

Food Security and Trade 2023

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Table of Contents

1. Introduction	3
2. Global trends in trade of food and agricultural products	5
3. Trade can help addressing food security issues in each of its dimensions	9
4. What if there are trade disruptions?	15
5. Conclusions	17

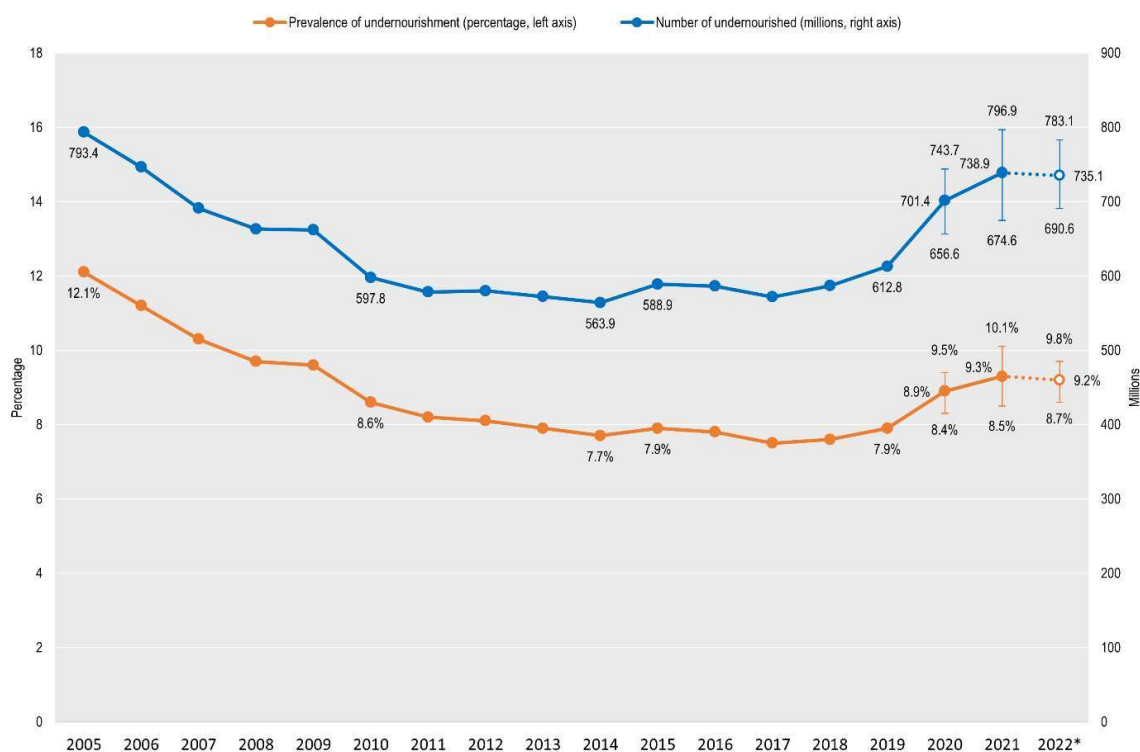
Figures

Figure 1. Prevalence of undernourishment and number of undernourished, 2005-2021	3
Figure 2. FAO Food Price Index, Jan 1990-Dec2022 (in nominal terms)	4
Figure 3. Evolution of share of global trade, in calories, impacted by export restrictions (2008, 2020, and 2022)	5
Figure 4. The food and agricultural trade network and trade hubs in 1995 and 2019	6
Figure 5. Regional trade agreements between countries by regions (%), 2022	6
Figure 6. Applied tariffs in agriculture, 1995-1999 and 2016-2020	8
Figure 7. Food and agricultural trade between and within regions, 1995 and 2019	9
Figure 8. Net trade by region, in constant value	10
Figure 9. Long-term evolution of commodity prices, in real terms	11
Figure 10. Distribution of trade connectivity across countries, 1995-2019	13
Figure 11. Distribution of trade connectivity across food products and countries, 1995-2019	14
Figure 12. Dependency on wheat imports from Russia and Ukraine (2018-20 average)	16

1. Introduction

Despite hopes that food security would begin to recover from the COVID-19 pandemic in 2021 and that the world economy would improve, world hunger increased in 2021. While there was an improvement in 2022, hunger has not returned to 2019 levels. According to estimates in *The State of Food Security and Nutrition in the World 2023* (FAO, IFAD, UNICEF, WFP and WHO, 2023^[1]), between 691 and 783 million people in the world faced chronic hunger in 2022. Considering the midrange (about 735 million), 122 million more people faced hunger in 2022 than in 2019, before the global pandemic (Figure 1).¹

Figure 1. Prevalence of undernourishment and number of undernourished, 2005-2021



Note: Projected values for 2021 are illustrated by dotted lines. Shaded areas show lower and upper bounds of the estimated range.
Source: FAO, IFAD, UNICEF, WFP and WHO (2023^[1]).

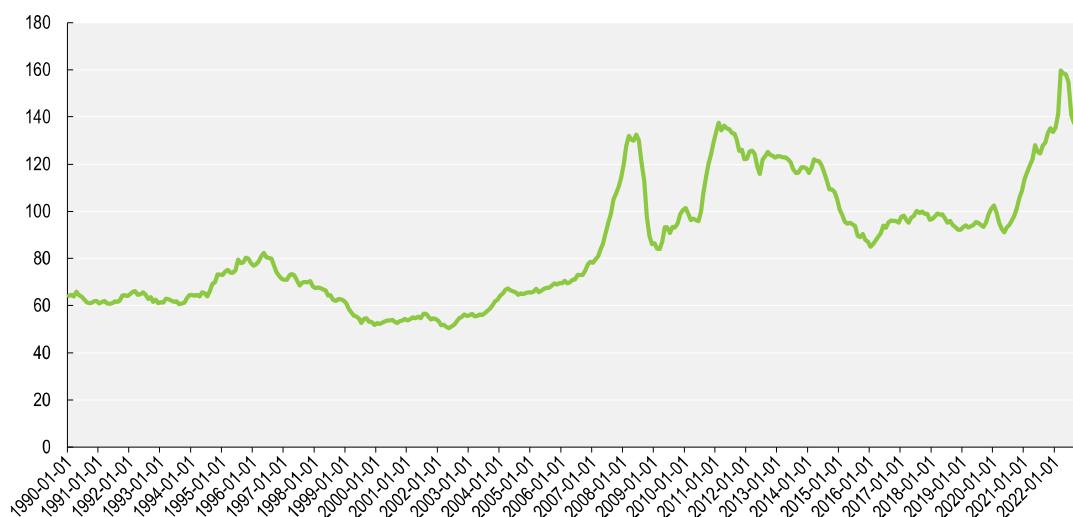
Inequalities across and within countries persist, due to an unequal pattern of economic recovery among countries and unrecovered income losses among those most affected by the pandemic. The prevalence of undernourishment varies among regions, with Africa bearing the heaviest burden. Nearly 20% of the population in Africa faced hunger in 2022, compared to 8.5% in Asia, 6.5% in Latin America and the Caribbean and 7% in Oceania, and less than 2.5% in Northern America and Europe. It is projected that almost 600 million people will continue to face hunger in 2030.

In addition to income losses due to COVID-19, rising food prices are a key driver behind the worsening global food security. According to the FAO Food Price Index (FFPI), international food commodity prices rose from 113.5 to 133.7 index points between January and December 2021, and reached 158.1 in March 2022, the highest level since the inception of the index in 1990. Prices have since come down, with the

¹ This report was first prepared as an issue note to the G7 Presidency of Japan in January 2023.

FFPI lowering to 132.4 in December 2022 and returning to roughly the levels seen prior to the Russian Federation's invasion of Ukraine (Figure 2).

Figure 2. FAO Food Price Index, January 1990-December 2022 (in nominal terms)



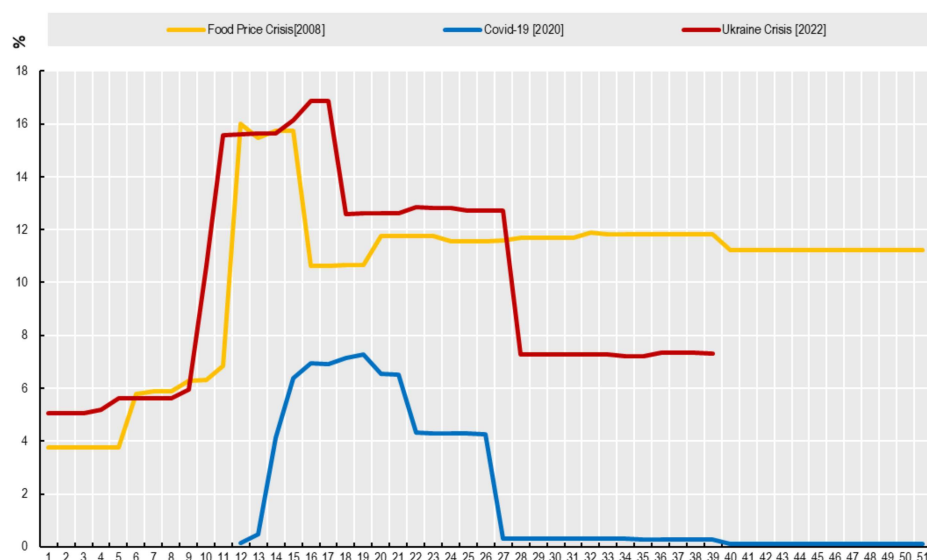
Updated data and information on the FAO Food Price Index be accessed at: <https://www.fao.org/worldfoodsituation/fao-food-price-index/en>. Source: FAO (2023^[2]).

The recent inflation in food prices started with the COVID-19 pandemic, which affected economies worldwide. Measures put in place to contain the pandemic and the lasting impacts of the pandemic have disrupted supply chains, affected the supply of labour, and sustained the rising of prices. The war in Ukraine added further upward pressure to food prices since agricultural exports from the Russian Federation (hereafter “Russia”) and Ukraine were seriously disrupted. Ukraine and the Russia are major exporters of food and agricultural products, in particular wheat, maize, sunflower, sunflowers oils, and fertilisers. Exports of these commodities is concentrated to a few countries, which makes these markets particularly vulnerable to shocks such as the current war.

The trade disruptions and rising prices led several countries to introduce export restrictions on agricultural products (Figure 3). During the COVID-19 pandemic, these measures were relatively short-lived and had a transitory impact on food trade (FAO, 2021^[3]), but they have re-emerged with the war in Ukraine, even though the evidence clearly shows that such measures are ineffective at keeping domestic prices stable and low, and could even lead to global price volatility and increases (Martin and Anderson, 2011^[4]) (Baylis, 2014^[5]). The re-introduction of these measures, coupled with the trade disruptions from the war and during COVID-19, has led several governments to question how much they can rely on international trade to guarantee the food security of their population.

This policy note first examines global trends in the trade of food and agricultural products. Next, it shows how trade and well-functioning markets can address food security issues in each of its dimensions. It then offers solutions on how food security can be guaranteed in the event of trade disruptions and concludes with several recommendations.

Figure 3. Evolution of share of global trade, in calories, impacted by export restrictions (2008, 2020, and 2022)



Note: X-axis shows week of the year. 1=first week of the year.

Source: Food Export & Fertilizer Restrictions Tracker (2022^[6]) data on 29 November 2022.

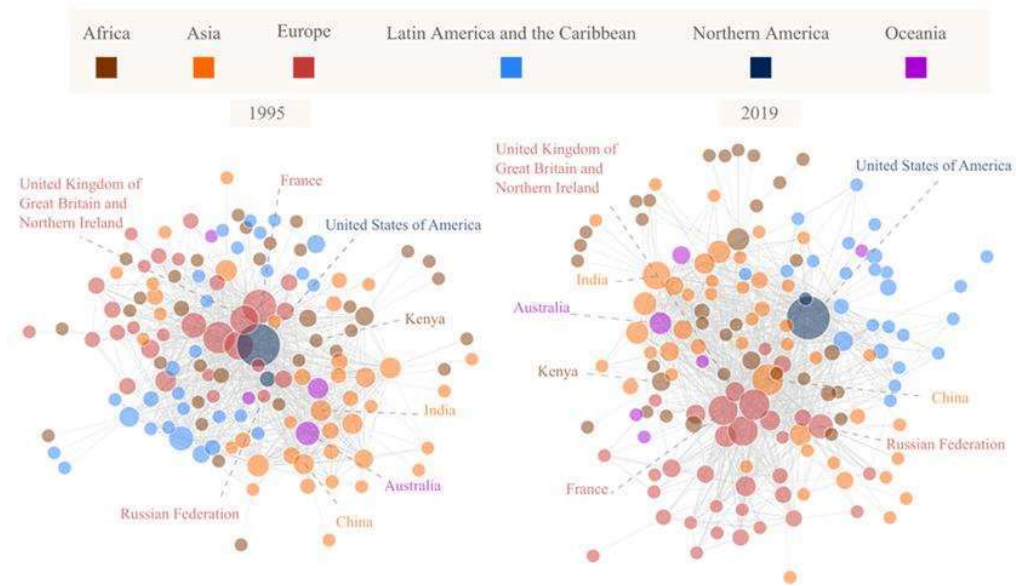
2. Global trends in trade of food and agricultural products

Regionalisation has replaced globalisation

Food and agricultural trade expanded rapidly in the new millennium, catalysed by trade liberalization at multilateral and regional levels. Today, more countries trade with each other than did in the last century. Emerging economies have become important players and low-income countries are better integrated into global markets. Although globalization has brought about important changes in the structure of the global food and agricultural market, it has lost steam since the financial crisis of 2008.

Indeed, the structure of the global network of food and agricultural trade became less concentrated and more decentralized between 1995 and 2019. In 1995, a few but large trade hubs – that is countries connected to many trade partners and characterized by a large number of trade links, many of which are of high value – dominated the global market (Figure 4). Over time, together with the expansion of trade and the emergence of new players, the number of these trade hubs increased while the dominance of the individual hubs weakened. For example, in terms of trade intensity, the United States was the most significant hub in 1995 and remained so in 2019. Following its accession to the WTO in 2001 and the rapid growth it experienced, the People’s Republic of China (hereafter “China”) evolved from a relatively small hub in 1995 to the second largest in 2019, moving from the periphery of the network to become one of its central players. Several Northern and Western European countries that were among the top ten hubs in 1995 were reduced in relative importance and gave way to emerging economies such as India, Russia and South Africa (Figure 4). These structural changes reflect a relatively even playing field and characterize a global food market conducive to economic growth. For example, low- and middle-income countries are more likely today to trade with high-income economies than two decades ago. This is important as trade facilitates the diffusion of technology and knowledge, and promotes productivity and growth.

Figure 4. The food and agricultural trade network and trade hubs in 1995 and 2019



Note: The circles denote countries. Large circles can be trade hubs. When trade hubs are located in (outside) the core of the network, the network is more centralized (decentralized). Countries with trade values lower than 0.01 percent of the overall trade are excluded. Measured on the basis of trade intensity.

Source: FAO (2022^[7]).

As globalization slowed after 2008, the regionalization of food and agricultural trade – the tendency of countries to trade more within a region than with countries outside the region – has become more pronounced. Countries form trade clusters, which may be regional or expanded to include countries across regions and within which they tend to trade more. Such clusters are often shaped by geographic proximity and economic integration forged by trade agreements.

The role of Regional Trade Agreements (RTAs) in promoting regional trade integration is reflected in the fact that almost half of RTAs currently in force were concluded between countries in the same region (Figure 5). Most other RTAs (around 50% of the total) cover countries in two different regions and only 1% of those include countries in three or more regions (FAO, 2022^[7]).

Figure 5. Regional trade agreements between countries by regions (%), 2022



Source: FAO (2022^[7]).

Comparative advantage and trade costs determine agricultural trade flows

Comparative advantage and trade costs determine trade partners and the trade flows between them, the value of food and agricultural products traded and the gains from trade. Comparative advantage is the ability of a country to produce a particular good at a lower opportunity cost than its trading partners. It entails a comparison of agricultural productivity per worker and input costs across countries, and products and reflects the state of technology and the resource endowments. In agriculture, other things being equal, comparative advantage has a much stronger influence on trade than in other sectors of the economy because of the large differences in agricultural productivity across countries and the uneven distribution of natural resources globally.

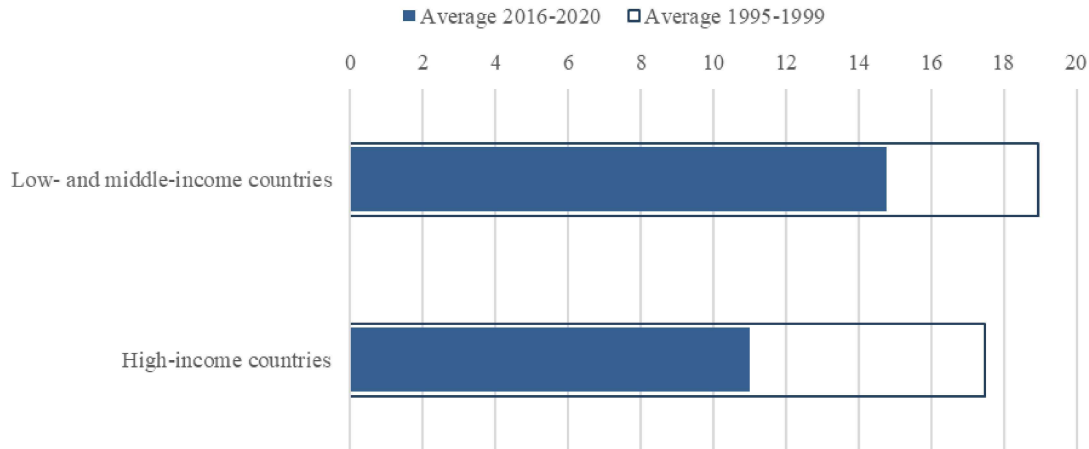
However, high trade costs in food and agriculture can weaken the underlying role of comparative advantage in determining trade flows. The main components of trade costs are transport and policy costs. Each of these two components varies over time, by commodity, and between trading partners, and is influenced by multiple factors. There are also costs that are more difficult to measure, such as search and communication, distribution, or those associated with documentation, procedures and clearance delays at the border. For perishable agricultural products, border delays can be particularly costly (ITC (International Trade Centre), 2015^[8]). On average, estimates suggest that for food and beverages, a delay at the border of one day is equivalent to a 3.1% ad valorem trade cost, compared with 2% for consumer and capital goods (Hummels and Schaur, 2013^[9]).

Transport costs are significant and increase with distance. A recent OECD study examines the global trade in grains and oilseeds, which for more than 80% is shipped via maritime transport. The analysis shows that a 10% increase in the bilateral distance between two ports is estimated to lead to a 2.5% increase in freight rates for grains and oilseeds (Deuss, Frezal and Maggi, 2022^[10]). Since costs incurred from transportation tend to increase with distance, countries are inclined to favour trading partners that are close by (Anderson and van Wincoop, 2004^[11]) (Pomfret and Sourdin, 2010^[12]).

Policies also have a significant impact on trade flows and trade costs. Agricultural tariffs and non-tariff measures (NTMs) drive a wedge between prices in exporting and importing countries, and as such influence trade flows. Since the Uruguay Round of negotiations and the Agreement on Agriculture in 1995, the reduction in applied tariffs has been significant. Multilateral, unilateral and regional concessions are estimated to have contributed to a reduction of about 27% in average food and agricultural tariff levels worldwide. These reductions brought greater market openness and promoted trade significantly. Nevertheless, the extent of tariff reduction in low- and middle-income countries was less than in high-income economies (Figure 6). Analysts suggest that this process of reduction in applied tariffs by low- and middle-income countries became less significant after the 2008 financial crisis (Bureau, Guimbard and Jean, 2018^[13]).

Whereas tariffs clearly reduce trade, with multiple studies showing how the reduction in agricultural tariffs has brought greater market openness and promoted trade, the impact of NTMs on trade is more complex. Almost 100% of food and agricultural imports are subject to NTMs compared to an average of 40% for all other sectors; and, on average, a food product faces eight different NTMs compared to just under two NTMs for products of all other sectors (UNCTAD & World Bank, 2018^[14]).

Figure 6 Applied tariffs in agriculture, 1995-1999 and 2016-2020



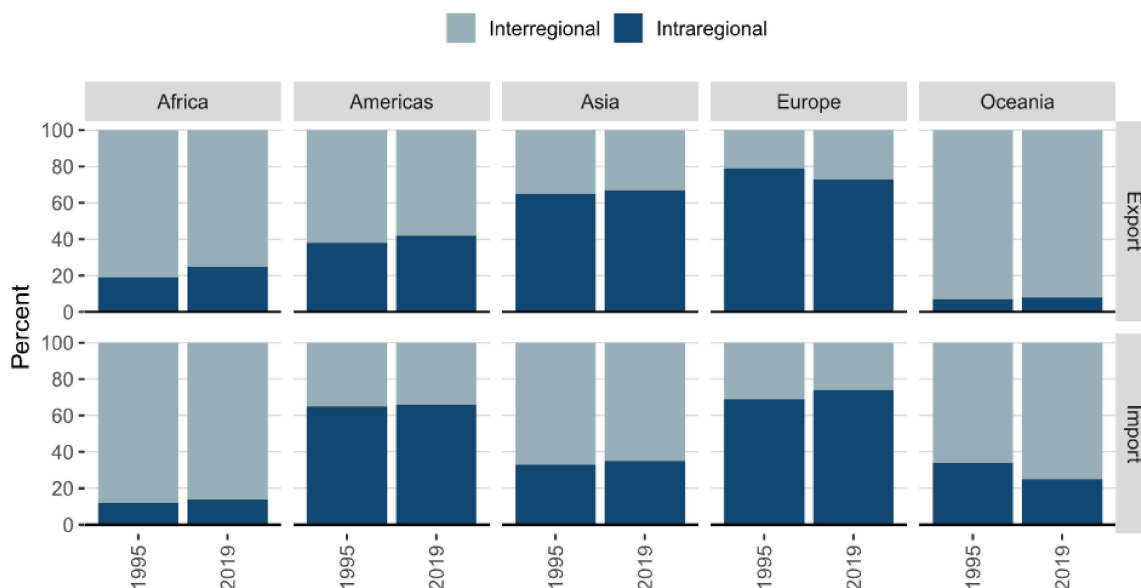
Note: Average of effectively applied tariffs.

Source: The World Bank (2023^[15]).

NTMs such as sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT) generally raise trade costs, but they can also expand trade volumes by increasing demand for imported products. Cadot, Gourdon and van Tongeren (2018^[16]) find that this is particularly the case for SPS measures in agriculture, where compliance with SPS regulations can provide a positive signal to consumers, thereby increasing consumer confidence in imported products. Harmonizing NTMs across countries is important to reduce their costs and to enhance trade. Often, RTAs include provisions for deeper cooperation in regulations and standards to promote trade amongst their members. The WTO offers a system that *inter alia* promotes discussion on border measures, contributes to reducing trade costs through trade facilitation, and the harmonization of rules, while recognizing diversity in preferences and standards across countries.

The interplay between comparative advantage and trade costs shapes the geography of trade as countries select their trading partners by balancing the gains from trade with its costs. The assessment of how comparative advantage overcomes the barriers imposed by trade policies and costs, and how these shape trade flows also points to the regionalization of food and agricultural trade. For example, recent research suggests that in Europe, comparative advantage exerts significant power within the region of Europe, overcoming average trade costs that on average are estimated to amount to 152% *ad valorem* equivalent. Within sub-Saharan Africa, the low level of comparative advantage and high trade costs are reflected by an average of 237% *ad valorem*; this translates into low levels of intra-regional trade (Figure 7)

Figure 7 Food and agricultural trade between and within regions, 1995 and 2019



Source: FAO (2023_[17]).

3. Trade can help addressing food security issues in each of its dimensions

The 1996 World Food Summit (FAO, 2008_[18]) stated “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. From this definition, four main dimensions of food security can be identified:

- *Food availability*: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).
- *Food access*: Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).
- *Utilization*: Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.
- *Stability*: To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.

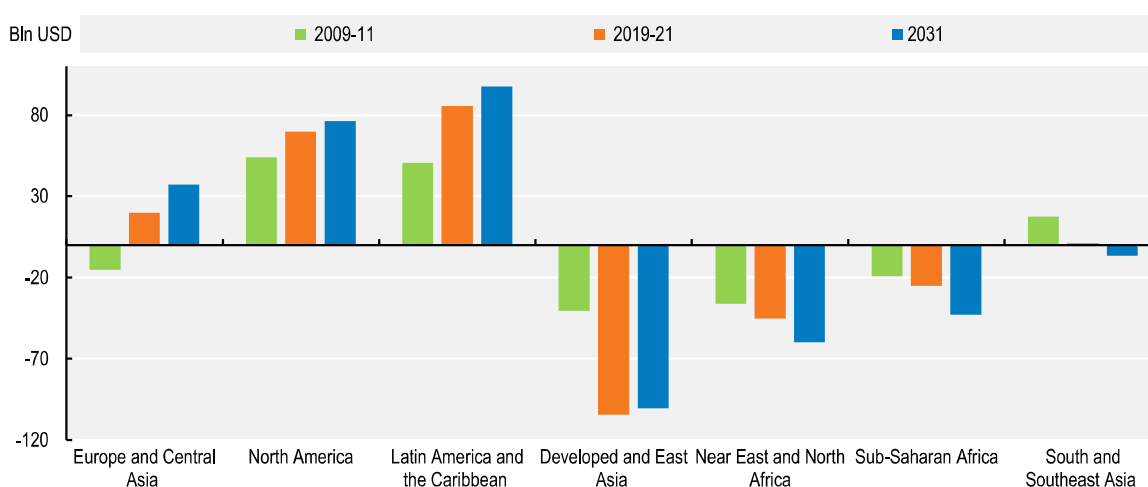
On balance, trade openness improves each dimension of food security. Indeed, trade has been identified as a mechanism for achieving Sustainable Development Goal 2 (SDG 2) under Agenda 2030, which sets out to “end hunger, achieve food security and improved nutrition and promote sustainable agriculture” (FAO, 2020_[19]).

Trade and food availability

Trade in food and agriculture can help balance global food supply and demand by moving food from surplus to deficit areas. In particular, countries with limited natural resources to produce adequate food are highly dependent on the import of basic and high value food commodities, with imports generally accounting for a large share of their total calorie and protein availability (FAO, 2022^[7]).

Globally, trade has become increasingly important for food security over the past decades, as growth in population and per capita food demand has been stronger in net food importing countries than in net exporters. This trend is expected to continue over the coming decade, with traditional exporters increasing their trade surplus and net importers seeing their trade deficit widening (OECD/FAO, 2022^[20]) (Figure 8).

Figure 8. Net trade by region, in constant value



Note: Net trade (exports minus imports) of commodities covered in the Agricultural Outlook, measured in constant 2014-16 USD. Net trade figures include intra-regional trade but exclude intra-EU trade.

Source: OECD/FAO (2022^[20]).

Considering the significant and uneven risks arising from climate change to agricultural production, trade is likely to become even more significant in the future as food demand grows in regions where productivity gains will not be enough to meet demand growth [OECD/FAO, 2022; (OECD, 2021^[21])]. Trade flows can partially offset how local climate change affects productivity, allowing regions with positive (or less negative) effects to supply those with more negative effects (Brooks and Matthews, 2015^[22]).

Together with productivity differences, the uneven allocation of natural resource endowments across countries is a key determinant of comparative advantage in food and agricultural trade. Land and water are crucial factors in food production, and their availability can influence the relative cost of agricultural products and shape comparative advantage. Differences in land and water endowment are substantial across countries. For example, agricultural land per capita in the United States is approximately 25 times higher than in Japan (FAO, 2022^[7]).

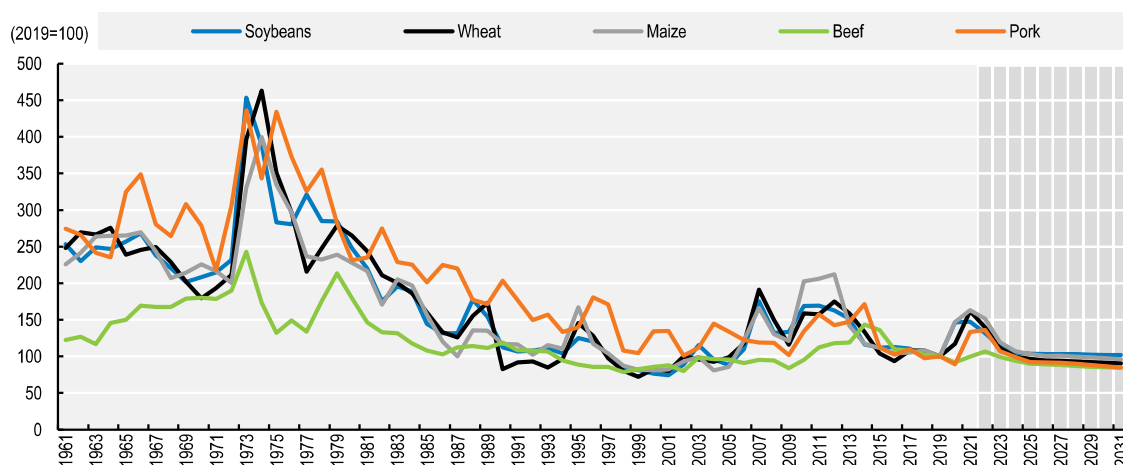
Without trade, such large differences would result in extremely high food prices in countries with few natural resources per capita and extremely low prices in countries with larger endowments of land and water; this would have large implications for food security. Trade ensures food security and helps countries overcome constraints in land and water, and to meet their food requirements in terms of quantity and diversity at levels above what domestic production could sustain (FAO, 2022^[7]).

In addition to moving food from surplus to deficit areas, trade can ensure the efficient and sustainable use of natural resources necessary for agricultural production (e.g. land, water) (OECD, 2021^[21]). Trade could help allocate production to regions that are characterized by relatively high water productivity – that is, regions that use relatively lower amounts of water per unit of output. In this way, more trade in food and agricultural products would foster water savings at the global level. One study estimates that trade could generate between 40 and 60 m³ of annual water savings per capita (Tuninetti, Ridolfi and Laio, 2020^[23]). Similarly, trade can also contribute to better use of land globally. For example, trade in cereals is estimated to enable annual land savings in the magnitude of 50 million hectares (Dalin and Rodríguez-Iturbe, 2016^[24]).

Trade and food access

Food prices are a key determinant of the affordability of food and hence access to food. Trade puts downwards pressure on food prices by increasing food supply. Whilst agricultural prices have increased in nominal terms over the past two decades (Figure 2), they have followed a long-term overall downward trend in real terms and it is projected that these prices will continue to decline, in real terms (OECD/FAO, 2022^[20]) (Figure 9).

Figure 9. Long-term evolution of commodity prices, in real terms



Note: Historical data for soybeans, maize and beef from World Bank, "World Commodity Price Data" (1960-1989). Historical data for pork from USDA QuickStats (1960-1989).

Source: OECD/FAO (2022^[20]).

The declining trend in food prices implies there is greater scope for improving access to food by raising incomes than there is by lowering prices. Trade can improve the incomes of both importers, who pay lower prices than in the absence of trade, and exporters, who receive higher prices than in the absence of trade.

For a country, trade also allows better access to the markets of other countries and promotes exports of agricultural products to these markets, thereby creating and expanding employment opportunities and raising farmers' incomes. The income effect of trade on economic access to food can be substantial, with higher incomes triggered by economic growth and the change in relative prices inevitably affecting food consumption (Brooks and Matthews, 2015^[22]). This conventional wisdom concerning the effects of trade openness on growth and productivity is questioned by many practitioners. Gains from trade are asymmetrically distributed. Trade openness affects the prices of goods and those of production factors, including labour, and thus can result in winners and losers. In agriculture, a major concern relates to the

ability of smallholder farmers from developing countries to compete effectively in open markets. A recent analysis of the impacts of eliminating tariffs on agricultural products across 54 low-and middle-income countries pointed to increases in both income and inequality. On average, liberalizing agricultural trade would increase household incomes. At the same time, eliminating import tariffs was found to have highly heterogeneous impacts across countries, and, within countries, across households. In most countries, the top 20% of the richest households would gain more from liberalization than the bottom 20%, thus exacerbating inequality (Artuc, Porto and Rijkers, 2019^[25]).

Trade, food utilisation and nutrition

Through its income-raising impacts, trade can improve the nutrition of households that are food insecure (in terms of quality/diversity) because of their poverty. In addition, trade can provide consumers access to more varied and diversified diets since natural conditions do not allow for producing all food everywhere. The exchange of foods produced under specific climate, soil and other natural conditions can broaden consumer choices, thus promoting more diversified diets, especially of fresh and minimally processed foods such as fruits, vegetables, meat and dairy products (FAO, 2018^[26]). Agricultural trade can improve the availability and diversity of foods and nutrients and provide the basis for better nutrition. Since the beginning of the 1960s, trade in crops has expanded and diversified, and this process has been identified as the main driver of a globally diversifying supply of vegetable products (FAO, 2022^[71]). Indeed, a study suggests that trade resulted in food and nutrients being more equally distributed in 2010 than in 1970 (Bell, Lividini and Masters, 2021^[27]). Another study suggests that the expansion and diversification of food trade has been main driver of the global diversification of food supply (Aguiar et al., 2020^[28]). For example, in Southeast Asia, where rising incomes are modifying consumer preferences, an increasing share of demand for meat (especially poultry and bovine meat) will be met through imports. Similarly, increasing demand for milk powders in Near East and North Africa, Southeast Asia, and sub-Saharan Africa will be met by suppliers from the developed world (OECD/FAO, 2022^[20]).

Agricultural and food trade constitutes an important means to ensure dietary diversity. However, as trade improves the availability and accessibility of foods necessary for a healthy diet and foods high in fat, sugar, salt and calories, the effects on nutritional outcomes can be mixed.

Trade and food stability

Trade plays an important role in stabilising availability and access to food: it reduces the risk that food will not be available on domestic markets and it prevents that people's access to food will be limited by severe price moments. The key manifestation to risks to availability and access is price volatility, which is caused by supply or demand shocks. By integrating national and international food markets, trade can help absorb domestic supply and demand shocks that could otherwise result in excess domestic food price volatility (FAO, 2018^[26]). Global markets are less prone to policy or weather-induced shocks (e.g. natural disaster, seasonal growing patterns) than domestic markets, and, on balance, international shocks tend to be less frequent and severe than domestic shocks. For this reason, international trade plays an important role in reducing volatility by enabling countries to make use of world markets in the face of domestic shocks (OECD, 2021^[21]).

With climate change, and an increased frequency and intensity of extreme weather events, the risk pooling effect of trade will become more important. There is thus a case for further trade liberalisation to "thicken" international markets and to enable trade to play its balancing and stabilising role (OECD, 2021^[21]) (FAO, 2018^[29]). A recent modelling study by OECD (using GLOBIOM, a partial equilibrium model for agriculture) looks at the impact of the removal of a set of trade barriers (including tariffs) and coupled payments to commodities on climate change adaptation. The authors found that policy reform reduces the extent to which climate change increases agricultural prices and undernourishment by enabling production shifts to

regions with a comparative advantage and by facilitating trade flows into regions negatively affected by climate change (Guerrero et al., 2022^[30]).

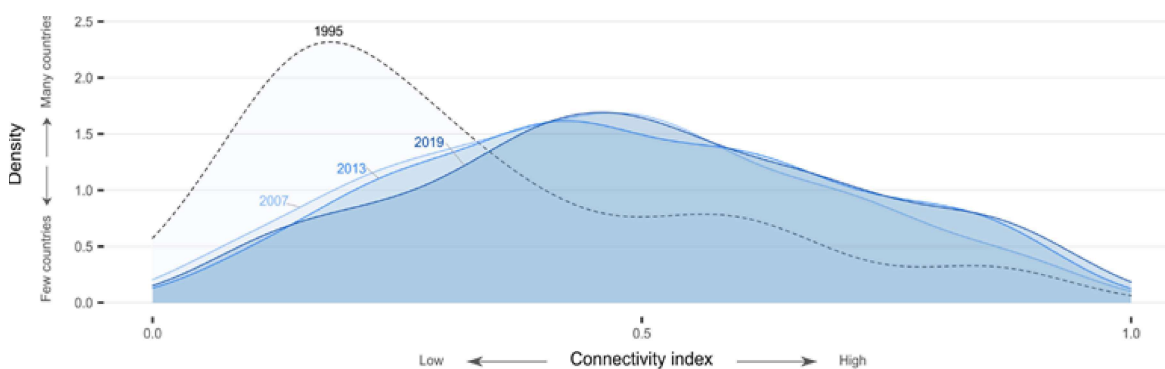
Global food markets are more resilient

At the global level, the extent to which countries are vulnerable to external trade shocks depends on many factors. An important determinant is the structure of the trade network. If a few large players dominate the network and many other countries are connected to these hubs, but are not connected among each other, shocks affecting these large players can easily transmit through the whole network. A shock to the system can dissipate when all (or many) countries in the network are connected to many trade partners.

Recent research suggests that in 1995, only a few countries were highly connected to the trade network; most countries were not well-integrated into global markets in the periphery of the trade network (FAO, 2022^[7]). Between 1995 and 2007, as the process of liberalization took hold, more countries increased their direct and indirect trade links with a larger number of other countries (Figure 10). As a result, the distribution of global trade links became much more even. Over a period of 12 years, the trade network moved from a pronounced core-periphery structure to a more symmetric, balanced, and resilient system.

While global food and agricultural trade became more balanced and resilient on the aggregate, there are still considerable dependencies at the product level, especially in staple foodstuffs. (Figure 11). Despite an increase in resilience between 1995 and 2007, trade links at the product level are still much less evenly distributed than aggregate trade links at the country level. Only a few countries source a large variety of food and agricultural products from many different exporters. The imports of most countries are more concentrated on a fewer number of products from a limited number of trade partners. Relying on a few trade partners can lead to imbalances and vulnerabilities to shocks in both importing and exporting countries. A study found that countries are least resilient to disruptions in the grain trade network, which consists of only a few major exporters, and this was the case during the 2007–2008 world food crisis and the high-price phase during 2010–2011 when several major producers imposed export restrictions (Karakoc and Konar, 2021^[31]).

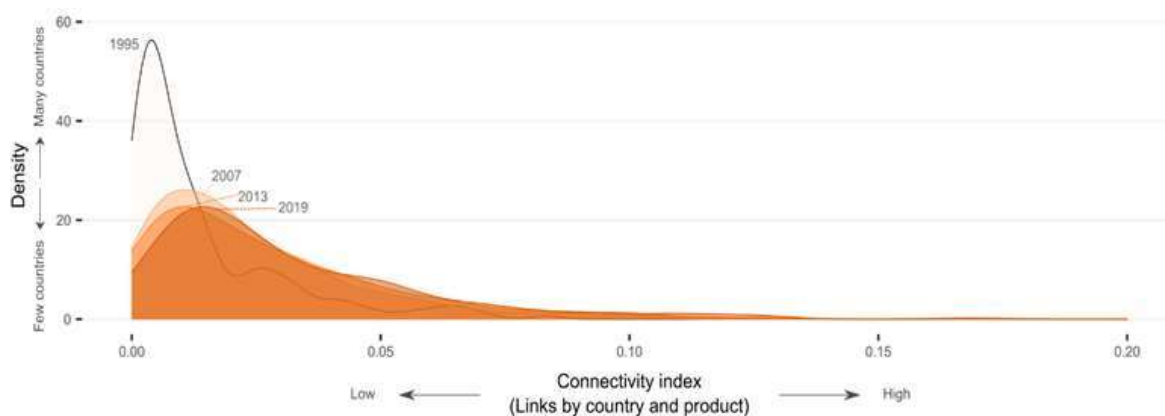
Figure 10. Distribution of trade connectivity across countries, 1995-2019



Note: A curve skewed to the left depicts a trade network where only a few countries are well-integrated in the global market. A bell-shaped curve depicts a balanced and more resilient trade network. Countries with high connectivity are located on the right tail; those with low connectivity are on the left tail of the curves. In 1995, very few countries were highly connected. Since 2007, many more countries are well-connected, and the food and agricultural trade network has become more symmetric.

Source: FAO (2022^[7]).

Figure 11. Distribution of trade connectivity across food products and countries, 1995-2019



Note: A curve skewed to the left depicts a trade network where only a few countries are sourcing a large variety of food products from many different exporters (located on the right-hand-side of the curve). Many countries source their food products from fewer exporters (located at the left-hand side of the curve).

Source: FAO (2022^[7]).

Open markets and complementary policies are crucial to unlock trade's potential in improving food security

The sections above describe the crucial role of trade to ensure food security and nutrition. Without trade, the availability and accessibility of foods and nutrients would be more unevenly distributed, domestic production disruptions would cause serious concern for food security, and diets would be less diverse.

Although the pathways of how trade can affect food security are well-established, the linkages between trade and the different dimensions of food security are complex and some of the impacts can offset each other (FAO, 2022^[7]). As explained above, although trade can contribute to a more sustainable use of natural resources, it can also lead to negative environmental externalities if production for exports results in unsustainable freshwater withdrawals, pollution, biodiversity loss, or greenhouse gas emissions. Trade can improve access to food, but imports can also expose small-scale farmers and processors to greater competition, which may undermine their livelihoods and, as a result, their own food security and nutritional outcomes. Trade can provide consumers with more varied and diversified diets, but it has also played a role in speeding up the transition towards foods that are higher in calories, saturated fat, sugar, and salt. Trade increases countries' resilience to shocks, but relying on a few trading partners can lead to imbalances and vulnerabilities in both importing and exporting countries.

In the absence of policies that address these negative effects, food security and the development prospects of rural areas – or even of agriculture-based countries – can be compromised (FAO, 2018^[26]). Trade openness thus needs to be properly managed (through appropriate policies) to maximize its positive effects on food security, while addressing trade-offs and minimizing potential negative consequences (Brooks and Matthews, 2015^[22]).

4. What if there are trade disruptions?

Agricultural trade can help improve food security in its different dimensions. However, when trade is disrupted because of shocks, bad harvests or policies, the food security situation in a country can be severely compromised. When dealing with trade disruptions, it is important to address the root causes, which require different solutions in the short- and long-term. Because of the unpredictability of such trade disruptions, some governments consider giving domestic production a higher priority in order to secure the food security of their population. However, domestic production alone is not sufficient to address food security and can even have negative effects on domestic and international food security.

Different trade disruptions need different responses

Broadly speaking, the three main causes of trade disruptions are natural, social and economic shocks, poor harvests, and policies that restrict trade. To address trade disruptions, it is crucial to identify the cause first. In the case of shocks, multiple solutions are possible in the short- and long-term; these will depend on whether the shock is localised or global, and whether it affects only specific agricultural sectors or the entire economy. In general, policy measures to deal with shocks should focus on keeping supply chain disruptions minimal, diversifying if possible, and introducing temporary relief measures.

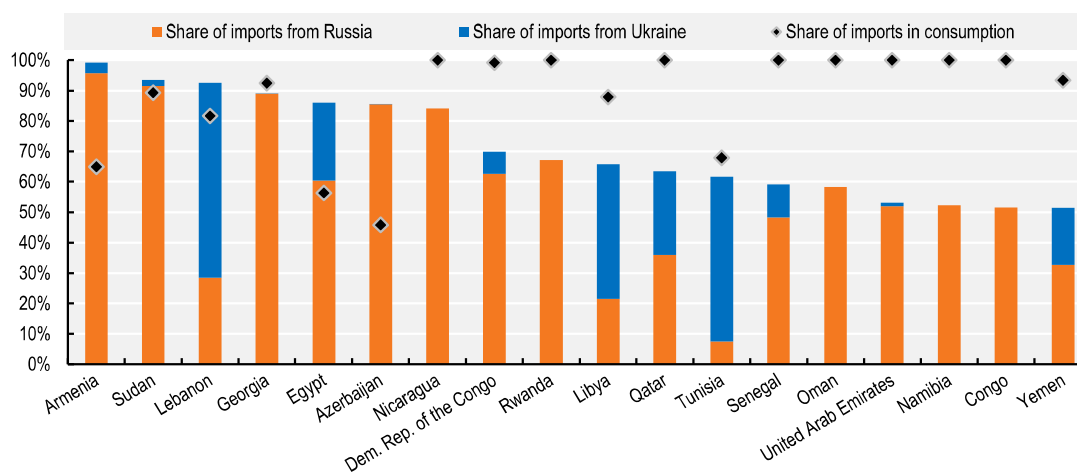
The COVID-19 pandemic led to a world-wide economic recession and impacted the food security of many low income or unemployed consumers. The pandemic also disrupted agricultural and food supply chains due to the lockdown measures in several countries which restricted the movement of food and agricultural products. Despite these significant disruptions, the agriculture and food sector demonstrated a relative economic resilience due largely to sector specific policy measures undertaken by governments in response to the COVID-19 pandemic and the associated restrictions (FAO, 2021^[31]).

The OECD examined policy responses adopted by governments of 54 OECD and emerging economies in 2020 (OECD, 2021^[32]). These measures varied widely, highlighting the breadth and responsiveness of public actions to address the impact of the crisis. Close to 20% of the total were urgent measures, adopted to contain the pandemic while keeping food and agriculture supply chains working. Just under 70% of measures took the form of temporary relief, seeking to contain the impact of the crisis on agriculture and food sector actors, and should be phased out as the crisis recedes. Most of the remaining measures (10%) were “no regrets” policies with the potential to improve the long-term resilience of the agro-food sector, and which have the potential to be scaled-up further. At the same time, 11% of measures had the potential to distort markets or to be harmful to the environment.

The war in Ukraine threatens global food security as a large number of food-importing countries, many of which are low-income food-deficit countries, rely on Russian and Ukrainian food supplies to meet their consumption needs. Several countries, for instance, receive over half, and some up to 100%, of their wheat imports from Russia and Ukraine, underlining the vulnerability of the food trade network to shocks in specific foods, such as grains (Figure 12). This includes a few countries already struggling with internal conflicts and precarious food security situations. These countries need to find alternative sources of supply to meet their consumption needs (OECD, 2022^[33]). In addition, rising energy and fertiliser prices are pushing up international food prices, thereby threatening global food security.

In the short term, efforts should focus on enabling agricultural exports from Ukraine by providing logistical support. This could be accomplished by enabling the use of Black Sea ports and by facilitating exports via alternative routes and the EU Solidarity Lanes. In addition, international trade in food and fertiliser should remain open to enable the necessary trade adjustments and to prevent the war from amplifying global food insecurity.

Figure 12 Dependency on wheat imports from Russia and Ukraine (2018-20 average)



Note: Only countries importing more than 40% of total wheat consumption and more than 50% of total wheat imports from Ukraine and Russia. Source: OECD (2022^[33]).

Harvest failures can lead to trade disruptions, especially if these bad harvests occur in large exporting countries. Imports of most countries are concentrated on a few products from a limited number of trade partners, making them vulnerable to shocks in exporter markets. To improve their resilience and ensure food security and healthy diets, countries should aim to diversify the products imported and to increase the number of trade partners. However, it should be noted that while global food and agricultural trade have become more balanced and resilient on the aggregate, there are still considerable dependencies at the product level, especially in staple foodstuffs. Only a few countries source a large variety of food and agricultural products from many different exporters. The imports of most countries are concentrated on a few products from a limited number of trade partners (FAO, 2022^[7]).

The third general cause of trade disruptions is the introduction of policies that restrict trade. Export restrictions are often implemented during times of increasing prices (e.g. during the food price crisis of 2007-08, COVID-19 pandemic, and the war in Ukraine – see Figure 3) in an attempt to protect domestic consumers from rising and volatile prices. These policies, however, not only affect markets in the restricting countries, but can also influence prices in global markets and in their trading partners (Deuss, 2017^[34]). Furthermore, they undermine the trust that countries have in the reliability of the international trading system as a source of supply. For this reason, export restrictions should be avoided and, where implemented, should be dismantled as soon as possible.

Domestic production alone is not the solution

The impact on international trade due to the COVID-19 pandemic and the war in Ukraine are leading to renewed discussions on food self-sufficiency and reshoring. More localised production is perceived by some governments as a way of providing greater security against disruptions to domestic supply. Countries adopt different approaches to balance between efficient use of existing domestic agricultural resources and food trade with a view to achieving food security. However, there are several reasons why domestic production alone is not sufficient to guarantee food security.

First, the contribution of domestic production to consumption needs to be evaluated in light of comparative advantages. Because of natural endowments with respect to land, labour, technology and climate, it is impossible for each country to produce sufficient, diverse and nutritious food to guarantee the food security

of its population. Furthermore, food self-sufficiency is not practical in many cases for environmental and resource availability reasons; trade can promote a more sustainable agricultural production on a global scale by specialising production in areas where crops can be grown without the need for excessive land clearing or irrigation (Clapp, 2015^[35]). Food self-sufficiency is an expensive way to ensure the availability of adequate and diverse foods. For many countries, trade together with domestic production can help promote food security and nutrition at a lower cost.

Second, some claim that more localised production would provide greater security against disruptions that can lead to shortages in supply and high uncertainty for consumers and businesses, thus calling for reshoring GVCs or at least rethinking their organisation. A recent OECD study shows, however, that re-localising GVCs would make the economy in most countries both less efficient and less stable (Arriola et al., 2020^[36]). Moreover, reshoring also means less diversification, which limits the scope for cushioning shocks, particularly those that may originate domestically (Bonadio et al., 2020^[37]) (Espitia et al., 2021^[38]).

Third, domestic policies that aim to increase domestic production can distort markets and trade. Past and ongoing OECD and FAO work shows that how support is provided matters for how it affects production, farm incomes and markets, as well as the performance of the agricultural sector with respect to environmental and other outcomes of social interest, such as nutrition (OECD, 2022^[39]). Market price support, and payments based on output and on the unconstrained use of variable inputs have long been identified as having the highest potential to distort production decisions and markets. They also have negative implications for global food security as they hamper the efficient allocation of resources and weaken the balancing role of trade to ensuring that the necessary products flow from surplus to deficit regions. This type of support is also the most harmful to the environment as it encourages unsustainable farming practices.

5. Conclusions

Agri-food trade affects the four dimensions of food security (availability, access, utilization, and stability). By moving food from surplus to deficit regions, trade can address production shortfalls, increase the diversity of available foods, and influence preferences and diets. However, the impacts of trade are complex and may create both synergies and trade-offs with respect to promoting global food security. In addition, trade disruptions can have serious implications on food security.

To maximise the potential for trade to contribute to food security and deal with the impacts of trade disruptions, efforts are needed to keep markets open, to invest in transparency, and to re-orient agro-food policies.

Commit to keeping markets open

During the 2007-8 food price crisis, export restrictions made a bad situation worse and created volatility and uncertainty. By contrast, several weeks after introducing export restrictions in response to the COVID-19 pandemic, policy makers committed to keeping markets open and lifted these restrictions. Yet, price increases in early 2022 saw countries once again restrict food exports.

Policy makers should implement the recent Ministerial Decision made at the 12th Ministerial Conference of the WTO (MC12) not to impose export restrictions or prohibitions on foodstuffs purchased for non-commercial humanitarian purposes by the World Food Programme (WFP). In addition, they should refrain from using export restrictions or prohibitions on agri-food trade, in line with the Ministerial Declaration at MC12.

Diversify products imported and increase the number of trading partners to strengthen resilience

The global food and agricultural market has become more resilient, but many countries remain vulnerable to trade shocks and should diversify their import sources to safeguard their food security. As countries have increased the number of their trading partners, the global food and agricultural market has become denser. This has strengthened the market's buffer capacity and resilience to shocks relative to the beginning of the 21st century. However, only a few countries still account for most of the value traded and only some countries source a large variety of food and agricultural products from many different exporters. The imports of most countries are concentrated on a few products from a limited number of trading partners, making them vulnerable to shocks occurring in the exporter markets. To strengthen their resilience and ensure food security and healthy diets, countries should diversify the products they import and increase the number of their trading partners.

Invest in market transparency to minimise disruptions to global trade

Investments in transparency during periods of stability have large payoffs when the unexpected occurs. Experiences during COVID-19 and Russia's invasion of Ukraine highlight the critical role of transparency in reducing uncertainty, and avoiding ill-informed decisions and counterproductive policy responses. The Agricultural Market Information Systems (AMIS) is an inter-agency platform to enhance food market transparency and policy response for food security (AMIS, 2023^[40]). It provides timely and reliable data regarding the market conditions of staple crops, monitors policy developments, and improves international coordination. AMIS also includes a rapid response forum, which can be convened during crises to discuss and align policy responses.

Policy makers should continue to support the work of AMIS with stable funding and consider expanding its scope to cover agricultural input markets, such as fertilisers, other commodities, and global food trade logistics. The continued support to AMIS was one of the actions identified in the Ministerial Declaration on Transformative Solutions for Sustainable Agriculture and Food Systems, adopted on 4 November 2022 during the Ministerial meeting of the OECD Committee for Agriculture (COAG) held in Paris (OECD, 2022^[41]), the G7 Agriculture Ministers' Communique on Pathways Towards Sustainable Food Systems in Times of Crises on 14 May 2022, the Chair's Summary of the G20 Agriculture Ministers' Meeting "Balancing Food Production and Trade to Fulfil Food for All" in Bali, 28 September 2022, and the G20 Leaders' Declaration in Bali, Indonesia, 15-16 November 2022.

Re-orienting policies through targeting productivity, resilience, and sustainability

While international agro-food markets have evolved, most countries continue to provide support and impose barriers through measures that affect trade flows and define the conditions in which interactions throughout the trading system occur. A key challenge is how to shape and design support to farmers in both developed and developing countries, while minimising distortions to global markets and trade.

Given the diversity of food systems, the way that trade and related policies affect food security differs across countries and changes over time. As such, these policies need to be adjusted accordingly and there is no one policy package that will be appropriate and applicable to all contexts. The WTO is the appropriate forum for dialogue on re-orienting policies and repurposing agricultural support. Efforts should focus on: phasing-out price interventions and market and trade distorting producer support; targeting income support to farm households most in need and, where possible, incorporate such support into economy-wide social policies and safety-nets; and to re-orienting public expenditures towards investments in public goods and services – in particular towards climate adaptation and mitigation programmes and innovation systems that promote sustainable production that benefit producers, consumers, and society overall.

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