

## **Global food security is threatened by the Russia-Ukraine conflict**

**Nabila Lakhali**

Maître de conférence (A), Laboratoire de recherche en intelligence économique et  
développement durable, Université Badji Mokhtar Annaba,  
nabila.lakhali@univ-annaba.dz

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### **Abstract:**

This research paper investigates the main threat to the global food security in the year 2022 by analyzing the drivers of the global food prices, stocks, exports and imports of food. The main driver that severely impacted prices, exports and imports was the Russian invasion of Ukraine. The results highlight that the Russia-Ukraine war has an induced volatility, risks, and potential shortages in the global food chain and is expected to have repercussions across the Middle East and North Africa (MENA), as well as the rest of the world. Algeria was used as a case study to examine their food prices and distribution. Russia's war in Ukraine is preventing grain from exportation to other countries and raising global food prices, threatening to exacerbate shortages and spark a global food crisis. This analysis aims to inform the economy and general population of the influence of world events on global food security and potential solutions.

**Keywords:** Food security, Wheat, Russia- Ukraine conflict, Import and Export.

**Jel Classification Codes :** D51, E27, Q18

## 1. INTRODUCTION

Countries around the world are still struggling to recover from the economic consequences of the Covid-19 pandemic, and the recent 2022 Russia war on Ukraine may exacerbate the problem as commodity prices and supply chain chokeholds climb further. As the "biggest provider of wheat in the world," Russia and Ukraine together represent over a quarter of all exports worldwide (Mbah & Wasum, 2022). The current war in Ukraine has intensified tensions in the agricultural commodities market. As of late 2021, the prices of food staples such as wheat and vegetable oil have soared and surpassed record highs (Glauben, et al., 2022). Prices have soared immensely to the point that they surpassed even the levels of the global food price crises of more than a decade ago. The invasion of Russian forces into Ukraine has sent prices even higher. As a result, this affected import-dependent countries worldwide. Focusing on North Africa and the Middle East region, which rely immensely on Ukrainian and Russian wheat, interferences in the Black sea region and the high prices are increasing the instability of these regions' food security. However, in the current marketing year, it is anticipated that the demand for wheat will be satisfied since nations like Australia, Brazil, and the United States will expand shipments to make up for the shortfall left by Russia and Ukraine.

After rice, wheat is the second most consumed cereal (as food) (81 kg, 46%). Wheat is consumed in 173 countries, with 102 countries consuming more than 50 kg per capita per year. Per capita, wheat consumption is exceptionally high in countries with strong wheat dietary traditions, such as those in Northern Africa, West/Central Asia, and Europe (Erenstein, et al., 2022). Wheat is an important component of global food security and agri-food systems worldwide. In terms of area, it is the most widely grown crop on the planet. It provides one-fifth of the world's food calories and protein. It is the most widely traded cereal globally, reflecting the significant spatial disparity between supply and demand. As a staple food commodity, the current conflict in Ukraine will increase food instability across the globe (Erenstein, et al., 2022).

## 2. Russia and Ukraine are major agricultural commodity exporters

Russia is the top largest global exporter of wheat and fertilizer, and Ukraine is the fifth-ranked exporter of wheat and a significant provider of

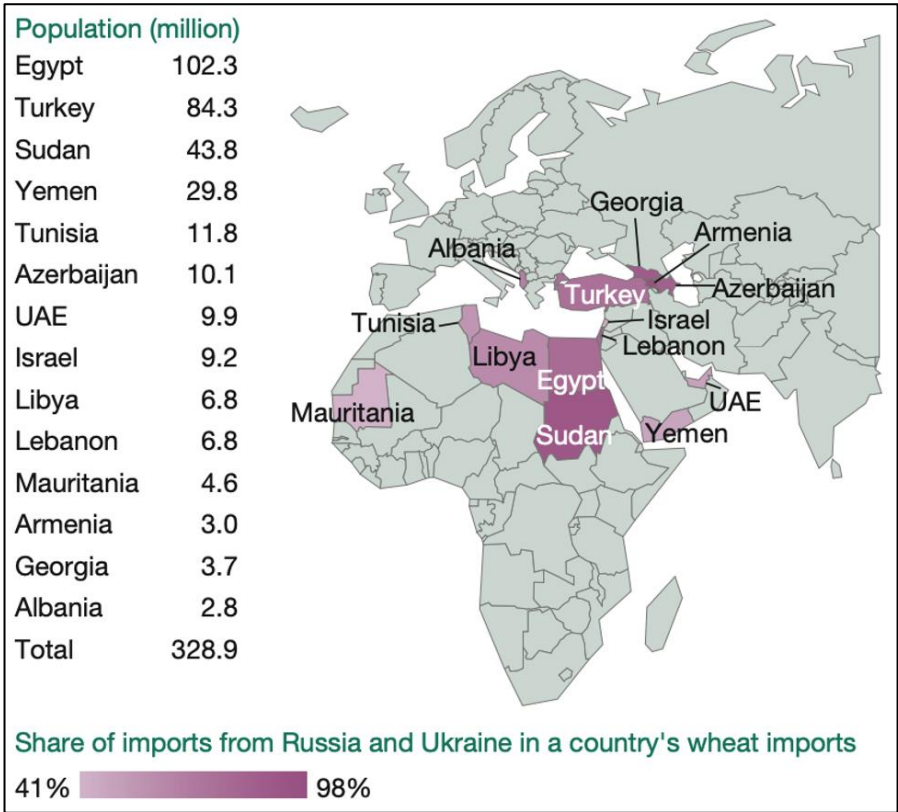
wheat to the World Food Programme (Jagtap, et al., 2022). Ukraine is ranked 8th in global wheat production accounting for 3.3% of the total global wheat production ( $24.9 \times 10^6$  tonnes of the global output  $760,926 \times 10^6$  tonnes) and the fifth-ranked global wheat exporter, with  $18.06 \times 10^6$  tonnes exported in 2020, accounting for 9% of global wheat exports. Ukraine is also the world's top exporter of sunflower seeds. 44% of the world's supply of sunflower oil is exported from Ukraine, which produces 29.1% of it globally (Jagtap, et al., 2022). Over the previous two decades, Russia and Ukraine have nearly tripled their export market shares for wheat and sunflower oil, while their combined export market shares for corn have increased by a factor of seven (Glauben, et al., 2022).

Over the years, Russia's and Ukraine's export markets have diversified. Between 2018 and 2020, Russia and Ukraine exported 56 million tonnes of wheat and 31 million tonnes of corn annually to 123 and 95 countries, respectively (Glauben, et al., 2022). Wheat is a staple food product for many regions around the world; the Middle East and North Africa (MENA) are highly dependent on imported wheat as these regions are unable to produce enough grain to meet the consumption of their growing populations. The MENA region is Russia's key market for grain exports (Heigermoser, Jaghdani, & Götz, 2021).

### **3. The MENA region is at high risk of food insecurity**

The MENA regions that depend highly on imported wheat, mainly from Russia and Ukraine, are likely to be most affected by the conflict in Ukraine.

Fig. 1. Countries that are at “High Risk” of food insecurity

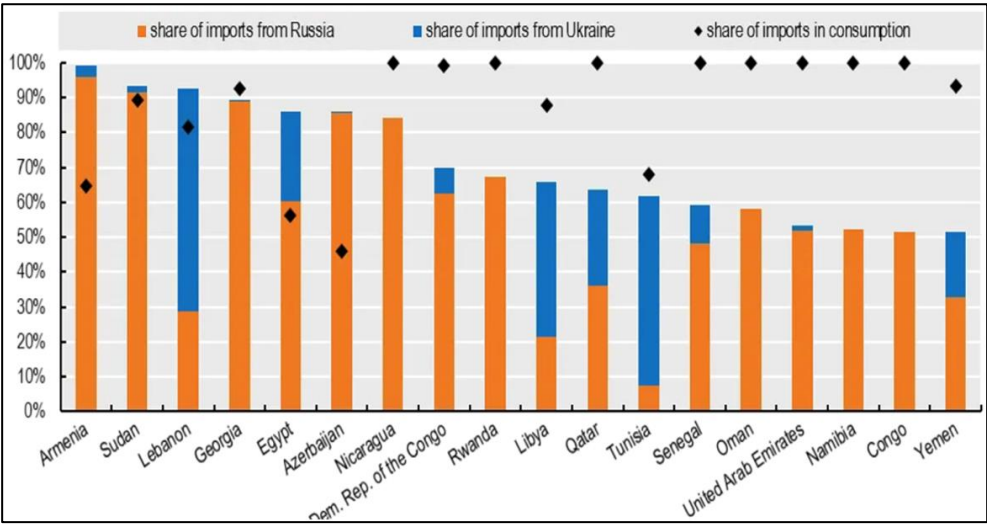


Source: Glauben et al, 2022

As a result of the ongoing Russia/Ukrainian conflict, many food-importing countries, many of which fall into the Low-Income Food-Deficit Countries (LIFDCs) category, will face food insecurity. Wheat-dependent countries, combined in figure, have a total population of 330 million people, and they source more than 40% of their wheat from Russia and/or Ukraine.

Several countries, for example, receive more than half, if not all, of their wheat imports from Russia and Ukraine (Figure 2). This includes a few countries already dealing with internal conflicts and precarious food security. To meet their consumption needs, these countries must find alternative sources of supply (OECD, 2022).

**Fig. 2.** Dependency on wheat imports from Ukraine and Russia (2018-2020)



Source: OECD, 2022

Food security difficulties may arise even in nations that rely less on wheat imports from the Black Sea region. These nations include those in the Middle East and North Africa (MENA), such as Algeria, Morocco, Saudi Arabia, and Jordan, as well as those in Central Asia and Afghanistan, which consume a substantial amount of wheat per capita. Although these nations buy cereal mostly from countries other than Ukraine or Russia, (consistently) high wheat prices could impact them.

Russia and Ukraine are significant producers of essential grains and oilseeds for the worldwide market; they will experience supply disruptions if crops aren't planted. Even when there is grain, acquiring access is an issue because critical Black sea ports and shipping lines have been blocked.

4. Supply Disruptions Leading to Global Food Insecurity

As more than half of Ukraine’s crop production is exported, logistics of the export supply chain play a vital role (OECD, 2022). Over 90% of Ukraine's crop exports went through ports on the Azov and Black Seas before the Russian intervention. In addition, Russian customs data shows that nearly 90 percent of Russia’s grain exports flow through ports located in the Black Sea. Currently, smaller quantities are exported by train or via ports at the Caspian Sea, the Baltic Sea, or Far Eastern ports (Heigermoser, Jaghdani, & Götz, 2021). As a result of the ongoing conflict, these ports are

currently inaccessible to Ukraine. Other export channels, such as road, rail, and river ports, do not have the same capacity to load high quantities as maritime ports. Therefore, according to estimates from the sector, current exports only account for 20% of average export volumes.

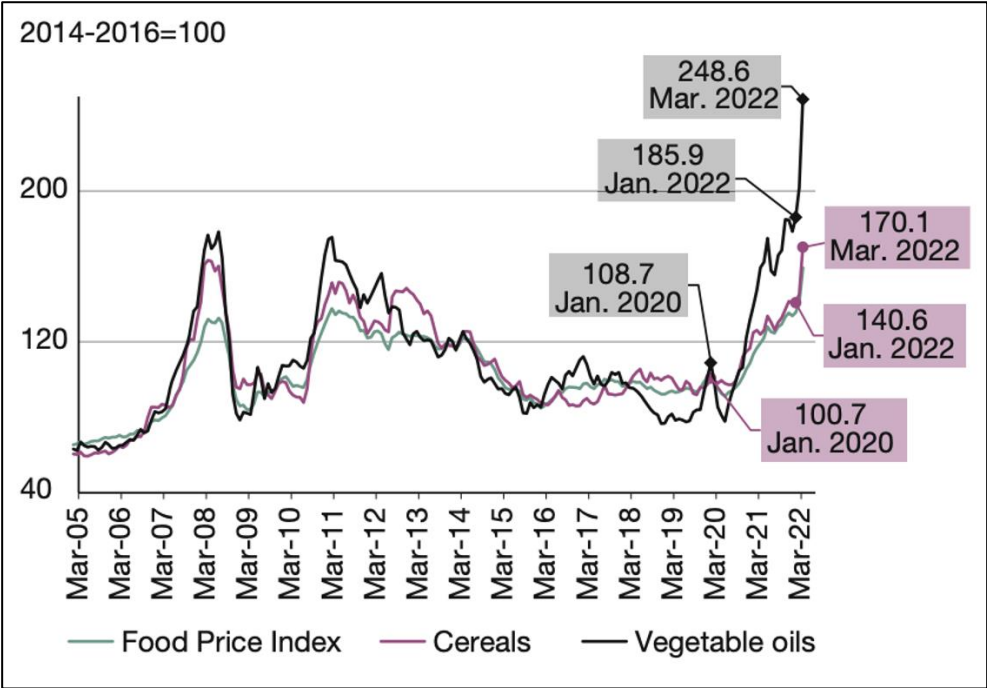
The capacity of alternate export routes is being expanded, and efforts are being made on a national and international level to discover new outlets. However, the higher-than-average volumes in storage and the approaching harvest in June–September 2022 will quickly yield massive quantities that will also need to be preserved to prevent substantial losses. Additionally, certain storage and processing facilities have been damaged, which has caused agricultural exports from Ukraine to be further delayed and constrained (OECD, 2022).

### **5. Continuously high prices agricultural commodities**

Russia's invasion of Ukraine, dubbed a "special operation" to demilitarise its neighbour, is the latest development in a growing global food crisis. World food prices were already climbing, and the war has made things worse, and as a result the reduced export availability of cereals in Ukraine, it is driving up international food and feed prices. Wheat has significantly decreased; Ukraine has only been able to export 1.5 million to 2 million tonnes of grain a month since the war started, down from more than 6 million tonnes (Chan & Wiseman, 2022). The Food and Agriculture Organization's (FAO) food price index, which analyses the international prices of the most widely traded food commodities, reached its highest position in March (2022) as seen in figure 3, since 1990 (when records began) as a result of the halt of Ukrainian exports following the outbreak of the conflict (Bankova, Dutta, & Ovaska, 2022).

While the food market has been under stress for the past two years due to post-pandemic global demand, extreme weather, shrinking food stocks, high energy prices, supply chain bottlenecks, and export restrictions and taxes, the recent convergence of all these factors in response to Russia's invasion is unprecedented. It has caused food inflation rates to soar around the world (Bankova, Dutta, & Ovaska, 2022).

Fig. 3. Food and Agriculture Organization price indices



Source: Glauben et al, 2022

While the CPI in the US has increased by more than 14 percentage points since January 2020, the Consumer Price Index for food has risen drastically in all of the continent's largest economies.

The index change is substantially more pronounced in developing, and emerging markets, meaning consumers must pay significantly more for basic food necessities. There are extreme cases where food inflation has risen hundreds of points. The price index has increased by over 3,000 percentage points since 2020 in Lebanon, a nation heavily dependent on food imports, with most of its wheat coming from Ukraine.

Food makes up a sizable portion of the Consumer Price Index, which economists use to determine how much it costs to live on average in many developing countries. According to data from the International Monetary Fund, it represents an average of 40% of the total cost of living, while for consumers in Pakistan and India, it can reach 50%.

Protests have already been sparked by rising food costs in several nations, including Argentina, Indonesia, and Greece. Following price

increases of up to 300% for essential foods made with flour, protesters went to the streets in Iran.

Furthermore, global energy and fertilizer prices have risen from high levels due to Russia's aggression and the resulting uncertainty about the availability of Russian energy and fertilizer around the world. Because the agri-food sector uses a lot of energy, rising energy and fertilizer prices translate into higher production costs and contribute to food price increases (OECD, 2022)

## **6. Russia and Ukraine's role in global agricultural producers**

Russia is a significant player in the world markets for fertilizer and energy. It is the world's largest natural gas exporter, the second-largest oil exporter, and the third-largest coal exporter, contributing 20%, 11%, and 15% of worldwide exports, respectively, in 2019. In addition, Russia accounts for over 15% of global fertilizer exports in 2020. It is the leading exporter of nitrogen fertilizers and the second and third largest supplier of potassic and phosphorous fertilizers, respectively (OECD, 2022).

Given the significance of Russia and Ukraine for international input and agricultural markets, Russia's aggression against Ukraine and related political reactions have major and possibly longer-lasting effects on producers and consumers. Global food and feed prices are rising due to the reduced availability of grains and oilseeds for export from Ukraine. Furthermore, due to Russia's aggression and the uncertainty regarding the availability of Russian oil and fertilizer globally, prices for these commodities have risen from their already high levels. Fertilizer prices have increased by 37%, and as a result, Ukrainian farmers suffered extra losses of \$378.9 million. Furthermore, Ukrainian agricultural producers suffered additional losses of \$480.4 million due to the fuel price hike, which is estimated to have increased by 39 cents per litre of diesel. Due to the high energy intensity of the agri-food industry, rising energy and fertilizer prices are translating into higher production costs and raising food prices (Kyiv School of Economics, 2022).

## **7. A potential turbulent road for Algeria**

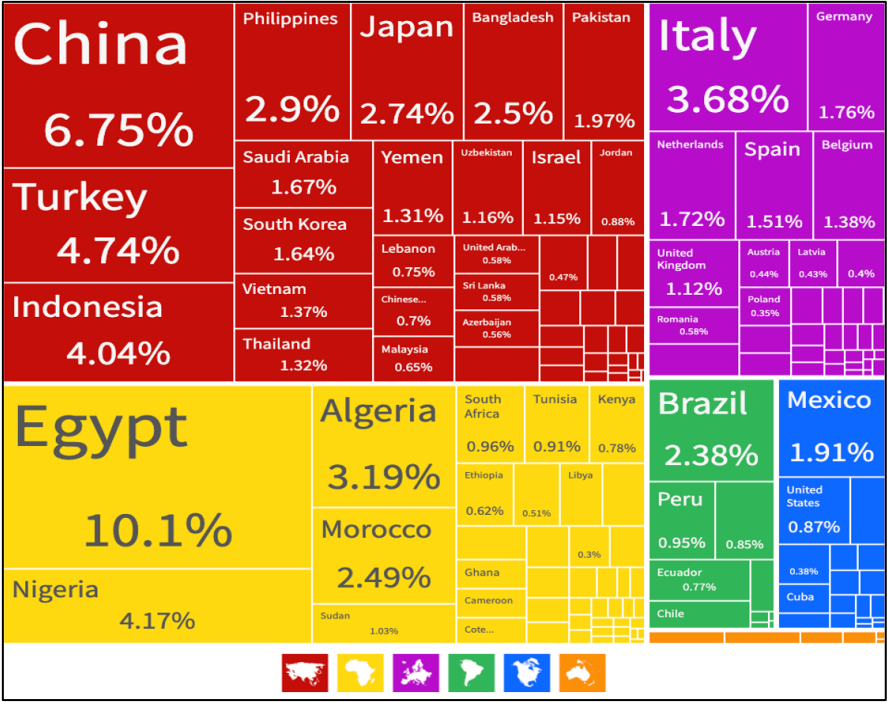
Unlike Libya, which imports 90 percent of its wheat from Ukraine and Russia, Algeria has the lowest exposure to the effects of the conflict in Ukraine out of all the Maghreb nations (Fasanotti, 2022). Only 3% of its



grain imports come from there, and Algeria is anticipated to have enough wheat stocks to last the rest of 2022. However, a prolonged crisis will eventually pressure the nation's wheat supply access. Over 11 million tonnes of wheat are consumed in Algeria every year. The majority, between 7.5 million and 8 million tonnes, is imported. Despite relying primarily on European producers like France and Germany, the nation also imports wheat from Canada and recommenced imports from Russia in 2021 after a five-year hiatus (Serrano, 2022).

Algeria was expecting to increase grain imports even before the war began. The United States Department of Agriculture (USDA) reports that unfavourable weather patterns caused a 38% decrease in Algerian cereal production during the 2021–2022 season. Algeria has been experiencing drought, just like its neighbours, Tunisia and Morocco. Low domestic harvests will probably increase the need for imports. Algeria produced 3.9 million tonnes of wheat during the 2020–2021 season, but the USDA predicted that production would decline to between 3.6 million and 2.5 million tonnes in 2021–2022.

Fig.5. Top Importers of Wheat (2020)



Source: OEC world, 2020

As the Ukraine conflict and its impact on global wheat prices and availability linger into 2022, wheat-producing countries will export less to secure their own supplies. Algeria may soon be further impacted by lower global production and high wheat export costs.

Algeria has suffered economically during the Covid-19 pandemic (Bougeurroumi & Boudjana, 2021). The nation is a major importer of food products and will see food prices rise further due to the current Russian-Ukraine crisis. In February 2022, the country's inflation rate reached 9.5% (Serrano, 2022). The conflict in Ukraine has also raised global prices for hydrocarbons, which account for 95% of export revenues and 60% of government income. Algeria's rulers are now better equipped to deal with instability, as the country is rich in hydrocarbons, which will significantly fill the state's coffers, especially given current prices. Algiers has a distinct advantage: They export oil, the cost of which is at an all-time high. This enables them to purchase wheat even as prices rise.

## **8. Coping with the crisis**

The current dispute has revealed and intensified strains on international agricultural commodities markets that have been present since the COVID-19 outbreak began. Import-dependent countries with low per capita incomes are more exposed to shocks caused by the Ukraine conflict, which increases their risk of food insecurity. A global supply chain framework must be in place to allow international trade to overcome the obstacles posed by potential food shortages in agricultural markets. This would result in more robust food markets and help lessen the danger of food shortages by compensating for supply disruptions in one location with supply changes from another (Glauben, et al., 2022)

Even in times of crisis, the free flow of goods across international borders is critical to achieving and maintaining global food security. In the short term, reducing trade barriers such as bureaucracy and tariffs is prudent. One illustration of this is the Green Corridor, created in 2020 in response to the COVID-19 pandemic and facilitated cross-border trade between Western Balkan nations like Serbia, North Macedonia, and Albania. Similarly, international business relations should be expanded, though this may come at a cost. Furthermore, no pressure should be applied to import-dependent countries to halt wheat imports from specific regions, particularly

Russia. Instead, focused political efforts are required to ensure that Ukraine and Russia remain vital components of the global agricultural trade system. Their substantial output and exports are still crucial for reducing hunger in the developing world. This is especially true when global supply chain disruptions, such as the COVID-19 pandemic, or supply concerns from other parts of the globe jeopardize the food security of growing populations in import-dependent countries.

## **9. CONCLUSION**

Although Ukraine is a small economy in terms of global trade, it is important in several commodities. Ukraine and Russia are both important players in global food markets. They are net exporters of several major cereal crops, including wheat, maize (corn), and barley. Ukraine and Russia account for roughly one-quarter of global wheat exports in 2019. One-fifth of global maize production, as well as barley. They supply nearly two-thirds of the world's traded sunflower oil, with Ukraine alone accounting for almost half of all global exports. World food prices were already rising, and the war exacerbated the situation by preventing 20 million tonnes of Ukrainian grain from reaching the Middle East, North Africa, and parts of Asia.

The potential consequences of reduced food output from Ukraine and Russia will not be felt equally. Countries that import directly from these countries, such as Libya, Egypt, and Lebanon, are among the most vulnerable. Food price inflation threatens political stability in these countries. They were one of the causes of the Arab Spring, and there are fears that this will happen again.

However, it will not be limited to those who are direct importers. Food prices are rising, so all countries that are net importers of these commodities, including Algeria, may suffer significant consequences. Ukrainian food supplies support 400 million people worldwide. According to the United Nations Food and Agriculture Organization, up to 181 million people in 41 countries could face a food crisis or worse hunger levels this year.

It is challenging to forecast what will happen after this marketing year because it will depend on how the current conflict plays out and agricultural fundamentals in crucial supply and demand regions. To mitigate

the risks of food instability in these regions, global food systems and international trade structures are vital players in stabilizing the current crises. Thus, disruptions in one exporting region can be offset by exports from another. However, broader international trade collaboration is necessary. Any calls to transition to a centrally planned economy are strongly discouraged since this would only harm food security in import-dependent countries.

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