Russia-Ukraine Armed Conflict and Global Food Security

Onyeanwula Pius Orunwa & Paul Ani Onuh
Department of Political Science, University of Nigeria
Correspondence: onyeanwula1991@gmail.com

Abstract

Recent studies reveal that the rest of the world is suffering greatly from conflict induced food shortages. Most affected are countries of Middle East and North Africa (MENA region) that depend significantly on food imports. Commodities like wheat, sunflower oil, vegetable oil, maize, rapeseed, and fertilizer are experiencing a sharp increase in inflation. This study examined the impact of military conflict between Russia and Ukraine on global food security. Special focus is on how the crisis has affected food production and distribution, as well as how the global food scarcity was caused by the Black Sea Grain Initiative between Russia and Ukraine. The study relied on realism theory as framework of analysis. Among other recommendations made, countries should invest more in food security measures in order to solve the more general problem of global food scarcity. This entails encouraging agricultural innovation and research, enhancing the infrastructure for the delivery and storage of food, and putting sustainable farming methods into practice. Improving food security on a global scale can act as a buffer against disturbances brought on by trade tensions and regional conflicts.

Keywords: Economic System, MENA regions, Global Food Scarcity Supply Chain Disruption, Stock Market Fluctuations.

Introduction

The bilateral relations between the Soviet Union successor states have experienced phases of closeness, strain, and outright animosity since its collapse in 1991. Early in the 1990s, Ukraine's foreign policy balanced collaboration with the European Union (EU), Russia, and other strong polities, with a focus on securing its sovereignty and independence (Shyrokykh, 2018). Following the Ukrainian revolution in 2014, which was followed by Russia's annexation of Crimea from Ukraine and the war in Donbas, wherein Russia supported the separatist rebels of the Donetsk People's Republic and the Luhansk People's Republic, relations between the two nations deteriorated. By early 2020, the wars had claimed the lives of over 13,000 people, and Russia was subject to Western sanctions (Crowley, 2021).

A Russian military build-up along Ukraine's border during 2021 and 2022 heightened tensions and damaged bilateral relations between the two nations, ultimately culminating in Russia's launch of a full-scale invasion of the nation (The Economist 2021). The armed conflict jolted the world's agricultural markets because Russia and Ukraine combined account for one-third of the world's wheat trade, 17% of the world's maize traffic, and nearly 75% of the world's sunflower oil trade (Welsh, 2023). The FAO Food Price Index reached an all-time high in February 2022, just after Russia's invasion, and then another all-time high in March 2022.

According to the World Food Programme (WFP), a record 349 million people in 79 different countries are currently experiencing severe food insecurity. This study examines how Russia-Ukraine armed conflict impacts global food security.

Review of Extant Literature

There is a general global apprehension that the conflict in Russia may trigger a worldwide food crisis akin to or more severe than the ones encountered in 2007 and 2008 (Caprile, 2022). The global food chain was already under pressure from the Covid-19 epidemic and climate change to feed the world's expanding population in a sustainable manner when the conflict broke out. Russia and Ukraine are important agricultural actors who together export up to 12% of the world's food calories (Caprile, 2022). They are important suppliers of staple agricultural products like wheat, maize, and sunflower oil, and Russia leads the world in fertilizer exports. Many areas rely heavily on imports from these two nations for their basic food supply (Caprile, 2022). In North Africa and the Middle East, Russia and Ukraine together account for more than 50% of cereal imports; in Eastern Africa, however, 72% of cereal imports come from Russia and 18% from Ukraine (Caprile, 2022).

From the standpoint of international trade, the crucial role that the Russian Federation and Ukraine play in world agriculture is even more apparent in a similar analysis conducted by the Food and Agricultural Organization (2022). According to the study, both nations are net exporters of agricultural goods and are major suppliers of food to international markets, where exportable supplies are frequently centralized in a small number of nations, making these markets more susceptible to shocks and unpredictability. The Russian Federation is the world's largest exporter of wheat, accounting for 32.9 million tonnes (in product weight) of shipments in 2021, or 18% of all shipments worldwide. With 20 million tons of wheat and meslin exported in 2021, Ukraine ranked sixth among all wheat exporters worldwide, accounting for 10% of the global market (FAO, 2022). According to the study, the two nations' prominence in the global trade arena is even more noteworthy in the sunflower oil sector, where their substantial production bases have given them a combined global export market share of nearly 80 percent over the past three years. This is in addition to their prominence in the global markets for maize, barley, and rapeseed years of marketing (2018/19–2020/21). Furthermore, the fertilizer industry, in which the Russian Federation is a major provider, exhibits a high degree of export concentration similar to the food commodity markets. The Russian Federation was the world's

greatest provider of potassium (K) fertilizers, second-largest exporter of nitrogen (N) fertilizers, and third-largest exporter of phosphorous (P) fertilizers in 2021.

According to Jacob & Zahn (2023), Ukraine's fertile soil—dubbed the "breadbasket of the world" because of its profusion of grains like wheat, barley, corn, and soybeans as well as other foods like poultry and sunflower oil—had guaranteed for decades prior that the country would continue to rank among the top producers and exporters of food worldwide. In Ukraine, agriculture is thought to occupy 70% of the country's territory. They claim that all of that could change as a result of the Russian invasion a year ago, and that the ongoing conflict in Ukraine, which is destroying the nation's agricultural lands and leaving behind dangerous obstacles, puts the country's status as the world's breadbasket in jeopardy and makes it more difficult to clean up and rebuild after the fields are restored. An already fragile food system is being exacerbated by war, which may have long-term effects (Jacob& Zahn, 2023). According to Joseph Glauber, a senior research fellow at the International Food Policy Research Institute, prices for grains like soybeans and some vegetable oils spiked by 50% to 60% within a week of Russia's incursion into eastern Ukraine on February 24, 2022 (Jacob& Zahn, 2023). Nearly immediately, specialists in worldwide food systems started alerting people to the potential consequences of the war on food scarcity and the ensuing malnourishment that susceptible populations in regions such as Yemen and the Horn of Africa may experience (Jacob& Zahn, 2023).

The international community, and the West in particular, have centered their response primarily around the use of autonomous (or unilateral) sanctions. Meanwhile, the UN Security Council, which counts Russia as one of its five permanent members, sits redundantly in the face of the conflict, accentuating the crisis in global governance of recent years. Moret (2022) focused on the costs of Russia's invasion of Ukraine on the European countries, claiming that it has wreaked havoc and devastation on Ukraine and its people while also posing a major threat to wider European security and sovereignty.

Aminu (2022) concurred that the conflict in Ukraine is upending the commodity market and jeopardizing the security of the world's food supply. According to him, Russia was targeted by Western economic sanctions, which are meant to make Russia stop its invasion, but Russia has responded to the sanctions with resiliency. Nobody knows when the conflict will end, but it is a major blow to the world economy, particularly for the Middle East and low-income African nations. However, Aminu (2022), using Africa as a case study, said that 40 percent of the

nation's population—or around 83 million people—live in poverty, citing a National Bureau of Statistics (NBS) report.

The economic recovery has been hindered by higher inflation and tighter global financial circumstances. Aminu (2022) added that the risk of capital reversals has increased due to rising interest rates and higher borrowing costs in global capital markets. The situation was made worse by Russia's invasion of Ukraine and the economic sanctions imposed on it by the West (Aminu, 2022). The decrease in exports from these nations aggravates social and economic vulnerabilities. Food costs have risen to 14-year highs, while energy and fertilizer prices are also skyrocketing, approaching 2008 levels. Russia and Ukraine are important suppliers of energy, wheat, fertilizers, and other agricultural products to the world market (Aminu, 2022). Not only that, but several of Russia's and Ukraine's agricultural exports have substantial global market shares (Aminu, 2022).

53% of the world's supply of sunflower seeds and oil comes from these two nations. Additionally, they provide 27% of wheat, 23% of barley, and 14% of corn (Aminu, 2022). The situation will probably have an instant effect on Russian and Ukrainian grain exports. Harvested in the summer and exported in the fall are the majority of wheat and barley harvests. Ukraine usually exports a lot of corn from the spring into the early summer. The sanctions placed on Russia due to their invasion of Ukraine are to blame for the entire worldwide inflation in the food supply (Aminu, 2022).

Theoretical Underpinning

The Realism theory serves as the theoretical foundation for this study. According to Duncan (2007), this group of connected theories of international relations places a strong emphasis on the state, national interest, and power in global politics. Since the end of World War II, realism has dominated the academic study of international affairs. 0It makes the claim to provide the most accurate explanation of state behavior as well as a set of policy recommendations (most notably about the distribution of power among states) for reducing the naturally unstable aspects of international relations.

Realist philosophy, which includes neo-realism, emphasizes enduring patterns of interaction in global systems devoid of a single, centralized political power. The logic of domestic politics, which is controlled by a sovereign power, frequently varies from that of foreign politics due to this anarchic state. Realists typically have a negative outlook on the likelihood of significant

systemic change. According to Duncan (2007), realism is a vast school of thought that includes many unique strands, the most notable of which are classical and neo-realism.

Mearsheimer (2014) argues that the primary reason behind Russia's decision to annex Crimea and destabilize the Donbas region was the EU's and NATO's eastward expansion, along with their promotion of democracy, which put Russia's core strategic interests in jeopardy. Putin has made this point very clear on numerous occasions. Mearsheimer (2014) cautioned further that it would be a far bigger error for the West to keep up its efforts to establish Ukraine as a Western bastion along Russia's border. Because of this last point, many have declared that Mearsheimer foretold the war in Ukraine (Douthat, 2022) and that his predictions and arguments should be taken seriously.

There are several clear advantages to the Realist interpretation of the war in Ukraine. According to Barry (2022), realism highlights the anarchic character of international relations, which implies that conflict is not surprising. It serves as a reminder that states still struggle for security, sometimes brutally, and that the cautious will arm themselves with self-preservation weapons in case of need. Shipingtang (2008) asserts that offensive realism is the belief that states ought to (and actually do) presume the worst about the intentions of other people. According to offensive realism, nations are naturally hostile because of anarchy, hence it is imperative to assume the worst-case scenario regarding the intentions of others.

Because realists are by nature pessimistic, this provided them an advantage when it came to analyzing the possibility that Russia might intensify its actions. Additionally, as Posen explains, realism's strength is the premise that other international factors like standards, multilateralism, economic interdependence, and morality are subordinated to the conditions that international anarchy produces for states.

Anarchy pushes and shapes because it encourages people to react in a certain manner and allows the powerful to do anything they want. Competition is encouraged by anarchy, especially when it comes to methods that enhance security. As stated by Posen (2022). Indeed, with the EU and NATO's eastward expansion, the structural geopolitics of Eastern Europe became much more complex, which in turn caused major concern about what that meant for Ukraine (Dannreuther 1999; Friedman 1998). Ukraine had, up until then, been following a multifaceted foreign policy that aimed to preserve good ties with both the East and the West (Smith 2020). In the 1990s and the first part of the 2000s, this was a fairly successful strategy, but by the mid-2000s, when Ukraine and Belarus and Moldova were situated in a geographic

corridor between Russia and the EU/NATO, also known as the "shared neighbourhood," the strategy was essentially unworkable (Averre 2010).

Mearsheimer makes a seemingly solid case that Russia's aggressive actions in Ukraine, including the annexation of Crimea, were prompted by the West's "misbegotten" policies of promoting democracy and institutional growth. Russia's self-described "near abroad"—the former Soviet Union's territories, with the exception of the Baltic three, which are now independent states and have been members of NATO and the EU since 2004 (Trenin 2006)—is undergoing structural changes that prompted it to wage a brief war in Georgia as a warning about the consequences of pursuing NATO membership (Jibladze 2007). During the conflict between Russia and Georgia, there was a lot of talk about Ukraine as well as concerns expressed about the West's involvement in that country (Kuzio 2009; Larrabee 2010).

It is reasonable to conclude, then, that realist concerns over the shifting political landscape of Eastern Europe and its potential to worsen instability and even conflict in Ukraine were fairly prophetic given the circumstances surrounding the 2014 start of the Ukraine crisis. Furthermore, many may have been taken aback by Russia's final choice to invade Ukraine in 2022 if structural realists had warned of the threat of the West failing to take the systemic feedback into account and change its policy toward Ukraine. According to Götze (2016), Russia is acting as a typical great power would in similar circumstances, not as a uniquely Russian one, but rather as an attempt by a local great power to maintain a sphere of influence around its borders in the face of increasing external pressure.

Russia-Ukraine Crisis and Disruption of Food Production and Distribution

The Russo-Ukrainian War, which started in February 2014, is an ongoing international conflict involving Russia, Ukraine, and separatists backed by Russia (Evans, 2008). Russia annexed Crimea from Ukraine after the Revolution of Dignity, and it backed pro-Russian separatists who were battling the Ukrainian military in the Donbas conflict. In addition, there were cyberattacks, increased political tensions, and naval mishaps during the first eight years of the battle.

Russia began a full-scale invasion of Ukraine in February 2022 (Harding, 2010). Early on Russia began a full-scale invasion of Ukraine in February 2022 (Harding, 2010).Viktor Yanukovych, the pro-Russian president of Ukraine, was overthrown by the Revolution of Dignity following the Euromaidan protests in early 2014. Pro-Russian protests broke out in

eastern and southern Ukraine shortly after. Concurrently, unmarked Russian forces invaded Crimea, Ukraine, seizing control of infrastructure, key locations, and government buildings.

Following a hotly contested referendum, Russia quickly annexed Crimea (Edward et al, 2022). The Donbas war began in April 2014 when armed pro-Russian separatists took control of government facilities in the eastern Donbas area of Ukraine and declared the DPR and LPR to be independent states. Russia provided significant but covert support to the separatists, and Ukrainian attempts to fully recover regions controlled by the rebels were unsuccessful. Russian troops participated in the fighting, despite Russia's denials of involvement (Edward, 2022).

The conflict was supposed to be resolved when Russia and Ukraine signed the Minsk II agreements in February 2015, but in the years that followed, the agreements were never properly carried out. With numerous short ceasefires but no long-lasting peace and little shifts in territorial control, the Donbas war became into a bloody but unchanging confrontation between Ukrainian forces and rebel and Russian forces (Edward, 2022). Russia began to establish a significant military presence in Belarus, a neighbor, and along its border with Ukraine in 2021. Plans to attack Ukraine were consistently denied by Russian officials. Vladimir Putin, the president of Russia, called for Ukraine to never be allowed to join NATO and denounced the military alliance's expansion.

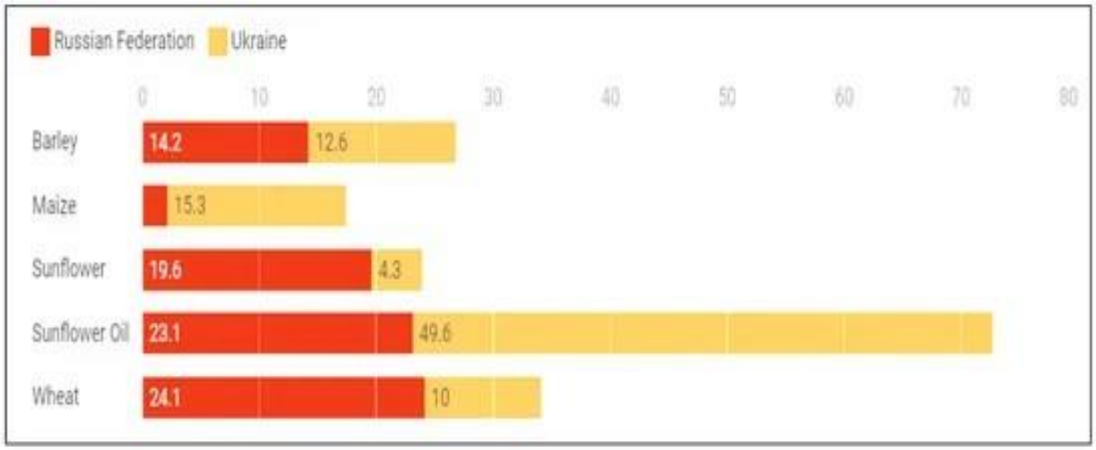
In addition, he questioned Ukraine's legitimacy to exist and advocated irredentist beliefs. In February 2022, Russia acknowledged the independence of the DPR and LPR. Putin then declared a "special military operation" in Ukraine, invaded the area to help Ukraine "demilitarize and denazify," and declared that Russia had no intention of occupying Ukrainian territory (Pullen, 2022). International condemnation of the invasion led to the imposition of additional sanctions on Russia by other nations. Amidst strong opposition, Russia gave up on its plan to annex Kyiv in early April 2022. Due to counteroffensives, Ukrainian forces started regaining territory in the northeast and south in August.

Russia announced the internationally recognized annexation of four partially-occupied districts in southern and eastern Ukraine in late September. In the Donbas, Russia conducted ineffective offensive operations over the winter and prepared for an expected Ukrainian counteroffensive by digging in during the spring of 2023. Tens of thousands of people have died and there is a refugee problem as a result of the war (Pullen, 2022).

Russia and Ukraine became net importers of food after the Soviet Union broke up in the early 1990s due to a drop in agricultural production and output (Bokusheva et al., 2012). But

following extensive mechanization and modernization over the previous three decades, Russia and Ukraine have become the world's breadbasket due to their substantial increases in agricultural output and food commodity exports. Nowadays, the two nations are among the top producers of a variety of agricultural goods worldwide, primarily cereals and sunflower oil. Together, they will be responsible for 34.1% of world trade in wheat and 72.7% of world commerce in sunflower oil and seeds in 2020 (UNCTAD, 2022). Russia and Ukraine export almost 12% of the world's total calories (Glauber&Laborde, 2022).

Figure 1: **Effects on the Fuel and Food Crises**



The World Trade Organization (WTO) has warned that Russia's invasion of Ukraine has caused enormous human misery as well as harm to world trade, which will probably have the greatest effect on low-income nations (Masterson, 2022).

According to the World Trade Organization's Trade Forecast 2022–2023, since the war began on February 24th, the outlook for the world economy has been worse. Currently, WTO analysts are projecting a lower growth rate for merchandise trade volumes in 2022, which refers to the import and export of goods from 4.7% down to 3%.The world's impoverished may have to make due without due to reduced food supplies and increased food prices, according to WTO Director-General Ngozi Okonjo-Iweala (Masterson, 2022).

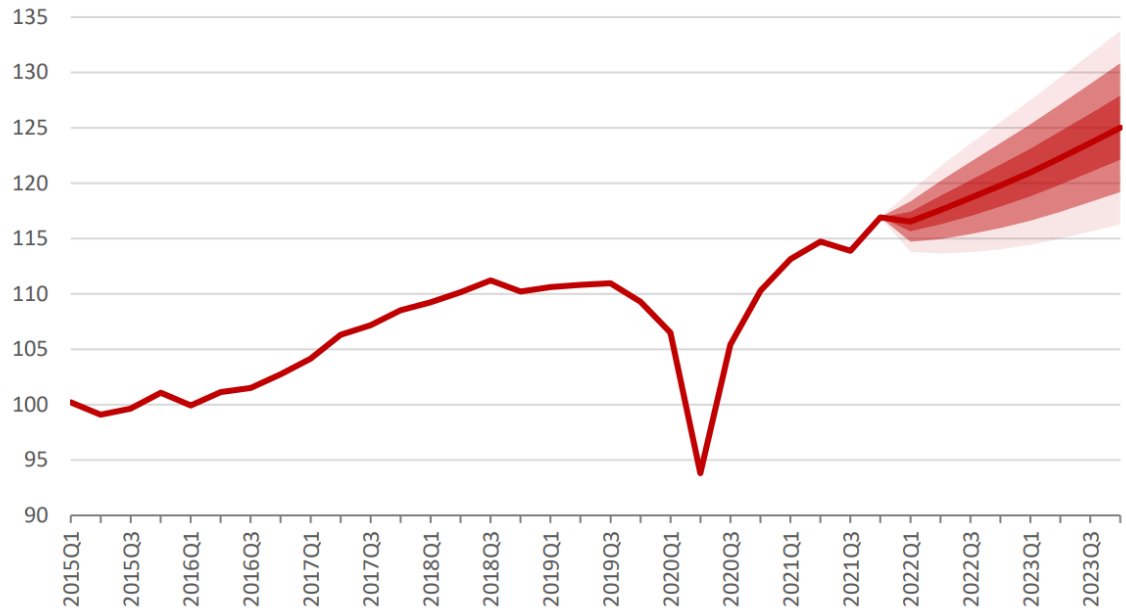
The WTO claims that the crisis in Ukraine has had the most direct economic impact on sharply rising commodity prices. Food, energy, and fertilizer supplies from Russia and Ukraine are also at risk because to the conflict. The World Trade Organization (WTO) cautions that the suspension of grain imports via Black Sea ports might have "potentially dire consequences" for food security in developing nations. The latest COVID-19 lockdowns in China are causing

disruptions to maritime traffic. This might result in fresh raw material shortages and increased inflation (Masterson, 2022).

Figure 2

Chart 1: Volume of world merchandise trade, 2015Q1-2023Q4

Seasonally-adjusted volume index, 2015=100



Source: WTO and UNCTAD, WTO Secretariat estimates.

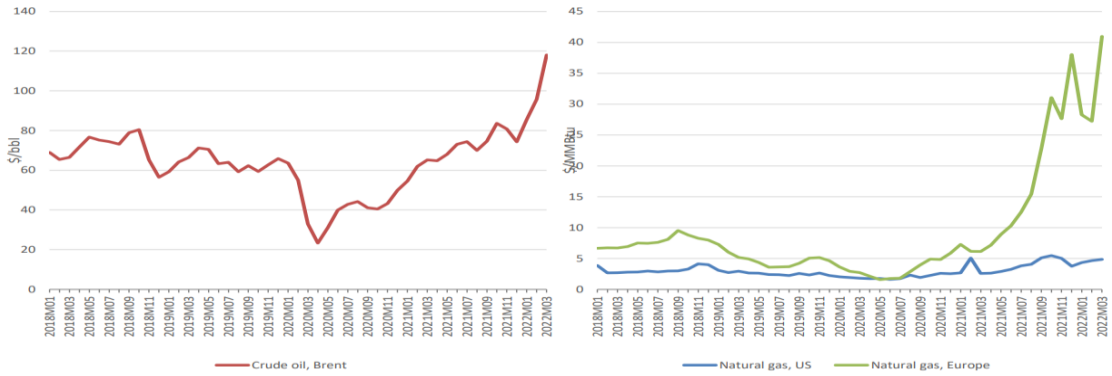
Due to the unpredictability of the Ukraine conflict and the absence of concrete information regarding its economic consequences, WTO experts have relied on simulations to generate plausible hypotheses regarding commerce. The rise of global merchandise trade volumes in 2022 "may be as low as 0.5% or as high as 5.5%," according to chart 1.

According to the WTO, more trade is necessary during a crisis to ensure that everyone has access to basic commodities. It is requesting cooperation amongst partner organizations and governments in order to facilitate trade.

Figure 3 illustrates the sharp increase in global fuel prices. Prior to the conflict in Ukraine, this began in 2020.

Chart 2: Monthly average prices for crude oil and natural gas, January 2018 – March 2022

US$ per barrel and US$ per million Btu



A barrel of oil cost $118 in March 2022, which is 38% more than it did in January 2022 and 81% more than it did at the same time previous year. By April 1, daily oil prices have dropped to $104 per barrel from their peak of $128 per barrel on March 8.

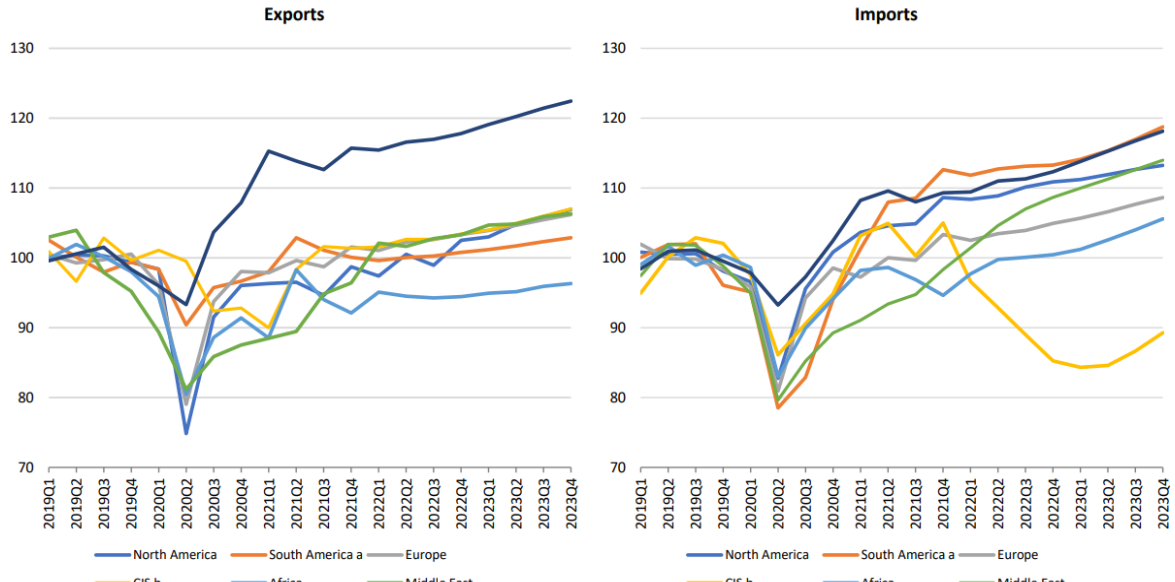
Regional differences exist in natural gas prices, according to the WTO. Between January and March, natural gas prices in Europe increased by 45% to $41 per million British thermal units (Btu), a unit of measurement for heat content. However, the WTO reports that prices in the US have "remained relatively low," at about $4.9 per million Btu (Masterson, 2022).

The World Trade Organization (WTO) states that while rising natural gas prices will likely have a greater impact in Europe, higher oil prices may lower real wages and import demand globally (Masterson, 2022).

Figure 4 (Chart) provides an overview of the regional variations in goods imports and exports from the first three months of 2019 to the anticipated last three months of 2023.

Chart 3: Merchandise exports and imports by region, 2019Q1-2023Q4

Volume index, 2019=100



According to the World Trade Organization, Europe, Africa, and the Commonwealth of Independent States (CIS) are currently anticipated to underperform on the import front. Following the disintegration of the Soviet Union in 1991, a coalition of governments from Eastern Europe and Asia, including Russia, came together to form the CIS. The WTO claims that sanctions against Russia are mostly to blame for this group's poor performance (Masterson, 2022).

The fact that Ukraine is a member of Europe's country group exacerbates its vulnerability. According to the WTO, "unexpected declines" in trade in the second half of 2021 are partially to blame for Africa's low import levels. Increased oil prices are predicted to increase export earnings for the Middle East.

Due to Middle Eastern countries' increased ability to import, this will probably also result in higher import quantities. The war in Ukraine, according to the WTO, will also have an impact on global trade in commercial services. This includes the transportation industry, which deals with air travel for passengers and container ships (Masterson, 2022).

Difficulties with Cereal Storage and Export

The amount of storage space available for the next harvest has been reduced due to the abrupt stop of maritime exports in February 2022 and the slow pace of exports conveyed via land and river channels (FAO, 2022).

FAO estimates that the amount of grain in storage as of June 2022 (estimated at 22 million tonnes)25 is more than four times higher than it was during the previous season at the same time. The Ministry of Agriculture estimated in January 2022 that the country's total storage capacity was 75 million tonnes. A lot of producers and traders are concerned about high stock levels because they can't export. In addition, people who live close to the frontlines need help moving fresh supplies from the upcoming harvest and current stock to safer areas. Roughly 14% of all grain storage facilities were destroyed or severely damaged as of May 2022. In the most conflict-affected areas, up to 25% of entities are smallholders with damaged and occupied storage, and they have few practical choices for acquiring storage capacity (FAO, 2022).

Additionally, remote sensing shows that, nationally, visual impairment affects roughly 11% of commercial capacity. Given that 16 percent of farmers nationwide are unable to store their harvest, this would greatly raise pressure in oblasts like Chernihivska, which was already

dealing with a storage shortfall of almost 2 million tonnes for the upcoming harvest. 23 percent are unable to store it entirely in the facilities that are currently in place due to an impending harvest (FAO, 2022).

There are currently just 60.9 million tons of storage capacity available when taking into account the eastern regions that have been directly impacted by conflict. According to FAO estimates, there would be a 16.3 million tonne storage space shortfall for the new harvest; if hostilities in the eastern regions continue, this amount might rise to 20 million tonne.

Impacts on Agriculture

The economy of Ukraine depends heavily on the agricultural sector. It produced more than 40% of all export earnings and about 20% of the nation's GDP prior to the conflict. It is anticipated that the conflict would continue to have a significant impact on Ukraine's economic development and undermine food security worldwide (Kyiv School of Economics, 2022).

Agricultural infrastructure around the nation has been damaged by the war; this includes greenhouses, standing crops, animals, processing units, irrigation, storage, machinery and equipment, and in-port storage and shipping infrastructure. According to preliminary projections, there would be between USD 4.3 billion and USD 6.4 billion in harm to the agriculture industry (KSE & Ministry of Agrarian Policy and Food of Ukraine, 2022). (FAO, 2022) (between 15 and 22 percent of the nation's pre-war agricultural value, or around USD 29 billion). Since smallholders in war-affected areas typically produce about 40% of Ukraine's total agricultural output, the true numbers are likely to be significantly higher as the above estimates do not account for potential damage to their agricultural capital (FAO, 2022). This suggests that the sector has suffered far more damage and loss than previously thought.

In light of this, the industry may face significant challenges from continued displacement in a nation where employment in rural areas is essential for subsistence and income.

Of the 44 million people living in Ukraine before the war, about 7.5 million employed in farming. According to the International Organization for Migration (2022), 14% of the country's population is displaced. This could mean that there is a shortage of 1.3 million agricultural workers in Ukraine, which would have an impact on household income across the board as well as commercial and smallholder agricultural production.

In late April, the Ministry of Agrarian Policy and Food of Ukraine (MAPF) released a report indicating that in 2022, only forty percent of the country's labor force is expected to be engaged

in harvesting activities. But the Ministry also said that this labor force should be enough to harvest the winter crops because there isn't as much land to be harvested as there was last year (Huston, 2022).

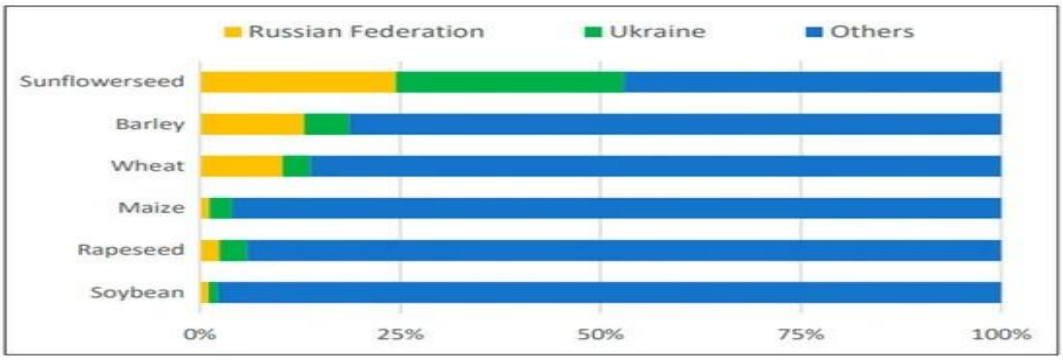
Effect on the World Cereal Market

The conflict is having a major effect on cereal output, both in terms of decreased harvest for winter crops and decreased planted area for spring crops, notwithstanding the considerable amount of carryover cereal stock that exists today. According to estimates made in March 2022 by the Global Information Early Warning System, 2022, almost 20 percent of the area planted with winter crops may not be harvested due to direct devastation, restricted field access, labor difficulties, and/or a lack of financial resources.

The winter crop harvest will begin in July, and the spring crops—which include maize, wheat, barley, rapeseed, sunflowers, and soybeans—have finished seeding. The amount of fuel available for farming equipment and the availability of storage will determine the harvest level. The current estimate for the 2022 cereal harvest places production at 51.1 million tonnes, with 20 million tonnes of wheat (much less than the record 33 million tonnes last year), 24 million tonnes of maize, and roughly 7 million tonnes of other coarse grain. This estimate is based on the area planted and the anticipated decline in yields. If these projections come to pass, they would equal almost 60% of the extraordinarily high crop from the previous year (FAO, 2022). We'll also harvest a few more tiny amounts of minor crops, like buckwheat. In a similar vein, the harvest of oilseeds is anticipated to decline. Sunflower seed production is anticipated to reach 7.5 million tonnes, a 45 percent decrease from the previous year; in contrast, soybean and rapeseed production is anticipated to reach 2.0 million and 1.7 million tonnes, respectively (FAO, 2022).According to MAPF, the fighting has affected the region sowed with spring grains and pulses for planting.

According to preliminary estimates, less than 20% less area was planted for spring crops and pulses in 2022 than was planted for the same crops in 2021 (Ministry of Agrarian Policy and Food of Ukraine, 2022). FAO data supported this, showing that 66% of the selected enterprises reported a comparable decrease in the amount of arable land available for spring planting when compared to the prior year (FAO, 2022).

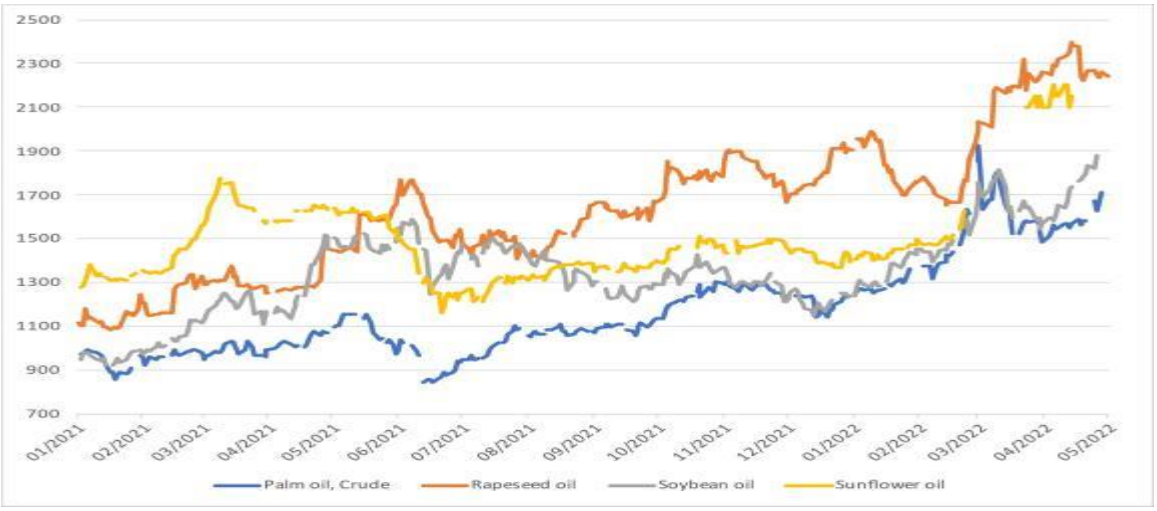
Figure 5: The proportion of certain crops exported worldwide that come from Russia and the Ukraine.



Effects on Production of Vegetables

The country's vegetable production and marketing have suffered greatly as a result of the war, both in terms of internal and international trade. Regions essential for the production, storage, and export of vegetables are still impacted by the ongoing conflict (FAO, 2022). Ukraine has nearly stopped exporting vegetables due to internal shortages brought on by supply chain obstructions, high domestic market pricing, and expensive transportation expenses. It is anticipated that the This year, the nation will become a net importer of staple vegetables. A large portion of the nation's vegetable crop is being impacted by the violence in the Chersonska oblast; almost 12% of the nation's onion and 10% of its carrot production are affected (FAO, 2022). The ongoing hostilities in the Khersonska oblast are making it difficult for farmers to access vital facilities for storing vegetables, which are used to store goods produced throughout Ukraine from fall to spring. This has a compounding effect on the country's entire vegetable production value chain (FAO, 2022).

Figure 6: Prices for a tonne of vegetable oil per day in USD in 2021–2022



Inflation of Domestic Food Prices Worldwide

The word bank's food security updates show how rapidly domestic food prices are rising worldwide. Based on data from May to August 2022, nearly all low- and middle-income countries have high rates of inflation. Inflation has exceeded five percent in ninety-three percent of low-income countries, ninety-nine percent of lower-middle-income countries, and ninety-three percent of upper-middle-income countries. Many of these countries have seen double-digit inflation. The percentage of high-income countries suffering high inflation has also dramatically grown, with 85.7% of these countries reporting high food price inflation (Blanchard & Pisani, 2022).

Despite the possibility that the Russia-Ukraine invasion had a major effect outside of the immediate region, especially on food prices (Alam et al., 2022), food insecurity was already on the rise globally prior to the most recent Ukraine War. Because there has been a long-term rise in hunger, prior to the current crisis and the Covid-19 pandemic. There were 800 million hungry individuals in 2020; compared to the previous year, that figure had increased by 100 million. This is caused by the ongoing sources of food insecurity, such as conflict, extreme weather, pests, and illnesses, in addition to the Covid-19 epidemic. 388 million individuals in 42 nations experienced acute severe food insecurity, a number that is more than 5% higher than in 2020 and puts people's lives at risk.

Wheat is the product most adversely affected by the conflict, followed by maize, vegetable oils, and fertilizers to a lesser degree. Among these, wheat is the principal product that was impacted by the invasion. Russia is the world's biggest exporter of wheat, making up about 20% of all exports worldwide in 2022 and 18% of global exports in 2021 (Ahmad et al., 2022).

An additional ten come from Ukraine. Since 35% of the world's population depends on wheat as their primary food source, Russia and Ukraine are now the world's top exporters of wheat rather than the world's top producers, which has caused a huge shock in reference to the surge in wheat prices on international markets, which had increased by more than 50% and almost 80% from a year ago.

Corn prices increased somewhat after the invasion as well, rising by roughly 25 to 30 percent above February levels and by roughly 37 percent annually, making those two commodities really more costly (Meijl et al., 2022). The invasion has no effect on other commodities, such as rice, and their prices remain lower than those of wheat. According to the expert, stock levels

in the nations that once imported from Russia and Ukraine will decline if exports from those nations are still banned, necessitating costly modifications.

The data presented above supports the study's first premise, which holds that Russia-Ukraine crisis accounted for the disruption of food production and distribution between 2014 and 2022.

Black Sea Grain Initiative and Global Food Scarcity

Ukraine and the Russian Federation, two of the biggest grain suppliers in the world, are crucial food supplies for many developing nations. However, the conflict slowed down the Russian Federation's shipments of grain and fertilizers and nearly stopped Ukraine's grain exports (United Nations Conference on Trade and Development, 2022).

On July 22, confronted with the possibility of food instability for millions of people worldwide,

The United Nations mediated two projects in 2022. The first is the memorandum of understanding that the UN and the Russian Federation have to allow their food and fertilizer exports to freely enter international markets. The second, on which this research focuses, is the Black Sea Grain Initiative (BSGI), which was signed by Ukraine, the Russian Federation, Turkey, and the UN to begin grain exports from Ukraine across the Black Sea in the midst of the conflict.

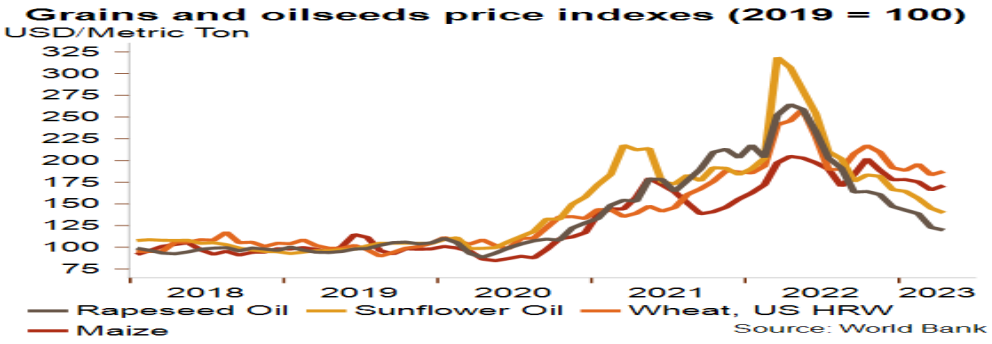
The impetus behind the BSGI quickly built up. Large supplies of grain started to reach international markets as port activity in Ukraine began to increase. With the Initiative, food prices have stabilized and subsequently decreased globally, and valuable grain has been transferred from one of the world's breadbaskets to the tables of those in need, (UNCTAD, 2022).

However, the price of some commodities, like wheat and maize, is rising once more due to the BSGI's expiration in July 2023 and the uncertainty surrounding its renewal. Food security is unlikely to be achieved without the program, particularly for poor and least developed nations (UNCTAD, 2022). Nonetheless, the foundation of this endeavor is the consents of the The International Ship and Port Facility Security Code (ISPS Code), Part B, paragraph 4.26 (UNCTAD, 2022) and the International Convention for the Safety of Life at Sea, 1974, as modified (SOLAS), Regulations XI-2/11.

This initiative's goal is to make it easier for grain and allied products and fertilizers, such ammonia, to be exported safely from the ports of Odesa, Chernomorsk, and Yuzhny (UNCTAD, 2022).

The parties acknowledge that the Secretary-General of the United Nations played a key role in securing the talks for this project, and they ask for his continued support in carrying it out in a way that advances the organization's humanitarian purpose while remaining within its bounds.

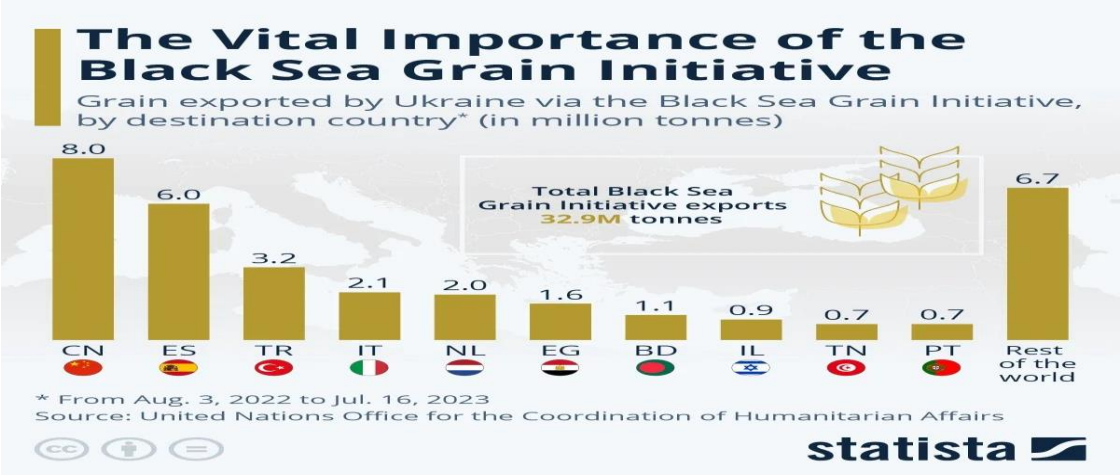
Figure 7: Showing grains and oilseeds price indexes.



Rises in Port Operations

The world witnessed the closing of important grain corridors as the conflict in Ukraine broke out. Ship departures from Ukrainian ports each week fell precipitously. In the weeks that followed, there was a slight rebound, although port departures were still far lower than in 2021. The initiative was signed, and ship departures gradually increased. Although shipments are still between 40 and 50 percent lower than they were before to the war, the trend is positive (UNCTAD, 2022).

Figure 8: This chart shows grain exported by Ukraine via the Black Sea Grain Initiative, by Destination country.



Port call patterns in Ukraine and the Black Sea region have seen substantial alterations as a result of the war. Ukrainian traders were looking for more profitable routes, thus while port visits from Ukraine decreased, they surged in Romania and Bulgaria (UNCTAD, 2022).

Furthermore, a significant change occurred as a result of the closure of Black Sea ports: rivers started to serve as the primary route for trade in Ukraine. More than 90% of ships sailed from seaports prior to the war. After the invasion, this percentage fell to 20%. This percentage rose to 36% following the initiative's signing in August and September (UNCTAD, 2022).

There were limitations to this greater reliance on river ports, though. These river routes served Ukrainian small cargo and multipurpose vessels, but they were not equipped to accommodate huge dry bulk vessels like seaports could. As a result, Odesa, Chornomorsk, and Pivdennyi/Yuzhny seaports were reopened notably under the plan. The consequence was a rise in port calls and, more crucially, a notable increase in the amounts transported.

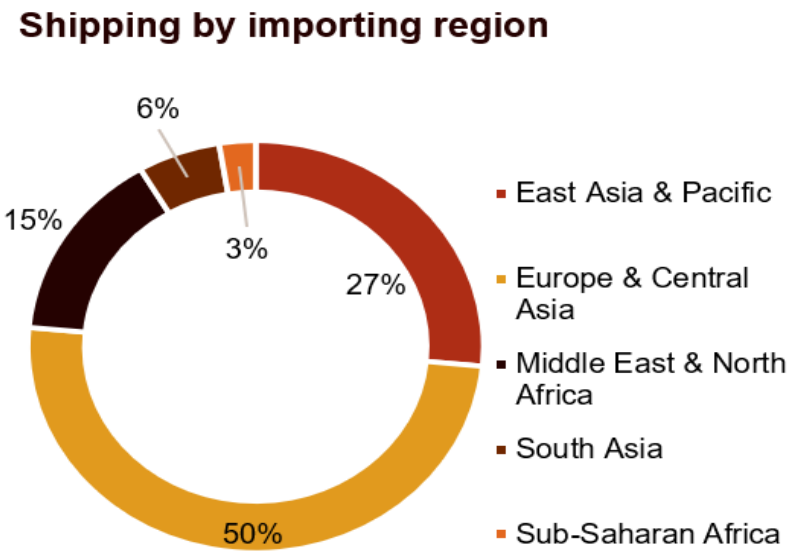
Seaports make up the majority of the tonnage carried even if Danube River ports still account for the majority of vessel departures because they are crucial hubs for considerably larger boats.

The volume of grain moved rose along with the number of dry bulk carriers departing from these important ports. By September, the Black Sea Grain Initiative was shipping 1.2 million tons per week. While still below 2021 levels, the difference is getting less (UNCTAD, 2022).

Reopening the Ukrainian Grain Gate for Developing Nations

Ukraine's grain gates were reopened to the outside world by the BSGI. Almost 8 million tonnes of food and grain had departed Ukrainian ports as of October 17, 2022, as a result of the campaign. Furthermore, this number continues to rise daily. Thus far, almost 70% of all exported goods consist of maize and wheat out of the total cargo carried (UNCTAD, 2022).

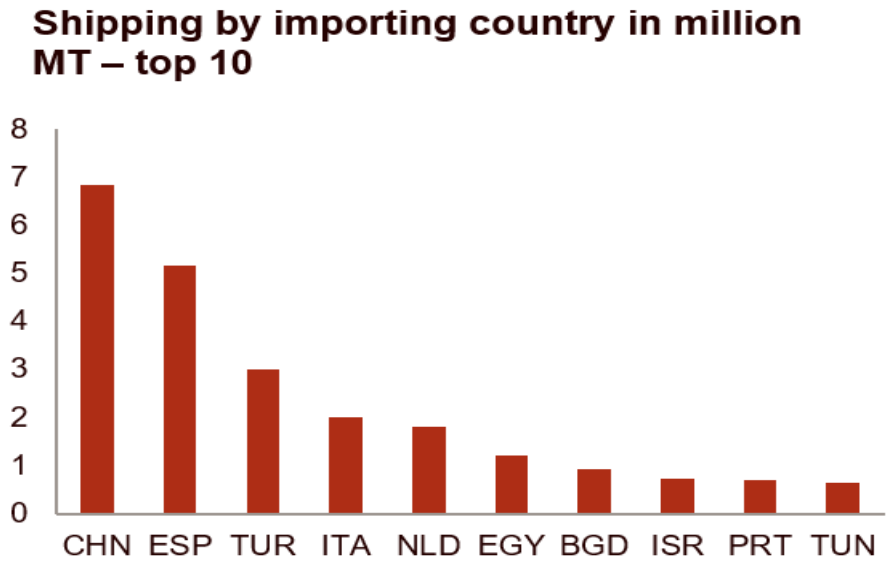
Figure 9



Source: United Nations

More than 3 million tonnes of maize have left Ukraine since the signing of the initiative, most Of which has gone to developed countries (UNCTAD, 2022).

Figure 10: Showing export to Countries.



Source: United Nations

It's crucial to remember that this might only apply to the original destination because it could be processed or exported again to other nations. Furthermore, developed nations are major

global exporters and importers of animal feed, a major component of which is maize. Therefore, it's possible that some maize will be used as feedstock in this shipment.

Conversely, the majority of wheat exports to developing nations are wheat, which is a vital component of food security for the Global South (UNCTAD, 2022). In actuality, the World Food Programme (WFP) and other least developed countries (LDCs) with vulnerable populations have received close to 20% of the wheat exported. Grain shipments to developing and least developed nations have begun to increase over the brief period that the program has been in place.

However, additional work must be done to bring export levels up to prior levels. For example, Ukraine exported about a million tonnes of wheat and corn to underdeveloped nations. Nonetheless, exports from January to September of 2022 remain lower than those from the same time in 2021 (UNCTAD, 2022).

Between August and September, the effort doubled the volume of wheat supplied to Least Developed Countries, amounting to around half a million tonnes. However, less than one million tonnes of wheat were exported to LDCs between January and September of 2022. This suggests a 1.2 million-ton export shortfall compared to 2021. The disparity's magnitude may differ amongst nations (UNCTAD, 2022).Without the BSGI, demand from developing and least developed nations might not be able to be satisfied by the end of 2022. It is impossible to overstate the significance of the BSGI for the most vulnerable countries.

Lowering the Price of Food

Food costs have been steadily rising over the past two years, partly as a result of COVID-19-related disruptions, climate change, and global warming, as well as further natural calamities including earthquakes, floods, and large fires. This trend was made worse by the conflict in Ukraine. Grain availability has increased thanks to the BSGI, which has also lessened the pressure on food costs. As a result, more people have access to food worldwide, especially the most vulnerable and impoverished. The reopening of the Black Sea ports and the potential of the Black Sea Grain Initiative contributed to the record high market prices falling. The FAO Food Price index has been declining since April 2022 (UNCTAD, 2022).

The cost of wheat and maize is remains historically high, which makes it harder to afford staple commodities and puts global food security at risk. This is just one more justification for the initiative's significance to developing nations when it is renewed on November 20.

Thus, we confirm the second hypothesis of this research, according to which the worldwide food scarcity was not caused by the Black Sea Grain effort, based on the evidence that was provided.

Conclusion

The Russia-Ukraine armed conflict has been a long-standing and complex issue that has had Far-reaching consequences. The Black Sea grain deal, which involves Ukraine as a major Grain exporter, plays a crucial role in global food security. As we conclude, it's evident that The armed conflict has disrupted Ukraine's agricultural sector, impacting its ability to Contribute to the world's grain supply. This disruption has added volatility to global grain Markets, affecting food prices and availability. Furthermore, the conflict's geopolitical implications have led to increased tension and Uncertainty in the Black Sea region, a critical area for grain production and trade. This Instability poses risks to the reliability of grain exports from the region, potentially Exacerbating food security challenges, particularly for nations heavily dependent on these supplies.

To mitigate the disruption of food production and Distribution caused by the Russia-Ukraine crisis, it is crucial for international actors to actively engage in diplomatic efforts aimed at resolving the conflict. A peaceful resolution would help stabilize the region and allow Ukraine to focus on its agricultural sector, which plays a significant role in global food production. Diversify Food Sources: In light of the uncertainty surrounding the Black Sea grain deal Due to geopolitical tensions, countries should prioritize diversifying their sources of grain and Agricultural products. This can be achieved by strengthening trade relationships with Alternative grain-producing regions and investing in domestic agricultural production to reduce reliance on the Black Sea region. To address the broader issue of global food scarcity, nations should increase investments in food security measures. This includes supporting research and Innovation in agriculture, improving infrastructure for food storage and transportation, and implementing sustainable agricultural practices. Enhancing food security globally can help Buffer against disruptions caused by regional conflicts and trade tensions.

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