What do we know about THE FUTURE OF FOOD TRADE?

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Key messages

- Trade in agriculture and food products increased dramatically over the past 20 years, driven by population and income growth that resulted in consumption exceeding production in many countries. Productivity growth grew as well, allowing countries with surplus production to meet global import demand. Reforms in the global trading system have reduced import barriers, also encouraging trade.
- As a result, imports as a percentage of total consumption have increased steadily (particularly in low-income countries) and forecasts for the near term (next 10 years) as well as longer-term projections (to 2050) suggest that these trends will continue.
- Climate change will pose continued challenges as production shifts due to increased temperatures and more variable rainfall. Trade will be necessary to help mitigate the impacts of these changes, so the global trading system must remain open and free of harmful distortions.

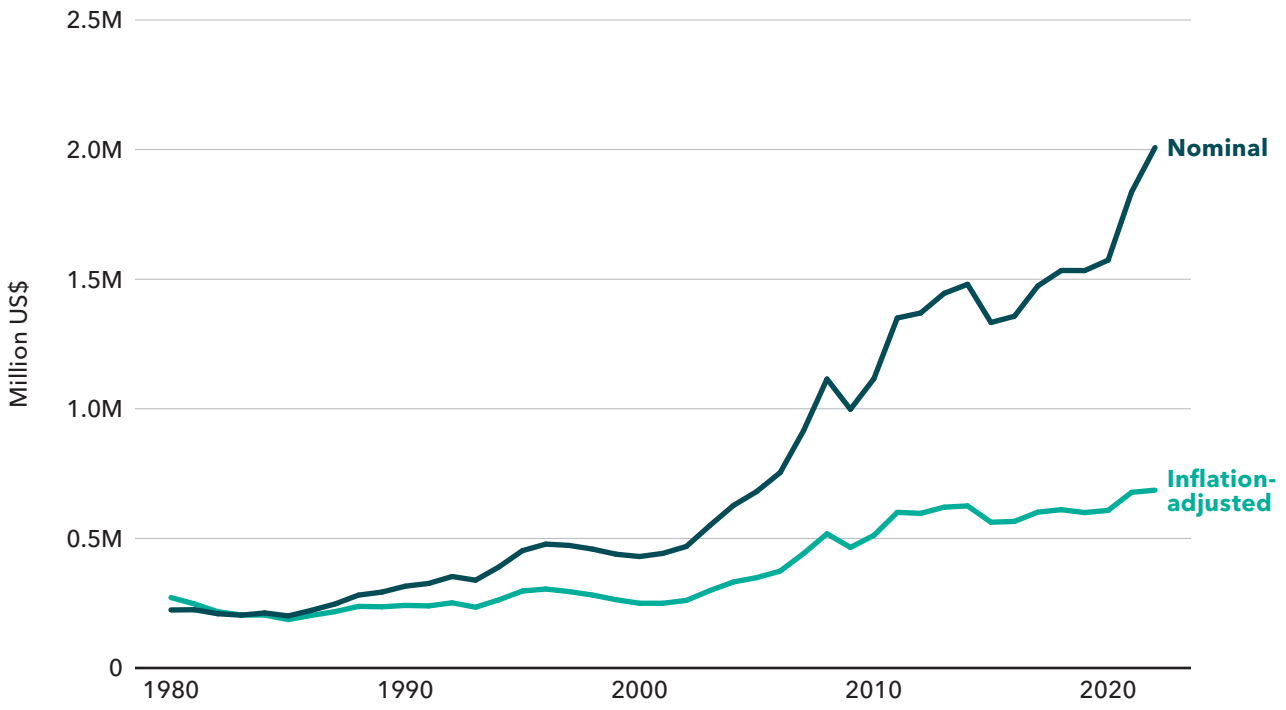
RECENT TRENDS AND CHALLENGES

Global trade in food products exceeded a record US$2 trillion in 2022 (WTO 2024). Over the past 20 years, global food trade more than tripled in nominal value and, accounting for inflation, more than doubled in real terms (Figure 1).

Developing countries are now playing a far larger role in global trade than they did 25 years ago (Figure 2). In 1995, developing countries accounted for only about 25 percent of global food imports and 30 percent of global food exports; by 2023, developing countries accounted for about 42 percent of global food trade. Productivity gains and technological innovations like double cropping in Brazil have helped developing countries increase export shares. Income and population growth have also spurred changes in diets, resulting in increased consumption of meat and dairy and processed food products. For some developing countries (for example, China), this has meant greater dependence on imports for feedstuffs and other agricultural products.

Another consequence of the growth of production in developing countries and in regions like the Black Sea following the breakup of the former Soviet Union is the growing diversification away from traditional suppliers like the United States, the European Union (EU), Canada, and Australia (Figure 3). Market concentration has declined for most cereals and oilseeds as global exporters including Brazil (soybeans, maize, animal products), Russia (wheat), Ukraine (wheat, maize, and sunflower oil), and Malaysia and Indonesia (palm oil) have grown in relative importance. With much of that growth occurring in the Southern Hemisphere, global production is more resilient to regional weather shocks. Moreover, diversified production means that producers in one hemisphere can often react within months of a production shortfall in another region, effectively reducing the global cycle to six months. Exceptions exist. Rice exports remain relatively concentrated in the exporting countries of South and Southeast Asia. Most palm oil production comes from Indonesia and Malaysia (though this is mitigated by its

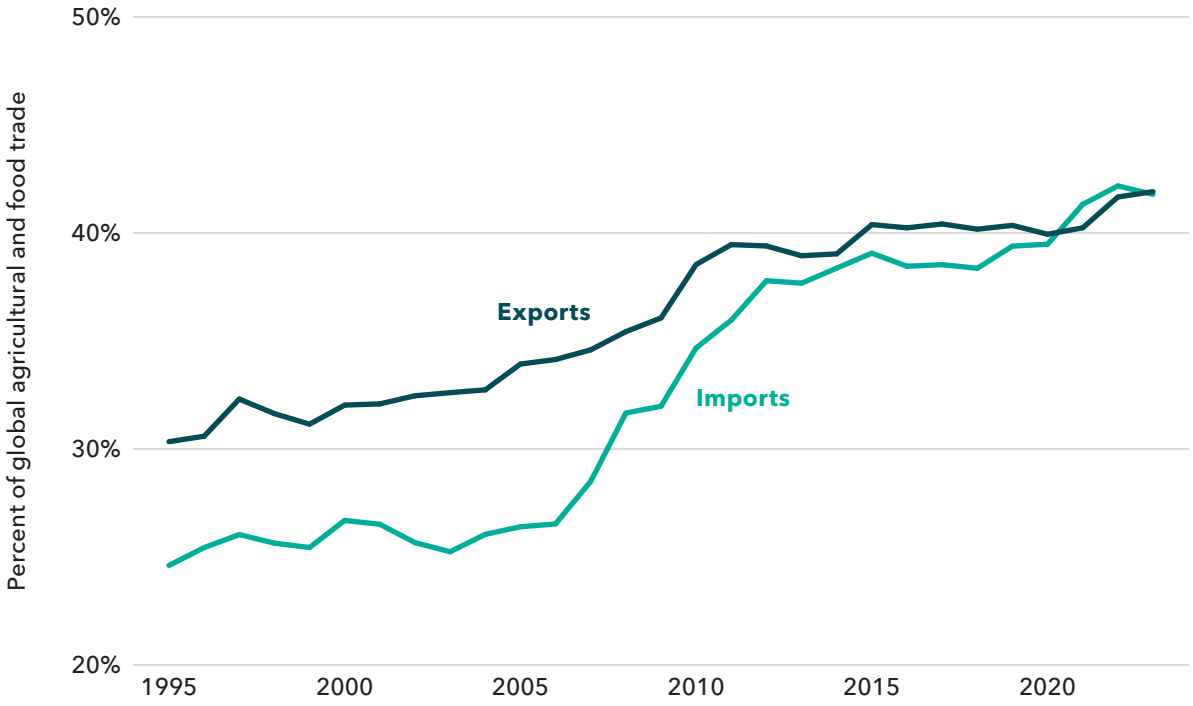
FIGURE 1 Value of world food trade, 1980–2022



Source: WTO Stats Portal.

Note: Trade value deflated by U.S. Consumer Price Index (1982–1984 = 100).

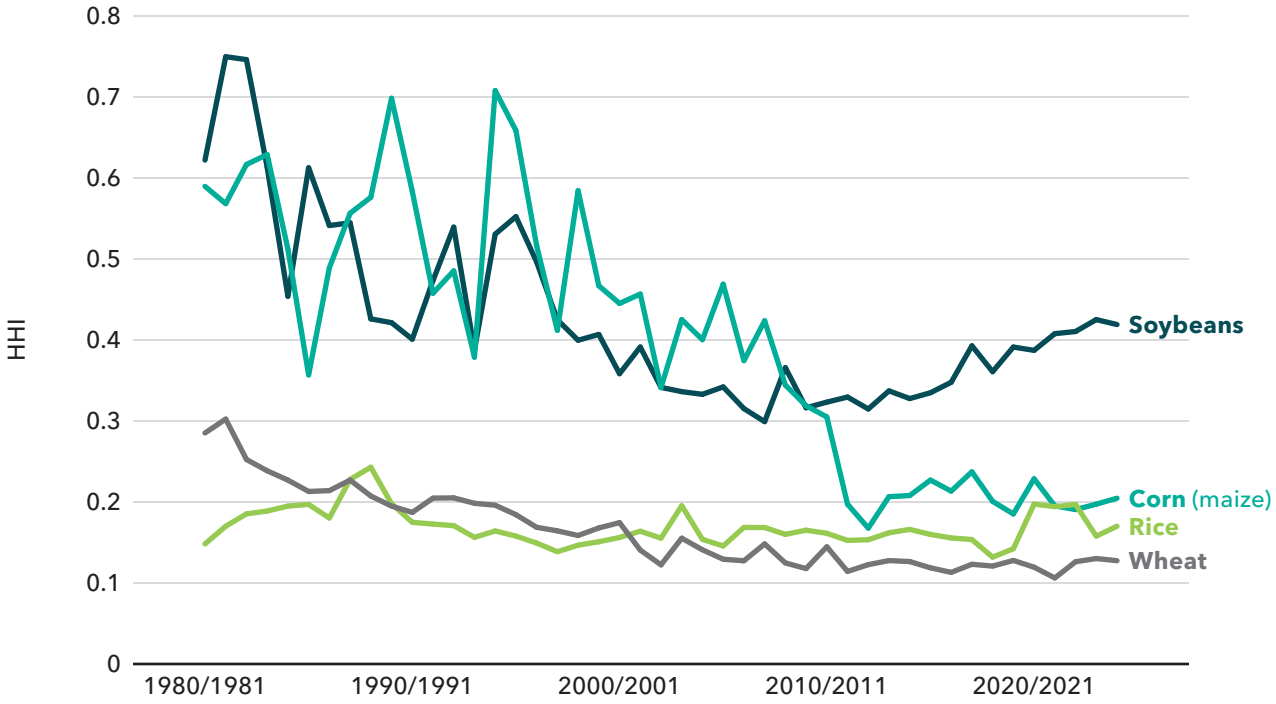
FIGURE 2 Developing countries' share of agricultural trade, 1995–2023



Source: UNCTAD Data Hub, https://unctadstat.unctad.org/

Note: All food items (SITC 0 + 1 + 22 +4).

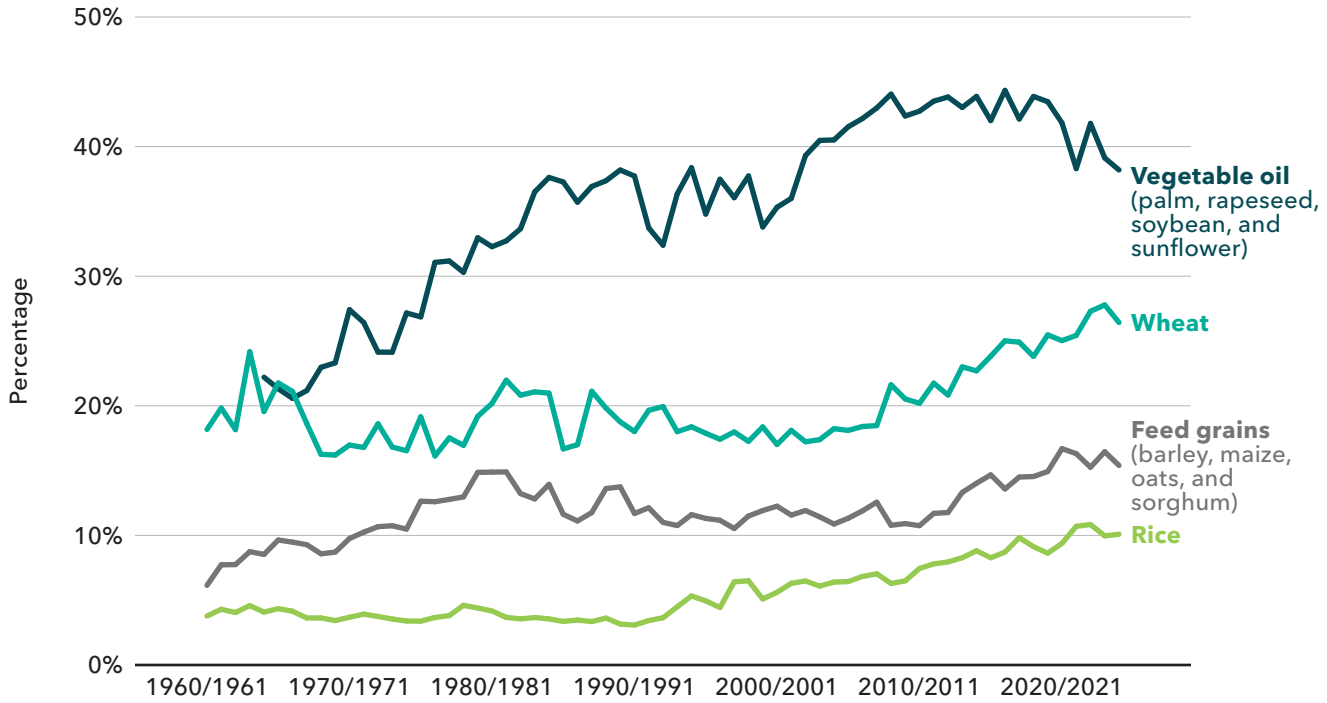
FIGURE 3 Concentration of global grain and oilseed exports, 1980/1981–2024/2025



Source: USDA/FAS/PSD Online, https://apps.fas.usda.gov/psdonline/app/index.html#/app/home

Note: HHI = Herfindahl-Hirschman Index. Herfindahl-Hirschman Index based on export quantities.

FIGURE 4 Imports as a share of total domestic use, 1960/1961–2024/2025



Source: USDA/FAS PSD database, October 11, 2024.

Note: Domestic use includes food, feed, and industrial use.

relative substitutability with other vegetable oils that are more regionally diversified).

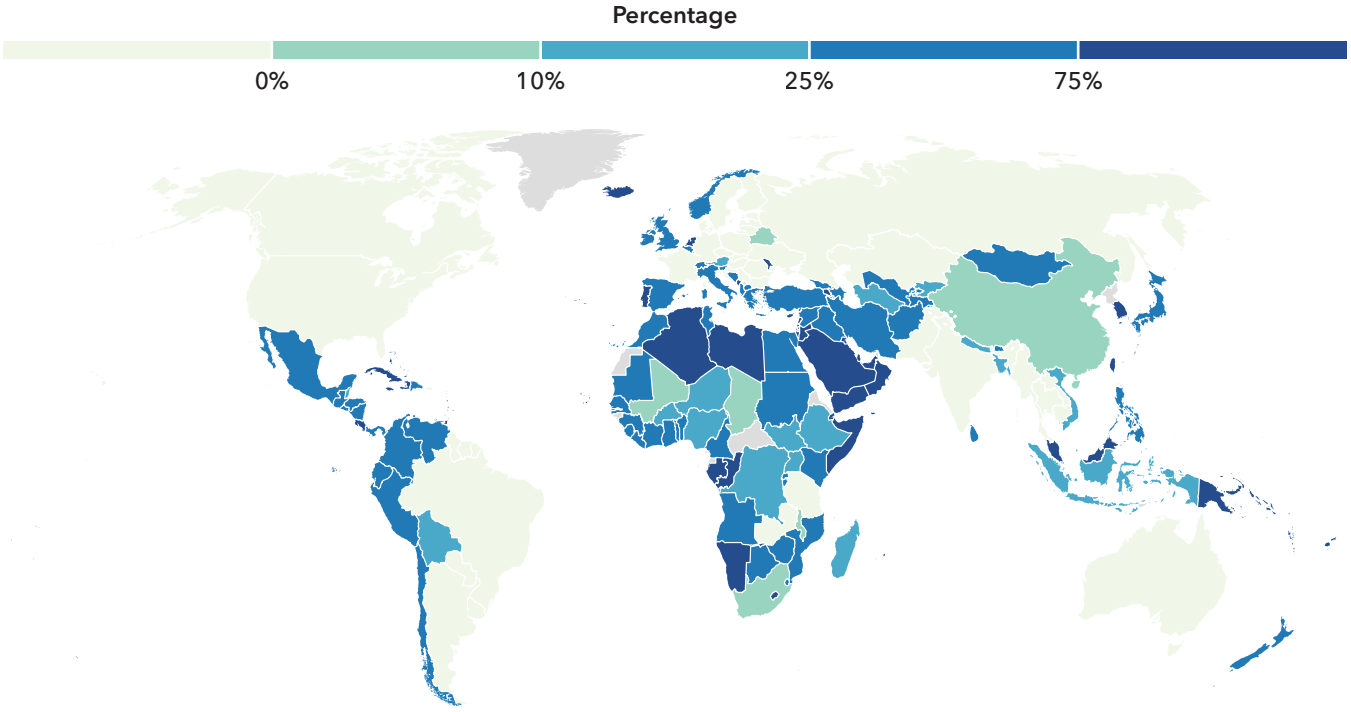
On the import side, increased demand means that many countries are increasingly dependent on foreign supplies. Import penetration rates at the global level have increased for wheat, rice, feed grains (barley, maize, oats, and sorghum), and vegetable oils (Figure 4). Not all of those imports go toward food consumption. Feed grains are primarily used as animal feed or in industrial uses such as biofuel production (though white maize is primarily consumed as food). Of the cereals, rice remains relatively thinly traded – imports account for only about 10 percent of global consumption. However, for many countries in sub-Saharan Africa such as Senegal or Benin, rice imports play a significant role in overall diets, particularly in urban areas.

Regionally, imports are important for much of Central America and non-MERCOSUR countries of South America, sub-Saharan Africa, and parts of Southeast Asia (Figure 5). The wheat-consuming countries of North Africa, the Middle East, and Central Asia are particularly dependent on imports, with import dependency rates in excess of 75 percent in countries such as Algeria, Libya, Saudi Arabia, and Yemen. The disruption in wheat trade following Russia's full-scale invasion of Ukraine in February 2022 demonstrated how vulnerable importing countries can be when supplies are adversely affected. Fortunately, the global trading system proved resilient, and countries were able to source food supplies (albeit at higher prices).

LATEST FORESIGHT RESEARCH

Near-term forecasts by the Organisation for Economic Co-operation and Development and the Food and Agriculture Organization of the United Nations (OECD/FAO 2024) and the U.S. Department of Agriculture (USDA/ERS 2024) estimate that imports as a share of global consumption will continue to grow for most cereals and oil crops over the next 10 years. The forecasts reflect continuing production growth in major exporting regions such as South America and the Black Sea region to meet growing demand in net food-importing regions like the Middle East and North Africa, China, and sub-Saharan Africa.

FIGURE 5 Cereal import dependency



Source: FAOSTAT

Note: Import dependency less than 0 indicate that the country is a net cereal exporter. Data reflect 3-year average (2020–2022).

In addition, projections from IFPRI's IMPACT[1] model suggest that global food trade will continue to expand over the longer term (Cenacchi et al. 2025 [Chapter 36 in this publication]; Robinson et al. 2024). Net exports of rice and wheat are projected to increase by more than 90 percent between 2020 and 2050, as rice production in India grows rapidly and as wheat production in Russia and Ukraine expands. Net exports of maize are projected to rise by 70 percent over the same period, driven by higher production in Brazil and Ukraine.

The United States is the world's largest net exporter of maize. Projections suggest, however, that growing domestic demand for bioethanol could significantly erode exportable supplies to the global market. This decrease is projected to be more than offset by rising maize exports from Latin America and Eastern Europe. By 2050, almost 90 percent of net maize exports are projected to come from seven countries.

Over the same period, climate change is expected to weigh on maize yields in several countries in which it is a key staple. For example, in Malawi, where maize accounts for one-half of daily per capita calories, rainfed yields are projected to be around 15 percent lower in 2050 than 2020. With little change in cultivated area expected, domestic maize production is also expected to fall by 15 percent over the period. This comes alongside an anticipated increase of 17 million in Malawi's population. As projected production and food demand for maize move in different directions, the country is likely to require significant imports to cover maize shortfalls. IMPACT projections suggest that net imports of maize could near 80 percent of Malawi's food demand by 2050, a significant increase over current levels. With few expected net exporters of maize in the region – South Africa's capacity to export maize is expected to decline significantly over the projection period – Malawi may be pushed to import from the major exporters noted above. The distance from these markets implies that trade costs will also exert pressure on the cost of staple foods.

1 International Model for Policy Analysis of Agricultural Commodities and Trade.

TABLE 1 Maize net imports as a share of maize food demand in selected countries in East and Southern Africa

Country	Maize contribution to average daily calorie availability (2020)	Maize net imports as a share of maize food demand	
		2020	2050
Malawi	50%	2.5%	78.8%
Zambia	40%	Net exporter	40.7%
Kenya	26%	25.9%	57.9%
Tanzania	25%	Net exporter	63.3%
Mozambique	22%	25.8%	80.1%

Source: IFPRI, IMPACT projections.

Several countries in East and Southern Africa are similarly vulnerable to this risk, which can materially affect food security and foreign exchange reserves. Table 1 identifies countries in the region where import dependency on maize is expected to rise sharply between 2020 and 2050.

This trend is not unique to maize in East and Southern Africa. Rice is an important staple in several countries in Asia, West Africa, and Latin America. Table 2 shows a selection of countries by region where rice import dependency is projected to increase significantly between 2020 and 2050. In the West and Central African countries identified, the import share of rice is already high, but these are expected to increase even more. Countries that have been close to self-sufficiency, such as Bangladesh, are expected to import as much as one-quarter of rice food demand by 2050.

Rice trade dependency is expected to be significant. Rice net exports are projected to be highly concentrated, with India's share of global net exports predicted to double to 70 percent between 2020 and 2050. This follows significant growth in rice production in India, while that of other

TABLE 2 Rice net imports as a share of rice food demand in selected countries

Country	Rice contribution to average daily calorie availability (2020)	Rice net imports as a share of rice food demand	
		2020	2050
West and Central Africa			
Guinea	37%	54%	>100%
Guinea-Bissau	51%	42%	57%
Côte d'Ivoire	24%	66%	84%
Sierra Leone	43%	40%	78%
Latin America and the Caribbean			
Costa Rica	15%	63%	78%
Ecuador	15%	26%	65%
Panama	24%	24%	61%
Peru	18%	13%	60%
South Asia and Southeast Asia			
Bangladesh	70%	2%	24%
Indonesia	43%	Net exporter	12%

Source: IFPRI, IMPACT projections.

TABLE 3 Wheat net imports as a share of wheat food demand in selected countries in Central Asia, West Asia, and North Africa

Country	Wheat contribution to average daily calorie availability (2020)	Wheat net imports as a share of wheat food demand	
		2020	2050
Afghanistan	60%	49%	83%
Turkmenistan	51%	12%	49%
Syria	49%	66%	>100%
Uzbekistan	42%	44%	85%
Pakistan	37%	Net exporter	53%

Source: IFPRI, IMPACT projections.

major exporters, such as Thailand and Viet Nam, slows over the projection period.

Wheat markets are less concentrated than rice and maize. IMPACT projections suggest that wheat net exports could grow by more than 90 percent between 2020 and 2050, with much of this growth driven by increased production in Russia and Ukraine. Wheat products are an important staple in most countries, and an especially important part of the food culture in Central and West Asia and North Africa. Table 3 shows countries in these regions where wheat import dependency is expected to increase significantly.

KEY GAPS AND OPPORTUNITIES FOR FORESIGHT RESEARCH

Food and agricultural trade grew substantially over the past 25 years, in part because of a more liberal trading regime under the World Trade Organization, but the global trading system faces challenges. Over the past 10 years, multiple trade disruptions occurred, including: conflicts such as Russia's invasion of Ukraine, which threatened global cereal and oilseed markets (Glauber and Laborde 2023); trade disputes, such as the recent trade war between the United States and China; export restrictions such as India's restrictions on rice exports, affecting almost 40 percent of global rice exports (Glauber and Mamun 2024); logistical disruptions affecting key chokepoints such as the Red Sea and the Panama Canal; and supply disruptions due to lockdowns and other responses to the COVID-19 pandemic.

Threats of increased protectionism under the new US administration and elevated trade tensions between China and other trading partners such as Canada and the EU could derail progress at a time when trade is becoming increasingly important.

Climate change will mean an increasing dependency on trade to meet global food needs. The disruptions to trade flows caused by weather extremes and subsequent reconstruction can undermine global supply chains (Verschuur, Koks, and Hall 2023).

Trade barriers and other distortions can thwart the movement of food and agricultural products, exacerbating food shortages when production shocks reduce global supplies. It is thus critical that the global trading system continue to facilitate trade by: reducing border measures and other trade-distorting measures; improving foresight and market analysis, such as through the G20 Agricultural Market Information System (AMIS), to better inform policy and investment choices; and promoting trade facilitation for lesser developed countries and developing countries highly dependent on imports to meet food needs.

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Related chapters on the future of food system drivers and impacts, regional and national perspectives, food commodities, and foresight tools are available in our Table of Contents.

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References

Cenacchi, N., T.B. Sulser, and A. Mishra. 2025. "What Do We Know About the Future of Food Demand, Production, and Food Security Based on IMPACT Model Projections?" In *What Do We Know About the Future of Food Systems?*, eds. K. Wiebe and E. Gator, Chapter 36. Washington, DC: IFPRI. https://hdl.handle.net/10568/175406

Glauber, J.W., and A. Mamun. 2024. "India Lifts Export Restrictions on Rice." *IFPRI blog*, November 8. https://www.ifpri.org/blog/india-lifts-export-restrictions-on-rice/

Glauber, J.W., and D. Laborde, eds. 2023. *The Russia-Ukraine Conflict and Global Food Security*. Washington, DC: IFPRI. https://doi.org/10.2499/9780896294394

OECD/FAO (Organisation for Economic Co-operation and Development/Food and Agriculture Organization of the United Nations). 2024. *OECD-FAO Agricultural Outlook 2024–2033*. Paris: OECD Publishing; Rome: FAO. https://doi.org/10.1787/4c5d2cfb-en

Robinson, S., S. Dunston, A. Mishra et al. 2024. *The International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT): Model Documentation for Version 3.6*. Modeling Systems Technical Paper No. 1. Washington, DC: IFPRI. https://hdl.handle.net/10568/148953

Rosegrant, M.W., T.B. Sulser, S. Dunston, A. Mishra, N. Cenacchi, Y. Gebretsadik, R. Robertson, T. Thomas, and K. Wiebe. "Food and Nutrition Security under Changing Climate and Socioeconomic Conditions." *Global Food Security* 41 (June): 100755. https://doi.org/10.1016/j.gfs.2024.100755

USDA/ERS (U.S. Department of Agriculture, Economic Research Service). 2024. International Baseline Database. https://www.ers.usda.gov/data-products/international-baseline-data/

USDA/FAS (Foreign Agricultural Service). 2024. PSD database. https://apps.fas.usda.gov/psdonline/app/index.html#/app/home

Verschuur, J., E.E. Koks, and J.W. Hall. 2023. "Systemic Risks from Climate-Related Disruptions at Ports." *Nature Climate Change* 13: 804–806. https://doi.org/10.1038/s41558-023-01754-w

WTO (World Trade Organization). 2024. Stats Portal. https://stats.wto.org/

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