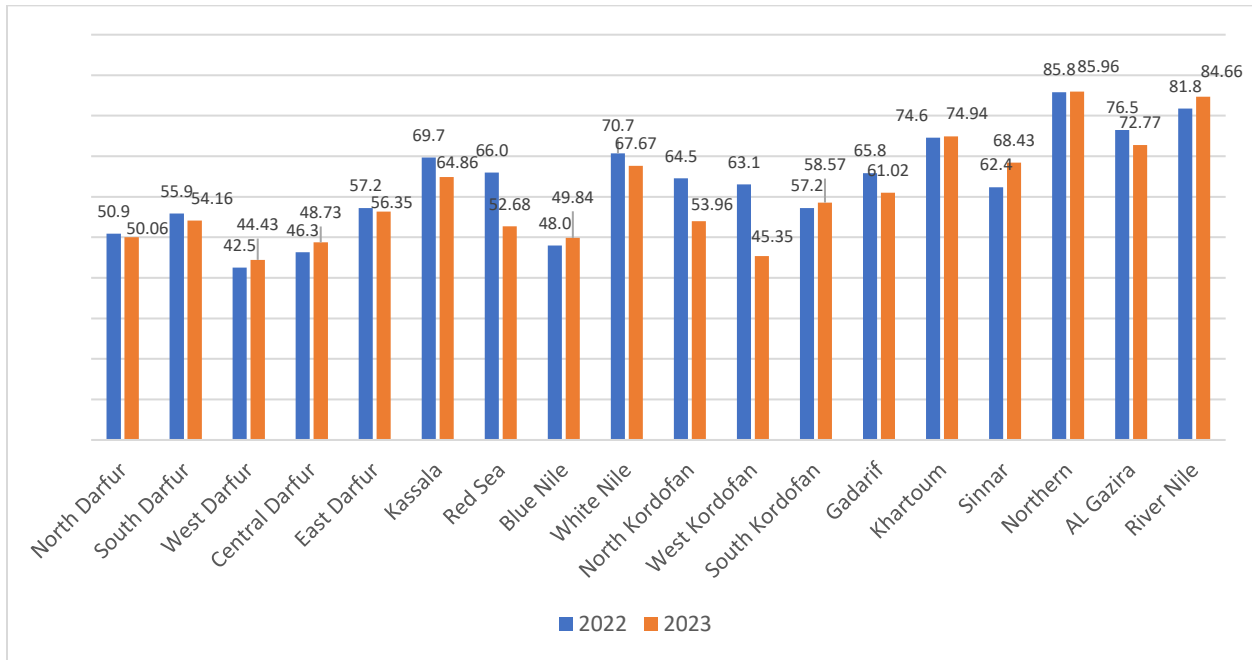
Table 3: Change in Food Consumption Score by state

State	Change in FCS (%)
North Darfur	↓-2%
South Darfur	↓-3%
West Darfur	↑5%
Central Darfur	↑5%
East Darfur	↓-2%
Kassala	↓-7%
Red Sea	↓-20%
Blue Nile	↑4%
White Nile	↓-4%
North Kordofan	↓-16%
West Kordofan	↓-28%
South Kordofan	↑2%
Gadarif	↓-7%
Khartoum	↑1%
Sinnar	↑10%
Northern	↔0%
AL Gazira	↓-5%
River Nile	↑4%

The Food Consumption Score-Nutrition (FCS-N) takes a closer look at the consumption of protein rich, iron rich and vitamin A rich foods. Protein plays a key role in child growth and is crucial for the prevention of wasting as well as stunting which takes place largely within the first 1,000 days. Iron deficiency is one of the main causes of anemia which affects approximately 25 percent of the world's population, mainly pre-school children and women. Vitamin A deficiency, if not tackled before the age of five, can increase child mortality and infectious diseases such as measles, diarrhea, and malaria by up to 30 percent.

The FCS-N results show low consumption of vitamin A rich foods, as 19 percent do not consume food rich in vitamin A. Furthermore, 25 percent of resident households never consume food that is rich in hem-iron. The prevalence of households who never consume food rich in vitamin A, protein and hem iron has increased compared to one year ago.[49]

Figure 13: FCS-N[50]
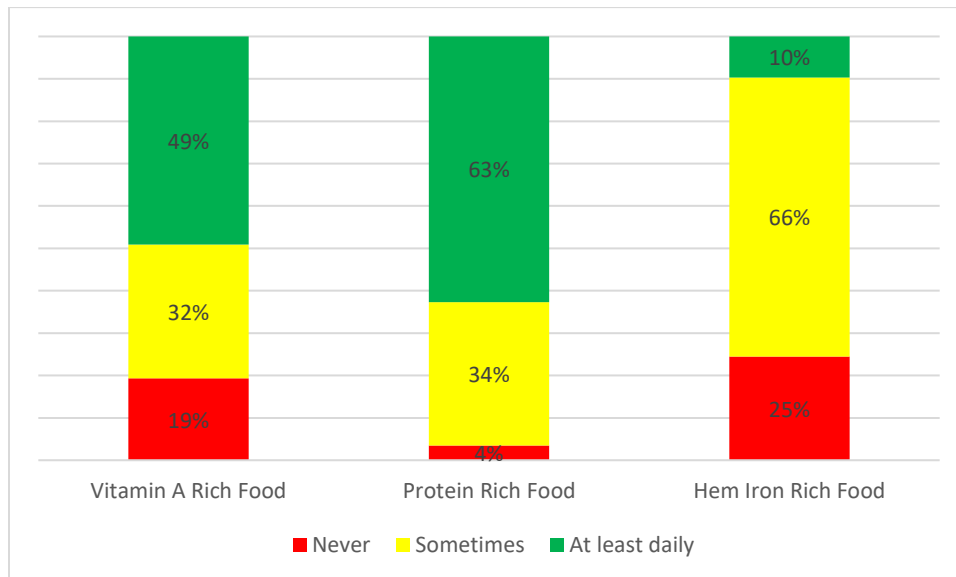
The Minimum Dietary Diversity for Women (MDD-W) is a dichotomous indicator whether women aged 15-49 have consumed at least five out of ten defined food groups[51] the previous day or night.[52] As a food group diversity indicator, it reflects an important dimension of diet quality, namely micronutrient adequacy summarized across 11 micronutrients,[53] and is thus a proxy indicator to reflect the micronutrient adequacy of women's diets. The results showed that in all states, most women do not meet the minimum acceptable diet, which indicates intra household disparity between male and female members in terms of food intake. 79 percent of women do not meet the minimum acceptable diet, which is the same prevalence as one year ago. The situation is particularly dire in East Darfur and North Darfur, where 90 percent or more do not meet the minimum acceptable diet.

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[49] According to the 2022 CFSVA, 16 percent never consumed food rich in vitamin A, 3 percent never consumed food rich in protein, and 24 percent never consumed food that is rich in hem iron.
[50] The recall period is 7 days. Never = 0 days; sometimes = 1 - 6 days; and at least daily = 7 days.
[51] These food groups are grains, white roots and tubers, and plantains; pulses (beans, peas and lentils); nuts and seeds; dairy; meat, poultry and fish; eggs; dark green leafy vegetables; other vitamin A-rich fruits and vegetables; other vegetables; other fruits
[52] Food and Agriculture Organization, link: http://www.fao.org/3/a-i5486e.pdf
[53] The 11 micronutrients are: vitamin A; thiamine; riboflavin; niacin; vitamin B-6; folate; vitamin B-12; vitamin C; calcium; iron; and zinc.

Figure 14: Minimum Dietary Diversity (MDD-W) for Women in Sudan
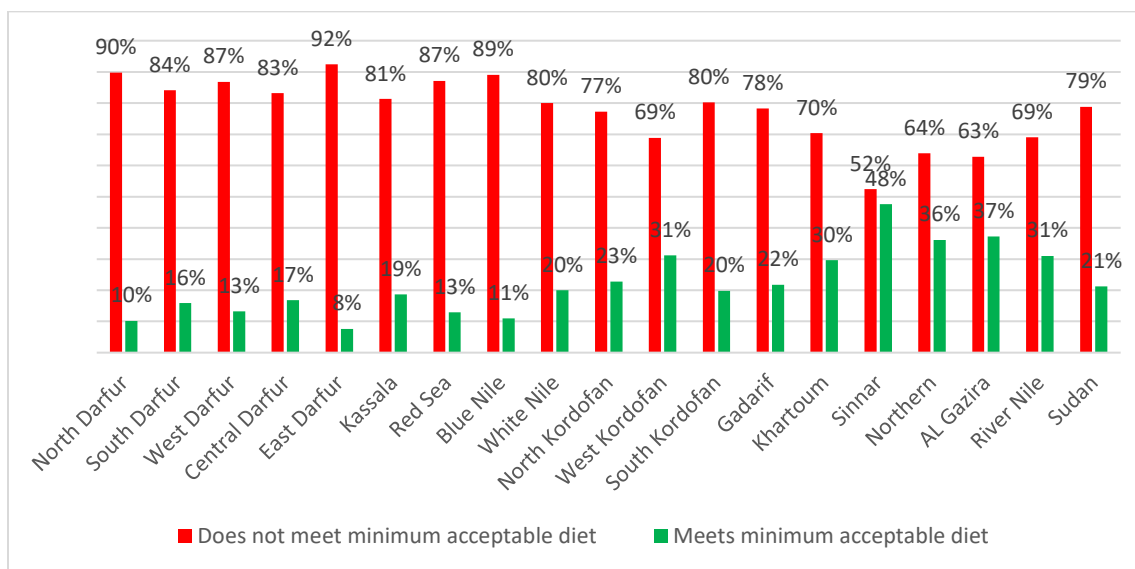
Sources of Food

Although the sources of food varied by the commodity, high market reliance was observed. About one-fourth of households obtained cereals through their own production in Q1 2023, which is an increase from last year, likely fuelled by the good harvest. Over one-fourth of households obtained milk and dairy products from their own production, and over one-fifth obtained eggs from their own production. For the remaining food groups, including pulses, meat, vegetables, fruits, oil, and sugar, the primary source is markets, indicating that a high market reliance is required to obtain adequate and diverse food consumption for households. Given the ongoing conflict, where market access and functionality is constrained, this will have a detrimental impact on household's dietary diversity.

Table 4: Sources of food groups

	OWN PRODUCTION	MARKET (CASH)	MARKET (CREDIT)	OTHER[54]
CEREAL	26%	68%	3%	4%
PULSES	6%	86%	5%	4%
MILK AND DAIRY	27%	68%	3%	2%
MEAT / FISH	1%	96%	1%	1%
EGGS	22%	74%	2%	2%
VEGETABLES	2%	94%	2%	2%
FRUITS	4%	92%	1%	2%
OIL	5%	88%	6%	2%
SUGAR	0%	93%	5%	1%

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[54] Other source includes loan, begging, exchanging labour or items for food, gift from family/ relatives, and food aid (from NGOs or WFP).

Market reliance for cereal is highest in Khartoum (99 percent), Red Sea (95 percent), and River Nile (90 percent). These urban households are particularly impacted by rising food prices amidst the current conflict, as they do not have food stocks from their own production to rely on. States with lower market reliance will be more cushioned by rising food prices.

Figure 15: Source of consumed cereal by state
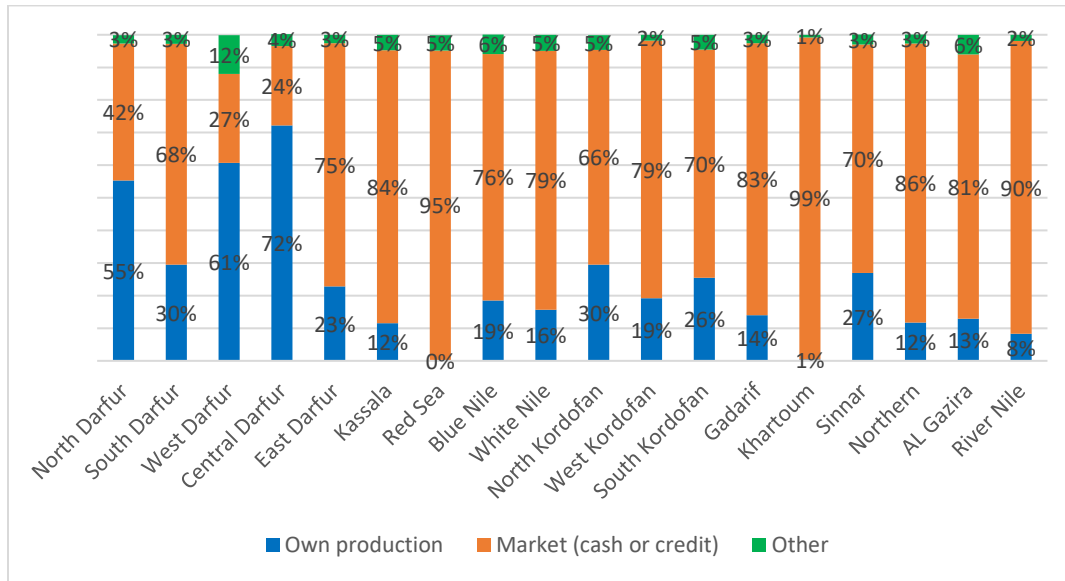
Local Food Basket

The local food basket in Sudan consists of eight food items that have been identified by focus group interviews with IDP, refugee and resident population communities based on food preferences, nutritional value and cost minimization. The eight items are sorghum, onion, vegetable oil, milk, cow meat, goat meat, dry tomatoes, and sugar. The prices of these items are combined, according to specific quantities that add up to 2020 kcal, to constitute the local food basket eaten by one person per day. [55] People's ability to buy the local food basket using their own resources is measured by the purchasing power.

The average price of the local food basket in Sudan increased from 138.7 SDG in Q1 2021 to 353.3 SDG in Q1 2022 and to 455.5 SDG in Q1 2023. This is 29 percent higher than the same time last year and 228 percent higher than two years ago. All but two states (Northern and River Nile) have experienced an increase in the price of the local food basket. Blue Nile experienced the largest increase, with the price of the local food basket 81 percent higher than one year ago. According to WFP's monthly market monitor, food prices, after peaking in October 2022, fell from November to February due to increased food supplies from the successful harvest.[56] Given the ongoing conflict, in which food value chains are greatly disrupted, as well as the looming lean season, food prices are anticipated to increase sharply in the coming months.

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[55] For full table, see Annex 3.
[56] The price of the LFB reached 567 SDG in October 2022, 565 SDG in November 2022 and 432 SDG in February 2023.

Table 5: Price of Local Food Basket (SDG) in Q1 2021, Q1 2022 and Q1 2023 by state

State	Q1 2021 (SDG)	Q1 2022 (SDG)	Q1 2023 (SDG)	Change between Q1 2022 & Q1 2023 (%)
North Darfur	143.2	314.5	506.3	↑61%
South Darfur	144.3	297.9	335.9	↑13%
West Darfur	104.7	292.2	414.1	↑42%
Central Darfur	115.4	304.9	399.7	↑31%
East Darfur	165.7	347.6	447.8	↑29%
Kassala	138.7	419.1	496.5	↑18%
Red Sea	163.3	440.1	637.5	↑45%
Blue Nile	144.8	299.0	541.9	↑81%
White Nile	115.0	277.3	438.4	↑58%
North Kordofan	123.3	396.7	421.1	↑6%
West Kordofan	121.8	334.1	457.3	↑37%
South Kordofan	130.0	355.0	424.0	↑19%
Gadarif	107.1	304.1	467.7	↑54%
Khartoum	274.6	434.4	450.6	↑4%
Sinnar	123.3	297.0	391.4	↑32%
Northern	135.9	484.3	463.9	↓-4%
Al Gazira	124.5	384.1	484.0	↑26%
River Nile	152.6	544.2	532.4	↓-2%
Sudan	***138.7***	***353.3***	***455.5***	**↑29%**

Vulnerability to Food Insecurity

The degree of vulnerability caused by shocks is measured by the negative coping strategies adopted by households. Coping strategies are divided into food-based and livelihood-based coping strategies.

Food-based coping strategies

Food-based coping strategies (also referred to as consumption-based coping strategies, reduced coping strategies index, rCSI) uses a set of coping behaviors to show how households manage or cope with shortfalls in food consumption. Data is collected on the frequency of specific coping behaviors, with a recall period of 7 days, and the severity of those strategies, which is combined in a single score, the coping strategies index. This is an indicator of a household's food security status, where a higher score indicates a greater level of coping, and hence increased food insecurity. A coping strategy index score above 11 indicates a high level of coping. A score between 6 and 11 indicates a medium level of coping, while a score below 6 indicates a low level of coping.

The assessment indicates that overall, 38 percent of the surveyed households had to adopt negative food-based coping mechanisms due to lack of food or money to buy food. This is an increase of 5 percent from one year ago, when 33 percent adopted negative food-based coping mechanisms, and

an increase of 12 percent compared to 2021, when 26 percent resorted to negative food-based coping mechanisms. Among them, 16 percent of households employed a high level of negative food-based coping mechanisms.

In Blue Nile, 61 percent of the households adopted food-based coping strategies, the highest among the 18 surveyed states. This was followed by the West Darfur (54 percent), Red Sea (53 percent) and Kassala (50 percent). The adoption of a high level of coping mechanisms was most prevalent in Sinnar (33 percent) and East Darfur (27 percent), followed by White Nile (25 percent) and Red Sea (24 percent).

Figure 16: Prevalence of negative food-based coping strategies by state
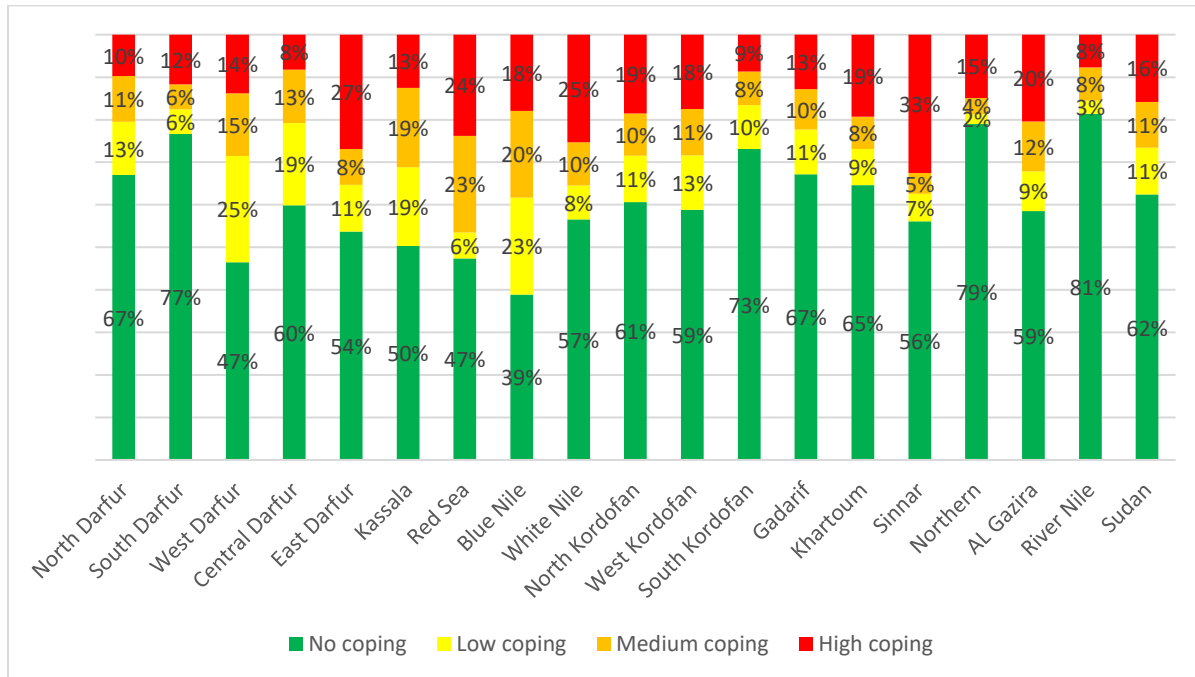
The most common food-based coping strategy was to rely on less preferred or less expensive food, with 32 percent of households resorting to this negative coping strategy, an increase from last year when 26 percent did so. This was followed by eating borrowed food or borrowing money to purchase food, which 25 percent resorted to, and reducing the number of meals eaten in a day, which 21 percent resorted to.

Table 6: Most common food-based coping strategies

FOOD-BASED COPING STRATEGIES	PREVALENCE (%)
RELY ON LESS PREFERRED AND LESS EXPENSIVE FOOD	32%
EAT BORROWED FOOD OR BORROW MONEY TO BUY FOOD	25%
REDUCE NUMBER OF MEALS PER DAY	21%
LIMIT PORTION SIZE OF MEALS	19%
RESTRICT CONSUMPTION OF ADULTS TO FEED CHILDREN	12%

Livelihood-based coping strategies

The livelihood-based coping module is used to understand the medium and longer-term coping capacity of households and if they are able to meet challenges in the future. The recall period is 30 days. Livelihood-based coping strategies are classified as stress, crisis or emergency strategies depending on their severity. Stress strategies indicate a reduced ability to deal with future shocks due to a current reduction in resources or increase in debts (e.g. buying food on credit or spending savings). Crisis strategies directly reduce future productivity, including human capital formation (e.g. selling productive assets). Emergency strategies are more dramatic in nature as they affect future productivity and are more difficult to reverse (e.g. begging or selling the last female animal).

The results show that 57 percent of resident households had to resort to negative livelihood-based coping strategies. This is an increase of 2 percent compared to one year ago and 12 percent compared to 2021.[57] 19 percent of households adopted emergency coping strategies, 27 percent adopted crisis coping strategies, and 12 percent adopted stress coping strategies.

67 percent of households in East Darfur adopted negative livelihood-based coping strategies, the highest in Sudan. This was followed by 66 percent of households in North Darfur, 65 percent in Central Darfur, and 64 percent in West Kordofan and South Darfur. The state with the highest prevalence of households adopting emergency coping mechanisms was Red Sea (34 percent), followed by North Darfur (30 percent), West Kordofan (27 percent) and East Darfur (both 23 percent).

Figure 17: Prevalence of negative livelihood-based coping strategies by state

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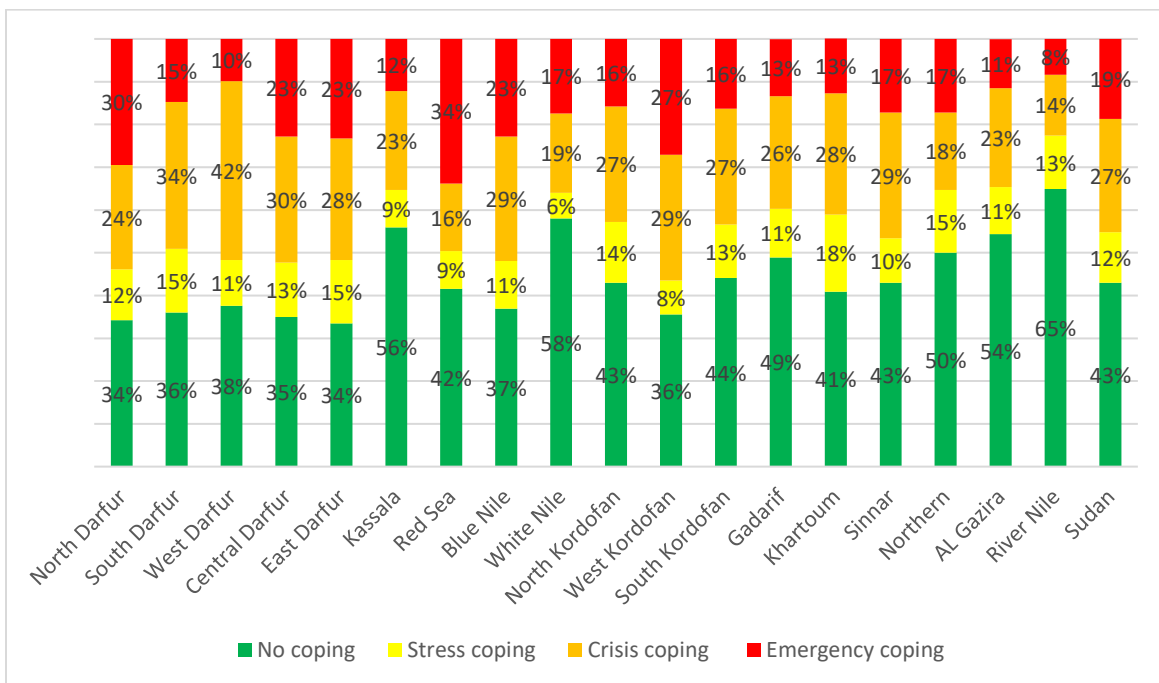
[57] According to the 2022 CFSVA, 55 percent of resident households had to resort to negative livelihood-based coping strategies, while the 2021 CFSVA indicates that 45 percent of resident households had to do so.

The most prevalent strategy was reducing non-food expenditure on health, employed by 22 percent of households. 21 percent of households were forced spend their savings, and 10 percent had to sell their last remaining female animals prompting an irreversible loss of livelihoods.

Table 7: Most common livelihood-based coping strategies

LIVELIHOOD COPING	YES (%)	NO, BECAUSE STRATEGY EXHAUSTED OR ASSET DEPLETED[58] (%)
REDUCED NON-FOOD EXPENSES ON HEALTH	22%	11%
SPENT SAVINGS	21%	4%
SOLD LAST FEMALE ANIMAL	10%	4%
SOLD MORE ANIMALS (NON-PRODUCTIVE) THAN USUAL	10%	5%
SOLD HOUSEHOLD ASSETS	10%	2%
WITHDREW CHILDREN FROM SCHOOL	9%	4%
SOLD PRODUCTIVE ASSETS OR MEANS OF TRANSPORT	5%	2%
BORROWED MONEY FROM FORMAL LENDER	5%	1%
SOLD HOUSE OR LAND	3%	1%
BEGGED	2%	1%

Economic Vulnerability

The CARI console sheds more light on the major driving forces behind household level food insecurity. Across the surveyed population, economic vulnerability remained one of the major reasons behind household food insecurity. Economic vulnerability is measured by food expenditure share, purchasing power, and economic capacity to meet essential needs.

Food expenditure share

This indicator is based on the premise that the greater the importance of food within a household's overall budget (relative to other consumed items or services), the more economically vulnerable the household. If food expenditure share is less than 50 percent, the household is considered to be economically better off, while more than 65 percent is considered to be economically vulnerable, as a large proportion of food expenditure means that households are forced to prioritize immediate short-term food needs over important longer-terms investments in e.g. health care or education.

The share of expenditure spent on food remains high in Sudan. 85 percent of resident households spend more than 65 percent of their expenditure on food, which is a decrease of 10 percent compared to the previous year. The decrease is a result of the good harvest, in which small-holder farmers could rely on their own production to a greater extent and thereby reduce their expenditure on food. The highest food expenditure share was observed in Red Sea, where 97 percent of households spend more than 65 percent on food, followed by Kassala (95 percent) and Khartoum (94 percent). These

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[58] This means that the household cannot apply the strategy anymore because it has been exhausted or the asset has been depleted.

states also have high market reliance. The state with the lowest share of food expenditure was observed in Central Darfur (61 percent), followed by West Darfur and North Darfur (75 percent respectively). These are all states which had a successful harvest in the 2022/23 agricultural season.

Nevertheless, food expenditure share remains at a high level, which is a reflection of high food prices and indicates a high level of economic vulnerability among the Sudanese population. While such a disproportionate amount of expenditure on food prevented the widening of the food gap in the short-term, it also added more risk factors to an already fragile economic situation and thus exposed households to future protection risks, food insecurity and degradation of their overall well-being. Households were forced to cut on their health and education expenditures and were unable to create or invest in livelihood assets as highlighted by the adoption of livelihood-based coping mechanisms.

Figure 18: Food expenditure share by state
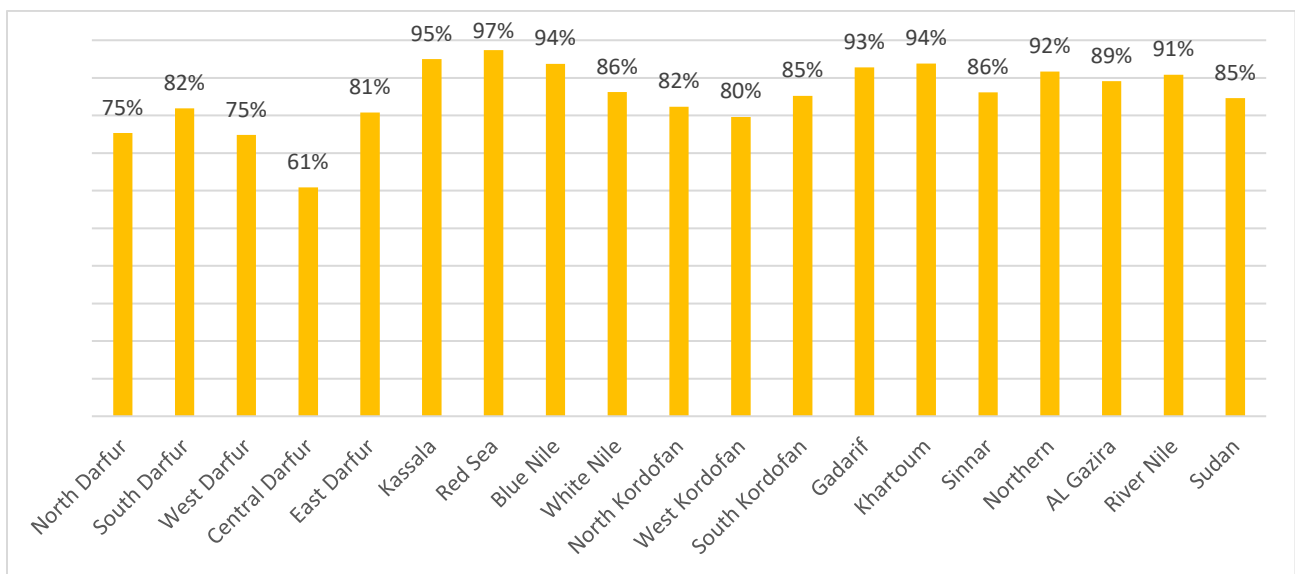
Purchasing power

Purchasing power, as measured by the ability of households to afford the local food basket, improved. 30 percent of residents cannot afford the local food basket, which is an improvement compared to the previous round when 48 percent were unable to do so. The improvement is a reflection of the stabilization in food prices during the data collection period. According to WFP's monthly market monitor, food prices peaked prior to the harvest season in October 2022, but subsequently fell due to the positive harvest. By February 2023, however, food prices began rising again.

In North Darfur, 60 percent cannot afford the local food basket, which is the highest in the country. This is followed by West Darfur (60 percent), East Darfur (53 percent), Blue Nile (50 percent) and Red Sea (43 percent).

Figure 19: Prevalence of households that cannot afford one local food basket (red) by state
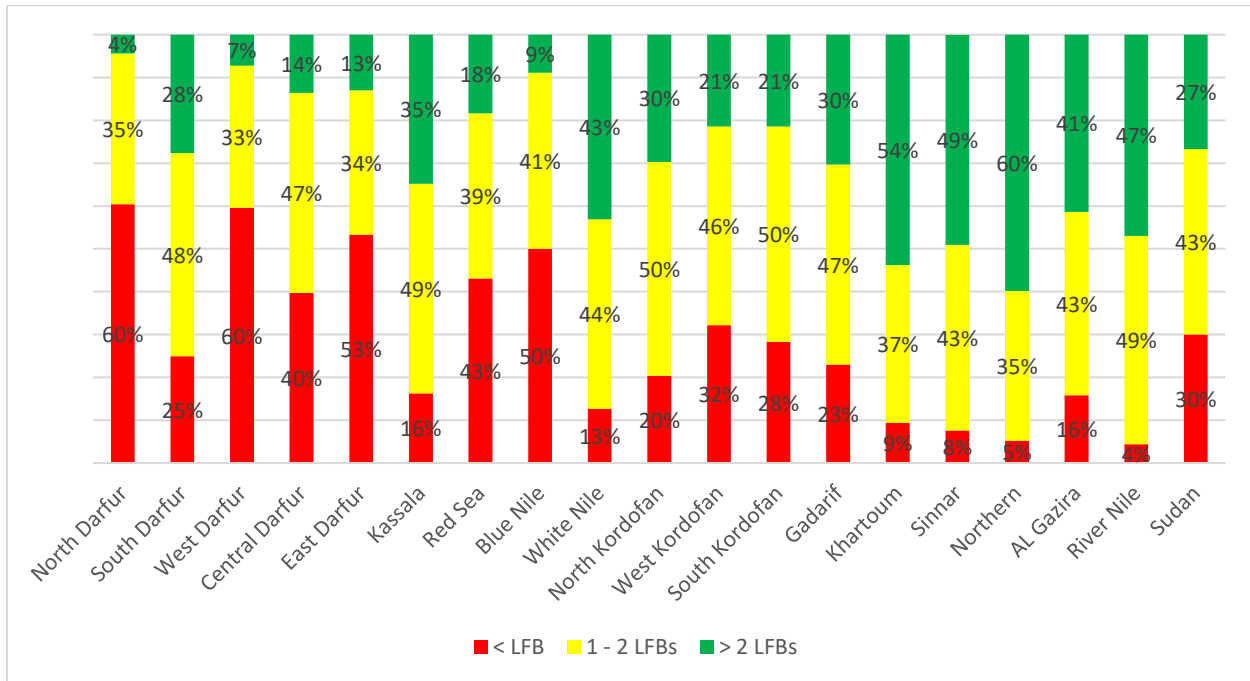
Economic capacity to meet essential needs (ECMEN)

The economic capacity to meet essential needs (ECMEN) is a measure of the economic vulnerability of a population, and looks at household economic capacity excluding assistance in reference to a recognized threshold. It is defined as the percentage of households whose economic capacity is sufficient to meet their essential needs, as measured through the minimum expenditure basket (MEB). The MEB is defined as what households require in order to meet their essential needs, on a regular or seasonal basis, and its cost. The MEB covers those needs that households meet fully or partially through the market. It serves as a monetary threshold that can be used to assess households' economic capacity to meet their needs. Households are considered to have the economic capacity to meet their essential needs if their consumption expenditures exceed the MEB. In March 2023, the value of the MEB was 19,337 SDG.[59]

The assessment indicates that 53 percent of households have a total expenditure that is less than the MEB. The state with the lowest economic capacity to meet essential needs is West Darfur, where 88 percent have a total expenditure that is less than the value of the MEB, followed by North Darfur (79 percent); Central Darfur (76 percent); and East Darfur (74 percent).

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[59] WFP Sudan has, within the framework of the Cash Working Group (CWG), opted to use a working MEB value, which is based on that marginally food secure people have an expenditure of 68 percent on food and 32 percent on non-food items. Using local food basket prices that WFP collects on a monthly basis, the non-food component is deducted to determine the working MEB value. In March 2023, the value of the local food basket amounted to 438 SDG, the non-food component amounted to 206 SDG and the MEB value amounted to 19,337 SDG per person per month.

Figure 20: Prevalence of household's whose total expenditure is less/more than the value of the MEB:

Legend: Total expenditure < MEB (red), Total expenditure > MEB (green)
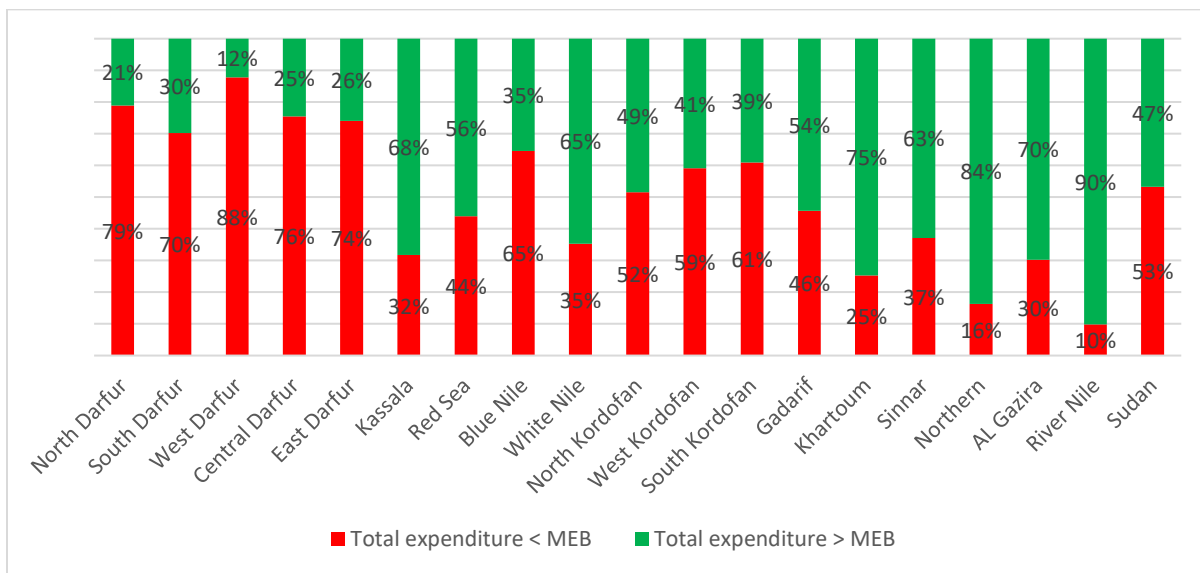
Multi-dimensional Poverty Index (MPI)

The multidimensional poverty index (MPI) is a measure of non-monetary poverty calculated at the household level based on deprivations in six essential needs dimensions: food, education, health, shelter, WASH, and livelihoods/climate. The indicator has been adapted by WFP, based on the Alkire-Foster methodology, which is also used for UNDP's Global Multidimensional Poverty Index (MPI). The MPI provides information about the share of households who are multidimensionally deprived (incidence); the number of different deprivations (intensity) experienced by poor households; and which dimensions exhibit larger degrees of deprivation.

The MPI indicates that the level of severe poverty is 19 percent of the population in Sudan. This amounts to 9.1 million people. West Darfur has the highest level of severe poverty (39 percent), closely followed by Red Sea (38 percent); East Darfur (35 percent); and Central Darfur (30 percent). Annex 2 contains the full list of localities by level of severe poverty.

Figure 21: Prevalence of severe poverty by state
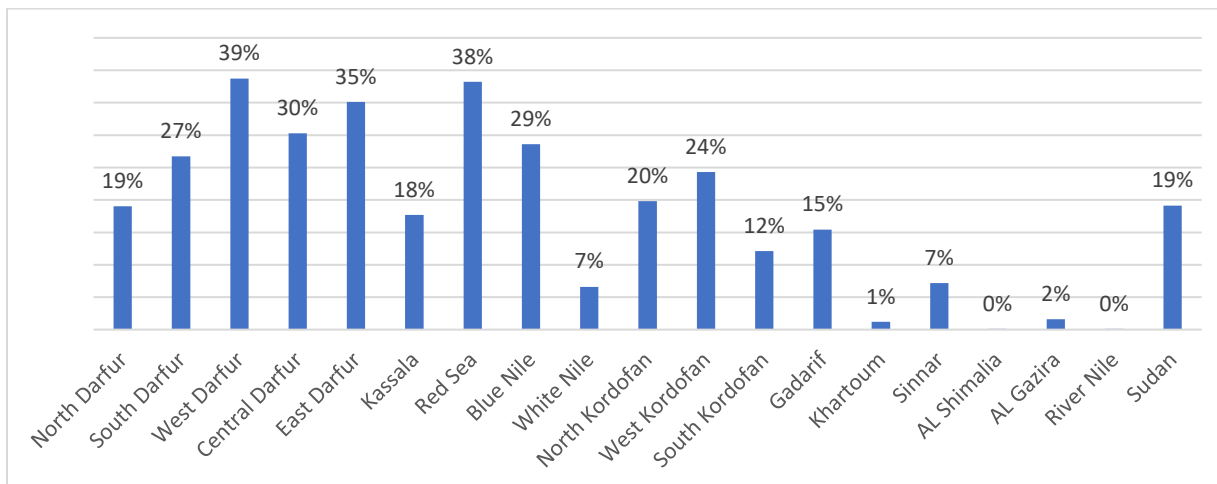
Conclusion and Food Security Outlook

In Sudan, 34 percent of resident households are food insecure during the first quarter of 2023. This amounts to over 16.2 million people. Food insecurity remains at the same level as the previous round conducted in the first quarter of 2022, but is higher by seven percent compared to 2021, which found that 27 percent of residents households were food insecure. Food insecurity worsened or remained at the same level across nine states, while nine states experienced an improvement in the level of food security. 38 localities have over 50 percent food insecurity.

The key causes spurring this high level of food insecurity include worsening food consumption (from 22 to 28 percent of households having inadequate food consumption); and an increase in the prevalence of negative food-based (from 33 to 38 percent) and livelihood-based (from 55 to 57 percent) coping strategies. Households were forced to cut on their health and education expenditures and spend their savings. 30 percent of residents cannot afford the local food basket and 53 percent of households have a total expenditure that is less than the minimum expenditure basket. While food expenditure share decreased by 10 percent (from 95 to 85 percent) due to the successful harvest which increased domestic food stocks, it nevertheless remains at a high. The disproportionate amount of expenditure on food prevented a further widening of the food gap in the short term, but added additional risk factors to an already fragile economic situation, exposing households to future protection risks, food insecurity and degradation of their overall well-being. Furthermore, they were unable to create or invest in livelihood assets as highlighted by the adoption of livelihood-based coping mechanisms.

It is critical to note that data collection for this assessment was conducted between January and March 2023. **The food security situation and outlook has changed dramatically since the eruption of conflict on April 15th 2023**. The coming months (June to September 2023) are the lean season when food security normally deteriorates, as household's food stocks are depleted and livelihood opportunities, particularly related to crops, agricultural wage labour, and salaried work, are more limited. Even though the surplus in sorghum and millet provides a temporary cushion during the coming months, the ongoing conflict, which has displaced millions of people as of mid-June 2023, will dramatically increase the level of food insecurity nationwide due to depletion of food stocks, particularly in areas with a high number of internally displaced people, rising food prices, dysfunctional markets, destruction of assets and eroded livelihoods. Disruptions in the supply of fertilizer, fuel and other crucial agricultural inputs will negatively impact the upcoming planting season, as farmers will be unable to access or afford these crucial agricultural inputs, thereby opting to plant less, adopt cash-crop production, or assume alternative livelihood activities, leading to lower yields and thereby reducing food availability.

Crippled domestic demand and exports will deprive Sudan of foreign currency needed to import fuel, wheat, medicine and food. Plummeting domestic and foreign private investment, halted flows of remittances, decline in government revenue collection, and reduced exports and imports due to supply chain disruptions, will all have a detrimental effect on the Sudanese economy, and financing trade and budget deficits will drive inflation, and thereby augment economic vulnerability. Given these circumstances, all four dimensions pertinent to food security – food availability, food access, utilization and stability – are currently endangered.

As a result of these factors, preliminary forecasts indicate that food insecurity may rise to 39 percent of the population, amounting to 19.1 million, in the next three to six months if the current conflict continues. Expected to be hit the hardest are those experiencing fighting, the urban and semi-urban populations that have high market reliance for their food purchase, such as Khartoum, and states hosting large numbers of Internally Displaced Peoples, such as West Darfur, White Nile, River Nile and Northern, as well as states with a high level of food insecurity, including West Kordofan, Blue Nile, Red Sea, and North Darfur. While routes to and from production areas in Gadarif, Al Gazira, Blue Nile, Sinnar, and White Nile remain open, the looming rainy season will impede access to certain areas, thereby compromising food security in those states.

On May 4th 2023, WFP Executive Director, Cindy McCain, announced the activation of a Corporate Scale-Up for Sudan until November 4th 2023, in response to the rapidly deteriorating humanitarian situation across the country. While humanitarian access remains constrained in parts of the country, and some of WFP's warehouses and premises have been looted, WFP is expanding lifesaving General Food Assistance coverage to 5.9 million beneficiaries and emergency Blanket Supplementary Feeding to reach 930,000 pregnant and lactating women and children under five by December 2023.[60] Targeted beneficiaries include parts of WFP's pre-crisis caseload, newly displaced IDPs and refugees, and vulnerable residents.

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[60] These targets have taken into account fluid access, security, resourcing, and partnership dynamics.

Annex 1: Methodology

Data collection for the CFSVA takes place once per year during the harvest season and covers 183 localities in all 18 states in Sudan. Due to access issues, data collection was not conducted in the following localities: At Tina (North Darfur); Al Buram, Um Durein, Heiban (South Kordofan); and Wad Al Mahi (Blue Nile). Household data collection for this round was conducted between January and March 2023. The findings were aimed to be representative of the households at the locality level. The survey design followed a two-stage stratified sample methodology, in which the samples were stratified by the states and localities. Within each locality, 13 locations were randomly chosen as the primary sampling units (PSU) and 16 households were sampled within each location (PSU). On average 209 households were surveyed per locality, amounting to a sample size of 37,816 households.

Indicators

Food insecurity is determined by the WFP corporate indicator, Consolidated Approach to Reporting Indicators of Food Security (CARI). Central to the approach is an explicit classification of households into four descriptive groups: food secure, marginally food secure, moderately food insecure, and severely food insecure. CARI combines a suite of food security indicators, including food consumption score, food expenditure share, and coping strategies, into a summary indicator.

Household food consumption data was collected and analyzed using standard WFP methodology in which the variety and frequency of foods consumed over a 7-day period was recorded to calculate a household food consumption score. Weights were based on the nutritional density of the foods. Using standard thresholds, households were classified as having either poor, borderline or acceptable food consumption. The indicator does not take into consideration the quantity of food consumed.

The local food basket in Sudan consists of eight food items that have been identified through focus group interviews with the IDP, refugee and resident population communities based on food preferences and cost minimization. The eight items are sorghum, onion, vegetable oil, milk, cow meat, goat meat, dry tomatoes and sugar in amounts sufficient to attain a nutritionally acceptable diet, while minimizing the cost. The prices of these items are combined based on specific quantities to constitute the local food basket (see Annex 3).

The coping strategy index is an indicator of household food security about how households manage to cope with a shortfall in food for consumption, and results in a numeric score. Data is collected on the frequency of specific coping behaviors and the severity of those strategies, which is combined in a single score, the coping strategies index. This is thus an indicator of a household's food security status, where a higher score indicates a greater level of coping, and hence increased food insecurity. A coping strategy index score above 11 indicates high coping. A score between 6 and 11 indicates medium coping, while a score between 1 and 6 indicates low coping.

Livelihood-based coping is used to understand longer-term coping capacity of households and if they are able to meet challenges in the future. The recall period is 30 days. Livelihood-based coping strategies are classified as stress, crisis or emergency strategies depending on their severity. Stress strategies indicate a reduced ability to deal with future shocks due to a current reduction in resources or increase in debts (e.g. buying food on credit or spending savings). Crisis strategies directly reduce future productivity, including human capital formation. (e.g. selling productive assets). Emergency strategies affect future productivity but are more difficult to reverse or more dramatic in nature (e.g. begging, selling last female animal).

Economic vulnerability was measured by expenditure share of food out of total expenditure. This indicator is based on the premise that the greater the importance of food within a household's overall budget (relative to other consumed items/services) the more economically vulnerable the household. If food expenditure share is less than 50 percent, the household is considered to be economically better off, while more than 65 percent is considered to be economically vulnerable, as a large proportion of food expenditure means that households are forced to prioritize immediate short-term food needs over important longer-terms investments in e.g. health care or education.

Economic capacity to meet essential needs (ECMEN) is a measure of the economic vulnerability of a population, and looks at household economic capacity excluding assistance in reference to a recognized threshold. It is defined as the percentage of households whose economic capacity is sufficient to meet their essential needs, as measured through the minimum expenditure basket (MEB).

The composition of the multi-dimensional poverty index is a combination of the standard MDDI developed by WFP HQ and the analytical needs of a joint project with the World Bank. The index is designed to score households and localities in six dimensions: Food, Education, Health, Shelter, WASH, and Livelihoods/Climate (see Annex 4).

For more information contact Karim Abdelmoneim, Head of Vulnerability Analysis and Mapping (OIC), at karim.abdelmoneim@wfp.org.

Annex 2: List of localities by prevalence of food insecurity

State	Locality	Food insecure	Severely food insecure	Severe poverty (MPI)
West Darfur	Kerenik	85%	19%	43%
West Darfur	Sirba	83%	7%	72%
Red Sea	Halaib	81%	51%	68%
South Darfur	East Jabel Marra	80%	26%	52%
Central Darfur	North Jabel Marra (Rokero)	78%	22%	25%
West Kordofan	AL Dibub	73%	30%	48%
Central Darfur	Central Jabel Marra (Golo)	72%	12%	5%
South Darfur	Bielel	72%	30%	51%
North Darfur	Kuma	70%	24%	27%
Red Sea	Dourdieb	69%	13%	51%
West Kordofan	Lagawa	68%	17%	20%
Blue Nile	Giessan	68%	16%	26%
West Darfur	Jebel Moon	68%	9%	37%
West Kordofan	Al Nuhod	65%	12%	33%
West Kordofan	Keilak	64%	25%	36%
Red Sea	Gabit-Elmadien	63%	24%	52%
West Kordofan	Gibeish	62%	12%	31%

Red Sea	Haya	61%	10%	31%
West Kordofan	Wad Banda	61%	14%	28%
North Darfur	Kebkabiya	60%	11%	25%
North Darfur	Tawila	60%	8%	20%
Blue Nile	Bau	59%	10%	46%
North Darfur	Malha	58%	22%	34%
West Kordofan	Almayram	56%	19%	23%
South Darfur	EL Wihda	55%	15%	20%
West Darfur	Habila	55%	7%	52%
Red Sea	Gunb/Awlib	54%	33%	37%
North Darfur	Mellit	54%	6%	16%
Central Darfur	West Jabel Marra	54%	8%	17%
West Kordofan	Al Khowai	54%	13%	23%
North Darfur	Umkedada	53%	12%	6%
South Darfur	Gerida	53%	8%	28%
West Darfur	Kulbus	53%	12%	29%
West Kordofan	Abyei	53%	12%	11%
West Kordofan	Abo Zabad	53%	11%	23%
South Darfur	Netega	53%	15%	46%
West Kordofan	Al Udayyia	51%	10%	23%
Blue Nile	Kurmuk	51%	10%	32%
South Darfur	Mershing	50%	10%	18%
Red Sea	Agig	49%	8%	36%
Gadarif	East Galabat	49%	5%	6%
West Kordofan	Elsanoot	49%	7%	19%
East Darfur	El Firdos	48%	5%	38%
Gadarif	EL Gerisha	48%	8%	16%
North Darfur	Kutum	48%	8%	7%
North Darfur	Um Buru	48%	4%	21%
West Darfur	Bida	48%	3%	30%
North Darfur	Saraf Omra	46%	3%	46%
South Darfur	EL Salam	46%	10%	31%
South Darfur	Shataia	45%	10%	41%
North Darfur	Al lait	44%	3%	9%
North Kordofan	Sodari	44%	7%	32%
Blue Nile	El Rosaries	43%	5%	29%
Central Darfur	Wadi Salih	43%	3%	50%
South Darfur	EL Sunta	43%	9%	36%
Red Sea	Sinkat	43%	8%	36%
Central Darfur	Bindisi	43%	5%	53%
Blue Nile	El damazine	42%	2%	12%

West Kordofan	Babanosa	41%	5%	12%
Red Sea	Tokar	41%	10%	57%
Gadarif	EL Fashga	41%	5%	15%
North Darfur	Kornoi	41%	4%	28%
Kassala	Telkok	40%	7%	28%
West Kordofan	Elfoula	40%	6%	11%
South Darfur	Kass	40%	6%	15%
North Kordofan	Om Rwaba	39%	2%	31%
East Darfur	Yassien	38%	3%	35%
North Darfur	El Fasher	38%	7%	16%
East Darfur	Bahar EL Arab	38%	7%	43%
Blue Nile	EL Tadamon	37%	4%	28%
South Darfur	EL Radoom	37%	1%	22%
North Darfur	El Tewiasha	36%	2%	6%
East Darfur	Shearia	36%	5%	22%
North Kordofan	West Bara	36%	7%	18%
North Darfur	El serief	36%	5%	24%
South Kordofan	Dallami	36%	4%	18%
South Kordofan	Al Liri	35%	4%	13%
North Darfur	Dar El Salam	35%	1%	15%
East Darfur	Abu Jabra	34%	3%	40%
South Darfur	Dimso	34%	6%	29%
Central Darfur	Azoom	34%	8%	18%
North Kordofan	Gabrat Al Sheikh	33%	2%	20%
Gadarif	Galaa EL Nahal	33%	3%	18%
Gadarif	El Garbia	33%	4%	10%
Central Darfur	Zalengi	33%	6%	28%
Central Darfur	Mukjar	32%	8%	44%
South Darfur	North Nyala	32%	2%	12%
North Kordofan	Um Dam	32%	3%	14%
West Darfur	EL Genina	31%	3%	17%
South Darfur	Reheed EL Berdi	31%	3%	23%
East Darfur	ED Deain	31%	4%	26%
South Darfur	Um Dafog	30%	4%	32%
East Darfur	Asslaya	30%	5%	41%
Sinnar	Dinder	30%	1%	5%
South Kordofan	Elgoze	30%	9%	18%
East Darfur	Abu Karinka	29%	3%	34%
North Darfur	Kalimenda	29%	8%	9%
South Darfur	Kateela	29%	2%	24%
Kassala	Hamshkoreeb	28%	2%	45%

North Kordofan	Al rahad	28%	3%	15%
North Kordofan	Shikan	28%	6%	16%
West Darfur	Fur Barnga	28%	6%	31%
White Nile	EL Jableen	27%	4%	5%
White Nile	Guli	27%	2%	12%
South Kordofan	Elref Elsharig	27%	3%	12%
South Kordofan	Abukrshola	27%	4%	11%
East Darfur	Adila	27%	3%	37%
White Nile	EL Salam	27%	5%	11%
South Darfur	South Nyala	26%	3%	7%
Gadarif	AL Mafaza	26%	5%	20%
Sinnar	Abohugar	26%	4%	11%
South Darfur	Buram	26%	3%	16%
Kassala	North Delta	26%	4%	24%
Kassala	Wadelhelio	26%	4%	13%
South Kordofan	Abbasiya	25%	4%	7%
South Kordofan	Habila	25%	2%	20%
Sinnar	Sinja	25%	4%	6%
White Nile	Rabak	25%	4%	4%
South Darfur	Kabom	24%	4%	22%
White Nile	Kosti	24%	4%	9%
Khartoum	Jabel Awlia	23%	4%	1%
Khartoum	Um Bada	23%	2%	3%
Kassala	Al Girba	23%	4%	9%
AL Gazira	East El Gezira	22%	7%	1%
Sinnar	Al Suki	22%	1%	2%
Central Darfur	Um Dukhon	22%	0%	34%
South Darfur	ED EL Firsan	22%	3%	22%
Gadarif	El Bottana	22%	2%	37%
South Darfur	Tulus	22%	1%	22%
Gadarif	El Rahad	22%	3%	6%
South Kordofan	Gadir	22%	2%	23%
Gadarif	Basonda	21%	2%	15%
White Nile	Tendalti	21%	2%	8%
South Kordofan	Dilling	21%	3%	3%
Sinnar	Aldali	20%	5%	17%
Kassala	Rural Kassala	20%	2%	13%
North Kordofan	Bara	20%	4%	13%
South Kordofan	Kadugli	20%	5%	3%
Sinnar	East Sinnar	20%	2%	4%
South Kordofan	Talodi	20%	2%	8%

AL Gazira	Um AlQura	20%	3%	3%
Kassala	West Kassala	20%	4%	15%
Kassala	Aroma	19%	7%	38%
Khartoum	Khartoum	18%	3%	1%
AL Gazira	Al Qurashi	18%	2%	2%
Northern	Dongola	17%	1%	0%
Northern	Halfa	17%	3%	1%
AL Gazira	South El Gezira	17%	6%	2%
Kassala	Atbara River	16%	2%	8%
Khartoum	Bahri	16%	1%	0%
Sinnar	Sinnar	16%	1%	7%
Gadarif	Central Gadarif	16%	1%	25%
Khartoum	Karrari	15%	1%	2%
Red Sea	Port Sudan	15%	1%	1%
White Nile	EL Deweem	15%	1%	6%
Kassala	Kassala	15%	1%	1%
Khartoum	Sharg EL Neel	15%	1%	1%
White Nile	EL Geteena	14%	1%	1%
Khartoum	Om Durman	14%	1%	1%
White Nile	Um Rimta	14%	1%	4%
Red Sea	Suakein	14%	3%	13%
River Nile	Shendi	13%	0%	1%
Northern	Dalgoo	13%	2%	0%
AL Gazira	Almanagil	13%	1%	2%
River Nile	El Matamma	13%	0%	0%
Northern	Al Goled	12%	1%	0%
AL Gazira	Madani Alkobra	12%	2%	1%
AL Gazira	Al-Hasaheisa	12%	1%	1%
Northern	Merowe	11%	0%	0%
South Kordofan	Rashad	11%	1%	8%
AL Gazira	Al Kamlin	11%	1%	1%
Northern	Al Daba	11%	0%	0%
River Nile	Ad Damar	11%	0%	0%
South Kordofan	El Tadamoon	10%	1%	16%
South Kordofan	Abugebiha	10%	1%	10%
Northern	Alborgaig	9%	1%	0%
Gadarif	Gadarif	9%	1%	4%
Gadarif	Fau	8%	0%	13%
Kassala	Halfa El Jadeeda	7%	1%	0%
River Nile	Atbara	6%	0%	0%
River Nile	Berber	3%	0%	0%

River Nile	El Buhira	2%	0%	0%
River Nile	Abu Hamad	1%	0%	0%

Annex 3: Composition of WFP Sudan's Local Food Basket

Elements of the minimum healthy food basket		Sorghum	Onion	US Vegetable oil	Milk	Cow meat	Goat meat	Dry tomatoes	Sugar	Total minimum food basket
Commodity properties	Kcal/100g	335	40	885	68	240	360	258	400	
	g protein/100g	11	1.1	0	3	14.3	20.6	14.1	0	
	g fat/100g	3	0.1	100	4	18	32	3	0	
	g/capita/day	450	50	25	25	5	5	25	40	625
Food basket properties	Kcal/capita/day	1507.5	20	221.3	17	12	18	64.5	160	2020
	% kcal	75%	1%	11%	1%	1%	1%	3%	8%	1
	g protein/capita/day	49.5	0.6	0	0.8	0.7	1	3.5	0	56.1
	g fat/capita/day	13.5	0.1	25	1	0.9	1.6	0.8	0	42.8

Annex 4: Composition of WFP Sudan's multi-dimensional poverty index

Dimension	Indicator	Weight	Threshold for Deprivation
Food	Food Consumption (FCS)	1/6*1/2	Borderline or poor
	Food Coping (rCSI)	1/6*1/2	>= 19
Education	Education of the household head	1/6*1/1	No education
Health	Disability	1/6*1/2	At least one disabled member in the household
	Infant nutrition	1/6*1/2	Less than 2 meals consumed by the child
Shelter/Assets	Shelter building material	1/6*1/2	Plastic or thatch
	Assets ownership	1/6*1/2	No productive or wealth assets
WASH	Access to safe latrine	1/6*1/2	No access to an improved toilet
	Access to safe water source	1/6*1/2	No access to safe water sources
Livelihoods/Climate	Main income activity	1/6*1/2	Main income activities are food aid, remittances or gifts, selling of charcoal, grass, or firewood, and begging
	Constraint to farming and/or livestock activities	1/6*1/2	Households reporting dry spells or floods as a constraint