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UK and Global Food Security in the Era Of ‘Permacrisis’

Jennifer Cole and Ivica Petrikova

The UK’s food security is currently dependent on complex international supply chains that are under threat from climate change, conflicts and geopolitical stressors; at the same time, climate change and the repercussions of Brexit challenge the UK’s ability to increase self-reliance and internal resilience. Jennifer Cole and Ivica Petrikova examine the key drivers and pressures on global food security and how this is likely to be impacted in the near- and mid-term future, including by shifting geopolitical alliances.

Food security is a cornerstone of UK national resilience¹ but it is vulnerable to external supply shocks,² and is likely to come under increasing threat from climate change in the mid- to long-term future.³ UK Government documents such as *Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy*,⁴ the Development, Concepts and Doctrine Centre’s ‘Global Strategic Trends’,⁵ and the Environment, Food and Rural Affairs Committee’s recent report ‘Food Security’⁶ articulate the complex links between not only UK national security and food

security, but also global food security and its influence on UK food availability, export opportunities and associated global trade. The precarity of UK food supply chains, highlighted by RUSI⁷ nearly a decade ago, received renewed attention during the Covid-19 pandemic, as supermarket shelves emptied and increasing numbers of the UK public were driven to rely on food banks when jobs were furloughed on only 80% of normal pay, fuel and energy prices increased, and the precarity of many people’s day-to-day finances was exposed. UK food supplies have since become further challenged by the war in

1. Jennie I Macdiarmid et al., ‘Assessing National Nutrition Security: The UK Reliance on Imports to Meet Population Energy and Nutrient Recommendations’, *PLoS One* (Vol. 13, No. 2, February 2018), e0192649.
2. L J Hubbard and Carmen Hubbard, ‘Food Security in the United Kingdom: External Supply Risks’, *Food Policy* (Vol. 43, December 2013), pp. 142–47.
3. Cheikh Mbow et al., ‘Food Security’, in P R Shukla et al. (eds), *Climate Change and Land: An IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse Gas Fluxes in Terrestrial Ecosystems* (IPCC, 2020).
4. HM Government, *Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy*, CP 403, (London: The Stationery Office, 2021).
5. Ministry of Defence, ‘Global Strategic Trends: The Future Starts Today (Sixth Edition)’, October 2018, <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065623/20181008-dcdc_futures_GST_future_starts_today.pdf>, accessed 1 February 2024.
6. Environment, Food and Rural Affairs Committee, ‘Food Security’, HC 622, 28 July 2023, <<https://publications.parliament.uk/pa/cm5803/cmselect/cmenvfru/622/summary.html>>, accessed 1 February 2024.
7. Jennifer Cole and John Tesh, ‘Supply-Chain Resilience: UK Country Report for CRSIMART/MSB’, *RUSI Occasional Papers* (May 2016), <<https://rusi.org/explore-our-research/publications/occasional-papers/supply-chain-resilience-uk-country-report-crismartmsb>>, accessed 1 February 2024.



The global food system is under strain.
Courtesy of zhang yongxin / Adobe Stock

Ukraine and may be impacted by the ongoing Middle Eastern conflicts, as the Red Sea unrest disrupts global food trade.⁸

The UK is currently a net-importer of food – in 2020, it imported 46% of the food it consumed⁹ – and so is reliant on overseas production to feed its population. This reliance is likely to be tested further over the coming decades. The world has now arguably entered an era of ‘permacrisis’,¹⁰ where as soon as we emerge from one crisis, another follows. The climate crisis in particular is expected to have a significant disruptive effect on global food security.¹¹ Combined with the increasing number and intensity of national and international conflicts and natural hazards that disrupt supply chains, it is time to reappraise the challenges and opportunities offered

by the UK’s approach to internal and global food security.

This article analyses the UK’s national and global food security in the ‘permacrisis’ era from the perspective of global geopolitics. In discussing food security, it concentrates predominantly on its macro-level pillars – food availability and food stability.¹² A stable and sufficient supply of food at the country or regional level is not in itself a guarantee for satisfactory food security at the household and individual level: the explosion in the number of food banks in the UK since 2008, as government social welfare declined, illustrates well this point.¹³ Nevertheless, satisfying the micro-level aspects of food security, that is food access and utilisation, is not possible without the macro-level ones on

8. *Bloomberg*, ‘Red Sea Unrest Is Bad News for World’s Fragile Food Supply’, 19 January 2024.
9. Department for Environment, Food and Rural Affairs (DEFRA), ‘UK Food Security Report 2021’, 16 December 2021, <https://assets.publishing.service.gov.uk/media/62874ba08fa8f55622a9c8c6/United_Kingdom_Food_Security_Report_2021_19may2022.pdf>, accessed 1 February 2024.
10. Neil Turnbull, ‘Permacrisis: What It Means and Why It’s the Word of the Year for 2022’, *The Conversation*, 11 November 2022, <<https://theconversation.com/permacrisis-what-it-means-and-why-its-word-of-the-year-for-2022-194306>>, accessed 1 February 2024.
11. Intergovernmental Panel on Climate Change, ‘AR 6 Synthesis Report: Climate Change 2023’, 2023, <<https://www.ipcc.ch/report/ar6/syr/>>, accessed 1 February 2024.
12. Ivica Petrikova, ‘Food-Security Governance in India and Ethiopia: A Comparative Analysis’, *Third World Quarterly* (Vol. 40, No. 4, 2019), pp. 743–62.
13. L Turnbull and D Bhakta, ‘Is UK Emergency Food Nutritionally Adequate? A Critical Evaluation of the Nutritional Content of UK Food Bank Parcels’, *Proceedings of the Nutrition Society* (Vol. 75, No. OCE1, January 2016), E8.

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which this article focuses. An understanding of the historical situation, which explains the UK's position as a net food importer, sheds light on global food trade patterns and their potential disruptions. This in turn provokes discussion of potential responses to the disruptions and will help to identify appropriate policy recommendations.

UK Food Production

Britain last produced enough food for its population in 1846, when the Corn Laws, which had protected British farmers from cheaper European grains but led to higher food prices, were repealed. Thereafter, British domestic agricultural production experienced a gradual decline. At the onset of the First World War, the UK was importing 60% of the food it consumed.¹⁴ Blockades and submarine warfare during both world wars prompted the UK to convert large swathes of pastures and parkland into arable land and rapidly expand domestic food production.¹⁵ Nevertheless, during neither conflict did the UK attain food self-sufficiency; at the peak of food production during the Second World War, the UK rationed key food items and still imported 56% of the calories consumed.¹⁶ Today, the UK imports about half the food that it consumes, and this proportion may increase in the coming years.

In a 2010 food security assessment,¹⁷ the Department of Environment, Food and Rural Affairs (DEFRA) tested a scenario in which the UK was cut off from all its trade partners, to assess if the country would be able to feed its population on its own. DEFRA concluded that it would be possible, but only if all arable land were used in crop production

for human rather than livestock consumption: the production of 100 g of protein from grains, pulses and peas requires only 2–5% of the land required to produce the same 100 g from lamb or beef.¹⁸ DEFRA's assumption in the exercise that cereal yield productivity will continue to rise in the future might not hold true, however, as both soil degradation – only 10% of soils in South West England are classified as not degraded¹⁹ – and increased incidence of adverse weather events threaten to reduce future crop yields.

Britain last produced enough food for its population in 1846

At the same time, the UK's post-Brexit agricultural scheme, in combination with new free-trade agreements, might lead to further reduction in domestic UK agricultural production. In 2022, the UK rolled out the Environmental Land Management scheme,²⁰ a replacement of the EU's Common Agricultural Policy, which is gradually substituting direct payments to farmers with payments for environmental protection and restoration of ecosystem services.

The same year, the UK signed a free-trade agreement with Australia, a large agri-food exporter, without any safeguards on environmental or animal welfare standards for food imports, on which tariffs will gradually be removed,²¹ potentially making it cheaper to import food from overseas than to produce it at home. In combination, and more so if similar free-trade agreements are signed in the future, these developments might lead to a situation where UK farmers focus more on environmental

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14. Laura Stearman and John Martin, 'Food Production in the First World War', <<https://www.hobyanddistricthistory.co.uk/food-production-in-the-first-world-war/>>, accessed 1 February 2024.
 15. John Martin, 'Dig for Victory: Britain's WW2 War on Hunger', History Extra, 17 March 2022, <<https://www.historyextra.com/period/second-world-war/dig-for-victory-campaign-ww2-food-shortages-how-britain-coped/>>, accessed 1 February 2024.
 16. *Ibid.*
 17. DEFRA, 'UK Food Security Assessment: Detailed Analysis', January 2010, <<https://www.yumpu.com/en/document/read/16951040/uk-food-security-assessment-detailed-analysis-archive-defra>>, accessed 1 February 2024.
 18. Our World in Data, 'Land Use Per 100g Protein', 2018, <<https://ourworldindata.org/grapher/land-use-protein-poore>>, accessed 1 February 2024.
 19. R C Palmer and R P Smith, 'Soil Structural Degradation in SW England and Its Impact on Surface-Water Runoff Generation', *Soil Use and Management* (Vol. 29, No. 4, August 2013), pp. 567–75.
 20. DEFRA, 'Future of Farming in England', updated 17 January 2024, <<https://www.gov.uk/government/publications/environmental-land-management-schemes-overview/environmental-land-management-scheme-overview>>, accessed 1 February 2024.
 21. Compassion in World Farming, 'Safeguarding the UK's Food and Farming Standards in Trade: Lessons from the Australia-UK Free Trade Agreement', 30 March 2022, <https://www.ciwf.org.uk/media/7450288/168678_lessons-learnt-from-australia-trade-deal-core-standards-ciwf-wwf-and-others-march-2022.pdf>, accessed 1 February 2024.

protection while reducing domestic agricultural and livestock production.

Globalised Food Systems

The UK's substantial and potentially increasing reliance on trade for its food availability is not seen as inherently problematic. The National Food Security Strategy, for example, rightly points out that 'being self-sufficient does not guarantee food security',²² as domestic harvest failure can get rid of that self-sufficiency in a matter of months. Indeed, as food production and trade became more globalised throughout the 20th and 21st centuries, global food security improved.²³ However, there are signs that the vulnerability of the global food system is increasing, which could have negative repercussions for the UK.

The global food system has grown increasingly interconnected since the beginning of the 20th century. Diets worldwide have experienced homogenisation – while in most places people now eat a greater variety of foods than in the past, human diets everywhere are increasingly similar.²⁴ This 'nutrition transition' generally involves an increased consumption of energy-dense foods (animal-sourced foods, plant oils and sugars) at the expense of traditional whole cereals, pulses and vegetables.²⁵ Mirroring the homogenisation of diets, global agricultural production has concentrated on

growing fewer crops of fewer varieties. In 2009, 50 crop commodities (from 94 crop species) accounted for 90% of calories, fat and weight consumed globally.²⁶ Crop genetic diversity has declined as a result – the UN Food and Agriculture Organization (FAO) estimated that over the 20th century, 75% of crop-species variety had been lost.²⁷

There are signs that the vulnerability of the global food system is increasing, which could have negative repercussions for the UK

The homogenisation in diets and food production has been enabled by rapidly increasing world trade in food and related products over the last century as well as by its increasing concentration in fewer hands.²⁸ The World Trade Organization's (WTO) Agreement on Agriculture, signed by WTO member states in 1995, liberalised global agricultural trade and spurred its growth.²⁹ The value of annual global food exports rose from \$13 billion in 1988 to \$820 billion in 2021.³⁰ More than a quarter of the food produced for human consumption is nowadays traded internationally³¹ and about 80% of the world's population lives in countries that are at least partially reliant on imported food.³² While most countries

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22. Compassion in World Farming, 'Safeguarding the UK's Food and Farming Standards in Trade: Lessons from the Australia-UK Free Trade Agreement', 30 March 2022, <https://www.ciwf.org.uk/media/7450288/168678_lessons-learnt-from-australia-trade-deal-core-standards-ciwf-wwf-and-others-march-2022.pdf>, accessed 1 February 2024.
 23. Marco Grassia et al., 'Insights into Countries' Exposure and Vulnerability to Food Trade Shocks from Network-Based Simulations', *Scientific Reports* (Vol. 12, No. 4644, March 2022).
 24. Colin K Khoury et al., 'Increasing Homogeneity in Global Food Supplies and the Implications for Food Security', *Proceedings of the National Academy of Sciences* (Vol. 111, No. 11, March 2014), pp. 4001–06.
 25. See Ivica Petrikova, Ranjana Bhattacharjee and Paul D Fraser, 'The "Nigerian Diet" and Its Evolution: Review of the Existing Literature and Household Survey Data', *Foods* (Vol. 12, No. 3, January 2023), p. 443.
 26. *Ibid.*
 27. Colin K Khoury et al., 'Crop Genetic Erosion: Understanding and Responding to Loss of Crop Diversity', *New Phytologist* (Vol. 233, No. 1, January 2022), pp. 84–118.
 28. Matti Kummu et al., 'Interplay of Trade and Food System Resilience: Gains on Supply Diversity over Time at the Cost of Trade Dependency', *Global Food Security* (Vol. 24, Article 100360, March 2020).
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 31. Paolo D'Odorico et al., 'Feeding Humanity Through Global Food Trade', *Earth's Future* (Vol. 2, No. 9, September 2014), pp. 458–69.
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participate in food trade in some capacity, just seven countries – Argentina, Australia, Brazil, Canada, New Zealand, Thailand and the US – account for 55% of food exports globally.³³ Concentration is also high and growing among companies active in the seed and agrochemicals trade, with just four companies controlling 62% of the world's pesticide market³⁴ and 70% of global trade in grain and oil seeds.³⁵ With increased trade, global food and agricultural-input supply chains have become longer, more complex and consequently more fragile.³⁶ The global food system has also become more financialised, which has encouraged large investments in commodity markets when prices are high, exacerbating global food-price volatility.³⁷

Another consequence of the increased global trade and concentration in food and agricultural inputs, in combination with high agricultural subsidies in many high-income countries, has been an increase in the number of net food-importing countries.³⁸ In fact, under the liberalised agricultural trade rules, many low- and middle-income countries (LMICs) have found themselves unable to compete with the subsidised agriculture from the Global North, leading to a reduction in their domestic food production, and an increase in food imports.³⁹ Just in the past decade, Africa's food imports have tripled in value;⁴⁰ in 2016–18, about 85% of the food consumed in Africa was imported.⁴¹ High reliance on food

imports combined with often low reserves of foreign currency have rendered net food-importing LMICs particularly vulnerable to disruptions in global food supply chains.

Throughout the 20th and beginning of the 21st century, the increasing interconnectedness of global agricultural and food systems was accompanied by improvements in global food security.⁴² Although, as mentioned earlier, countries' sufficient food availability does not automatically lead to satisfactory food access for all inhabitants, the two are positively correlated, and from 1950 to 2017, the world's proportion of food-insecure population declined spectacularly.⁴³ While about 65% of the global population was estimated to be undernourished (lacking access to sufficient daily calories) in 1950, the proportion dropped to 25% in 1970, to 15% in 2000 and to 8% in 2017.⁴⁴ However, since then, the global proportion of undernourished population has risen again, propelled among other factors by the increasing disruptions of the globalised food system.

Ongoing and Potential Disruptions to the Globalised Food System

The Covid-19 pandemic (2020–23) contributed significantly to the recent deterioration in global food security. While it did not majorly hinder global food

33. Huang Jikun, 'Brief 2: Global Food Security and Market Stability: The Role and Concerns of Large Net Food Importers and Exporters', *T20 Argentina: Food Security and Sustainable Development Task Force Brief*, 2018, IFPRI, <https://www.g20-insights.org/policy_briefs/global-food-security-and-market-stability-the-role-and-concerns-of-large-net-food-importers-and-exporters/>, accessed 1 February 2024.
34. ETC Group, 'Food Barons 2022: Crisis Profiteering, Digitalization and Shifting Power', 20 September 2022, p. 15, <<https://www.etcgroup.org/content/food-barons-2022>>, accessed 1 February 2024.
35. Jennifer Clapp, *Food*, 3rd edition (New York, NY: John Wiley & Sons, 2020).
36. Thomas Reardon et al., 'Urbanization, Diet Change, and Transformation of Food Supply Chains in Asia', Michigan State University, Global Center for Food Systems Innovation, May 2014, <https://www.fao.org/fileadmin/templates/ags/docs/MUFN/DOCUMENTS/MUS_Reardon_2014.pdf>, accessed 1 February 2024.
37. Jennifer Clapp, 'Concentration and Crises: Exploring the Deep Roots of Vulnerability in the Global Industrial Food System', *Journal of Peasant Studies* (Vol. 50, No. 1, October 2022), pp. 1–25.
38. Monir Ghaedi, 'Why Is Africa Dependent on Imported Grain?', *DW*, 29 June 2022, <<https://www.dw.com/en/with-vast-arable-lands-why-does-africa-need-to-import-grain/a-62288483>>, accessed 1 February 2024.
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42. Grassia et al., 'Insights into Countries' Exposure and Vulnerability to Food Trade Shocks from Network-Based Simulations'.
43. Andrew Carlson, 'Hunger Is Not Eradicated: The Food Crisis in Africa', *Origins*, April 2023, <<https://origins.osu.edu/read/hunger-not-eradicated-food-crisis-africa>>, accessed 1 February 2024.
44. *Ibid.*; World Bank, 'Prevalence of Undernourishment (% of Population)', <<https://data.worldbank.org/indicator/SN.ITK.DEFC.ZS>>, accessed 1 February 2024.

production, it notably weakened global food trade during its first months, exposing the relative fragility of the interconnected, financialised and highly concentrated global food system.⁴⁵ Subsequently, the pandemic-related public health measures and economic disturbances hindered financial and physical access to food in most countries,⁴⁶ including in the UK, where the inability to eat a healthy and nutritious diet rose from 3.2% in April 2020 to 16.3% just three months later.⁴⁷ The FAO estimated that 150 million additional people worldwide were food insecure in 2021 as compared to 2019 as a result of the pandemic.⁴⁸

The Russia–Ukraine war had a similar negative effect on global food security, brought about by the disruption of global agricultural trade.⁴⁹ Before the war, Russia and Ukraine were major grain and oil producers and exporters, together accounting for 73% of all sunflower oil, 34% wheat, and 17% maize traded globally.⁵⁰ Russia is also a major producer and exporter of oil, gas and chemical fertilisers. In the aftermath of Russia’s invasion of Ukraine in February 2022 and the associated imposition of sanctions on Russia and Belarus, global prices of food, energy and fertilisers skyrocketed. In March 2022, the FAO Food Price Index reached its highest level since its inception in 1990; the price of natural gas quadrupled and that of fertilisers tripled compared

to the prices in 2020,⁵¹ leading the UK to organise a Food Security Summit in November 2023 to address ‘Putin’s weaponisation of Ukraine grain’.⁵²

The rise in global prices of food and agricultural inputs affected local food prices everywhere but the most negatively affected were low-income countries⁵³ – most of them net food-importing and often dependent on international aid, to which the UK has traditionally been a major donor – with food inflation in January 2023 reaching almost 40%.⁵⁴ The food security situation in these countries was further exacerbated by the negative impact of the Russia–Ukraine war on the UN World Food Programme (WFP), the multilateral institution in charge of distributing food assistance, which used to source 40% of its wheat from Ukraine.⁵⁵ While global food, energy and fertiliser prices declined again by the end of 2023, high local food-price inflation has largely persisted, remaining at 30% in low-income countries in the last quarter of 2023.

Other conflicts, both ongoing and potential, might disrupt the global food system further. The number of state and non-state violent conflicts in the world has doubled since 2010.⁵⁶ The 21st century has also seen a marked increase in the nature and complexity of both internal conflicts and internationalised internal conflicts (for example, Russia’s complex involvement in Yemen’s civil war or China’s security

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45. Jennifer Clapp and William G Moseley, ‘This Food Crisis is Different: COVID-19 and the Fragility of the Neoliberal Food Security Order’, *Journal of Peasant Studies* (Vol. 47, No. 7, October 2020), pp. 1393–417.
 46. Christophe Béné et al., ‘Global Assessment of the Impacts of COVID-19 on Food Security’, *Global Food Security* (Vol. 31, No. 100575, December 2021).
 47. Hartwig Pautz and Damian Dempsey, ‘Covid-19 and the Crisis of Food Insecurity in the UK’, *Contemporary Social Science* (Vol. 17, No. 5, May 2022), pp. 434–49.
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 49. FAO, IFAD, UNICEF, WFP and WHO, *The State of Food Security and Nutrition in the World 2023: Urbanization, Agrifood Systems Transformation and Healthy Diets across the Rural–Urban Continuum* (Rome: FAO, 2023).
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 55. Mark A Green, ‘Forty Percent of the World Food Program’s Wheat Supplies Come from Ukraine’, Wilson Center, 2 June 2022, <<https://www.wilsoncenter.org/blog-post/forty-percent-world-food-programs-wheat-supplies-come-ukraine>>, accessed 1 February 2024.
 56. UCDP, ‘Uppsala Conflict Data Program’, Department of Peace and Conflict Research, <<https://ucdp.uu.se/>>, accessed 1 February 2024.

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operations in Mali and South Sudan). The strikes on ships in the Red Sea by Yemen's Houthis, related to the current intense Israel–Gaza conflict, are already disrupting trade routes⁵⁷ and might again fuel food-price inflation.⁵⁸ The eruption of new or the escalation of existing conflicts – for example, a potential Chinese invasion of Taiwan, regional spread of the Israel–Palestine war or of the civil war in Sudan – could lead to further disturbance of global markets and supply chains, dragging UK military assets further into conflict or peacekeeping operations.

In addition to conflicts, which undermine food security directly in affected countries and indirectly in unaffected countries through trade disruptions, climate change has also contributed to the recent deterioration in global food security.⁵⁹ Increasing temperatures, changing precipitation patterns, and adverse weather events driven by climate change have already reduced crop yields in many regions and their negative effects on food production are poised to intensify.⁶⁰ While some predictions see the UK as a net short-term winner from climate change, with land becoming more arable, this could be offset by damage to crops from severe weather and flooding.⁶¹

Disruptions in agricultural trade linked to climate change have not yet garnered as much attention as those due to conflicts, but this is likely to change in the future. A recent study highlighted that existing climate models have underestimated the likelihood

of concurrent harvest failures across the world as a result of a strongly meandering jet stream, which brings increased risk of extreme weather events including droughts, heatwaves and increased precipitation, all of which are detrimental to crop yields.⁶² While simultaneous harvest failures in global breadbaskets would likely not lead to a complete breakdown in global food trade, they would significantly disrupt it, and thus also place pressure on the UK's food availability.

Geopolitics, Yemen and Food Supply to the UK

Recent events in Yemen – the gateway to the Red Sea, the Suez Canal, and thus the movement of goods from East Africa and India to the UK – should act as a stark reminder of the intersection between geopolitics and trade. UK food imports are less vulnerable than some other commodities, such as clothes and shoes manufactured in Asia, but grain and palm oil, as well as luxuries including coconut milk, chocolate, wine, spices and tropical fruits all make the journey north through the Suez Canal. Costs of all these are set to rise to compensate for the longer journey around South and Western Africa,⁶³ with 'inevitable' food inflation forecast.⁶⁴ The disruption also highlights the vulnerability of world trade to other choke points, such as the Strait of Gibraltar, Panama Canal and Strait of Malacca.⁶⁵

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57. Alessandro Ford, 'Spoilage Alert: Red Sea Crisis Hits Europe's Fresh Food Trade', *Politico*, 26 January 2024, <<https://www.politico.eu/article/spoilage-alert-red-sea-crisis-hits-europes-fresh-food-trade/>>, accessed 1 February 2024.
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 62. Kai Kornhuber, 'Risks of Synchronized Low Yields Are Underestimated in Climate and Crop Model Projections', *Nature Communications* (Vol. 14, Article 3528, July 2023).
 63. Cahal Milmo, Arj Singh and Sam Rucker, 'UK Faces Price Rises on Food, TVs and Trainers due to Red Sea Shipping Crisis', *iNews*, 19 December 2023, <<https://inews.co.uk/news/uk-price-hikes-food-tvs-trainers-red-sea-shipping-2816246>>, accessed 1 February 2024.
 64. Ian Quinn, 'Red Sea Shipping Attacks Will Lead to 'Inevitable' Food Inflation', *The Grocer*, 4 January 2024, <<https://www.thegrocer.co.uk/supply-chain/red-sea-shipping-attacks-will-lead-to-inevitable-food-inflation/686760.article>>, accessed 1 February 2024.
 65. Sarah Schiffling and Matthew Tickle, 'Red Sea Crisis: Suez Canal is Not the Only "Choke Point" that Threatens to Disrupt Global Supply Chains', *The Conversation*, 15 January 2024, <<https://theconversation.com/red-sea-crisis-suez-canal-is-not-the-only-choke-point-that-threatens-to-disrupt-global-supply-chains-221144>>, accessed 1 February 2024.

For most of the 21st century, Yemen has been embroiled in an internal civil war that has dragged in Saudi Arabia, the US and the UK, while Russia has tried to maintain diplomatic relations with both the UN-recognised government and the Houthi rebel insurgents in an attempt to protect Russian interests in the region, including access to and control of trade routes. This has been severely tested by the Russia–Ukraine conflict’s impact on Yemen’s already dire food insecurity and will be tested further by the current conflict – particularly as it pulls Western allies further in.

Yemen itself is one of the world’s most food insecure countries. The long running internal crisis means that although the country should have sufficient arable land to feed its population, in-country farming production of previous key exports, such as coffee, have been decimated. Yemen is highly dependent on imported food, spending 15% of its GDP on food imports, and is thus extremely vulnerable to international price fluctuations and increases. Undernourishment in the country is high and water supplies are often contaminated: outbreaks of infectious waterborne disease including cholera are rife. More than 50% of Yemeni households are dependent on some type of food assistance, much of which is sourced from other MENA countries, including Egypt, the UAE and Turkey, which have traditionally been highly dependent on Russian/Ukrainian imports.⁶⁶ Such allegiances can be consolidated or fractured through food aid as soft power, but the influence of food supply on geopolitics beyond the immediate region, and on UK policy specifically, must not be underestimated.

Responses to Global Food System Disruptions

Increased food prices and deficient food access, resulting from disruptions to the global food system, have far-reaching consequences not only within the countries affected but also across borders. Food insecurity often provides a window of opportunity for populist leaders and the fossil fuel industry offering immediate, but environmentally unsustainable, ‘quick fixes’, which might damage transitions towards a greener economy. There is already evidence⁶⁷ that the UK far-right has been emboldened by populist opposition to green politics, which is pushing the government to backtrack on key net-zero policies that would help protect future food production. Food availability and affordability can in general be an important factor in popular government support, while steep food-price increases often lead to protests and riots.⁶⁸ For example, the ‘Arab Spring’ is believed to have been partly triggered by food-price increases during the 2008–09 food crisis.⁶⁹ Finally, severe food insecurity fuels distress migration, increasing numbers of internally displaced people and refugees,⁷⁰ which might trigger new or further exacerbate existing conflicts. The experience of the first few weeks of the Covid-19 pandemic, with empty supermarket shelves and food hoarding, is a potent reminder of how quickly food shortages can lead to civil disruption in the UK too.

To avoid these ramifications, net food-exporting countries often react to crises by banning or restricting their food exports. During the 2008–09 global food crisis, 32 countries placed restrictions on some food exports, usually on staple grains such as wheat, rice, maize or soybeans.⁷¹ Similarly, in the

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66. Jennifer Cole et al., ‘Conflict, Collapse and Covid-19: Lessons from Yemen on Elevated Disease Risk in Regions Under Stress’, *RUSI Journal* (Vol. 166, No. 3, 2021), pp. 10–19.
67. Garrett L Grainger, ‘Sunak’s Rhetoric on Climate Action May Embolden Britain’s Far Right’, 5 October 2023, LSE, <<https://blogs.lse.ac.uk/politicsandpolicy/sunaks-rhetoric-on-climate-action-may-embolden-britains-far-right/>>, accessed 1 February 2024.
68. Davide Natalini, Giangiacomo Bravo and Aled Wynne Jones, ‘Global Food Security and Food Riots – An Agent-Based Modelling Approach’, *Food Security* (Vol. 11, July 2017), pp. 1153–73.
69. Giulia Soffiantini, ‘Food Insecurity and Political Instability during the Arab Spring’, *Global Food Security* (Vol. 26, Article 100400, September 2020).
70. Giovanni Anania, ‘Agricultural Export Restrictions and the WTO: What Options do Policy-Makers have for Promoting Food Security?’, International Centre for Trade and Sustainable Development, Issue Paper No. 50, November 2013.
71. *Ibid.*

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first months of the Covid-19 pandemic, 21 countries put in place export restrictions, affecting 8% of all calories traded globally,⁷² and following Russia's invasion of Ukraine in February 2022, 74 countries restricted or banned exports of some foodstuffs.⁷³ The export restrictions often, although not always, help reduce domestic food prices in the countries that impose them,⁷⁴ but simultaneously, by restricting global food supply, they contribute to higher food prices elsewhere. The export restrictions imposed because of the Ukraine–Russia war were estimated to have increased the global price of rice by 12% and of wheat by 9%.⁷⁵ The impacts of food-export restrictions in the UK could be mitigated with forward-planning and stockpiling, but this does not sit easily with the prevalent 'just in time' supply chain culture.

However, some net food-importing countries have already reacted to the increasing disruptions of the global food system, either by increasing domestic food production or by diversifying trade partners. China has attempted to do both. Its food self-sufficiency has steadily decreased, from 94% in 2000 to 66% in 2020, but driven by fears that global food trade could become weaponised, since 2023, China has attempted to increase local food

production again by expanding its agricultural land.⁷⁶ At the same time, China has decreased its food-import reliance on the US, reducing the share of US farm products in food imports from 26% in 2012 to 18% in 2022,⁷⁷ while increasing imports from Brazil. Along with India and South Africa, Brazil is an increasingly important global food exporter, which is somewhat diversifying the global food trade system;⁷⁸ from just three major agriculture trade communities before 2010, there are now five, with Brazil–South Asia (as well as South Africa) becoming a serious global contender.⁷⁹ Even countries in the Middle East with climatic conditions inimical to agriculture, such as Saudi Arabia and the UAE, have begun trying to reduce their food-import dependency by investing in vertical farming technology,⁸⁰ drought-resistant biotechnology⁸¹ and in purchasing farmland overseas, for example in the US.⁸² Vertical farming is growing in popularity also in the UK, due to its lower space and water requirements, climate-controlled conditions, and year-round production.⁸³

Disruptions to established trade routes can sometimes inspire positive innovation. The decline in UK food imports during the Second World War led to the introduction of food rationing, higher consumption of fruits and vegetables, and lower

72. Joseph Glauber, David Laborde and Abdullah Mamun, 'From Bad to Worse: How Russia-Ukraine War-Related Export Restrictions Exacerbate Global Food Insecurity', IFPRI, 13 April 2022, <<https://www.ifpri.org/blog/bad-worse-how-export-restrictions-exacerbate-global-food-security>>, accessed 1 February 2024.
73. Alvaro Espitia, Nadia Rocha and Michelle Ruta, 'How Export Restrictions Are Impacting Global Food Prices', World Bank Blogs, 6 July 2022, <<https://blogs.worldbank.org/psd/how-export-restrictions-are-impacting-global-food-prices>>, accessed 1 February 2024.
74. Sonia Akter, 'The Effects of Food Export Restrictions on the Domestic Economy of Exporting Countries: A Review', *Global Food Security* (Vol. 35, Article 100657, December 2022).
75. Espitia, Rocha and Ruta, 'How Export Restrictions Are Impacting Global Food Prices'.
76. Lin Ganfeng, 'To Increase Food Security, China Expands Farmland', VOA, 23 August 2023, <<https://www.voanews.com/a/to-increase-food-security-china-expands-farmland/7237866.html>>, accessed 1 February 2024.
77. Chad P Bown and Yilin Wang, 'Five Years into the Trade War, China Continues its Slow Decoupling from US Exports', Peterson Institute for International Economics, 16 March 2023, <<https://www.piie.com/blogs/realtime-economics/five-years-trade-war-china-continues-its-slow-decoupling-us-exports>>, accessed 1 February 2024.
78. See Josh Lipsky and Mrugank Bhusari, 'Brazil Aims to Advance Its Bid for Leadership of the Global South through Food Security', Atlantic Council, 14 February 2024, <<https://www.atlanticcouncil.org/blogs/econographics/brazil-aims-to-advance-its-bid-for-leadership-of-the-global-south-through-food-security/>>, accessed 27 February 2024.
79. See Xian Wang et al., 'Trade for Food Security: The Stability of Global Agricultural Trade Networks', *Foods*, (Vol. 12, No. 2, 2023).
80. Meshal J Abdullah, Zhengyang Zhang and Kazuyo Matsubae, 'Potential for Food Self-Sufficiency Improvements through Indoor and Vertical Farming in the Gulf Cooperation Council: Challenges and Opportunities from the Case of Kuwait', *Sustainability* (Vol. 13, No. 22, Article 12553, November 2021).
81. Seema R Bajaj et al., 'First Report of European Truffle Ectomycorrhiza in the Semi-Arid Climate of Saudi Arabia', *3 Biotech* (Vol. 11, Article 24, January 2021).
82. Ian James, 'Saudi Firm that Grows Hay in California and Arizona To Lose Farm Leases over Water Issue', *Los Angeles Times*, 5 October 2023.
83. Evengate Financial Services, 'Vertical Farming UK – the Future or a Phase?', <<https://www.evengatefs.com/vertical-farming-uk-the-future-or-a-phase/>>, accessed 1 February 2024.

consumption of meat and sugar. Many people consequently enjoyed healthier diets, which contributed to lower infant mortality and a higher average age of death from natural causes.⁸⁴ Similarly, following the collapse of trade with the Soviet Union in 1989, Cuba managed to revitalise its domestic agriculture and strengthen food security in an environmentally sustainable way. Immediately following the collapse, Cuban food availability drastically decreased, as the country lacked foreign currency to import food or agrochemicals from other countries. However, Cuba managed to rapidly increase domestic food production through the expansion of agricultural land, including the establishment of thousands of urban gardens, and development of a successful system of organic farming.⁸⁵ Within the next decade, food insecurity in Cuba declined to levels below those in 1989.⁸⁶

Some net food-importing countries have already reacted to the increasing disruptions of the global food system, either by increasing domestic food production or by diversifying trade partners

However, such success stories are uncommon. Sri Lanka recently attempted to emulate Cuba's transition to organic agriculture but with disastrous results, largely due to poor management of the transition. Faced with a shortage of foreign currency during an economic crisis, the Sri Lankan government banned virtually overnight the imports of chemical fertilisers.⁸⁷ The ban, combined with fuel and water shortages, led to widespread harvest failures, and was withdrawn six months later amid growing food insecurity. Many other LMICs also

currently face severe food insecurity but cannot easily raise domestic food production, whether due to ongoing conflicts, adverse climate conditions, foreign currency shortages, or the inability to compete with cheaper food imports from countries with subsidised agricultural production in a liberalised agricultural trade regime. Moreover, due to the escalating 'permacrisis', global availability of humanitarian assistance has decreased, with the WFP presently facing a 60% funding shortfall.⁸⁸

Increasing global instability resulting from worsening food insecurity has direct implications for UK national security – but do these issues carry any relevance for UK food security as well? As noted, the UK is not self-sufficient in food production, and this might decline further in the future. However, the country has ensured sufficient domestic food availability through food imports for decades and, post-Brexit, it has diversified its portfolio of agricultural trading partners through new free-trade deals, which could enhance the resilience of its food supply chains. Nevertheless, as a net food importer, the UK is arguably more exposed to global agricultural trade disruptions than net food-exporting countries. That food-price inflation in the UK in 2023 was higher than in all large net food-exporting European countries provides some evidence for this claim.⁸⁹ The more restricted post-Brexit trade between the UK and EU countries (many of them large food producers) makes UK food imports yet more vulnerable during crises, as illustrated by the shortage of fresh vegetables in the UK in spring 2023.⁹⁰

Recommendations

UK food security and the global food system are connected. The UK is not self-sufficient in food production, but as the global food production and trade system has grown more interlinked

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84. Michael Denham, 'As We Once Were: Wartime Rationing', British Geriatrics Society, 14 November 2015, <<https://www.bgs.org.uk/resources/as-we-once-were-wartime-rationing>>, accessed 1 February 2024.
 85. Sinan Koont, 'Food Security in Cuba', *Monthly Review* (Vol. 55, No. 8, January 2004), pp. 11–21.
 86. Food and Agriculture Organization, 'FAOSTAT: Food and Agriculture Data', <<https://www.fao.org/faostat/en/>>, accessed 1 February 2024.
 87. Nick Young, 'Sri Lanka's Fertiliser Ban and Why New Zealand Can Phase Out Synthetic Nitrogen Fertiliser', Greenpeace, 14 December 2022, <<https://www.greenpeace.org/aotearoa/story/on-sri-lankas-fertiliser-ban/>>, accessed 1 February 2024.
 88. New Humanitarian, 'What WFP Cuts Mean for People in Hunger Crises around the World', 13 December 2023, <<https://www.thenewhumanitarian.org/feature/2023/12/13/wfp-aid-food-cuts-mean-people-hunger-crisis-around-world>>, accessed 1 February 2024.
 89. Anthony Reuben, 'Is Food Inflation Higher in Europe than in the UK?', *BBC News*, 20 June 2023.
 90. Sam Jones, 'Spanish Growers Say Weather, Rising Costs and Brexit Caused UK Salad Shortages', *The Guardian*, 23 February 2023.

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throughout the past century, this has correlated with improvements in global and domestic food security. Nevertheless, the global food system has experienced more disruptions in recent years and is poised to see more such disruptions in the future, related to conflicts, climate change, or most likely both.

A global food system in which production is more widely distributed could be more resilient, with fewer single points of failure, more self-sufficiency, and more stable prices. One step towards this would be renegotiation of the WTO Agreement on Agriculture to allow net food-importing LMICs to increase their domestic food production, which would reduce the concentration in global food production and thus reduce the likelihood of trade disruption. Greater global investment in agricultural research could improve the resilience of food production in the face of accelerating climate change. International agreements guaranteeing the movement of food trade even amid conflicts, along the lines of the Russia–Ukraine Black Sea grain deal, could help ameliorate food trade disruptions triggered by geopolitical instability. These actions would all strengthen global food security and, along with it, the food security of the UK.

To specifically bolster UK food security, however, it may be necessary to ensure both the diversification of food and other trade routes, and uninhibited trading relationships, particularly with regional

neighbours. A more radical approach would be to also consider specifying a minimum level of food that has to be produced domestically, with subsidies and support to encourage agricultural production built into future resilience and security budgets.⁹¹

Increased domestic food production could be attained through investment in urban gardening as well as changes to agricultural policy to make crop and livestock farming more attractive to UK farmers. The latter could bolster national security and resilience from a number of directions: promoting jobs and careers in the rural economy; encouraging research into environmental protection (particularly to avoid further degradation of soil) and sustainable farming methods; as well as ensuring UK food security in the near- and longer-term future. ■

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91. UK farmers have been demanding more financial support and in February 2024 the UK Government provided them with some additional funding to help increase UK food production. See Malcolm Prior and Jonah Fisher, 'PM Announces Support for Farming amid Industry "Crisis"', *BBC News*, 21 February 2024.