



London School of Economics

Cite this as: *BMJ* 2026;395:e101113<http://doi.org/10.1136/bmj-2026-101113>

Conflict and climate change are driving food shortages

Systemic changes are needed across the full agri-food supply chain, writes **Elizabeth Robinson**

Elizabeth J Z Robinson *director, Grantham Research Institute on Climate Change and the Environment, and professor of environmental economics, Department of Geography and Environment*

The world is still producing more calories per capita year on year, despite a growing population.^{1,2} Yet localised food shortages continue to occur across the globe, driven primarily by conflict,^{3,4} and also increasingly by climate change.⁵

Conflict affects all dimensions of food security:^{6,7} production is affected as land is either abandoned or harder to cultivate and people are displaced; access to markets is restricted; and people are less able to afford sufficient food.⁴ There are long term negative impacts on health, manifested particularly in the increased prevalence of stunting.⁸

The Food and Agriculture Organization (FAO) and World Food Programme 2026 Global Report on Food Crises identifies 13 countries and territories where acute food insecurity is expected to increase.⁹ Twelve of these 13 hotspots are affected by armed conflict and violence, and risk of famine is identified in four: Sudan, South Sudan, Gaza Strip, and Somalia.¹⁰ More broadly, around 60%-70% of the world's most undernourished people live in areas affected by conflict¹¹ and 85% of those facing hunger are reported to live in conflict affected countries.^{12,13}

In parallel, climate change, as manifested in increasing temperatures, and increasing frequency and intensity of extreme weather, including heatwaves and precipitation extremes, is having far reaching negative impacts on food security.^{14,15} Farmers experience crop losses owing to, for example, adverse weather and changes in the spread of pests and diseases; supply chain disruption; and food price volatility increases.¹⁶ An estimated 123.7 million additional people experienced moderate or severe food insecurity in 2023 owing to the higher frequency of heatwave days and drought months compared with 1981-2010.¹⁷

Food insecurity has been reported as triggering violence and instability, and increasing the risk of political unrest and conflict.⁸ There is no clear consensus as to the extent to which climate change is driving food insecurity linked to conflict. However, it is generally agreed that climate change is a threat multiplier,¹⁸ and climate shocks have been shown to exacerbate hunger in conflict-hunger hotspots.¹⁹ There is also evidence of a vicious cycle of reinforcing crises where conflict worsens food insecurity which in turn worsens conflict.¹⁵

While some conflicts drive localised food insecurity, Russia's invasion of Ukraine and the US-Iran war have global food security ramifications, particularly for countries dependent on food and agricultural input imports that are affected by conflict-affected countries and shipping routes. Ukraine is a

"breadbasket country" that has historically supplied a significant share of the global markets for wheat, maize, barley, and sunflower oil, each of which has been disrupted by the war.²⁰ And the disruption of shipping in the Strait of Hormuz is affecting energy and fertiliser prices, with ramifications for next season's harvests in countries dependent on inputs sourced from this region.²¹

In 2019 the Security Council of the UN passed Resolution 2417, which explicitly recognises the link between hunger and conflict and the need to break this link.²² Climate change is making this ever harder. But there are steps that can be taken, focused on strengthening agri-food systems and protecting the most vulnerable populations.

Most importantly, global emissions need to fall, including in the agri-food sector, which accounts for almost a third of total emissions.²³ This will not be simple given that a growing population needs to be fed, and climate change is making that all the harder. However, a move towards more plant based diets, particularly in higher income countries, and efforts to reduce food loss and waste, can both reduce emissions and increase the availability of food.²⁴⁻²⁶

In a relatively stable world, the global food system in its current form can be efficient and effective in ensuring people have access to sufficient affordable food. But the food system is particularly vulnerable in the context of both climate change and conflict. A more resilient food system requires greater diversification of supplies and diets. For example, export markets are currently highly concentrated, with around four fifths of the international maize market supplied by just five breadbasket countries. Three crops: rice, wheat, and maize, provide over 40% of the world's food calories.²⁷

Greater cooperation and coordination are also needed,²⁸ but at a global level this is proving ever harder. National governments have been reported as hoarding food supplies²⁹ in response to Russia's invasion of Ukraine and, similar to the 2008 food crisis, some countries have imposed export restrictions.³⁰ Both actions amplify rather than dampen shocks.³¹

Increased cooperation over regional storage may be more feasible. Indeed, rebalancing countries' reliance on trade versus storage and domestic production can introduce much needed redundancy into food systems, thereby helping to dampen price spikes. Strengthening local food systems also helps, such as through improved governance and shorter supply chains.^{32,33} But farmers also need much more specific support such as climate insurance, drought resistant

seeds, smart irrigation, and greater investment more broadly in new technologies and innovations.³⁴

Even when food is physically available, shocks can push up food prices and make it economically unavailable to the poor. The most vulnerable households need extra support, such as through targeted safety nets, whether cash or food based.^{35 36}

Clearly there is plenty that could be done in the short term to reduce food insecurity linked to conflict and climate change. Anticipatory support is particularly important, whether protecting local agricultural production or providing cash and food relief to households in affected areas. But in the medium to long term, systemic changes are needed across the full agri-food supply chain, from what we grow and how through to what we eat.

Competing interests: ER is carrying out a paid consultancy for the EEA on food security Board Member of Resource Resolutions (in receipt of small stipend).

Provenance and peer review: Commissioned, not externally peer reviewed.

AI use: none declared.

- 1 Berners-Lee M, Kennelly C, Watson R, et al. Current global food production is sufficient to meet human nutritional needs in 2050 provided there is radical societal adaptation. *Elem Sci Anth* 2018;6:.
- 2 Roser M, Ritchie H, Rosado P. Food supply. How has the availability of food changed over time? How does food supply vary across the world today? 2013. <https://ourworldindata.org/food-supply>
- 3 Bora S, Ceccacci I, Delgado C, et al. Food security and conflict. Washington DC, USA: World Bank. 2011. <https://openknowledge.worldbank.org/server/api/core/bitstreams/7332c5aa-2d5b-5a51-9d83-c8d1542a45fb/content>
- 4 Shemyakina O. War, conflict, and food insecurity. *Annu Rev Resour Econ* 2022;14:-32. doi: 10.1146/annurev-resource-111920-021918
- 5 Wheeler T, von Braun J. Climate change impacts on global food security. *Science* 2013;341:-13. pmid: 23908229. doi: 10.1126/science.1239402
- 6 Fiandrino S, Dowd C, Martini G, et al. Impact of food-related conflicts on self-reported food insecurity. *Front Sust Food Sys* 2023;7doi: 10.3389/fsufs.2023.1239992
- 7 Kafando WA, Sakurai T. Armed conflicts and household food insecurity: effects and mechanisms. *Agric Econ* 2024;55:-28. doi: 10.1111/agec.12814
- 8 Holleman C, Jackson J, Sánchez MV, et al. *Sowing the seeds of peace for food security—disentangling the nexus between conflict, food security and peace*. Food and Agriculture Organization. Agricultural Development Economics Technical Study 2. 2017. Rome, Food and Agriculture Organization, p.
- 9 World Food Programme. New FAO-WFP report warns worsening hunger puts 13 hotspots at significant risk. 2026. <https://www.wfp.org/news/new-fao-wfp-report-warns-worsening-hunger-puts-13-hotspots-significant-risk>
- 10 Food and Agriculture Organization, World Food Programme, Global Network Against Food Crises. 2026Global Report on Food Crises—joint analysis for better decisions. Rome, Food and Agriculture Organization and World Food Programme. 2026. doi: 10.4060/cd9424en.
- 11 International Fund for Agricultural Development. *The state of food security and nutrition in the world 2017*. Food and Agriculture Organization, 2017. [AU: check - just IFAD authored this?]
- 12 Action Against Hunger UK. World hunger facts, statistics and causes. <https://www.actionagainsthunger.org.uk/why-hunger/world-hunger-facts>
- 13 World Food Program USA. Conflict is the primary cause of hunger globally. <https://wfpusa.org/hunger/issues/conflict/>
- 14 IPCC. 2023. *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva, Switzerland: IPCC.
- 15 Woomer A. The Climate Change, Food Insecurity, and Conflict Nexus. Report on the nexus between climate change and food insecurity, particularly that caused or accentuated by conflict. Bonn Contact Group on Climate, Peace and Security ahead of COP29. 2024. https://www.comonspace.eu/sites/default/files/2024-10/3.0%20Report%20on%20The%20Climate%20Change%2C%20Food%20Insecurity%2C%20and%20Conflict%20Nexus_0.pdf
- 16 Mirzabaev A, Bezner Kerr R, Hasegawa T, et al. Severe climate change risks to food security and nutrition. *Clim Risk Manage* 2023;39:. doi: 10.1016/j.crm.2022.100473
- 17 Romanello M, Walawender M, Hsu SC, et al. The 2025 report of the Lancet Countdown on health and climate change: climate change action offers a lifeline. *Lancet* 2025;406:-57. pmid: 41175887. doi: 10.1016/S0140-6736(25)01919-1
- 18 Plougarli S, Caliste R, Barrow E, et al. Climate change, food insecurity and conflict. 2025 <https://repository.graduateinstitute.ch/record/321847>
- 19 Food and Agriculture Organization, World Food Programme. 2025. Hunger Hotspots. FAO-WFP early warnings on acute food insecurity: November 2025 to May 2026 outlook. Rome. doi: 10.4060/cd7310en
- 20 Jagtap S, Trollman H, Trollman F, et al. The Russia-Ukraine conflict: its implications for the global food supply chains. *Foods* 2022;11:2098. pmid: 35885340. doi: 10.3390/foods11142098
- 21 Food and Agriculture Organization. FAO chief economist warns of severe global food security risks from disruption to Strait of Hormuz trade corridor. 2026 <https://www.fao.org/newsroom/detail/fao-chief-economist-warns-of-severe-global-food-security-risks-from-disruption-to-strait-of-hormuz-trade-corridor/en>
- 22 Läderach P, Pacillo G, Thornton P, et al. Food systems for peace and security in a climate crisis. *Lancet Plan Health* 2021;5:-50. pmid: 33838764. doi: 10.1016/S2542-5196(21)00056-5
- 23 Crippa M, Solazzo E, Guizzardi D, et al. Food systems are responsible for a third of global anthropogenic GHG emissions. *Nat Food* 2021;2:-209. pmid: 37117443. doi: 10.1038/s43016-021-00225-9
- 24 Ritchie H. Emissions from food alone could use up all of our budget for 1.5°C or 2°C—but we have a range of opportunities to avoid this. Our World in Data 2021 <https://ourworldindata.org/food-emissions-carbon-budget>
- 25 Forbes Technology Council. Transforming the food supply chain: reducing waste can feed the world. Forbes 2024. <https://www.forbes.com/councils/forbestechcouncil/2024/09/09/transforming-the-food-supply-chain-reducing-waste-can-feed-the-world/>
- 26 Gál T, Kovács S, Buglyó-Nyakas E. A comprehensive analysis of food waste through historical context: a bibliometric study from 2019 to 2024. *Clean Waste Sys* 2025;11:. doi: 10.1016/j.cwas.2025.100318
- 27 Erenstein O, Jaleta M, Sonder K, et al. Global maize production, consumption and trade: trends and R&D implications. *Food Secur* 2022;14:-319. doi: 10.1007/s12571-022-01288-7
- 28 Wood A, Queiroz C, Deutsch L, et al. Reframing the local-global food systems debate through a resilience lens. *Nat Food* 2023;4:-9. pmid: 37118580. doi: 10.1038/s43016-022-00662-0
- 29 Hill ML. Ukraine conflict prompts countries to hoard grain, endangering global food supply. Politico 2022. <https://www.politico.com/news/2022/03/12/ukraine-grain-food-supply-00016764>
- 30 Lee M. Ukraine conflict prompts countries to hoard grain, endangering global food supply. Politico 2022. <https://www.politico.com/news/2022/03/12/ukraine-grain-food-supply-00016764>
- 31 Committee on Climate Change and China Expert Panel on Climate Change (2018) UK-China Co-operation on Climate Change Risk Assessment: Developing Indicators of Climate Risk. 2018. <http://www.theccc.org.uk/publication/indicators-of-climate-risk-china-uk>
- 32 Guell C, Brown CR, Navunicagi OW, et al. Perspectives on strengthening local food systems in Small Island Developing States. *Food Secur* 2022;14:-40. pmid: 35528949. doi: 10.1007/s12571-022-01281-0
- 33 Das A. Nurturing local food systems: elevating food and nutrition security in low-and middle-income countries. In. *Economics of Development*. Routledge, 2026, pp -201.
- 34 Awais M, Wang X, Ashraf MU. 2026. Mitigation and adaptation strategies in climate-smart agriculture: a review for sustainable production. *Clim Smart Agri* 2026:.
- 35 Dasgupta S, Robinson EJZ. Improving food policies for a climate insecure world: evidence from Ethiopia. *Natl Inst Econ Rev* 2021;258:-82. doi: 10.1017/nie.2021.35
- 36 Dasgupta S, Robinson EJZ. Impact of COVID-19 on food insecurity using multiple waves of high frequency household surveys. *Sci Rep* 2022;12:. pmid: 35115569. doi: 10.1038/s41598-022-05664-3