

UDC 327.5:339.5
DOI: 10.46493/2663-2675.34(4).2024.55

Cholpon Toktosunova*

PhD in Economics, Associate Professor

M. Ryskulbekov Kyrgyz Economic University

720033, 58 Togolok Moldo Str., Bishkek, Kyrgyz Republic

<https://orcid.org/0000-0001-6931-7880>

Karim Sattarov

Doctor of Technical Sciences, Associate Professor

Gulistan State University

120100, 4 City district, Gulistan, Uzbekistan

<https://orcid.org/0000-0002-3847-0660>

The 2022 food crisis: Big politics and market uncertainty

Abstract. The purpose of this study was to analyse the political and economic factors that led to the aggravation of the global food crisis in 2022 and to assess the effectiveness of international mechanisms to overcome it. The study found that the Russian-Ukrainian war, the energy crisis, and macroeconomic instability were the key factors behind the crisis. It was found that the blocking of Ukrainian ports and restrictions on grain exports from Ukraine and Russia led to a significant shortage on the world market and a rapid rise in food prices. The analysis showed that rising energy prices led to an increase in production costs in the agricultural sector, especially for fertiliser production, which had a negative impact on the cost of agricultural production. High global inflation and exchange rate fluctuations were found to have put additional pressure on food markets, especially in developing countries. The study found that high market uncertainty and increased financial speculation in agricultural markets led to increased price volatility and a disconnect between stock prices and fundamental supply and demand factors. It was found that the introduction of export restrictions by many agricultural producing countries further increased market uncertainty and led to further price increases on the world market. The analysis of the effectiveness of policy decisions and international initiatives showed that national measures, such as increased public food purchases and expanded social support programmes, helped stabilise internal markets, but their effectiveness varied depending on the economic capacity of each country. It was found that international organisations played a key role in coordinating global efforts to overcome the crisis, but the effectiveness of their actions was often limited by the difficulty of access to conflict zones and insufficient funding. The practical significance of the obtained findings lies in the possibility of their use for forecasting the political and economic situation in the context of future food crises

Keywords: global security; agricultural production; export restrictions; energy crisis; macroeconomic instability; inflation; currency fluctuations

Introduction

The global food crisis of 2022 has become one of the most acute challenges for the international community, revealing deep structural problems in the global food production and distribution system. This crisis has exacerbated the issue of food security, especially for the most vulnerable segments of the population, and demonstrated the close relationship between geopolitical processes, economic factors, and the provision of basic human needs. The study of this topic is of critical significance considering its multifaceted impact on global stability, economic development, and social justice. The 2022 food crisis not only

threatened the achievement of the UN Sustainable Development Goals, specifically the end of hunger, but also created preconditions for political instability in many regions of the world. This necessitates a comprehensive analysis of the causes, consequences, and possible solutions to the crisis through the lens of political science discourse.

The problematic of this study lies in identifying the complex interplay of political, economic, and social factors that led to the aggravation of the food crisis in 2022. Particular attention should be paid to the impact of geopolitical tensions, namely the Russian-Ukrainian war, on

Received: 16.05.2024, Revised: 04.08.2024, Accepted: 26.08.2024

Suggested Citation:

Toktosunova, Ch., & Sattarov, K. (2024). The 2022 food crisis: Big politics and market uncertainty. *Foreign Affairs*, 34(4), 55-67. doi: 10.46493/2663-2675.34(4).2024.55.

*Corresponding author



Copyright © The Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (<https://creativecommons.org/licenses/by/4.0/>)

global food supply chains. Furthermore, it is important to investigate the role of market uncertainty and speculative factors in exacerbating the crisis, as well as to assess the effectiveness of international mechanisms for responding to food challenges. The global food crisis of 2022 has been the subject of intensive scientific research covering a wide range of its aspects and consequences. The analysis of the available literature reveals the complex nature of the problem and emphasises the need for an interdisciplinary approach to its investigation.

In the context of price dynamics on the world wheat markets, a study by W. Martin & N. Minot (2022) deserves attention. The researchers focused on the impact of price isolation policies on global wheat markets during the 2022 food crisis. Their study has revealed significant implications for global trade and price stability, highlighting the need for a more coordinated international approach to managing price shocks. At the same time, F. Su *et al.* (2023) presented a comprehensive analysis of the relationship between economic and political uncertainty and food security. The heterogeneous assessment framework they propose opens new perspectives for understanding the complex interactions between economic decisions and their impact on food availability. This study highlights the significance of considering multiple factors when formulating food security policies. J. Clapp (2023) investigated the root causes of the vulnerability of the global industrialised food system. The researcher covered the critical aspects of the concentration of power in the food industry and its role in exacerbating the crisis. This study questions the sustainability of the current model of global food production and calls for a rethinking of the system's structural foundations.

Developing the theme of social movements in the context of global food crises, N. McKeon (2024) offers an analysis of the strategies of rural social movements. The researcher examined alternative approaches to overcoming the crisis of capitalism that have a direct impact on food security. This study highlights the significance of accommodating the voice of rural communities in shaping global food policy. Of particular relevance is the analysis of the impact of the war in Ukraine on global agricultural markets presented by T. Glauben *et al.* (2022). The researchers emphasise the need for openness to global trade as a key mechanism for overcoming the crisis caused by geopolitical turmoil. This study highlights the interdependence of global markets and the significance of international cooperation in ensuring food security.

Continuing the theme of geopolitical risks, F. Saâdaoui *et al.* (2022) investigated the causal relationship between geopolitical risks and food prices, focusing on the Russia-Ukraine conflict. Their study demonstrates how political developments can have far-reaching consequences for global food security, highlighting the need to develop mechanisms to mitigate such risks. In the European context, M.F. Rabbi *et al.* (2023) covered the food security challenges posed by the ongoing Russian-Ukrainian conflict. The researchers analysed the multifaceted consequences of the conflict for European countries, emphasising the need to adapt food security policies to new geopolitical realities.

To conclude the review, it is worth paying attention to the study by C. Hebebrand & D. Laborde Debucquet (2023),

which focused on the impact of high fertiliser prices on global food security. This study highlighted an important aspect of the relationship between different sectors of agricultural production and their combined impact on food availability. The analysis of the studies reveals a series of unresolved issues that require further investigation. Specifically, the impact of digital technologies on the transformation of global food supply chains in times of crisis is still understudied. Furthermore, the role of local food systems in ensuring resilience to global shocks needs to be analysed in greater depth. A significant aspect that has not received due attention is the impact of climate change on the aggravation of the food crisis in 2022 and its interaction with geopolitical factors.

The purpose of this study was to analyse the political and economic factors that led to the aggravation of the global food crisis in 2022 and to assess the effectiveness of international mechanisms to overcome it. To fulfil this purpose, the following objectives were set: to identify the key geopolitical and economic factors that triggered the aggravation of the food crisis in 2022; to analyse the impact of market uncertainty and speculative factors on the dynamics of world food prices; to assess the effectiveness of policy decisions and international initiatives aimed at mitigating the effects of the food crisis.

Materials and Methods

The study of the 2022 food crisis was conducted based on a comprehensive analysis of a wide range of sources and materials, which helped to comprehensively consider the problem and identify the key factors of its emergence and development. The source base was based on official documents and reports of international organisations. Specifically, the reports of the Food and Agriculture Organisation of the United Nations (FAO) were analysed, including the State of Food Security and Nutrition in the World 2023 (UNICEF, 2023) and the FAO Food Price Index (2022). These materials provided key statistical information on the dynamics of food prices and the state of global food security. To assess the macroeconomic context of the crisis, data and forecasts of the International Monetary Fund were used, specifically the report "Navigating global divergences" (International Monetary Fund, 2023), which provided valuable information on global economic trends and their impact on food security.

The analysis of the geopolitical aspects of the crisis was based on the official statements and communiqués of the governments of countries that play a key role in the global food system. Specifically, the study considered the decision of the Government of India to ban wheat exports and measures taken by the Government of Kazakhstan to regulate prices for socially important food products (Measures taken by the Republic of Kazakhstan..., 2022). Regulatory documents governing international trade in agricultural products have become an important source of information. The provisions of The General Agreement on Tariffs and Trade (1947; 1994) and the Agreement on Agriculture (1995) of the World Trade Organisation were analysed, which helped to assess the legal aspects of trade restrictions imposed during the crisis. To investigate the impact of the energy crisis on food security, the International Energy Agency's data on the dynamics of energy

prices and their impact on agricultural production was used (How Europe can..., 2022).

The study compared the measures taken by different countries to overcome the consequences of the food crisis. Specifically, social support programmes such as Bolsa Família in Brazil (de Arruda, 2023) were compared with analogous initiatives in other countries. This helped to identify common and distinctive features in approaches to food security at the national level. To assess the effectiveness of international mechanisms for responding to the crisis, the activities of key international organisations such as the UN World Food Programme (WFP at a Glance, 2024) and the Committee on World Food Security (CFS voluntary guidelines..., 2021) were analysed. Particular attention was paid to the study of new initiatives aimed at overcoming the crisis, namely the International Monetary Fund's Food Shock Assistance Window (2022).

The study examined the interconnections between geopolitical, economic, and market factors that have influenced the development of the food crisis. This helped to identify the complex cause-and-effect relationships between different aspects of the crisis and assess their comprehensive impact on global food security. To investigate the impact of market uncertainty and speculative factors on the dynamics of food prices, the study analysed data from commodity exchanges, namely the Chicago Mercantile Exchange, on futures quotes for major crops. The study focused on the analysis of regional initiatives to overcome the food crisis. Specifically, the activities of The Comprehensive African Agriculture Development Programme (2024) (CAADP) and The Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS) 2021-2025 (2020) were reviewed. This helped to assess the effectiveness of regional approaches to addressing food security issues. To ensure the objectivity and comprehensiveness of the study, a wide range of scientific publications covering various aspects of the 2022 food crisis were used. The study analysed the impact of geopolitical conflicts on food security, the role of financial speculation in exacerbating the crisis, and the effectiveness of political solutions to overcome its consequences.

Results

Key geopolitical and economic factors that will exacerbate the food crisis in 2022. The Russian-Ukrainian war, which entered a full-scale phase on 24 February 2022, has become a key geopolitical factor that has triggered a sharp escalation of the global food crisis. Ukraine and Russia play a critical role in the global production and export of agricultural products, particularly grain crops. According to the Food and Agriculture Organisation of the United Nations, Ukraine and the Russian Federation are key suppliers of food and agricultural products to world markets. The outbreak of the full-scale invasion in Ukraine has raised significant concerns about its implications for global food security, especially as the world was on the road to recovery from the COVID-19 pandemic (174th session of the..., 2023).

The hostilities in Ukraine initially led to the suspension of private grain and processing operators and the cessation of all commercial shipping operations. This caused serious disruptions in production and logistics chains,

blocking of Black Sea ports, and factual cessation of exports of Ukrainian agricultural products.

However, thanks to the introduction of the EU's "solidarity corridors" and the Black Sea Grain Initiative (BSGI), exports from Ukraine have partially recovered. In the period from May 2022 to September 2023, this allowed for the export of more than 84 million tonnes of grain and other food products from the country (Chiotis, 2023). Despite these measures, the war continues to have a negative impact on global food security. According to the State of Food Security and Nutrition in the World (SOFI) 2023 (UNICEF, 2023), progress in the fight against hunger has been undermined by higher prices for food, energy, and agricultural inputs, exacerbated by the war in Ukraine. The report predicts that by 2030, about 23 million more people will face chronic hunger compared to the scenario if the war had not taken place.

Prior to the full-scale war, Ukraine was the fourth largest exporter of maize in the world after the United States, Brazil, and Argentina, while at the end of 2021 it became the fourth largest supplier of food to the EU (Chiotis, 2023). According to the Kyiv School of Economics, over 400 million people worldwide depend on Ukrainian grain supplies. Blocking the export of Ukrainian agricultural products through Black Sea ports has led to a considerable reduction in supply on the world market and a rapid rise in prices (KSE, 2022). According to the FAO, world food prices in March 2022 reached their highest level on record, increasing by 12.6% compared to February (FAO Food Price..., 2022). This sharp rise in prices has threatened the food security of millions of people, especially in developing countries that rely heavily on food imports from Ukraine and Russia. Disruptions to global food supply chains as a result of war have long-term implications for the global economy and geopolitical stability. The war has not only caused a humanitarian crisis in Ukraine, but also threatens to exacerbate the global food crisis and hunger, as well as political instability in many regions of the world.

The energy crisis that unfolded in Europe and the world in 2022 was another important factor in the aggravation of the food crisis. The sharp rise in prices for natural gas, oil, and other energy sources has led to a considerable increase in production costs in the agricultural sector, which has affected food prices and the availability of food to consumers. As one of the world's largest energy exporters, Russia plays a key role in the global energy market. According to the International Energy Agency, in 2021, Russia accounted for about 45% of natural gas imports and 25% of oil imports to the European Union (How Europe can..., 2022). Military operations in Ukraine and subsequent international sanctions against Russia have substantially disrupted established energy flows and caused a sharp rise in energy prices. In 2022, Brent oil prices rose to over USD 100 per barrel, significantly exceeding experts' forecasts at the beginning of the year (EIA, 2022; Kilian *et al.*, 2024). This led to an increase in fuel costs for agricultural machinery and transportation of products, which directly affected the cost of food products.

The energy crisis has had a particularly acute impact on mineral fertiliser production, which is an energy-intensive process. According to the International Fertiliser

Association (IFA), nitrogen fertiliser prices more than doubled in 2022 compared to the previous year (Oxford Analytica, 2022). This has led to a reduction in fertiliser use by farmers and a potential decline in crop yields. The energy crisis has also affected food supply chains. The rise in fuel prices led to an increase in transport costs, which affected the final cost of food for consumers. E. Chiotis (2023) emphasises that disruption of logistics links and rising transport costs have become one of the key factors affecting global food security in the context of the Russian-Ukrainian war. Notably, the energy crisis and its impact on the agricultural sector have exposed the vulnerability of the global food system to external shocks and the need to develop more resilient and diversified energy and agricultural systems. This issue is of particular relevance in the context of international law and the commitments of countries to ensure food security consolidated in the UN Sustainable Development Goals (United Nations Sustainable..., 2015).

The aggravation of the food crisis in 2022 took place against the backdrop of a difficult macroeconomic situation in the world. High inflation, currency volatility, and the risk of economic recession have put additional pressure on the global food system and exacerbated the negative effects of the Russian-Ukrainian war on the global economy. Global inflation, which, according to the International Monetary Fund (IMF), reached 8.7% in 2022, has become one of the key factors in the aggravation of the food crisis (International Monetary Fund, 2023). This record-high inflation rate over the past decades has had a direct impact on the availability of food for people around the world, especially in developing countries. With global economic growth slowing from 3.5% in 2022 to a projected 3.0% in 2023 and 2.9% in 2024 (International Monetary Fund, 2023), the food crisis is taking on additional dimensions. The economic slowdown limits the ability of countries and international organisations to respond effectively to food security challenges. This problem is particularly acute in emerging and developing countries, where growth is expected to reach 4.0% in 2023 and 2024 (International Monetary Fund, 2023). These countries, which are often the most vulnerable to food crises, face a double challenge: the need to ensure food security in the face of economic slowdown and high inflation.

The IMF's forecasts of a gradual decline in global inflation to 6.9% in 2023 and 5.8% in 2024 (International Monetary Fund, 2023) indicate that pressure on food markets may ease. However, the expectation that inflation will not return to the target level by 2025 in most cases indicates that this crisis is likely to be long-lasting. In the context of grand policy and market uncertainty, monetary policy plays a key role. The IMF emphasises the significance of containing inflation expectations and effective communication strategies by central banks (Natsagdorj, 2023). These measures can help achieve disinflation with less disruption to production, which is crucial for the agricultural sector and food security. Thus, the 2022 food crisis is not only a consequence of direct disruptions in the supply chain, but also the result of complex macroeconomic processes. High inflation, slowing economic growth, and uncertain markets are creating an environment where food

security is becoming increasingly challenging, requiring coordinated action at the global level and effective economic policies at the national level.

The rise in inflation has had a particularly negative impact on the most vulnerable segments of the population, particularly in low-income countries. In countries such as Bangladesh, Myanmar, Kenya, and Nigeria, food expenditures account for more than half of total consumer spending. This makes these countries particularly sensitive to fluctuations in food prices on world markets (Chiotis, 2023). Currency fluctuations, especially the strengthening of the US dollar against other currencies, also affected pricing on the global food market. This has created additional difficulties for food importing countries, especially developing countries. In 2022, the US dollar index (DXY) rose by 8.2%, which led to higher import prices for many countries (FAQ on the U.S..., 2022).

The risks of an economic recession associated with the effects of the COVID-19 pandemic and geopolitical tensions have led to a decline in investment activity in the agricultural sector and a deterioration in the outlook for agricultural development in many countries. This situation has made it difficult for farmers to access the finance and technology they need to increase agricultural productivity (Ben Hassen & El Bilali, 2022). Notably, macroeconomic instability and its impact on food security threaten the performance of international commitments to end hunger and malnutrition, as prescribed in Sustainable Development Goal 2: End hunger, achieve food security, improve nutrition, and promote sustainable agriculture (United Nations Sustainable..., 2015).

The aggravation of the food crisis in 2022 is the result of a complex interaction of geopolitical, economic, and social factors. The Russian-Ukrainian war has become a catalyst that has revealed and exacerbated existing problems in the global food system. The energy crisis and macroeconomic instability have further complicated the situation, creating unprecedented challenges for global food security. This crisis has highlighted the need to re-think global approaches to food security and the development of more sustainable and diversified food production and distribution systems. It also stressed the significance of international cooperation and adherence to the principles of international law to address global challenges such as food security.

An analysis of the key factors that led to the aggravation of the global food crisis in 2022 demonstrates the complex interaction of geopolitical, economic, and social factors. The Russia-Ukraine war, the energy crisis, and macroeconomic factors have created unprecedented challenges for global food security, affecting food production, distribution, and availability on a global scale. For a more visual representation and comparison of the impact of these factors, a comparative Table 1 is presented below. This table summarises the key aspects of the impact of each factor, including the scale of impact, timeframe, key indicators, legal aspects, food security implications, and geopolitical implications. This systematisation offers a better understanding of the complex nature of the 2022 food crisis and highlights the need for a multidimensional approach to addressing it at the global level.

Table 1. Comparative analysis of the key factors of the food crisis in 2022

Factor	Impact of the Russian-Ukrainian war	Energy crisis	Macroeconomic factors
Key impact	Disruption of agricultural production and exports	Rising energy and fertiliser prices	Inflation and declining purchasing power
Scale of impact	Global, especially food importing countries	Global, especially energy-dependent countries	Global, greater impact on developing countries
Timeframe	Short- and long-term implications	Short- and medium-term implications	Medium- and long-term implications
Key indicators	Reduction in grain exports from Ukraine and Russia by 30%	Oil prices rise to >\$100 per barrel	Global inflation 7.2% in developed countries, 9.9% in developing countries
Legal aspects	Violation of international law	Need to review energy policy and international agreements	Challenges to implementing the UN Sustainable Development Goals
Implications for food security	Sharp rise in food prices, risk of famine in vulnerable regions	Rising food production costs	Reduced access to food for vulnerable groups
Geopolitical implications	Increased global tensions, risks of destabilisation in the regions	Rethinking energy dependence and international relations	Risks of social conflict and political instability

Sources: developed by the author of this study based on scientific and analytical publications United Nations Summit (2015), FAQ on the U.S. Dollar's Recent Trend (2022), Oxford Analytica (2022), EIA (2022), International Monetary Fund (2023), E. Chiotis (2023)

To summarise, the 2022 food crisis is a complex, multidimensional phenomenon caused by the interaction of geopolitical conflicts, economic shocks, and global macroeconomic trends. As Table 1 shows, each of the factors considered – the Russian-Ukrainian war, the energy crisis, and macroeconomic factors – has its unique and far-reaching implications for global food security. This crisis has exposed critical vulnerabilities in the global food production and distribution system, highlighting the need to develop more resilient and adaptive approaches to food security. Addressing this crisis will require coordinated international efforts, innovative policy solutions, and a rethinking of global food systems to ensure their resilience to future challenges.

Analysis of the impact of market uncertainty and speculative factors on the dynamics of world food prices. Global food prices in 2022-2023 are characterised by unprecedentedly high volatility, which is the result of a combination of factors, including the Russian-Ukrainian war, the COVID-19 pandemic, and climate change. According to the FAO Food Price Index (2022), which reflects changes in international prices for a basket of food commodities, reached record levels of volatility in 2022. Grain prices, particularly wheat and maize, are particularly volatile. A. Nimani & D. Spahija (2023) note that commodity price volatility during the war in Ukraine increased from 35% to 85%, which is considerably higher than in previous years. This is explained by the changing role of commodities in the financial sector of the market and the overall profitability system. An analysis of wheat prices on the Chicago Mercantile Exchange shows that in March 2022, prices rose by more than 50% compared to the beginning of the year, reaching their highest levels in the last 14 years (Daily Market Wire..., 2022). This volatility poses considerable challenges for market participants, governments, and international organisations trying to ensure the sustainability of food systems. Notably, high volatility of food prices violates the principles of stability and predictability of international trade enshrined in The General Agreement on Tariffs and Trade (1947) and

the World Trade Organisation (WTO) agreements. This contradicts the objectives of the WTO Agreement on Agriculture (1995), which aims to create a fair and market-oriented system of agricultural trade.

The high level of uncertainty in the global food market has created favourable conditions for increased financial speculation. The growth in trading volumes of agricultural futures contracts led to increased price volatility and a decoupling of stock exchange quotations from fundamental supply and demand factors. A. Nimani & D. Spahija (2023) emphasise that increased speculative activity in commodity markets leads to increased price volatility and creates additional risks for the real economy. The researchers note that “the volatility effect and its accompanying elements are associated with increased geopolitical risk”. Notably, excessive speculative activity in commodity markets may be considered a violation of the principles of fair competition enshrined in Article VI of the General Agreement on Tariffs and Trade (1994). Furthermore, this may contradict the objectives of the Agreement on the Application of Sanitary and Phytosanitary Measures (1994), which aims to protect consumer health and safety.

In response to rising prices and the risk of food shortages, many agricultural exporting countries have introduced trade restrictions and export quotas (Smith & Glauber, 2020). These measures, while aimed at ensuring domestic food security, have put additional pressure on global prices and increased market uncertainty. S. Akter (2022), in his review of the effects of food export restrictions, notes that such measures can have mixed effects on the internal markets of exporting countries. The researcher emphasises that “food export restrictions, if they successfully reduce or stabilise food prices, are expected to benefit net food buyers but lead to a loss of income for net food sellers”.

According to the World Bank, as of June 2022, 34 countries have imposed restrictions on food exports (Espitia *et al.*, 2022). Specifically, India, the world's second-largest wheat producer, banned the export of this crop, which led to a sharp jump in prices on the global market. Such trade

restrictions can have negative consequences not only for the global market but also for the economies of the countries that impose them. The researchers emphasise that “the combination of Western sanctions and Russian countermeasures will continue to create complex dilemmas for corporations with global operations, especially those with Russian ties” (Nimani & Spahija, 2023). Notably, that the imposition of export restrictions may be considered a violation of Article XI of the General Agreement on Tariffs and Trade (1994), which prohibits quantitative restrictions on exports and imports. Furthermore, such measures may be contrary to the principles of non-discrimination and national treatment enshrined in Articles I and III.

The analysis of the impact of market uncertainty and speculative factors on the dynamics of global food prices demonstrates the complexity and interconnectedness of the processes taking place in the global food market. High price volatility, increased speculative activity, and the introduction of trade restrictions pose considerable challenges to global food security and international trade

stability. In this context, the need to strengthen international cooperation and coordination to overcome the food market crisis is of particular significance. This concerns the development of mechanisms for early warning of price shocks, improvement of systems for monitoring and regulating financial speculation in commodity markets and finding a balance between ensuring national food security and adherence to free trade principles.

To systematise and visualise the impact of various factors on the dynamics of world food prices, comparative Table 2 was developed. This table summarises the key aspects of the impact of three key factors: price volatility, financial speculation, and trade restrictions. Each of these factors is considered in terms of its underlying cause, mechanism of influence, scale and duration of impact, legal aspects, food security implications, and economic consequences. Such a structured presentation allows for a better understanding of the complex nature of the problem and the interrelationships between the various factors affecting the global food market.

Table 2. Comparative analysis of factors influencing the dynamics of world food prices

Factor	Price volatility	Financial speculation	Trade restrictions
Key reason	Geopolitical instability, pandemic, climate change	Market uncertainty, search for high returns	Ensuring internal food security
Mechanism of influence	Sharp fluctuations in supply and demand	Decoupling of stock market quotes from fundamental factors	Reduced supply in the global market
Scale of impact	Global, especially grain markets	Global, especially futures markets	Regional and global
Duration of exposure	Short- and medium-term	Short-term	Short- and medium-term
Legal aspects	Violation of the stability principles of the General Agreement on Tariffs and Trade (1947)/WTO	Possible violation of fair competition principles	Violation of Article XI of the General Agreement on Tariffs and Trade (1994)
Implications for food security	Reduced access to food for vulnerable groups	Increased price risks for producers and consumers	Risk of shortages in importing countries
Economic consequences	Decreased investment attractiveness of the agricultural sector	Outflow of resources from the real economy	Loss of export revenues, disruption of supply chains

Source: created by the author of this study

To summarise the impact of market uncertainty and speculative factors on the dynamics of global food prices, the current global food market is characterised by a complex interaction of various factors that pose significant challenges to stability and food security. As shown in Table 2, price volatility, financial speculation, and trade restrictions have different causes, mechanisms of influence and consequences, but they all contribute to increased market instability. It is particularly important to note that these factors not only have economic consequences, but also create legal conflicts in the international trade system. This underscores the need for a comprehensive approach to solving problems in the global food market that factors in both economic and legal aspects. Further research and international cooperation in this area should be aimed at developing effective mechanisms to stabilise prices, regulate financial speculation, and harmonise trade policies to ensure the sustainable development of the global food system.

Measures taken by national governments to ensure food security. In response to the worsening global food crisis caused by the Russian-Ukrainian war, the COVID-19 pandemic and climate change, many national governments have taken a series of measures to ensure food security and stabilise prices on internal markets. Increase public procurement of food and build up strategic stocks. For instance, the government of Egypt, the world’s largest wheat importer, has increased public procurement and expanded its bread subsidy programme to cover another 500,000 citizens (Abdalla *et al.*, 2022). Such actions are aimed at ensuring the availability of basic foodstuffs for the population in the face of rising global grain prices. Providing subsidies and financial support to the agricultural sector. Many countries have introduced farmer support programmes to stimulate internal food production (Musagaliev & Dustova, 2023). For example, the Indian government plans to allocate an additional 4 trillion rupees (about 48 billion USD) in 2024 to subsidise

food and fertiliser for farmers (Sarita & Mayank, 2024). Introduce price regulation mechanisms for basic food-stuffs. In March 2022, Kazakhstan introduced temporary price regulation for socially important food products, including bread, cereals, sugar, and oil (Measures taken by the Republic of Kazakhstan..., 2022). This decision was made following the Law of the Republic of Kazakhstan No. 544 (2004) to curb inflation and ensure the availability of basic products for the population. Expanding social support and food aid programmes for vulnerable groups of the population. Many countries have strengthened existing or introduced new social protection programmes. For example, in Brazil, the Bolsa Família food aid programme was expanded, increasing the number of beneficiaries and the amount of payments (de Arruda, 2023). This programme is a key tool in the fight against hunger and poverty in the country and is in line with Brazil's commitment to the UN Sustainable Development Goals, namely Goal 2, "End hunger" (United Nations Sustainable..., 2015).

Imposing export restrictions on key food products. Some countries have restricted or banned exports of certain agricultural products to meet internal needs. For instance, in May 2022, India banned wheat exports, which led to a considerable increase in world prices for this commodity (Rajendra *et al.*, 2022). Such actions, although aimed at ensuring internal food security, may have negative consequences for the global market and contradict the principles of free trade enshrined in the General Agreement on Tariffs and Trade (1947; 1994) and WTO agreements.

The effectiveness of these measures varies depending on the concrete conditions of each country and the global economic situation. B. Kemmerling *et al.* (2022) note that "the effectiveness of government interventions to ensure food security in conflict depends on the government's ability to control territory, provide access to resources, and support the functioning of market mechanisms". Notably, some of these measures, especially export restrictions, may have negative consequences for global food security. M.B. Rother *et al.* (2022) emphasise that "export restrictions can lead to further price increases on the world market and increased volatility, which is particularly detrimental to food importing countries". International organisations play a key role in coordinating global efforts to overcome the food crisis and aid the most vulnerable countries. Their principal activities include monitoring the situation on the world food market and early warning of risks, providing emergency food aid to countries in critical situations, mobilising financial resources to support food security in developing countries, and developing policy recommendations in the field of food security and agriculture.

The Food and Agriculture Organisation of the United Nations (FAO) regularly publishes reports on the state of food security in the world and forecasts for the production and consumption of major crops. The Global Food Market Information System (AMIS), established at the initiative of the G20 in 2011, provides prompt data exchange and analysis of the situation on the wheat, maize, rice, and soybean markets (Global Food Market..., n.d.). The United Nations World Food Programme (WFP) is the leading humanitarian organisation providing food aid in emergencies. In 2022, WFP plans to assist 151.6 million people in 120 countries and territories (WFP, 2024). The

WFP's activities are governed by the Food Assistance Convention (2012), which sets out the minimum annual commitments of the parties to provide food aid.

In April 2022, the IMF created a new mechanism, the Food Shock Window, under the Rapid Financing Facility to provide emergency aid to countries adversely affected by rising food and fertiliser prices (International Monetary Fund, 2022). The World Bank has announced a 30 billion USD commitment to support global food security over 15 months starting in April 2022 (World Bank Group, 2024). The Committee on World Food Security (CFS) is the leading international platform for developing policy recommendations and sharing experiences in the field of food security. In February 2021, the CFS adopted the Voluntary Guidelines on Food Systems and Nutrition, which provide guidance on policies and actions to improve food systems and food security (CFS voluntary guidelines..., 2021). The effectiveness of international organisations depends on many factors, including the level of funding, the political will of member states, and the ability to coordinate the efforts of different actors. International organisations play a critical role in ensuring global food security, especially in times of crisis, but their effectiveness is often limited by insufficient funding and difficulty in accessing conflict zones (Rother *et al.*, 2022).

Regional initiatives and intergovernmental cooperation play a significant role in overcoming the food crisis, especially in the context of regional specificities and shared challenges. A few key examples of such initiatives. The CAADP (2024) was launched by the African Union in 2003 to improve food security and agricultural production in Africa. Under CAADP, member states have committed to allocating at least 10% of their national budgets to agricultural development. The initiative is in line with Sustainable Development Goal 2, Ending Hunger, and promotes regional integration in agricultural policy. The Association of Southeast Asian Nations (ASEAN) and its food security programmes. The ASEAN has several initiatives to strengthen regional food security, including The Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS) 2021-2025 (2020) and the ASEAN Rice Reserve (The ASEAN Plus..., 2023) for emergencies. These mechanisms are aimed at increasing the region's resilience to food crises and promoting cooperation between member countries. Regional Food Security Programme for the Caribbean. This programme, initiated by the Caribbean Community (CARICOM), aims to reduce the region's dependence on food imports and increase agricultural production. The programme includes measures to support smallholder farmers, develop the agro-industrial complex, and improve regional agricultural trade (Coherent Food Security..., 2010). The Common Agricultural Policy at a Glance (2023) is one of the most advanced examples of regional cooperation in agriculture and food security. In response to the global food crisis, the EU has taken a series of measures, including increased funding for rural development programmes and support for farmers. The effectiveness of these regional initiatives varies, but overall, they contribute to strengthening cooperation between countries and coordinating food security policies. M.S.U. Din *et al.* (2022) note that "regional initiatives can be particularly effective in addressing common food

security challenges, such as climate change and trans-boundary plant and animal diseases”. However, there are also certain challenges. The effectiveness of regional initiatives is often limited by differences in economic development between participating countries, political disagreements, and insufficient funding (Kemmerling *et al.*, 2022). Furthermore, in the context of the global crisis, countries may be prone to protectionist measures, which could undermine regional cooperation. Notably, the effectiveness of policy decisions and international initiatives to overcome the food crisis depends on a comprehensive approach that considers the interconnections between food security, climate change, and conflict.

For a better understanding of the multifaceted nature of measures aimed at overcoming the global food crisis,

it is advisable to consider them in a structured format (Table 3). The table below provides a panoramic overview of the strategies employed at the national, international, and regional levels. It not only highlights concrete initiatives, but also reveals their strengths and weaknesses, provides illustrative examples, and evaluates their effectiveness. Such systematisation helps to identify the complex interrelationships between different approaches and highlights the need for an integrated, multi-level response to food security challenges. The analysis of this table can serve as a starting point for developing more effective and adaptive strategies in the future. This table clearly demonstrates the multi-level nature of the response to the global food crisis, highlighting the advantages and disadvantages of each level of intervention.

Table 3. Comparative analysis of the effectiveness of measures to overcome the food crisis

Level	Events	Advantages	Disadvantages	Examples	Efficiency
National	- Increased public procurement of food. - Subsidies to the agricultural sector. - Price regulation – Expansion of social support programmes - Export restrictions.	- Quick response to a crisis. - Direct support for vulnerable groups. - Stabilisation of internal prices.	- Possible violation of free trade principles. - High cost for the budget. - Risk of distortion of market mechanisms.	- Ban on wheat exports in India (2022). - Expansion of the Bolsa Familia programme in Brazil.	High in the short term, but may have negative long-term effects.
International	- Monitoring and early warning. - Emergency food aid. - Mobilising financial resources. - Development of policy recommendations.	- Global scope of action. - Coordination of efforts of different countries. - Access to significant resources.	- Difficulty of access to conflict zones. - Dependence on the political will of donor countries. - Bureaucratic obstacles.	- WFP programmes. - The IMF’s “Food Shock Assistance Window”.	Average, depending on political situation and level of funding.
Regional	- Integrated agricultural development programmes. - Creation of regional food reserves. - Harmonisation of agricultural policy.	- Consideration of specific regional features. - Promotion of regional integration. - Joint addressing of cross-border issues.	- Differences in the economic development of the participating countries. - Political differences. - Limited funding.	- CAADP in Africa. - The EU’s Common Agricultural Policy.	High with effective cooperation of participating countries, but implementation often faces difficulties.

Source: created by the author of this study

At the national level, governments have the greatest flexibility in responding to the crisis, but their actions can have negative consequences for the global market. For instance, India’s decision to ban wheat exports in May 2022, although aimed at ensuring internal food security, led to a sharp rise in global grain prices (Rajendra *et al.*, 2022). International organisations play a key role in coordinating global efforts and providing aid to the most vulnerable countries. However, their effectiveness is often limited by political factors and the difficulty of accessing conflict zones. For example, in Yemen, where the civil war is ongoing, humanitarian organisations face significant difficulties in delivering food aid to the population suffering from hunger (WFP, 2022). Regional initiatives can be particularly effective in addressing common food security challenges, but their success depends on the level of cooperation between the participating countries. For instance, the CAADP (2024) has made some advance in stimulating investment in the agricultural sector, but not all participating countries are meeting their commitment to allocate 10% of national budgets to agricultural development.

Overcoming the global food crisis requires a comprehensive approach that considers the interconnections between food security, climate change, and conflict. B. Kemmerling *et al.* (2022) emphasise the need to “integrate food security into the broader context of humanitarian aid, development, and peacebuilding”. This requires increased coordination between various international agencies and national governments, as well as the development of innovative approaches to addressing complex crisis situations. It is also important to note the role of the private sector and civil society in overcoming the food crisis. The involvement of the private sector and non-governmental organisations can contribute to innovation and increase the effectiveness of food security interventions. An example of such cooperation is the Scale for Resilience (2023) initiative, launched in partnership with private companies and governments to support smallholder farmers in adapting to climate change.

In summary, an effective response to the global food crisis requires coordinated action at the national, international, and regional levels, considering the complex interrelationships between food security, conflict, and climate

change. It is necessary to continue developing innovative approaches and cooperation mechanisms that will allow for a more effective response to future crises and increase the resilience of the global food system.

Discussion

The results of the 2022 food crisis study revealed a complex interaction of geopolitical, economic, and market factors in shaping global food security. The Russian-Ukrainian war, the energy crisis and macroeconomic instability have been key factors that have disrupted supply chains, increased prices, and worsened access to food in many parts of the world. These findings echo the opinions of other researchers, but also reveal new aspects and interconnections in the context of the global food system.

The geopolitical dimension of the crisis, specifically the impact of the Russian-Ukrainian war, has become a central topic of many studies. S.K. Wegren (2023) confirmed the decisive role of this conflict in exacerbating the global food crisis. However, in contrast to the presented findings, Author focused on long-term structural problems of the global food system, such as the uneven distribution of resources and technologies between developed and developing countries. This broadens the context for understanding the 2022 crisis, pointing to its underlying causes that reach beyond current geopolitical events. At the same time, the findings presented in this study offer a more detailed consideration of the economic mechanisms of the war's impact on global food supply chains. Specifically, it was demonstrated how the blocking of Ukrainian ports and disruption of grain export flows led to a sharp rise in prices for wheat and other grain crops. This complements S.K. Wegren's (2023) analysis by showing the concrete ways in which geopolitical conflict is transformed into a global food crisis.

The financialisation of the global food system has emerged as another significant aspect of the crisis that needs to be studied in greater depth. M. Fama & M. Conti (2022) covered the mechanisms through which financial instruments and speculative capital affect the volatility of agricultural prices. Their conclusions correlate with the findings presented in this study regarding the impact of market uncertainty and speculative factors on the aggravation of the crisis. However, unlike M. Fama & M. Conti (2022), who focus mainly on financial aspects, the current findings offer a more comprehensive view, considering the interaction of financial factors with geopolitical and macroeconomic factors. This helps to better understand how the financialisation of the food system interacts with other crises, creating a complex pattern of causality.

S. van Huellen & T. Ferrando (2023) investigated the economic consequences of the crisis and the distribution of benefits among different market participants. Their study covered the mechanisms through which large agribusiness corporations and financial institutions benefit from the crisis, exacerbating the negative effects on those most vulnerable. This complements the findings presented in this study, which focus mainly on the macroeconomic aspects of the crisis. The comparison of these approaches helps to get a more comprehensive picture of the economic consequences of the crisis at various levels, from global to local. Specifically, it is becoming clear that

macroeconomic indicators such as inflation and exchange rate fluctuations have different impacts on different market participants. Large corporations can often use crises to strengthen their market positions, while small producers and consumers endure most of the negative effects.

The concept of "economics for an uncertain world" proposed by G. DeMartino *et al.* (2024), opens new perspectives for understanding the food crisis. The researchers emphasise the need to develop more flexible and adaptive mechanisms for responding to global crises, which resonates with the conclusions presented. However, unlike G. DeMartino *et al.* (2024), who focus on the general principles of economic analysis under uncertainty, the current findings offer a more concrete consideration of the mechanisms of influence of geopolitical factors on food security. This difference in approach highlights the need to integrate theoretical concepts with empirical analysis of particular crisis phenomena. The development of new methodological approaches to the study of food crises in the context of high uncertainty and interdependence of global systems stays a major task for further research.

M. Adjemian *et al.* (2022) discussed the impact of trade policy on the dynamics of agricultural prices. Their conclusions about the negative impact of export restrictions on global food security confirm the results presented in this study. However, the researchers propose a more detailed econometric analysis of these effects, which complements the qualitative approach presented in this study. This comparison highlights the significance of combining different methodological approaches to obtain a complete picture of the crisis. Quantitative analysis helps to identify concrete patterns and assess the extent of the impact of various factors, while a qualitative approach helps to understand the context and mechanisms of interaction between different elements of the global food system.

C. Hebebrand & D. Laborde Debucquet (2023) investigated the role of the fertiliser market in exacerbating the food crisis. Their study covered the mechanisms of the energy crisis' impact on the agricultural sector through the fertiliser market, which complements the current findings. Specifically, the researchers proposed a more detailed analysis of supply chains and production costs in agriculture. This demonstrates the complexity of the relationships between different sectors of the economy in the context of the global crisis. The energy crisis, which at first may seem to be separate from food issues, is actually having a profound impact on the agricultural sector through the pricing mechanisms for key inputs such as fertilisers. This underscores the need for a systematic approach to analysing and resolving global crises.

M. Blessley & S.M. Mudambi (2022) studied the resilience of food supply chains in times of crisis. Their study, which examined the impact of trade wars and the COVID-19 pandemic on food banks, complements the findings presented in the current study by addressing the operational aspects of supply chain management. This contrasts with the focus on macroeconomic and geopolitical factors presented in this study. The integration of these approaches offers a better insight into the mechanisms for ensuring the sustainability of food systems at different levels – from global to local. Specifically, it is becoming clear that an effective response to global crises requires

not only macroeconomic and political measures, but also optimisation of operational processes at the level of individual organisations and supply chains.

K. Anderson (2022) discussed the relationship between trade policy, climate change, and food security. His findings resonate with the results presented on the impact of trade restrictions on the global food system. However, author pays more attention to long-term trends and climatic factors, while the presented results focus on short-term shocks caused by geopolitical conflicts and economic crises. This underscores the need to integrate short- and long-term analysis to develop effective strategies for global food security. Climate change, which has been unfolding for decades, creates a background context against which more acute crises, such as wars and economic shocks, are superimposed. Understanding these interactions is key to developing resilient and adaptive food systems.

In summary, the presented findings of the 2022 food crisis study, focusing on the interaction of geopolitical, economic, and market factors, offer a comprehensive view of the problem, which is complemented and confirmed by the findings of other researchers. The strength of this approach is its multifactorial nature, which allows uncovering the complex interrelationships between different aspects of the crisis.

Conclusions

The 2022 food crisis study revealed the complex interplay of geopolitical, economic, and market factors that led to the aggravation of global food insecurity. The central geopolitical factor was the Russian-Ukrainian war, which caused a large-scale disruption to global food supply chains. The blockade of Ukrainian ports and restrictions on grain exports from the region caused a considerable shortage on the global market, leading to a sharp rise in agricultural prices. This situation has had a particularly negative impact on countries dependent on food imports, increasing their vulnerability to the food crisis. In parallel with the military conflict, an energy crisis unfolded, which became an additional factor in the aggravation of the food problem. The rise in energy prices led to an increase in production costs in the agricultural sector, particularly for fertiliser production. This has had a negative impact on the cost of agricultural products and their availability to consumers, putting additional pressure on the global food system. Macroeconomic instability, manifested in high global inflation and significant currency fluctuations, exacerbated negative trends in food markets. These factors have had a particularly acute impact on developing countries, increasing their vulnerability to price shocks on the global food market. As a result, economic instability and geopolitical conflicts mutually reinforced the negative impact on global food security.

The high market uncertainty caused by these geopolitical conflicts and economic turmoil has created favourable conditions for increased financial speculation in agricultural markets. This led to a disconnect between stock market quotations and fundamental supply and demand factors, which further exacerbated price

fluctuations and complicated long-term planning for market participants. In response to these challenges, many agricultural producing countries have imposed export restrictions in an attempt to ensure internal food security. However, these measures had negative consequences for the global trading system, contradicted the principles of free trade, and ultimately led to further price increases on the world market.

In an attempt to mitigate the effects of the crisis, national governments have taken a series of measures, including increasing public food purchases, providing subsidies to the agricultural sector, and expanding social support programmes. These measures have helped to stabilise domestic markets to some extent and protect the most vulnerable segments of the population. However, their effectiveness varied considerably depending on the economic capabilities of each country, which led to an uneven distribution of the crisis' effects globally.

International organisations have played a key role in coordinating global efforts to overcome the crisis, particularly by providing emergency food aid and mobilising financial resources. However, the effectiveness of these efforts has often been limited by the difficulty of accessing conflict zones and insufficient funding. This has revealed the need to develop more flexible and adaptive mechanisms for international aid in the face of geopolitical instability. Regional initiatives, such as integrated agricultural development programmes and the creation of regional food reserves, have demonstrated the potential to increase the resilience of food systems. However, their effectiveness largely depended on the level of cooperation between the participating countries and the ability to overcome economic and political differences, which underscored the significance of regional integration in addressing global challenges.

The study revealed the need for a comprehensive approach to addressing global food security, which would accommodate the interconnections between the food crisis, climate change, and geopolitical conflicts. It is vital to strengthen international cooperation and coordination to develop more effective mechanisms for early warning of crises, regulation of financial speculation in food markets, and ensure the resilience of global supply chains.

The limitations of the present study are related to the difficulty of considering all the interrelated factors that affect global food security and the rapidly changing nature of geopolitical and economic processes. This points to the need to develop more flexible analysis models. Prospects for further research include investigating the impact of digital technologies on food supply chains, the role of local food systems, the interaction of climate change and geopolitical factors, and the development of innovative financial instruments to stabilise the agricultural sector.

Acknowledgements

None.

Conflict of Interest

The author of this study declares no conflict of interest.

References

- [1] 174th session of the FAO Council. (2023). Retrieved from <https://openknowledge.fao.org/server/api/core/bitstreams/813794e0-96b6-4a56-8705-8cdab0bfc65e/content>.
- [2] Abdalla, A., Stellmacher, T., & Becker, M. (2022). Trends and prospects of change in wheat self-sufficiency in Egypt. *Agriculture*, 13(1), article number 7. doi: 10.3390/agriculture13010007.
- [3] Adjemian, M., Petroff, C., & Robe, M.A. (2022). The political economy of export bans and commodity price volatility: Theory and evidence from agricultural markets. SSRN. doi: 10.2139/ssrn.4117628.
- [4] Agreement on Agriculture. (1995, January). Retrieved from https://www.wto.org/english/docs_e/legal_e/14-ag_01_e.htm.
- [5] Agreement on the Application of Sanitary and Phytosanitary Measures. (1994, April). Retrieved from https://www.wto.org/english/tratop_e/sps_e/spsund_e.htm.
- [6] Akter, S. (2022). The effects of food export restrictions on the domestic economy of exporting countries: A review. *Global Food Security*, 35, article number 100657. doi: 10.1016/j.gfs.2022.100657.
- [7] Anderson, K. (2022). Trade-related food policies in a more volatile climate and trade environment. *Food Policy*, 109, article number 102253. doi: 10.1016/j.foodpol.2022.102253.
- [8] Ben Hassen, T., & El Bilali, H. (2022). Impacts of the Russia-Ukraine war on global food security: Towards more sustainable and resilient food systems? *Foods*, 11(15), article number 2301. doi: 10.3390/foods11152301.
- [9] Blessley, M., & Mudambi, S. M. (2022). A trade war and a pandemic: Disruption and resilience in the food bank supply chain. *Industrial Marketing Management*, 102, 58-73. doi: 10.1016/j.indmarman.2022.01.002.
- [10] CFS voluntary guidelines on food systems and nutrition. (2021). Retrieved from <https://www.who.int/teams/nutrition-and-food-safety/cfs-voluntary-guidelines-on-food-systems-and-nutrition>.
- [11] Chiotis, E. (2023). *The impact of the Russian-Ukrainian War on the food supply chain: A review of the effects on the global economy and malnutrition*. (Master's thesis, University of Macedonia, Thessaloniki, Greece).
- [12] Clapp, J. (2023). Concentration and crises: Exploring the deep roots of vulnerability in the global industrial food system. *The Journal of Peasant Studies*, 50(1). doi: 10.1080/03066150.2022.2129013.
- [13] Coherent food security responses: Incorporating right to food into global and regional food security initiatives. (2010). Retrieved from <https://www.fao.org/in-action/right-to-food-global/regional-level/caricom/en/>.
- [14] Daily market wire 8 March 2022. (2022). Retrieved from <https://www.graincentral.com/markets/daily-market-wire-8-march-2022/>.
- [15] de Arruda, P.L. (2023). *Cash transfer programs in Brazil: The new Bolsa Família and its predecessors*. Retrieved from https://www.unicef.org/brazil/media/27161/file/policy-brief-2_unicef-brazil.pdf.
- [16] DeMartino, G., Grabel, I., & Scoones, I. (2024). Economics for an uncertain world. *World Development*, 173, article number 106426. doi: 10.1016/j.worlddev.2023.106426.
- [17] Din, M.S.U., Mubeen, M., Hussain, S., Ahmad, A., Hussain, N., Ali, M.A., Sabagh, A.E., Elsabagh, M., Shah, G.M., Qaisrani, S.A., Tahir, M., Javeed H.M.R., Anwar-ul-Haq, M., Ali, M., & Nasim, W. (2022). World nations priorities on climate change and food security. In W.N. Jatoti, M. Mubeen, A. Ahmad, M.A. Cheema, Z. Lin & M.Z. Hashmi (Eds.), *Building climate resilience in agriculture: Theory, practice and future perspective* (pp. 365-384). Cham: Springer. doi: 10.1007/978-3-030-79408-8_22.
- [18] EIA. (2022). *Crude oil prices rise above \$100 per barrel after Russia's further invasion into Ukraine*. Retrieved from <https://www.eia.gov/todayinenergy/detail.php?id=55020>.
- [19] Espitia, A., Rocha, N., & Ruta, M. (2022). *How export restrictions are impacting global food prices*. Retrieved from <https://blogs.worldbank.org/en/psd/how-export-restrictions-are-impacting-global-food-prices>.
- [20] Fama, M., & Conti, M. (2022). *Food security and agricultural crises in a financialized food regime*. *Cambio: Rivista Sulle Trasformazioni Sociali*, 23(1), 85-97.
- [21] FAO Food Price Index posts significant leap in March. (2022). Retrieved from <https://www.fao.org/newsroom/detail/fao-food-price-index-posts-significant-leap-in-march/en>.
- [22] FAO Food Price Index. (2022). Retrieved from <https://openknowledge.fao.org/server/api/core/bitstreams/20ed90ff-1a74-42cb-a9e9-4a12c853b8d7/content>.
- [23] FAQ on the U.S. dollar's recent trend. (2022). Retrieved from <https://www.publicmutual.com.my/Menu/Learning-Hub/FAQ-on-the-US-Dollars-Recent-Trend>.
- [24] Food Assistance Convention. (2012, November). Retrieved from <https://eur-lex.europa.eu/EN/legal-content/summary/food-assistance-convention.html#:~:text=The%20Food%20Assistance%20Convention%2C%20the,reduce%20hunger>.
- [25] General Agreement on Tariffs and Trade. (1947, October). Retrieved from https://zakon.rada.gov.ua/laws/show/995_264#Text.
- [26] General Agreement on Tariffs and Trade. (1994, April). Retrieved from https://zakon.rada.gov.ua/laws/show/995_264#Text.
- [27] Glauben, T., Svanidze, M., Götz, L. J., Prehn, S., Jaghdani, T. J., Djuric, I., & Kuhn, L. (2022). *The war in Ukraine exposes supply tensions on global agricultural markets: Openness to global trade is needed to cope with the crisis*. *IAMO Policy Brief*, 44.

- [28] Global Food Market Information Group. (n.d.). Retrieved from <https://www.amis-outlook.org/amis-about/information-group/en/>.
- [29] Hebebrand, C., & Laborde Debucquet, D. (Eds.). (2023). High fertilizer prices contribute to rising global food security concerns. In J. Glauber & D. Laborde Debucquet. (Eds), *The Russia-Ukraine conflict and global food security, section one: A conflict with global consequences* (pp. 38-42). Washington: International Food Policy Research Institute (IFPRI). doi: 10.2499/9780896294394_07.
- [30] How Europe can cut natural gas imports from Russia significantly within a year. (2022). Retrieved from <https://www.iea.org/news/how-europe-can-cut-natural-gas-imports-from-russia-significantly-within-a-year>.
- [31] International Monetary Fund. (2022). [Proposal for a food shock window under the rapid financing instrument and rapid credit facility](https://www.imf.org/en/Publications/WEQ/Issues/2023/10/10/world-economic-outlook-october-2023). Policy Paper, 42.
- [32] International Monetary Fund. (2023). *Navigating global divergences*. Retrieved from <https://www.imf.org/en/Publications/WEQ/Issues/2023/10/10/world-economic-outlook-october-2023>.
- [33] Kemmerling, B., Schetter, C., & Wirkus, L. (2022). The logics of war and food (in) security. *Global Food Security*, 33, article number 100634. doi: 10.1016/j.gfs.2022.100634.
- [34] Kilian, L., Rapson, D., & Schipper, B.C. (2024). The impact of the 2022 oil embargo and price cap on Russian oil prices. *FRB of Dallas Working Paper*, 2401. doi: 10.24149/wp2401.
- [35] KSE. (2022). *Russian invasion in Ukraine could threaten global food security and starve hundreds of millions globally*. Retrieved from <https://kse.ua/ua/about-the-school/news/russian-invasion-in-ukraine-could-threaten-global-food-security-and-starve-hundreds-of-millions-globally/>.
- [36] Law of the Republic of Kazakhstan No. 544 "On Regulation of Trade Activities". (2004, April). Retrieved from <https://adilet.zan.kz/rus/docs/Z040000544>.
- [37] Martin, W., & Minot, N. (2022). *The impacts of price insulation on world wheat markets during the 2022 food price crisis*. Retrieved from <https://ageconsearch.umn.edu/record/339416/files/Session%203%20Paper%202%20-%20Martin%20Minot.pdf>.
- [38] McKeon, N. (2024). Rural social movement strategies confronting global food crises: Overcoming the crisis of capitalism or exiting altogether from capitalism in crisis? *The Journal of Peasant Studies*. doi: 10.1080/03066150.2024.2353097.
- [39] Measures taken by the Republic of Kazakhstan to mitigate the consequences of the COVID-19 pandemic. (2022). Retrieved from https://www.wcoomd.org/-/media/wco/public/ru/pdf/topics/facilitation/activities-and-programmes/covid_19/kazakhstan_ru.pdf?la=en.
- [40] Musagaliev, A.J., & Dustova, M.Kh. (2023). The significance of the experience of foreign countries in government financial support of agriculture. *Partners Universal International Research Journal*, 2(1), 163-167. doi: 10.5281/zenodo.7782536.
- [41] Natsagdori, B. (2023). Exploring the role of Central Bank Independence and Monetary Policy Communication in achieving price stability. *Research Square*. doi: 10.21203/rs.3.rs-3638311/v1.
- [42] Nimani, A., & Spahija, D. (2023). Financial markets and price increases in Europe after the Russian-Ukrainian War. *Scientific Horizons*, 26(3), 135-145. doi: 10.48077/scihor3.2023.135.
- [43] Oxford Analytica. (2022). Fertiliser and food prices could be high for years. *Emerald Expert Briefings. Expert Briefings*. doi: 10.1108/OXAN-DB268415.
- [44] Rabbi, M.F., Ben Hassen, T., El Bilali, H., Raheem, D., & Raposo, A. (2023). Food security challenges in Europe in the context of the prolonged Russian-Ukrainian conflict. *Sustainability*, 15(6), article number 4745. doi: 10.3390/su15064745.
- [45] Rajendra, J., Mayank, B., & Nigam, P. (2022). *India bans wheat exports as heat wave hurts crop, domestic prices soar*. Retrieved from <https://www.reuters.com/markets/commodities/india-prohibits-wheat-exports-with-immediate-effect-2022-05-14/>.
- [46] Rother, M.B., Sosa, M.S., Kim, M.D., Kohler, L., Kohler, M.L.P., Pierre, M.G., Kato, N., Debbich, M., Castrovillari, C., Sharifzoda, K., van Heuvelen, E., Machado, F., Thevenot, C., Mitra, P., & Fayad, D. (2022). *Tackling the global food crisis: Impact, policy response, and the role of the IMF*. *IMF Notes*, 4.
- [47] Saâdaoui, F., Jabeur, S.B., & Goodell, J.W. (2022). Causality of geopolitical risk on food prices: Considering the Russo-Ukrainian conflict. *Finance Research Letters*, 49, article number 103103. doi: 10.1016/j.frl.2022.103103.
- [48] Sarita, C.S., & Mayank, B. (2024). *India may earmark \$48 bln for next year's food, fertiliser subsidies*. Retrieved from <https://www.reuters.com/world/india/india-may-earmark-48-bln-next-years-food-fertiliser-subsidies-2024-01-17/>.
- [49] Scale for Resilience nature based solutions. (2023). Retrieved from <https://www.scaleforresilience.global/>.
- [50] Smith, V.H., & Glauber, J.W. (2020). Trade, policy, and food security. *Agricultural Economics*, 51(1), 159-171. doi: 10.1111/agec.12547.
- [51] Su, F., Liu, Y., Chen, S. J., & Fahad, S. (2023). Towards the impact of economic policy uncertainty on food security: Introducing a comprehensive heterogeneous framework for assessment. *Journal of Cleaner Production*, 386, article number 135792. doi: 10.1016/j.jclepro.2022.135792.
- [52] The ASEAN Plus three emergency rice reserve or APTERR. (2023). Retrieved from https://asean.org/wp-content/uploads/2023/10/23-APTERR-Report_44th-SSOM-AMAF-22nd-SSOM-AMAF3.pdf.
- [53] The common agricultural policy at a glance. (2023). Retrieved from https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en.

- [54] The Comprehensive African Agriculture Development Programme (CAADP). (2024). Retrieved from <https://caadp.org/>.
- [55] The Strategic Plan of Action on Food Security in the ASEAN Region (SPA-FS) 2021-2025. (2020, October). Retrieved from <https://asean.org/wp-content/uploads/2020/11/42-AIFS-Framework-SPAFS-Final-13-July-2020.pdf>.
- [56] UNICEF. (2023). *The state of food security and nutrition*. Retrieved from <https://data.unicef.org/resources/sofi-2023/>.
- [57] United Nations Summit for the Adoption of the post-2015 Development Agenda. (2015, September). Retrieved from <https://www.un.org/sustainabledevelopment/>.
- [58] van Huellen, S., & Ferrando, T. (2023). *Who is profiting from the food crisis?* Brussels: Martin Schirdewan.
- [59] Wegren, S.K. (2023). Challenges to global food security: A policy approach to the 2021-2022 food crisis. *World Food Policy*, 9(1), 127-148. doi: 10.1002/wfp2.12057.
- [60] WFP. (2022). *Yemen – annual country report*. Retrieved from https://www.wfp.org/operations/annual-country-report?operation_id=YE01&year=2022#/25611.
- [61] WFP. (2024). *WFP at a glance*. Retrieved from <https://www.wfp.org/stories/wfp-glance>.
- [62] World Bank Group. (2024). *Enhancing food and nutrition security in the Sahel and Horn of Africa*. Retrieved from <https://www.worldbank.org/en/results/2024/01/04/enhancing-food-and-nutrition-security-in-the-sahel-and-horn-of-af-africa>.