

EXPORT OF UKRAINIAN GRAIN: PROBLEMS AND MECHANISMS OF ENSURING GLOBAL FOOD SECURITY

In a world where food security is a critical concern, the impact of geopolitical conflicts on global food supplies cannot be understated. One of the consequences of the war in Ukraine is the threat of a global food crisis due to the destruction and blockade of Ukraine's export infrastructure and logistics, endangering the delicate balance of food production and distribution worldwide. Despite the military actions being confined within Ukraine's territory, their impact has spread far beyond the region. Therefore, this article delves into these multifaceted implications, analyzing not just the disruptions in Ukraine's agricultural sector and its ripple effect on international trade but also the humanitarian, economical, and political dimensions that underscore these disruptions. It explores how the war conflict disrupts Ukraine's agricultural sector and international trade, affecting millions of people, depending on Ukrainian grain supplies. The article highlights the significance of Ukraine as a major global food supplier, particularly in the production of wheat, maize, sunflower oil and other commodities. It also examines the mechanisms put in place to ensure Ukraine's food exports, including the Black Sea Grain Initiative and the challenges, faced in reopening Ukrainian ports for export. It is shown that despite Russia's withdrawal from the Black Sea Grain Initiative, the export of Ukrainian agricultural products through the Black Sea continues. It is substantiated that strengthening the protection of the port infrastructure against missile attacks is also one of the strategic priorities of preserving the export potential of Ukraine. And this is one of the key issues to be discussed at the international peace summit in Switzerland. The strategic initiatives of Ukraine that contribute to the sustainability of food production systems and, together with diplomatic efforts, can contribute to the formation of a safer global food future are analyzed. The main directions of state regulation and support of the export potential, in particular of the agrarian sector of the economy, by simplifying customs procedures, financial and economic support of producers of grain products are outlined. The authors identified future challenges to global food security and their impact on the global architecture of world security.

Key words: international trade, food exports, mechanisms of state regulation, global food security, food crisis, Black Sea Grain Initiative, simplification of customs procedures, state support for exporters.

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Introduction. Ukraine is one of the world's leading producers and exporters of agricultural production. Food exports play a significant role in the country's economy. Notably, Ukraine has become one of the biggest suppliers of foods such as sunflower oil, wheat and corn for the low-income countries worldwide as well as for the international development organizations.

Specifically, the country is a major producer and exporter of staple grains which are vital commodities for the international food system. In fact, the World Food Program, which is the United Nations' humanitarian food-assistance organization, gets 40 per cent of its wheat from Ukraine (Feingold, 2022).

However, Russian large-scale invasion of Ukraine has a devastating impact not only on the country's food security but also posed a serious threat to global food security. It has raised profound questions about the resilience of the international food supply chain. Due to the Russian blockade in the Black Sea, about 22 million tons of grain were blocked in Ukrainian ports, a significant part among them was intended for the UN World Food Program.

In accordance with the Council of the European Union and the European Council (CEU and EU, 2023), the tragedy unfolding in Ukraine is having an impact all over the world as Russia's

unprovoked and unjustified invasion is intensifying a global food crisis. The war in Ukraine is stifling trade and logistics of Ukraine and the Black Sea region, as noticed by the United Nations Conference on Trade and Development (UNCTAD, 2022).

The invasion has affected some of Ukraine's most productive agricultural regions, including the Black Sea region which is a major source of grain and vegetable production. Many farmers have been forced to abandon their fields due to military fighting. Most of the food storage and transportation infrastructure has been damaged or destroyed.

Additionally, the war has disrupted the transportation of food in Ukraine across its borders. Trade blockades and restrictions have made it difficult to transfer food to the most needed areas. Millions of people in the world depend on grain supplies from Ukraine. The population of the most of these countries traditionally suffers from food shortages and even hunger.

Namely, according to the Food and Agriculture Organization, nearly 50 countries depend on the Russian Federation and Ukraine for at least 30 percent of their wheat import needs. Of these, 26 countries source over 50 percent of their wheat imports from these two countries (FAO, 2022b). This underscores the region's enormous influence on the dynamics of international trade.

This means that for a number of countries in South Asia, Western Asia and Africa cutting of the major source of supply for wheat, corn and vegetable oils will definitely rise the food insecurity and may even lead to increase in global hunger (Maciejewska & Skrzypek, 2022). The paper (Ben Hassen & EL Bilali, 2022) also highlights that the war resulted in immediate and far-reaching cascading consequences on global food security.

Based on the FAO Global Report, food availability and access are likely to remain limited by conflict-related market disruptions and high food prices, exacerbated by the ripple effects of the war in Ukraine on international trade and commodity prices (FAO, 2022, p. 15). As food shortages and price spikes loom, it becomes imperative to understand the intricacies of this crisis and explore potential pathways to mitigate its effects.

Methodology. This paper focuses on Ukraine's role in global food security and the broader implications of the war on international trade, humanitarian concerns and geopolitics. It employs a comprehensive methodology that includes data analysis, literature review, and qualitative assessment. This article draws upon existing research, governmental reports, and international organizations' data to analyze the impact of the conflict on Ukraine's agricultural sector and its global repercussions. Regarding the mentioned above, this article underscores the importance of Ukraine's role in global food security and the need for continued efforts to stabilize grain exports from the region. Through a multidisciplinary approach, this article aims to provide a holistic understanding of the crisis and offer insights into strategies for safeguarding global food security in times of geopolitical upheaval.

1. Global Food Security

Global food security refers to availability, accessibility and affordability of food for people all around the world. It ensures people to have access to sufficient and nutritious food according to their dietary needs and cultural preferences.

Based on the Rome Declaration on World Food Security and World Food Summit Plan of Action (FAO, 1996), food security is defined when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Therefore, ensuring global food security is an integral component of the fundamental natural rights to life, health, and nutrition. Food security upholds people's right to feed themselves with dignity, protecting everyone from hunger, food insecurity, and undernourishment. It is legally derived from the International Covenant on Economic, Social, and Cultural Rights (General Assembly, 1996).

However, for millions of people around the world, food security needs no explanation. They face food shortages and hunger themselves, suffering from it. They feel it on a physiological level and do not need additional explanations of that term. That is why this topic is so relevant.

Although under international law, states are recognized the fundamental right of everyone to be free from hunger and obligated to respect, protect, and fulfill the right to food, according to the Global Report on Food Crisis 2022 Mid-year Update (Food Security Information Network, 2022, p. 8), up to 205 million people are expected to face acute food insecurity and to be in need of urgent assistance in 45 countries.

One of the key challenges to global food security is the increasing world population. The United Nations predicts that the global population could grow to around 9.7 billion people in 2050 (United

Nations Department of Economic and Social Affairs, 2022, p. 28), which will require a significant increase in food production to meet demand.

Another challenge is the impact of climate change on food production. Extreme weather conditions, such as floods and droughts, can lead to crop failures and food shortages. Additionally, climate change is affecting the geographic distribution of plant and animal species, which can alter the availability and quality of food.

Other key factors which can affect food security include political instability, conflicts, trade barriers, and economic shocks. These issues can disrupt the production and distribution of food, making it more difficult for people to access the food they need. In a world where food security is a critical concern, the impact of geopolitical conflicts on global food supplies cannot be understated.

In accordance with the Joint Statement on the Global Food and Nutrition Security Crisis (FAO et al., 2023), globally, poverty and food insecurity are both on the rise after decades of development gains. Supply chain disruptions, climate change, the COVID-19 pandemic, financial tightening through rising interest rates and the war in Ukraine have caused an unprecedented shock to the global food system, with the most vulnerable hit the hardest. Food inflation remains high in the world, with dozens of countries experiencing double digit inflation.

The results of the European Council meeting (European Council, 2022, p. 3) strongly concluded that, by weaponising food in its war against Ukraine, Russia is solely responsible for the global food security crisis it has provoked.

Indeed, the war has exposed vulnerabilities in the global food security system and resulted in far-reaching consequences for both regional and global food security, as international food prices reached historic highs even before the outbreak of the war in Ukraine.

That way the war in Ukraine has caused significant damage and shaken the already vulnerable global food security system. It has become one of the most disruptive factors in destabilizing global supply chains and causing food shortages in vulnerable markets, especially for low-income, food import-dependent countries and vulnerable communities, marking a pivotal challenge for global food security and international trade.

To address these complex challenges, the Global Strategic Framework for Food Security & Nutrition emphasizes four pillars of food security: availability, access, utilization and stability (FAO, 2014, p. 7). These pillars provide a comprehensive conceptual framework for addressing food insecurity. It requires more than just increasing food production; it's about ensuring that food is consistently available, accessible, nutritionally adequate, and stable for all.

2. Exploring Ukraine's Agrarian Export Potential

Ukraine's food exports have been growing steadily over the past few years, driven by a combination of factors. These include the country's fertile soil, favorable climate, and skilled labor force, as well as its access to global markets through trade agreements with the key partners. In addition, Ukrainian producers have invested heavily in modernizing their production facilities and adopting advanced technologies to improve the quality and safety of their products.

Ukraine is one of the world's top agricultural producers and exporters and plays a critical role in supplying oilseeds and grains to the global market (USDA, 2022). Often called the breadbasket of Europe, Ukraine boasts roughly 42 million hectares of agricultural land and is home to vast quantities of black "chornozem" soil, which is highly fertile (Feingold, 2022). Pre-war agricultural sector represented about 10 per cent of its GDP of Ukraine and about 40 per cent to its exports.

However, the full-scale Russian invasion of Ukraine has been detrimental to Ukraine's agricultural sector. Based on certain calculations, the areas directly affected by the war accounted for about 36 per cent of the country's crop production before the war. About 30 per cent of Ukraine's territory could be mined (Matvieiev, 2023).

Moreover, significant damage to the agriculture of Ukraine was caused by the destruction of the Kakhovka Hydroelectric Power Plant. According to preliminary estimates of the Ministry of Agrarian Policy and Food of Ukraine (MAPFU, 2023b), about 10,000 hectares of agricultural areas were flooded on the right bank of the Kherson region and also several times more on the left bank.

In addition, this man-made disaster will stop the water supply of irrigation systems of the fields of Dnipropetrovsk, Kherson and Zaporizhzhya regions. In 2021 these systems provided irrigation for 584 thousands of hectares, which produced approximately four million tons of grain and oilseeds, valued at about USD 1.5 billion (MAPFU, 2023b). However, it is currently difficult to assess the full scale of the consequences of this ecocide and its impact on the agricultural sector of Ukraine.

Nevertheless, Ukraine continues to play a leading role in securing global food supplies, despite the ongoing war. The main food products, exported by Ukraine in the 2021/22 marketing year, were grains and oilseeds. The country is the world's largest producer of sunflower meal, oil, and seed and the world's top exporter of sunflower meal and oil. Other significant exports include wheat, barley and corn (Table 1).

Table 1

Ukraine Agricultural Production and Exports (2021/22 marketing year)

Product	Production			Exports		
	Volume (1,000 MT)	Rank Among Global Producers	% of Global Production	Volume (1,000 MT)	Rank Among Global Exporters	% of Global Exports
Corn	41,900	6	3.5%	23,000	4	12%
Wheat	33,000	7	4.3%	19,000	5	9%
Sunflower	17,500	1	30.6%	75	9	3%
Barley	9,900	4	6.8%	5,800	3	17%
Sunflower Oil	5,676	2	30.6%	4,950	1	46%
Sunflower Meal	5,452	2	27.5%	4,100	1	54%
Rapeseed	3,015	6	4.2%	2,700	3	20%

Source: Based on the U.S. Department of Agriculture (USDA, 2022)

According to the U.S. Department of Agriculture (USDA, 2022), Ukraine produces one-third of the world's sunflower oil and accounts for nearly half of global exports. Those exports were valued at USD 6.4 billion in 2021. Top markets in 2021 were India (31%), the European Union (30 percent), and China (15%). At the same time, Ukraine supplies nearly two-thirds of the world's sunflower meal with exports valued at USD 1.2 billion in 2021. Top markets in 2021 were China (48%), the European Union (25%), and Turkey (7%).

Over the past years, Ukraine has mainly increased its exports of cereals, legumes, and flour (Figure 1). Specifically, in the 2013-2014 marketing year, Ukraine exported 32.5 million tons of cereals and legumes to foreign markets. In the 2014-2015 marketing year, exports increased to 34.8 million tons. In the following 2015-2016 marketing period, exports increased to 39.5 million tons, reaching 44.4 million tons in the 2016-2017 marketing year.

In the 2017-2018 marketing year, the volume of export returned to previous level, decreasing to 39.4 million tons. However, according to the Ministry of Economy of Ukraine, in the 2019/2020 marketing year, a record 57.2 million tons of cereals, legumes, and flour were exported, marking a 6.8 million tons increase from the previous 2018/2019 marketing year when exports totaled 50.4 million tons (Ministry of Economy of Ukraine, 2020).

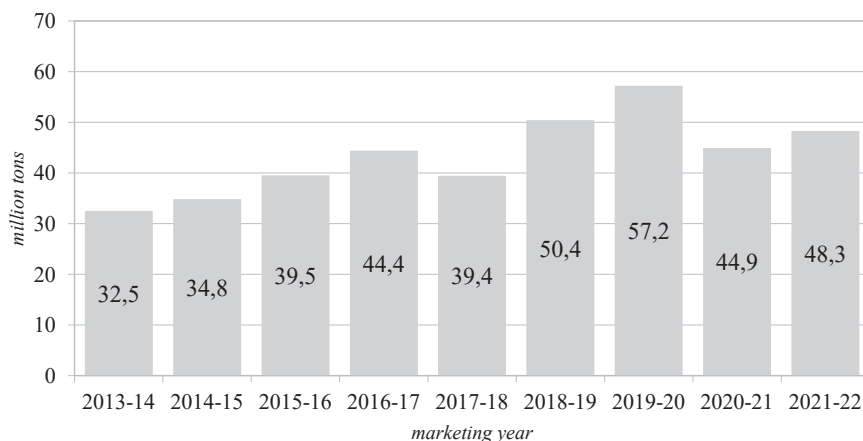


Figure 1. Export volumes of grains, legumes and processed products from Ukraine

Source: Based on the Ministry of Agrarian Policy and Food of Ukraine

In the 2020/21 marketing year, exports amounted 44.9 million tons, including 16.6 million tons of wheat, 4.2 million tons of barley, 18.4 thousand tons of rye, 23.1 million tons of corn, and 126.9 thousand tons of flour. However, the next year turned out to be the most challenging year for the Ukrainian agricultural sector and exports.

As of July 2022 Ukraine's export of major cereals in the beginning of the 2022-2023 marketing year decreased by 40 per cent and amounted 556 thousand tons compared to 926 thousand tons on corresponding date of the previous marketing year. Specifically, corn decreased by 17.4 per cent to 403 thousand tons, wheat decreased by 2.2 times to 113 thousand tons, and barley decreased by 4.9 times to 37 thousand tons (Melnyk, 2022).

Nevertheless, according to the Ministry of Agrarian Policy and Food of Ukraine (Table 2), during the 2022/2023 marketing year Ukraine has exported 48.996 million tons of cereals, legumes, and flour, including 16.836 million tons of wheat, 2.707 million tons of barley, 18.0 thousand tons of rye, and 29.128 million tons of maize. For comparison, during the corresponding period of the previous 2021/2022 marketing year, Ukraine exported 48.355 million tons of cereals, legumes, and flour, including 18.720 million tons of wheat, 5.747 million tons of barley, 161,5 thousand tons of rye, and 23.409 million tons of maize.

Table 2

Exports of cereals, legumes (with products of their processing), and flour from Ukraine, thousand tons

Product	2022/2023 Mkt year	2021/2022 Mkt year
Cereals and legumes, total	48996	48355
Wheat	16836	18720
Barley	2704	5747
Rye	18,0	161,5
Maize	29128	23409
Wheat flour, thousand tons	147,1	69,2
Other flour, thousand tons	6,5	1,5
Total export (grain + flour)	49200	48449

Source: Based on the Ministry of Agrarian Policy and Food of Ukraine (2023a)

Thus, despite the wartime conditions, Ukraine has managed to preserve its agriculture potential and remain a global food supplier. The Black Sea Grain Initiative has become a pivotal factor in achieving this feat and played a crucial role in reestablishing food exports from Ukraine. Therefore, the search for and implementation of legal and practical mechanisms for the continuation and increase of export of agricultural products from Ukraine, in particular by sea, is a strategic priority both for Ukraine and for international trade in general.

3. Mechanisms for Ensuring Ukraine's Food Export

Global trade depends on a complex system of ports and ships, connecting the world. If global trade is to flow more smoothly, it must be ensured that Ukrainian ports are open to international shipping and that collaboration among transport stakeholders continues to provide services (UNCTAD, 2022). Logistics is the key issue for Ukrainian agricultural export traders.

Overall, the Black Sea ports play a crucial role in Ukraine's exports, as they provide access to global markets and allow for efficient transportation of goods. Before the war, Ukraine exported about 5-6 million tons of agricultural products per month (MAPFU, 2022); the majority of this volume was shipped through Ukrainian seaports along the Black Sea.

In terms of their strategic importance, ports have always been superior to other modes of transport links, and have also performed essential defensive functions. Before the war more than 75% of Ukraine's foreign trade took place through sea routes, processed in 13 Ukrainian seaports (Kormych & Averochkina, 2022, p. 8).

On the Russian full-scale invasion eve most of the Ukrainian seaports and maritime waters were already partially blocked. Contrary to international law, including international maritime law, the operations of Ukrainian ports were completely disrupted after the full-scale invasion began on 24 February 2022, with no ships allowed to enter or leave the ports.

As noted by the National Institute for Strategic Studies (NISS, 2023), 10 out of 13 ports, which in 2021 accounted for the processing of 62.4% of all export-import cargo in Ukraine, were blocked. In 2022, due

to the blockade of the maritime coast, the cargo processing by Ukrainian seaports decreased by 61.5%, including exports by 54.4% and imports by 70.3%.

Since the majority of agricultural exports from Ukraine rely on maritime transportation, the blockade of Ukraine’s port infrastructure and maritime waters had a critical impact on Ukraine’s export potential and the volume of exported goods, including agricultural production.

The following diagram (Figure 2), based on the data from the Ministry of Agrarian Policy and Food of Ukraine (MAPFU, 2023c), clearly illustrates the role of port transportation of agricultural products in the foreign trade of Ukraine, as well as the dynamics of export volumes broken down by major types of transport.

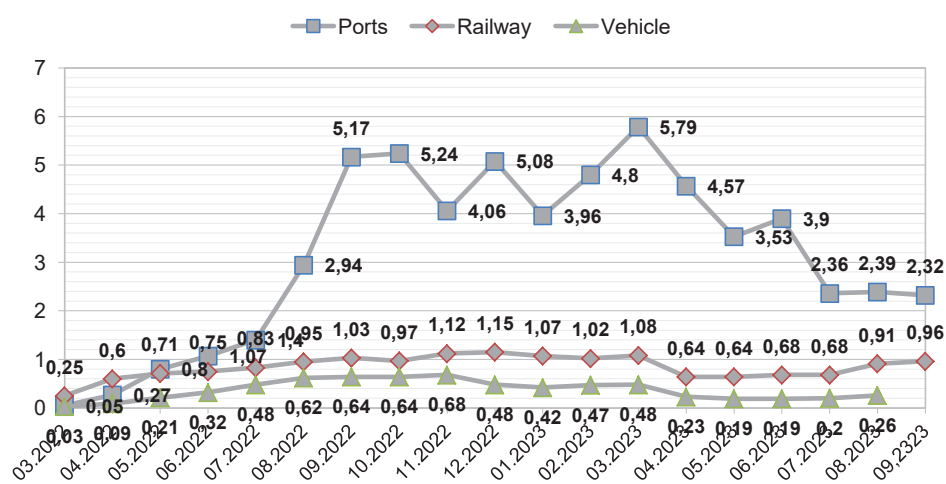


Figure 2. Export of agricultural products by types of transport

Source: Based on the Ministry of Agrarian Policy and Food of Ukraine (2023c)

For over four months, Ukrainian seaports and port infrastructure have been blocked. It was only about four months after the start of the full-scale invasion, Ukrainian seaports were partially unblocked and agricultural exports started to resume gradually, thanks to the agreement signed in Istanbul on July 2022. An agreement was brokered by the United Nations and Turkey to open a safe maritime humanitarian corridor in the Black Sea (the Black Sea Grain Initiative).

As a result of Initiative, Ukraine regained its ability to export grain and foodstuffs from the seaports of Odesa, Chornomorsk, and Pivdennyi, substantially increasing the volume of exports. Getting these three ports back in business allowed Ukrainian exporters to return to their markets in Africa, the Middle East, and Asia, as well as allowed the cost-efficient alternative for truck and rail shipments to the EU (USDA, 2023).

Based on the Black Sea Grain Initiative, the Joint Coordination Centre was officially inaugurated on 27 July 2022 in Istanbul. The Joint Coordination Centre was established to monitor the implementation of the Black Sea Grain Initiative to provide a humanitarian maritime corridor to allow ships to export grain and related foodstuffs via the Black Sea from three key Ukrainian seaports “Odesa”, “Chornomorsk”, and “Pivdennyi”. Under the safe-corridor deal all ships, headed to Ukraine, had to undergo inspections in Istanbul.

The JCC monitors the movement of commercial vessels and ensures the compliance with the procedures developed through the Initiative for shipments to and from Ukrainian ports. Inspections of vessels are conducted by joint inspection teams, under the auspices of the JCC (United Nations, 2023). Commercial ships can apply with the JCC via Ukrainian port authorities to ensure the appropriate monitoring, inspection process and safe passage (Figure 3).

As of July 2023, almost 33 million tons of agricultural goods, including maize (51%), wheat (27%) and sunflower products (11%), had been exported from Ukraine via the Black Sea Grain Initiative (CEU and EU, 2023a). During its implementation, over 32 million metric tons of grain and foodstuffs were moved to 45 countries, in close to 2,000 voyages back and forth helping to bring down global food prices and stabilizing the markets (United Nations, 2023).

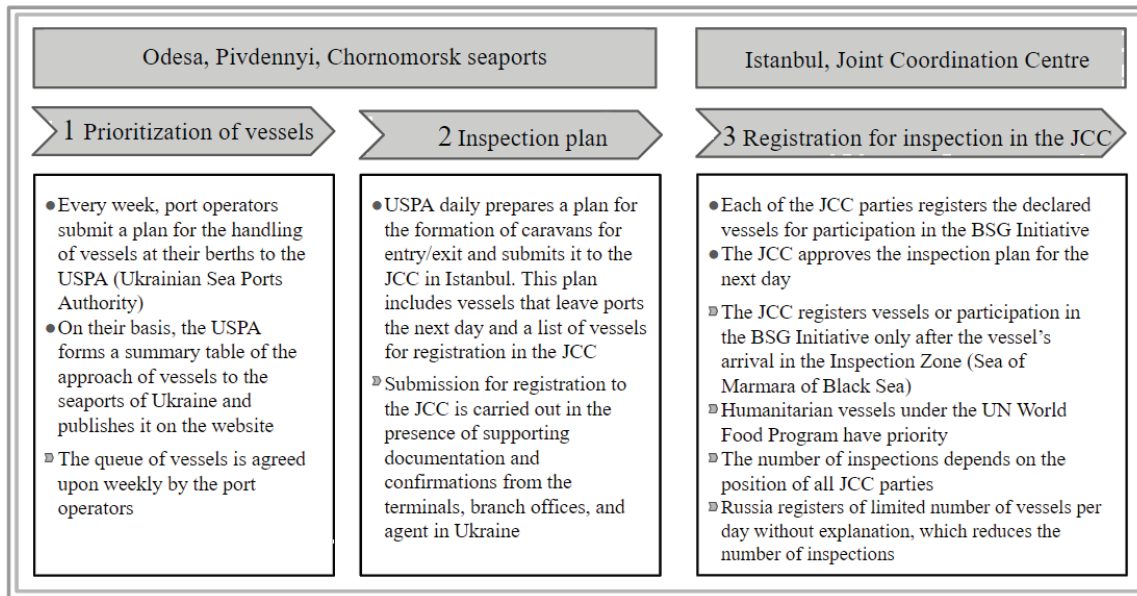


Figure 3. The Grain Corridor: Inspection of Vessels

Source: Based on the Ukrainian Sea Ports Authority (USPA, 2022)

UNCTAD's report "A Trade Hope: The impact of the Black Sea Grain Initiative" (UNCTAD, 2023) said developing countries have benefited the most from the initiative, supporting food security among the most vulnerable. This initiative has not only resuscitated Ukraine's vital exports of grain and related food products but also underscored the significance of international collaboration in sustaining global food security.

However, Russia withdrew from an agreement that ensures the safe passage of vessels exporting Ukrainian grains and other food products from three primary Black Sea ports. Ukraine established unilateral corridors for merchant ships in the Black Sea in response. Despite the challenges, this strategic move proved to be fruitful: the first ships to utilize these corridors successfully exported 50,000 tons of agricultural products from Ukrainian Black Sea ports. This shows that the decision to create its own trade route in the absence of a corridor agreed with Russia was justified.

At the same time, alternative ways of transport ways must be pursued too. In particular, as the research by Kuznietsov, Vladyshevskaya, and Kuznetsov (2023, p. 40) has noted, the "Danube" direction of the development of inland water transport and its infrastructure should be singled out due to the inclusion of the inland waterways of Ukraine to TEN-T. Furthermore, it is the Danube region that currently most demonstrates the tendency to create logistics hubs (grain direction), resulting in a threefold increase in cargo processing from 5.5 million tons to 16.5 million tons (NISS, 2023).

Because of the implementation of various complex measures, smooth functioning of Danube ports was ensured, producing the best results since Ukraine gained independence. The port of Reni handled 5 times as much cargo in 2022 (6.82 million tons) as in 2021 (1.37 million tons). The port of Izmail more than doubled shipments, from 4 million tons in 2021 to 8.89 million tons in 2022. The port of Ust-Dunaisk increased handling volumes from 64 thousand tons to 785 thousand tons (World Bank, 2023, p. 10-11).

Therefore, maximizing the diversification of transportation routes and logistics is essential for ensuring the uninterrupted access of Ukrainian products to international markets. Engaging a variety of transportation and delivery methods will not only bolster the security of exports but also enhance overall efficiency.

4. Mechanisms of State Regulation and Support

The paper (Skrypnyk, Protseviat & Voronova, 2022) highlights that exceptional circumstances, experienced by country during the martial law, drive the increasing needs to find new mechanisms to impact on foreign economic activity, as well as improve the ways to tap the stimulation or restraint instruments of international trade as efficiently as possible.

Since the introduction of martial law Ukraine has implemented a set of measures in the field of currency regulation and banking supervision, customs and tax regulation, trade restrictions, which are primarily

directed against aggressor countries. A number of relevant regulatory government acts in the field foreign economic activities were adopted.

Digitization and simplification of customs procedures have become characteristic features of recent changes in the field of state regulation of foreign economic activities, allowing to reduce corruption and create favorable conditions for foreign economic activity subjects, providing a balance between customs control and facilitation of trade.

Supporting Ukrainian agricultural producers is also one of the priority directions of state policy. In 2020 the government introduced the state program of business support “Affordable Loans 5-7-9%”, which provides financial assistance through cheaper loans through government compensation of interest rates, including the priority direction of support for agricultural producers.

According to the Ministry of Finance of Ukraine, during the period of martial law in Ukraine (as of 16 October 2023), 39,127 loan agreements totalling UAH 152,3 billion were concluded of which: UAH 8.77 billion for investment purposes, UAH 9.11 billion for anti-crisis loans, UAH 3.8 billion for refinancing, UAH 34.85 billion for loans to agricultural producers, and UAH 58.31 billion for anti-war purposes (Ministry of Finance of Ukraine, 2023).

Back in 2017 the government adopted the Export Strategy of Ukraine (Cabinet of Ministers of Ukraine, 2017), which determined the priority vectors of trade development for 2017-2021. Obviously, the modernized strategy should consider Ukraine’s export potential and priority development directions, both during the martial law period and in the post-war recovery of the Ukrainian economy, while relying on mechanisms for state regulation of foreign economic activity.

As a result, Ukraine’s regulatory system needs to strike a balance between strength and adaptability, providing exporters with both the protection and flexibility they require to thrive in global markets. This involves not only establishing favorable domestic conditions but also forging strategic alliances and partnerships abroad.

Overall, ensuring smooth grain exports has a multi-faceted impact, holding significance in the realm of global trade and the assurance of food security worldwide. In essence, the ripple effect of grain trade touches various sectors, from agriculture to transportation and even finance. Realizing this importance, the Ukrainian government, in collaboration with the international community, is making concerted efforts to safeguard the logistic routes of grain export. It’s a testament to the intertwined nature of trade, economics, and diplomacy.

5. Global Trade and Price Volatility: Food Availability, Access, and Stability

The global rise in food prices is a critical concern that directly impacts food availability and access. Such factors as population growth, climate change and geopolitical conflicts have contributed to a significant increase in food prices worldwide. This upward trend in prices poses a substantial challenge to food security, particularly for vulnerable populations and low-income countries.

Furthermore, the increase in food prices has a global ripple effect, impacting countries that heavily rely on food imports. Many nations, particularly in regions where food production is limited, are heavily reliant on international markets to meet their food needs. These countries face the dual challenge of reduced food availability due to supply chain disruptions and diminished access due to higher costs since prices climb.

As a result, only a balanced approach (Figure 4) is able to ensure food security by achieving a balance between food exports and imports, as well as satisfy the existing demand for food with a sufficient supply, restraining the sharp rise in prices on world markets.

The Figure 4 simplistically illustrates that countries that do not have their own production and show complete dependence on food imports are in the zone of greatest turbulence. They are the most vulnerable and dependent on the world situation in the global food market. The population of such countries and their territories are the most vulnerable to food shortages and hunger.

Whereas countries with a developed agricultural sector and their own production are also dependent on world food prices and external supplies of the necessary range of goods. However, they are able to at least independently ensure the availability of food inside the country for their own consumption.

In the situation with exporting countries like Ukraine, the mentioned countries simultaneously influence both the formation of prices on foreign markets and the provision of food availability and access, restraining price growth. Such countries are the guarantors of global food security.

In a situation where large exporters are unable to provide sufficient food on foreign markets under pressure from internal and external factors, food prices rise, leading to a global food crisis. Such crises

are significantly intensified under the pressure of several factors at the same time, such as the COVID-19 pandemic and the war in Ukraine.

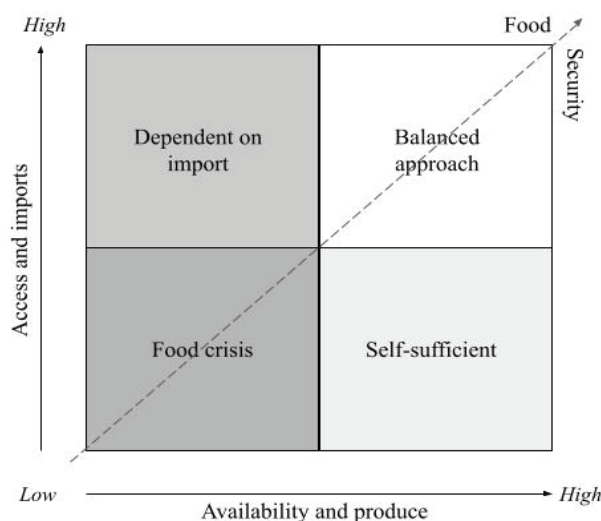


Figure 4. Food Security Matrix

Food access difficulties, which already existed due to the prolonged COVID-19 pandemic, have increased dramatically with the onset of full-scale war in Ukraine, exacerbating the global food crisis. The war in Ukraine is not just a regional crisis, it has far-reaching consequences affecting different regions of the world, leading to higher food prices and faster inflation, since both countries are major world suppliers of wheat and grain, especially for Africa, the Middle East and Asia that were already struggling with hunger.

In particular, as a result of the outbreak of the war in Ukraine on 24 February 2022, global food prices increased further from already high levels in 2021 and have been at record highs since March 2022. The FAO Food Price Index averaged 159.3 points in March 2022, leaping 17.9 points (12.6%) from February 2022 and reaching its highest value since the creation of the index in 1990. Multiple sub-indexes also surged to records. In particular, the FAO Cereal Price Index increasing by 24.9 points in March 2022 from February 2022 (17.1%) and the FAO Vegetable Oil Price Index increasing by 46.9 points from February 2022, a 23.2 percent increase (FAO, 2022a).

However, prices began to decrease later on, indicating an increase in global export opportunities, which was also facilitated by the Black Sea Grain Initiative, allowed continuing food export from Ukraine. This historic agreement facilitated the transport of grain and other goods across the Black Sea, but supply disruptions pushed prices to record highs, exacerbating inflation, poverty and food insecurity in the most dependent countries.

As followed, the FAO lowered its forecast for world trade in cereals in 2023/24 to 466 million tones, a 1.7 percent drop from the previous marketing season. Traded volumes of wheat and maize are all predicted to decline, due to a mix of reasons, including falling exports by Ukraine due to trade disruptions associated with the ongoing war (FAO, 2023a).

As follows, the surge in food prices is a pressing issue that not only threatens food security but also exacerbates inequalities in access to nutritious food. Addressing this challenge requires international cooperation, sustainable agricultural practices, and policies aimed at stabilizing food prices to ensure that all individuals regardless of their economic status, have access to affordable and nourishing food.

Conclusions

1. Ukraine's Position in Global Trade and Food Security: Ukraine with its robust agricultural sector holds a prominent position in international trade, significantly contributing to its GDP. As a major exporter, Ukraine's agricultural produce doesn't only underpin its economy but also stabilizes global food prices. The country's fertile land and modernization efforts have made it a top global producer of commodities such as wheat, maize and sunflower oil. However, war-induced disruptions in Ukraine have rippled through international markets. Damage to infrastructure and trade routes has led to gaps in the

global supply chain, amplifying food insecurities, especially in countries that heavily rely on Ukrainian exports of these vital commodities.

2. Humanitarian and Global Food Market Impact: The war has resulted in significant loss of life and the humanitarian crisis in Ukraine while also affecting global food markets. It has led to increased world prices, food inflation and reduced food access in countries reliant on Ukrainian imports. Prolonged conflict threatens global food sufficiency, especially for low-income nations dependent on imports. Ukraine's food exports can address this challenge by providing a dependable source of affordable, high-quality food production to countries worldwide.

3. The Black Sea Grain Initiative: The establishment of the Black Sea Grain Initiative was a critical step in reopening Ukraine's ports for agricultural exports. This agreement allowed to ensure the safe passage of Ukrainian grain cargoes. It played a crucial role in restoring Ukraine's ability to export grain and stabilizing world food prices despite the difficulties. Despite Russia's withdrawal from the Black Sea Grain Initiative, the export of Ukrainian agricultural products via the Black Sea should continue. International security guarantees and military deterrence against Russian aggression and threats to cargo ships should ensure the ongoing operation of the grain corridor and access of Ukrainian food to international markets. Simultaneously, enhancing the protection of port infrastructure from missile attacks is also one of the strategic priorities for preserving Ukraine's export potential, which is another key issue to be discussed at the international peace summit in Switzerland.

4. Strategies for Enhanced Global Food Security: Global food security is confronted with an intricate interplay of factors: from population growth and climate change to political instability and economic shocks. The war in Ukraine intensified these pre-existing challenges, pushing food prices higher and causing further instability in international markets. Overcoming these challenges requires international cooperation, a focus on diversifying supply chains and investing in sustainable agricultural practices. Initiatives that promote resilience in food production systems along with diplomatic efforts to reduce trade barriers and conflicts can pave the way for a more secure global food future. At the same time, strengthening the protection of the port infrastructure against missile attacks is also one of the strategic priorities of preserving Ukraine's export potential,

5. State Regulation and Support: In the context of global food security, Ukrainian grain exports have emerged as a cornerstone in international trade. Recognizing these stakes, during martial law, Ukraine advanced its foreign economic strategy by simplifying and digitizing customs procedures. This not only streamlined grain exports but also strengthened Ukraine's position on the global stage. Furthermore, state initiatives like the "Affordable Loans 5-7-9%" program underscore the nation's dedication to its agricultural sector. By offering financial assistance to its producers Ukraine is not only stimulating domestic production, but also strengthening its commitment to addressing global food security challenges. The constant evolution of international trade dynamics underlines the importance of proactive state regulation and support for Ukraine in this area.

6. Future Challenges: Preserving the logistic routes of grain export remains a priority for Ukraine and the international community. The ongoing conflict and its ripple effects underscore the need for resilient mechanisms to ensure food availability, access and stability on a global scale.

7. Impact on Global Architecture of World Security: Russia's invasion has not only jeopardized global food security but also undermined the post-World War II global security and peace framework. It has revealed vulnerabilities in the global security system, necessitating comprehensive measures to prevent future aggression against sovereign nations. Obviously, relying on traditional measures alone will not be enough. International legal mechanisms and institutions which demonstrated their inadequacy and inefficiency in preventing and resistance such global challenges are needed to be reformed. The proactive approach that includes strengthening alliances, expanding diplomatic dialogue and rethinking international institutions is vital to ensure a more sustainable and secure world order in the future.

In summary, the war in Ukraine has had far-reaching consequences on global food security, highlighting Ukraine's crucial role in supplying essential food commodities, especially to low-income countries and international development organizations. It has revealed vulnerabilities in the global food security system and highlighted the need for continued efforts to ensure food access for millions of people worldwide.

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ЕКСПОРТ УКРАЇНСЬКОГО ЗЕРНА: ПРОБЛЕМИ ТА МЕХАНІЗМИ ЗАБЕЗПЕЧЕННЯ ГЛОБАЛЬНОЇ ПРОДОВОЛЬЧОЇ БЕЗПЕКИ

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У світі, де продовольча безпека є критичною проблемою, вплив геополітичних конфліктів на глобальні поставки продовольства не можна недооцінювати. Одним із наслідків війни в Україні є загроза глобальної продовольчої кризи через руйнування та блокаду експортної інфраструктури та логістики України, що ставить під загрозу крихкий баланс виробництва та розподілу продовольства у світі. Незважаючи на те, що військові дії обмежуються територією України, їхній вплив поширився далеко за межі регіону. Тому ця стаття заглиблюється в ці багатогранні наслідки, аналізуючи не лише проблеми в аграрному секторі України та їх хвильовий вплив на міжнародну торгівлю, але й гуманітарні, економічні та політичні аспекти, які підкреслюють ці проблеми. У ньому досліджується, як військовий конфлікт порушує сільськогосподарський сектор України та міжнародну торгівлю, впливаючи на мільйони людей, які залежать від поставок українського зерна. У статті висвітлено значення України як великого світового постачальника продовольства, зокрема у виробництві пшениці, кукурудзи, соняшникової олії та інших товарів. Також розглядаються механізми, запроваджені для забезпечення українського експорту продовольства, включаючи Чорноморську зернову ініціативу, та виклики, з якими стикаються у зв'язку з відкриттям українських портів для експорту. Показано, що попри вихід Росії з Чорноморської зернової ініціативи, експорт української агропродукції через Чорне море продовжується. Обґрунтовано, що посилення захисту портової інфраструктури від ракетних атак, також є одним зі стратегічних пріоритетів збереження експортного потенціалу України. І це є ще однією з ключових проблем для обговорення на міжнародному Саміті миру в Швейцарії. Проаналізовано стратегічні ініціативи України, які сприяють стійкості систем виробництва продовольства та поряд із дипломатичними зусиллями можуть сприяти формуванню більш безпечного глобального продовольчого майбутнього. Окреслено основні напрями державного регулювання та підтримки експортного потенціалу, зокрема аграрного сектору економіки, шляхом спрощення митних процедур, фінансової та економічної підтримки виробників зернової продукції. Авторами означено виклики майбутнього глобальній продовольчій безпеці та їх вплив на глобальну архітектуру світової безпеки.

Ключові слова: міжнародна торгівля, експорт продовольства, механізми державного регулювання, глобальна продовольча безпека, продовольча криза, Чорноморська зернова ініціатива, спрощення митних процедур, державна підтримка експортерів.