

POLICY BRIEF

IMPACTS OF WAR ON FOOD PRICES AND FOOD SECURITY IN POTENTIALLY VULNERABLE COUNTRIES

Steve Wiggins, Overseas Development Institute (ODI)

Summary

War in Ukraine may be distant, but may still seriously affect countries in the global south as war drives up the prices of commodities, including imported wheat, maize and fertilisers. Just how serious is this threat? To explore the consequences, four countries – Kenya, Mali, Sudan and Yemen – have been selected to represent differing circumstances within low- and lower-middle-income countries.

These countries regularly face threats to their food security from the vagaries of weather, crop and livestock pests and diseases, pandemics and, in some areas, conflict. The shock of spiking world prices for wheat, maize, fertiliser, oil and gas adds another layer to the challenges already faced.

Higher world prices for wheat and maize will tend to raise domestic prices in the countries that import them, potentially affecting people on low incomes, who may be unable to afford to feed themselves. For some farmers, higher prices of grains may present an opportunity.

Higher prices could see farmers apply less fertiliser, so that local food production falls. Many farmers in Africa, however, especially those in the semi-arid areas, use little or no mineral fertiliser. Those with irrigated fields or in higher potential zones however do apply fertiliser. How much they will reduce use, and how much this may reduce



A baker gets the bread from the oven in his bakery in El Fasher, North Darfur (Sudan).
Photo by Albert González Farran, UNAMID

yields, remains to be seen, but impacts will not be proportionate: a 50% rise in fertiliser prices would not cut yields by 50% because many other inputs are used to produce crops and because reduced use at the cost/benefit margin is least damaging to yields.

How these effects play out depends hugely on the specific circumstances of countries, and these vary greatly. Two main factors make a difference. The first concerns the staples people eat and where this food comes from: how exposed is the country and its inhabitants to rising wheat and maize prices?

For Mali, almost no threat exists: people mainly consume locally produced rice, millet and sorghum. Wheat imports are limited, and few people on low incomes see bread and other wheat products as essentials. In Kenya, a wide range of staples is consumed. Wheat imports are substantial, and bread, pasta and snacks made from wheat flour have become common in the diets of low-income urban households, partly because they are very easily prepared and served, and therefore popular with working mothers. In (urban) Sudan and Yemen, bread is the predominant staple. Almost all wheat is imported in both countries, much of it from Russia and Ukraine. In Yemen, war will increase the cost of bread to consumers. In Sudan, increased costs will probably fall on the government, which controls the price of *baladi* (rustic) bread through subsidised public procurement.

The second factor is agricultural development. Both Kenya and Mali have developing agricultural sectors, with dramatic progress in Mali since the mid-2000s. These countries rely little on imports of staples, and import mainly the crops they cannot grow easily, such as wheat. However, both countries produce a range of cereals, roots and tubers, which may allow some consumers to switch from wheat products to more traditional foods. Both countries have farmers with experience of producing for the markets, with traders and agro-dealers who make supply chains work. They can boost production if higher world prices of staples persist. Sudan and Yemen, having had the advantage of oil exports, have neglected their agriculture and relied heavily on food imports to feed urban areas. The capacity of farmers to grow more is limited, at least in the immediate future.

Policy implications

Lessons can be learned from previous crises, especially the 2007/08 food price spike. In brief, these include the following.

- **Beware of early judgments.** These may prove wrong as more is understood of the crisis. Learn as you go, be prepared to revise understandings and change course as things become clearer.

- **Do not exaggerate the crisis.** It is tempting to sound the alarm and plan for the worst, but that can lead to rushed and counter-productive responses.
- **Expect private firms in supply chains and the farmers they work with to adapt to challenges and to raise output.** That is the experience following the food price spike of 2007/08 and, in some respects, has also been seen in the COVID-19 pandemic.
- **Much of the response to hardships faced by people on low incomes will come from themselves, their families and their neighbours.** No matter how commendable public responses to crises are, few households get assistance directly from government, donors or non-governmental organisations. Most people get through hard times through their own agency; concerned outsiders should seek to work with them, rather than imagining people are waiting for help.

With such lessons in mind, what responses may be appropriate in the countries reviewed?

Protecting consumers from hunger

Some people will suffer from price rises, which will affect mainly those on low incomes. Food insecurity is almost always first and foremost a matter of poverty, affecting people who eat bread as their preferred and cheapest option. Hence the people of Sudan and Yemen are far more exposed than those in Kenya and Mali. Price rises also affect people who grow little or none of their own food, hence predominantly urban populations.

If these people are not to suffer, either prices must be controlled, or cash transfers must be made available to compensate those most affected. What can be done depends, in the short run, on the administrative capacity and experience of national agencies. In Sudan, for example, bread prices are controlled, albeit indiscriminately (well-off households benefit from very cheap bread) and at high public cost. Kenya has experience of cash transfers. Mali has little experience of either measure, but these are not needed because the country is not threatened. In Yemen the considerable experience of humanitarian agencies means that transfers could be increased to help people cope with higher prices, provided the agencies have sufficient funds.

Helping farmers

Farm households face both threats and opportunities. **Higher food prices** are of less concern than for urban households, partly because many farm households provision themselves to some degree, and because they tend to consume more traditional staples (such as millet and sorghum) that are not affected by changes in world prices.

For the many smallholders who use little or no mineral **fertiliser**, higher prices will not have a significant impact, but high prices are more likely to affect farmers with irrigated fields and in high-potential zones. While better-off farmers can probably absorb higher costs, some on low incomes may be unable to afford higher prices and cut back their fertiliser use, even when they know the returns outweigh the costs. For such farmers, there is a case to offer them support such as a cash transfer, which would be better than subsidising fertiliser.

For some farmers, **higher prices may provide an opportunity**. However, a wider consideration is evident from looking at these four countries. Kenya and especially Mali are far less exposed to higher cereal prices owing to their agricultural development. Not only are these two countries less exposed to external shocks, they also have the capacity to raise national production in response. Farmers can produce for markets, and traders and agro-dealers run the supply chains. Sudan and Yemen are more exposed to the effects of high input prices and are less able to boost farm output in the short term. Reinvigorating agricultural development in these countries makes sense; and experience in the years after 2007/08 has shown that public support can help farmers raise outputs far more than some expect. What that support should be depends overwhelmingly on local conditions and challenges. Planning is best done locally.

All four countries, in common with the rest of the world, will need to invest in changed farming practices to ensure agriculture is environmentally sustainable, adapted to climate change, and with low emissions of greenhouse gases. Renewed agricultural development can be combined with these imperatives.

Final reflection

A final reflection concerns the **advantages to Kenya of regional economic integration**. Kenya now has the considerable advantage of free trade with its neighbour Tanzania, whose agricultural development since the early 1990s has been quietly impressive. Kenya can produce higher value crops on its relatively scarce high potential land and import staples from Tanzania where land abounds.

Introduction

The war in Ukraine may be far from countries in Africa and the Near East, but because the war is driving up commodity prices (especially oil and gas, cereals and fertilisers), people living in these countries face threats to their food security. This brief explores these threats.

The higher price of commodities constitutes another shock facing these countries, adding to drought and

flood, conflict and violence, and the COVID-19 pandemic. Many people are, at any given time, dealing with one or more of these shocks, and recovering, coping or being rendered destitute. That they should soon expect higher prices for cereals and fertiliser is alarming. Two sets of questions are addressed in this brief.

- What may happen to people in potentially affected countries? How vulnerable are they to the consequences of a war in Europe? Who is most at risk?
- What may be learned from previous crises where commodity prices have spiked?

To focus the brief, four countries have been selected to represent a range of circumstances in low- and lower-middle-income countries: Kenya, Mali, Sudan and Yemen. All these populations are vulnerable to food insecurity when shocks arise. Mali and Yemen also have protracted conflict.

Potential effects on vulnerable countries

Pathways to impact

War will probably reduce harvests in Ukraine in 2022. Winter wheat to be harvested in June may already be growing, but in some areas it may not be harvested, or disrupted transport will make it difficult to get the crop to stores or ports. Summer crops are unlikely to be fully planted and, again, may not be harvested. Occupation and blockade of Ukraine's Black Sea ports means that even if crops are harvested, they may not be exported. The Black Sea has become dangerous for shipping, with insurance reportedly so hard to obtain that most captains will not enter. That puts in doubt the export of Russia's crops as well. Russia and Ukraine are major exporters of wheat and maize, with Ukraine also exporting large quantities of sunflower oil. Kazakhstan's exports of wheat are less significant, but these too may be blocked if the Black Sea remains effectively inaccessible (Glauber and Laborde, 2022; The Economist, 2022).

It is not only crops that are affected. Russia and Ukraine are major producers of urea fertiliser, while Belarus produces large quantities of potash. Both fertilisers are exported through Black Sea ports. In addition, sanctions on Russia are increasing prices of oil and gas, leading to wider fuel price rises and increasing the cost of production of fertilisers.

Prices for fuels, grains and fertilisers on world markets are spiking (mid-March 2022). Maize, soybeans and wheat prices have risen by 75–89% from September 2021 (Table 1). Urea fertiliser prices have increased by a similar margin. Prices for potash and oil have risen by

TABLE 1. PRICE FOR GRAINS, FERTILISERS AND OIL (SEPTEMBER 2021 AND MID-MARCH 2022)

	Sept 2021 US\$/tonne	Mid-March 2022 US\$/tonne	Change (factor)
Wheat, July 2022	202.1	382.1	1.89
Maize, July 2022 future	157.5	276.9	1.76
Soybeans, July 2022 future	330.7	600.4	1.82
Urea, US Gulf, March 2022	440	800	1.82
Potash, muriate, late Feb 2022	265	392	1.48
Oil, West Texas Intermediate (WTI) and Brent crude, US\$ per barrel	70	105	1.50

Source: Most from Chicago exchange quotes (see CME Group, 2022).

half since September 2021. The only welcome news is that the price of rice, the other major grain staple, has not been affected by the war so far.

Assuming prices continue at these levels, or perhaps rise still further, we can expect several effects in low- and lower-middle-income countries.

Effects of higher fuel prices

Higher fuel prices will affect almost everyone in the countries that import fuel. Balance of trade deficits will widen, requiring more foreign exchange. With petrol and diesel becoming more costly, transport rates will rise, pushing up the prices of most goods and the cost of passenger travel. Inflation is thus likely. With foreign exchange in short supply, national currencies are likely to depreciate, raising the costs of imports still further in domestic currency.

In rural areas, higher transport costs effectively raise the costs of inputs and consumer goods while reducing the effective price for agricultural produce at the farm gate. Those twin effects discourage investment on farms and marketing of produce.

For countries exporting oil, such as Sudan, higher oil prices bring windfall gains in royalties to governments, and more foreign exchange. However, this may cause currencies to appreciate, making imports cheaper and their exports less valuable (known as ‘Dutch disease’). With free markets, the price of domestic fuel would still rise towards the higher world price, but governments with additional royalties may well choose to subsidise domestic prices.

Effects of higher cereal prices

The effect of higher world prices for grains depends on two questions: how much do higher world prices transmit to domestic prices? And how exposed is the country and people within it to higher prices of staples?

Regarding the first question, if a country relies heavily on imported grains, higher world prices will transmit almost entirely to domestic markets. But even if the country was self-sufficient, domestic prices would move towards higher world prices because traders would have incentives to export harvests to the world market. In practice, however, transport costs and policies affect such transmission.

Transport costs from the world market to the main centres of production and consumption within a country introduce a price wedge between world and domestic prices. Wedges are small for coastal countries, but high overland trucking costs make them substantial for landlocked countries. For example, transport from the port of Dakar in Senegal to Bamako, Mali, 1,360 km distant, can easily cost US\$100 per tonne (see, for example, African Development Bank, 2019; Teravaninthorn and Raballand, 2009). That puts a US\$200 price wedge between import parity price (the price paid by an importer in Bamako) and the export parity price (that received by an exporter from Bamako). World maize prices at US\$277 per tonne would bind domestic prices between US\$177 per tonne export and US\$377 per tonne import. Unless world prices move hugely, there would be no effect on domestic prices if local production can serve the domestic market (which it does in this case, see below).

Governments can mitigate the effect of higher world prices on domestic prices. Local prices may be controlled by dictating an official price; this is seemingly costless but hard to enforce and risks creating a parallel market, or local prices may be subsidised but at considerable cost, which will rise if world prices rise. For net exporting countries, border measures can help control prices. Governments can limit exports or impose taxes on exported foods. For net importing countries, no corresponding border actions can control domestic prices. For low-income countries with limited public

budgets and that are dependent on imported staples, there may be little that governments can do about price effects, because any countervailing measures would be too costly.¹

Regarding the second question: how exposed is the country and people within it to higher prices of staples? This depends on (a) the importance of wheat and maize in local diets; (b) the possibilities for substituting a cheaper staple for a costly grain, which is a function of prices, availability of alternatives and food preferences; and (c) the share of income spent on staple food.

Most rural households grow some of their own food and hence may spend relatively little on staples (what food they buy is often higher value items such as cooking oil, sugar, meat and fish). They may thus escape much of the impact of higher world prices. For urban households on low incomes, it is a different matter. Such households typically spend more than 40% of their incomes on food. Higher prices for staples will be a far greater burden to poor households than to better-off ones, where staples may cost less than 10% of the household budget.

Higher grain prices may be an opportunity for some farmers. If domestic prices of staples rise – and if local consumers switch from increasingly expensive imported wheat to locally grown staples, this effect will be all the stronger – this can be good news for farmers. They can be expected to respond to better prices, especially if government helps them overcome obstacles to higher production (see the policy considerations listed in this brief). Many farmers in the global south did increase production when cereal prices spiked in the years following 2007/08 (Wiggins and Keats, 2013).

Moreover, in countries where substantial numbers of rural households depend on farm labouring for their incomes, higher prices can mean more work on farms and better wages. This happened in India when rice prices rose after 2007 (Jacoby, 2016). Further benefits to those working in the local rural economy can be expected when farmers spend incomes inflated by higher prices.

Effects of higher fertiliser prices

Higher fertiliser prices threaten to reduce crop harvests. Higher world prices will affect low-income economies because most import all their fertiliser, with little if any manufactured in the country. High transport costs to

landlocked countries means the rise in international prices of urea and potash will see less than proportionate rises in domestic prices.²

The impact of such rises depends in large measure on the amount of fertiliser that farmers have been using on their crops. By and large, most farmers in dryland Africa apply very little manufactured fertiliser to their crops. Some high-value cash crops, such as cotton and vegetables, may be fertilised, especially when they are irrigated.

If fertiliser prices rise, it is not inevitable that production costs of fertilised crops will rise by a similar amount, because farmers have options on how they grow their crops. More costly fertiliser may be replaced by animal manure where available. A farmer might use less fertiliser but compensate by weeding the crop more thoroughly. More costly fertiliser may cause the farmer to think harder about how best to apply a lesser amount through careful placement and timing. Using less fertiliser will not necessarily cut yields proportionately, either. Reductions in fertiliser should take place along the yield response curve, where the marginal value of fertiliser has fallen to match the marginal cost. Less fertiliser should lead to smaller reductions in yields.³

Effects on export crops

A final consideration on impacts concerns export crops. If prices of fuels and some agricultural commodities rise, might this affect the prices of export crops where there is no clear and direct link to events in Ukraine? Commodity prices do tend, to some extent, to move together. Prices of different commodities correlate through time. But much of that arises through inflation. A rapid check on price correlations (see Appendix A) shows that tendencies for prices to move together vary considerably across key agricultural exports. Correlations with fuels and metals prices are quite low for coffee, tea and cotton, but considerably higher for bananas, cocoa, groundnuts, palm oil and rubber. If export crop prices are pulled upwards, not only would this help reduce trade deficits, but may also deliver some (probably modest) windfall gains to growers of the affected crops.

As can be seen, many factors apply in tracing the impacts in specific circumstances. Rather than discussing all of these, it is easier to see how they may play out in Kenya, Mali, Sudan and Yemen.

1 This includes opportunity costs: a government that chooses to subsidise food may have to cut back spending on items like education and health.

2 For example, if the free on board price of urea in Bamako is the world price plus transport to Dakar and then transport to Bamako, where the total transport may be more than US\$100 per tonne, consider what happens when the urea price rises from US\$440 to US\$800 per tonne, as it has since September 2021. With US\$100 of transport costs, the price in Bamako would have been US\$540; with the price increases seen, it would now be US\$900, a price rise of 66%, not the 82% seen on the world market.

3 Diminishing returns apply to increments in fertiliser. The gains to yields from the application of the first bag will be larger than those when fertiliser is being applied liberally. Good crop managers thus apply fertiliser until the point where the marginal value of yield gains equals the marginal costs of more fertiliser.

Kenya

Background

Kenya's agriculture is concentrated in the densely settled humid highlands, where most farming is carried out on smallholdings. The highlands include areas of fertile volcanic soils, with food crops including maize, beans, bananas and plantains, as well as coffee and tea for export.

Exposure to higher cereal prices

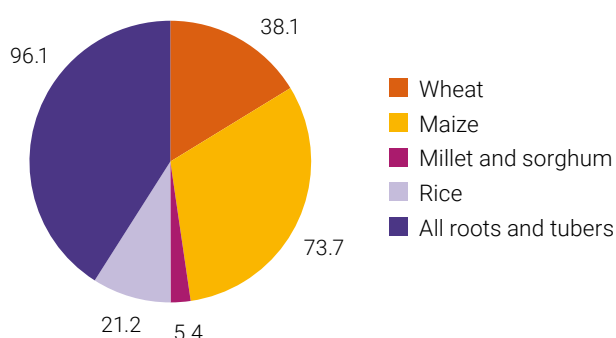
Kenya's consumption of staples is quite diverse (Figure 1) and includes maize, roots and tubers (plantain, potato, cassava, sweet potato). Wheat consumption, if substantial, is less prominent. Kenya imports 84% of its wheat and, of this, 44% has come from Russia and Ukraine in recent years. (See Appendix B for more details).

Major increases in wheat prices will lead to higher costs for bread, chapatis, noodles, pasta and snack foods like *mandazi*. For most rural households on low incomes, these are not their main staples, but in urban areas, including in households on low incomes, wheat products are consumed more widely. Bread, noodles and pasta are extremely convenient for time-pressed working mothers because they require so little preparation.

How much low-income urban households are able and willing to shift to other staples is a moot question. A wide range of alternatives are grown in the country, and others can be imported from East African Community neighbours, especially Tanzania. But how acceptable is it to substitute, say, sweet potato for bread or spaghetti?

Maize is another food threatened by high world prices. Kenya imports 10% of its maize, with just 2% coming from Russia and Ukraine. If only the price of imported maize rises, the effect on local maize prices should be small, so long as higher world prices do not lead to Kenyan maize being exported. It is hard to imagine the

FIGURE 1. PER CAPITA CONSUMPTION OF STAPLES, KENYA (2019, KG/PERSON/YEAR)



Source: FAO food balance sheets for 2019 (FAOSTAT, 2019).

government would not intervene if large consignments of maize start to appear at the border for export.

Exposure to higher prices for urea and potash

Kenya is one of few countries in sub-Saharan Africa where many farmers, above all in high potential zones, routinely use fertiliser. More costly fertiliser will probably see some farmers using less, especially those with low margins on their crops and those who simply cannot afford to pay more, the latter probably being smallholders on low incomes with no access to credit.

Current and impending threats to food security

Higher food and fertiliser prices come at a bad time for Kenya because the last harvest, from the short rains at the end of 2021, was poor.

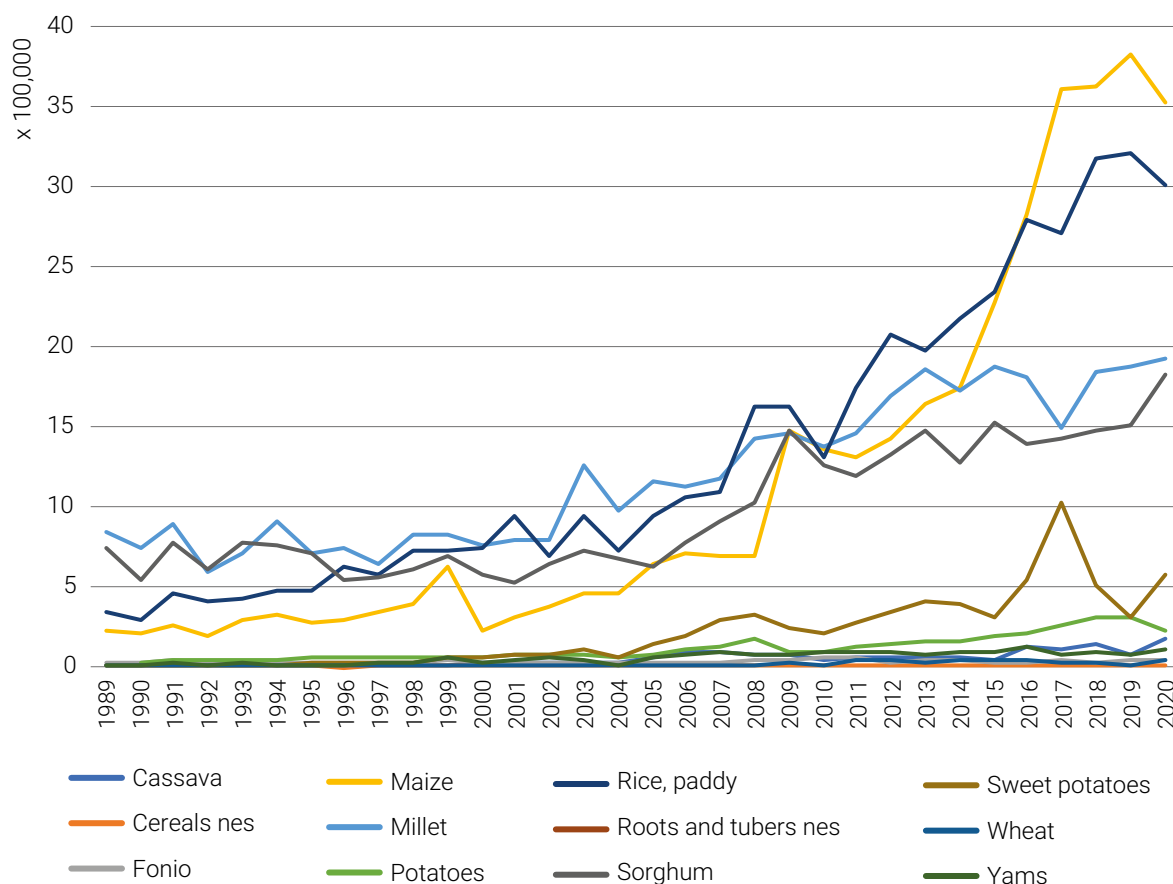
'Crop production was significantly affected by late-onset, poor temporal distribution, and cumulatively below-average rainfall during the October to December short rains, resulting in a significantly below-average harvest. According to the Kenya Food Security Steering Group (KFSSG), the maize harvest in the marginal agricultural areas is 45–50 percent of the five-year national maize production average. There was widespread below-average crop production in the marginal agricultural areas, with crop failure in Kilifi, Kwale, Taita Taveta and Tharaka Nithi, where maize production was 1–7 percent of the five-year average. In the marginal agricultural areas, most poor households have one to two months of food stocks, compared to a typical two to four months before household food stocks are depleted.' (FEWSNET Kenya, 2022.)

The poor harvest means more rural households are buying food from the market. They are likely to face a hard time before the next harvest and higher food prices will exacerbate this.

Do higher food prices represent an opportunity?

Kenya has little additional high-potential land to cultivate, but it has experienced farmers and comparatively well-developed supply chains. If the prices of maize and wheat rise, some farmers may be able to increase their production. The degree of response, however, is next to impossible to assess from secondary data.

FIGURE 2. PRODUCTION OF STAPLES, MALI (1989–2020)



Source: Compiled from FAOSTAT data (1989–2020). Vertical axis is 100,000 tonnes.
 Note: nes = not elsewhere specified.

Mali

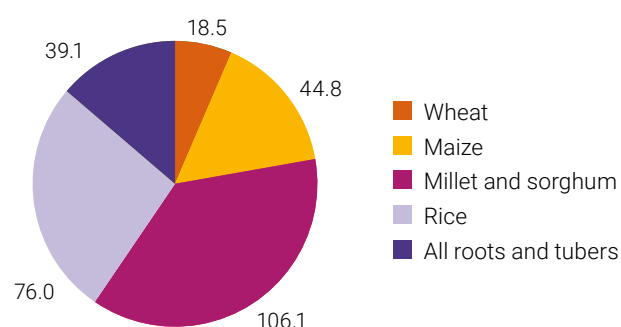
Background

Mali has been markedly successful in raising the production of staple foods since the mid-2000s (Figure 2).⁴ Much more maize (largely in the south, in the cotton belt) and rice (above all from the Office du Niger irrigation scheme) has been produced. Consequently, Mali imports few staples.

Exposure to higher cereal prices

The main staples consumed in Mali are rice, millet and sorghum, traditional staples consumed widely in rural areas (Figure 3). Wheat consumption is notably low. Maize consumption (by humans) is modest. Higher prices for wheat and maize hold little threat to people on low incomes in Mali, even if almost all the wheat is imported. Given the high costs of transport from the world market to landlocked Mali, changes to world prices have a limited impact on domestic prices in an economy that produces enough staples for the national market.

FIGURE 3. PER CAPITA CONSUMPTION OF STAPLES, MALI (2019, KG/PERSON/YEAR)



Source: FAO food balance sheets for 2019 (FAOSTAT, 2019).

Exposure to higher prices for urea and potash

Mali uses more fertiliser than might be imagined for a landlocked country in the Sahel, with nitrogen and potash

⁴ This achievement is not often mentioned in discussions on African agricultural development, but it has not gone unnoticed either: see Gro Intelligence (2016).

applications similar to those in Kenya on average. Two crops are commonly fertilised: the irrigated rice of the inland Niger Delta, and cotton grown in the south of the country. Higher prices may lead to some reductions in fertiliser use on these crops, but by how much is difficult to assess. Higher fertiliser prices should not affect most farmers, who grow dryland crops with millet and sorghum to the fore.

Current and impending threats to food security

Mali has seen reasonable harvests over the last few years. The main threat comes from insecurity, above all in the conflict zones of the centre and north of the country (FEWSNET Mali, 2022). Conflict disrupts farming and trade.

Do higher food prices represent an opportunity?

Mali is unusual in the large harvests of maize reported in recent years. Most maize is apparently not eaten but used to raise chickens (180 kg of maize per person is produced, but only 45 kg per person is for human consumption). The Food and Agriculture Organization of the United Nations (FAO) reports 1.4 million tonnes of maize in 2019 going to animal feed (FAOSTAT, 2019).⁵

If maize prices rise on the world market, prices may also increase in neighbouring coastal countries of West Africa. Traders may see the chance to export some of the feed maize to those countries. This may represent an opportunity for farmers in the more humid southern zones of Mali.

Sudan

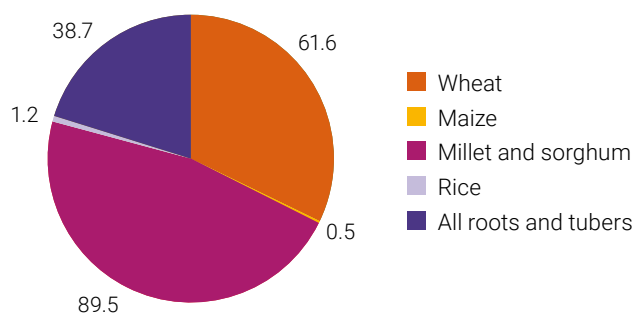
Background

Sudan's economy limps along in a country badly hit by conflict and political crises. Given the country's resources of medium-potential land, 1 million or more hectares under irrigation from the Nile and oil revenues, the country should be able to feed itself and should have a much better developed economy. Inflation in 2021 was running at 200% or more, with some estimates putting inflation as high as 350% (Abay et al., 2022).

Exposure to higher cereal prices

Two staple foods dominate in Sudan (Figure 4): millet and sorghum, consumed mainly in rural areas, and wheat, the urban staple. Sudan imports more than 5 million tonnes of wheat, 87% of its consumption; of these imports, 94% comes from Russia and Ukraine. Sudan is brutally exposed to interruption of Black Sea harvests. Its urban population relies heavily on flatbread and if the bread price were to rise significantly, households on low incomes would face great hardship.

FIGURE 4. PER CAPITA CONSUMPTION OF STAPLES, SUDAN (2019, KG/PERSON/YEAR)



Source: FAO food balance sheets for 2019 (FAOSTAT, 2019).

Note: Maize and rice have very low consumption, at 0.5 and 1.2 kg/person/year.

Exposure to higher prices for urea and potash

Use of fertiliser is very low in Sudan. Higher prices will only be a problem for the few farmers who use fertilisers, for example, those in the large irrigation schemes of Gezira. Were farmers to apply less fertiliser, it could mean smaller harvests and less hiring of labour or, alternatively, it might lead to more careful weeding and more careful application of fertiliser, thereby maintaining or increasing the demand for labour. FEWSNET Sudan (2022) reports that farm wages in Sudan in 2021 rose by 300%, probably ahead of inflation.

Current and impending threats to food security

The harvest of 2021 was close to the five-year average. Sudan is, however, beset by rampant inflation. Higher costs of transport fuel, labour and electricity (to run irrigation pumps) are hindering food production, while large increases in food prices threaten households on low incomes.

'By mid-January 2022, staple food prices continued increasing atypically in most markets while remaining stable or slightly decreasing in other markets. Staple food prices are approximately 100-200 percent higher than last year and three to four times greater than the five-year average. The high cereal prices are being driven by the lower-than-expected harvests, the continued high production and transportation costs.' (FEWSNET Sudan, 2022).

⁵ If this were fed to chickens, then at a (poor) feed conversion ratio of 3 kg of feed to 1 kg of meat gain (the ratio should be less), Mali would produce more than 475,000 tonnes of chicken, but FAO reports production of 60,000 tonnes. Something is amiss with the statistics.

The price of *baladi* (rustic) bread is controlled in Sudan, with the government subsidising the difference between costs and sale prices. Sales of subsidised bread are not targeted, so households who could afford to pay market prices also benefit. Analysts from the International Food Policy Research Institute (IFPRI) argue that a better use of public funds would be to replace the controlled bread prices with cash transfers to those on low incomes (Abay et al., 2022). As may be imagined, however, the price of *baladi* bread is highly politically sensitive. Moreover, switching from controlled prices to cash transfers when inflation is so high is challenging and the transfer values would need frequent adjustment to retain their purchasing power.

Do higher food prices represent an opportunity?

Higher food prices should represent an opportunity in this case. Sudan has the resources to grow more. Only 23% of potential arable land (19.9 million hectares [ha]) is cultivated. As much as 2.5 million ha could be irrigated, mainly drawing on the waters of the Blue and White Nile and their tributaries; 1.8 million ha is equipped for irrigation, but only 58% is currently used (World Bank, 2020; FAO Aquastat, 2021).⁶

Lack of roads, failings in irrigation operation and maintenance, under-development of services for agriculture, and policy disincentives comprise part of a long list of problems cited to explain the failure to develop the country's potential (World Bank, 2020). Many of these factors, however, would apply equally to Mali, where agricultural growth has been more impressive in the new century. The difference between the two countries perhaps lies in the attention given in Mali to reforming the large Office du Niger irrigation scheme to good effect, and the high priority – and large share of public budget (15%) – Mali gives to its agriculture. Oil revenues in Sudan have allowed governments to ignore farmers and farming.

Yemen

Background

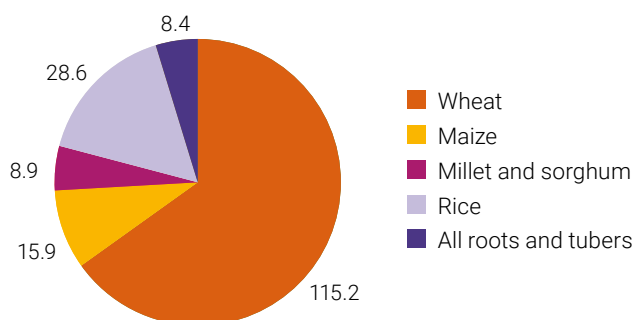
Yemen remains locked in conflict since open war broke out in 2014. Violence has cost jobs and incomes. Agricultural production has stagnated, but only partly owing to war: income from oil exports and remittances had, from the 1970s, led to neglect of farming (Thomas, 2022a; 2022b). Yemen depends heavily on food imports. Despite imports, food insecurity is widespread because people on low incomes struggle to feed themselves. Analyses in the 2010s show higher food prices to be the most damaging shock for people on low incomes. While

people have coped with small price increases, large increases overwhelm many households (Favari et al., 2021).

Exposure to higher cereal prices

Yemen is highly exposed to high wheat prices (Figure 5). Most staples consumed are derived from wheat, 94% of which is imported, with half of those imports coming from Russia and Ukraine and the remainder largely from Australia and the USA, in equal measure.

FIGURE 5. PER CAPITA CONSUMPTION OF STAPLES, YEMEN (2019, KG/PERSON/YEAR)



Source: FAO food balance sheets for 2019 (FAOSTAT, 2019).

Exposure to higher prices for urea and potash

Yemeni farmers use little fertiliser, and what they use may be applied first and foremost to the main cash crop, qat.⁷ Higher fertiliser prices should have little effect on food production.

Current and impending threats to food security

Violence increased in the last quarter of 2021. Fuel is expensive and in short supply across much of the country. Food prices were already on the rise in January 2022 and war in Ukraine will add to the misery. Analysis from the World Food Programme and World Bank suggests that while people can live with small increases in food prices, when they suddenly spike, the impact is heavy (Favari et al., 2021). FEWSNET Yemen (2022) assessments indicate dire conditions in Yemen that are now likely to get worse.

Do higher food prices represent an opportunity?

Under current insecurity and given the record of slow, if any, growth in food output in the 2010s, it is hard to imagine a significant response from farmers.

⁶ Since the 1970s if not earlier, Sudan planned to become the breadbasket for neighbouring countries, above all those across the Red Sea, with oil revenues financing agricultural investment. This potential has not been realised in half a century. Agricultural growth in the 2010s has been slow. Imports of wheat remain massive, at 5 million tonnes per year. Much of the land planned to be developed became part of South Sudan in 2011, but Sudan retained almost all the irrigated land.

⁷ If qat (khat) farmers were to use less fertiliser, the effect on tree yields is hard to predict. Demand for fertiliser for qat may be inelastic, given the value of the crop. Qat trees are sprayed with pesticides to an alarming degree because protecting the crop is such a priority (Darbyshire, 2020).

Effects on countries: similarities and differences

The four cases were chosen to illustrate what were expected to be contrasting conditions, and so it has proved. The differences are striking.

Exposure to higher wheat prices

The single main difference across the countries is the degree to which people eat wheat and its derivatives. In all four countries, any wheat consumed comes largely from imports. The highest level of self-sufficiency in wheat is just 16% (in Kenya). In these countries, at least 42% of wheat imports comes from Russia and Ukraine, rising to more than 90% for Sudan.

Higher wheat prices threaten people on low incomes in urban Sudan and all of Yemen, where bread is by far the main staple. In Kenya, some urban households would find a rise in wheat prices hard to absorb. Although alternative staples exist, food derived from wheat is usually tasty and extremely easy to prepare. For Mali, higher wheat prices are practically irrelevant.

Exposure to higher fertiliser prices

Use of fertiliser in the four countries is modest to low. More to the point, use is differentiated by crops. Profitable crops grown in high-potential areas or under irrigation may be fertilised; staple crops grown on drylands usually do not receive mineral fertiliser (but may be fertilised with animal manures).

Because mineral fertilisers tend to be used on profitable crops, elasticity of use with respect to price may well be low. Because farmers can compensate for using less fertiliser, elasticity of yield with respect to fertiliser may be modest to low. It would take much more analysis, crop by crop and zone by agro-ecological zone to confirm this. The concern must be for farmers on low incomes who struggle to buy inputs every season, who cannot get credit, and who may simply stop using fertiliser when prices rise, even if the benefits of the fertiliser on subsequent yields outweigh the immediate costs.

Shocks and threats

In each of the countries, the higher prices considered here can be added to other shocks. These include the poor short rains of late 2021 in Kenya; the conflict affecting northern, eastern and central Mali; rampant inflation in Sudan; and the protracted civil war in Yemen. In these contexts, another unpleasant surprise may push people who have been just about coping over the edge, and where the efforts of governments, donors and civil society to protect people may already be at their limits.

The only potential positive is that all four countries, and their vulnerable populations, have ample experience of

shocks. Indeed, for many households, news of higher prices for wheat, maize and fertilisers will be the least of their concerns. This clearly applies to people living in the middle of a war, but it also applies to any farm household realising that the rains this season are failing. Paying more for fertiliser or finding the price of bread high is one thing; losing a crop is another. Similarly, for public agencies, experience in assisting people vulnerable to shocks may give them the capacity to increase that support, so long as they have the funds.

Opportunities for farmers

If higher prices do create opportunities, who can respond and benefit will vary considerably by agro-ecological zone and the resources available to individual farmers. Across the countries, farmers in medium- and high-potential Kenya and in Mali have much more scope than others, in large part because they have experience of investment, intensification and marketing of produce.

The stuttering growth of farm output in Sudan, and difficulties of farming during wartime in Yemen, suggest far less scope in those countries, although possibilities should not be written off. When crops are profitable enough, such as qat in Yemen, it is remarkable how much can be produced and marketed despite the violence and disruption.

Policy considerations

Lessons from previous crises

We reviewed several sets of crises: the food price spike of 2007/08 and subsequent high prices for cereals on world markets that lingered until 2014 (Wiggins and Keats, 2013); seven disease crises plus the food price spike and the Asian currency crisis of 1988 (Wiggins et al., 2020); and a review of the impacts of COVID-19 and responses to it undertaken in late 2021 (Wiggins, 2021). Some lessons may apply for responding to the effects of the war in Ukraine.

Beware of early judgments

These may prove wrong as more is understood of the crisis. In previous crises, some early judgments were later proved wrong. For example, when food prices spiked in 2007/08, some commentators believed that small-scale farmers in the global south would not be able to grow more to take advantage of higher prices, and that only large-scale commercial farms in high-income countries could profit. A few years later, it was clear that the small-scale farmers had increased output more than the large-scale ones. Hence, learn as you go, be prepared to revise understandings and change course as things become clearer.

Do not exaggerate the crisis

The temptation, especially if analysts feel they have to shock politicians and the public into taking action, is to exaggerate the likely effects or to present the worst case scenarios. This may prompt action, but runs the risk that responses may be rushed, designed with too little information and reflection, and implemented as blueprints with little scope to adapt responses in the light of new information and understanding. For example, the belief that only military-cum-medical command and control could arrest Ebola in rural Sierra Leone failed, and the tide was turned only when medical staff began to talk to local people and listen to their concerns.

Respect private enterprise

Expect private enterprise in supply chains to show more response, flexibility and ingenuity in surmounting problems than might be imagined. Do not readily accept arguments that this or that is not possible. In crises, with threats and opportunities concentrating minds and energies, some surprising things can be achieved. The emerging evidence from the COVID-19 pandemic shows that although food supply chains were initially disrupted by public health controls, subsequent problems were often largely overcome.

Expect a strong response from farmers

Farmers around the world will respond to higher prices. The increases in grains harvested in the five years or so after 2008 were remarkable, and larger than most informed observers had believed likely or had dared hope. Response, however, cannot happen until farmers have had a full growing season to produce more. The lag will usually be at least six months.

Recognise the agency of individuals

Expect individuals, households, extended families and local communities to bear the brunt of hardship and expect them to strive to cope. In crisis after crisis, despite the often considerable (and indeed capable) efforts of governments, donors and charities, very little if any external assistance directly reaches those most affected. For example, as public health controls on COVID-19 were put in place, governments across the global south rolled out social protection quite remarkably: the catch was that they could offer so little compared to need, with an average of under US\$5 per beneficiary in low-income countries and under US\$50 per beneficiary in lower-middle-income countries.

Most people facing crises in the global south have to make do with the resources they, their families and neighbours can muster. For the unfortunate, the result can be ruin and death, but most do survive, albeit experiencing hardship. This reflection risks complacency; most of the vulnerable survived last time with no help, so they can be left to cope alone this time. A better and more compassionate response is to recognise the

agency of affected people, and seek to support their responses. The framing of response may then shift. For example, if we imagine people cannot cope, we have to reach each and every person affected with food, cash, medicines, etc. That is quite difficult, both to identify them and to reach them. But if we imagine they are responding, then it may be that assistance at community or district level can be more effective. For example, repairing a road, or recapitalising traders, may benefit more people than handing targeted households US\$10 of cash, food, seeds or tools.

Low-income households are more vulnerable

Hardship is more or less inevitable for those on low incomes and they are vulnerable to many shocks. The ethical question is how much protection they should be offered; the practical questions are what means are available to do so, and how best to protect them. Most of those likely to be hit hard are only too experienced in coping, and coping with little or no outside help. In the long run, welfare states that put a safety net under people are ideal. In the short term, outsiders need to help vulnerable people get through hard times. Warnings of long-term harm are a useful spur to action in making the vulnerable a political priority, but may, fortunately, be an exaggeration. For example, most demographic and health surveys of the stunting of infants before and after the 2007/08 food price spike show few signs of widespread and lasting nutritional harm. But that is no cause for complacency.

Potential responses

Protecting consumers from hunger

Some people will suffer from the price rises. These people will have low incomes, since food insecurity is almost always a matter of poverty; those who eat bread as their preferred and cheapest option, hence the people of Sudan and Yemen are far more exposed than those in Kenya and Mali; and those who grow little or none of their own food and hence are predominantly urban.

Establishing who will be most affected and how badly in enough detail to plan response, is no simple matter. The analysis of Yemen (Favari et al., 2021) draws on seven years of study since the conflict broke out in 2014, during which time humanitarian agencies have strived to identify those most at risk from conflict and economic hardship, creating some impressive systems to monitor food prices and people's access to food. Even so, it is striking to read such well-informed authors admit how little they know of the detail. If vulnerable people are not to suffer, then either the price of food must be kept down, or those affected must receive compensation so they can afford more costly food.

Keeping prices down requires much administration: it is only an option in the short term – the next half year –

for countries that already control prices, such as Sudan with its subsidy on *baladi* bread. Holding down prices for everyone is costly and means much of the benefit goes to people who could pay higher prices (Abay et al., 2022 discuss this for Sudan). Targeting – for example through ration books – can reduce costs, but requires a system to administer the books, identify those eligible and police implementation.

A simpler alternative to protect low-income consumers is to transfer cash to them. This entails identifying who they are, so this is only an option for countries such as Kenya that already have registers of vulnerable people, created in Kenya to protect people when drought strikes. Where the most vulnerable people are already getting transfers, then it is relatively straightforward to top up the allowances to reflect the extra costs of more costly staples, provided, of course, the government has the funds to do so.

Because experience and systems being in place matter so much for short-term response, Yemeni consumers can be protected because agencies working there have so much experience gained through the seven years of war, again, provided the agencies have sufficient funds.

Helping farmers

Farm households face both threats and opportunities. Higher food prices concern them less than urban households, partly because many farm households provision themselves in part, and because they tend to consume staples not affected by price rises. There is a marked disparity between, for example, the diets of rural households in Mali and Sudan, which traditionally consume foods from millet and sorghum, and urban households, which are much more likely to consume rice (Mali) and bread (Sudan). The differences between rural and urban diets may be less marked in Kenya, but even so, rural households are accustomed to eating dishes based on plantains, greens, maize and beans, which generally take longer to cook and are thus impractical for urban households.

Increased prices for fertiliser may not burden many farmers in sub-Saharan Africa because they use little or none, especially farmers in semi-arid areas. They may not burden most farmers in the more favoured areas, or those with irrigation, who do apply fertiliser, but who work their land intensively to produce profitable high-value crops, so they can absorb modest increases in the cost of one input (fertiliser costs rarely exceed 20% of all production costs).

That said, some smallholders on low incomes do apply fertiliser, for example, the many smallholders in the highlands of Kenya. Many have little cash at the start of the crop season and no access to credit, so they may

have to cut back their use of fertiliser even when the value of the foregone output exceeds the extra cost.

Should, then, countries try to subsidise or otherwise control fertiliser prices? Fertiliser subsidies are risky: some of the benefits will go to farmers who can afford more costly fertiliser. Costs can balloon because lower prices encourage fertiliser use. It would be better to target farmers unable to afford fertiliser at higher prices and give them either a cash payment or a voucher for farm inputs. Vouchers have the apparent advantages of encouraging investment in farming and preventing funds being used for other purposes, but they require administration and may lead to collusion and rent-seeking as agro-dealers raise prices still further, knowing their customers have the added value of the vouchers. Paying cash may be simpler and allows farmers to use the funds according to the needs of their own farm, about which they know more than most outsiders.

If farmers on low incomes were given a payment to cover extra costs of fertiliser, making the transfer on time, right at the start of the season, is critical. This is another reason to prefer cash, especially where and when almost all farmers have a mobile phone and could receive e-payments. Subsidised fertiliser, in contrast, may arrive too late to be of any use, and this has been seen in some subsidy programmes in Africa.

If those are threats to farmers, the opportunity lies in producing more of the foods that have raised prices. This applies both to individual farmers and nationally. To appreciate the strategic point, compare Sudan and Yemen to Kenya and Mali. The former two countries, both of which have had oil exports to pay the bills, have neglected agricultural development and come to depend heavily not just on food imports, but on a narrow range of imported staples, with wheat dominating imports. Not only has this left them exposed to the current and impending shock, but it also means their farmers lack capacity to respond. Supply chains for inputs, credit, advice, marketing and processing are largely underdeveloped.

In contrast, Kenya and Mali – the latter has made massive strides to become self-sufficient since the mid-2000s – have the benefit of a diversified food supply and are much less exposed to the world wheat price. They have farmers who know how to grow more, to produce for markets, and they have the traders and agro-dealers who make supply chains work.

In the medium term, there is much to be said for reinvigorating agricultural development in Sudan and Yemen. For Yemen it might be thought that little can be done while the war rages, but this is not so: the war does not seem to have detracted from growing qat bushes.

Indeed, Yemen has dealers who provide irrigation pumps, pesticides and fertiliser for this lucrative crop (Darbyshire, 2020; Thomas, 2022a).

From 2008 onwards, alarmed by the 2007/08 food price spike, many governments in Africa and Asia strived to help their farmers raise output. These measures, by and large, often worked. The response to the price shock was much greater production of cereals in Africa and Asia, which helped push world prices down to the levels (in real terms) existing before the shock. Donor programmes such as the G20's Global Agriculture and Food Security Program that supported governments must have helped as well.

Just what works to support farmers in particular areas is a function of local conditions, both agro-ecological and economic. In some places it may be distributing packs of better seed, or invigorating extension services, or repairing rural access roads, or devising value-chain finance, or refocusing agricultural research to tackle a critical bottleneck such as the susceptibility of a crop to disease or pests, or underwriting small loans for irrigation pumps, and so on. Action programmes are probably best designed when informed by local knowledge.

All four countries, in common with the rest of the world, will need to invest in changed farming practices to ensure agriculture is environmentally sustainable, adapted to climate change, and with low emissions of greenhouse gases. Renewed agricultural development can be combined with these imperatives.

Final reflection

A final consideration, and lesson, is the value of regional trade. For Kenya, with limited good agricultural land compared to the population, East African integration is a boon, since neighbouring Tanzania has the land and resources needed to feed Kenya. Tanzania's agricultural output has been increasing well ahead of its population in the 2000s (Wineman et al., 2020). In the 2010s, Tanzania went from being a net importer of rice to a net exporter to its East African Community neighbours. That is a remarkable achievement, largely from the efforts of smallholders who, under the radar of the government,⁸ have bought pumps to irrigate small rice plots.

This does not mean that Kenya should not develop its farming: it has some very high-potential land worked by farmers who are used to producing for the market, supported by equally experienced traders and inputs suppliers. Producing high-value perishables for the growing cities of Kenya should provide a living for those staying on their farms. Additional staples can be sourced from Tanzania.

References

- Abay, K.A., Abdelaziz, F., Abdelfattah, L., Breisinger, C., Dorosh, P., Resnick, D., Siddig, K. and William, A. (2022) *Wheat subsidies, wheat markets and food security in Sudan. Current state and options for the future*. Strategy Support Program Policy Note 1. Washington DC: International Food Policy Research Institute.
- African Development Bank (2019) *Cross border road corridors. The quest to integrate Africa*. Abidjan: African Development Bank.
- CME Group (2022) Agricultural futures and options (<https://www.cmegroup.com/markets/agriculture.html>).
- Darbyshire, E. (2020) *Report: Yemen's agriculture in distress. Mytholmroyd: Conflict and Environment Observatory* (<https://ceobs.org/yemens-agriculture-in-distress/>).
- FAO Aquastat (2021) FAO Global Information System on Water and Agriculture. Food and Agriculture Organization of the United Nations (<https://www.fao.org/aquastat/en/>).
- FAOSTAT (all dates) Food and agriculture data. Food and Agriculture Organization of the United Nations (<https://www.fao.org/faostat/en/#home>).
- FAOSTAT (2019) Food Balances (2010–). Food and Agriculture Organization of the United Nations (<https://www.fao.org/faostat/en/#data/FBS>).
- Favari, E., Geiger, M., Krishnaswamy, S. and Tandon, S. (2021) *The 2020 food security crisis in Yemen*. Cairo: World Food Programme and Washington DC: World Bank.
- FEWSNET Kenya (2022) Famine Early Warning Systems Network (<https://fews.net/east-africa/kenya>).
- FEWSNET Mali (2022) Famine Early Warning Systems Network (<https://fews.net/west-africa/mali>).
- FEWSNET Sudan (2022) Famine Early Warning Systems Network (<https://fews.net/east-africa/sudan>).
- FEWSNET Yemen (2022) Famine Early Warning Systems Network (<https://fews.net/east-africa/yemen>).
- Glauber, J. and Laborde, D. (2022) How will Russia's invasion of Ukraine affect global food security? IFPRI Blog, February 24 (<https://www.ifpri.org/blog/how-will-russias-invasion-ukraine-affect-global-food-security>).

⁸ A few years ago, Tanzania announced an ambitious target to irrigate more of its land, all of one million hectares. Radar surveys of flooded paddy fields indicate that the country probably already had more than that under irrigation but that the small plots were not officially counted (Venot et al., 2021).

Gro Intelligence (2016) Grains in Mali: more than meets the media (<https://ftp.gro-intelligence.com/insights/grains-in-mali-more-than-meets-the-media>).

Jacoby, H.G. (2016) Food prices, wages, and welfare in rural India. *Economic Inquiry*, 54(1): 159–176.

Teravaninthorn, S. and Raballand, G. (2009) *Transport prices and costs in Africa. A review of the main international corridors*. Washington DC: World Bank.

The Economist (2022) *Grain damage. War in Ukraine will cripple global food markets* (<https://www.economist.com/finance-and-economics/2022/03/12/war-in-ukraine-will-cripple-global-food-markets>).

Thomas, E. (2022a) *Food security in Yemen: the role of the private sector in promoting domestic food production*. London: Overseas Development Institute (www.odi.org/en/publications/food-security-in-yemen/).

Thomas, E. (2022b) *Food security in Yemen: the private sector and imported food*. London: Overseas Development Institute (www.odi.org/en/publications/food-security-in-yemen/).

Venot, J.P., Bowers, S., Brockington, D., Komakech, H., Ryan, C.M., Veldwisch, G.J. and Woodhouse, P. (2021) Below the radar: Data, narratives and the politics of irrigation in sub-Saharan Africa. *Water Alternatives*, 14(2): 546–572.

Wiggins, S. (2021) *Implications of COVID-19 for agricultural development, food and nutrition security in the global south*. Review for GIZ. London: Overseas Development Institute.

Wiggins, S. and Keats, S. (2013) *Looking back, peering forward. Food prices and the food price spike of 2007/08*. Project Report, ODI Shockwatch: Managing Risk and Building Resilience in an Uncertain World. London: Overseas Development Institute.

Wiggins, S., Calow, R., Feyertag, J., Levine, S. and Löwe, A. (2020) *Rapid evidence review. Policy interventions to mitigate negative effects on poverty, agriculture and food security from disease outbreaks and other crises*. London: Overseas Development Institute.

Wineman, A., Jayne, T.S., Isinika Modamba, E. and Kray, H. (2020) The changing face of agriculture in Tanzania: Indicators of transformation. *Development Policy Review*, 38(6): 685–709.

World Bank (2020) *Sudan. Agriculture value chain analysis*. Washington DC: World Bank.

Acknowledgements

Many thanks to those who provided information or commented on an earlier draft: Sharad Tandon (World Bank), Mark Redwood (SPARC), Simon Levine (ODI), Julius Court, Richard Erlebach, Rachel Lambert and Donald Menzies (all Foreign, Commonwealth and Development Office). Nevertheless, the views in this brief are those of the author and do not necessarily reflect those of anyone else, including the rest of ODI and SPARC.

Appendix A: Will other agricultural commodity prices be pushed up?

Correlations: monthly prices, January 1992 to November 2021, in percentages

Coefficients of more than 50% shaded in purple; those of more than 70% shaded in orange

	Bananas	Beef	Cocoa beans	Coffee, other mild Arabicas	Coffee, Robusta	Cotton	Groundnuts	Palm oil	Poultry	Rubber	Sugar, free market	Sugar, US import	Tea
Correlation coefficients													
All Commodity Price Index, 2016 = 100, includes both fuel and non-fuel price indices	73	73	76	63	51	48	76	74	68	77	71	54	63
Crude Oil (petroleum), Price Index, 2016 = 100, simple average of three spot prices; Dated Brent, West Texas Intermediate, and Dubai Fateh	67	69	71	54	43	41	72	66	63	74	65	46	60
Fuel (energy) Index, 2016 = 100, includes crude oil (petroleum), natural gas, coal price and propane indices	62	62	69	55	44	48	66	75	58	80	67	48	58
All Metals Index, 2016 = 100: includes metal price index (base metals) and precious metals index	86	84	78	70	55	59	83	84	76	80	76	73	67
Base Metals Price Index, 2016 = 100	77	75	75	69	54	60	74	84	68	85	74	68	62
Coefficients of determination													
All Commodity Price Index, 2016 = 100, includes both fuel and non-fuel price indices	53	54	58	39	26	23	58	55	46	60	50	30	40
Crude Oil (petroleum), Price Index, 2016 = 100, simple average of three spot prices; Dated Brent, West Texas Intermediate, and Dubai Fateh	45	47	51	29	18	17	51	43	39	55	42	21	36
Fuel (energy) index, 2016 = 100, includes crude oil (petroleum), natural gas, coal price and propane indices	38	38	47	30	19	23	44	57	33	65	45	23	33
All Metals Index, 2016 = 100: includes metal price index (base metals) and precious metals index	73	71	61	50	30	35	69	70	58	65	58	53	45
Base Metals Price Index, 2016 = 100	59	56	56	48	29	36	55	71	46	72	55	46	39

Commodity prices, full specification

Bananas, Central American and Ecuador, free on board (FOB) US ports, US\$ per tonne
 Beef, Australian and New Zealand 85% lean fores, cost, insurance and freight (CIF) US import price, US cents per pound
 Cocoa beans, International Cocoa Organization cash price, CIF US and European ports, US\$ per tonne
 Coffee, other mild Arabicas, International Coffee Organization New York cash price, ex-dock New York, US cents per pound
 Coffee, Robusta, International Coffee Organization New York cash price, ex-dock New York, US cents per pound
 Cotton, Cotton Outlook 'A Index', Middling 1-3/32 inch staple, CIF Liverpool, US cents per pound
 Groundnuts (peanuts), 40/50 (40 to 50 count per ounce), CIF Argentina, US\$ per tonne
 Palm oil, Malaysia Palm Oil Futures (first contract forward) 4-5% forward freight agreement (FFA), US\$ per tonne
 Poultry (chicken), whole bird spot price, ready-to-cook, whole, iced, Georgia docks, US cents per pound
 Rubber, Singapore Commodity Exchange, No. 3 Rubber smoked sheets, 1st contract, US cents per pound
 Sugar, free market, Coffee Sugar and Cocoa Exchange (CSCE) contract no.11 nearest future position, US cents per pound
 Sugar, US import price, contract no.14 nearest futures position, US cents per pound
 Tea, Mombasa, Kenya, auction price, US cents per kilogram, from July 1998, Kenya auctions, Best Pekoe Fannings. Prior, London auctions, CIF UK warehouses

Source: International Monetary Fund Primary Commodity Prices: <https://www.imf.org/en/Research/commodity-prices>

Appendix B: Agricultural and population statistics for Kenya, Mali, Sudan and Yemen

	Year	Units	Kenya	Mali	Sudan	Yemen
Population	2020	persons	53,771,300	20,250,834	43,849,269	29,825,968
Wheat production	2018–20	tonnes	369,167	24,845	726,274	97,801
Wheat imports, total	2018–20	tonnes	1,872,644	310,519	5,011,665	1,805,359
Wheat imports, Russia	2018–20	tonnes	637,766	104,249	4,586,453	579,067
Wheat imports, Ukraine	2018–20	tonnes	179,976	26,969	100,615	334,161
Wheat imports, Russia and Ukraine	2018–20	tonnes	817,742	131,218	4,687,068	913,228
Import dependency, wheat			84%	93%	87%	95%
Dependency on Russia and Ukraine			44%	42%	94%	51%
Maize production	2018–20	tonnes	3,794,926	3,652,784	28,196	53,562
Maize imports, total	2018–20	tonnes	409,950	465	17,306	147,199
Maize imports, Russia	2019	tonnes	0	0	0	0
Maize imports, Ukraine	2020	tonnes	10,000	–	–	10,100
Maize imports, Russia and Ukraine	2018–20	tonnes	10,000	–	–	10,100
Import dependency, maize			10%	0%	38%	73%
Dependency on Russia and Ukraine			2%	0%	0%	7%
Millet and sorghum production			384,000	3,481,170	5,317,306	43,261
Rice production, paddy	2018–20	tonnes	151,360	3,124,630	32,044	–
Rice production, milled equivalent	2018–20	tonnes	105,952	2,187,241	22,431	–
Rice imports	2018–20	tonnes	246,528	178,332	38,827	328,524
Apparent cereal consumption*						
Wheat consumption	2018–20	kg/person/year	41.7	16.6	130.9	63.8
Maize consumption	2018–20	kg/person/year	78.2	180.4	1.0	6.7
Millet and sorghum consumption	2018–20	kg/person/year	7.1	171.9	121.3	1.5
Rice consumption	2018–20	kg/person/year	6.6	116.8	1.4	11.0

	Year	Units	Kenya	Mali	Sudan	Yemen
Fertiliser						
Fertiliser imports, all		tonnes	340,032	273,662	149,128	9,788
Fertiliser imports, nitrogenous		tonnes	146,362	142,612	120,477	7,929
Fertiliser imports, potash		tonnes	40,194	61,563	1,693	874
Arable land	2019	k ha	5,800	6,411	19,823	1,158
Fertiliser use, all		kg/ha arable	58.6	42.7	7.5	8.5
Nitrogen fertiliser		kg/ha arable	25.2	22.2	6.1	6.8
Potassium fertiliser		kg/ha arable	6.9	9.6	0.1	0.8
Food balance consumption						
Food consumption	2019					
All cereals	2019	kg/person/year	138.4	245.4	152.8	168.6
Wheat	2019	kg/person/year	38.1	18.5	61.6	115.2
Maize	2019	kg/person/year	73.7	44.8	0.5	15.9
Millet and sorghum	2019	kg/person/year	5.4	106.1	89.5	8.9
Rice	2019	kg/person/year	21.2	76.0	1.2	28.6
All roots and tubers	2019	kg/person/year	96.1	39.1	38.7	8.4

*Apparent consumption is domestic production plus imports: in almost all cases, exports are insignificant.



Fund manager



Funded by



This material has been funded by UK aid from the UK government; however the views expressed do not necessarily reflect the UK government's official policies.