

The Impact of the Russia-Ukraine War: Estimating the Economic and Welfare Losses in Africa using a Global CGE Model.

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Executive summary

Since February 2020, the Russia-Ukraine War (RUW) has split the world community into factions supporting either Ukraine or Russia, and those who prefer to take a neutral stance on the conflict. The latter includes many countries in the Global South now suffering the economic consequences of higher inflation and trade distortions (partly) caused by the RUW. Therefore, politicians worldwide and international organisations face a dilemma: On the one hand, allies of Ukraine support its territorial integrity, sovereignty, and independence by sending financial aid and arms, and installing sanctions against Russia. On the other hand, the sanctions contribute to trade disruption and inflation, which create adverse indirect impacts in countries of the Global South, that are not involved in the conflict. The geopolitical complexity of the problem makes finding a solution very challenging. However, analysing the impacts on countries of the Global South can support evaluating measures to help find the most optimal response and design effective mitigation measures.

The RUW has caused trade disruptions and artificial supply shortages on world markets for energy, fertiliser, and food products, amongst others. Increasing energy prices and other spillover effects pushed global inflation higher and hampered production in many regions. Alongside rising energy costs, increased fertiliser prices impacted agricultural production, leading to fast-rising food prices during most of 2022 that impacted many low- and middle-income communities. In Africa, economies and consumers suffered significantly because of a combination of high exposure in many cases and limited resilience to cope with economic shocks. As is well known, a large share of the African population already suffers from poverty and hunger. Furthermore, African countries have to cope with the RUW impact in the context of many existing problems: military conflicts, climate change impacts, migration and the lingering effects of the Covid-19 pandemic.

Our analysis with a Global Computable General Equilibrium (GCGE) model based on the GTAP database shows that African countries suffer from global trade shocks in both general economic performance and, more specifically, food consumption. The country-specific impacts depend on the country-specific economic system, industry inter-linkages and trade structures. Countries with lower resilience suffer a relatively large drop in gross domestic product and increased risk of food insecurity. To prevent countries from falling into deeper poverty and hunger requires policies that increase their robustness and resilience. Thus, policies must address food systems as a social-ecological complex at different levels. Policies can target the benefits of global trade and stimulate domestic production. Furthermore, governments can regulate the domestic supply and distribution of food in extreme crises. One priority is protecting the most vulnerable populations (e.g., women and children) with social assistance programs.

Solving this complex multidisciplinary task requires the engagement of many actors (governments, donors, private sector and civil society organisations, non-governmental groups, and consumer and trade bodies) considering multiple aspects (e.g., environmental, social and

governance factors). Given the limited fiscal space in many developing countries, the fight against the food crises requires international collaboration and support. The most effective measure, however, might be reducing the origin of the trade disruption, as a political challenge for international policymakers.

Trade disruptions from the Russia-Ukraine War

The trade disruptions

In February 2022, Russia invaded Ukrainian territory and started the still ongoing Russia-Ukraine War (RUW). The RUW created various trade disruptions via different channels. Ukrainian allies implemented sanctions against some Russian commodity exports. In addition, Russia reduced its exports of food and fertiliser, which were not directly subject to the allies’ sanctions. Russian military operations destroyed Ukrainian production and trade infrastructure, and Russia blocked exports from Ukrainian Black Sea harbours. Russia, Ukraine, and Belarus are important exporters of fossil fuels, fertiliser, and food commodities (e.g., grains and oilseed, see Figure 1). Therefore, these trade disruptions reduced the flow of the supply of commodities on the world market. For grains, the RUW caused scarcity in some markets, adding to the poor harvests in other key exporting countries caused by weather conditions (e.g., United States). As a consequence of these trade distortions and poor harvests, world prices for energy, fertiliser and food products significantly increased and continue the steeply rising trend observed during 2020 and 2021 (Figure 2).

Figure 1: Shares of Russia, Ukraine, and Belarus in per cent of global trade (FAO and UN)

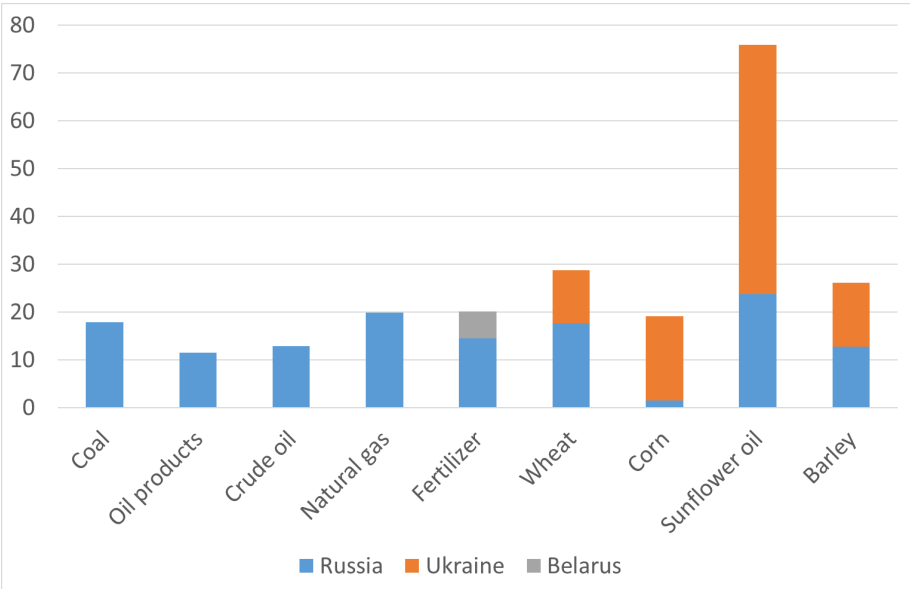
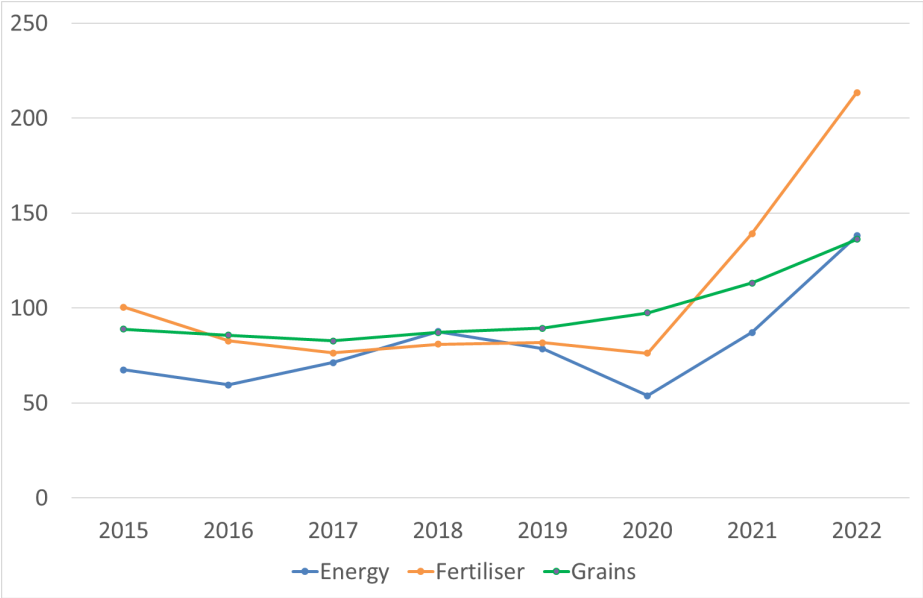


Figure 2: Development of world prices since between 2015 and 2023 in per cent with 2010=100 per cent (real 2010 US\$) (World Bank, 2023)



Rising prices for energy and food-related products had a significant impact on many African countries. With import shares between 10 and 20 per cent of the total demand, African regions depend strongly on energy and food imports from world markets (Figures 3 and 4). The import shares differ between the regions in Northern, Southern, Eastern and Western Africa (Figures 3 and 4) though and are even more heterogeneous at a country level. Different trade and production structures create region-specific impacts and exposure to the effects of the RUW; thus, impacts are contingent on those global inter-linkages as well as internal country and region-specific issues such as macro institutional factors and poor harvests and droughts in the Horn of Africa.

Figure 3: Share of fuel imports in African regions in per cent of total consumption

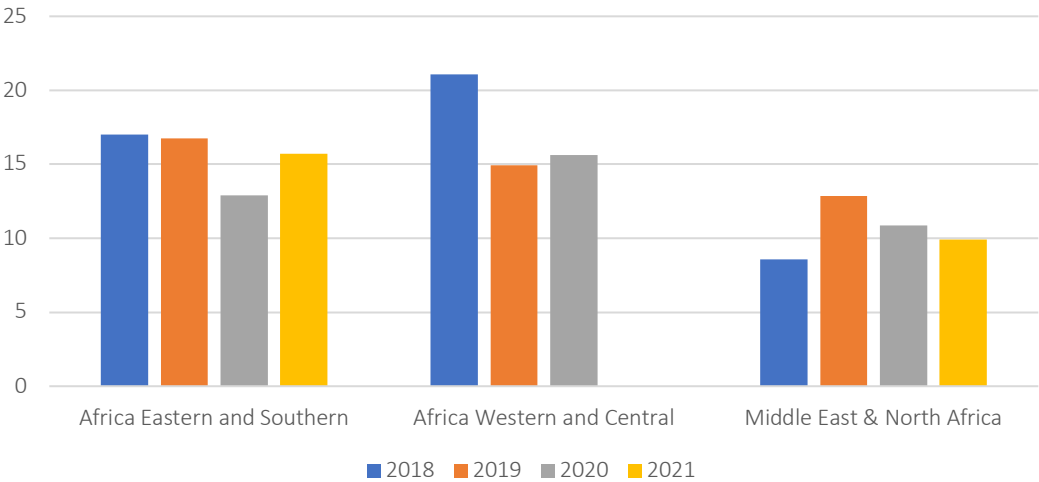
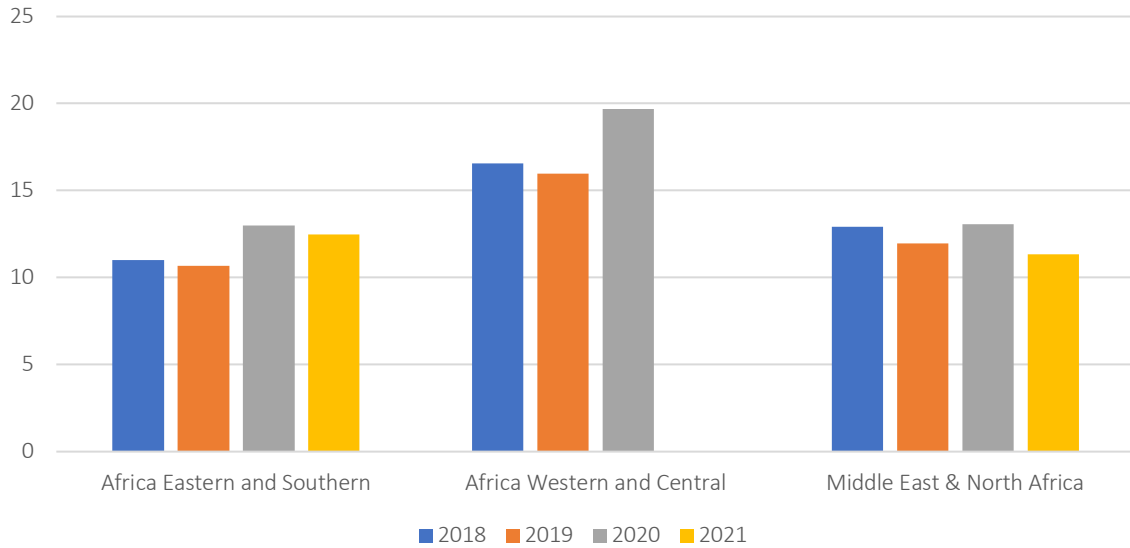


Figure 4: Share of food imports in African regions in per cent of total consumption. (World Bank, 2023)



The impacts in African countries

A multi-country Global Computable General Equilibrium (GCGE) model, based on the standard model documented in Robichaud et al. (2013), considers the regional and country-specific responses in Africa to the impact of the RUW. The GCGE model allows the simulation of the trade distortions over time and the analysis thereof across specific African countries and regions. The simulated trade distortions include Russia’s export ban on food and agricultural commodities, the disruption and reduction of crude oil production in Russia and other exporters, the reduction of fertiliser production, a food-trade restriction, and the losses of agricultural production caused by poor harvests in Northern Hemisphere (United States, Canada, and European Union) and in the Horn of Africa (Ethiopia, Sudan, and Kenya). The direct economic impacts of the Covid-19 pandemic or policy measures to mitigate the impacts of the RUW are not considered in the policy simulations.

The increased prices for energy and food production inputs create higher production costs in all sectors and increased consumer prices. Due to the intricate nature of global inter-linkages and indirect spillover effects, increased inflation, production costs and consumer prices were observed in all countries. In the short term (next three years) economic growth decreases significantly in Sudan, Kenya, and Ethiopia with a drop of more than one per cent seen relative to the unperturbed baseline (Figure 5). The baseline represents a scenario in which no RUW and its subsequent impacts are observed. The negative impacts continue to linger in the long run (up to 2030) in most of the countries, while economic growth recovers in countries with more developed and diverse economies (e.g., in South Africa). While increased energy prices drive inflation in all sectors, increased fertiliser prices negatively impact agricultural production specifically, spilling over into higher food prices in most cases. As an important sector in African

countries, this negatively impacts economic growth, with reduced output leading to reduced employment. Food security is also adversely impacted in many countries, specifically those more dependent on fertiliser imports.

The spike in global inflation significantly reduces the purchasing power of the population and decreases total consumption (Figure 6), with the consumption of food products specifically impacted, particularly in Sudan, Kenya, and Ethiopia (Figure 7). The situation of food scarcity is most critical for the vulnerable populations (children and women) in those countries and creates problems of undernourishment and other health problems.

Figure 5: Impact on the gross domestic product relative to the baseline (% change)

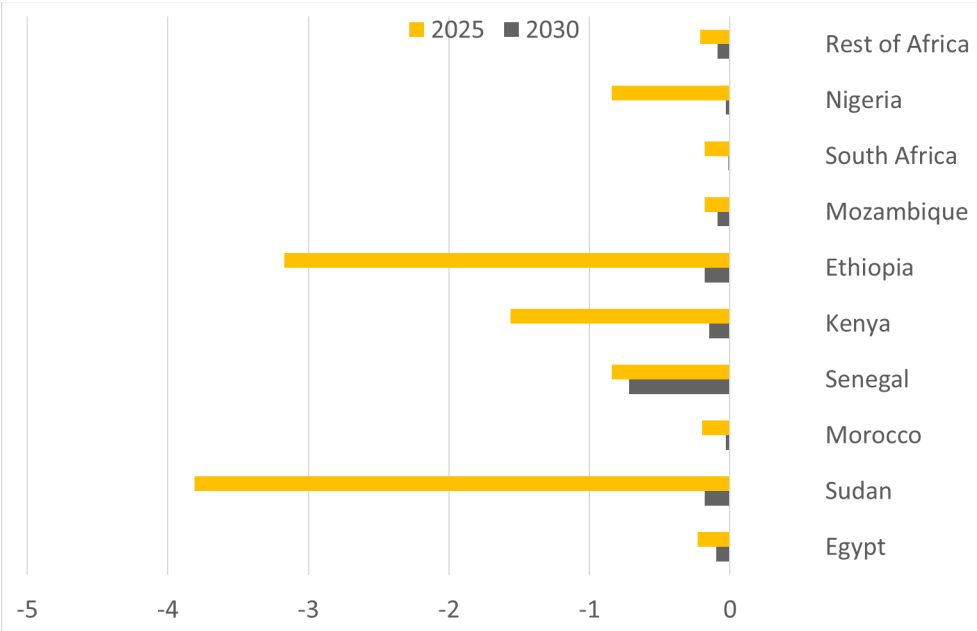


Figure 6: Impact on the consumption of all products relative to the baseline (% change)

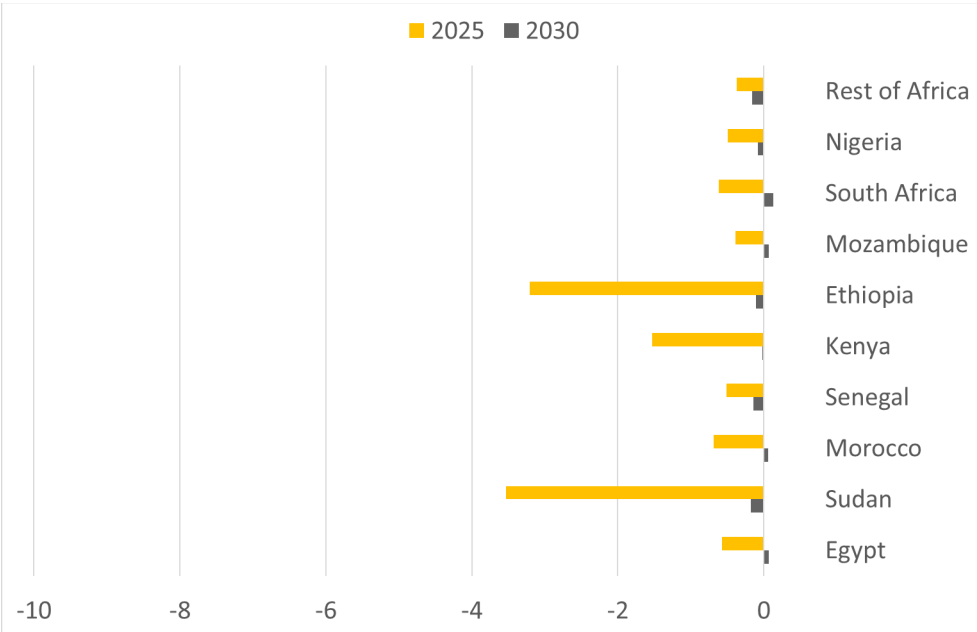
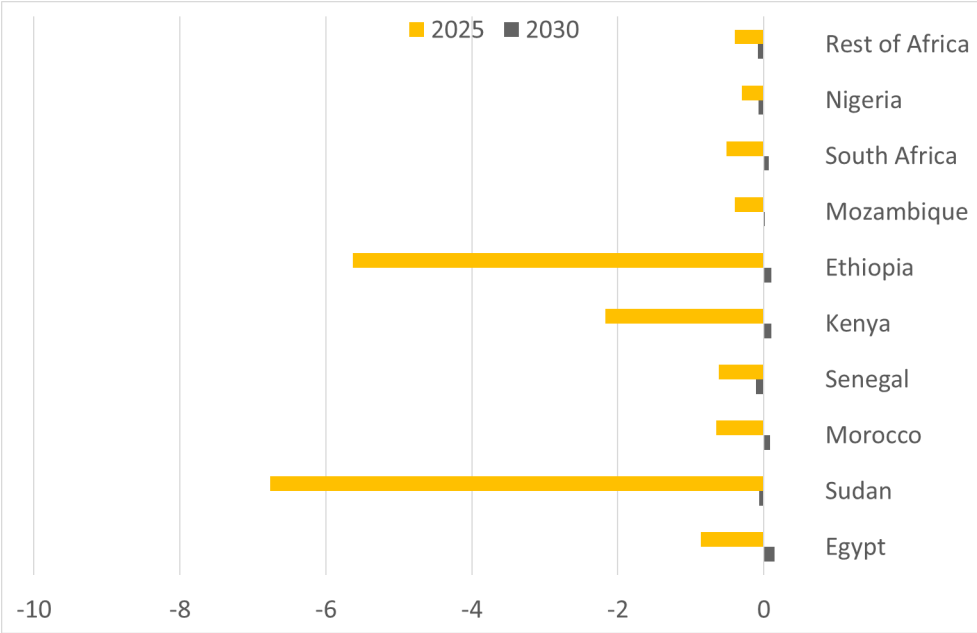


Figure 7: Impact on the consumption of agri-food products relative to the baseline (% change)



Challenges of current policies: The Grain Deal and export bans

The Grain Deal between Russia, Ukraine, Turkey, and the United Nations allowed for the temporary exports of Ukrainian food products via the Black Sea Corridor. The agreement, in force via several extensions from July 2022 to July 2023, supported the recovery of food prices. After Russia’s withdrawal from the agreement, food prices increased again. Ukraine focused its exports on Danube harbours but faced military attacks on transport and storage infrastructure.

Russia requested the reduction of sanctions on Russian exports as a condition for the renewal of the Black Sea Grain Initiative (Wintour, 2023). The sanctions against Russia have a political rationale, i.e., to limit Russia's state income used to fund military operations. However, to date, they were not effective in stopping the war as rising oil and gas prices offset losses in export volumes. Export volumes themselves have also not fallen fast enough due to the short-term dependence from some countries, including those in the West actively supporting Ukraine. As an indirect impact, the sanctions also contribute to expanding the impacts to more countries through real or artificial food and energy shortages, potentially creating more conflicts between countries (Deng et al., 2022).

Export restrictions are implemented at a state or country level, with a number of direct and indirect effects. The number of such restrictions has increased after the RUW started (Glauber et al., 2023; Osendarp et al., 2022). Export restrictions aim to protect the domestic supply and its use for domestic consumption when shortfalls are anticipated. However, for global trade, export restrictions create another trade barrier and distortionary effects in markets, often to the detriment of poorer countries and their citizens.

Improving the resilience of food systems

Releasing international trade

To cope with current and future trade shocks, policies should target improving robustness, resilience, and reorientation of food systems as social-ecological systems (Zurek et al., 2022). These objectives require consideration at the local, regional, and global levels, forming resilience from local to global, and balanced adjustments at each level (Bentley et al., 2022).

At the global international level, the most effective measure against food insecurity is maintaining global trade openness, particularly for key inputs such as in the agricultural and food supply chain, including fertilisers. Removing or reducing market distortions mitigates the impact of high food prices (Abay et al., 2023; Deng et al., 2022). If, for example, reducing sanctions motivates Russia to continue with the Grain Deal, it would reduce the pressure on the world market prices for food. Of course, the continuation of the sanctions against Russia is subject to a specific political-strategic rationale, and perhaps rightly so. However, their impact on world food and energy prices, especially in poorer African countries, does urgently call for high-level mitigation strategies to be designed and implemented.

Export controls and taxes, implemented by individual countries, create national market protections, but also barriers to international trade. Coordinated and multilateral state agreements via the United Nations could be more effective than isolated country-level interventions (Bentley et al., 2022). Governing bodies should therefore assist in reducing restrictions on exports where feasible, especially bans of staple foods in times of crisis (Dyson et al., 2023; Mottaleb et al., 2022). Reducing trade restrictions will ease access to food for net-importing countries, but as noted, will require coordination by international institutions (e.g., FAO and the WHO) (Abay et al., 2023; Deng et al., 2022).

Stimulating domestic production

Building self-sufficiency pathways at the country level can support a resilient food system from the bottom up (Bentley et al., 2022). However, self-sufficiency will not solve the problems of global food insecurity. Regional shocks on production (e.g., climate, weather events or pests) can jeopardise self-sufficiency, particularly in countries with low and fragile production structures. Global trade allows for more diversity, flexibility, and faster reactions to market shocks (Abay et al., 2023).

Structural policies should target the whole production chain and the required services (Bentley et al., 2022; Guénette et al., 2022) and aim at intensifying existing production, where productivity in terms of natural yields is high (Bentley et al., 2022). Measures should also target closing existing yield gaps where possible and parallel adjustments of trade structures (Deng et al., 2022; Mottaleb et al., 2022). Also, expanding production frontiers can increase the local

food supply (Bentley et al., 2022; Mottaleb et al., 2022). Where applicable, countries could suspend their biofuel mandates and subsidies, setting free resources for increased food production (Abay et al., 2023). Furthermore, production can be stimulated by increasing prices and quota measures (Arndt et al., 2023).

Monitoring global production capacities could provide valuable information for production planning and trade (Bentley et al., 2022). The whole food supply chain should be oriented towards sustainability in terms of environmental protection and reducing waste at each production level. Waste reduction and retaining nutritional value allow for maintaining food value in storage (Osendarp et al., 2022). Extending agroecosystem diversity increases resilience against climate impacts, reduces production risk (Bentley et al., 2022) and lessens dependency on imports (Mottaleb et al., 2022).

The agri-food transformation will require, in some countries, the modernising of farming systems (Bentley et al., 2022) and support for more productive agri-techniques (e.g., mechanisation, crop management) (Abay et al., 2023; Bentley et al., 2022). Ideally, by allowing the support of technology, countries at high risk of food insecurity (Laborde and Piñeiro, 2023) will benefit from these interventions, including training, education, and improved communication taking into consideration farmers' socioeconomic attributes (e.g., gender and income class) (Bentley et al., 2022).

Regulating domestic supply

At the country level, food-exporting countries should increase the exportable surplus to fill the trade gaps resulting from the trade shock (Mottaleb et al., 2022). Food-importing countries should diversify their supply from different trade partners (Abay et al., 2023; Adenäuer et al., 2023; Jagtap et al., 2022). Governments could plan strategic reserves (Arndt et al., 2023) and control the usage of grain stock for human consumption rather than industrial and livestock production (Bentley et al., 2022). On the consumer side, governments should prevent panic buying and food hoarding through regulations to avoid consumer-driven market distortions in scarcity situations (Abay et al., 2023).

Protecting vulnerable consumers

In crises, governments should protect, particularly, their most vulnerable population groups. This includes taking a holistic approach to all essential services, including education, care services, health, and nutrition (Guénette et al., 2022), in social protection programs (Dyson et al., 2023). Particularly, poor populations in affected countries are vulnerable to food insecurity (Mottaleb et al., 2022). Households can be supported with different instruments (e.g., cash transfers, food transfers, vouchers, providing micronutrient-enriched food) (Osendarp et al., 2022). In crises, such social safety nets can be effective tools to support poor households

(Abay et al., 2023; Guénette et al., 2022). For example, social protection programmes implemented during the Covid-19 pandemic can be expanded (Arndt et al., 2023). Countries may further consider social protection in the form of direct food support for the most vulnerable households (Abay et al., 2023) and within the most vulnerable population groups, specifically, women and children. Governments could prevent and treat acute malnutrition with micronutrient supplements (e.g., for pregnant women, young children, and adolescents), and educational and other tools to promote healthy diets (Osendarp et al., 2022).

Concluding remarks

The complex multidisciplinary task of **building food security and resilience requires the engagement of many actors** (e.g., governments, donors, the private sector and civil society organisations, non-governmental groups and consumer and trade bodies) that consider multiple aspects (e.g., environmental, social and governance factors) (Mottaleb et al., 2022; Osendarp et al., 2022). For some countries with limited fiscal space, international humanitarian programs (e.g., World Food Program) are crucial for the protection of the most vulnerable populations (e.g., women and children) (Abay et al., 2023).

Available measures to increase food production are well-known in the fight against global hunger. The recent food crises emphasize the importance to **consider not only the local and regional food supply but also the international trade and food markets**. Thus, besides local food production, global market regulations also need to be considered as a mandate for governments and international organisations.

Supporting local food security and resilience are important and urgent objectives to avoid future food crises and to strengthen economic development in the Global South. The current global food crises, however, require the careful evaluation of policy measures which partially caused the crises: the sanctions combined with the lack of mitigation strategies for vulnerable countries neutral to the RUW. The sanctions against Russia are policy measures supporting the fight for freedom and regional integrity in the Global North. **If the results of these sanctions harm the Global South, their effectiveness and efficiency need to be re-evaluated in a global context and feasible mitigation strategies developed.** Worsening the Global South's conditions for growth and food security will increase regional armed conflicts and migration from the South to the North. Thus, if the measures taken by the Global North to deliver territorial integrity, sovereignty, and independence, create harm to the Global South, these costs need to be considered in the overall calculus and design of policies.

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