SPARC
Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises

ISSN 2977-9669
December 2025

TECHNICAL REPORT

FOOD PRICES IN MALI AND SUDAN

Changes, causes, consequences and responses – May 2025 update

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How to cite: Wiggins, S., Barry, B., Patel, N. and Sulieman, H. (2025) *Food prices in Mali and Sudan: changes, causes, consequences and responses – May 2025 update*. Technical Report. London: SPARC Knowledge (https://doi.org/10.61755/AEYM4467).

About SPARC – IDRC

Climate change, armed conflict, environmental fragility and weak governance, and the impact these have on natural resource-based livelihoods, are among the key drivers of both crisis and poverty for communities in some of the world's most vulnerable and conflict-affected countries.

Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises (SPARC) aims to generate evidence and address knowledge gaps to build the resilience of millions of pastoralists, agro-pastoralists and farmers in these communities in sub-Saharan Africa and the Middle East.

We strive to create impact by using research and evidence to develop knowledge that improves how the United Kingdom's Foreign, Commonwealth and Development Office (FCDO), Canada's International Development Research Centre (IDRC), donors, non-governmental organisations (NGOs), local and national governments, and civil society can empower these communities in the context of climate change.

Acknowledgements

This work was carried out with the aid of a grant from Canada's International Development Research Centre (IDRC), awarded in partnership with the Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises (SPARC) programme, which is funded by the United Kingdom's Foreign, Commonwealth & Development Office (FCDO).

We are grateful to all the people in Mali who made time to answer our questions. Two reviewers, one from within the SPARC consortium, the other external, provided highly pertinent and helpful comments that have helped much improve the first draft.

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ABBREVIATIONS

BCEAO	Banque Centrale des États de l'Afrique de l'Ouest
CPI	Consumer Price Index
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
FCFA	Franc CFA, Mali currency
FEWS NET	Famine Early Warning Systems Network
GIEWS	Global Information and Early Warning System, FAO
IPC	Integrated Food Security Phase Classification
IDP	Internally displaced person
IMF	International Monetary Fund
k	Thousand
kg	Kilogramme
M	Million
NGO	Non-governmental organisation
RSF	Rapid Support Forces
SAF	Sudanese Armed Forces
SDG	Sudanese pound
SPARC	Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises
t	Tonne, metric tonne
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
US	United States
US$	US dollar
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VAM	Vulnerability Assessment Monitoring
WFP	United Nations World Food Programme

EXECUTIVE SUMMARY

Background and motivation

This paper updates a previous one (Wiggins et al., 2023), which examines movements of cereals prices in Mali and Sudan, causes of such movements, effects on vulnerable people and public responses from 2020 to 2023. The earlier study was carried out in reaction to the huge rises in the world prices of cereals (fuel and fertiliser) – some had doubled or more – with the concern that higher prices might then transmit to domestic markets in the Global South.

This paper extends that analysis from 2023 to mid-2025.

Key findings of the earlier study are that:

- Cereal prices in both countries had doubled or more since early 2020.
- The price rises were (very) largely a result of domestic drivers. In Mali, low rains in 2021 – combined with conflict that reduced cultivated areas – led to low harvest and then to higher cereals prices. In addition, the Economic Community of West African States (ECOWAS) trade embargo that applied to Mali in the first half of 2022 interrupted the supply of fertiliser, pushing up its price. In Sudan, extremely high domestic inflation explained most of the price increases in cereals. Increases in world prices played only a small part in pushing up higher prices for cereals in the two countries.
- Most people living on low incomes, vulnerable to higher food prices, tried to cope by economising on their diets by cutting out costly foods, giving up small luxuries such as moto-taxi rides and trying to earn more by taking on more work.
- Those already struggling to make ends meet – people in households lacking assets, savings and labour – were pushed towards eating wild foods and begging.
- Public responses – from government, donors, NGOs (both international and local) – were limited compared to the scale of hardship inflicted by higher prices. In Mali, the government tried to subsidise prices of staple foods and other essential items, but with only a small budget to do so, it had seemingly little effect.
- Otherwise, agencies responded by trying to reach hard-hit households with cash grants and food parcels, or by providing nutrition interventions, for example, to protect infants and mothers against malnutrition.

Since 2023, world prices of cereals (fuel and fertiliser) have declined from their peak in mid-2022. Both countries have, however, seen increased conflict. In Mali, the insurgency that was largely contained within the north of the country has spread to the centre, south and even the west. In Sudan, civil war broke out in April 2023 as the Sudanese Armed Forces (SAF) fought with the paramilitary Rapid Support Forces (RSF) for national control, with intense conflict in Khartoum and in the west of the country, above all in Darfur.

Data sources

To examine food price changes, we drew on monthly price data collected by Vulnerability Assessment Monitoring (VAM) teams from the United Nations World Food Programme (WFP). To look for potential drivers of price changes, we examined: cereal harvests and likely causes of changes – droughts, floods, conflict, etc.; imports of cereals whether as whole grain or flour; overall inflation in the domestic economy; and any other factor identified in the literature that might affect food prices.

To see how people had been affected by price changes, we drew on secondary literature, above all the reports from the Famine Early Warning Systems Network (FEWS NET) (United States Agency for International Development, USAID), the Global Information and Early Warning System (GIEWS) (Food and Agriculture Organization of the United Nations, FAO) and WFP. We interviewed 18 selected respondents in Mali for their direct experience of living with rising food prices. To record public responses to price rises and their effects, we reviewed documents on government policy, and those from NGO and donor sources. In Mali, we also asked the selected informants what they had observed of public responses. Data, literature and interviews were collected in late 2024 and the first half of 2025.

Findings

Prices of cereals have increased greatly since early 2020 in both Mali and Sudan, with Sudanese prices rising by many multiples in an economy experiencing hyperinflation.

Since early 2020, it is increasingly clear that world prices have had only a small influence on domestic prices in Mali and Sudan; this is most clearly seen since mid-2022 when world prices have been falling, while those in Mali and Sudan have remained high. The fundamental problem in both countries is that per capita domestic cereal production has fallen markedly over the last five years or more. Harvests have barely increased, while the population has grown. It is not hard to diagnose the reasons for faltering harvests: in the face of conflict affecting much of both countries, farmers struggle to plant, tend and harvest crops – indeed, hundreds of thousands of farmers have been displaced and no longer work their original farms – while disruptions to trading reduce the incentive to produce a surplus.

The consequences of higher prices of staple foods have been predictably dire for people on low incomes: they have been forced to economise on food, eating the cheapest foods and often eating less. They have further cut spending on health care and schooling for their children, with many children removed from school entirely. Assets have been sold, loans have been taken out. Searching for extra income, people have had to take on arduous jobs or very low-paid employment, and sometimes both. Only a few options offer good returns to labour, but these also entail risks: informal gold mining, migration from rural areas to towns and sometimes leaving the country altogether.

In areas of (active) conflict in Sudan, the situation has become desperate: in parts of Darfur from 2024 onwards the Integrated Food Security Phase Classification (IPC) had reached phase five, famine, while large areas of the rest of the country were considered at phase four, food emergency.

Public responses – from government, donors, and local and international NGOs – have been insufficient to alleviate hardship. Most hard-hit households have had to cope with whatever resources they and their close families, friends and neighbours could muster.

Discussion

Options to prevent food prices rising, or at least to prevent the extraordinarily high increases seen in Mali and Sudan, include:

- Importing more cereals to make up for domestic harvest losses – surprisingly, given harvest failures, there were no increased imports in either country in years of poor harvests. This is puzzling: domestic production had fallen to levels where imported grains, even after costly transport to the inland markets of Mali and Sudan, would have been cheaper.
- Holding public stocks to cover harvest losses — but neither country held stocks of sufficient size.
- Controlling prices or subsidising prices of staple foods – the former unfeasible, the latter too costly.
- Reducing the incidence and severity of harvest failures – for which there are agricultural development options, but which are difficult to fund and implement when large parts of both countries are conflict zones.

If governments struggle to contain food prices, can the worst effects be contained? The hardship and distress to people on low incomes caused by higher prices is all too clear; raising the question of whether hardship is temporary – something people can survive, able to resume fuller lives with hopes and expectations when prices fall back or their incomes rise – or is hardship threatening long-term welfare? The latter particularly applies to children caught up in current food crises who may, as infants, suffer malnutrition that impedes their mental and physical development, a lifetime impairment, and who may be unable to go to school, potentially another lifetime disadvantage. Whatever national and international resources exist to provide some relief should prioritise children, albeit not necessarily exclusively so.

Overall, this update prompts the question of what food policy should be in conflict zones; one addressed in a previous SPARC study about livelihoods in areas of conflict (Wiggins et al., 2021). That report has two key messages that apply to this paper. One is that even in situations of conflict, most people do whatever they can to maintain some livelihoods activity; and hence agencies seeking to provide relief need to think more widely about what support may help people who either try to maintain economic activities or undertake new ones that are viable in conflict.

The other message is that local and regional trading often persists to a remarkable extent during conflicts and plays a vital role in allowing people to earn income – and to acquire goods, including additional food. Food prices may escalate under conflict, but if there were no local trading, then there might be no food at all in local markets – leading to famine conditions. Actions to sustain trading can be valuable, whether to maintain and repair roads and bridges, or to find ways to recapitalise traders who have lost vehicles, stores and cash to conflict.

1. INTRODUCTION

1.1 Background

From April 2020, world prices of cereals, fertilisers and oil began to rise, which accelerated when Russia embarked on its full-scale invasion of Ukraine in late February 2022. World prices peaked in May to June 2022, by which time prices had risen – in constant terms by 181% for crude oil, 144% for (an index of) fertiliser, 28% for the agriculture index, 73% for maize and by 111% for wheat. Russia's full-scale invasion brought the attention of world leaders and international agencies to the already increased world prices of cereals, fertiliser and oil – and the prospect that the war would reduce exports of maize, wheat and fertiliser from Black Sea ports, driving prices still higher. Agencies, leaders and commentators became alarmed at how higher world prices would affect people living on low incomes in the Global South.[1]

The local market in Karma, Sudan
© Sergey-73/Shutterstock

1 Commentaries on expected impacts were drafted by research institutes and think tanks (Gill, 2022; Glauber and Laborde, 2022; Mitchell et al., 2022, Smith, 2022); as well as by the business press (Financial Times, 2022; The Economist, 2022). The likely impact on Egypt and Yemen, countries heavily dependent on wheat imports from Russia and Ukraine, was a particular focus of concern (Abay et al., 2022; Kurdi et al., 2022; World Bank, 2022).

In 2022 FCDO commissioned SPARC researchers to explore the potential impacts of higher world prices in the countries covered by the consortium (the Sahel from Mauritania to Somalia, plus Syria and Yemen). The exposure of Kenya, Mali, Sudan and Yemen to international price increases for cereals and fertiliser was assessed (Wiggins, 2022). The food systems of 14 countries[2] that the FCDO considered to be particularly at risk of food crises and emergencies were scanned to assess their vulnerability to higher world prices (Mendez Parra et al., 2023).

Those studies were followed up by a more detailed examination of what had happened to food prices in Mali and Sudan since 2020, with what effects, and with what public responses (Wiggins et al., 2023). Published in 2023, key findings of that study include the following:

- Prices of cereals in both countries had at least doubled since early 2020.
- The price rises were (very) largely a result of domestic drivers. In Mali, low rains in 2021 combined with conflict that reduced cultivated areas led to low harvest and then to higher. In addition, the ECOWAS trade embargo that applied to Mali in the first half of 2022 interrupted the supply of fertiliser, pushing up its price. In Sudan, extremely high domestic inflation explained most of the price increases in cereals. Increases in world prices played only a small part in pushing up higher cereals prices in the two countries.
- Most people living on low incomes, vulnerable to higher food prices, tried to cope by economising on their diets, cutting out costly foods; giving up small luxuries such as moto-taxi rides; and trying to earn more by taking on more work.
- Those already struggling to make ends meet – people in households lacking assets, savings and labour – were pushed towards eating wild foods and begging.
- Public responses – from government, donors, NGOs (local and international) – were limited compared to the scale of hardship inflicted by higher prices. In Mali, the government tried to subsidise prices of staple foods and other essential items, but with only a small budget to do so, it had seemingly little effect.
- Otherwise, agencies responded by trying to reach hard-hit households with cash grants and food parcels, or by providing nutrition interventions, for example, to protect infants and mothers against malnutrition.

It is time to learn what has happened subsequently. World prices of cereals, fertiliser and fuel have fallen back considerably from the peaks seen in mid-2022 (see Box 1) but, as will be seen, domestic prices in Mali and Sudan have not followed suit.

In both countries, the context since 2022 has been one of increased conflict. In Mali, the insurgency that was largely contained within the north of the country has spread to the centre, south and even the west. In Sudan, civil war broke out in April 2023 as SAF fought with the RSF for national control, with intense conflict in Khartoum and in the west of the country, above all in Darfur.

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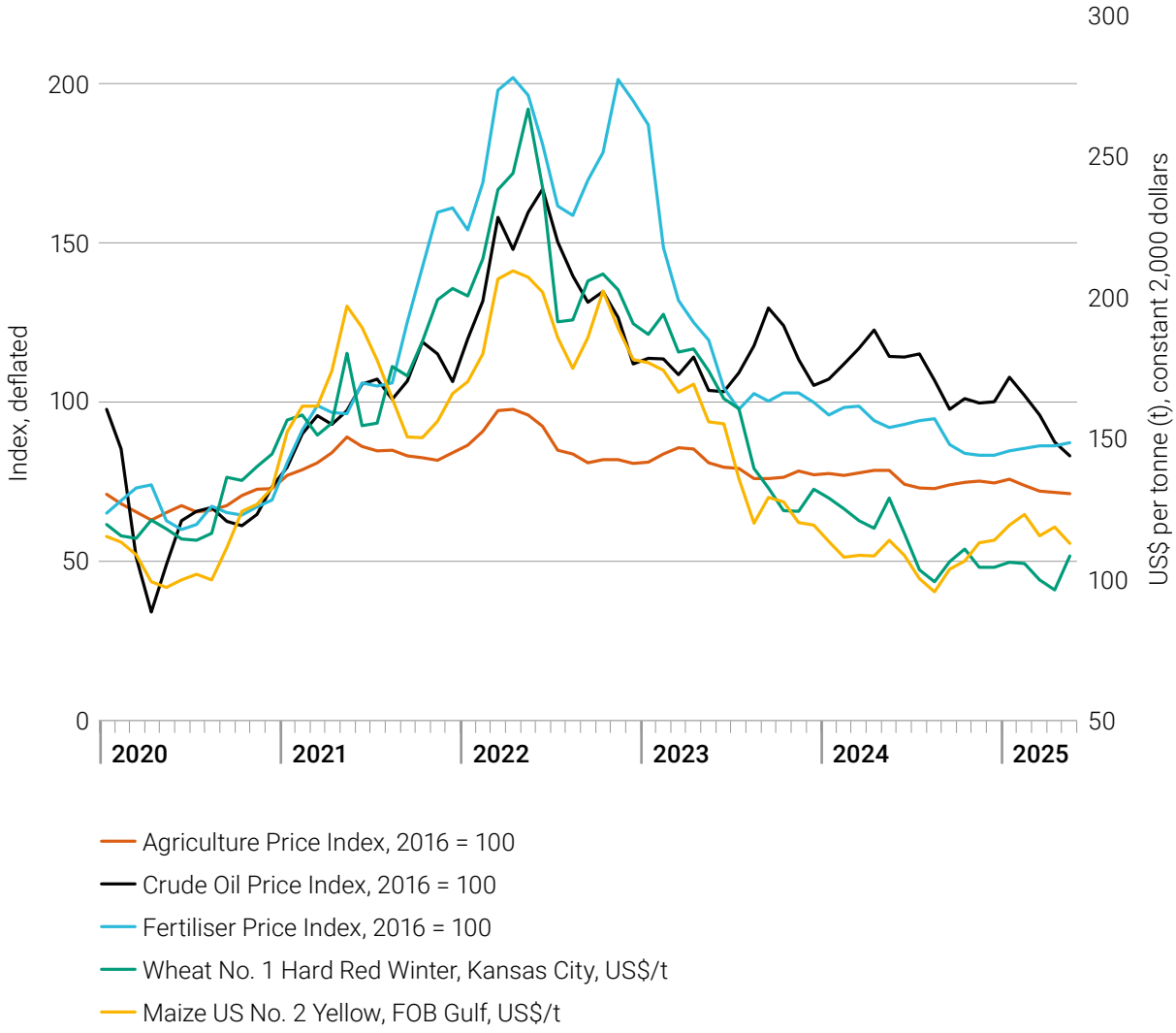
2 FCDO termed these countries the 'Ten Plus One' group: they comprised ten countries — Afghanistan, Central African Republic (CAR), Democratic Republic of Congo (DRC), Ethiopia, Nigeria, Somalia, South Sudan, Sudan, Syria, Yemen — plus one Sahelian region — Burkina Faso, Chad, Mali and Niger. Eleven of these countries lay within the SPARC consortium's research remit.

1.2 Research questions and methods

Three questions were posed:

1. What has happened to the prices of staple foods in Mali and Sudan since 2022? What explains changes in prices?
2. What impact have price changes since 2022 had on consumers, especially those on low incomes? How have those vulnerable to higher prices responded? Have there been impacts on producers?
3. What public and collective responses to changed prices have been seen? How effective have they been?

FIGURE 1. COMMODITY PRICES FROM JANUARY 2020 TO MAY 2025



Source: Compiled from International Monetary Fund (IMF) primary commodity prices; indices and prices deflated using United States gross domestic product (US GDP) deflator, based on July 2000

BOX 1. THE 2022 SPIKE IN FERTILISER, FOOD AND OIL PRICES ON WORLD MARKETS

The recent surge in world prices of commodities began in the first quarter of 2020 with prices peaking in May/June 2022. During that time, prices – in constant terms – rose by 181% for crude oil, 144% for (an index of) fertiliser, 111% for wheat, 73% for maize and by 28% for the agriculture index.

Subsequently, prices have fallen back so that, by May 2025, prices of maize and wheat, and the agriculture price index, had returned to their levels of early 2020. Fertiliser and oil prices also fell back but remained above their levels of early 2020.

Price movements from January 2020 to May 2025 show a cycle, a pattern frequently seen with commodity prices.

To examine changes in food prices, we drew heavily on the monthly data collected by WFP VAM teams since the early 2000s, for multiple markets in Mali and Sudan, recording the prices of basic foods.

To look for potential drivers of price changes, we examined: cereal harvests and likely causes of changes – droughts, floods, conflict, etc.; imports of cereals whether as whole grain or flour; overall inflation in the domestic economy; and any other factor identified in the literature that might affect food prices.

To see how people had been affected by price changes, we read secondary literature, above all the reports from FEWS NET (USAID), GIEWS (FAO) and WFP, which two or three times a year estimate food insecurity in both countries. We interviewed 18 selected respondents in Mali for their direct experience of living with rising food prices.

To record public responses to price rises and their effects, we reviewed documents on government policy, and those from NGO and donor sources. In Mali, we also asked the selected informants what they had observed of public responses.[3]

Data, literature and interviews were collected in late 2024 and the first half of 2025.

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3 Selected to represent different walks of life, they included a farmer, organiser in smallholder federation, gas cylinder trader, wholesaler, transporter, dispatcher, shopkeeper, sheep trader, journalist, economics consultant, watchman, technician, office worker, female head of household, NGO project manager secondary school teacher, etc.

2. FINDINGS FOR MALI

2.1 Price movements in Mali since 2020

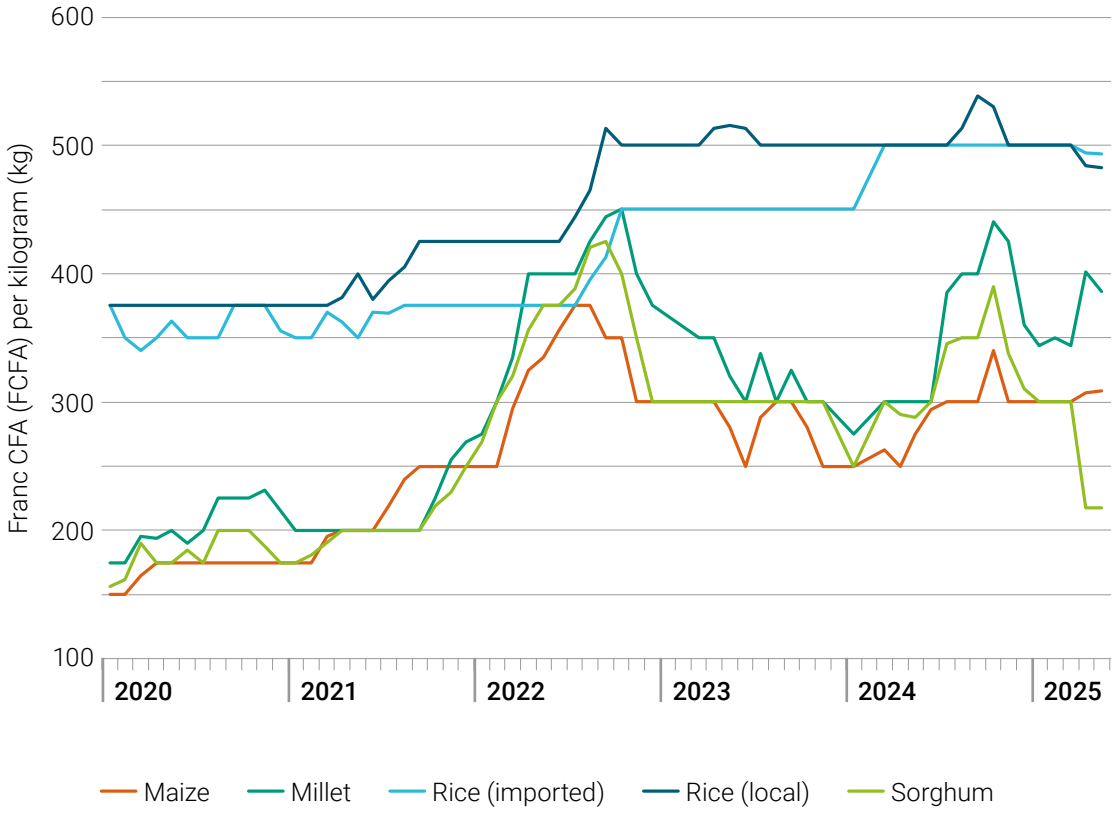
From mid-2020 to mid-2022, (nominal) prices of maize, millet and sorghum – almost all grown within Mali – doubled. Rice prices, which had long cost twice the price of maize, millet and sorghum, rose by far less. Figure 2 shows prices for the main market in the capital of Bamako, Niarela. Price levels and movements for other markets in the centre and south of Mali are similar: it seems that markets are integrated (see Box 2 for evidence).

From mid-2022 to early 2024, prices of maize, millet and sorghum fell to 75% or less of their prior levels. Rice prices, however, rose.

From early 2024 to November 2024, prices again rose – by 20% to 55% for maize, millet and sorghum, and by less for rice. Since late 2024, the prices of most grains other than maize have fallen back slightly.

Overall, between May 2020 and May 2025, the price of cereals rose by between 29% (local rice) and 93% (millet) (see Table 1).

FIGURE 2. CEREALS PRICES IN MALI, NIARELA (BAMAKO), JANUARY 2020 TO MAY 2025



Source: compiled from WFP/VAM data

TABLE 1. CHANGES TO NOMINAL PRICES IN NIARELA MARKET, BAMAKO

Price rising Price falling

Changes	Cowpeas (niébé)	Maize	Millet	Rice (imported)	Rice (local)	Sorghum
Five-year change						
May 20 to May 25	1.75	1.76	1.93	1.36	1.29	1.24
Sub-periods (a)						
May 20 to May 22	1.66	1.91	2.00	1.03	1.13	2.14
May 22 to Jan 24	0.75	0.75	0.69	1.20	1.18	0.67
Jan 24 to Nov 24	1.20	1.20	1.55	1.11	1.00	1.35
Nov 24 to May 25	1.17	1.03	0.91	0.99	0.97	0.64

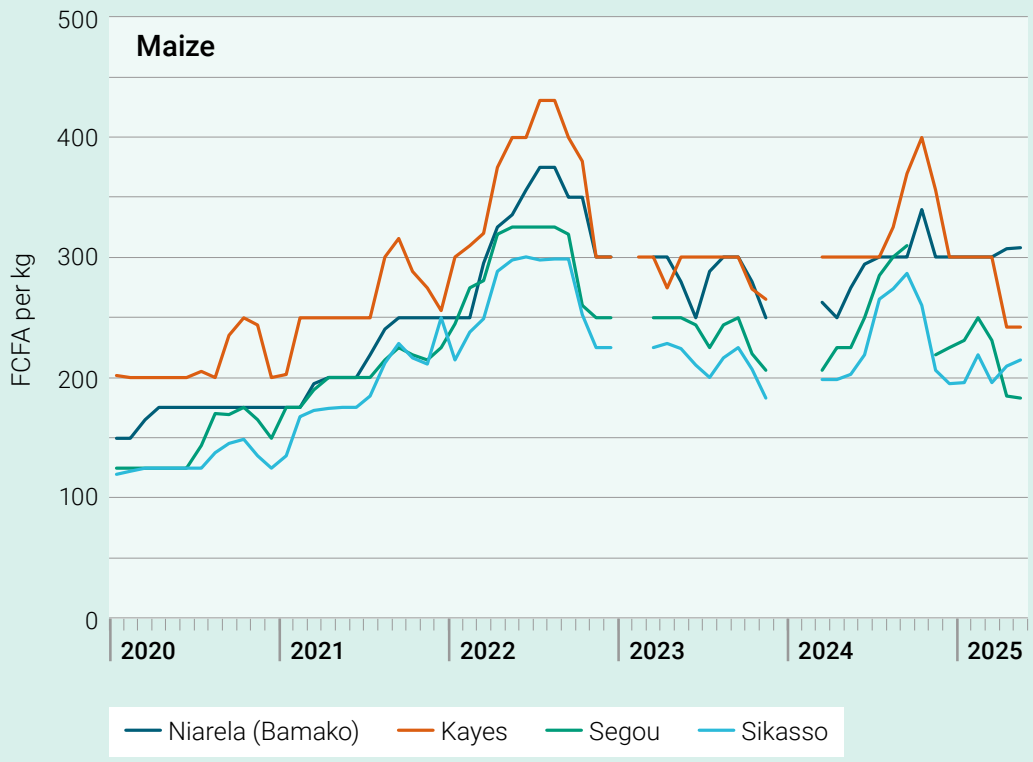
Source: compiled from WFP/VAM data

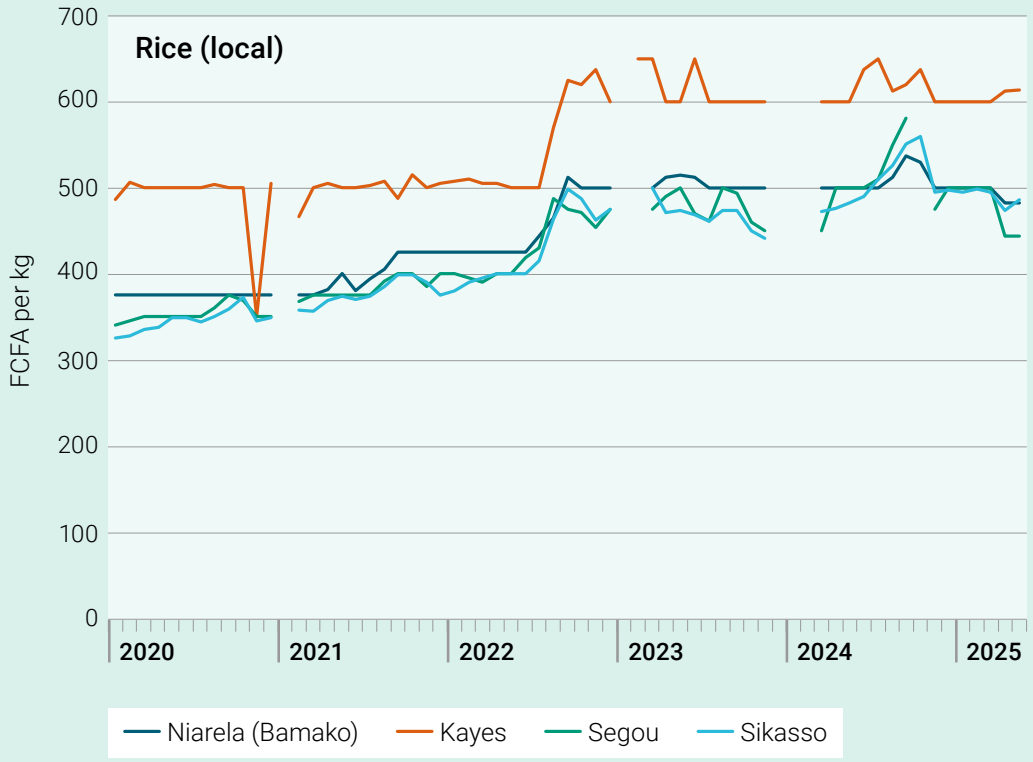
Note: (a) Five years have been broken down into periods defined by turning points in prices

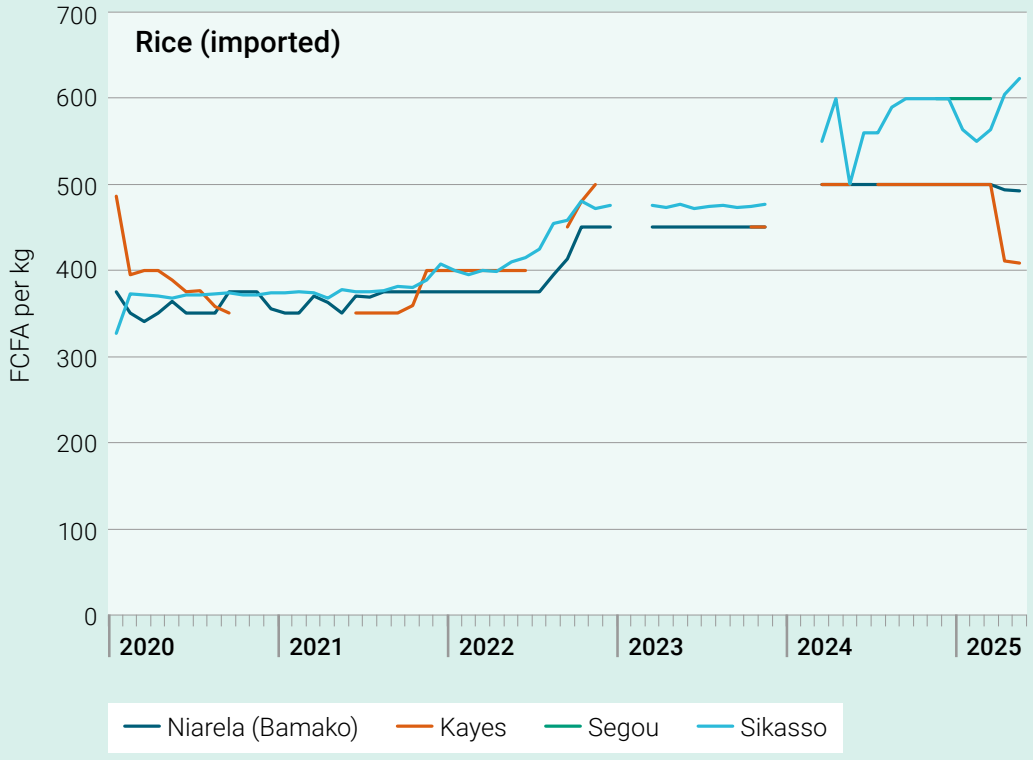
BOX 2. CEREALS MARKET INTEGRATION, CENTRE AND SOUTH OF MALI

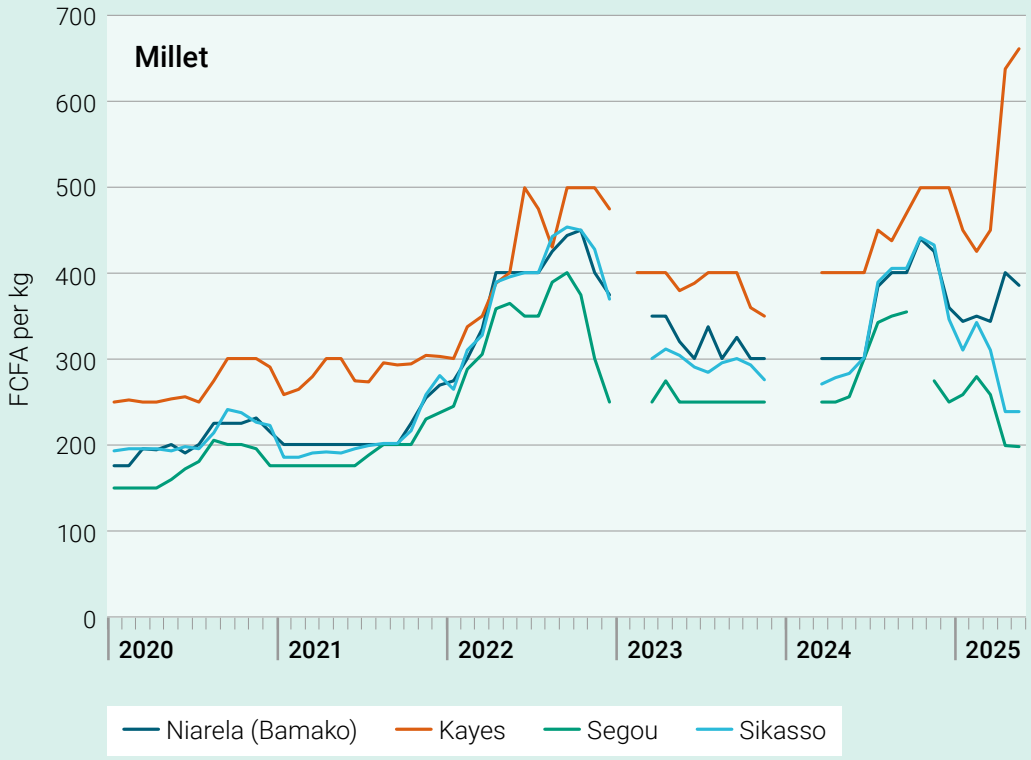
Figure 3 shows price levels and movements of the maize, rice (both local and imported), millet and sorghum for the markets of Niarela (Bamako), Kayes (west of country), Ségou (centre) and Sikasso (south-east) – for locations see Figure 4.

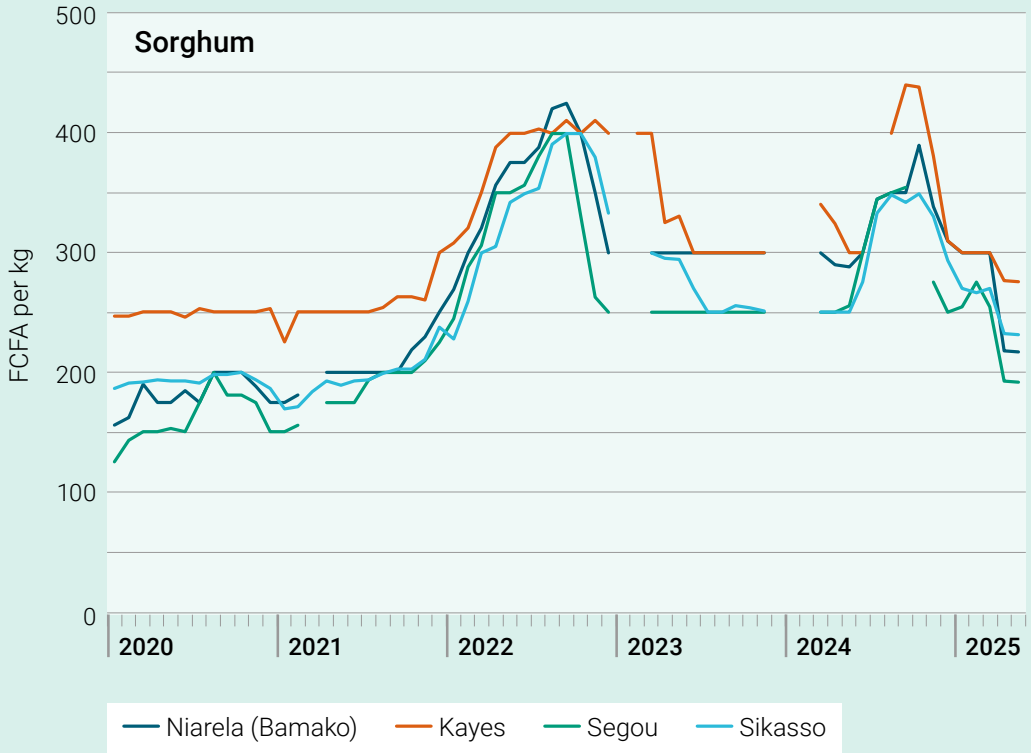
FIGURE 3. CEREALS PRICES, FOUR MARKETS, SOUTH AND CENTRE OF MALI, JANUARY 2020 TO MAY 2025




Rice (local)
FCFA per kg
700
600
500
400
300
200
100
0
2020
2021
2022
2023
2024
2025
Niarela (Bamako)
Kayes
Segou
Sikasso


Rice (imported)
FCFA per kg
700
600
500
400
300
200
100
0
2020
2021
2022
2023
2024
2025
Niarela (Bamako)
Kayes
Segou
Sikasso





Source (for all five charts): WFP VAM price data

FIGURE 4. MAP OF MALI

Source: United Nations map of Mali – Public domain (https://commons.wikimedia.org/wiki/File:Un-mali.png)

Inflation, as reported by the central bank (Banque Centrale des États de l'Afrique de l'Ouest, BCEAO) for the monetary union to which Mali belongs, has been lower than the increases registered in cereal prices (Figure 5, Table 2). Between early 2020 and May 2022, the consumer price index (CPI) for all items rose by just 16%, and for food by 25%: well below the increases seen for cereals. Since May 2022, official inflation figures show an increase of 8% for all items, but a fall of 12% for food. It is hard to reconcile these statistics with cereals prices. If the prices of cereals other than rice doubled from mid-2020 to mid-2022, how could the food price index have risen only by 25%? This would suggest that the prices of other foods saw little or no inflation over the same period, which is hard to believe.

All the interviewees in Mali were well aware of, and much concerned by, the increases in the prices of cereals and other staples. The few who quantified these increases reported similar leaps to those seen in the WFP database. For example, in Bandiagara,

> 'The price of staple foodstuffs has increased since 2022. The price of a bag of millet has risen from 26,250 francs to 37,500 francs.'

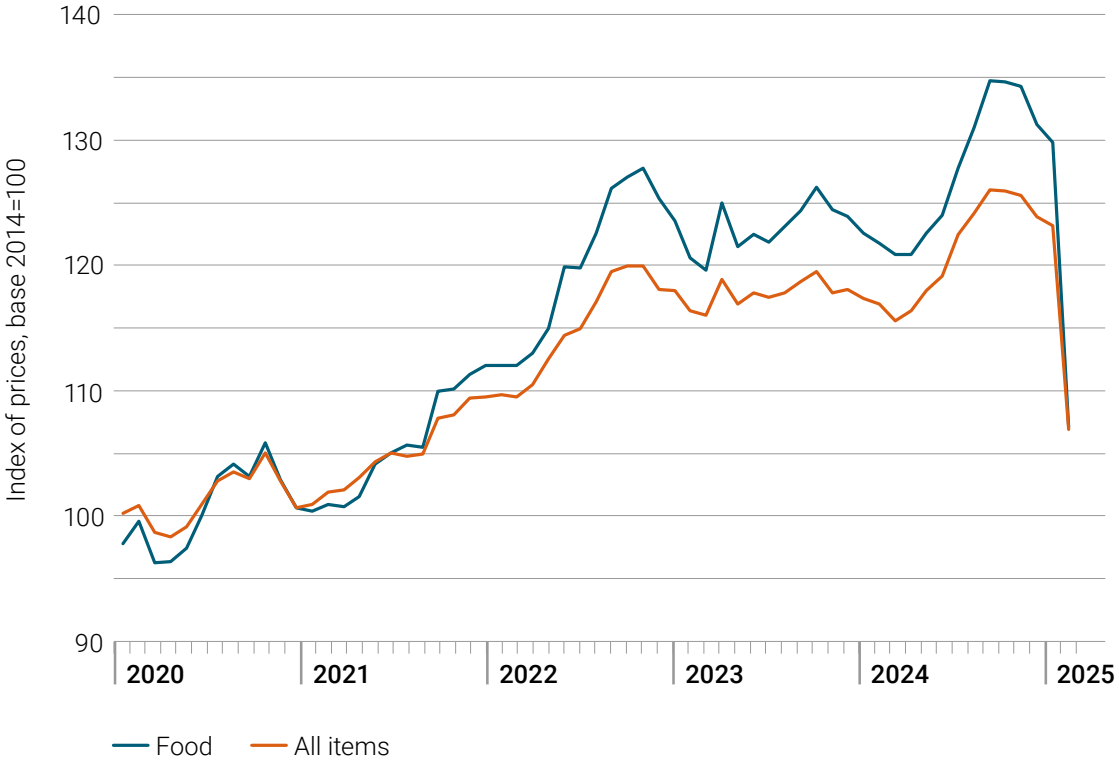
And,

> 'In the Yorosso area, staple food prices are increased by 30% from 2022 to 2024.
>
> Product prices have evolved as follows between 2022 and 2024:
>
> - Maize has increased from 120 FCFA/kg in December 2022 to 160 FCFA/kg in December 2024.'

- Millet has increased from 150 FCFA/kg in December 2022 to 250 FCFA/kg in December 2024.
- Rice has increased from 300 FCFA/kg in December 2022 to 450 FCFA/kg in December 2024.'

[From interviews conducted in late 2024]

FIGURE 5. OFFICIALLY REPORTED INFLATION IN MALI, JANUARY 2020 TO FEBRUARY 2025



Source: compiled from data from BCEAO https://edenpub.bceao.int/rapportPredefini.php

TABLE 2. OFFICIALLY REPORTED INFLATION RATES IN MALI SINCE EARLY 2020

Period	Price increase over period		Annual equivalent inflation rate (percentages)	
	Food	All items	Food	All items
April 20–May 22	1.25	1.16	13%	8%
May 22–Feb 25	0.88	1.08	-4%	3%
April 20–Feb 25	1.10	1.08	2%	2%

Source: based on BCEAO data

2.2 Explaining price rises in Mali

Two reasons may explain the increase in the price of cereals: falling supply of grains relative to population; and traders who manipulate prices to their own advantage. We start with the first explanation.

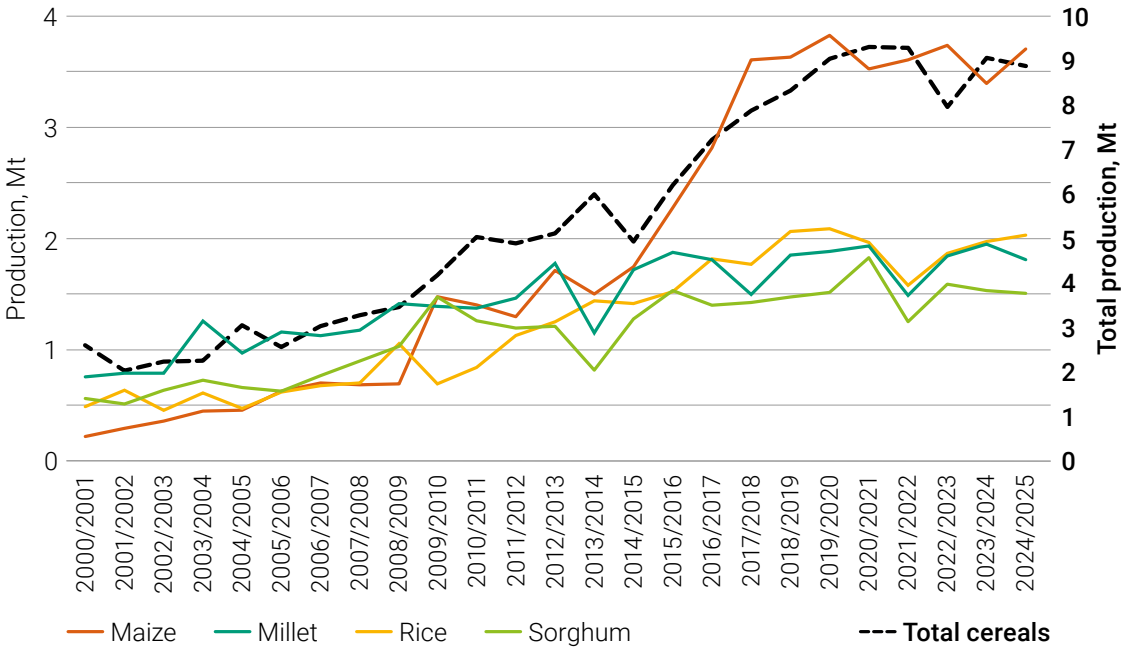
Since 2000, production of cereals in Mali increased markedly through to 2019, with total supply rising from 2 million tonnes (Mt) to 10Mt (Figure 6). Almost all the increased supply came from domestic farms: imports – largely of rice and wheat – have been rising, but by 2024 these represented just 7.5% of total supply. Mali produces almost all the cereals consumed in the country. Since 2019, however, production and supply have stagnated, with a notably poor harvest in 2021.

The details of Mali's increased cereals production since 2000 (Figure 6) show very large increases in maize output from 2013 to 2018, and greater increases in harvests of rice than in those of millet and sorghum. Production of all cereals dipped in 2021, recovered in 2022, and has since stagnated.

Most of the decline in output in 2021 resulted from low yields: most of the variation in production from year to year is accounted for by changes in yields (see Figure 7).

Larger domestic harvests since 2002 have resulted in rising cereals available per person. From under 200kg of cereals per person in 2000, availability rose to 475 kg per person by 2019:[4] subsequently availability has fallen to around 400 kg per person (Figure 8).

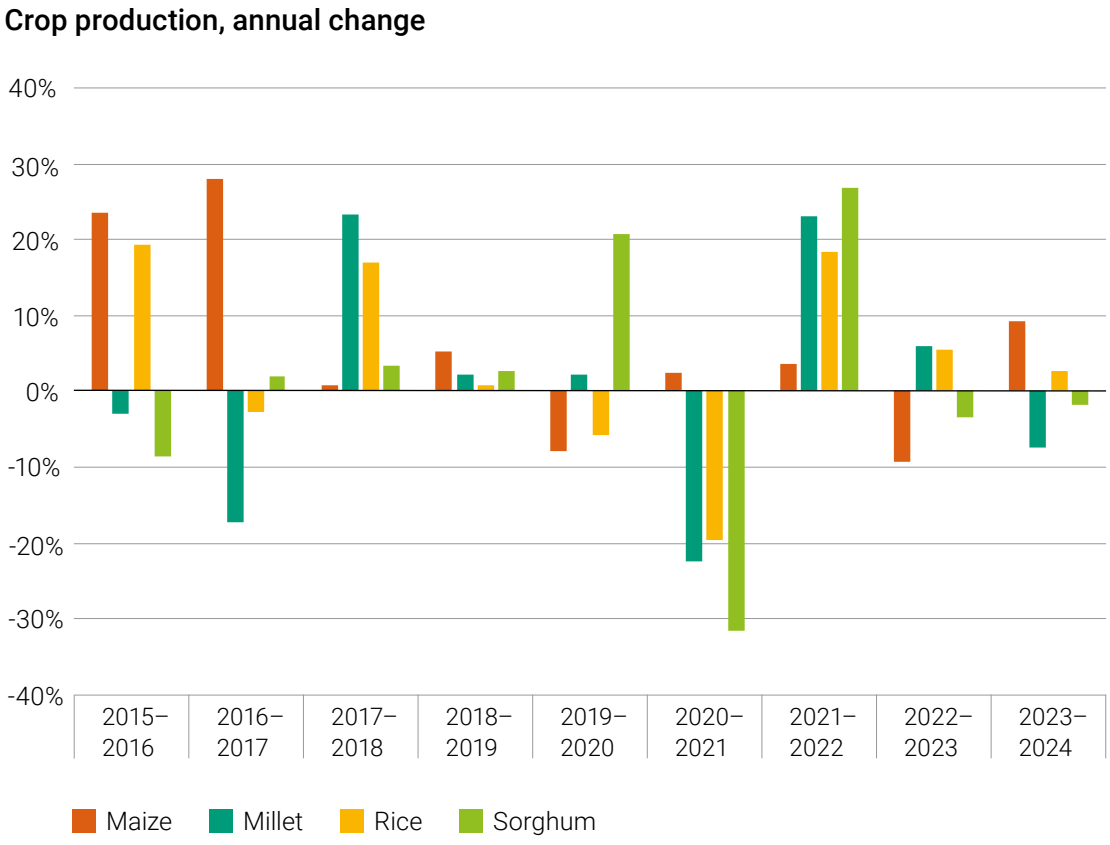
FIGURE 6. CEREALS HARVESTS IN MALI, 2000 TO 2024

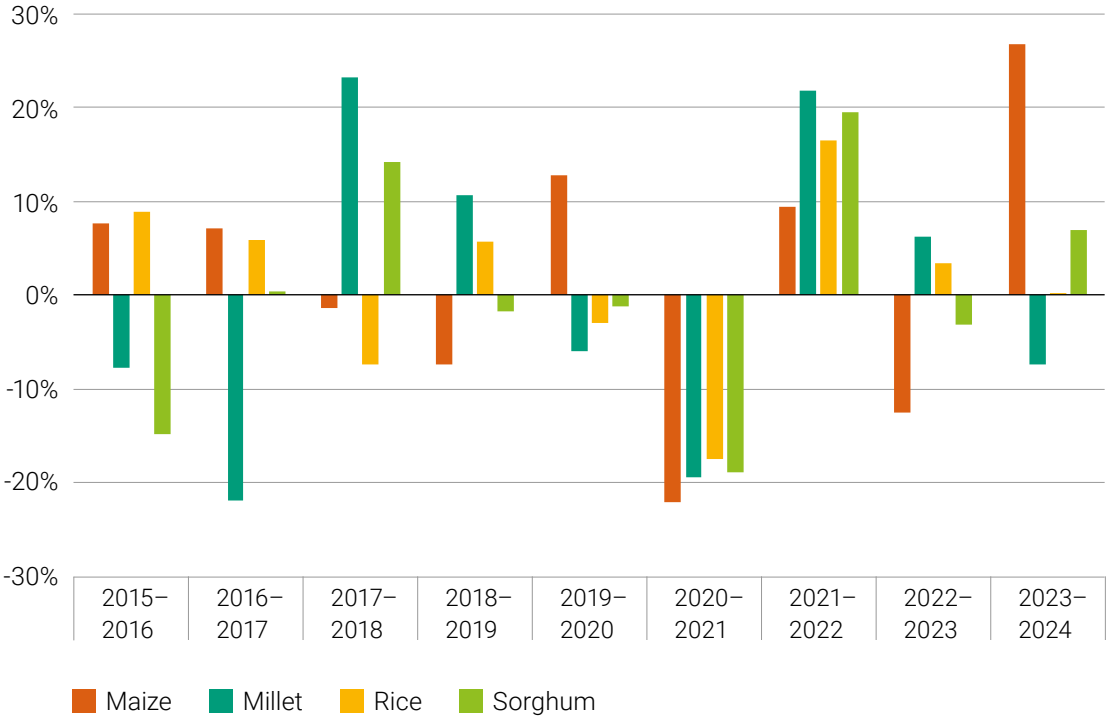


Source: compiled from data from the US Department of Agriculture (USDA). Years are marketing years: in effect the first year corresponds to the calendar year

4 The amounts per person are surprisingly high. To meet the needs of an adult consuming grains directly, in breads, baked foods and porridges, 200 kg a year should suffice. The difference between this figure and the 450kg per person apparently available in 2019 may in (small) part arise from use of maize as feed to produce chickens and to fatten sheep and cattle. Even so, it is hard to imagine that this accounts for more than a small part of the maize harvest. Mali reports production in recent years of 60kt of chicken: if all birds were fed maize, that would still only require (at most) 300kt of maize, against increases in the maize harvest measured in millions of tonnes.

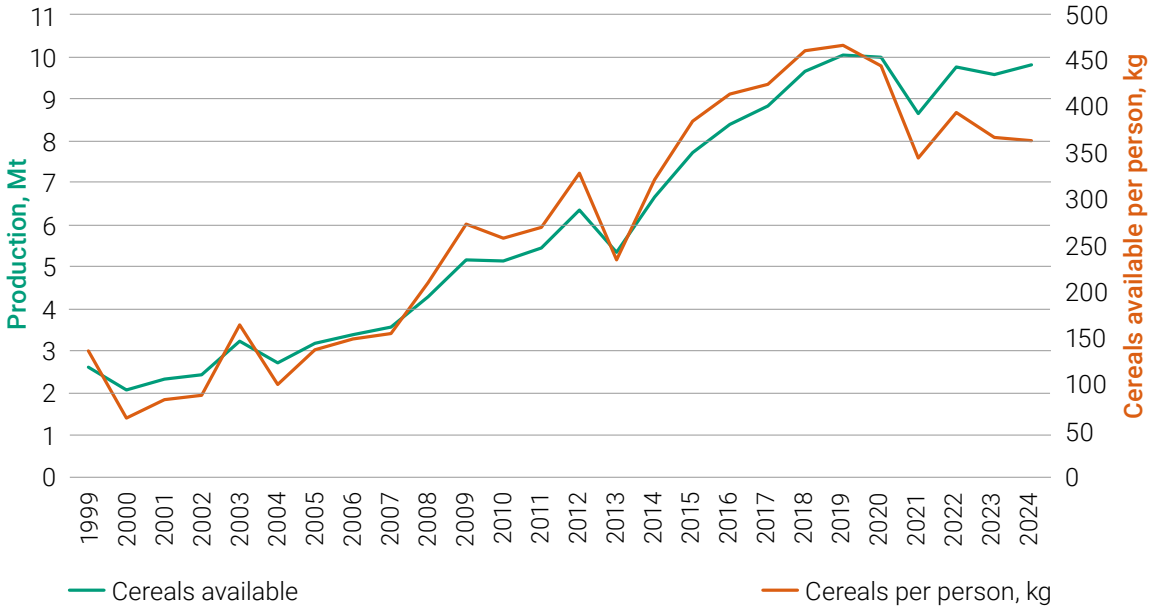
FIGURE 7. YEARLY CHANGES TO CEREALS PRODUCTION AND YIELDS, 2015 TO 2024





Source: compiled from USDA data

FIGURE 8. AVAILABILITY OF CEREALS IN MALI 1999 TO 2024



Source: compiled from USDA data on cereals production, exports and imports of grain, plus population estimates from FAO[5]

The interviewees cited three factors to explain disappointing cereals harvests in most years since 2020.

First, conflict and population displacement. As conflict has spread across Mali from the north and east towards the centre and south of the country in the 2020s, so populations have been displaced and those remaining have sometimes found it difficult to get to their outlying fields and pastures. The scale of displacement can be seen in FAO GIEWS reports (drawing on sources from the International Organization for Migration (IOM) and the UN Office for the Coordination of Humanitarian Affairs (UN OCHA)):

- 2020, May: internally displaced persons (IDPs) = 250,000 plus 25,000 refugees
- 2021, September: IDPs = 400,000
- 2022, July: IDPs = 400,00 plus 56,000 refugees, 'mostly from Niger, Mauritania and Burkina Faso'
- 2024, September: IDPs = 378,000

One interviewee reported:

> 'In the central regions (Mopti, Ségou) the displaced populations have lost everything (land, crops, livestock), they are currently IDPs in the big cities which are strongly affected by the price variation.' [Consultant, San]

5 Estimates of cereals production in Mali come from two sources: FAO's FAOSTAT and USDA. For the four main grains and for at least the last 20 years, FAOSTAT reports official data from the government. USDA draws on official data and sometimes its own, revised estimates. For most years since 2000, the two records are identical, but in 2013 USDA reported significantly lower figures for millet, rice and sorghum harvests, presumably because USDA considered the official government record reported to FAO to be over-optimistic. For the period since 2020 on which this account focuses, the FAO and USDA records are almost identical.

To appreciate the potential impact of displacement, assume that 80% of IDPs are from farm households, that the average farm household family has 16.5 members,[6] and that the average farm cultivates 5.5 hectares of crops.[7] Some 400,000 IDPs would thus imply 107,000 hectares lost to cultivation. That would represent 1.2% of the 8.8M hectares cultivated in 2023 (FAO data). To that may be added land not being cultivated in insecure areas by the remaining farm population – although it is hard to estimate just how much land has been so affected.

Second, reduced use of fertiliser and farm chemicals. Mali imports all the manufactured fertiliser used in the country: world prices of fertiliser rose strongly from 2020 to 2022, the urea price index tripling from March 2020 to May 2022 (IMF primary commodities data); subsequently international prices of fertiliser have fallen back, but by the end of 2024 the index was still 50% higher than it had been in 2020. On top of higher world prices, transport costs have risen with worldwide increases in the price of oil.

There have also been disruptions to supply, above all in the first half of 2022 when ECOWAS sanctions on Mali applied. One interviewee alleged that the government had mismanaged the supply of fertilisers.[8]

The International Fertilizer Development Center (IFDC) reports that fertiliser use fell from 709.5 thousand tonnes (kt) in 2019 to just 434kt in 2023 – a cut of almost 40%.

Third, losses to natural hazards including periods of low rainfall, floods, and pest and disease attacks. Cereals in Mali are overwhelmingly grown on dryland fields, with the notable exception of rice, which is mostly irrigated. With only one rainy season a year, variations in rainfall strongly affect harvests. In 2021, for example, rainfall in Bamako was 14% down on the medium-term mean.

The alternative explanation that several interviewees proposed was that traders were manipulating prices. For example, one person argued that:

> 'In Mali, unfortunately, we have traders who are very greedy and who have no sense of sacrifice for the homeland. They have a very large share in the rise in prices, because they always put mechanisms in place to circumvent the measures announced. For locally produced foodstuffs, they exaggerate prices from one locality to another. An exaggeration that nothing justifies. As for imported foodstuffs, although they benefit from exemptions, consumers do not benefit from them in turn.' [Teacher, Bamako]

And another interviewee stated:

> '… the proximity of the circle to Burkina Faso mean that Burkinabe traders and Tamashek traders increase the price to quickly build up large stocks.' [Local government leader, Koro]

As did another respondent who alleged:

> 'Massive and often fraudulent exports of foodstuffs to neighbouring countries.' [Consultant, San]

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6 Median household size for village households surveyed in five villages of southern Mali, 2025.

7 In the mid-2010s, Mali was estimated to have 805,200 farm households, cultivating 4.5M hectares, just over 5.5 ha per household.

8 Much of the fertiliser used is that distributed to cotton-growing households by the state cotton marketing company, CMDT, which procures large quantities of fertiliser.

The government sets the prices of key produce – which suggests that the state does not trust the traders either. But price-setting is apparently ignored, as one interviewee stated:

> 'The first cause of the variation in food prices is impunity because even if the state sets the price of foodstuffs, most traders do not respect this and the agents in charge of sanctioning them prefer to compromise with them by taking money from them.' [Development Project Field Officer, Bamako]

It is hard to judge between these two sets of quite different explanations: market forces or market manipulation – although these are not exclusive. It is quite possible that although diminished supply may be driving up prices, some traders have the power to push prices up still further and realise excess profits.

Two arguments, however, suggest that market manipulation is not the main cause of price increases. One is that this factor is not mentioned in the market analyses of GIEWS or FEWS NET. Their early warning (of food crises) reports explain price movements very largely by variations in supply (and occasionally by changes in demand). Of course, this is not a strong argument against possible market manipulation: the analysts at FAO and USAID may not know of, or look for evidence of, price hiking by traders.

The other argument is that if traders were able to manipulate prices, then prices would rise and stay at high levels. But that is not what the record of prices over the medium term (5–10 years) shows: prices move up and down, with price falls quite as large as price rises. For example, Figure 2 shows large falls in the price of maize, millet and sorghum during 2023. If traders had the market power alleged by some observers, why would traders let prices fall?

But to reiterate: the very different explanations are not mutually exclusive – it is quite possible that even if changes to supply may in large part explain price movements, traders also have some power to increase prices to their advantage.

2.3 Consequences of food price increases in Mali

For people on low incomes, higher prices of food and other staples have affected their diets, their spending on other essentials, and their search for more work and extra income, and they have resulted in social distress. Interviewees reported these changes, although the incidence and magnitude of the processes described cannot be established by qualitative enquiry.

> 'Consumers in general suffer from price changes because these changes always have a tendency to increase prices. In general, in Mali, once the price of a commodity increases, the price is rarely revised downwards. These variations considerably reduce the purchasing power of households, which is reflected in a reduction in the ability to meet the basic needs of household members, including a healthy and balanced diet, adequate medical care, schooling for children, and a welcoming work environment.' [Coordinator, Farmers' Organisation, Bamako]

2.3.1 Food and diet

With higher food prices, those on low incomes have switched to cheaper foods, and reduced food consumption entirely.

> 'Changing eating habits by eating more foods that have a low nutrient intake. Some prefer to give food to the youngest and oldest in the household and make do with the little that remains.' [Development Project Field Officer, Bamako]

'Since 2022, the impact has been the reduction in the number of meals consumed per day from three (3) to two (2) meals or even one (meal per day).' [Development Project Field Officer, Bamako]

Insecurity has prevented some forms of coping, specifically foraging for food in the bush:

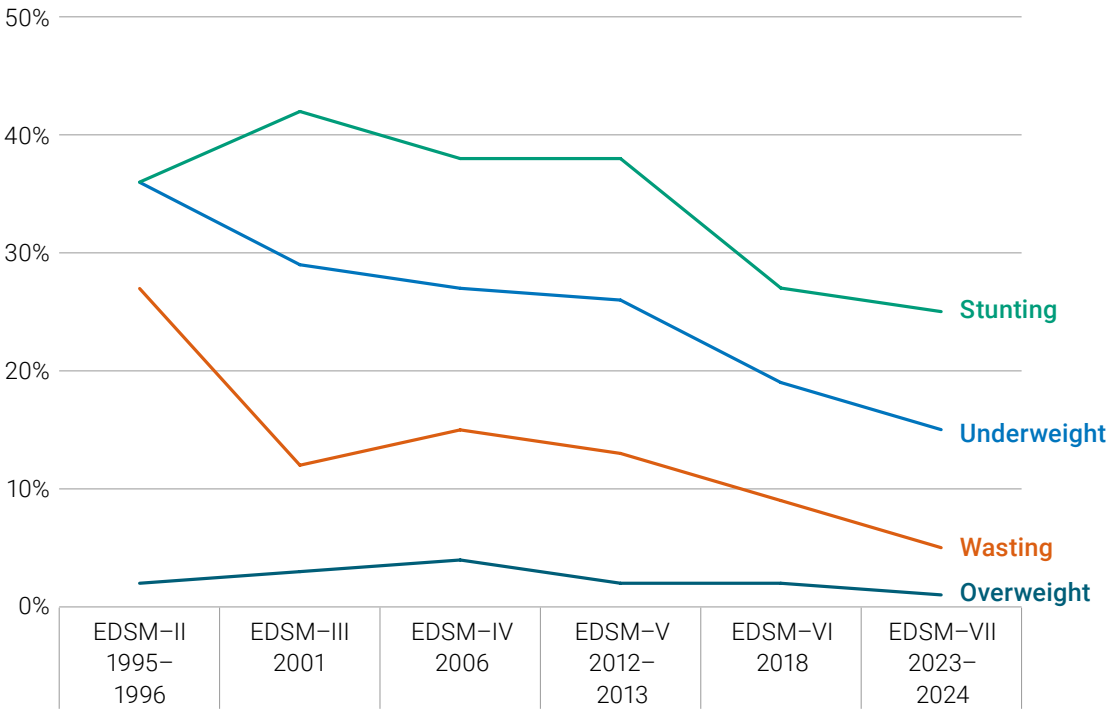
'Unfortunately, the other people did not dare to go into the bush in search of millet because of the terrorists'. [Head of a Women's Cooperative, Bandiagara]

Consequently, some interviewees reported increased malnutrition:

'Low-income households in particular are the most affected by this situation, since the family budget allocated to basic foodstuffs falls far short of the needs of family members. As a result, there is an increase in morbidity and mortality related to malnutrition'. [Coordinator, Farmers' Organisation, Bamako]

' … undernourishment of breastfeeding and pregnant women, malnutrition (severe and acute) of children aged 0 to 5 years'. [Humanitarian Project Manager, Ségou]

FIGURE 9. TRENDS IN STUNTING, WASTING, UNDERWEIGHT AND OVERWEIGHT AMONG INFANTS IN MALI, 1995/96 TO 2023/24



Source: République du Mali, 2025, Enquête Démographique et de Santé du Mali 2023–2024, Institut National de la Statistique (INSTAT), Bamako, Mali

In 2023/24 Mali carried out a demographic and health survey (DHS), the first since 2018. A reassuring statistic from the survey is that the considerable decline in stunting of infants since 2001 – which had fallen from 43% of infants in 2021 to 27% in 2018 – has not been arrested in the 2020s, although the rate of decline has slowed (Figure 9). Given the challenges of higher food prices, conflict and the COVID-19 pandemic, this is a remarkable outcome.

2.3.2 Health and education

Spending on health care has reportedly fallen. Some parents have taken their children out of school to save on fees and expenses.

> 'There are children who have been taken out of school.' [Development Project Field Officer, Bamako]

2.3.3 Search for work

A key concern the informants expressed was about young people leaving villages: young men to informal gold mining, young women to towns:

> 'Some families have sent some of their children elsewhere to work in order to have money or food to help the family. So, the rate of rural exodus has increased.' [Development Project Field Officer, Bamako]

> ' … has led to the mass exodus of young people to gold panning sites.' [Secondary Teacher, Bankass]

> ' … the rural exodus of young people to gold panning sites.' [Development Project Manager, Koumantou]

> '… early departure of girls from rural areas to urban centres [as domestic helpers].' [Humanitarian Project Manager, Ségou]

> 'These difficulties, which are felt even at the village level, lead to the rural exodus of able-bodied workers to mining areas or even to Europe where they are exposed to all kinds of dangers.' [Independent Consultant, San]

The interviewees almost always saw migration as negative, whatever the potential earnings from, for example, gold mines or international migration. They did not, perhaps surprisingly, mention people taking up additional work locally.

2.3.4 Social trauma

Several interviewees mentioned social problems arising from hard times: people resorting to crime, to commercial sex work, to begging, to joining insurgent militias.

> 'Youth unemployment, prostitution of young girls, alcoholism, smoking, banditry among the juvenile strata, school dropout and prey to recruitment for terrorism.' [Humanitarian Project Manager, Ségou]

> 'We are then witnessing a massive departure of able-bodied workers to exodus, or to crime, banditry and even terrorism. Young people are recruited by terrorists who promise them a better tomorrow.' [Humanitarian Project Manager, Ségou]

> '… and the proliferation of beggars (mothers of twins and *talibés*) in the streets of urban centres.' [Humanitarian Project Manager, Ségou]

> 'Vulnerable people have no other solution than to turn to mayors and NGOs to ask for donations, to come and overpopulate Koro for small lucrative jobs. A 300% increase in the rate of child begging everywhere.' [Local government leader, Koro]

'… conflict in families, inability of families to cope with the other essential burdens of their families. Fracture of social fabrics. Increase in rural exodus, forced migration.' [NGO Programme Officer, Bamako]

Increased conflict within families was also mentioned. Coping with higher prices was demoralising the population, with frustration manifested, according to one informant, in bad tempers and petty arguments.

A 2018–2023 national household survey (NHS) of the ways that households cope with shocks in Mali produced a ranking of coping strategies (Figure 10).[9] Curiously, the survey does not seem to have asked about changes in purchases of food and diet, such as reducing the number or size of meals. That aside, the most common strategies included cutting down spending on education (with children taken out of school) and health, borrowing money, and selling off household assets, including productive assets. The survey does not appear to have covered coping by migration.

FIGURE 10. ESTIMATED PROBABILITY OF COPING STRATEGIES IN MALI, 2018 TO 2023

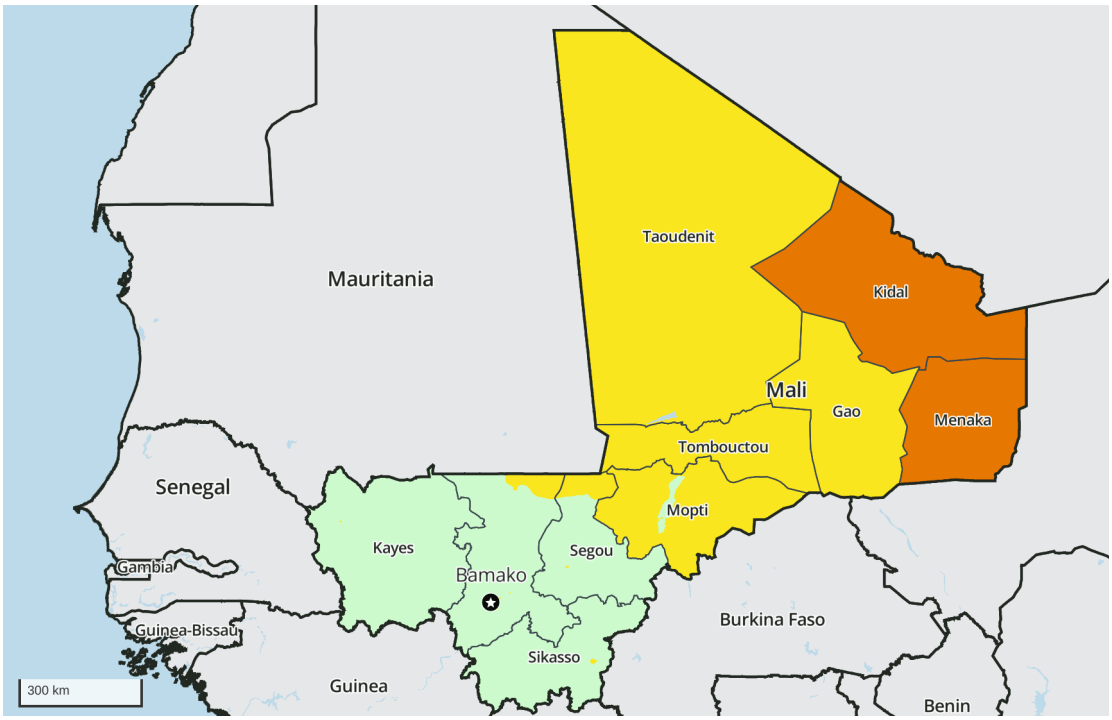
Source: Ulimwengu (2025), based on the integrated and enhanced dataset on food security and household coping strategies of Mali (2018–2023), see: https://doi.org/10.7910/DVN/NNAYAM

9 The survey, Enquête Nationale sur la Sécurité Alimentaire et Nutritionnelle (ENSAN), was carried out in 11 waves — February to March (2018/19/20/21/23) and September to October (2018/19/20/21/22/23) — for 50 cercles (circles) covering 123,382 households.

2.3.5 Spatial differences

Food insecurity in Mali varies markedly by region: the areas longest and hardest affected by conflict, in the east and north, have seen higher levels of distress than other areas (see Figure 11). (The price of food is only one factor leading to hardship in the east and north, the conflict the principal driver.)

FIGURE 11. FOOD SECURITY ASSESSMENT OCTOBER 2025



IPC 3.1 Acute food insecurity classification

Sub-national level data

- 1: Minimal
- 2: Stressed
- 3: Crisis
- 4: Emergency
- 5: Famine

Source: FEWS NET https://fews.net/west-africa/mali

2.4 Public responses to higher prices

2.4.1 Market interventions

The state has tried to regulate food trade and markets. Specifically, it has set maximum prices, provided subsidies to those importing rice and sugar, and banned cereals exports in December 2021, a ban that was renewed in October 2024.

> 'At one point, the state took certain measures to appease the situation, in particular, the strengthening of border controls to prevent the illegal exit of food products, especially livestock and cereals.' [Local NGO Manager, Bamako]

'There was the Directorate of Trade and Competition which issued notes mentioning the selling prices and saying to report all traders who are going to sell more than that. There were agents who walked around to check the prices in the shops.' [Development Project Field Officer, Bamako]

'Suspension of cereal exports, setting ceiling prices for rice, flour and sugar, granting of subsidies for the import of rice and sugar to economic operators.' [Private Sector Executive, Bougouni]

Such measures have reportedly been largely ineffective owing to the state's inability to enforce the rules set and the profit from flouting the regulations.

'While the measures to suspend cereal exports have been effective, the other measures have not been effective in our analysis (non-compliance with ceiling prices, low market supply despite the import subsidies granted).' [Private Sector Executive, Bougouni]

'The measures have made it possible to temporarily mitigate the impacts, but they remain insufficient in the face of the needs.' [State Technical Agent, San]

'They have not been effective because even if we report cases, there are no sanctions. The shopkeepers bribe the agents. It is only in a few rare shops that prices have fallen.' [Development Project Field Officer, Bamako]

But regulation has some, or considerable, support among the public who see unjustified price rises and profiteering as an affront. Interviewees spoke about:

'Denunciation [of profiteering] on social networks.' [Private Sector Executive, Bougouni]

'Strong denunciation of prices that are out of reach … Calling on the authorities to reduce the prices of foodstuffs, raising awareness through the media and social networks, raising awareness in places of worship. … Shouts in alarm. Appeal to all stakeholders in the face of their responsibility.' [NGO Programme Officer, Bamako]

'The government must set the price of basic foodstuffs and ensure strict compliance with these prices by traders, sellers and resellers, set up control commissions at the national, regional and local market level.' [Facilitator of a farmers' organisation, Sikasso]

2.4.2 Provision of relief

The state has also tried to provide some relief to people hard hit by higher prices, distributing foods at little or no cost:

'The state, through the Food Security Commission, has implemented the promotional sales system for certain foodstuffs allowing the poor to access. Cereal bank systems have been set up in the municipalities.' [Programme Manager, Cooperation Agency, Bamako]

'They concerned subsidies, exemptions and food distributions to certain populations at the central and decentralized levels of the country.' [Coordinator of a farmers' organisation, Bamako]

Civil society and donors have also helped:

> 'It is thanks to the charities of the transitional authorities and some donors who came from all over the world that saved the lives of people on low incomes.' [Head of a Women's Cooperative, Bandiagara]

But interviewees commented that any relief provided was inadequate:

> 'Emergency humanitarian relief efforts have temporarily alleviated the suffering of vulnerable beneficiary households, coverage and sustainability remains limited.' [Technical officer of a farmers' organisation, Yorosso]

And some criticised donors from the west for not doing enough to help:

> 'The authorities are making efforts, but the country lacks the resources to deal with the lack of external aid and especially with the unwillingness of the West to see our country come out of the abyss.' [Independent Consultant, San]

Mali receives international humanitarian aid in response to the several crises that affect the population, including natural disasters, conflict and associated internal displacement and refugees from neighbouring countries. In 2024, UN OCHA, as coordinator of international relief, assessed that, out of more than 22 million Malians, 7.1M persons needed relief, of whom 4.1M were meant to be attended, but only 2.1M were reached. Relief needs were budgeted at US$702M, but by June 2025 only US$235M had been funded. The budget equates to an average of US$171 per person targeted; but the funding received would be worth just US$57 person (UN OCHA, 2024a) – minus the costs of delivery.

Market in Djenne, Mali
© Kirsz Marcin/Shutterstock

3. FINDINGS FOR SUDAN

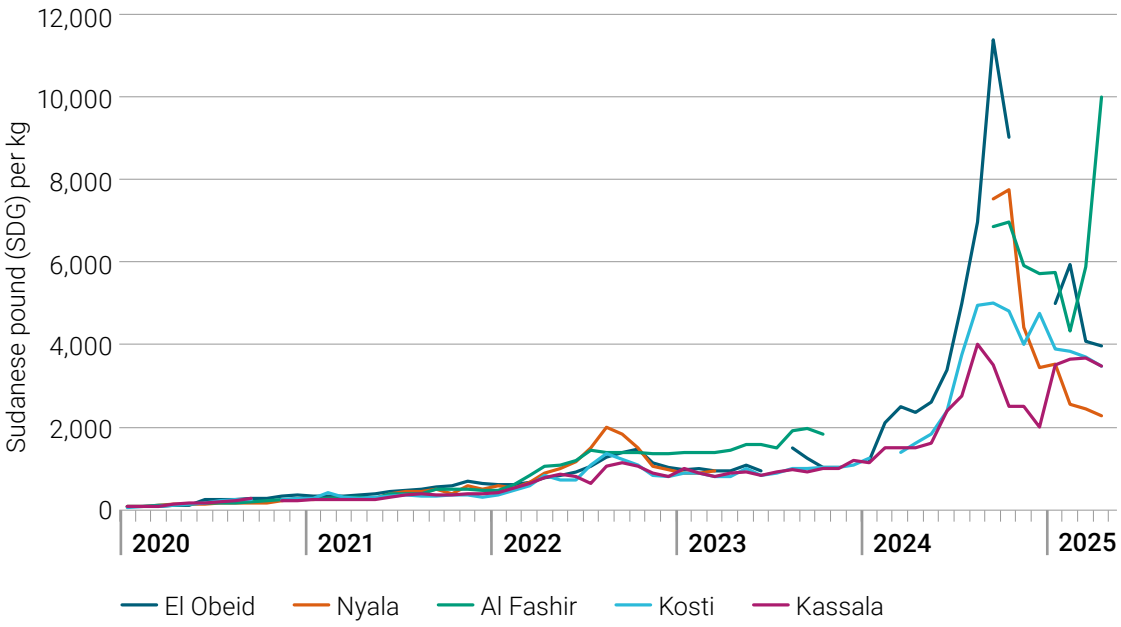
3.1 Price movements in Sudan since 2020

Increases in food prices in Sudan in recent years have been very high indeed: in nominal terms, millet and sorghum were, depending on the market, at least 44 times higher in April 2025 than in January 2020 – and in El Fasher market in Darfur, almost 100 times higher (see Table 3 and Figure 12). Such huge increases are hard to contemplate. They have arisen within an economy that since 2019 has seen hyperinflation, an indicator of which is depreciation of the unofficial exchange rate of the Sudanese pound to the US dollar (see Figure 13):[10] between January 2020 and April 2025 the rate deteriorated by 27 times.

If prices are viewed in US dollar terms (at the unofficial rate), a simpler picture of movements in cereals prices appears. Yet even in dollar terms, cereals prices rose strongly from January 2020 to April 2025 (see Table 3, Figure 14), typically by 60% or more, by far more in El Fasher. Only in Nyala did prices increase slightly or even fall.

If price rises have been steep, the record also shows that cereals prices have been volatile (see Figure 14). Three cycles and trends can be seen. One, there is an annual cycle with prices tending to rise in the months leading up to the main harvests of dryland crops, above all millet and sorghum, in October to December, after which prices fall back. That cycle can be seen for each year other than 2023. Two, prices have become far more volatile since mid-2022. Three, the market of El Fasher in Darfur has seen extraordinary increases, presumably because the city has been under siege since early 2024.

FIGURE 12. SORGHUM PRICES, NOMINAL, SDG PER KG, JANUARY 2020 TO APRIL 2025



Source: compiled from WFP VAM data, collected monthly, based on retail prices

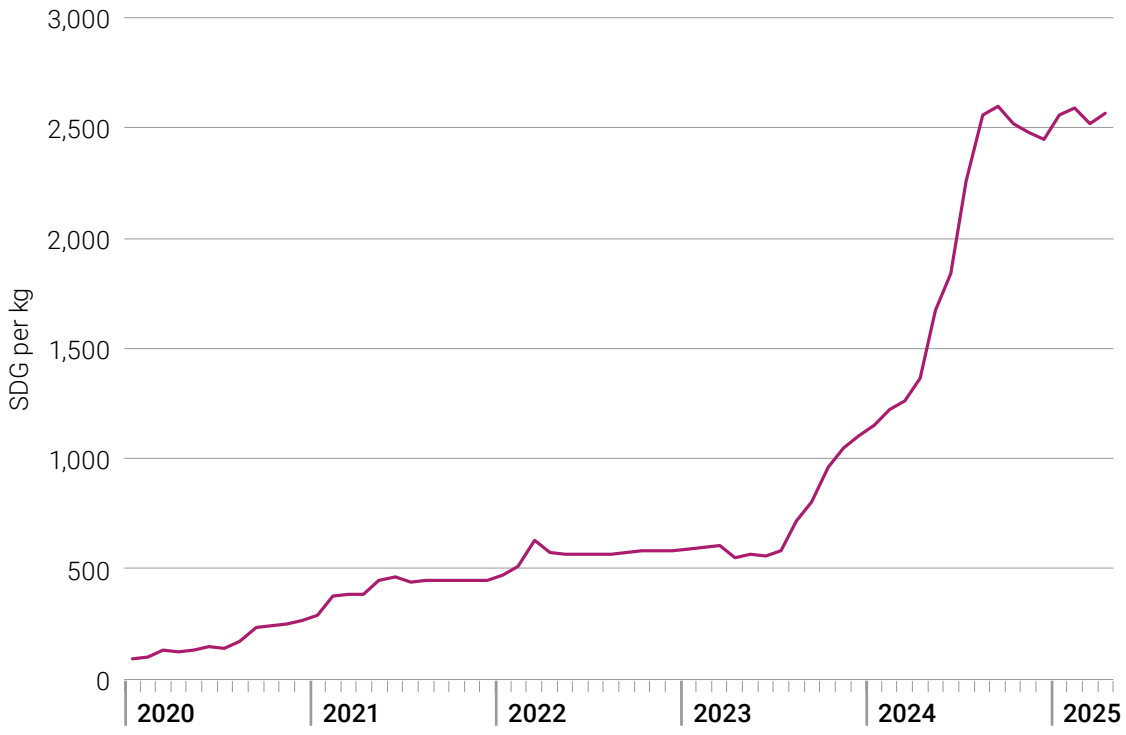
10 The unofficial (parallel) exchange rate should change by the ratio of domestic to US dollar inflation; that is, if domestic inflation is higher than that of the dollar, the rate should depreciate.

TABLE 3. PRICE INCREASES FROM JANUARY 2020 TO APRIL 2025 (IN PERCENTAGES)

Market	Millet	Sorghum
In SDG		
El Obeid	+ 4,650	+ 4,330
Nyala	+ 2,980	+ 2,260
El Fasher	+ 9,110	+ 10,600
Kosti	+ 4,370	+ 4,530
Kassala	+ 5,590	+ 4,240
In US$ at unofficial rate		
El Obeid	+ 80	+ 60
Nyala	+ 10	- 10
El Fasher	+ 240	+ 300
Kosti	+ 70	+ 70
Kassala	+ 110	+ 60

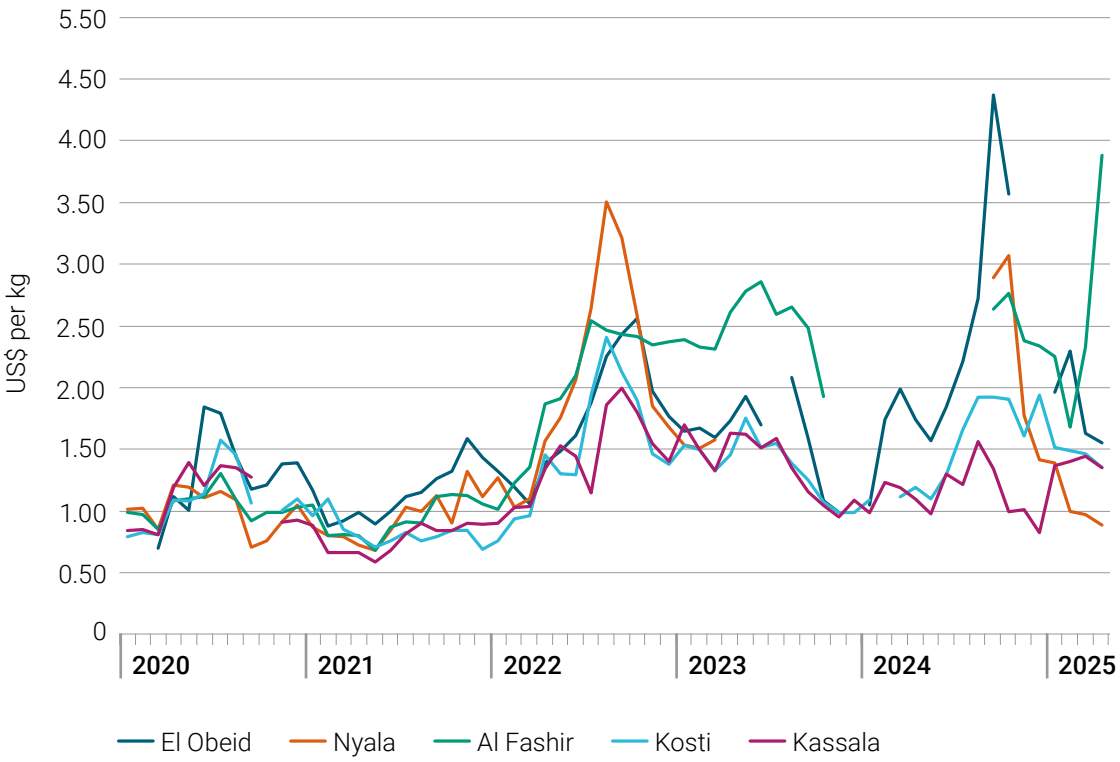
Source: compiled from WFP VAM data

FIGURE 13. UNOFFICIAL EXCHANGE RATE SUDANESE POUND TO US DOLLAR, JANUARY 2020 TO APRIL 2025



Source: compiled from WFP VAM data

FIGURE 14. SORGHUM PRICES, RETAIL, IN US DOLLARS PER KG, JANUARY 2020 TO APRIL 2025



Source: compiled from WFP VAM data. Prices in Sudanese pounds exchanged to US dollars at unofficial rate

Data on wheat prices have not been reported by WFP since 2022, nor by GIEWS or FEWS NET. Bread baked from wheat flour is the staple in urban Sudan, and the bulk of this wheat is imported. Given that world prices have been falling since mid-2022, wheat and bread prices should not have increased to the same extent as those for domestically produced grains, although the costs of transporting and processing wheat will have been pushed up by disruptions to transport and by general inflation.

3.2 Explaining price rises in Sudan

Two factors can explain the extraordinary rises in the prices of millet and sorghum: harvest failures and limited supply, in part owing to conflict; and hyperinflation in the economy, also exacerbated by conflict.

3.2.1 Harvest failures and limited supply

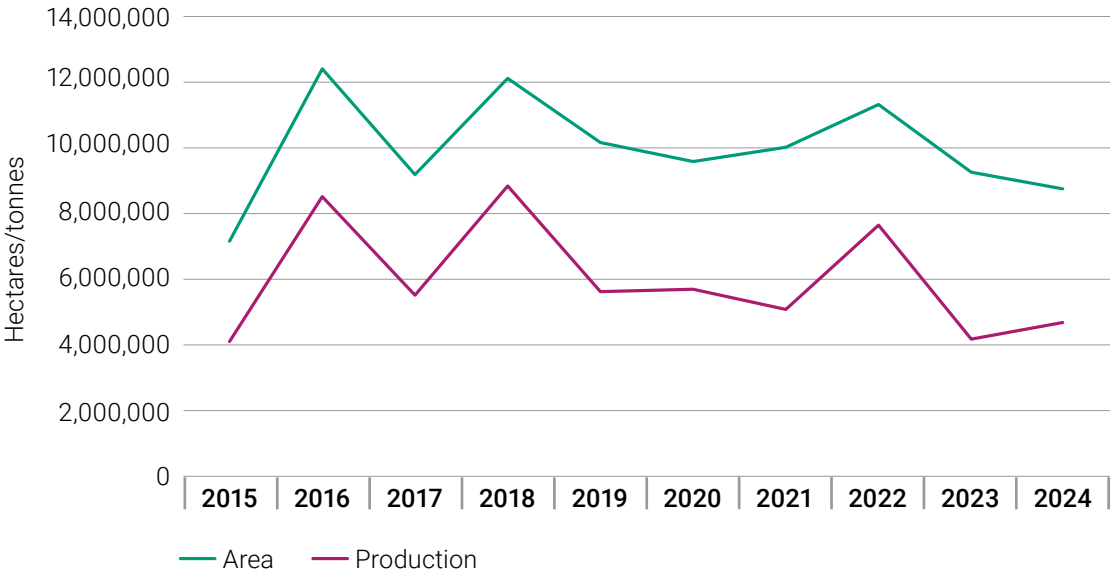
In the ten years since 2016, cereals harvests in Sudan – very largely made up of millet, sorghum and wheat – have been highly variable (Figure 15). The harvests in 2016, 2018 and 2022 were above average: harvests for the other seven years have been low. Much of the fluctuation corresponds to variations in the area planted. If there is any trend over the years, it looks to be a decline.

Meanwhile the population has been rising – from 40M in 2015 to 50M in 2024. Hence the domestic supply per person has been falling (Figure 16). In 2016 domestic harvests were equivalent to 200kg per person: by 2024 that figure had fallen to under 100kg per person. Domestic supply is augmented by wheat imports: these have risen since 2016, but by nothing like enough to compensate for poor harvests and a declining amount grown per person. Wheat

imports have made up between 18% and 34% of total supply, with larger shares in years when domestic harvests have been low. While imports raise the availability of cereals per person, they have not prevented a decline: in 2016 total availability was around 250kg per person, but by 2024 it was below 150kg per person.

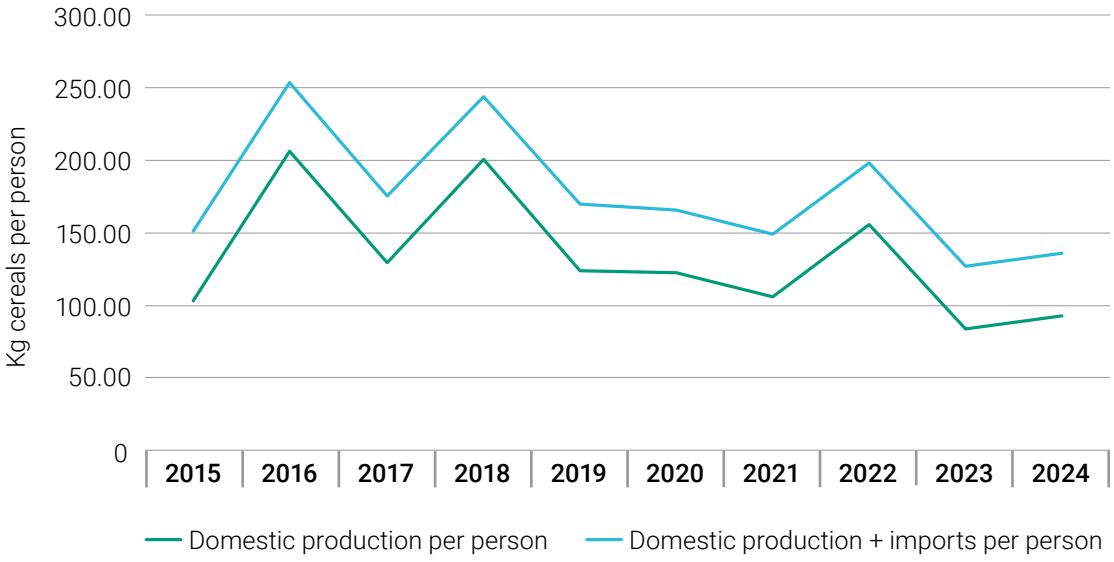
Given that demand for cereals, the staples of diet, per person is relatively constant,[11] the large falls in available cereals can account for the rise in prices, even if we also need to factor in inflation to explain the size of the very high increases.

FIGURE 15. SUDAN CEREALS PRODUCTION, 2015 TO 2024



Source: compiled from FAOSTAT data; for 2024 the estimate comes from USDA

FIGURE 16. SUDAN CEREALS AVAILABILITY PER PERSON, 2015 TO 2024



Source: compiled from FAOSTAT data; for 2024 the estimate comes from USDA

11 Demand per person for cereals will rise if incomes rise, because with higher incomes the demand for (cheap) meat will rise, some of which will be met by feeding cereals to chickens.

Harvest failures are partly the result of longstanding hazards such as drought and floods that can decimate harvests when so much of Sudan's agricultural production comes from rainfed fields with just one crop a year. The open conflict that broke out in April 2023 has added considerable new hazards.

Conflict has affected agriculture in several ways. In areas with open warfare between factions – for much of 2023 and 2024 that meant Khartoum and its immediate surrounding areas, most of Darfur and parts of Kordofan – farmers have been unable to get to their fields and farm (and herders have been unable to move their herds). Some farmers have fled conflict, leaving behind their farms and not all of them have been able to farm in their zones of refuge.

A 2023 survey of more than 3,000 farmers[12] found more than a quarter had been displaced:

> '… 28 percent of the surveyed farmers were displaced from their usual place of residence because of the conflict. Approximately, 50 percent of them were moved to other states and the other half moved to a different location within their usual state of residence. The majority (73 percent) of those displaced originated from Khartoum state …'. (Kirui et al., 2023)

But it was not just among displaced farmers that planting in 2023 was unlikely:

> 'At the national level, 40 percent of farmers indicated that they did not prepare for planting in the summer season. Among them, 44 percent indicated that they do not even have plans to plant later in the season. This translates to an average of 18 percent of farmers at the national level that did not or would not plant this season.' (Kirui et al., 2023)

For most farmers not intending to plant, whether on time or late, the direct effects of conflict were not the main reason (see Figure 17). Instead, they were deterred by economic factors – unavailability and high cost of seeds, fertiliser, herbicides, crop-protection chemicals and farm machinery, no working credit and even lack of labour. The availability of migrant labour was inhibited by insecurity, reducing typical flows to the commercial farms in the southeast of the country from neighbouring areas of Ethiopia and areas of lower productivity in Sudan.

When scarce agricultural inputs were available, they were expensive. The average price of seeds for main staple cereals was 63% higher in 2023 compared to the previous season. Farmers relied mainly on seeds retained from the harvest of the previous year (FAO, 2024a).

Disrupted supplies of inputs and credit, and high prices of inputs, result from the economic consequences of conflict – farms and firms producing less, trade made more difficult and costly, and less public spending on public goods (World Bank, 2025).

It is perhaps a little surprising to see how rarely farmers were deterred directly by conflict, although this varied greatly by state – see the appreciable proportion of farmers affected directly by conflict in Khartoum and North Kordofan in Figure 17. (Had Darfuri farmers also been surveyed, conflict would surely have loomed large in their considerations.)

Trade disruptions and limited mobility led to a shortage of labour and agricultural inputs – seeds, fertilisers, herbicides and agricultural machinery – which disrupted planting and harvesting for the 2023/24 season. Trade disruptions also interfered with marketing, thereby

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12 Most of the interviews were conducted by phone or internet. Although the survey was intended to cover the nation, it was not possible to interview enough farmers in Darfur where conflict had disrupted phone networks.

reducing the incentive to produce surpluses. Disruption, unsurprisingly, correlated closely with intensity of conflict (see Figure 18).

Insecurity and the incidence of checkpoints, restrictions and blockades along trade routes limited movement of food and goods between farms and urban centres. Many of Sudan's imports – food, fuel, medicines, machinery – and much domestic trade in agricultural produce from high-production southeastern areas to central and western deficit ones flows through Khartoum for onward distribution: intense conflict in Khartoum rendered routes in and out of the city largely inaccessible, preventing food supplies reaching deficit areas (ACAPS, 2024).

Insecurity along trade routes across Greater Darfur and Greater Kordofan has reduced supply to key markets, causing prices to rise above already seasonally high levels. El Obeid – the regional commercial centre that links markets in central, western and southern Sudan – came under siege in mid-2023, restricting supplies to the aforementioned markets, particularly El Fasher and Nyala (FEWS NET, 2024). Intense fighting in El Fasher – as of February 2025 the city had been under siege for nine consecutive months – saw food shortages and prices worsen.

Informal taxation across trade routes and high fuel prices have increased the cost that transport vendors and wholesalers pay to deliver goods to the market. Setting up toll gates at security checkpoints in the areas of the west they control, the insurgent RSF have imposed illegal fees on trucks transporting crucial supplies such as food and medicine, both for humanitarian aid and the private market. These high costs add to the price of the food sold in the market.

Regional variations

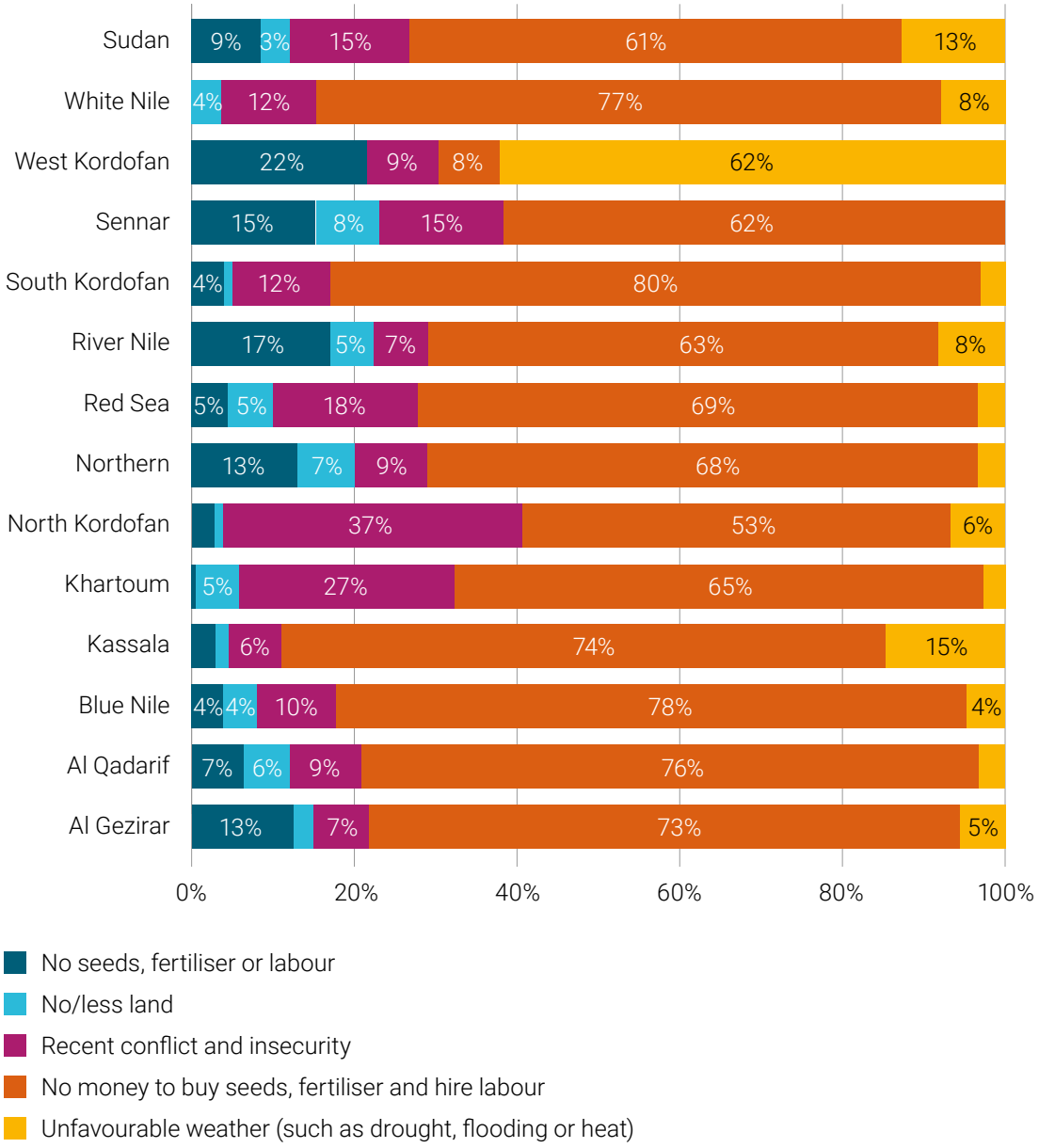
The impacts of conflict differ markedly across Sudan. The millet harvest was hit hard because millet is mainly grown in Darfur. In the main sorghum-producing regions in the southeast – El Gedaref, Sennar, El Gezira, Blue Nile, White Nile, Kassala – where agriculture is both traditionally rainfed and semi-mechanised, fields were accessible during 2023 owing to better security. Rather than conflict, the main concerns were reduced access to financing, because of disrupted banking, and shortage of agricultural machinery owing to disrupted trade flows. Cash shortages coupled with limited access to expensive inputs reduced semi-mechanised production as farmers increasingly shifted to traditional rainfed production systems, resulting in lower yields and output (FAO, 2024b).

While a reduction was reported in the semi-mechanised sector, the traditional rainfed sector reported an increase in planted area – 7% and 14% higher than in the previous year and the five-year average, respectively. In Sennar State, the main producer of sorghum, the planted area was reported as three times higher than the previous year and more than four times higher than the five-year average owing to the influx of IDPs mainly from Khartoum State engaging in agriculture. Overall, the area planted for sorghum in 2023/24, was estimated at about 9.8 million hectares, about 1% higher than the previous year and the average of the previous five years.

Millet and sorghum harvests in the 2023/24 cropping season were also lower than the previous year and the five-year average owing to rainfall deficits and irregularities (FAO, 2024b) – about 95% of the cultivated area is rainfed, making rainfall a key driver of food crop production.

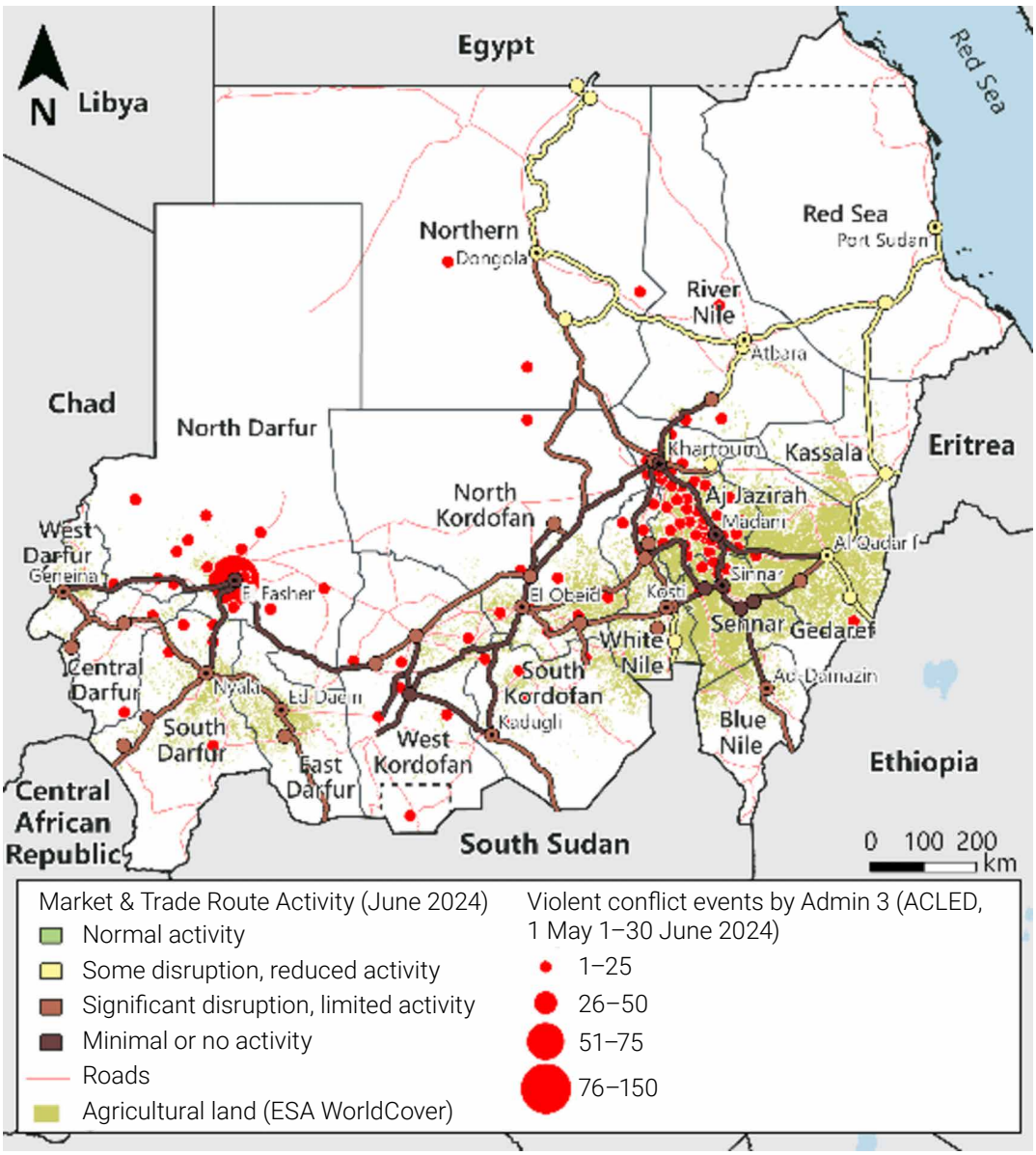
With the conflict spreading to southeastern key-producing areas since late 2023 (Sennar, White Nile and Blue Nile states), the 2024 agricultural season was also affected by lack of access to farmlands and inputs, disrupting local food production (FAO GIEWS, 2024).

FIGURE 17. REASONS FOR NOT PLANTING, BY STATE, SUMMER SEASON 2023



Source: Kirui al. (2023: Figure 6)

FIGURE 18. TRADE FLOWS, MARKET FUNCTIONALITY, CONFLICT (MAY TO JUNE 2024), AND AGRICULTURAL LAND EXTENT



Source: FEWS NET (2024: Figure 9), from FEWS NET/United States Geological Survey and ACLED

3.2.2 Hyperinflation

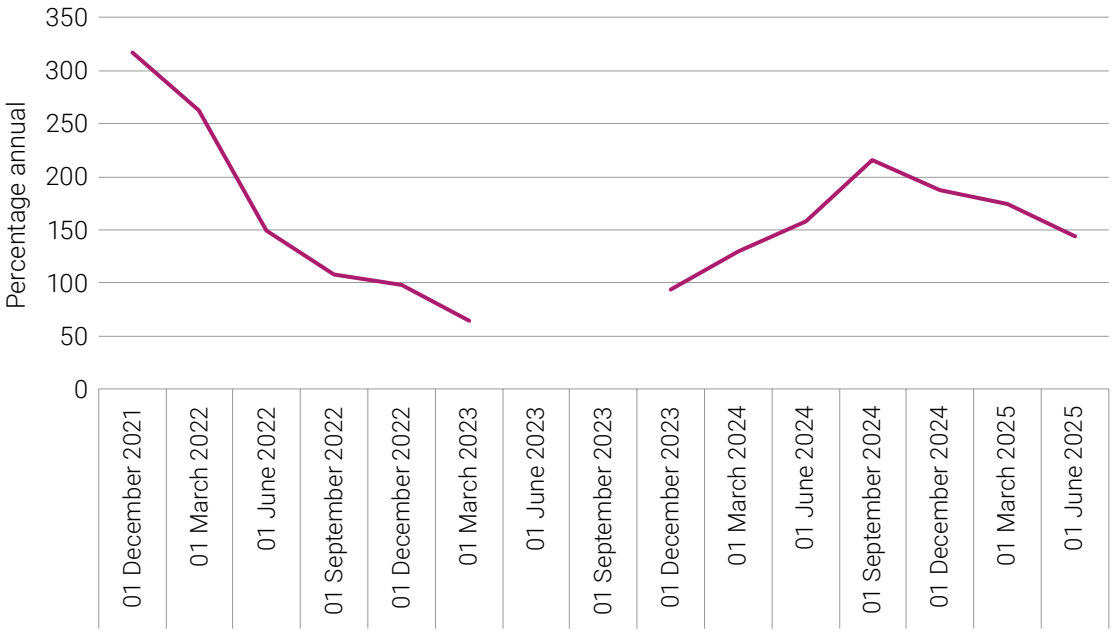
Since 2019, inflation in Sudan has run at very high rates, of 100% a year or more in some months up to the equivalent of 300% a year (Figure 19). The cause of hyperinflation is overwhelmingly monetary and macroeconomic policy to cope with trade deficits[13] and the gap between government revenues and spending which has seen the government create additional money to fund public spending (Abdelkarim, 2021; AfDB, 2023; Baldo, 2021; Darbo and Nakumuryango, 2019; Elsaui 2022).

Consequently, most prices have been rising fast, including, for farmers, the costs of manufactured inputs (fertiliser, chemicals, machinery) and transport. At the same time, lagging supply against demand has led to traders and consumers bidding ever more for scarce supplies of cereals.

Changes to general inflation and to cereals prices (Figure 20) do not perfectly correspond: since late 2021 cereals prices have been more volatile than the overall inflation rate, but cereals prices and inflation move in the same direction – as might be expected when cereals prices are themselves a significant component of the CPI which marks inflation.

Hyperinflation may not be the main reason for rising cereals prices in Sudan – lagging supply against a growing demand is the fundamental cause – but it helps explain why the price rises seen in the 2020s have been so extraordinarily high.

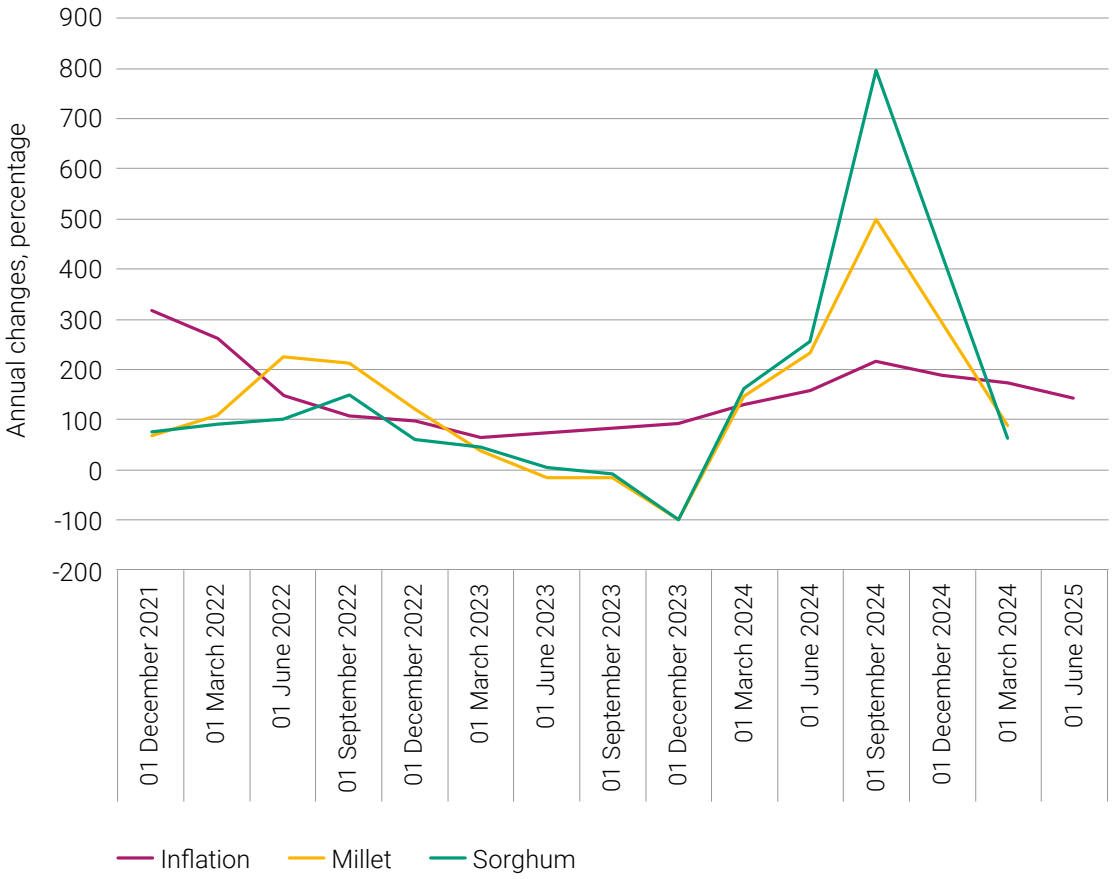
FIGURE 19. ANNUAL INFLATION RATES, QUARTERLY ESTIMATES, SUDAN, DECEMBER 2021 TO JUNE 2025



Source: compiled from Central Bank of Sudan statistics; data not available from March 2023 to December 2023

13 The conflict has reduced key exports: Sudan reported an 80% decrease in the exports of gold, the main forex earner, in 2023 compared with the previous year. Sheep exports have also been impeded. With fewer US dollars earned, but continuing demand for imports of food (above all, wheat), medicine and other goods, Sudan has seen sharp depreciations in exchange rate (ACAPS, 2024).

FIGURE 20. INFLATION RATES AND CEREALS PRICE CHANGES IN EL OBEID MARKET, DECEMBER 2021 TO MARCH 2025



Source: inflation data from Central Bank of Sudan, cereals price in Ol Obeid, from WFP VAM data

3.3 Consequences of higher food prices in Sudan

The people of Sudan face a combination of shocks in which higher food prices are but one element. The conflict since April 2023 is the most noticeable. Areas of fighting have seen not only death and destruction, but also mass displacement of people fleeing the fighting. As of June 2025, out of a population estimated at around 50M, over 10.1M individuals have been internally displaced, 7.7M or more of them since April 2023 when conflict erupted. In addition, by June 2025 an estimated 4M[14] had fled across the border, most noticeably to Chad (UN OCHA figures, 20 June 2025).

Areas with the highest concentration of IDPs (River Nile, South Darfur, East Darfur, Northern, Sennar and North Darfur) have seen increased demand for food amid large population influxes, resulting in higher market prices, especially given already scarce resources (IPC, 2024).

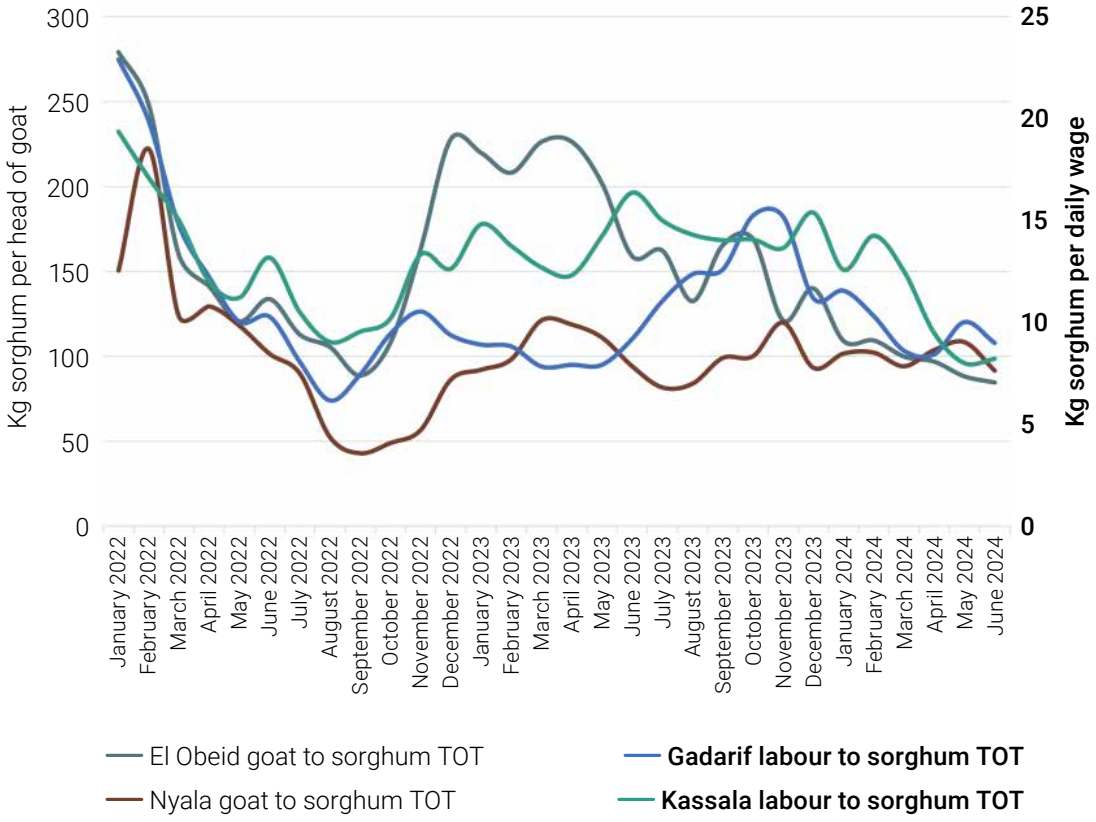
Conflict has also ravaged the economy, transmitting the effects of warfare across the country to areas that have seen little or no active fighting. FEWS NET reported in mid-2024 severe reductions of economic activity:

14 This includes 800k persons who were foreign refugees within Sudan who then left Sudan.

'Macroeconomic conditions: Severe disruption of economic activities, massive capital flight, a high and worsening exchange rate, and high inflation are compounding years of already severe economic challenges, including rampant inflation and widespread shortages of essential goods. In 2023, the economy contracted an estimated 37.5 percent. While the African Development Bank (AfDB) has projected that it could further contract by 5.9 percent in 2024, the International Monetary Fund (IMF) anticipates it could be as high as 18.3 percent.' (FEWS NET, 2024)

A contracting economy results in less employment, or lower pay. The value of a day's casual labour, in terms of the ability to buy sorghum with a daily wage, has been falling since the outbreak of conflict through to mid-2024 (Figure 21). The exchange value of a goat for sorghum has also fallen.

FIGURE 21. TERMS OF TRADE (TOT) OF LABOUR AND GOATS, JANUARY 2020 TO JUNE 2024



Source: FEWS NET (2024: Figure 10), using data from the Food and Agricultural Market Information System (FAMIS)

People have tried to cope by reducing consumption, selling off assets, and seeking additional income.

3.3.1 Reducing food consumption

Reduced food consumption has meant buying cheaper and often less preferred food, limiting portion sizes, or reducing the number of daily meals (Kirui et al., 2024c). In areas experiencing extreme food shortages, such as El Fasher, displaced and resident populations have resorted to consuming wild and famine foods – seeds, grasses, leaves, bark, twigs, peanut shells, and even dirt (IPC, 2024).

> 'Wild foods are normally collected by poor households (even in years of good production) to store in anticipation of food shortages. Since the start of the conflict there are indications of increased consumption of wild foods, including leaves and grass – as well as resorting to eating dirt – among IDPs and poor households, particularly in Greater Darfur and Greater Kordofan.
>
> *Mukheit* (*Boscia senegalensis*) is the most common wild food in drier areas of Darfur and is the main species consumed as an emergency food to mitigate food shortages: it is typically harvested late in the season and can be stored for years but requires a high level of processing.
>
> Earlier maturing wild foods include *deffra* and *koraib*, which are typically harvested before the cereals. In Greater Kordofan, consumption of wild edible plants (WEPs) is a traditional practice in many rural areas, including different species of shrubs, trees, herbs, and grasses. Edible fruits that are generally consumed without processing include *lalob* (*Balanites aegyptiaca*) and *nabag* (*Ziziphus spina*).' (FEWS NET, 2024)

But FEWS NET (2024) also reports that in areas of active fighting, looking for wild foods may well have been too dangerous; moreover, as many people switched to wild food, there may have been too little to meet demand.

In the areas most affected by conflict food insecurity has risen alarmingly, with assessments using the Integrated Phase Classification (IPC) reporting food insecurity passing through stages of crisis and emergency to the ultimate stage of famine. This applied above all to the besieged city of El Fasher where many IDPs had sought refuge – with little work, unable to farm, and with rapidly rising prices of grains.

> 'Data from Médecins Sans Frontières (MSF) collected in January and March/April [2024] provide evidence that acute malnutrition levels (23.1-29.4 percent) are above the Middle Upper Arm Circumference (MUAC) threshold for Famine (IPC Phase 5), while the non-trauma Crude Death Rate – estimated at 1.9 deaths per 10,000 per day in January 2024 – had likely surpassed the Famine threshold of 2 deaths per 10,000 per day by June.' (FEWS NET, 2024)

Other areas facing food emergencies with the threat of famine by mid-2024 included 'areas with very high concentrations of IDPs across Greater Darfur and South Kordofan, as well as in El Fasher of North Darfur, parts of West Darfur, and in some neighborhoods of Khartoum' (FEWS NET, 2024).

> 'Emerging evidence of a high and rising number of cases of acute malnutrition in parts of Central and South Darfur, and of excess mortality as observed via satellite imagery analysis of graveyards around displacement camps, underscore that a humanitarian catastrophe is already unfolding and Famine (IPC Phase 5) will only be confirmed after many deaths have already occurred and mortality rates reach extreme levels.' (FEWS NET, 2024)

Food insecurity has been rising even in areas with little or no conflict: '... the share of rural households in East Darfur that were experiencing severe food insecurity rose from 14.9% in 2022 to 72.4% by September 2024, a more than fivefold increase. Similarly, River Nile saw the proportion of severely food-insecure rural households soar from zero in 2022 to 54.7% in September 2024' (Kirui et al., 2024a).

3.3.2 Selling off assets

FEWS NET (2024) reports people as selling off assets but gives few details. Stocks of food are an asset. Farmers were releasing stocks earlier than usual to increase their own income to meet rising costs of living and often to support the arrival of family members displaced by conflict (FEWS NET, 2024). Poor pastoral and agro-pastoral herders have also been forced to sell more at lower prices to meet rising costs of food and non-food essentials.

3.3.3 Seeking extra income

The possibilities of taking up extra work has depended in large part on location. In cities under siege, El Fasher in particular, work opportunities have been very scarce. Urban areas have seen formal jobs curtailed or workers going unpaid. It has been harder to obtain informal work as 'markets close and economic activity stagnates' (FEWS NET, 2024).

In Khartoum, remittances have helped sustain households, although access has been intermittent given disruption to telecommunications and banking. Alternative ways to generate income are also taking place, including working as security guards in places where most people have fled their homes, selling water from a donkey cart, delivering food and services to households with limited mobility, and small-scale trading in relatively secure areas. However, all these activities have been risky when moving across the fighting zones within the city. (FEWS NET, 2023).

In rural areas, people have turned to longstanding ways to earn more, albeit often in activities which have low pay:

> 'In **rural areas**, poor and very poor households are increasing their dependence on the collection and sale of firewood, charcoal, and bush products, as well as on migration in search of non-agricultural unskilled labor opportunities, such as informal labor in artisanal mining sites and in safer towns, where feasible.' (FEWS NET, 2024)

> '… Media reports have indicated increased artisanal gold mining in parts of Kordofan as well as in River Nile, likely driven by the importance of gold as a key source of revenue for belligerents in the war and the rising demand for wage labor opportunities.' (FEWS NET, 2024)

Some displaced populations benefited from labour opportunities during 2023/24 harvest activities. For example, the large numbers of displaced people who fled from Khartoum mainly to southeastern agricultural areas, including Gedaref, Kassala and Sennar States, worked as agricultural labourers, though at low wages owing to saturation of the labour market. In general, income-generating opportunities for IDPs were scarce outside the planting and harvesting season.

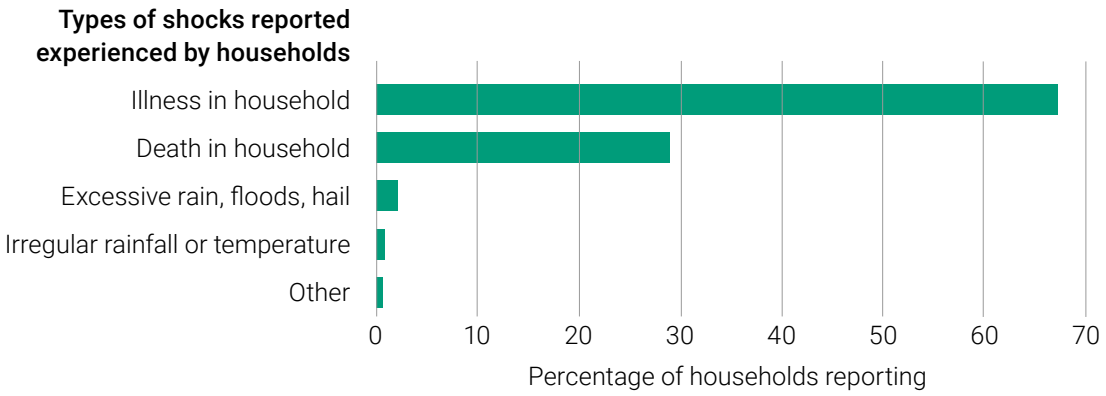
3.3.4 Individual shocks

The Sudan Rural Household Survey 2023 collected data through phone interviews from more than 4,000 rural households between November 2023 and January 2024. Responses to a question about shocks experienced in the previous year are surprising and perhaps revealing (see Figure 22).

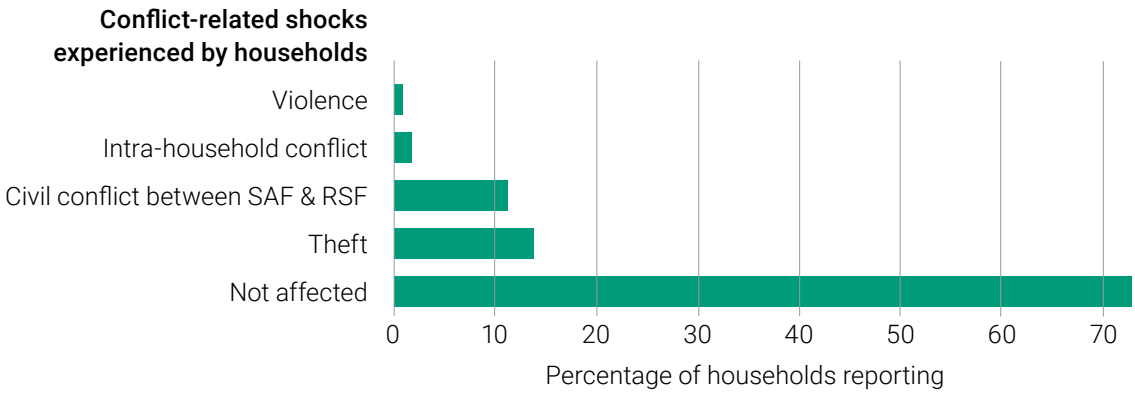
Two shocks were common and dominated responses: illness and death in the household. Few other shocks were reported – barely a mention of bad weather (although 2023 was not a drought year). More than 70% said they had not experienced a shock associated with conflict: of those that did report such a shock, 14% mentioned theft.

FIGURE 22. TYPES OF SHOCKS EXPERIENCED BY HOUSEHOLDS IN THE PREVIOUS YEAR

Panel A



Panel B



Source: IFPRI and UNDP (2024: Figures 8.1 and 8.2)

It is possible, perhaps likely, that the survey results were affected by response rates: people would surely find it easier to reply to a phone survey in areas least affected by conflict; and survivor bias means there would have been no responses from those who had fled or died from warfare or its consequences. Even so the results are striking. Outsiders observing events in Sudan have pointed to the covariant shocks – droughts, floods, conflict, hyperinflation, etc. – which are so evident: they readily see the everyday financial and emotional toll that illness, disability and premature deaths have on rural households.

3.4 Response from government, donors and NGOs in Sudan

3.4.1 Humanitarian assistance

Sudan has seen some of the world's largest humanitarian relief operations to date in the 2020s. The scale of this effort is impressive, although insufficient to meet assessed needs.

Since mid-April 2023, WFP has supported over 11M people with emergency food packages, cash-based assistance, hot meals, and specialised nutrition supplements. In late 2024, as roads dried following the rainy season, WFP launched a major surge in food assistance to hard-to-reach areas with more than 700 trucks carrying WFP food aid sent to communities across Sudan (WFP, 2024a). This included around 135,000 people in Zamzam camp (Darfur, close to El Fasher) since September 2024 where commodity vouchers for locally sourced food were also provided.

To address concerns about access, WFP has used alternative forms such as voucher-based assistance; mobile money transfers; and working through community kitchens in Khartoum to provide hot meals.

In the context of civil war, the logistics of providing aid have become more difficult, costly and time-consuming. From the first few days of fighting in Khartoum in April 2024, the UN and other international organisations were impeded by a lack of access. The combination of insecurity and administrative barriers such as checkpoints, trans-shipment of goods across borders, and the very poor condition of roads make the logistics chain tortuous, expensive and inflexible.

This continues to hinder the free flow of goods and food into Greater Darfur and Greater Kordofan, as well as in Khartoum and Al Jazeera (Gezira). The ability to assist populations is heavily constrained by bureaucratic requirements and approval processes imposed by the parties to the conflict. These procedures severely limit both the reach and scale of humanitarian efforts, even affecting informal trade.

UNICEF has scaled up nutrition interventions in Sudan, integrating them with health, water and sanitation (WASH), and other services. Interventions focus on localities experiencing extremely high and rising levels of malnutrition and food insecurity. Between January and November 2024, 6.7M under-fives were screened for malnutrition, and more than 415,772 children suffering from severe acute malnutrition were treated, 74% of the annual target. Despite limited access, significant scale-up of nutrition interventions was achieved through more than 1,900 health facilities and 82 mobile teams, in partnership with State Ministries of Health and 41 NGOs across Sudan (WFP, 2024b and 2025).

While aid to Sudan has provided much-needed assistance, it pales in comparison to what is needed. WFP's aid programme was suspended for 1.2 million Sudanese refugees and crisis-affected people in April 2024 due to funding shortfalls, including for new Sudanese refugees. The UN goal of US$2.7 billion to fund humanitarian relief during 2024 was only 57% met (UN, 2024).

In early July 2025, the UN-coordinated Sudan Humanitarian Needs and Response Plan for 2025 calculated that 30.4M people required humanitarian assistance, with 20.9M targeted for assistance by the UN and its specialised agencies and other partners. The Plan appealed for US$4.2 billion, with US$3 billion urgently required. Funding by 9 July 2025 had reached US$916.9M, 22% of the appeal. Between January and May 2025, only 12.4M people (60% of the target of 20.9M; 41% of the 30.4M people requiring assistance) had received humanitarian assistance, including 8.7M who had received food assistance, and 2.7M who had received health support (UN OCHA, 2025).[15]

3.4.2 Self help

With only some of those requiring humanitarian assistance receiving any help, many people have had to fall back on the resources of the household, family and local community. FEWS NET (2024) quotes Birch et al. (2024) to the effect that:

15 The same UN OCHA source also reports 24.6M people facing food insecurity of IPC phase 3 or more, including 637k persons facing catastrophic food insecurity (IPC 5) by June 2025; with 3.7M children under five years and pregnant and breastfeeding women needing treatment for acute malnutrition in 2025.

'… mechanisms of social support are diverse and have historically had a high level of support and participation across both rural and urban settings, with strong local leadership both for regular support mechanisms and more ad hoc community mobilization and support.' (FEWS NET, 2024)

The same source comments on the Sudanese ethos of sharing money and food, and offering gifts to those in need:

'Less formalized mechanisms of sharing also have deep roots in Sudanese culture, including gift-giving between families and relatives (the more formalized version being *Zakat*), community-led support for IDPs via the provision of cooked meals and shared food, and practices of sharing such as *Darra,* where multiple households come together to share meals even if not every household can contribute to the meal.' (FEWS NET, 2024)

Such mutual help also applies among those in IDP camps:

'Among IDPs, the primary forms of community and social support are joint meals, sharing available food items with relatives and those in need, borrowing cash, and, in some cases, women's groups preparing and distributing food to new arrivals in IDP camps/gathering points.' (FEWS NET, 2024)

Emergency Response Rooms (ERRs) seen in major cities represent a more formalised form of mutual aid, providing, among other things, community kitchens and medical services, and other activities (FEWS NET, 2024).

3.4.3 Agricultural support

In 2023, FAO supported more than a million farmers – mainly in the traditional rainfed and in the irrigated sectors – with seed distributions (sorghum, millet and small quantities of seed of cash crops such as groundnut and sesame). This provided about 10,290t of certified seeds, about 90% more than the amount distributed in 2022. The distribution of certified seeds by FAO partially offset the reduction in sorghum production caused by the conflict. The FAO also supported 1.3M pastoralists with livestock services and inputs (FAO, 2024a).

The European Union (EU) launched a three-year initiative in August 2024 in cooperation with the international relief and recovery organisation ZOA International to enhance food security in Gedaref and Kassala, which hosts increasing numbers of IDPs coming from conflict zones. Activities focus on improving agroecology rainfed farming and horticulture, enhancing the capacities of fishery production associations, and facilitating access to finance for farmers, livestock and fishery producer associations. The project also focuses on improving access to water for drinking and agriculture and to create sustainable and decent jobs for youth and women (EU, 2024).

The emergency wheat-production project in Sudan, funded by the African Development Bank and implemented by WFP, distributed climate-adapted wheat seeds and fertilisers to over 170,000 smallholder farmers in five states during the 2023/24 agricultural season, covering areas largely located in the then stable northern and eastern states, as well as conflict-affected areas such as Gezira and White Nile states. The project resulted in a claimed 70% increase in wheat production in targeted project locations (AfDB, 2024).

4. DISCUSSION AND CONCLUSIONS

4.1 Key points recapped

Cereal prices have increased greatly since early 2020 in both Mali and Sudan, with Sudanese prices rising by many multiples in an economy experiencing hyperinflation.

Since early 2020, it is increasingly clear that world prices have had only a small influence on domestic prices in Mali and Sudan; most clearly seen since mid-2022 when world prices have been falling, while those in both countries have remained high. The fundamental problem in both countries is that domestic production of cereals per person has fallen markedly over at least the last five years. Harvests have barely increased, while the population has risen. It is not hard to diagnose the reasons for faltering harvests: in the face of conflict affecting much of both countries, farmers struggle to plant, tend and harvest crops – indeed, hundreds of thousands of farmers have been displaced and no longer work their original farms – while disruptions to trading reduce the incentive to produce a surplus.

The consequences of higher prices of staple foods have been predictably dire for people on low incomes: they have been forced to economise on food, eating the cheapest foods and often eating less. They have further cut spending on health care and schooling for their children, with many removed from school entirely. Assets have been sold off, loans have been taken out. Searching for extra income, people have had to take on arduous jobs or very low-paid employment for long hours, and sometimes both things. Only a few options offer good returns to labour, but these also entail risks: informal gold mining, migration from rural areas to towns and sometimes out of the country altogether.

In areas of (active) conflict in Sudan, the situation has become desperate: in parts of Darfur from 2024 onwards the IPC classification reached phase five, famine, while large areas of the rest of the country were considered at phase four, food emergency.

Public responses – from government, donors and NGOs, both international and local – have been insufficient to alleviate hardship. Most hard-hit households have had to cope with whatever resources they and their close families, friends and neighbours could muster.

4.2 Discussion and implications

Options to prevent food prices rising, or at least to prevent the extraordinarily high increases seen in Mali and Sudan, include:

- reducing the incidence and severity of harvest failures
- importing additional cereals to make up for domestic harvest losses
- holding public stocks to cover harvest losses
- controlling prices or subsidising prices of staple foods; and
- protecting those most at risk from higher food prices.

There is a large literature on these policy options which will not be rehearsed here.[16] Instead, we briefly review the options to comment on their feasibility in the two countries.

4.2.1 Mitigating harvest failures

Early warnings of expected poor weather in growing seasons can be useful; but in Mali and Sudan conflict is the overwhelming problem for farmers. If peace were restored, it would be possible to consider measures to boost domestic harvests – and make cropping more resilient to a changing and more variable climate. But little can be done while farmlands are abandoned, input supply and marketing are disrupted, and while overall economies stagnate. The tragedy is that both countries have arable land sufficient to grow staples and more than enough to meet domestic demand; they have large areas of grazing land for livestock; and they have irrigated tracts – which could be expanded – to produce high-value crops. But while conflict persists, there is little chance to realise the agricultural potential of either country.

4.2.2 Importing additional cereals to make up for domestic harvest losses

If increasing domestic supply during conflict is difficult, importing cereals might bring down domestic prices, to benefit people on low incomes who do not or cannot grow their own staple foods.

Imports of cereals to Mali and Sudan since 2020, and especially since 2023, have been falling when compared to population: in 2019, Mali imported some 38kg per person; the estimate for 2025 is 34kg per person; for Sudan the equivalent figures are 64kg in 2019 and 50kg person in 2025.[17] This is surprising. In November 2024, world prices of maize were US$202 a tonne, and of sorghum, US$242 a tonne.[18] But in that month prices of sorghum in domestic markets were far higher: US$610 a tonne in Bamako, Mali, and US$980 a tonne in Kassala, Sudan. While these are inland markets requiring costly overland transport of imports from the world market, such costs are a small share of the difference between domestic and world prices — for example, road freight in Africa typically costs as much as US$0.15[19] per tonne per kilometre: at that rate, shipping a tonne of cereals from Abidjan to Bamako would cost US$180, and from Port Sudan to Kassala US$85. Even if actual transport costs were twice as much, and they may be in Sudan owing to conflict, a trader should be able to make a large profit from importing cereals. Presumably there are obstacles to such trade, possibly high tariffs, quotas or bans: otherwise, it is hard to explain the declining trend for imports of grain per person in each country – especially given the recent creation of the Africa Continental Free Trade Area (ACFTA).

4.2.3 Holding public stocks to cover harvest losses

In theory governments can build public buffer stocks in years of good harvests at modest cost, then sell off the stock in deficit years at a higher price (thereby paying for the cost of storage): actions that would tend to stabilise prices of staple foods. In practice, public storage is usually more costly than imagined, and especially so if the aim is to stabilise market prices.[20]

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16 For a short treatment of the options see Poulton et al. (2006).

17 Using USDA data for imported grains; and US Bureau of Census data for estimated populations.

18 See IMF primary commodities data at https://www.imf.org/en/Research/commodity-prices.

19 Sahinyazan et al. (2017) reported WFP national shipping costs to be at most US$0.11 per tonne-kilometre in 2017. With 32% inflation from 2017 to 2025, that rate would come to US$0.15.

20 If the price (or price range) to be stabilised diverges too far from the price that would, absent any stock operations, otherwise be set in the market, stock managers may find themselves either having to buy too much produce to defend a minimum price, or running down the stock completely to contain a rising price. Given changes to underlying demand and supply, stock managers need to be well-informed about changing supply and demand, and agile to adjust the target price (or range) — and permitted to do so — to prevent such outcomes.

Mali has public stocks both to release for emergencies and to stabilise prices, but the amounts held are small compared to variations in domestic harvests: for example, in 2024 USDA reported 163kt of rice held in public stocks – compared to a typical rice harvest of 1.9–2.0Mt.

Sudan does not apparently – at least, the literature does not mention them – hold public stocks.

4.2.4 Controlling prices or subsidising prices of staple foods

The government of Mali aims to control prices, but as reported, struggles to implement that policy, whether for lack of officials to check and sanction breaches of rules, or owing to unwillingness to confront traders. Even when governments have the means and will to regulate prices, it typically proves hard to prevent parallel markets from appearing.

In Sudan, the government used to subsidise the price of the common bread (largely consumed in urban areas): it was a costly policy and largely abandoned in 2018.[21]

4.2.5 Protecting those most at risk from higher food prices.

The hardship and distress to people on low incomes caused by higher prices is all too clear. Hardship raises the question of whether hardship is temporary – something people can survive, able to resume fuller lives with hopes and expectations when prices fall back or their incomes rise; or whether hardship threatens long-term welfare. The latter particularly applies to children caught up in current food crises who may, as infants, suffer malnutrition that impedes their mental and physical development, a lifetime impairment, and who as school-agers are unable to go to school, potentially another lifetime disadvantage.[22]

4.2.6 Food policy in conflict zones

Overall, this update prompts the question of what food policy should be in conflict zones. This is a topic previously addressed in a SPARC study about livelihoods in areas of conflict (Wiggins et al., 2021). That report has two key messages that apply to this paper. One is that even under conflict, most people do whatever they can to maintain some livelihoods activity; and hence agencies seeking to provide relief need to think more widely about what support may help people who either try to maintain economic activities or undertake new ones that are viable in conflict.

The other message is that local and regional trading often persists to a remarkable extent during conflicts and plays a vital role in allowing people to earn an income – and to acquire goods, including additional food. Food prices may escalate under conflict, but if there were no local trading then food might be absent from markets entirely – leading to famine conditions. Actions to sustain trading can be valuable, whether they be to maintain and repair roads and bridges, or to find ways to recapitalise traders who have lost vehicles, stores and cash to conflict.

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21 Before reform, wheat imports had been subsidised: '… major milling companies would import at a preferential exchange rate and then distributed subsidized wheat flour to bakeries, which sold bread at a fixed price' (FAO, 2018).

22 Infants who experienced hardship during the war of independence in Zimbabwe and in the 1991 drought were found, 20 years on, to be shorter than comparable infants who had not so suffered: they also had lower incomes (Alderman et al., 2006).

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Funded by

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This work was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada, and by UK aid from the UK government. The views expressed herein do not necessarily represent those of IDRC or its Board of Governors, or the official policies of the Canadian or UK governments.