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Policy Brief
Regional Food Trade

RFT-A05

Food, Fuel and Fertiliser Crisis:

Situation Report – February 2023

Watson, D. (2023). Food, Fuel and Fertiliser Crisis. February 2023. Russia Ukraine Crisis Series, AGRA, Westend Towers, Nairobi, Kenya.

This report provides an overview of the Food, Fuel and Fertiliser Crisis for February 2023. It focuses on key trends in the supply, demand, and prices of food, fuel and fertilisers, and analyses the impacts of these trends, especially across sub-Saharan Africa (SSA).

Key Take-Aways:

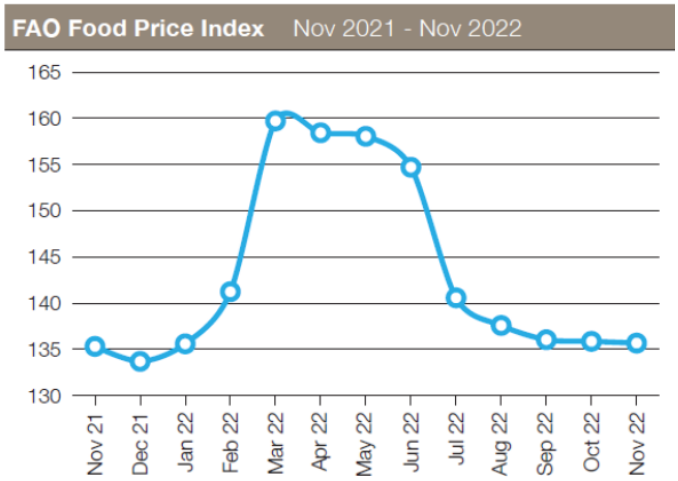
- Food, fuel, and fertiliser prices remain high leading to increased poverty and food insecurity.
- Food, fuel, and fertiliser markets remain volatile.
- High food prices are driven by a range of factors, including food volumes coming out of war-torn Ukraine; lower crop yields (linked to droughts/floods/reduced fertiliser applications); high production, transportation, and energy costs as well as post-Covid supply logistics issues; low food commodity stocks, export restrictions, and strong global demand.

The price of food

Figure 1 illustrates that the FAO Food Price Index (FPI) fell from its all-time high of 159.7 points in March 2022, to 132.4 points in December 2022 (FAO 2022a).

Figure 1. FAO Food Price Index November 2021 to November 2022 (FAO-AMIS 2022a).

Whilst the FPI has fallen significantly, it's important to note that it was already high in November 2021. Indeed, as Figure 2 illustrates, in real terms, the FPI hasn't been this high since the economic crisis of 1974 (FAO 2022a).



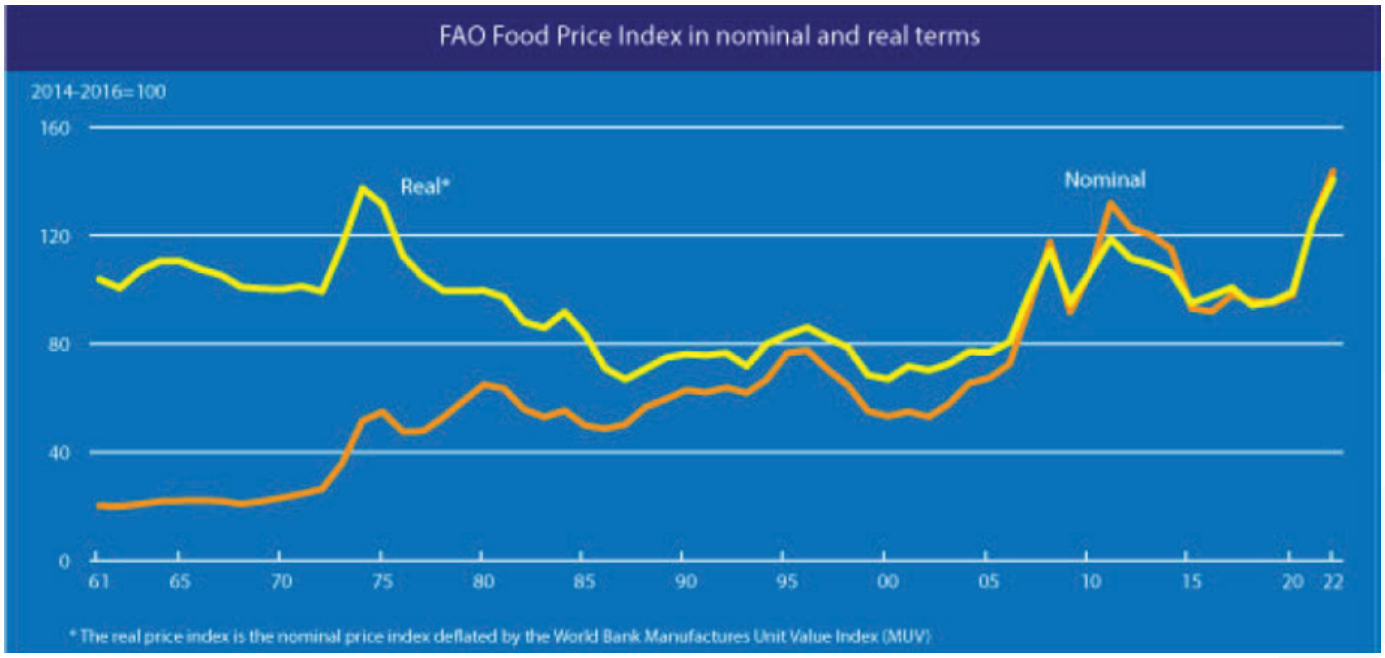


Figure 2. FAO Food Price Indices 2019-2022 (FAO 2022a)

More importantly, whilst it is encouraging to see food commodity prices decline, global agricultural markets remain volatile and sensitive to a number of key variables, such as the volume of food commodity exports from the Black Sea region; low crop yields, and poor quality due to climate change-induced droughts and floods, as well as reduced fertiliser application; high production, transportation, and energy costs as well as Covid-linked supply logistics issues;

low food commodity stocks, export restrictions, and strong global demand (FAO 2022a; Bloomberg 2022a; AHDB 2022). Indeed, grain market analyst ODA Connect suggests that Black Sea volatility still accounts for approximately 90% of price movements (Farmers Weekly 2022a). According to John Baffes (World Bank), "it's like flying with one engine… as long as that engine works, it's fine, but if the engine stops then you have problems… If any of the risks above materialise, we'll see a rise in prices very, very quickly" (Financial Times 2023).

Wheat Prices - Whilst global wheat prices continued their downward trend until June/July 2022, the period through August 2022 to January 2023 has seen greater volatility (see Figure 3). Much of this volatility has been attributed to intensified fighting between Russia and Ukraine, concerns for the volumes of food commodity exports coming out of the Black Sea, and downward revisions for wheat supplies in the USA (FAO-AMIS 2022b). Other factors, such as a softening demand for wheat, and good sowing conditions for wheat in the USA and Europe for 2023 harvests, tended to temper price increases (FAO-AMIS 2022a).

Maize Prices – In a similar vein to wheat, global maize prices continued their downward trend until June/July 2022, and then rallied through August to October, falling again in November and December (see Figure 3) (FAO-AMIS 2022a). Price increases have been attributed to concerns for the volumes of maize coming out of the Black Sea Region, lower production estimates for the USA and Europe, as well as dry sowing conditions for maize in Argentina (for 2023 harvest), and a reasonably firm demand (FAO-AMIS 2022b). High volumes of maize leaving Brazil, and slightly reduced demand, tended to temper price increases (FAO-AMIS 2022b).

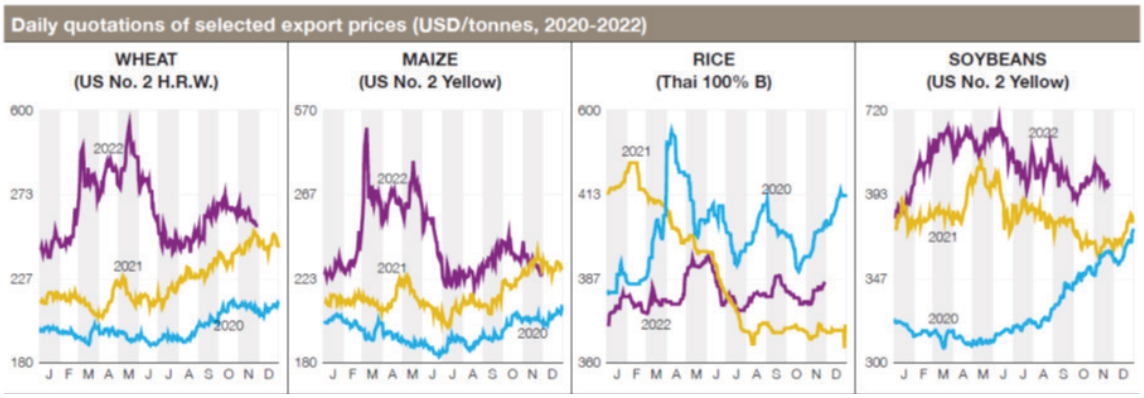
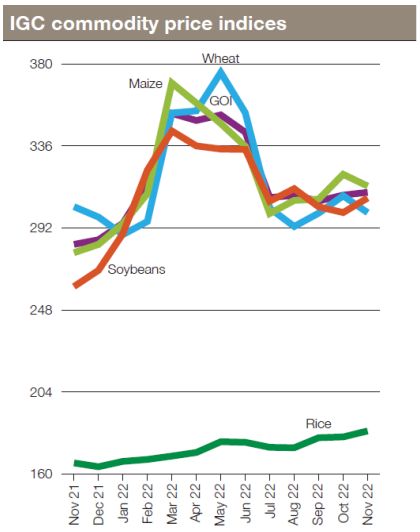


Figure 3. December 2022 export prices for wheat, maize, rice, and soybeans (FAO-AMIS 2022a)

Rice Prices – Aside from the specific case of broken rice, which acts primarily as a substitute for wheat and maize in animal feeds, month by month rice prices remain largely unaffected by the war in Ukraine, and the broader food crisis (see Figure 3) (FAO-AMIS 2022b). Whilst slightly tighter supplies of rice, due to India's export ban on broken rice and 20% duty on some non-basmati rice exports (The Economic Times 2022), and lower yields and logistical challenges in Pakistan (due to flooding), provided some upward pressure on market prices, the advent of new harvests coming onto the market, record high rice stocks, and overall ample rice production, tended to restrict significant upward pressure on prices (Reuters 2022e; World Grain 2022g; FAO-AMIS 2022b; Rother et al 2022).

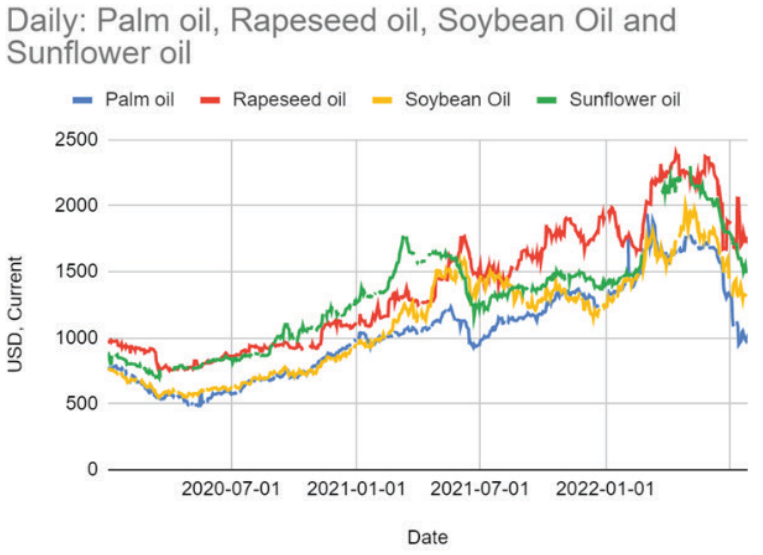
Figure 4. IGC Commodity Price Indices - FAO-AMIS 2022a



However, this situation might change. India is the 2nd most important rice producer in the world, responsible for 40% of the global rice trade (Rother et al 2022), and acts as a price anchor, being the cheapest source of the commodity, by far (Reuters 2022b). Erratic monsoons promise to reduce the 2023 rice harvests, which, in turn could reduce the amount of rice available for export, causing a global surge in rice prices (Rother et al 2022). In September 2022, the Rice Price Index increased by 2.2%, to its highest level for 18 months (see Figure 4) (World Grain 2022g). Whilst global rice production remains robust, higher production costs (linked to high fertiliser and energy prices), and high demand, linked to high wheat prices, may see rice prices increase (Bloomberg 2022a)

Soyabean and oilseeds - The FAO Vegetable Oil Price Index slipped further, decreasing by 1.6% in the month of October, almost 20% below the same time last year. Lower prices for palm oil, soya bean and rapeseed oils, were only partially tempered by slightly higher prices of sunflower seed oil – see Figure 5 (FAO-AMIS 2022b). After a shaky start earlier in the year, palm oil prices decreased almost 50% from their highs in March 2022.

Figure 5. Global oil seed prices Laborde 2022a

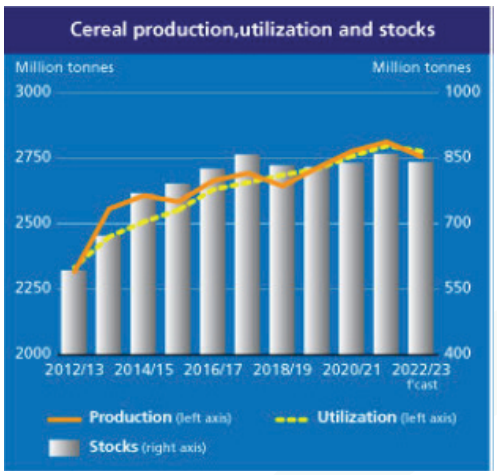


In summary, according to Máximo Torero Cullen, the FAO's chief economist, the factors outlined above, which initially drove food prices higher, still exist and could quite easily conspire to drive prices back up (CNN 2022). According to the UN, food prices could increase by an average of 8.5% by 2027 (CNBC 2022).

What's the current state of food supplies?

According to the FAO (2022b), the global cereal stocks-to-use ratio is forecast to fall from 30.9 percent in 2020/21 to 29.4 percent in 2022/23 (see Figure 6 below), their lowest level since 2013/2014. This situation is primarily the result of adverse climatic conditions (drought and floods), which negatively affected the production of maize, wheat, and rice (discussed below).

Figure 6. Cereal Production, Utilisation and Stocks (FAO 2022b)



Wheat Supply and Demand

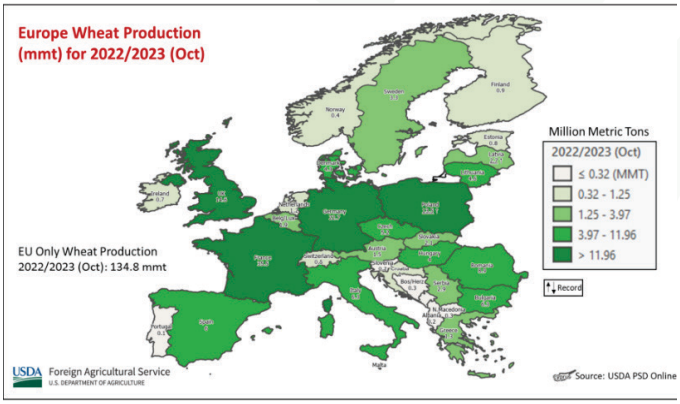
According to the USDA-FAS (2023), the global wheat production for 2022-2023 is projected to total 781.312 MMT against a consumption of 783.163 MMT (see Table 1). The overall situation for SSA has slightly worsened since the May 2022 Report. Whilst wheat production is projected to increase slightly from 9.369 MMT to 9.694 MMT, consumption is projected to increase from 33.705 MMT to 34.703 MMT, requiring importation of 26.035 MMT. However, it must be noted that SSA has struggled to substitute traditional wheat imports from Russia and Ukraine. Wheat ending stocks are projected to be a little higher at 4.368 MMT compared to 4.039 MMT (subject to SSA being able to secure all its wheat import volumes).

Wheat Supply and Demand 2022-2023 (MMT)				
	Production	Consumption	Imports	Ending Stocks
World	781.312	783.163	204.88	268.389
SSA	9.694	34.703	26.035	4.368

Table 1. Wheat Supply and Demand Statistics for 2022-2023 (World versus SSA) (USDA-FAS 2023)

Climate variability has resulted in mixed fortunes for global wheat production. Whilst the EU, Russia, Canada, Kazakhstan, and Australia have witnessed higher than expected yields, others, such as Argentina, and the USA have had reductions in their expected yields.

Figure 7. European Wheat Production – (USDA-FAS 2022a)



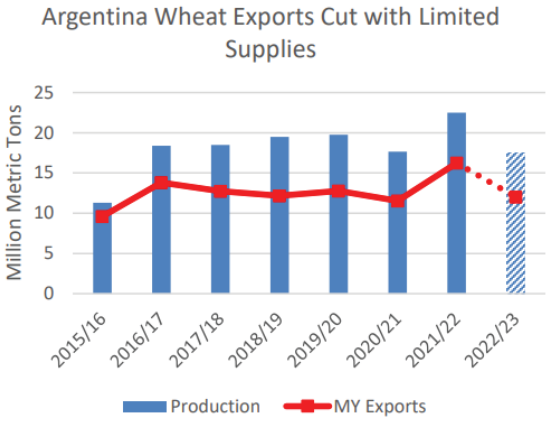
Whilst wheat production was forecast to decline due to dry weather (Wall Street Journal, 2022), higher than expected yields emerged across many parts of Europe (USDA-WASDE 2022a) (see Figure 7).

For example, increased production from Poland and Germany are expected to contribute to Europe's estimated 134.8 MMT, which is 2.7 MMT more than originally estimated (USDA-WASDE 2022a). Both Russia and Canada, which benefited from warmer (presumably) climate-change-induced temperatures, and cropping area expansions of 2 million hectares, are expected to deliver bumper wheat harvests. Russia is expected to produce anything from a

record breaking 89 MMT to 100 MMT of wheat (Farmers Weekly 2022a; Bloomberg 2022b), whereas Canada expects to benefit from its third highest harvest of 34.6 MMT (Bloomberg 2022d). Climate-change-induced La Niña rains are expected to increase Australia's wheat production by 1.5 MMT to 34.5 MMT (USDA-WASDE 2022b). Whilst climate change has undoubtedly benefited Canada, Russia, and Australia, it has had the opposite effect on other countries, such as the USA and Argentina.

Figure 8. Argentinian wheat exports 2022/23 (USDA-FAS 2022c)

Figure 8 illustrates the projected reduction in Argentinian wheat exports, which is a direct result of reduced harvested area, and reduced yields of 1.5 million tonnes due to prolonged drought conditions (USDA-WASDE 2022a). As a result, Argentina is only expected to export 7 million tonnes of wheat this year, which is less than half the 14.5 million tonnes exported in the 2021-22 marketing year (World Grain 2022q)



Ukraine

Despite earlier, more pessimistic, predictions, wheat production in Ukraine in the 2022/2023 season is expected to reach between 16 million and 20.5 million tonnes, compared to the approximately 33.01 million tonnes harvested in 2021-22 (UKRINFORM 2022a; World Grain 2022m; World Grain 2022l). Wheat available for export in the 2022/2023 marketing season is expected to amount to 11 million tonnes, which is 41% less than in the 2021–2022 marketing season. Despite shipments of wheat via rail, road, river, and sea, a considerable amount of exportable wheat from the 2021/2022 harvest remains trapped inside Ukraine. Figure 9 illustrates the food commodities shipped out of Ukraine's Black Sea Ports by the end of August 2022.

Figure 9. Food commodities shipped from Ukraine's Black Sea Ports (BBC 2022b)

Despite the volumes of wheat and other food commodities, leaving Ukraine increasing by 20-30% month on month (UKRINFORM 2022b), even with the Black Sea Grain Initiative, the overall grain exports in 2022 reduced by 32% (5.7 MMT) compared to the same period in 2021 (see Figure 10 below).

Figure 10. Black Sea Grain Exports 2019-2022 (Financial Times 2022d)

By November 2022, Ukraine had only exported 5.4 MMT of wheat (World Grain 2022j), and most of that was due to the Black Sea Grain Initiative. Before the war, Ukraine exported up to 5 MMT of grain each month via the Black Sea route (Telegraph 2022). Figure 11 illustrates the volume of exports and destination, as of the beginning of November 2022.

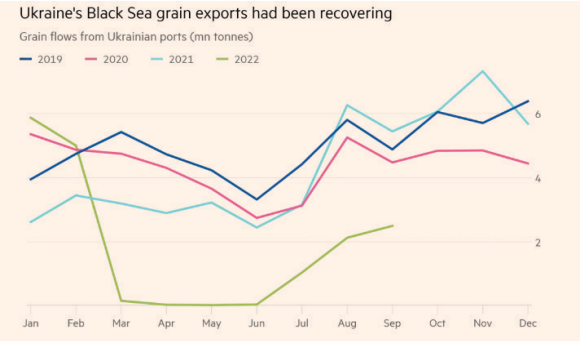
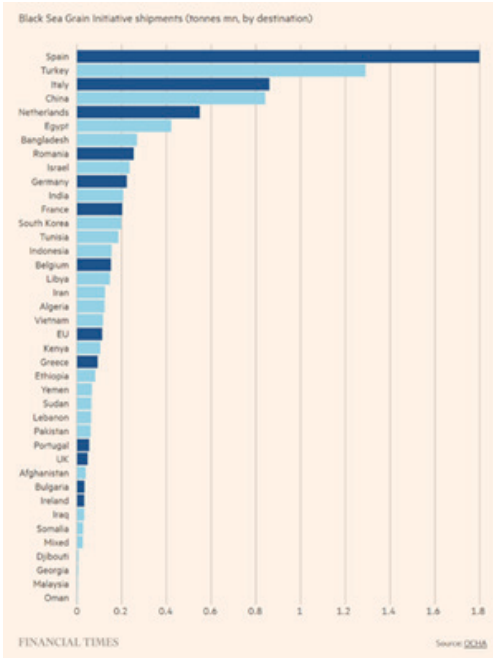


Figure 11. Black Sea Initiative shipments (Financial Times 2022d)



Whilst grain exports via road, rail and river have increased, at only 2.7 MMT/month, this is only a drip-feed contribution to the exportation of food commodities (Reuters 2022f). Of this, only about 30% of shipments have been destined for Less Developed Countries (LDCs) countries. In total, between January and September 2022, this amounted to less than 1 million tonnes being exported to LDCs, which is 1.2 million tonnes less than the same period last year (World Grain 2022m). Concerns also abound regarding Ukraine's capacity to store this year's harvests, especially as many stores are either destroyed or still contain grain stocks from 2021. Further concerns relate to the country's capacity to sow winter crops for harvest in 2023. Indeed, the wheat area for 2022/2023 is expected to decline by more than 20% due to the Russian invasion (BBC 2022c). This could reduce Ukraine's 2023 harvest by more than a third (World Grain 2022j).

Russia

Russia, which is also sitting on large stocks of wheat (USDA-FAS 2022c), initially struggled with food exports, as several banks failed to open letters of credit, and insurers stepped away from providing cover for Russian food and fertiliser exports. The country's wheat exports in July and August 2022 reportedly fell by 22% to 6.3 million tonnes, compared with the same period last year (World Grain 2022j). Indeed, Russia insisted that assistance with its own food and fertiliser exports was negotiated in parallel with a 120-day extension of the Black Sea Grain Initiative (World 2022j; Reuters 2022i; Financial Times 2022c). As a result, the UN brokered an accord with the US, UK, and EU to "create a general licence to assure private companies that there was a "blanket exemption" from sanctions on Russian food and fertiliser, and to encourage insurers to cover Russian-flagged vessels (Financial Times 2022c). During October 2022, Russia exported 6.53 million tonnes of food commodities (including wheat), compared to 4.59 million tonnes of at a similar time in 2021 (Bloomberg 2022c). Recent reports suggest that Russia may export a record 41 MMT of wheat in the 2022/2023 marketing season (Reuters 2022k).

India

Despite placing a ban on wheat exports, India has allowed wheat shipments based on government-to-government deals to neighbouring wheat insecure countries such as Bangladesh, the Philippines, and Malaysia, with some shipments going to Tanzania (Reuters 2022c). Sources suggest that Indian wheat stocks fell to 19 MMT in December 2022, compared to 37.85 MMT held in stores in 2021 during the same period (Reuters 2022l).

Egypt

Traditionally heavily-dependent on Ukraine for wheat imports, Egypt remains one of many countries struggling to make up for the shortfall of 5 million to 5.5 million tonnes at an affordable price. Since the invasion of Ukraine, Egypt has placed tenders with France, United States, Canada, Australia, Argentina, Russia, Romania, Bulgaria, and Brazil, (World Grain 2022b; World Grain 2022c). However, just like many other countries, Egypt struggles to find enough foreign exchange to purchase expensive wheat. Indeed, World Grain (2022e) suggested that Egyptian importers "are struggling to pay for wheat stuck at ports amidst a dollar shortage, causing 80% of mills to cease activity completely". Subsequently, the World Bank is providing $500 million in development funds to ensure food security and bolster grain reserves (Reuters 2022d). In addition to diversifying its wheat sourcing strategy, Egypt plans to reduce its wheat imports by 500,000 tonnes (Bloomberg 2022e). Just like Nigeria, Malawi, Zimbabwe and others, Egypt has invested in increased domestic wheat production (World Grain 2022b; Vanguard 2022).

Figure 12. Major Wheat Exporter Stocks 2022/2023 (USDA-FAS 2022c)

For the 2022/23 season, exporter stocks (see Figure 12) are forecast to decline to the lowest levels since 2012/13 (USDA-FAS 2022c).

Maize Supply and Demand

According to the USDA-FAS (2023b), global maize production in 2022-2023 is expected to total 1,155.934 MMT, down from 1,214.875 MMT in 2021-2022. Maize consumption is expected total 1,162.740 MMT, slightly down from 1,181.507 MMT in 2021-2022 (see Table 2). SSA maize consumption is expected to exceed maize production, and lead to reduced ending stocks.

Maize Supply and Demand 2022-2023 (MMT)				
	Production	Consumption	Imports	Ending Stocks
World	1,155.934	1,162.74	175.51	296.419
SSA	83.75	84.847	2.934	9.303

Table 2. Maize Supply and Demand Statistics for 2021-2022 (World versus SSA). USDA-FAS (2023b)

Figure 13 Global Maize Production and Consumption (USDA-FAS 2022a)

Figure 13 illustrates that global maize production continues to roughly equate to maize consumption. The 4% reduction in maize production (World Grain 2022q) is primarily linked to reduced output in the USA and EU, due to drought (see Figure 14 below) (USDA-FAS 2022b). On the other hand, the 1% - 2% reduction in consumption is primarily due to reduced demand for maize as livestock feed and industrial use, especially in China and the USA (World Grain 2022h). For maize, this is the first annual reduction in production and consumption since 2015-16 (World Grain 2022h).

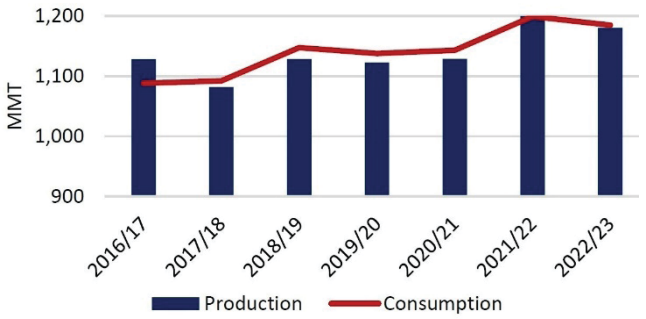
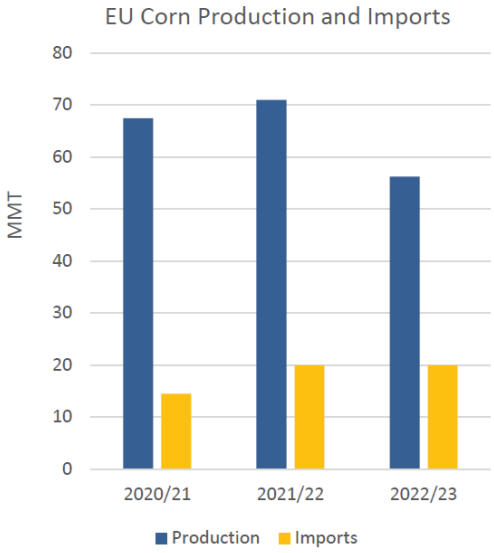
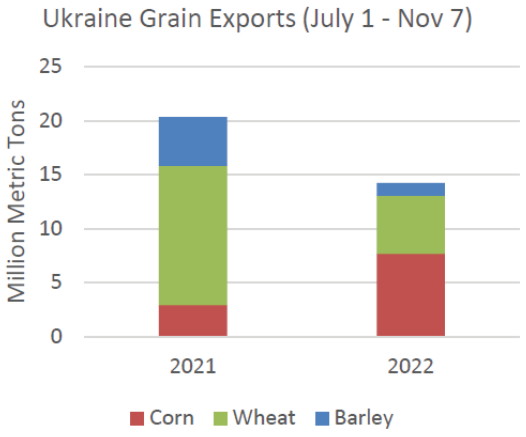


Figure 14. EU Maize Production and Imports (USDA 2022ca)

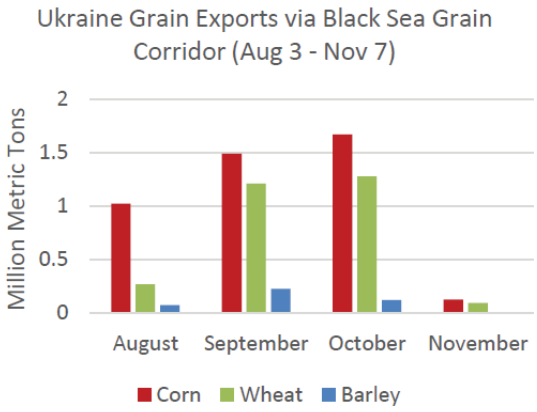
Maize production in the EU in 2022/2023 is expected to be 21% lower than the 2021/2022 harvest, and the lowest since 2007/2008. Because of this, and China's 16% reduction in maize imports to 19 MMT, the EU is likely to be the number one maize importer in 2022/2023 (USDA 2022c), increasing maize imports from 17.8 MMT in 2021/2022 to 20.5 MMT in 2022/2023. Already, the EU is importing large volumes of maize from Brazil, as well as Ukraine, via land, and the Black Sea Grain corridor.

Ultimately, the amount of maize available on the world market is dependent on the performance of key exporters, including the USA, Brazil, Argentina, and Ukraine. Exports from the USA in the 2021/2022 season totalled 62.978 MMT, whilst estimates for the 2022/2023 season are down to 57 MMT (USDA-FAS 2022b). On a positive note, both Brazil and Argentina are expected to increase their exports from 32.439 MMT and 38.853 MMT, respectively, in 2021/2022, to 46.5 MMT and 40. MMT in 2022/2023, respectively (USDA-FAS 2022b; World Grain 2022q). Maize has also dominated Ukrainian exports, via land as well as sea. To date, maize shipments have accounted for 43% of the total cargo shipped from Ukraine (see Figure 15 below) (AHDB 2022). Indeed, maize exports, via all routes, between July and November 2022 have doubled to 7.7 MMT compared to 2021 (USDA-FAS 2022b)..





Source: Ukraine Ministry of Agriculture



Source: Black Sea Grain Initiative website

Figure 15. Ukrainian Grain Exports via Black Sea Grain Corridor (USDA-FAS 2022b).

Maize exports from Ukraine have been prioritised due to significant levels of remaining 2021/2022 stocks, a strong harvest in 2022/2023, and a limited storage capacity for grains in Ukraine (FAO 2022c). The EU, Turkey, and China have been the main destinations for Ukrainian maize (USDA-FAS 2022b).

Figure 16. Global Ending Stocks for Maize, Wheat, Rice and Soyabean (Laborde 2022b)

Figure 16 illustrates that maize inventories are expected to fall to their lowest levels since 2012/2013.

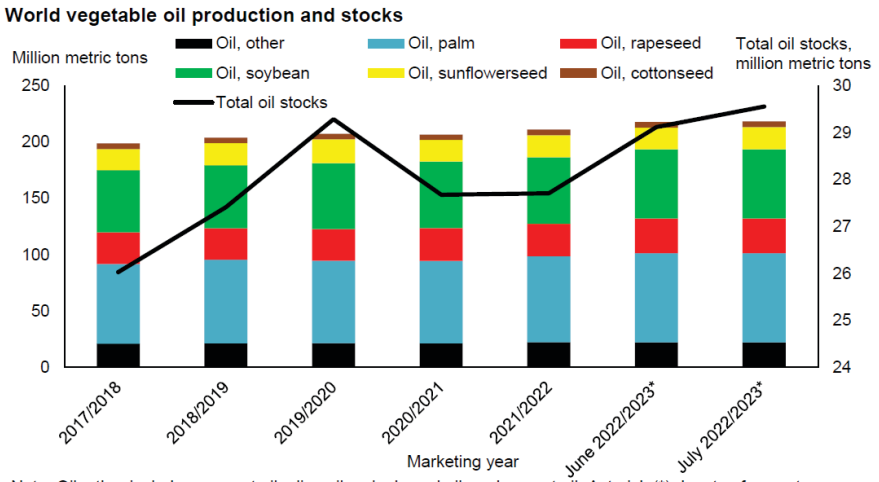
Oilseeds Supply and Demand

Juxtaposed with wheat, maize, and rice, global vegetable oil production and consumption remains stable. Oilseed production in 2022/2023 is expected to reach 645.60 MMT, up from 604.61 MMT in 2021/2022. Figure 17 (below) illustrates global vegetable oil production and stocks, broken down by oil types. Palm oil inventories increased 10.54% due to high yields (Reuters 2022h). Global vegetable oil trade is expected to increase in 2022/23 to 197.57 MMT, compared to 178.31 MMT in 2021/2022. Global ending stocks for oilseed is likely to increase to 121.94 MMT, compared to an estimated 113.55 MMT in 2021/2022 (USDA-WASDE 2022b).

Brazil

According to Brazil's National Supply Company (Conab), soybean production for 2022/2023 is estimated at 152 MMT, up from 127 MMT in 2021/2022 (USDA-WASDE 2022b), primarily due to a 2.9% increase in the land sown with soybean (World Bank 2022). Brazil's soybean exports continue to grow from 81.65 MMT in 2020/2021 to an estimated 89.50 MMT for 2022/2023 (USDA-WASDE 2022b).

Figure 17. Global Vegetable Oil Consumption and Stocks (Ates and Bukowski 2022).



Note: Oil, other includes coconut oil, olive oil, palm kernel oil, and peanut oil. Asterisk (*) denotes forecast.
Source: USDA, Economic Research Service using data from USDA, Foreign Agricultural Service, *Production, Supply and Distribution* database, July 2022.

USA

In the USA, soybean production remains reasonably strong at 118.27 MMT in 2022/2023, down from 2021/2022 (121.53 MMT), but still higher than 114.75 MMT in 2020/2021 (USDA-WASDE 2022b). Soybean exports from the USA were 61.67 MMT in 2020/2021, an estimated 58.72 MMT in 2021/2022, and a projected 55.66 MMT for 2022/2023 (USDA-WASDE 2022b).

Argentina

Argentina exported 5.2 MMT of soybean in 2020/2021, which reduced to 2.86 MMT in 2021/2022 due to drought, but projected to rise to 7.2 MMT for 2022/2023 season (USDA-WASDE 2022b) due to a larger planted area, but somewhat tempered by on-going drought, due to La Nina (Reuters 2022j; World Grain 2022d).

China

China's soybean production in 2022-23 is expected to reach a near-record 19 million tonnes, due to higher yields (averaging 2.03 t/ha, up 4% on 2021/2022) (World Grain 2022a). However, the country remains the major importer of soybeans, with expected imports reaching 98 MMT in 2022-23, up from 91.57MMT in 2021/2022 (USDA-WASDE 2022b).

Rice Supply and Demand

Rice Supply and Demand 2022-2023 (MMT)				
	Production	**Consumption**	**Imports**	**Ending Stocks**
World	502.968	515.052	52.794	169.983
SSA	20.693	37.766	16.9	3.51

Table 3. Rice Supply and Demand Statistics for 2022/2023 (World versus SSA) (USDA-FAS 2023b)

Table 3 illustrates the changing dynamic between rice production and consumption. In 2021/2022, the estimated

global rice production stood at 512.856 MMT, whilst consumption stood at 509.934 MMT. However, the situation for 2022/2023 has reversed, with forecast consumption increasing to 515.052 MMT versus production of only 502.968 MMT. World rice production is expected to fall 2.4% in 2022/2023 compared to record yields in 2021/2022 (World Grain 2022f), due to lower than expected yields in India and Pakistan (USDA-FAS 2022b). In SSA, whilst rice production remains almost constant (20.694 MMT in 2021/2022 and 20.693 MMT in 2022/2023), rice consumption has increased by over 1 MMT to 37.766 MMT in 2022/2023 from 36.613 MMT in 2021/2022 (USDA-FAS 2023b). Rice ending stocks in SSA are also predicted to fall slightly to 3.51 MMT in 2022/2023 compared to 3.526 MMT in 2021/2022. Ultimately, much of SSA remains reliant on rice imports to meet its consumption needs (USDA-FAS 2023).

Figure 18 Global Rice Production and Consumption (USDA-FAS 2022a)

Figure 18 illustrates the changing dynamic between rice production and consumption. Global rice supplies are dependent on a few major exporters, India, Thailand, and Vietnam, with limited exports from Pakistan and Myanmar (USDA-WASDE 2022a). In contrast to earlier in the year, global rice production in 2022/2023 is projected to be slightly less than 2021/2022, with exports predicted at 53.22 MMT. Ultimately, the amount of rice available on the world market is dependent on the performance of key exporters. These include India, which is by far the most important country, predicted to export 19.5 MMT in 2022/2023, followed by Thailand (8.2 MMT), Vietnam (7.2 MMT), and Pakistan (4 MMT) (USDA-FAS Trade 2022).

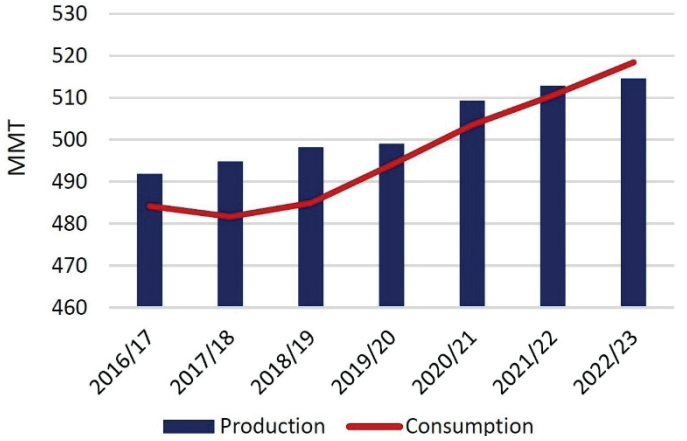
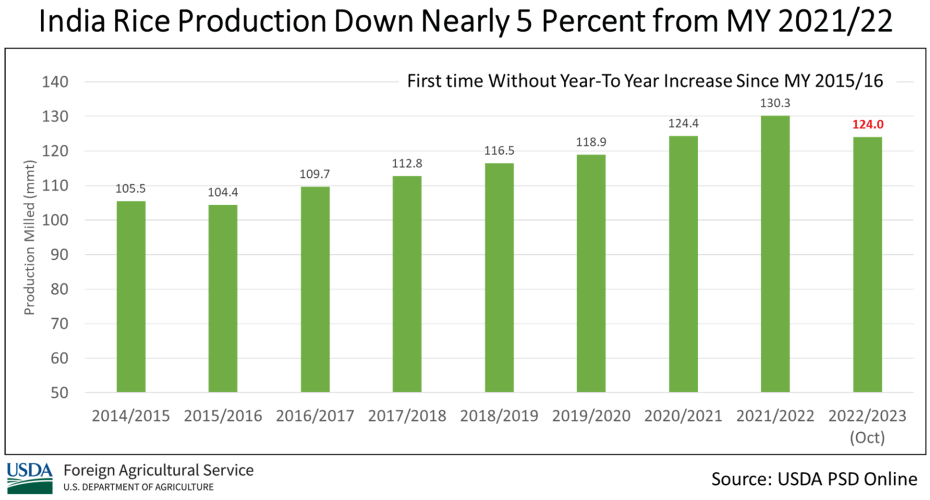


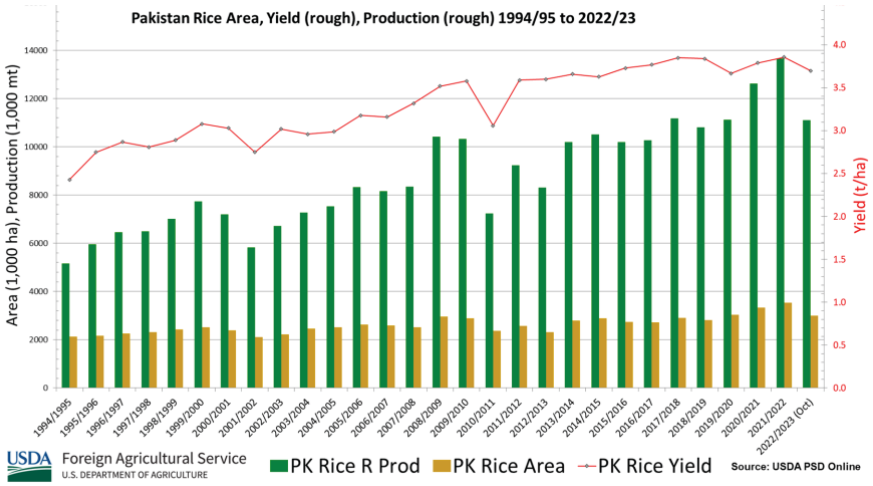
Figure 19. India's Rice Production (USDA-FAS 2022a)

India



Rice production in India during 2022/2023 is expected to fall by 2.5 MMT (around 6%), to between 122 MMT and 124 MMT, due to uneven monsoon rains (see Figure 19) (Reuters 2022e; USDA-WASDE 2022a; World Grain 2022i). In turn, expected reductions in rice production are likely to translate into lower rice ending stocks, which are expected to fall by 18% to 28 MMT in 2022/2023 (World Grain 2022i). To control price inflation in the country, India "banned exports of broken rice and slapped a 20% export tax on some non-basmati varieties" (Reuters 2022e). Monsoon floods are also expected to reduce Pakistan's rice production from 8.4 MMT to 7.4 MMT (see Figure 20) (USDA-WASDE 2022b). Both Thailand and Vietnam initiated talks to coordinate an increase in the price of their rice exports (Reuters 2022m).

Figure 20. Pakistan's estimated Rice Area, Yield, and Production - 1994/199 to 2022/2023 (USDA-FAS 2022a).



Global rice ending stocks 2022/23 are expected to decline to between 171.2 MMT and 193.4 MMT, primarily due to India's lower predicted harvest. Whilst this would be the lowest level since 2017/2018 ending stocks, it would still be the 3rd highest ending stocks due to bumper harvests in recent years (USDA-WASDE 2022b; FAO 2022b).

Fertiliser Prices

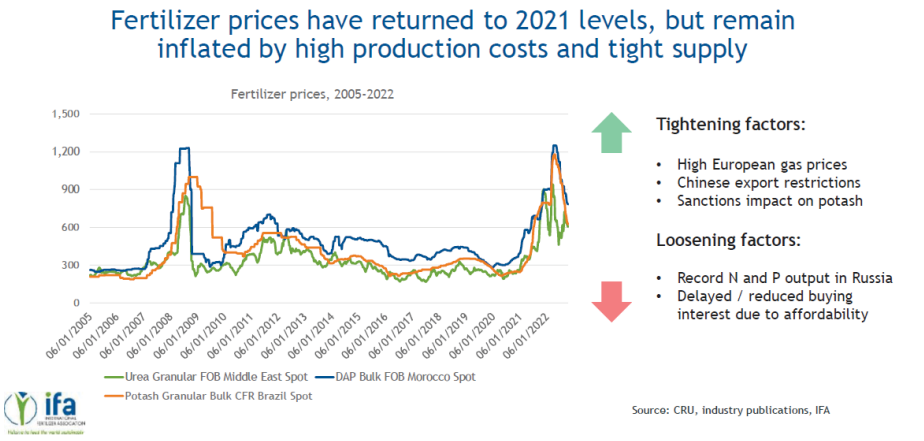
Contrary to initial concerns that fertilizer prices would continue increasing in 2022 (World Bank 2022a), since the peak in May, June and July 2022, the prices for most fertiliser types either stabilised or decreased (see Table 4 below) (Schnitkey et al 2022). However, it is important to note that 1) exceptional price vari-

ability exists between geographies, and 2) fertiliser prices remain high (see Figure 21).

Global Fertiliser Prices by type and month (Dry)				
	DAP	MAP	Potash	Urea
Nov 15-19 2021	825	911	769	859
Dec 13-17 2021	858	935	796	901
Jan 10-14 2022	863	932	807	913
Feb 7-11 2022	876	935	815	905
Mar 7-11 2022	919	955	822	901
Apr 4-8 2022	1040	1056	875	1031
May 2-6 2022	1057	1081	881	1001
May 30-Jun 3 2022	1056	1079	880	979
Jun 27-Jul 1 2022	1039	1053	885	867
Jul 25 -27 2022	1005	1041	887	836
Aug 22-26 2022	972	1026	880	804
Sep 19-23 2022	950	1005	875	811
Oct 17-21 2022	930	986	863	826
Nov 14-18 2022	930	978	848	812
Dec 19-23 2022	890	909	790	757
Jan 16-20 2023	859	865	721	712

Table 4. The price of Diammonium Phosphate (DAP), Mono-Ammonium Phosphate (MAP), Potash and Urea – November 2021 to January 2023 (DTN 2023)

Figure 21. Global Fertiliser Price trends 2005-2022 Cross and Gruère (2022)



Much of this price volatility hinges on the dynamics of local/regional supply and demand. On the supply-side, several fertiliser importing countries have already purchased high inventories of nitrogen, phosphate, and potash-based fertilisers in anticipation of strong demand, driven by high commodity prices (FAO-AMIS 2022b). However, many farmers, appear to be taking a much more cautious approach to fertiliser prices, deferring just-in-time purchases until late 2022 or early 2023, in the hope that fertiliser prices will continue to fall (FAO-AMIS 2022b). Conversely, whilst local production is increasing, taking the edge of ammonia prices, nitrogen-based fertilisers in Europe remain higher than in other parts of the world (FAO-AMIS 2022b). Figure 22 below clearly illustrates that fertiliser prices remain extremely high compared to recent years. Fertiliser prices across much of SSA are also either stable or decreasing (AGRA 2022).

Figure 22. CRU-Fertiliser Price Index 2003 to 2022 (Financial Times 2022b)

Fertiliser Supplies

Both the public and private sector are increasingly ramping up efforts to ensure adequate availability of fertilisers.

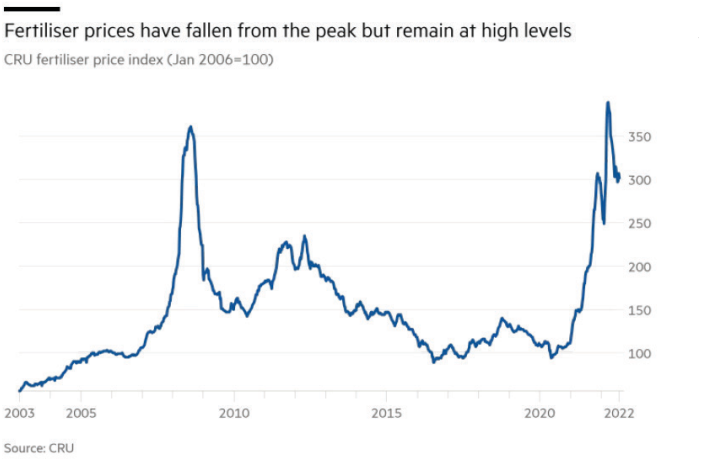


Figure 23. Global Urea production (2022 estimate) Cross and Gruère (2022)

Nitrogen – Figure 23 illustrates a relatively buoyant situation (2% increase) for global urea production in 2022, with countries such as Nigeria, Brunei, India, and Brazil increasing production (Cross and Gruère 2022).

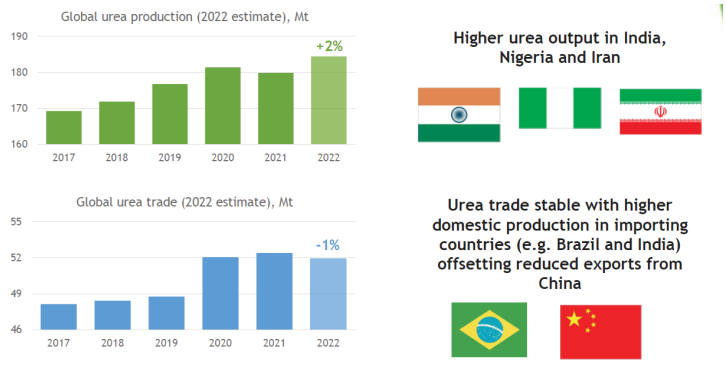
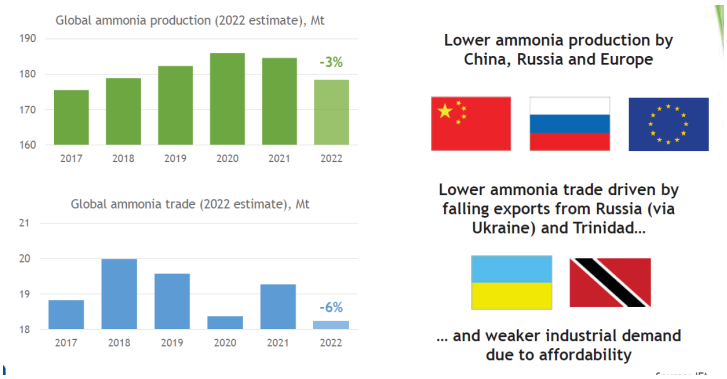


Figure 24. Global Ammonia production (2022 estimate) Cross and Gruère (2022)

Unfortunately, Ammonia production was expected to decrease by 3% in 2022 (Cross and Gruère 2022), driven by lower output in China, Russia, and West and Central Europe (WCE) (see Figure 24). The production of ammonia in Europe decreased as natural gas prices spiked due to reduced access to cheap Russian gas. Approximately 50% of Europe's ammonia production capacity was lost, leading to around a 33% reduction in the production of nitrogen-based fertilisers. Yara, one of the world's leading fertiliser producers, cut ammonia production in Europe by 35%, which equates to 4 MMT of fertiliser (Yara 2022). Other ammonia producers, such as CF Industries in the UK, BASF in Germany, Achema AB in Lithuania, Nitrogenmuvek Zrt in Hungary, and Grupa Azoty in Poland have also ceased production (Reuters 2022a). Conversely, Russia's production and exports of both urea and ammoniated phosphate were expected to reach record levels in 2022 (Cross and Gruère 2022).

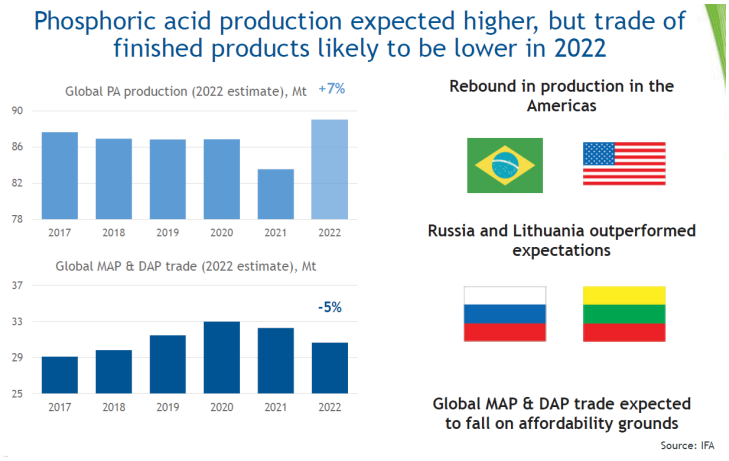


There are also growing opportunities to produce green ammonia, which uses renewable energy sources in place of fossil fuels. Figure 25 illustrates the significant potential across the globe to generate green hydrogen, and, in turn, green ammonia.

Figure 25 Global Green Ammonia Production Potential (AFDB 2022)

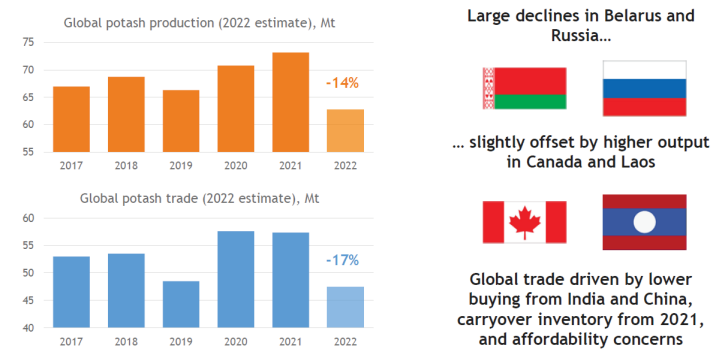
The highest potential for green ammonia production is in SSA, where there is also the greatest potential for increasing agricultural production. Green ammonia production facilities are currently being developed in the UK, USA, Australia, Japan, Spain, Denmark, and Norway (Brown 2018).

Figure 26 Phosphate production and trade (2022 estimates) (Cross and Gruère 2022)



Phosphate – Based on increased production in the USA, Brazil and Russia, global phosphoric acid production was expected to increase by 7% in 2022. International trade, however, is predicted to decrease due to lower demand linked to lower levels of farmer affordability (Cross and Gruère 2022) (see Figure 26). Phosphate production is likely to receive added stimulus with the re-entry of Tunisia into the phosphate marketplace (Reuters 2022o). In addition, Morocco intends to almost double phosphate production from 12 MMT in 2022 to 20.2 MMT by 2026 (The Conversation 2022). Saudi Arabia is looking to expand its phosphate production by 50% to 9 MMT, aiming to capture up to 24% of the global DAP and MAP market (Financial Times 2022a). According to the Cross and Gruère (2022), over the next 5 years, most of the expansion of phosphate production will occur in Africa and East Asia. Global phosphate production is expected to increase from 48.9 MMT in 2021 to just over 50 MMT by 2026 (Cross and Gruère 2022). Overall, the phosphate fertiliser situation looks positive.

Figure 27 Reductions in Potassium production and trade (2022 estimates) (Cross and Gruère 2022)



Potassium – Global potash supplies were expected to decrease by 14% in 2022, driven by reduced potash supplies coming out of Belarus and Russia. Lower demand, due to reduced farmer affordability, and high stock inventories from 2021, was expected to reduce global potash trade by 17% in 2022 (Cross and Gruère 2022). Without exports from Belarus and Russia, the potassium fertiliser situation looks decidedly negative, with only partial market recovery expected in 2023 (see Figure 28). On a positive note, Canada's Nutrien expects to be producing 18 MMT of potash fertiliser by 2025, which is 40% more than production levels in 2020 (Successful Farming 2022).

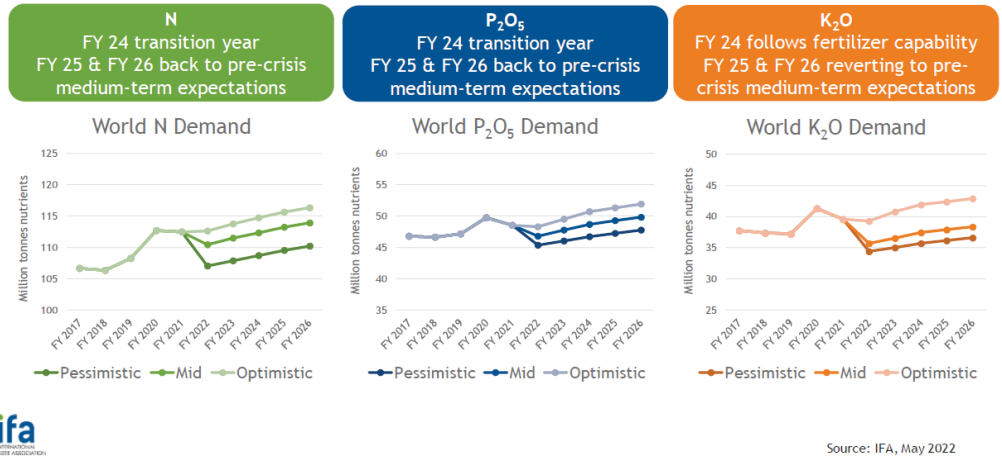


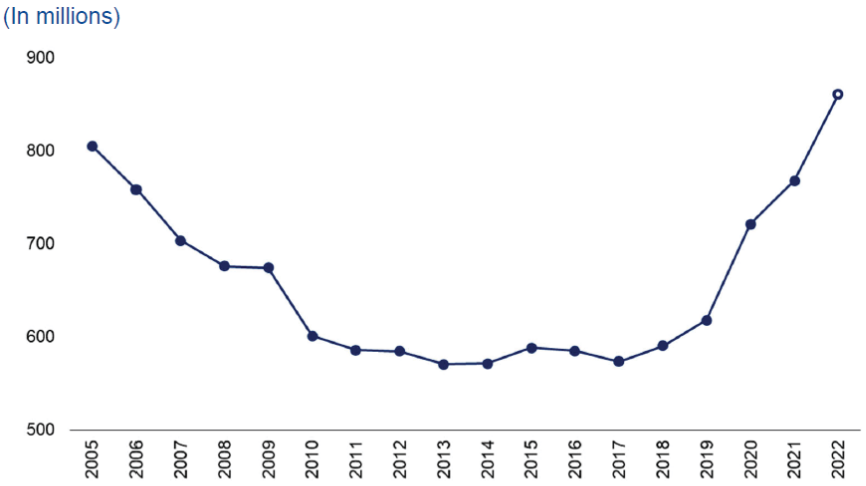
Figure 28. Capacity Expansion Forecasts for NPK (Cross and Gruère 2022)

According to the IFA, whilst nitrogen and phosphate production and consumption are projected to quickly bounce back, potash production and consumption could take several years before pre-food crisis volumes are restored (Figure 28) (Cross and Gruère 2022).

What does this mean for the poor?

Ultimately, unless food production is dramatically curtailed in 2023, there should be sufficient food produced, and available from food stocks, to feed the global population. However, issues with both food accessibility and affordability are likely to continue, especially in developing countries, disproportionately affecting the poorest.

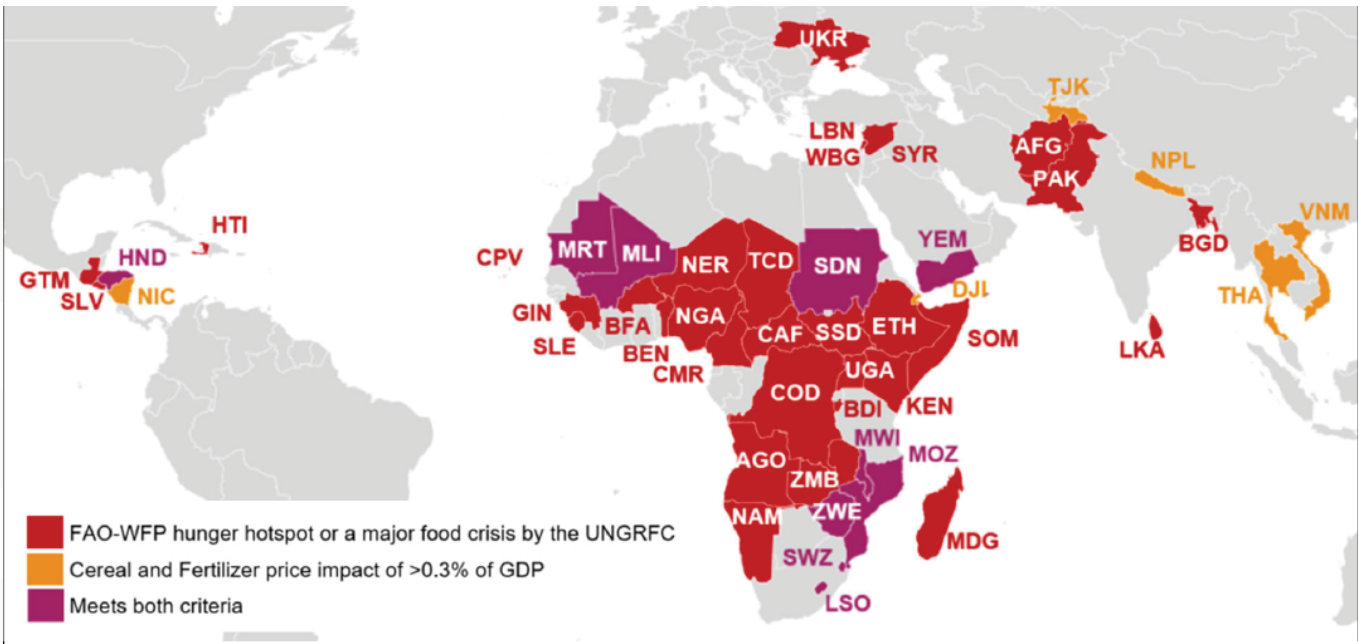
Figure 29 Global undernourished Population (Rother et al 2022).



Source: FAOSTAT.
Notes: Undernourished people are defined by FAO as those whose habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal active and healthy life. The last point for 2022 is an estimate from WFP's HungerMap Live as of August 3, 2022.

Reduced local food availability is most likely to occur due to conflict, reduced levels of production (linked to lower crop productivity and profitability due to increased production costs, and climate change), continued global supply disruptions, reduced food imports in food deficit countries due to high food prices, devalued exchange rates (especially against the US dollar), and the reduced fiscal capacity of many governments to pay for food imports (UNGCRG 2022; IFPRI 2022; Reuters 2022g; Financial Times 2022d). Figure 29 illustrates a rapid increase in the number of people suffering from undernourishment since 2019.

According to (Rother et al 2022), projections by FAO, IFAD, UNICEF, WFP, and WHO indicate that by 2030, almost 670 million people globally will be facing hunger, with up to 1 billion people facing either acute or chronic food insecurity. In Africa alone, at least 80 million people are acutely food insecure, which is nearly 30 million more people than in 2021 (see Figure 30) (BBC 2022a).



Source: WFP, FAO, UNGRFC, UN Comtrade, USDA, WEO, Staff calculations.
1/ Countries classified as (i) suffering from acute food insecurity by the FAO-WFP or in a major food crisis by the UNGRFC (see footnote 13 for details) or (ii) facing a negative impact of international price changes for food and fertilizers on the external current account of at least 0.3 percent of GDP (excluding countries with a positive overall commodity ToT shock).

Figure 30 Countries Highly Exposed to Food Insecurity (Rother et al 2022)

IFPRI undertook an analysis across 16 vulnerable countries (see Figure 32) to ascertain the proportionate effects of food, fuel, and fertiliser price increases on urban and rural poverty (see Figure 31).

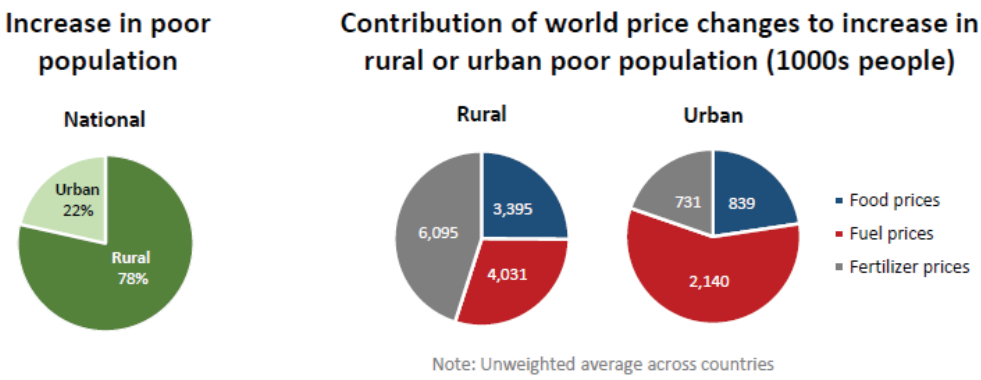
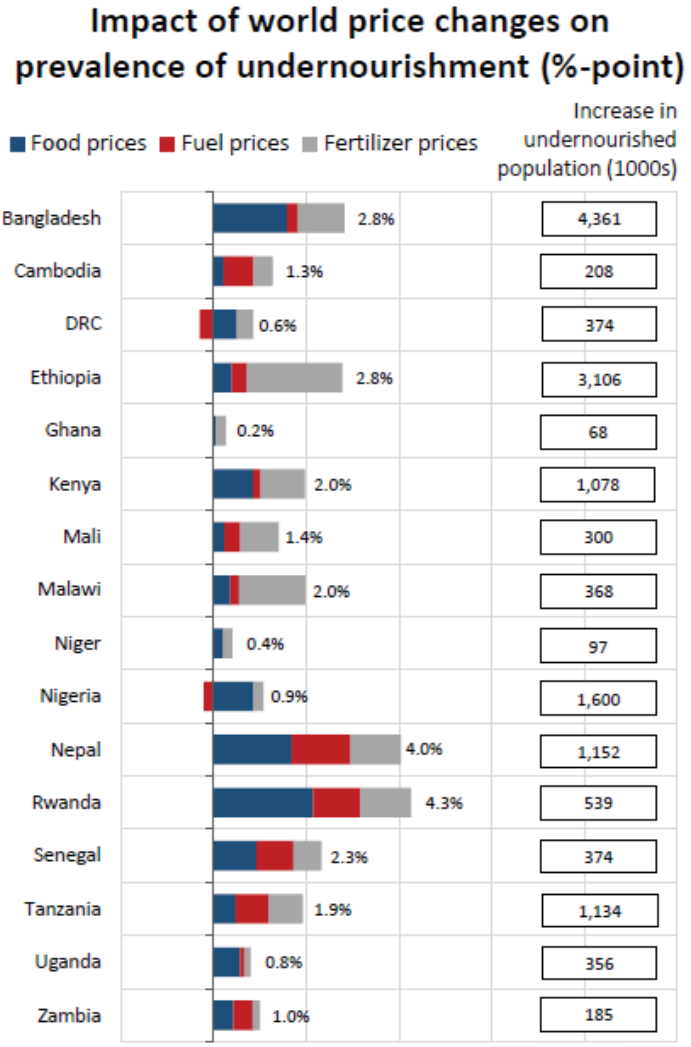


Figure 31 Contribution of world price changes to increase in rural and urban poor population (IFPRI 2022)

Figure 31 illustrates that rural populations are hardest hit, comprising 78% of those forced into poverty. Importantly, whilst increased fuel prices have the greatest effect on urban populations, increased fertiliser prices have the greatest overall effect on rural populations. In the 16 countries alone, the Food, Fuel, and Fertiliser Crisis is expected to increase the number of poor people by 17 million people, undernourished people by 15 million, and people with deteriorating diets by 73 million.

Figure 32 Impact of world price changes on prevalence of undernourishment (IFPRI 2022).

Figure 32 illustrates the varying country-level prevalence of undernourishment brought about by the food, fuel, and fertiliser crisis across IFPRI's 16 target countries. Percentagewise, Rwanda was expected to suffer the most, with a 4.3% increase in undernourishment, whilst only a 0.2% increase in undernourishment is predicted in Ghana (IFPRI 2022). Increased prices for wheat, maize, and oils have also spilled over into rice and local food crops, such as cassava and Irish potatoes, which have witnessed unseasonal increases in prices across many SSA countries (FSMC 2022).

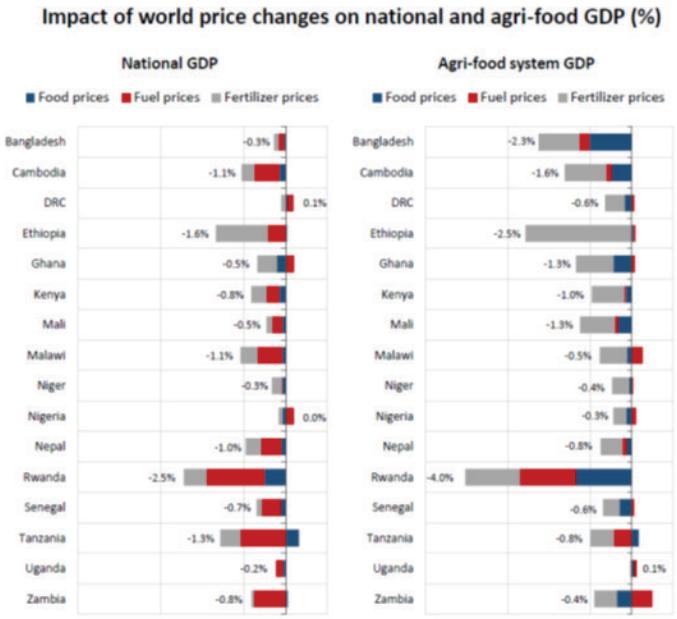


Economic, Political and Social Instability

The Food, Fuel, and Fertiliser Crisis struggle continues to put pressure on governments across the globe. However, this pressure remains acutely felt across many developing countries, where governments continuE to manage their balance of payments, inflation, reduced tax revenues and debt servicing (FAO 2022c). Food costs and higher transportation costs (supply chain bottlenecks and higher fuel costs), for example, made it likely that food imports costs exceeded a record $2 trillion in 2022 (Reuters 2022g).

Figure 33 Impact of world price changes on national and agri-food GDP (IFPRI 2022)

Figure 33 illustrates this impact across IFPRI's 16 target countries. Whilst food importing countries are paying considerably more for their food, fuel, and fertiliser imports, they are buying significantly lower volumes than in previous years (FAO 2022c). Indeed, according to (Reuters 2022g), food import volumes have shrunk 10% compared to 2021. Increased food, fuel, and fertiliser prices are likely to have had a significant impact on both agri-food and national GDP.



Keep an eye on the Wild Cards

There are several wild cards that directly impact on global food security, including food and fertiliser hoarding by both governments and private sector actors; food and fertiliser export restrictions (bans or other restrictive measures); farmer production decisions, and the effects of climate change. The following sections will elaborate a little on farmer production decisions and the effects of climate change.

Farmer Production Decisions

How did farmers respond to the volatility created by the food, fuel, and fertiliser crisis in 2022? Crop management decisions for commercial farmers are usually driven, or at least guided, by profit maximisation, that is, the financial return, after all costs (inputs, rent, labour, finance costs etc.) have been subtracted, that a farmer expects to receive for growing a particular crop, under a particular management regime.

Figure 34 Price Indices for Grains and Fertilisers (UNGCRG 2022)

Farmers generally follow similar production regimes each year or season, and only adjust/refine their cropping patterns and input-use based on expected changes (upward or downward) in the future price for their chosen crops. However, this relatively predictable farmer behaviour has been thrown into disarray since the initial rapid, and volatile, increase in both agricultural commodity prices and input prices, especially the price of fertiliser and fuel, in late 2021 and early 2022. Indeed, the price of fertilisers increased so much that it managed to outstrip increases in the price of agricultural staple commodities, such as maize, rice and wheat, as well as soybeans, sugar, and oil palm (UNGCRG 2022). Figure 34 Illustrates the gap between price indices for cereal grains and fertiliser. For farmers to increase food production, either input costs need to fall or output prices need to increase further (FAO 2022c).

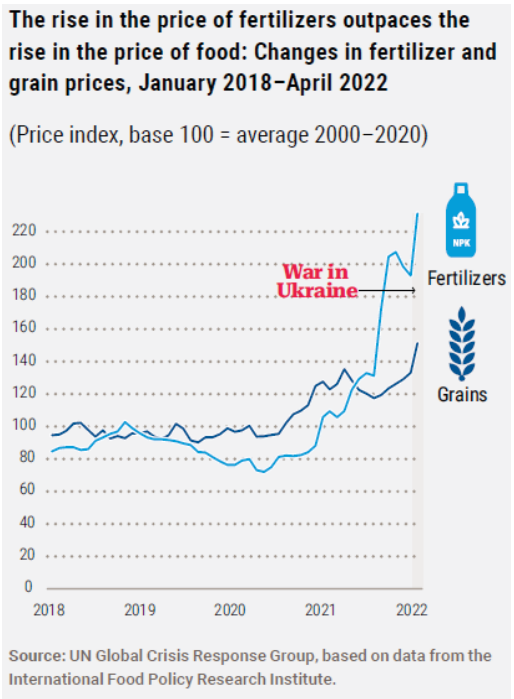
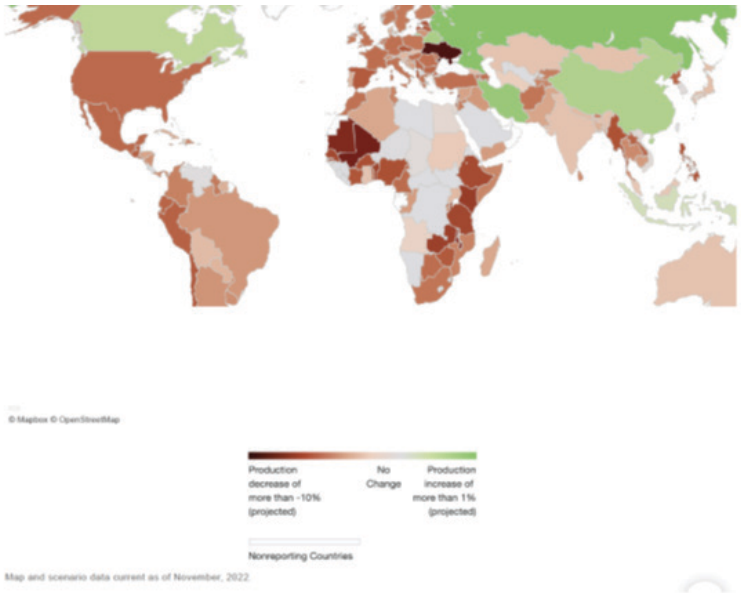


Figure 35 Changes in nitrogen fertiliser applications in 2022 (Cross and Gruère 2022).



Initial estimates suggested that commercial farmers across the world would reduce fertiliser applications by between 20% and 30%, potentially leading to a reduction in yields of up to 25% (Reuters 2022n). However, more recent analysis by Gro Intelligence suggests that global fertilizer consumption fell by 2.4% in 2021, and a further 4.8% in 2022 (Cross and Gruère 2022). This was primarily attributed to fertilizer affordability issues, and the reduced area sown to nitrogen hungry crops, especially cereals such as maize, by 10.8 million ha in 2022, and an increase in legume area, especially soybeans, by 6.8 million ha. Gro Intelligence predicted that reduced applications of nitrogen fertilizer would lead to a 2.3%, 2.3%, and 3.4% decrease in global maize, rice and wheat production, respectively, and that, if sustained, reduced applications of phosphorous and potassium would also result in lower production levels over subsequent years (Cross and Gruère 2022). Figure 35 illustrates the geographical impact of changes in nitrogen applications in 2022. Interestingly, whilst global production estimates of the major food staples (rice, wheat, and maize) are expected to contract by similar amounts, most analysts attribute this reduction to drought, rather than decreased fertiliser applications. Many commercial farmers across the world are being increasingly tactical with their purchases. Many purchased their 2022 fertilisers ahead of the major price hikes and are delaying current fertiliser purchases in the hope that fertiliser prices will continue to decrease. Purchasing fertilisers and fuel at the right price, at the right time, and locking in forward grain contracts, make all the difference to farmer's profitability.

Figure 36 Fertiliser consumption trend in SSA (Cross and Gruère (2022)

Figure 36 Illustrates the sharp decrease in fertiliser consumption across SSA. Excluding South Africa, SSA is expected to see the largest percentage decrease (25%) in fertiliser applications (Cross and Gruère (2022), which is estimated to be the most significant decline in fertiliser use since the 1960s.

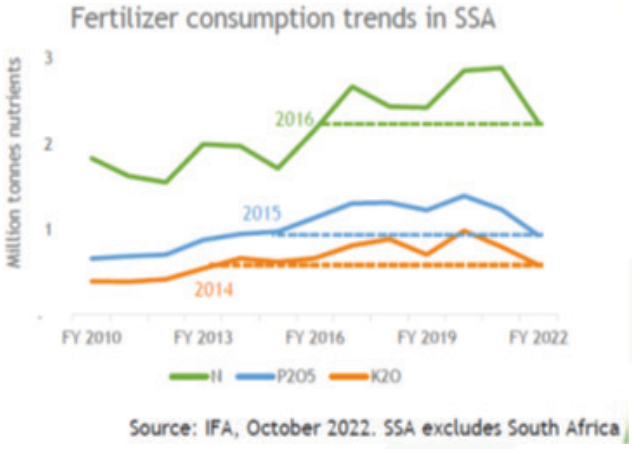


Figure 37 Fertiliser inventories and market size (Cross and Gruère (2022).

Unlike much of the developed world, where most farmers have been able to secure access to fertilisers, many farmers, and national governments across SSA have found it increasingly difficult to both access fertilisers, and to pay for them. Figure 37 Illustrates the deficit in national fertiliser stocks (inventories/market size), as of October 2022.

Whilst West Africa, excluding countries in conflict, such as Mali and Burkina Faso, had reasonable stocks of fertiliser, Zambia, Zimbabwe, Malawi, Mozambique, and Tanzania were struggling to access enough fertiliser to meet their needs (Cross and Gruère 2022). According to Gro Intelligence, these deficits are caused by low availability, and low affordability, of fertilizers (Cross and Gruère 2022). Low inventories and low affordability prompted a plethora of interventions by IFIs and MDBs to provide credit and facilitation support to increase fertiliser imports into SSA. Others, such as the AFDB, and the Bill and Melinda Gates Foundation (Sustain Africa Initiative) have interventions in countries

across SSA that negotiate access to fertiliser at concessionary prices, coordinate fertiliser supply chains, and provide seed and extension support to farmers.

Figure 38 Estimated crop reduction due to decreased fertiliser application (WFP 2022)

According to the WFP (2022), decreased fertiliser applications across Eastern Africa were expected to result in between a 0.6% and 21.1% reduction in cereal yields. In countries such as Kenya and Ethiopia, where between 30% to 55% of farmers use fertiliser, reductions in yields are expected to be high. Whereas yield reductions in countries, such as Somalia and Burundi, where only 1.5% to 3% of farmers use fertilisers, are expected to be minimal. In attempts to maintain yields, some farmers are turning to animal manure and compost to provide the nutrients required by their crops (National Geographic 2022; Washington Post 2022; Guardian 2022). Despite the more positive estimations of food production in 2022, generated by FAO-AMIS, USDA, and the International Grains Council (IGC), the full toll of both drought, floods, and reduced fertiliser applications across SSA is yet to be determined.

Country	% reduction in crop Crop Production adjusted for fertilizer use
Kenya	11.9%
Ethiopia	21.1%
Sudan	11.9%
SSD	1.6%
Rwanda	1.5%
Burundi	1.1%
Uganda	1.2%
Somalia	0.6%

Climate change

Climate change, in the form of a 'triple-dip' La Niña, wreaked havoc across the globe in 2022, reducing crop yields in parts of southern North America, South America, Europe, Central and Southern Asia, and both Southern and Eastern Africa (FAO-AMIS 2022a), whilst increasing yields across Australia, Canada and Russia. Figure 39 illustrates the status of global crop production conditions at the end of November 2022 across AMIS countries.

Figure 39 Global Synthesis of Cropping Conditions – FAO-AMIS 2022)

Whilst Canada (for 2022 wheat harvest) and Australia continue to experience exceptional conditions, and parts of global food baskets in the North and South America, Eastern Europe, South and East Asia, are experiencing favourable conditions, major areas across Europe (2022 maize crop), Central Asia, and both North and South America are either poor or under watch status. Figure 40 illustrates mixed conditions in Argentina.

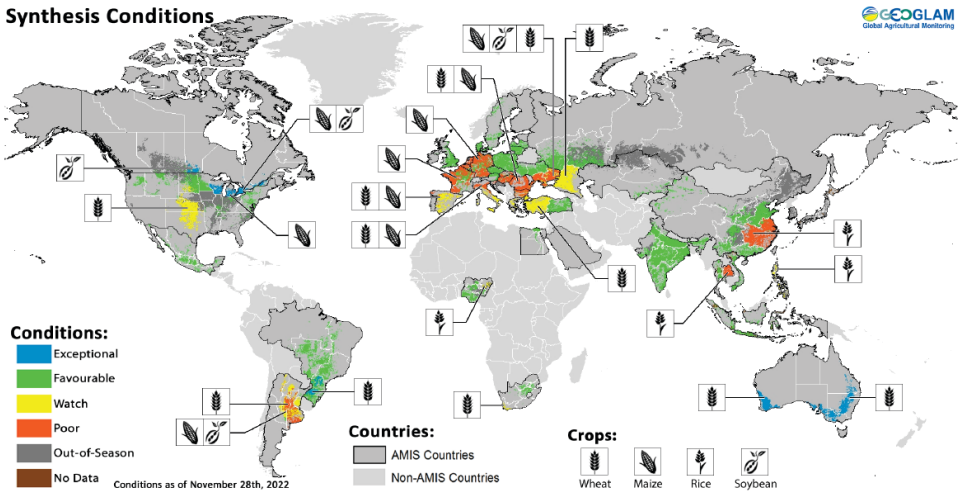


Figure 40 Precipitation levels across Argentina – (USDA 2023a)

Wheat production in Argentina has suffered significantly from drought, whereas soybean production has rallied after recent rains (AHDB 2023)

Brazil is also experiencing mixed conditions, with parts of Central and Northern Brazil experiencing high rainfall and parts of Western and Southern Brazil experiencing drought (see Figure 41)

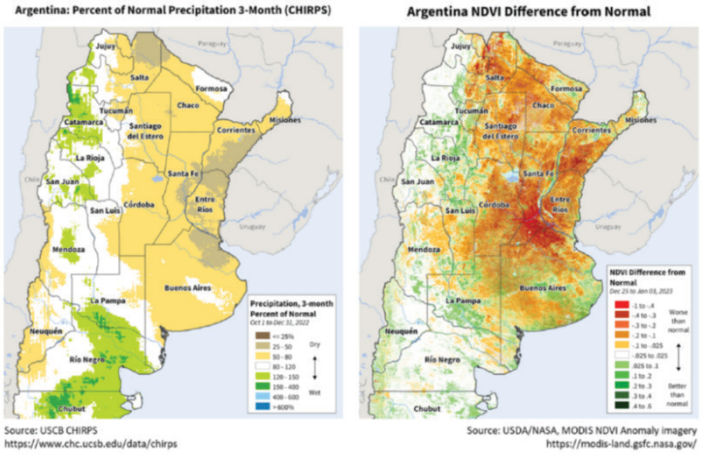
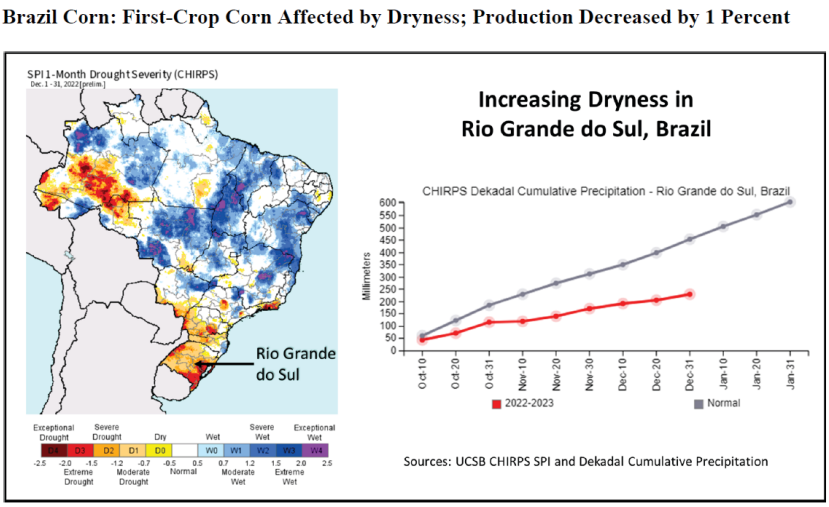


Figure 41. Rainfall distribution across Brazil (USDA-FAS 2023a)

The Return of El Niño



According to seasonal forecast models, the current La Nina is breaking down, and we're likely to see the emergence of El Niño conditions in the summer of 2023, which will likely run into 2024 (Guardian 2023a, 2023b). What is this likely to mean for global crop production and food security? According to climate scientists, 2023 and 2024 are shaping up to be the hottest on record, with unprecedented heat waves and further changes to rainfall patterns, (Guardian 2023a, 2023b). Places such as India, Indonesia, Australia, the Amazon Region, Eastern USA, and Southern Africa are expected to face both hotter and drier conditions, whereas parts of China, the southern USA, southern Europe, southern South America, and Eastern Africa are expected to experience higher rainfall. High temperatures, droughts and floods generally conspire to reduce crop production (Guardian 2023a).

Policy Responses (Short-term)

Governments should:

- Work to quickly to resolve the Russia/Ukraine situation.
- Provide adequate social safety nets for consumers, in both developed and developing countries, that account for food, fertiliser and fuel inflation. This could include nutrition-sensitive cash transfer programmes (IFRI 2022; ECOWAS, FAO, WFP 2022; Rother et al 2022).
- Ensure balance of payments support to the most vulnerable food importing countries, and provide support to secure alternative sources of essential foods and fertilisers (ECOWAS, FAO, WFP 2022).
- This should include support to Afreximbank's Ukraine Crisis Adjustment Trade Financing Programme for Africa (UKAFPA).
- Reduce import tariffs, VAT, and other product taxes on wheat, wheat flour, oilseeds, and edible oils. Subsidize domestic consumption of some of the affected food products (Amede and Dialo 2022).
- Advise against unnecessary hoarding of food commodities.
- Consider releasing a proportion of available strategic food reserves.
- Avoid imposing export bans or other measures that would limit the free flow of agricultural commodities from food surplus producing areas to food deficit areas (Rother et al 2022).
- Reduce dependence on any single supplier of food (AFDB 2022).
- Support the G7 and World Bank's Global Alliance for Food Security to increase supplies of food, fertilizer, and fuel, remove barriers to trade, and provide financial support to ease the impacts of this crisis (ECOWAS, FAO, WFP 2022).
- Support farmers to underpin crop production during 2022/2023, especially access to affordable fertiliser, fuels, labour, and support with improving nutrient, energy, and labour use efficiency, such as precision agriculture etc. Consider the use of smart subsidies (IFRI 2022a; ECOWAS, FAO, WFP 2022; Amede and Dialo 2022).
- Support for AFDB's African Emergency Food Production Facility - AEFPF.
- Support the direct use of food crops, and discourage the diversion of potential food crops into livestock production and biofuels.

Policy Responses (medium-term)

Governments should:

- Reconsider increasing stocks held in Strategic Grain Reserves to ensure market and consumer confidence. The "Just-in-Time" approach to food stocks needs to be revisited (ECOWAS, FAO, WFP 2022).
- Invest in infrastructure (physical, institutional etc.) to support competitive regional trade in sub-Saharan Africa to facilitate the movement of agricultural commodities from surplus to deficit areas (Rother et al 2022).
- Increase investments in sustainable intensification of crops, including traditional crops, and irrigation, in regions that are highly dependent on food imports (IFRI 2022a; ECOWAS, FAO, WFP 2022; AFDB 2022; Rother et al 2022).
- Invest in the development of climate -resilient and green supply chains, based on renewable energy and environmentally sensitive agriculture (ECOWAS, FAO, WFP 2022; Rother et al 2022).
- Invest in developing circular food systems, which reduce food losses and reuse and recycle plant nutrients from organic wastes (ECOWAS, FAO, WFP 2022; IFRI 2022a)
- Consider investing in African fertiliser manufacturing and blending plants (IFRI 2022a; ECOWAS, FAO, WFP 2022).

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