Chapter 8

FOOD CONSUMPTION PATTERNS AND DIETARY DIVERSITY AMID CONFLICT

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Sudan is currently experiencing one of the most severe food security crises globally. According to the Integrated Food Security Phase Classification (IPC) more than 21.2 million people—45 percent of the population—are acutely food insecure (IPC Phase 3 or above), with more than 146,000 people facing catastrophic levels of food insecurity (IPC Phase 5) as of February 2026 (IPC 2025). As of September 2025, El-Fasher (North Darfur) and the besieged town of Kadugli (South Kordofan) were classified as experiencing famine (IPC Phase 5) with reasonable evidence. These conditions were expected to persist through January 2026. The crisis has also led to the acute malnutrition of 4.7 million children under five and pregnant and breastfeeding women and girls (IPC 2024a).

This alarming situation is largely driven by the ongoing armed conflict between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF). The conflict has caused widespread displacement, disrupted markets and supply chains, damaged agricultural livelihoods, and severely limited humanitarian access. An estimated 7 million people have been displaced internally, with an additional 4.5 million having fled to neighboring countries (UNHCR 2026). Insecurity and restricted movement have negatively affected agricultural activities in key food-producing states such as Aj Jazirah, Sennar, Darfur, and Kordofan, exacerbating the crisis (UNFPA 2024).

In conflict contexts like Sudan, understanding food security dynamics requires more than macroeconomic or supply-side analyses. Household-level data on food consumption and nutrition are vital to assess not just food availability but also actual access and dietary quality at the individual and community levels (FSIN 2022; UNOCHA 2022). Indicators such as the Food Consumption Score (FCS), Minimum Dietary Diversity for Women (MDD-W), and nutrition-based proxies such as mid-upper arm circumference (MUAC) allow humanitarian actors to detect early signs of deterioration in food access and to target interventions more effectively (WFP 2008; FAO and

FHI 360 2016; UNICEF 2017). These indicators are especially crucial when formal monitoring systems are degraded or absent due to conflict (IPC 2021a; FEWS NET 2026).

In this chapter, we analyze trends in household food consumption, dietary diversity, and nutrition in Sudan before and during the current conflict, using data from the World Food Programme's (WFP's) Comprehensive Food Security and Vulnerability Assessments (CFSVA) conducted in early 2023 and early 2024, respectively. With this analysis, we aim to document the evolving impact of conflict on food security and nutrition and to inform evidence-based humanitarian and policy responses.

Among our key findings, the study shows a worsening across key food security indicators between 2023, prior to the eruption of conflict, and 2024, during the conflict. The prevalence of inadequate food consumption increased from 22 percent in 2022 to 33 percent in 2024. Conflict-affected states, such as East Darfur and South Kordofan, experienced the largest increases. The vast majority of women (84 percent) did not meet the minimum acceptable diet (MAD) threshold in 2024, which is an increase of 5 percentage points compared to 2023 (79 percent). Moreover, the consistent consumption of foods rich in vitamin A, protein, and heme iron decreased between 2023 and 2024, with an increase in the share of households never consuming these foods. These findings highlight the detrimental impact of conflict, macroeconomic deterioration, and disruption of livelihoods on the food security situation among populations in Sudan.

Methodology

Conceptual framework

This study is grounded in the understanding that armed conflict profoundly disrupts food systems, affecting every link in the chain—from production and markets to household access and individual consumption. In the case of Sudan, the ongoing conflict has not only displaced millions but has also destabilized agricultural livelihoods, damaged infrastructure, inflated food prices, and restricted humanitarian access, leading to a dramatic erosion in household food security in parts of the country (UNFPA 2024; IPC 2024b).

The conceptual framework guiding this analysis draws from the Food and Nutrition Security Framework and humanitarian food security models that emphasize four core pillars: food availability, access, utilization, and stability

(IPC 2021b). These pillars are used to understand how conflict-induced shocks affect both the supply and demand dimensions of food security, with a particular emphasis on access and utilization, which are often most severely impacted during crises (Maxwell et al. 2014).

A central premise of this framework is that household-level food consumption and dietary quality serve as effective proxies for understanding the real-time impacts of conflict on food security. These micro-level indicators offer granular and actionable insights into the severity and extent of food insecurity. This is especially critical in Sudan, where conflict dynamics vary widely by region and over time (FEWS NET 2026; UNOCHA 2022).

To operationalize this framework, the study employs three key indicators that capture different dimensions of food access and dietary quality. The FCS is used to measure household-level dietary diversity and food frequency, serving as a proxy for food access (WFP 2024b). The MDD-W assesses the micronutrient adequacy of diets among women of reproductive age, providing critical insight into gendered nutritional vulnerabilities (FAO and FHI 360 2016). Complementing these, the Food Consumption Score–Nutrition (FCS-N) disaggregates food consumption data to evaluate the frequency of intake of nutrient-rich food groups—specifically protein-, vitamin A-, and iron-rich foods—highlighting potential deficiencies in essential micronutrients (WFP 2024b).

Together, these indicators allow for a multidimensional analysis of food security and nutrition, extending beyond caloric sufficiency to assess dietary quality, vulnerability to malnutrition, and risk of micronutrient deficiencies. This framework also incorporates a temporal dimension, comparing preconflict and postconflict data (2023 versus 2024) to capture the evolving impact of violence and displacement on household consumption behaviors and nutritional outcomes.

Ultimately, this conceptual approach enables the study to move beyond macroeconomic or supply-side analyses and focus instead on the lived experiences of households and individuals, particularly women, under conditions of severe fragility. By anchoring the research in indicators that are globally recognized, field-tested, and context-relevant, the framework aims to provide evidence that is both analytically rigorous and programmatically useful for humanitarian planning, policy design, and targeted food and nutrition interventions in Sudan and comparable conflict-affected settings.

Measuring food consumption and dietary quality

Food Consumption Score

The FCS is a widely used proxy indicator developed by the WFP to assess household-level dietary diversity and food frequency. During food security assessments, enumerators ask respondents about the number of days in the past seven days that their household consumed specific food items. These items are grouped into eight standard food groups: staples, pulses, vegetables, fruits, meat and fish, milk, sugar, and oil.

Each food group is assigned a weight based on its relative nutritional value (for example, meat and dairy receive higher weights due to protein and micronutrient content). The weekly frequency reported for each food group is multiplied by its weight, and the values are summed to derive the FCS. Based on the total score, households are classified into three categories:

- Poor consumption: FCS ≤ 21
- Borderline consumption: 21.5 ≤ FCS ≤ 35
- Acceptable consumption: FCS > 35

While the FCS is simple to calculate and widely used for rapid assessments, offering a useful snapshot of food access and diversity, it does not account for portion size or intra-household food distribution and may overestimate dietary adequacy if small amounts of a food are consumed frequently (WFP 2008; FAO and WFP 2011).

Minimum Dietary Diversity for Women

The MDD-W is a globally recognized indicator that assesses the micronutrient adequacy of diets among women of reproductive age (15–49 years). It measures whether a woman has consumed at least 5 out of 10 specified food groups in the previous 24 hours. These food groups include grains, dairy, eggs, meat and fish, dark leafy greens, vitamin A–rich fruits and vegetables, legumes, nuts and seeds, and other fruits and vegetables.

The MDD-W is a critical indicator of women's access to a diverse and nutritious diet, which has strong implications for maternal and child health. It is particularly valuable in emergency contexts, where women are disproportionately affected by food insecurity and are key decision-makers in household food preparation (FAO and FHI 360 2016).

Food Consumption Score–Nutrition

The FCS-N is an extension of the FCS that disaggregates dietary data to assess the frequency of consumption of key micronutrient-rich food groups: protein-rich foods, vitamin A-rich foods, and iron-rich foods. This indicator helps to identify not just how diverse the diet is, but whether it includes critical nutrients essential for child growth, immunity, and development.

Protein-rich foods: meat, fish, dairy, legumes

Vitamin A-rich foods: orange vegetables, liver, dark green leafy vegetables

Iron-rich foods: red meat, organ meat

The FCS-N is especially useful for assessing the risk of micronutrient deficiencies and guiding nutrition-sensitive programming in food-insecure populations (WFP 2025).

Data

This chapter draws on primary data from the CFSVA conducted in Sudan by WFP (WFP 2024a). The CFSVA is an annual nationwide face-to-face assessment designed to evaluate household food access, consumption patterns, nutrition, and vulnerability.

Primary data from the first quarters of 2023 and 2024 offer a comparative look at food security trends before and during the conflict. However, the 2024 survey round faced operational constraints: due to insecurity and limited access, data could not be collected in severely affected states including North and South Darfur, West Kordofan, Khartoum, and Al Jazira.

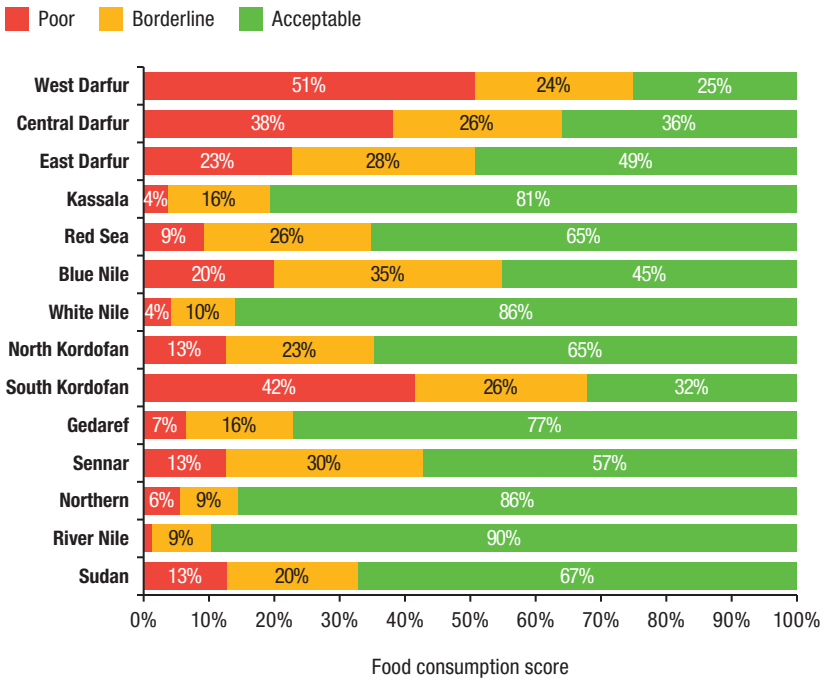
It is important to note that the data were collected during the postharvest season, which is when food security typically improves as food availability, even in conflict-affected areas, increases. The extent of deterioration in food access is therefore not fully captured. Moreover, as the conflict has evolved since data collection, these findings provide a snapshot rather than a comprehensive view of current conditions.

Results and discussion

National trends in food consumption

In the first quarter of 2024, 67 percent of Sudan's resident households had acceptable levels of food consumption (Figure 8.1), while 20 percent had borderline food consumption, and 13 percent had poor food consumption,

FIGURE 8.1 Food consumption by state, Sudan, 2024



Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

meaning that a total of 33 percent had inadequate food consumption. This is a worsening of 11 percentage points compared to 2023, when 22 percent of households in the assessed states had inadequate food consumption.[1] West Darfur had the highest prevalence of households with poor food consumption (51 percent), followed by South Kordofan (42 percent), and Central Darfur (38 percent). Similar deteriorations in food consumption have been documented in other conflict-affected regions. For example, in northern Nigeria, conflict-induced shocks have significantly worsened household food security and reduced dietary diversity (Olanrewaju and Balana 2023). Likewise, in Chad and Mali, increases in inadequate food consumption have been reported following conflict escalation (FAO and WFP 2023). These parallels reinforce

1 In 2023, 73 percent of resident households had acceptable food consumption, 21 percent had borderline food consumption, and 7 percent had poor food consumption.

the finding that conflict consistently drives reductions in household dietary quality across the Sahel region.

The prevalence of inadequate food consumption—that is, households reporting either poor or borderline food consumption and primarily consuming food from only few food groups—increased across the country, with at least one-third of households not consuming nutritionally adequate diets in 2024, which results in malnutrition, particularly among the most vulnerable population groups (children under five and pregnant and lactating women). While the level of food insecurity was high before the war, it has increased since the war began. The prevalence of inadequate food consumption significantly increased in South Kordofan, Sennar, and East Darfur, which are states that have been impacted by conflict, where food prices have increased, and where the functionality of markets has been disrupted (Figure 8.2).

Gender disparities in food consumption

A trend observed every year is that female-headed households have poorer food intake than male-headed households. Among female-headed households, in 2024, 48 percent had inadequate food consumption, up from 37 percent in 2023, while the share was 30 percent for male-headed households, up from 25 percent in 2023. WFP and other humanitarian entities use this information to target specific types of households for assistance. As female-headed households manifest worse food security outcomes, they are often prioritized for assistance. This gender gap is consistent with findings from rural Burkina Faso, where women's dietary diversity remains persistently low due to limited access to productive resources and markets (JRC 2025). It also mirrors evidence from conflict-affected northern Nigeria, where female-headed households face higher risks of food insecurity due to displacement and livelihood disruption (FAO and WFP 2023).

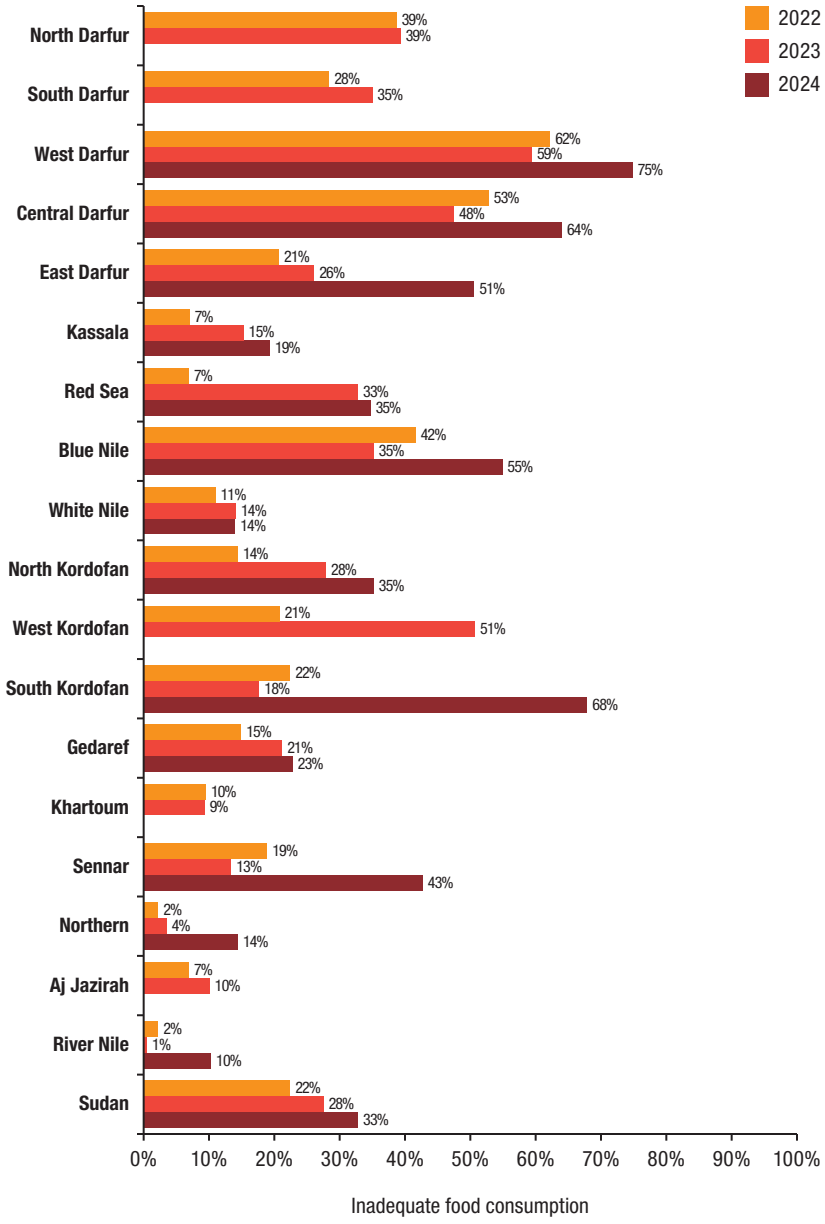
Women's dietary diversity: MDD-W results

Another important indicator is the MDD-W, which indicates whether women ages 15 to 49 consumed at least 5 out of 10 defined food groups[2] the previous day or night.[3] This proxy indicator reflects the micronutrient adequacy of women's diets. The results showed that in all states, most women did not

2 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; and other fruits.

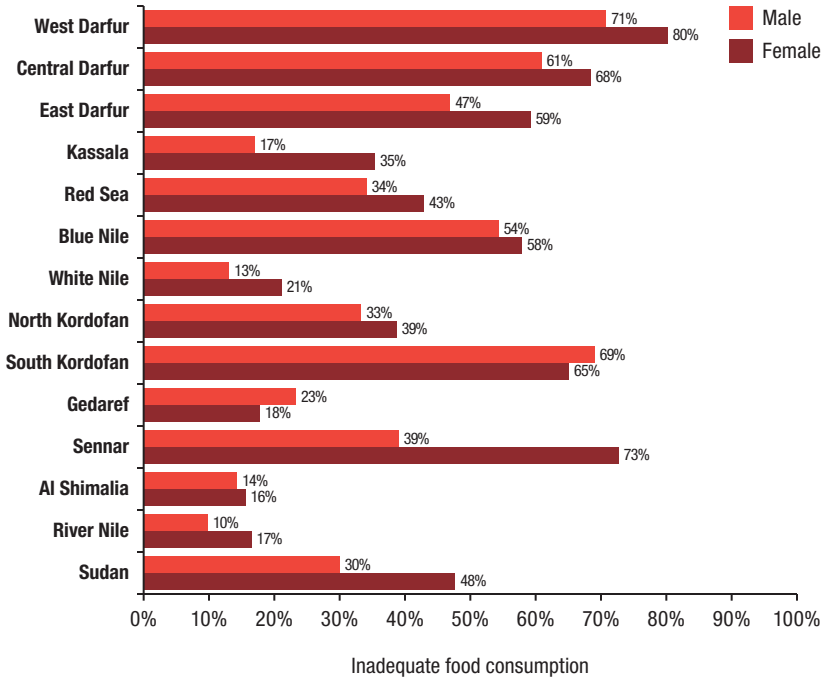
3 Food and Agriculture Organization, link: http://www.fao.org/3/a-i5486e.pdf

FIGURE 8.2 Prevalence of inadequate food consumption by state, Sudan, 2022, 2023, and 2024



Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

FIGURE 8.3 Prevalence of inadequate food consumption by gender of household head, Sudan, 2024



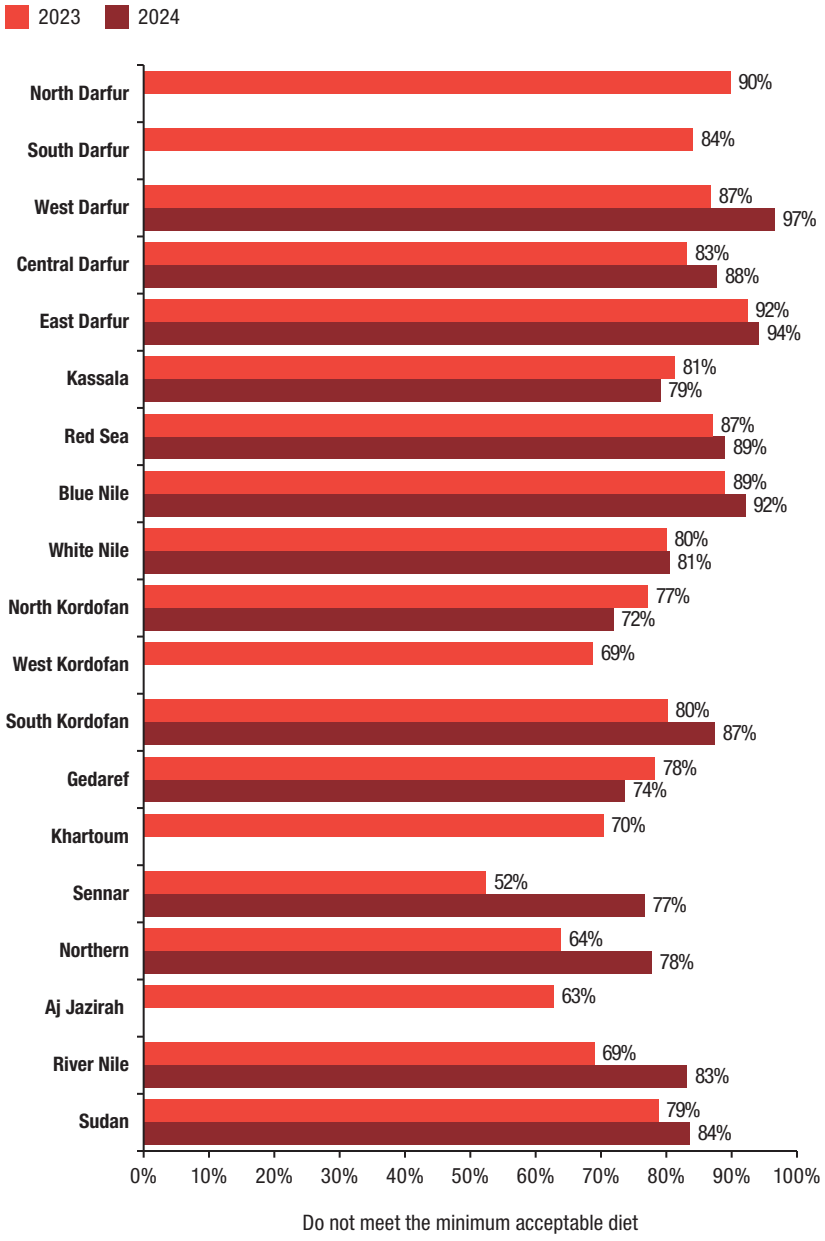
Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

meet the MAD threshold, which indicates intrahousehold disparity between male and female members in terms of food intake (Figure 8.4). As of 2024, 84 percent of women did not meet MAD, an increase of 5 percentage points compared to 2023 (79 percent); this highlights the importance of targeting women for both food and nutrition assistance.

Micronutrient consumption and FCS-N

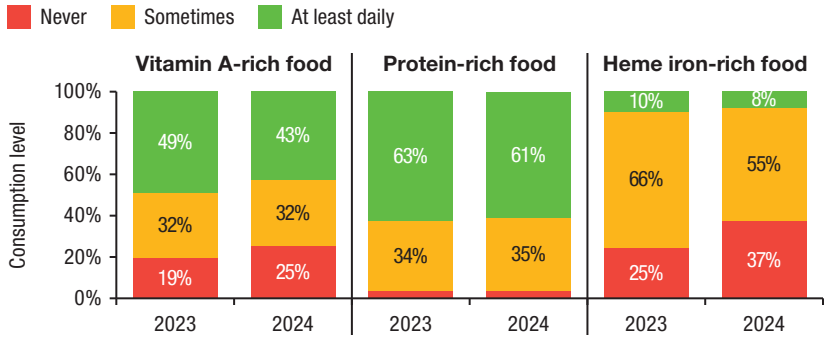
The FCS-N measures consumption of food rich in protein, iron, and vitamin A at the household level. Protein plays a key role in child growth and is crucial for the prevention of both wasting and stunting, which occurs largely within a child's first 1,000 days. Iron deficiency is one of the main causes of anemia. Vitamin A deficiency, if not tackled before the age of five, can increase child mortality and susceptibility to infectious diseases, such as measles and malaria.

FIGURE 8.4 Minimum Dietary Diversity for Women by state, Sudan, 2024



Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

FIGURE 8.5 Food Consumption Scores, all Sudan, 2023 and 2024



Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

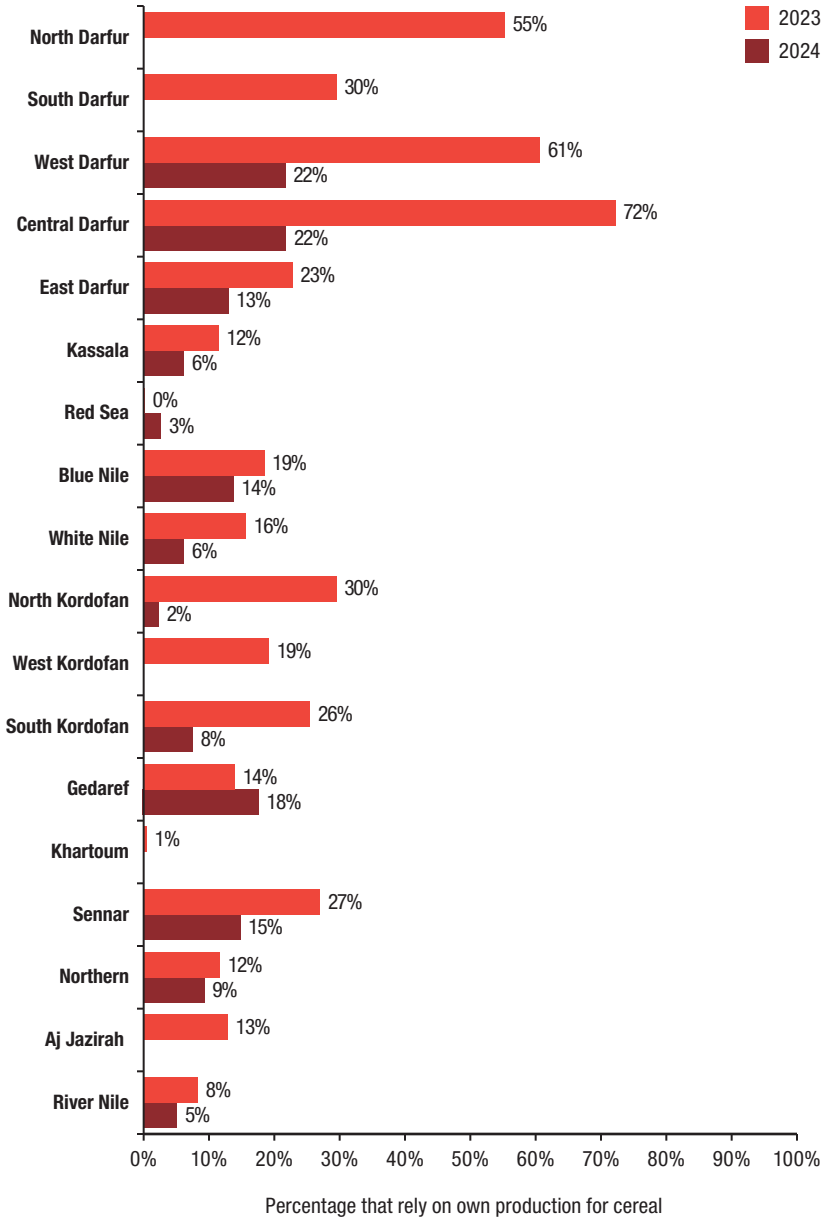
The FCS-N results indicate low consumption of vitamin A-rich foods, as after the war began, 25 percent of households were not consuming these foods (Figure 8.5). Furthermore, 37 percent of resident households reported never consuming foods rich in heme iron, a significant increase in malnourishment compared to before the onset of the war.[4] Comparable micronutrient deficiencies have been reported in other conflict settings. In Nigeria, the combination of conflict and food price shocks reduced calorie intake and worsened wasting among children (Akerele et al. 2024). Similarly, studies in Gaza have linked conflict-related market disruptions with reduced intake of vitamin A- and iron-rich foods (FAO 2024).

Decline in household food production

Moreover, households' ability to produce their own food has decreased, particularly in conflict-affected states in the Darfur region (Figure 8.6). Households' own production of cereals decreased while market reliance increased, reflecting the disruption of agricultural activities in many areas. Some households that rely on farming or crop production were displaced during the planting or cultivation season; the prices of agricultural inputs increased or the inputs became inaccessible; and rainfall in the 2024 season was below average. Information about households' food production can inform resilience activities to support farmers in increasing their output.

4 According to the 2023 CFSVA, 19 percent never consumed food rich in vitamin A, 4 percent never consumed food rich in protein, and 25 percent never consumed food rich in heme iron.

FIGURE 8.6 Percentage of households that rely on own production for their household cereal consumption by state, Sudan, 2023 and 2024



Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

TABLE 8.1 Prevalence of acute malnutrition in children under five years of age, Sudan, based on mid-upper arm circumference

	All n = 8,730	Boys n = 4,545	Girls n = 4,185
Prevalence of GAM	(1,665) 19.1% (18.3–19.9 95% C.I.)	(867) 19.1% (18.0–20.2 95% C.I.)	(798) 19.1% (17.9–20.3 95% C.I.)
Prevalence of MAM	(960) 11.0% (10.4 –11.7 95% C.I.)	(495) 10.9% (10.0–11.8 95% C.I.)	(465) 11.1% (10.2–12.1 95% C.I.)
Prevalence of SAM	(705) 8.1% (7.5–8.7 95% C.I.)	(372) 8.2% (7.4–9.0 95% C.I.)	(333) 8.0% (7.2–8.8 95% C.I.)

Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

Note: GAM = global acute malnutrition; MAM = moderate acute malnutrition; SAM = severe acute malnutrition. Mid-upper arm circumference is a simple measure of arm size used to assess acute malnutrition.

Nutritional status of women and children

The CFSVA also assesses the nutritional status of children and women of reproductive age. A total of 8,530 children under age five and 1,886 women of reproductive age were screened for MUAC and interviewed for nutrition indicators. Mothers/caregivers of the children were also interviewed about complementary feeding practices. The screening indicated that wasting among children 6 to 59 months remains at a critical level. Comparable proxy global acute malnutrition (GAM) rates that exceed the World Health Organization (WHO) emergency threshold have also been recorded in northern Nigeria and parts of Chad (IPC 2024a; WFP 2023), underscoring that Sudan's levels are in line with patterns observed in other places facing protracted conflict.

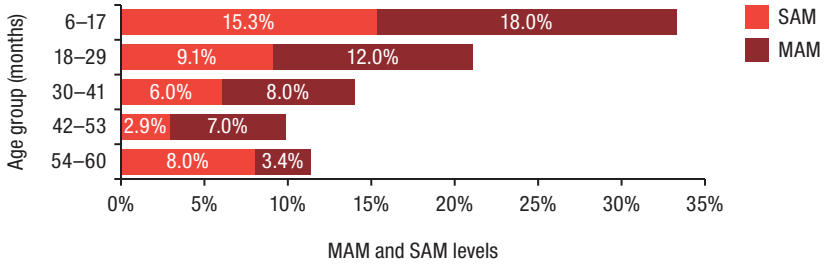
As shown in Table 8.1, overall proxy GAM was 19 percent, of which proxy moderate acute malnutrition was 11 percent and proxy severe acute malnutrition was 8 percent. These wasting rates exceed the WHO emergency threshold of 15 percent (WHO and UNICEF 2025). Levels of wasting were similar for boys and girls.

Across the age groups, the youngest children (6–17 months) show higher rates of proxy GAM than children of 18 to 29 months (Figure 8.7). Inadequate feeding practices are typically one of the major causes of malnutrition during the first two years of life. The figure also shows that the proxy GAM for this sample decreases with age.

There were, however, variations across assessed states, with the proxy GAM ranging from 4 percent to 59 percent (Figure 8.8). Five of the 13 states had a proxy GAM above 15 percent.

The CFSVA also used MUAC to assess women's nutritional status, finding that 26 percent of pregnant or lactating women were acutely malnourished

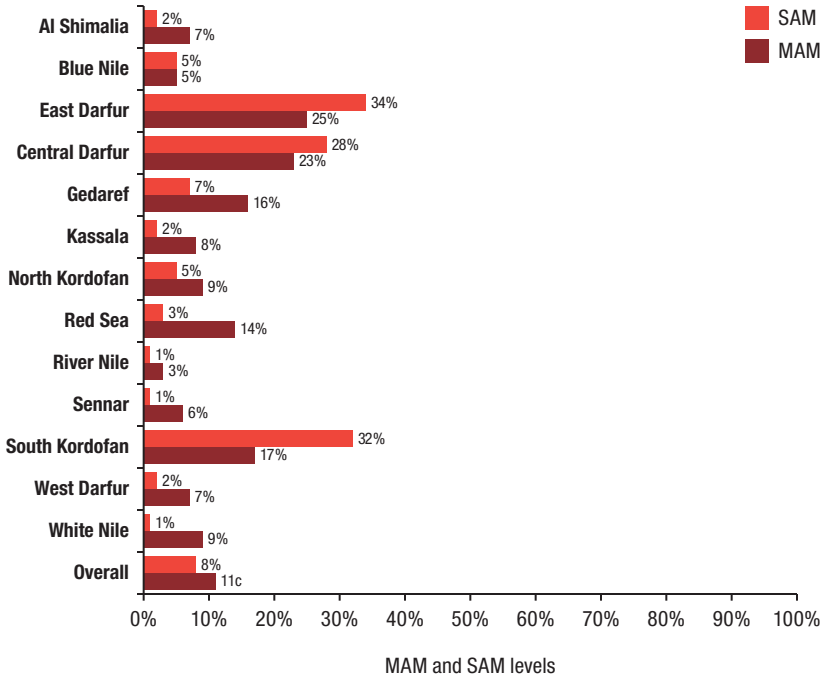
FIGURE 8.7 Proxy measures of wasting in children under five, by age, Sudan, 2024



Source: Authors' calculations based on 2024 CFSVA data (WFP 2024a).

Note: MAM = moderate acute malnutrition; SAM = severe acute malnutrition. Age is measured in months.

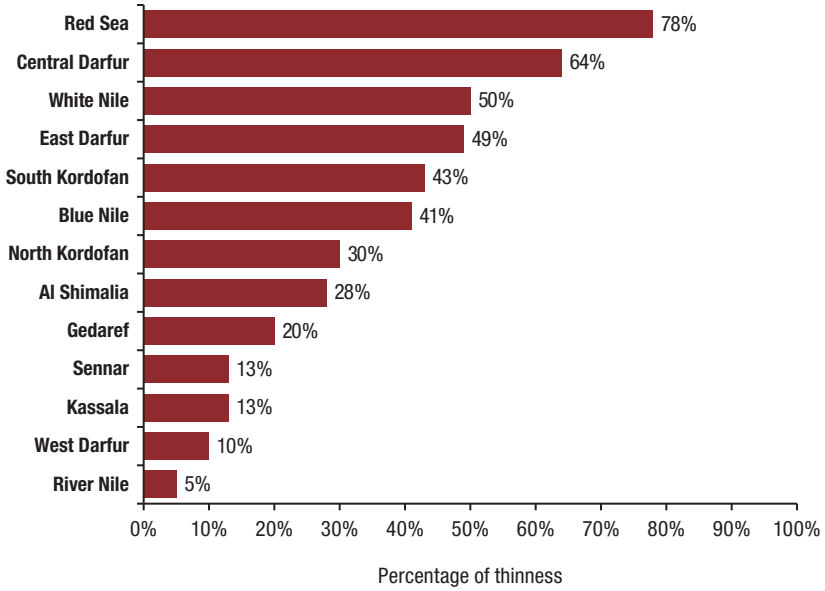
FIGURE 8.8 Proxy severe and moderate acute malnutrition levels by state, Sudan, 2023–2024



Source: Authors' calculations based on 2024 CFSVA data (WFP 2024a).

Note: MAM = moderate acute malnutrition; SAM = severe acute malnutrition. MAM and SAM were measured through mid-upper arm circumference.

FIGURE 8.9 Proxy thinness of women, Sudan, 2024



Source: Authors' calculations based on 2024 CFSVA data (WFP 2024a).
Note: Proxy thinness is determined through a mid-upper arm circumference of <230 mm.

(Figure 8.9). The largest proportion was found in Red Sea state (78 percent), while the smallest (5 percent) was reported in River Nile state.

Complementary feeding practices

Complementary feeding involves providing infants with other foods in addition to breastmilk from the age of six months, as breastmilk alone is insufficient to meet their increasing nutritional needs. For complementary foods to meet nutrient requirements, they should comprise a variety of food groups, given at the right amount and frequency for the child's age. Inadequacy in any of these factors means that nutrient needs are not met, ultimately resulting in malnutrition. In addition to care practices, food security is a key factor for achieving adequate complementary feeding.

The assessment indicated that 80 percent of children ages 6 to 23 months are breastfeeding, but only 37 percent met the threshold for MDD, consuming at least five of eight food groups (Table 8.2). Moreover, only 19.7 percent of children ages 6 to 23 months met the recommended minimum meal

TABLE 8.2 Minimum acceptable diet and subcomponents, disaggregated by age group, Sudan, 2024

Age category	Breastfed (percent)	Minimum meal frequency (percent)	Minimum dietary diversity (percent)	Minimum acceptable diet (percent)
6–11 months	93.0	24.2	28.8	10.4
12–17 months	85.7	15.5	40.3	8.7
18–23 months	62.8	19.1	42.6	11.2
Overall	80.7	19.7	37.1	10.1

Source: Authors' calculations based on 2024 CFSVA data (WFP 2024a).

frequency for other foods in addition to breastmilk. Using MAD as the standard, 10 percent of children 6 to 23 months were deemed malnourished.

Variation is also observed across the different age groups and states, specifically in children ages 12 to 17 months, which indicates potentially fatal malnutrition—painting a bleak picture for young children if malnutrition is not addressed. Around 14 percent of children had some kind of illness in the two weeks preceding the survey (Figure 8.10). The proportion of children who had experienced a fever in the prior two weeks ranged from 20 percent in Gedaref to 42 percent in Red Sea (Figure 8.10).

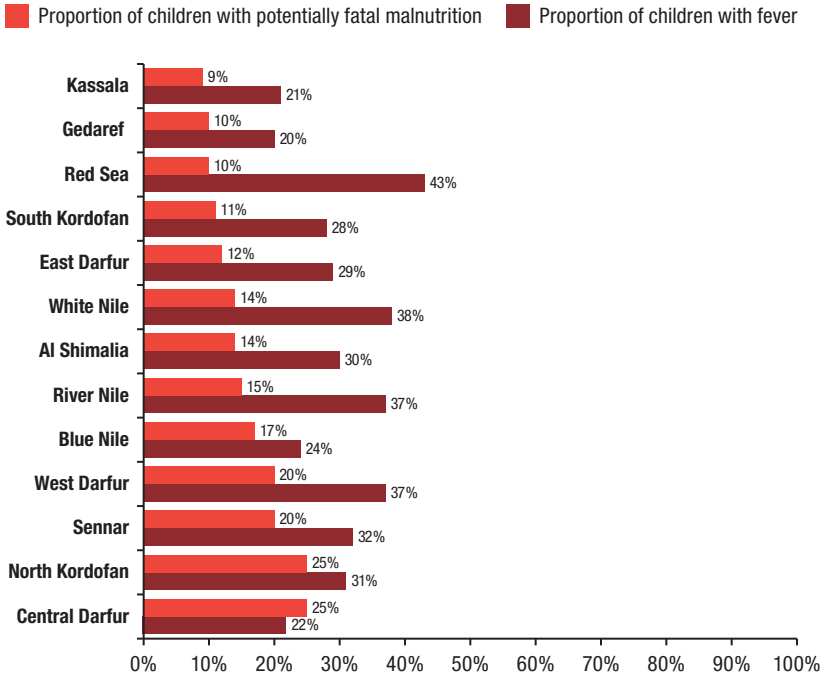
Information on household food consumption, dietary diversity, and nutrition status is used to inform the responses of WFP and other humanitarian actors. The CFSVA data remain the cornerstone of WFP's prioritization of geographic areas and populations for assistance. Assistance provided by WFP and other partners makes an important difference for communities. For instance, humanitarian assistance helped to reduce the risk of famine in six areas in Central Darfur and two areas in West Darfur, where nearly 1 million people received regular WFP food or cash aid during 2024.

Conclusions and policy implications

This chapter assesses the impacts of Sudan's ongoing conflict on household food consumption patterns, dietary diversity, and nutrition outcomes. By analyzing data from the WFP's CFSVA for 2023 and 2024, the chapter provides a granular, evidence-based understanding of how conflict has reshaped food security dynamics across the country—especially for vulnerable groups such as women and children.

The data from the 2023 and 2024 CFSVA surveys highlight a significant deterioration in food consumption and dietary quality in Sudan since the outbreak of conflict. By early 2024, one in three households had inadequate

FIGURE 8.10 Proportion of children with potentially fatal malnutrition and fever in the last two weeks, Sudan, 2024



Source: Authors' calculations based on 2023–2024 CFSVA data (WFP 2024a).

food consumption, an 11 percentage point increase from the previous year. The worst conditions were observed in conflict-affected states such as West Darfur, South Kordofan, and Central Darfur. Gender disparities were pronounced, with 48 percent of female-headed households food insecure, compared with 30 percent among male-headed households. Women also experienced worsening dietary diversity: 84 percent of women of reproductive age failed to meet the MDD threshold in 2024, up from 79 percent in 2023. Micronutrient consumption declined across the board. A quarter of households did not consume any vitamin A-rich foods, and 37 percent reported no intake of iron-rich foods.

Child nutrition outcomes are alarming. The proxy GAM rate among children under five stood at 19 percent, exceeding the WHO emergency threshold. The state of women's nutrition was similarly dire, with 26 percent of pregnant or lactating women acutely malnourished. Complementary

feeding practices remain inadequate, and only 10 percent of children ages 6–23 months meet MAD.

While seasonal and geographic disparities exist, the convergence of conflict, displacement, economic decline, and inadequate humanitarian access has led to widespread undernutrition, dietary monotony, and deteriorating child health. The assessment underscores the urgent need to prioritize not just food quantity, but dietary quality, particularly for women and young children.

Policy and programmatic recommendations

To address the escalating food insecurity and malnutrition in Sudan, immediate and well-targeted humanitarian interventions are essential. Within these interventions, priority should be given to vulnerable populations, especially female-headed households, pregnant and lactating women, and children under age five, who face the most severe nutritional deficits. Strengthening nutritional screening and supplementation programs can help identify at-risk individuals early and reduce mortality and morbidity associated with severe acute malnutrition.

Alongside emergency assistance, there is a critical need to invest in recovery and resilience-building efforts. Agricultural production must be restored in relatively stable areas through the provision of seeds, tools, and inputs, as well as support to smallholder farmers affected by displacement and market disruption. Restoring local food production is essential to reduce market dependence and stabilize food access over the medium term. Livelihoods programming should also include support to informal markets and income-generating activities, particularly those led by women, to help households rebuild purchasing power and diversify food sources.

Finally, nutrition-sensitive programming should be mainstreamed across sectors. Health, water, sanitation, and education services must be linked to food security initiatives to address the underlying drivers of malnutrition. Complementary feeding programs, promotion of diverse diets, and community-based nutrition education are crucial, particularly for young children and women. Equally important is improved coordination among humanitarian actors, local authorities, and international donors to ensure access to conflict-affected populations and to scale assistance efficiently and equitably. Peacebuilding efforts that enhance stability and enable humanitarian access are vital to creating a sustainable pathway out of Sudan's food crisis.

Limitations and suggestions for future research

This analysis is primarily descriptive and relies on secondary survey data, which limit causal interpretation. Conflict was treated as an external, given factor, without controlling for other potential drivers of food insecurity such as climatic shocks, economic instability, or governance challenges. Moreover, the study did not disaggregate food security outcomes between more and less conflict-prone areas, which could provide deeper insights into the spatial heterogeneity of impacts. Future research should employ econometric or spatial analysis methods to isolate the effects of conflict from other determinants of food insecurity and explore how varying levels and types of conflict influence nutrition and livelihoods over time. Longitudinal data and mixed-methods approaches could also strengthen understanding of household adaptation and resilience in Sudan's situation and similar protracted crises.

References

Akerele, D., O. Fadare, A. Ogunniyi, O. Adeyemi, and M. Rufai. 2024. "Effects of Food Price Changes on Child Undernutrition Among Agricultural Households in Nigeria." *World Development Sustainability* 4:100158. https://doi.org/10.1016/j.wds.2024.100158

FAO (Food and Agricultural Organization of the United Nations). 2024. "GIEWS Update – Palestine, Population of the Gaza Strip at Risk Due to Conflict." FAO Global Information and Early Warning System (GIEWS). https://openknowledge.fao.org/server/api/core/bitstreams/ca4d5997-653e-4fe1-8e1b-002d1bcfc627/content#:~:text=Food%20security%20in%20the%20Gaza,been%20estimated%20at%2026%20percent

FAO and FHI 360. 2016. *Minimum Dietary Diversity for Women: A Guide for Measurement*. https://openknowledge.fao.org/handle/20.500.14283/i5486e

FAO and WFP (World Food Programme) WFP. 2011. *Guidelines for Measuring Household and Individual Dietary Diversity*. https://www.fao.org/agrifood-economics/publications/detail/en/c/122321/

FAO and WFP. 2023. *Monitoring Food Security in Food Crisis Countries and Territories with Conflict Situations*. FAO and WFP. https://openknowledge.fao.org/handle/20.500.14283/cc5722en

FEWS NET (Famine Early Warning Systems Network). 2026. "Sudan | Latest Food Security Analysis." Accessed February 17, 2026. https://fews.net/east-africa/sudan

FSIN (Food Security Information Network). 2022. "Sudan." In *Global Report on Food Crises 2022*, 195–199. FSIN. https://www.fightfoodcrises.net/global-report-food-crises

IPC (Integrated Food Security Phase Classification). 2021a. *Sudan: Acute Food Insecurity Situation September 2021 – March 2022*. IPC. https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1154254/

IPC. 2021b. *Technical Manual Version 3.1: Evidence and Standards for Better Food Security and Nutrition Decisions*. IPC. https://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/manual/IPC_Technical_Manual_3_Final.pdf

IPC. 2024a. *Sudan: Acute Food Insecurity Situation, October 2023 – February 2024 and Projection for March – May 2024*. IPC. https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1154254/

IPC. 2024b. *Sudan: Acute Food Insecurity Snapshot – Mid 2024*. IPC. https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1159791/

IPC. 2025. *Sudan: Acute Food Insecurity Situation September 2025 – May 2026. Integrated Food Security Phase Classification.* https://reliefweb.int/report/sudan/sudan-ipc-acute-food-insecurity-analysis-september-2025-may-2026-issued-november-2025

JRC (European Commission Joint Research Centre). 2025. *Gender Equality and Food Systems - A Knowledge Review*. Science for Policy Brief No. JRC140233. Knowledge4Policy. https://publications.jrc.ec.europa.eu/repository/handle/JRC140233

Maxwell, D., P. Hailey, and L. Spainhour Baker. 2014. *Alternatives for Monitoring Food Security in Real Time in Somalia*. Feinstein International Center, Tufts University. https://fic.tufts.edu/assets/Alternatives-for-Monitoring-Food-Security-in-Real-Time-in-Somalia.pdf

Olanrewaju, O., and B.B. Balana. 2023. "Conflict-Induced Shocks and Household Food Security in Nigeria." *Sustainability* 15(6):1–15. https://ideas.repec.org/a/gam/jsusta/v15y2023i6p5057-d1095691.html

UNFPA (United Nations Population Fund). 2024. *Sudan Emergency Situation Report No. 18*. UNFPA. https://reliefweb.int/report/sudan/unfpa-sudan-emergency-situation-report-no-18-november-2024

UNHCR (United Nations High Commissioner for Refugees). 2026. *Sudan Situation Map Weekly Regional Update – 02 February 2026*. UNHCR. https://data.unhcr.org/en/documents/details/120945

UNICEF. 2017. *Measuring Mid-Upper Arm Circumference (MUAC)*. UNICEF. https://www.unicef.org/media/120256/file/MUAC_guidelines.pdf

UNOCHA (United Nations Office for the Coordination of Humanitarian Affairs). 2022. *Sudan Humanitarian Needs Overview 2023*. UNOCHA. https://www.unocha.org/publications/report/sudan/sudan-humanitarian-needs-overview-2023-november-2022

WFP (World Food Programme). 2008. *Food Consumption Analysis: Calculation and Use of the Food Consumption Score in Food Security Analysis*. WFP.

WFP. 2023. *Cadre Harmonis?: Harmonized Framework for the Identification of Areas and Populations in Food and Nutrition Insecurity—Chad and Nigeria Analysis Update, November 2023.* Rome: WFP and CILSS. https://www.ipcinfo.org

WFP. 2024a. *Comprehensive Food Security and Vulnerability Assessment (CFSVA), Q1 2024*. WFP.

WFP. 2024b. *Food Consumption Score & Food Consumption Score Nutritional Analysis: Guidance Note*. WFP. https://docs.wfp.org/api/documents/WFP-0000158062/download/

WFP. 2025. *Food Consumption Score Nutritional Quality Analysis (FCS-N): Guidance Note*. WFP. https://docs.wfp.org/api/documents/WFP-0000158062/download/

WHO (World Health Organization) and UNICEF. 2025. *Global Nutrition Targets 2030: Child Wasting Brief*. World Health Organization. https://doi.org/10.2471/B09520