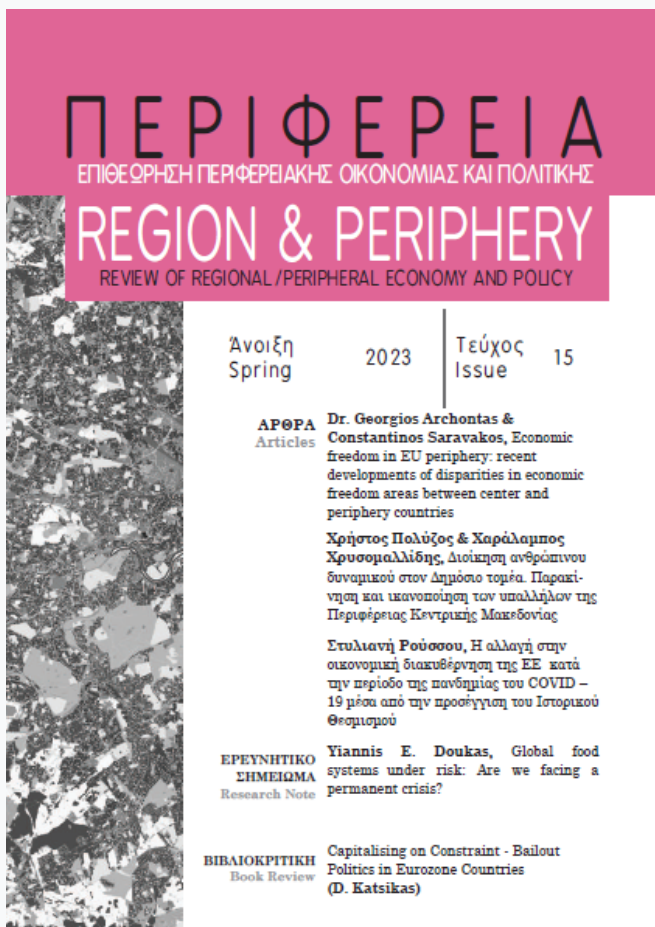


## Περιφέρεια

Τόμ. 15, Αρ. 15 (2023)

Περιφέρεια | Region & Periphery



Τα παγκόσμια συστήματα τροφίμων σε κίνδυνο: Βρισκόμαστε μπροστά σε μία μόνιμη κρίση;

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## **Global food systems under risk: Are we facing a permanent crisis?**

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### **Abstract**

**G**lobal food systems are facing a prolonged challenge, as food prices are remaining at high levels. The lives of the world's poor and food-insecure communities are greatly affected by changes in the food supply, rising commodity prices, and the new shapes that the food chain between producers and consumers has adopted. At the same time, consumers in more advanced economies are also experiencing sharp rises in food prices. In the current paper, we will try to address the issues related to the current food crisis and explore whether the global food systems are facing a state of permanent crisis.

**KEY-WORDS:** Food systems, Food crisis, Covid-19, War in Ukraine

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### **Τα παγκόσμια συστήματα τροφίμων σε κίνδυνο: Βρισκόμαστε μπροστά σε μία μόνιμη κρίση;**

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### **Περίληψη**

**T**α παγκόσμια συστήματα τροφίμων αντιμετωπίζουν μια παρατεταμένη πρόκληση, καθώς οι τιμές των τροφίμων παραμένουν σε υψηλά επίπεδα. Οι ζωές των φτωχών και επισιτιστικά ανασφαλών πληθυσμών επηρεάζονται σε μεγάλο βαθμό από τις αλλαγές στην προσφορά τροφίμων, τις αυξανόμενες τιμές των βασικών αγροτικών προϊόντων και τα νέα σχήματα που έχει υιοθετήσει η διατροφική αλυσίδα μεταξύ παραγωγών και καταναλωτών. Την ίδια στιγμή, ακόμη και οι καταναλωτές στις πιο αναπτυγμένες οικονομίες αντιμετωπίζουν απότομες αυξήσεις στις τιμές των τροφίμων. Στην παρούσα εργασία, να παρουσιαστούν τα ζητήματα που σχετίζονται με την τρέχουσα επισιτιστική κρίση και θα εξεταστεί εάν τα παγκόσμια συστήματα τροφίμων βρίσκονται σε ένα καθεστώς μόνιμης κρίσης.

**ΛΕΞΕΙΣ-ΚΛΕΙΔΙΑ :** Συστήματα τροφίμων, Επισιτιστική κρίση, Covid-19, Πόλεμος στην Ουκρανία

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## 1. Introduction

It is well known that the world agri-food system evolves throughout time and is influenced by new driving forces. Food consumption, production, and markets have changed as a result of shifts in income, the climate crisis, high energy prices, globalization, urbanization, and unstable geopolitical conditions. The impact of the food industries and retailers working in the sector has increased significantly and empowered the private sector's position in the world agri-food system. Changes in the food supply, rising commodity prices, and the new forms the food chain has taken between producers and consumers have profound impacts on the lives of the world's poor and food-insecure populations (Doukas and Maravegias, 2021). Of course, if food was distributed fairly and equally to everyone, the world's food supply would be more than enough to meet the nutritional demands of the whole human population (ibid). Nevertheless, according to the latest Global Report on Food Crises, around 258 million individuals in 58 countries faced severe acute food insecurity in 2022, necessitating immediate assistance, the highest rate since the first Global Report was published in 2016 (FSIN, 2023). However, even in the more advanced economies, consumers are facing extreme increases in food prices. For example, the rate of food inflation in the European Union (EU) in April 2023 was 16.41% compared to the corresponding month of the previous year (Eurostat, 2023), putting significant strain on household budgets. In this paper, we will attempt to address the issues underlying today's food crisis and examine whether the global food systems are going through a period of permanent crisis.

## 2. Covid-19 and the food systems' challenges

According to the Organization for Economic Co-operation and Development (OECD), Food Systems, which refer to “all the elements and activities related to producing and consuming food, and their effects, including economic, health, and environmental outcomes”, face a *triple challenge*: “ensuring food security and nutrition for a growing population, supporting the livelihoods of millions of farmers and others in the food chain, and doing so in an environmentally sustainable way”(OECD, 2021). These challenges are interconnected and consequently, it is important to seek synergies and trade-offs within the individual sectors of the agri-food system to develop a more cohesive and global policy, particularly due to the risks stemming from the outbreak of the “COVID-19” pandemic (OECD, 2021).

In this context, the United Nations (UN), aligning with the priorities of the OECD, convened the Food Systems Summit in September 2020 to create a new approach for more effective management of the “triple challenge” in relation

to the declared Sustainable Development Goals for 2030<sup>1</sup>. As clarified in the relevant text of the Summit, the term “food system” also refers to the network of activities encompassing food production, processing, transportation, and consumption. Food systems permeate every aspect of human activity and impact global balance (UN, 2021). However, they are fragile and often vulnerable to threats such as the COVID-19 pandemic, resulting in the disruption of crucial sectors like education, health, economy, human rights, peace, and global security. Clearly, the most vulnerable populations, who often reside in rural areas, are disproportionately affected by such extreme conditions (UN, 2021).

For example, before the outbreak of the pandemic, 850 million people worldwide were registered as food insecure. Among them, 135 million were in the high-risk category, and an additional 130 million were estimated to fall into this category by the end of 2020 due to the pandemic. Furthermore, data indicate that 35% of jobs across the entire agri-food chain, which employs 1 billion people globally, are highly threatened (Doukas and Maravegias, 2021). Particularly, groups with specific characteristics are dramatically affected, such as young people living in rural areas engaged in informal forms of work, primarily family-based, with low levels of education and skills, small-scale self-employed farmers, the poorest rural populations whose income depends mainly on agricultural activities, and refugees with limited legal rights to work, cultivable land, and mobility (UN, 2020).

Furthermore, the joint report of the OECD and FAO on the outlook for the agricultural sector for the period 2022-2031, predicts that, after falling in 2020, global per capita income increased by 4.4% in 2021 but is expected to slow down in 2022 and 2023. Over the next decade, an average annual growth rate of 1.8% in real terms is projected<sup>2</sup>.

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<sup>1</sup> “...the 2030 Agenda for Sustainable Development, which all U.N. Member States including the EU28 adopted in 2015, offers a shared blueprint for stability and prosperity for people and the world now and in the future. The 17 Sustainable Development Goals (SDGs) form the core of the 2030 Agenda, and represent an immediate call to action for all countries in a global partnership. All countries accepted that eradicating poverty and other deprivations must be followed by policies that secure a sustainable agro-food chain, improve health and education, reduce inequalities, and promote economic growth while fighting climate change and protecting the oceans and forests. Each aim usually has 8 to 12 targets, and each target has between 1 and 4 metrics used to track progress against the goals. The goals are either “outcome” targets (to be achieved circumstances) or “means of implementation” targets.” (Doukas and Petides, 2021 : 113)

<sup>2</sup> As shown in the World Bank’s Poverty and Shared Prosperity 2020 report, however, national economic growth is unevenly distributed. In particular,

Finally, the relevant report notes that the pandemic erupted at a time when food security and food systems were already under pressure. Conflicts, natural disasters, and climate change preceded COVID-19 and undermined the balance in the agri-food economy (UN, 2020).

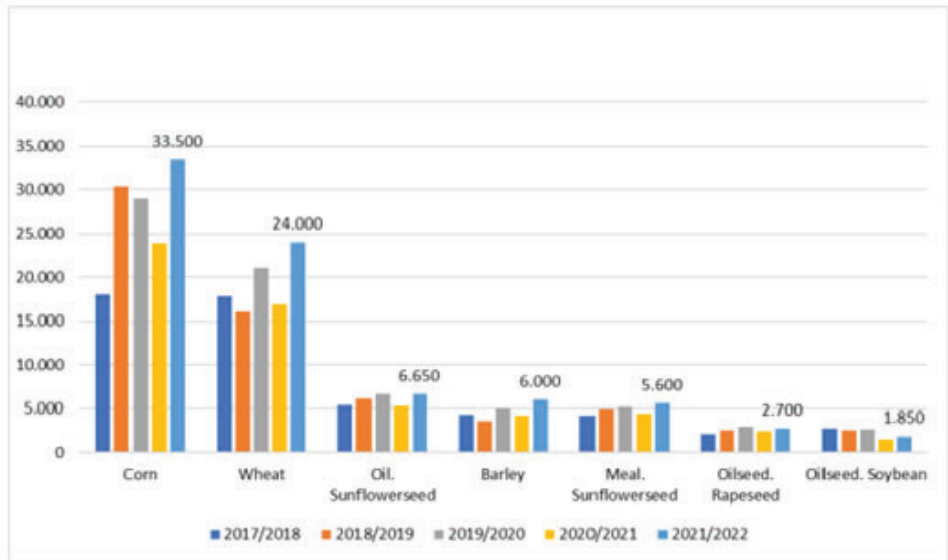
### 3. The 2022 food crisis

In 2021, Russia and Ukraine were ranked among the top three world exporters of wheat, corn, oilseed rape, sunflower seeds, and oil (FAOSTAT, 2023). More specifically, the Black Sea region is a significant source of grains and oilseeds for the global market; Ukraine and Russia account for more than 30% of the world wheat and barley trade, while the corn and sunflower oil percentages 17% and 50%, respectively). Ukraine alone sent roughly 60 million tonnes of grain to the rest of the world and anticipated exporting around 33 million tonnes of corn and 24 million tonnes of wheat in the current marketing year. Maize is Ukraine's biggest export to Europe, with an annual average of 11 million tonnes imported in the last three years. According to the most recent information from the EU customs statement, Ukraine sold 5.5 million tonnes of corn to the EU (FEFAC, 2022). (see figures 1& 2)

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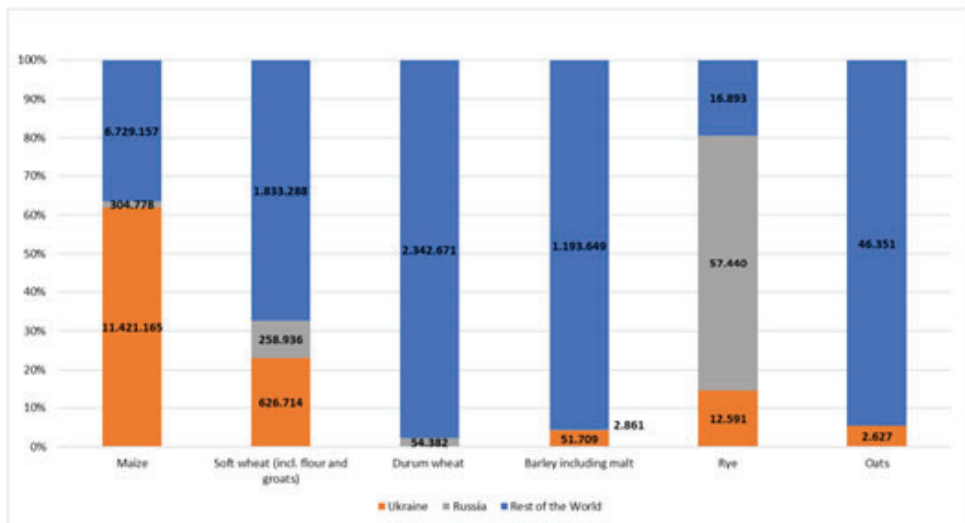
in several Sub-Saharan African countries the incomes of the poorest 40% of the population have lagged average income growth. For this reason, national average food demand projections in this Outlook can deviate from what might be expected based on average income growth. In addition, the COVID-19 pandemic has deepened income inequalities within countries. In 2020-21, the annual growth rate in per capita income of the poorest 40% of the population declined sharply in all economies (compared to 2012-17 period) .“ (OECD-FAO, 2022 : 29).

Figure 1. Ukraine Exports to the World, Main Commodities (in '000 tonnes)



Source: FAO, DG AGRI and USDA on FEFAC, 2022

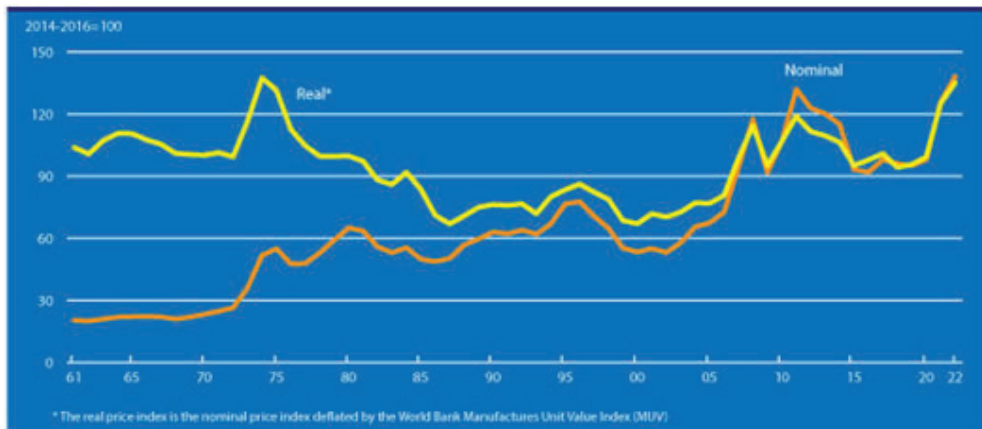
Figure 2. EU imports of Main Cereals (5 years trim Average, in tonnes)



Source: FAO, DG AGRI, and USDA on FEFAC, 2022

The war and the economic sanctions imposed on Russia by Western countries have disrupted the chains of transportation and distribution of products. Therefore, a significant reduction in the supply of these products has occurred. As a result, wheat and barley prices have increased by 31% compared to the corresponding period in 2020 (see Figure 3) (FAO, 2022a).

**Figure 3. FAO Food Price Index in nominal and real terms**



Source: FAO, 2022b

These products are intended for human consumption, for livestock, and some of them are committed to producing bio-energy. The rapid increases in their prices significantly affected the whole spectrum of global economic activity, creating a domino of inflationary pressures with adverse effects on the global economy.

At the same time, many developing countries, some of which were already suffering from the effects of extreme conditions such as wars or natural disasters, were entirely dependent on imports of essential agri-food products from both Russia and Ukraine to meet their nutritional needs. Imports mainly concern wheat, corn, and sunflower oil.

For example, the top destinations for wheat from Russia are, Egypt (by far the largest importer of Russian wheat) followed by Turkey, Bangladesh, Sudan and Tanzania. For corn, which is a significant source of livestock, the leading importers from Russia are Iran, Turkey, South Korea, Vietnam, and Lebanon (UN-Comtrade, 2022). Among the top ten importers there are also two European countries, the Netherlands and Greece. Finally, it is worth noting that 70% of Egypt's wheat imports come from Russia and Ukraine, with the percentage for Ethiopia and Yemen reaching 45% and 41% respectively (ibid).

Therefore, sharp and significant increases in the prices of essential agri-food products dramatically affected the capability of the world's poorest populations -which spend most of their income on food- to ensure an adequate food supply. Such extreme conditions usually lead to intense social and political upheavals (e.g., the "Arab Spring" in the late 2000's) and an increase in migratory flows.

Within this global framework, the EU did not remain unaffected as increases in energy prices, essential industrial inputs in agriculture, and shortages created intense pressures on production costs and, therefore, on food supply. Russia is the world's largest exporter of nitrogen fertilizers, the second-largest supplier of potassium fertilizers, and the third-largest exporter of phosphorus fertilizers, whose prices have soared. This increases prices for essential goods such as bread, meat, pasta, and milk.

It is worth mentioning that the producers do not benefit from these increases, as the final prices of the products on the shelf are set at higher levels due to the intermediate increases (intermediaries, processing, transport costs), but also the structure of the markets of agricultural products that are fully competitive. This means that the producer, in most cases, cannot influence the selling price, while he is also a recipient of the price for his inputs (seeds, fertilizers, pesticides, feed) as these markets have an oligopolistic structure.

Recognizing the unique circumstances created by the war in Ukraine, the European Union (EU), under pressure from both European farmers' organizations and the input industries, postponed the implementation of some measures under the Strategy "Farm to Fork" and Biodiversity, which are leading to a reduction in agricultural production in the EU (EC, 2020). In other words, there was a suspension of the implementation of the "Green Deal" for the agricultural sector, which has been incorporated into the new Common Agricultural Policy (CAP). So, the European Commission (EC) enabled farmers to grow crops on fallow land that has been classified as "Ecological Focal Areas" and reviewed the targets for levels of reduction in pesticide use to ensure adequacy in the production of essential agri-food products. Member States could join coupled crop aid schemes such as common wheat and maize, providing incentives to increase production. In addition, it was decided to activate the € 500 million crisis reserve to support producers with the possibility of doubling the amount with national funding (EC, 2022).

Additionally, great relief was given through the *Black Sea Grain Initiative* -a UN deal between Russia and Ukraine launched on 22 July 2022- to facilitate the export of grain and other foodstuffs from the ports of the Black Sea around the world and mainly to the developing countries. According to the Black Sea Grain Initiative Joint Coordination Centre, as of May 2023, over 30 million tonnes of grain and other foodstuffs have been exported.



#### 4. Structural pressures to global food systems

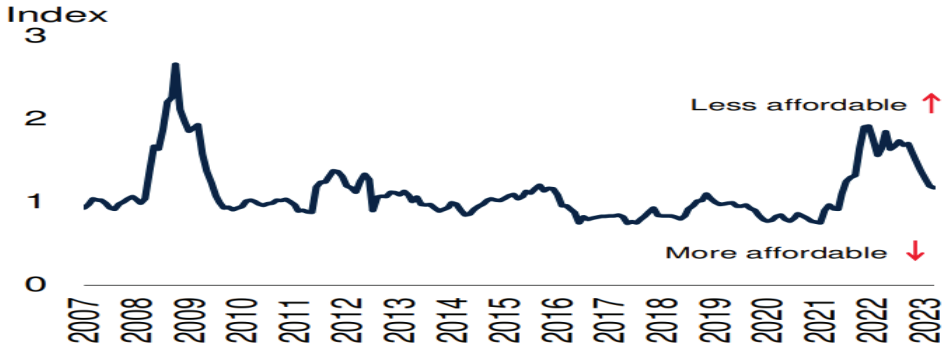
As can be observed in figure 3, crises in food systems have been happening periodically during the last decades. In many cases, the sharp increase in agricultural prices is connected to an increase in energy prices (see figure 4) and in the level of affordability of basic agricultural inputs like fertilizers (see figure 5), associated with the level of input costs. However, as was demonstrated above, other factors as well may cause a food crisis, like speculative behavior and the trading of primary agricultural products on parallel commodity exchanges. The European Economic and Social Committee (EESC) argues that the way the commodities market currently operates does not support the “sustainable economy we need” or the goals for just transition, ambitious climate change, and sustainable development outlined in the European Green Deal and the UN Agenda 2030. In fact, it actively undermines these goals. (EESC, 2022). It also, stresses the need to address food chain and financial ownership concentration, as well as the extremely concentrated nature of the world’s physical grain trade, where four highly financialized companies control around 70 and 90 percent of the world’s grain trade and establish a dominant position based on information about market fundamentals, leading to high and fast-rising food prices (ibid). Moreover, speculative behaviour and the tendency for private and public storage, with the return of commercial entrenchment within national borders has had an impact, as most governments primarily meet the nutritional needs of their populations. Those factors were key drivers in the 2007-08 food crisis and are still present in the current crisis (Doukas and Maravegias, 2021).

**Figure 4. Brent crude oil price**



Source: World Bank Group, 2022

Figure 5. Fertilizer unaffordability



Source: World Bank Group, 2023

Also, the shift to Western dietary patterns of large sections of the population in developing countries (mainly the middle class), increases the amount of animal feed and drives up the price of primary agricultural products like wheat and maize (The Economist, 2022). It’s worth mentioning that in 2021, China imported 28m tonnes of maize, a bigger quantity than Ukraine’s maize exports over a year (ibid). Moreover, this shift to Western dietary patterns, among other factors - such as inadequate systems for storing, preserving, and transporting perishable foods in many developing and poorer countries-, intensifies the tendency to dispose food (about 18-20% of world production), further contributing to food waste and scarcity (EC, 2021).

Lastly, conflict and insecurity, economic shocks, and weather extremes exert significant pressure on the global food systems. Conflict and insecurity led 117.1 million people in crisis or worse acute food insecurity across 19 nations and territories in 2022, with the economic shocks affecting 83.9 million people in 27 countries – up from 30.2 million people in 21 nations in 2021- and weather extremes caused acute food insecurity for 56.8 million people in 12 countries, more than twice as many (23.5 million) living in eight different nations in 2021. Poor countries today experience longer recovery times and have less ability to cope with shocks in the future since their economic resilience has dropped dramatically (FSIN, 2023). Additionally, as it was mentioned above, even in the more advanced economies, consumers are facing extreme increases in food prices.

## 5. Final Thoughts

As several of the above factors are not expected to change significantly in the near future, while at the same time, we see them coming back to the fore over time, many analysts are wondering whether global food systems are under a constant threat of crisis if a drastic transformation is not carried out in the global agri-food chain.

Of course, although immediate action needs to be taken to ensure food adequacy and price restraint - such as reductions in VAT on feed and staple foods - it is important not to abandon the goal of sustainability and protection of the natural environment. As the demand to “produce more with less” becomes even more urgent, the effective management of available resources through precision agriculture and renewable energy sources, and the modernization of the agricultural sector through farmers’ education and digital applications, have become top priority policies.

Also, as food production increases at twice the global population growth rate, food savings - now discarded- through a series of interventions (modernization of production and distribution systems, accurate information, and education of consumers on healthier food standards) can adequately meet global food needs. Finally, the “Mediterranean diet” can help address the crisis as it includes foods of high nutritional value and lower cost of production and, therefore, more accessible to the poorest sections of the world population.

## References

- Doukas, Y. E. and Maravegias, N. (2021). *Ευρωπαϊκή αγροτική οικονομία και πολιτική: Μετασχηματισμοί και προκλήσεις προσαρμογής*. Athens, Greece: Kritiki. ISBN: 9789605863753
- Doukas, Y. E. and Petides, P. (2021). The Common Agricultural Policy’s green architecture and the United Nation’s Development Goal for climate action: Policy change and adaptation. *Region & Periphery*, 11, 107–128. <https://doi.org/10.12681/rp.27247>
- EC (2020), *The Farm to Fork Strategy*, <https://www.efsa.europa.eu/sites/default/files/event/2020/R.Chehlarova-European-Green-Deal-EU-Farm-Fork.pdf>
- EC (2021), *EU Platform on Food Losses and Food Waste*, [https://ec.europa.eu/food/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste\\_en](https://ec.europa.eu/food/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en)

- EC (2022), *Commission acts for global food security and for supporting EU farmers and consumers*, [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_1963](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1963)
- EESC (2022), *Food price crisis in the aftermath of the Ukraine war*, NAT/873.
- Eurostat (2023), *Trading Economics*, Statista, <https://www.statista.com/statistics/680184/inflation-rate-food-in-european-union-eu/>
- FAO (2022a), *Information Note: The importance of Ukraine and the Russian Federation for global agricultural markets and the risks associated with the current conflict*, <https://reliefweb.int/sites/reliefweb.int/files/resources/cb9013en.pdf>
- FAO (2022b), *World Food Situation*, <https://www.fao.org/worldfoodsituation/foodpricesindex/en/>
- FAOSTAT (2023), *Trade Data*, <https://www.fao.org/faostat/en/#data>
- FEFAC (2022), *Re: Measures required in the face of the Ukraine crisis*, [https://fefac.eu/wp-content/uploads/2022/03/22\\_INST\\_15.pdf](https://fefac.eu/wp-content/uploads/2022/03/22_INST_15.pdf)
- FSIN (2023), *FSIN and Global Network Against Food Crises. 2023. GRFC 2023*. Rome, <https://www.fsinplatform.org/sites/default/files/resources/files/GRFC2023-compressed.pdf>
- Haniotis, T. (2022), *Towards a new (ab)normal on food security?*, Vision 2030: A World leader in Sustainable Food Systems, 13 October 2022, The Printworks, Dublin Castle,
- OECD/FAO (2022), *OECD-FAO Agricultural Outlook 2022-2031*, FAO, Rome/OECD Publishing, Paris, <https://www.oecd-ilibrary.org/docserver/f1b0b29c-en.pdf?expires=1687856278&id=id&accname=guest&checksum=E2BB6492292A9FA382733AF7C4752188>
- TheEconomist (2022), *After the pestilence, after the war*, Briefing the food crisis, May 21st 2022.
- UN (2020), *Policy Brief: The Impact of COVID-19 on Food Security and Nutrition*, [https://www.un.org/sites/un2.un.org/files/sg\\_policy\\_brief\\_on\\_covid\\_impact\\_on\\_food\\_security.pdf](https://www.un.org/sites/un2.un.org/files/sg_policy_brief_on_covid_impact_on_food_security.pdf)
- UN (2021), *2020 International Trade Statistics Yearbook : Volume I- Trade by Country*, Department of Economic and Social Affairs - Statistics Division, <https://comtrade.un.org/pb/downloads/2020/VolI2020.pdf>
- World Bank Group (2022), *Commodity Markets Outlook: Pandemic, war, recession: Drivers of aluminum and copper prices*, October 2022. World Bank,

Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO, <https://openknowledge.worldbank.org/server/api/core/bitstreams/813e7ba3-332f-55f0-a857-85c2cc773d7a/content>

World Bank Group (2023), *Commodity Markets Outlook: Lower Prices, Little Relief*, April 2023, World Bank, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO, <https://openknowledge.worldbank.org/server/api/core/bitstreams/6864d537-d407-4cab-8ef1-868dbf7e07e2/content>