

## Effects of information, capacity strengthening and behaviour change interventions on food security and nutrition in sub-Saharan Africa: lessons for research

Global food insecurity and malnutrition continue to affect approximately two billion people worldwide. In 2024, an estimated 8.2 percent of the global population faced hunger, and the Zero Hunger Sustainable Development Goal (SDG 2) is far from being on track (UN 2025). In Africa, the situation is particularly severe: in 2024, 323 million people (20.2 percent of the continent's population) were affected by hunger, and 60 percent of the global population projected to face hunger by 2030 will be in Africa (FAO et al. 2025).

Among the ten countries with the most people facing high levels of acute food insecurity in 2024, four were in Sub-Saharan Africa, as were five of the ten countries with the highest proportion of affected populations (FSIN and GNAFC 2025). The region experiences severe challenges across the six pillars of food security and nutrition (availability, access, utilisation, stability, agency and sustainability), while progress is limited by fragile food systems (FAO et al. 2023; AGRA 2021; IFPRI 2024).

Across Sub-Saharan Africa, climate change and environmental crises are two of the foremost threats to food security and nutrition. The region's reliance on rainfed agriculture makes it highly vulnerable to climate extremes such as droughts and floods, which reduce agricultural yields, increase food price volatility, and strain food systems (AGRA 2021). Such impacts are compounded by conflict, fragility and economic shocks to the global system. The regional food security and nutrition crisis also

disproportionately affects marginalised groups, especially smallholder farmers, women and children (FAO et al. 2023).

In this context, information, capacity strengthening, and behaviour change (ICSBC) interventions offer a promising pathway to food security and nutrition. By strengthening knowledge and capacities for sustainable behavioural change across food supply chains, consumer behaviour, and food environments, these approaches can promote sustainable practices and support climate adaptation (Verma et al. 2025; Toromade et al. 2024; Ofosu-Ampong et al. 2025; Kabato et al. 2025; Barr, Gilg, and Shaw 2011).

Addressing food security and nutrition challenges in the face of environmental vulnerability in Sub-Saharan Africa requires effective, context-sensitive, and inclusive strategies grounded in robust empirical evidence. Rigorous research plays a central role in informing these strategies. It provides evidence on what works, for whom, and under what conditions. It also enables practitioners and policymakers to design and implement more effective interventions.

Based on the body of evidence in [the living Food Systems and Nutrition Evidence and Gap Map](#), 3ie and DEval recently completed a mixed-methods rapid evidence assessment to examine how ICSBC interventions can improve food security and nutrition and build systemic resilience in Sub-Saharan Africa. This research brief presents evidence clusters, gaps and methodological patterns that can inform future research in the field of ICSBC in the region.

## Highlights

### Evidence clusters and gaps

- Evidence on ICSBC interventions in Sub-Saharan Africa has increased (primarily since 2015) but remains relatively minimal within the greater evidence landscape for food systems and nutrition.
- Most studies focus on food supply-chain interventions, with limited evidence on consumer behaviour and food environment interventions.
- Available outcome measures concentrate on the access, utilisation and availability pillars, while agency, stability and sustainability are underrepresented.
- Many interventions target environmentally vulnerable rural populations (e.g., women, children, displaced groups); however, outcome disaggregation for these populations remains limited.

### Evidence patterns and limitations

- Mixed-methods analysis combining meta-analysis, moderator analysis and qualitative thematic synthesis revealed the promising effects of ICSBC interventions across the food security and nutrition pillars, and their contribution to building food system resilience.
- Methodological challenges are common, with 74 percent of quantitative effect sizes having a high risk of bias, mainly from spillovers and contamination.
- Qualitative studies vary in quality; only one was rated as high quality, which precluded a robust understanding of implementation considerations.

### Future directions for research

- Expand and strengthen the evidence base by addressing gaps in food environments, consumer behaviour, and outcome measurement, to inform more holistic and integrated food system strategies.
- Prioritise vulnerable contexts and population groups by generating disaggregated, longitudinal evidence to better understand differential impacts. This can inform targeted and inclusive interventions and strengthen food system resilience in the face of climate shocks.
- Address methodological flaws by improving study designs and adopting mixed-methods approaches to reduce bias, enhance the robustness of findings, and generate more relevant and actionable evidence for strengthening food security and nutrition outcomes.

Figure 1: The six pillars of food security and nutrition (reference)



**Food availability:**  
the physical presence of food



**Food access:**  
the resources and means to obtain food



**Food utilisation:**  
the intake of sufficient and safe food



**Food stability:**  
the reliable supply of food over time



**Food agency:**  
the power to make decisions about food eaten and produced



**Food sustainability:**  
the food system's ability to provide long-term food security

## Identifying evidence clusters and gaps

The body of evidence assessing the effects of ICSBC interventions on food security and nutrition in Sub-Saharan Africa is nascent but has grown steadily in recent years, with most studies published after 2015. This growth might be explained by a series of factors, such as the launch of the SDGs, efforts to define food security and nutrition, and global trends in increasing the number of publications of rigorous evidence.

Our review identified 53 quantitative impact evaluations, representing a small fraction of studies in the evidence and gap map. The research team extracted data on the intervention type, outcomes and indicators measured by each of these studies. These were then mapped against the rapid evidence assessment intervention and outcome framework of the evidence and gap map and food security and nutrition pillars for synthesis and analysis. We complemented this body of quantitative evidence with 20 qualitative and mixed-methods studies and 63 descriptive sources to explore how ICSBC interventions affect the resilience of food systems.

Table 1, below, shows that, despite its growth, the evidence base remains uneven, with most studies focusing on food supply interventions, especially farmer field schools, agricultural extension services, and short trainings. In contrast, evidence on consumer behaviour and food environment interventions is limited. Similarly, outcome measurement varies widely. Most studies assess single food-security and nutrition pillars (primarily access, utilisation and availability). Limited attention is given to agency, stability and sustainability.

## Identifying evidence clusters and gaps

Project	Implementing organization(s)	Product	Food security and nutrition outcomes							Total
			Food security - Aggregated	Food availability	Food access	Nutrition, adequacy and utilisation	Stability	Agency	Sustainability	
Food supply	Farmer field schools	Hands-on agricultural training for farmers	6	7	9	8	2	4	4	15
	Agricultural extension services	Trained agents visit communities to teach current practices, organise cooperatives, and engage in other secondary activities	2	6	12	7	2	3	5	12
	Workshop / short training	Provision of ad-hoc or short training to food producers on farming techniques, use of equipment, or best practices	2	5	8	7	3	2	4	11
	Peer-to-peer learning	Facilitation of meetings of food producers to share their knowledge with peers and/or connect with professionals of the same sector	2	2	4	5	1	1	3	6
	Information and guidance	Agricultural information via phone/SMS		2	2	1		1	2	2
Consumer behaviour	Peer support / counsellors	The use of peer support or counsellors to increase healthy eating	7	2	10	15	4	3	1	16
	Classes	The use of a classroom structure to provide messages regarding healthy eating, including classrooms outside of school	3	2	5	9	2			9
	Community meeting	Public meetings for discussion and mobilisation	4	1	6	7	1	3	2	8
	Healthy food social marketing campaigns	Media campaigns promoting healthy eating			4	5	2			5
	Professional services (dietitians / nurses)	Food and nutrition, advice from trained health professionals	1		4	3	1	1		5
	Door to Door	Health messages delivered door-to-door	2		3	4		1		4
Food environment	Storage and distribution, education, and capacity strengthening	Educational programmes to support storage and distribution techniques	2	6	8	5	2	3	4	9
<b>Grand Total</b>			<b>14</b>	<b>21</b>	<b>38</b>	<b>35</b>	<b>12</b>	<b>9</b>	<b>12</b>	<b>53</b>

## Identifying evidence clusters and gaps

Figure 2, below, highlights regional evidence clusters in Eastern and Western Africa, particularly in Kenya, Ethiopia, Tanzania, Ghana, and Nigeria. Central and Southern Africa remain underrepresented, and some of the countries most affected by environmental vulnerability (e.g., Chad, South Sudan, Central African Republic) are notably absent.

Studies are concentrated within countries with relatively lower environmental vulnerability levels. This disparity complicates efforts to fully understand and address the resilience of food systems in the most precarious contexts. It might also highlight the complexity of conducting research in highly vulnerable settings due to barriers such as logistical challenges, restricted access,

unstable infrastructure, security risks for participants and research, or higher levels of attrition (Wolbers, Kuipers, and Boin 2021; Wordsworth et al. 2021; Sami 2024; Kohrt et al. 2019).

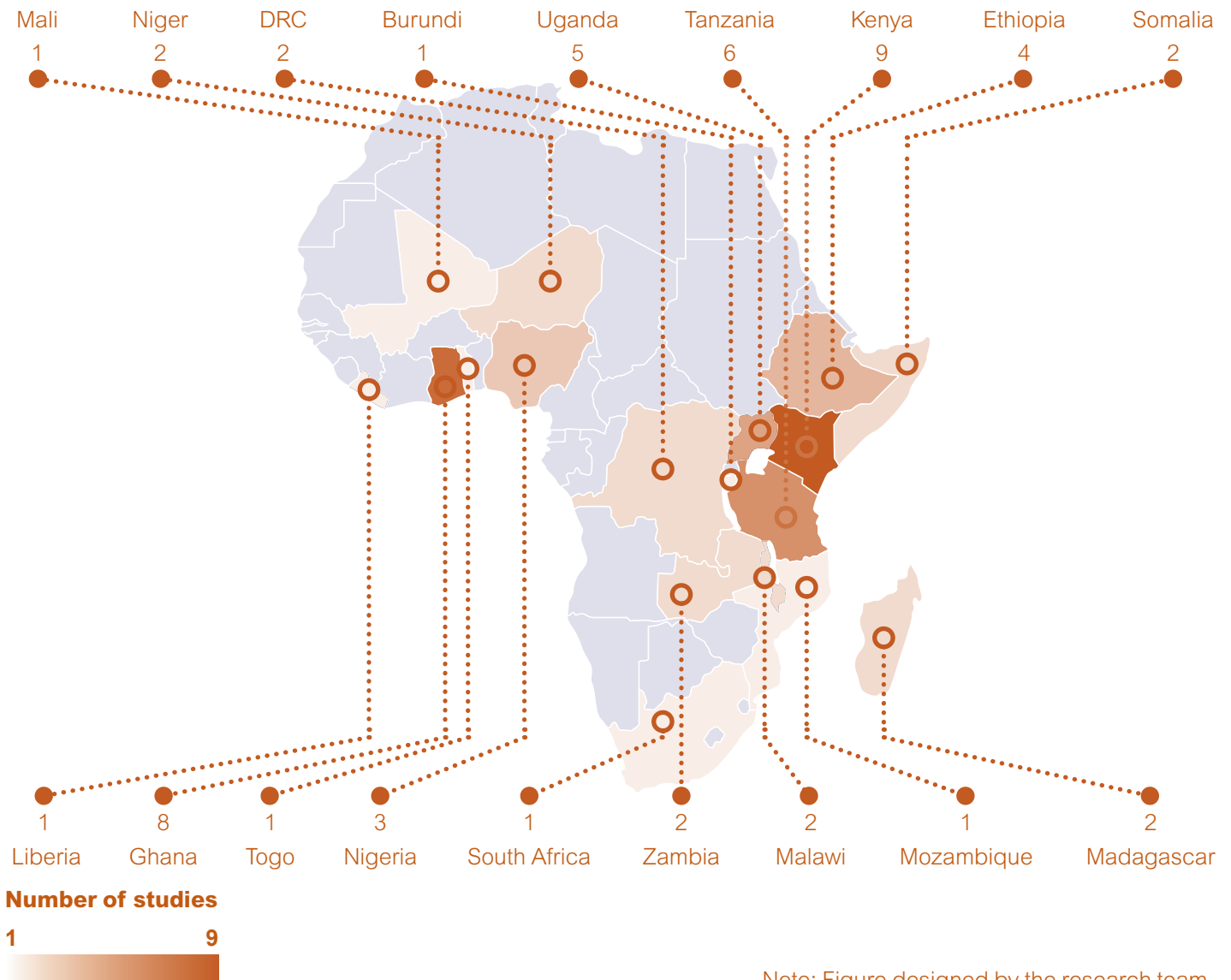
Despite differences in environmental vulnerability levels across Sub-Saharan Africa, environmental shocks and stressors pose challenges throughout the continent. The World Meteorological Organisation’s 2025 report highlights droughts and floods as prominent issues affecting the region (WMO 2025).

Accordingly, our review findings reveal that nearly a quarter of interventions were implemented during ongoing crises, with floods, droughts, and epidemics being the most prevalent stressors. Over half of

the interventions explicitly aimed to enhance environmental resilience through strategies such as building long-term adaptive capacity, supporting recovery from past shocks, addressing immediate needs during crises, and preparing for recurring seasonal stresses.

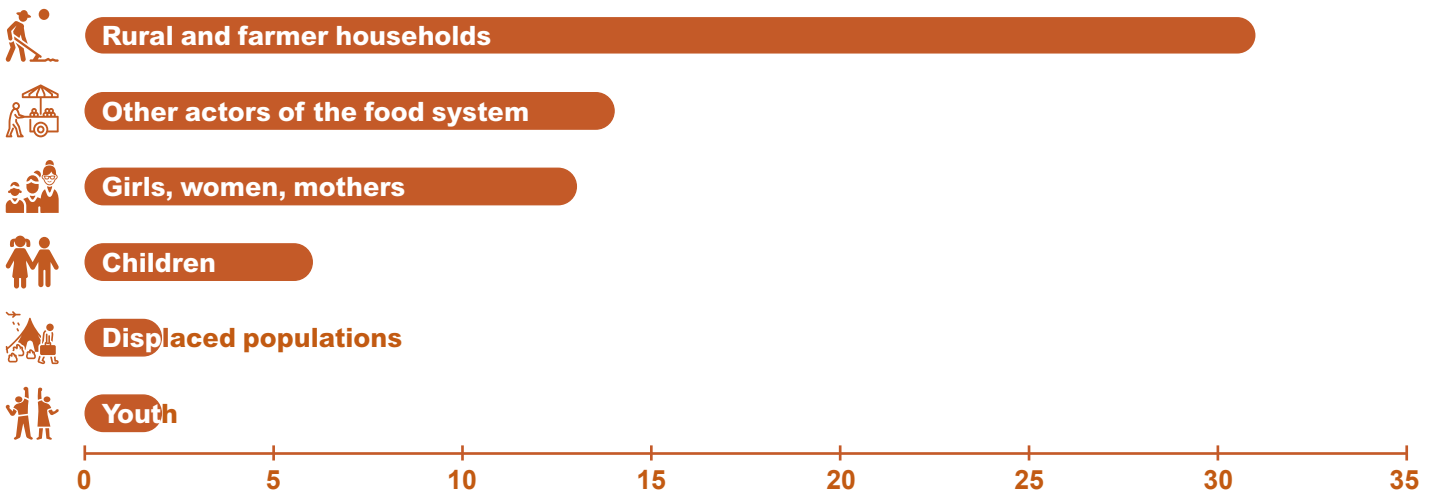
A number of these interventions prioritised vulnerable groups particularly affected by environmental stressors, such as women, mothers, children, youth and displaced populations (Figure 3). Nonetheless, the evidence often fell short of capturing the interventions’ effects on these groups. Overall, the evidence indicated a need for deeper insight into the effectiveness of resilience-building within the most precarious contexts and among the most vulnerable.

**Figure 2: Map of studies by country**



Note: Figure designed by the research team.

**Figure 2: Distribution of evidence specifically analysing effects on food systems actors and vulnerable groups**



Note: Figure designed by the research team.

## Analysing evidence patterns and limitations

The team analysed quantitative studies using random effects meta-analyses. Moderator analyses proved useful for identifying the conditions under which interventions had stronger or weaker effects. We combined the quantitative analyses with qualitative data from primary studies and additional descriptive sources using thematic synthesis. By combining methods, the rapid evidence assessment was able to unpack whether, how, why, where and for whom ICSCB interventions were effective in supporting food

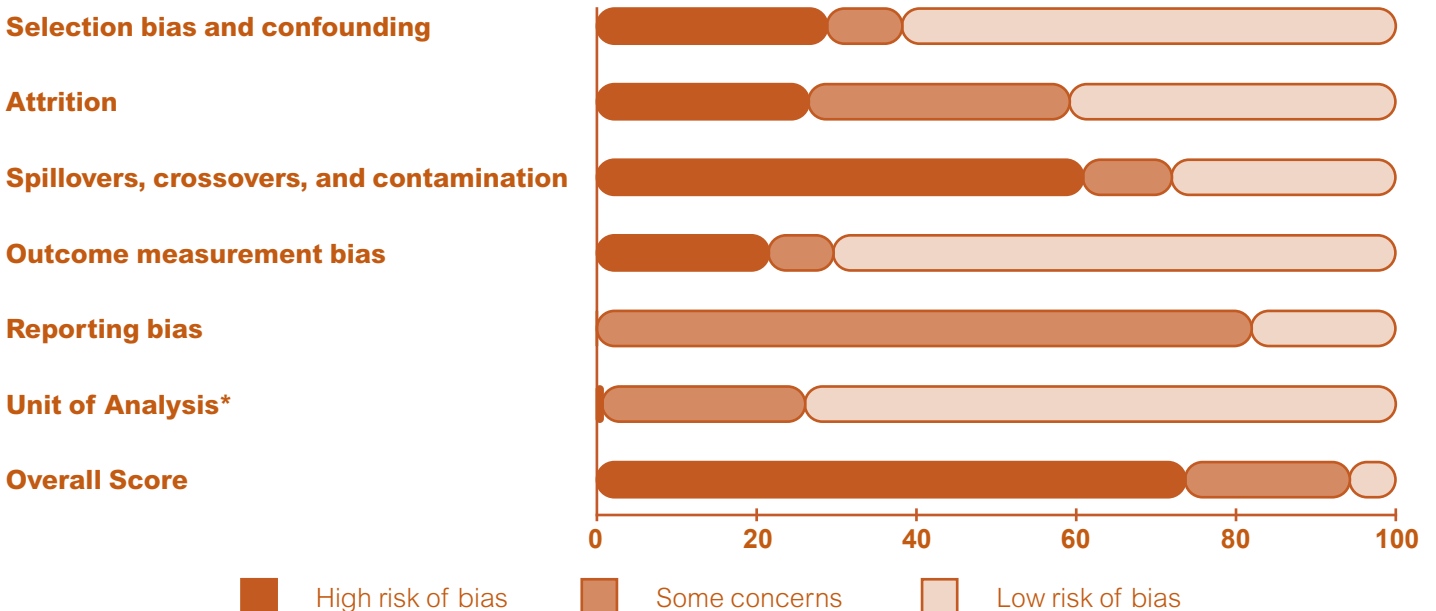
security, nutrition, and food system resilience.

Despite employing a rigorous mixed-methods approach, the assessment faced several methodological limitations that may affect the strength and generalisability of findings. Alongside the uneven distribution of the evidence base, the risk of bias in quantitative evidence and the quality of qualitative evidence emerged as some of the main limitations.

We determined that 74 percent of effect sizes had a high risk of bias

(Figure 4), primarily due to spillovers and contamination, selection bias and confounding. Similarly, the quality of qualitative studies was varied, with numerous studies failing to state a clear research design appropriate to address the stated research question and objectives; therefore, only one qualitative study was rated as high quality. This assessment highlights the need for better scientific practices to improve the quality of future evidence and increase confidence in findings.

**Figure 3: Risk of bias of included estimates**



Note: Figure designed by the research team.

\* The unit of analysis is just measured among RCT (a smaller sample of our body of evidence).



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## Future directions for research

**The evidence on ICSBC interventions shows promising but varied impacts on food security and nutrition across multiple outcome pillars.** No single intervention universally delivers strong effects; however, results often show small-to-moderate and highly context-dependent effects, as highlighted by the moderator analysis. On the other hand, no intervention shows a negative and statistically significant effect: ICSBC interventions are unlikely to affect participants negatively.

In addition, ICSBC interventions can contribute to strengthening resilience if they consider some of the building blocks of food system resilience (Harris and Spiegel 2019; OECD 2025; FAO 2021; Global Panel on Agriculture and Food systems for Nutrition 2025; De Steenhuijsen Piters et al. 2021; Moore et al. 2025; AGRA 2021; Hiller, Bas-Defosse, and Baldock 2021), such as:

- **Agency:** empowering individuals and communities with decision-making power and resources in the food

system, through inclusive and accountable approaches, to strengthen their ability to cope with external shocks

- **Buffering:** establishing reserves, infrastructures and livelihoods to absorb shocks
- **Connectivity:** enhancing linkages to support a coordinated response to shocks
- **Diversity:** building pluralism across production, consumption, ecological systems and markets to reduce single-point failures and ensure self-regulating and sustainable food systems

**Despite these promising effects, there remains much to be done to achieve food security and nutrition in Sub-Saharan Africa.** The stark reality of SDG progress shows that only 35 percent of the 169 SDG targets show adequate progress. In addition, over 50 percent of the *End Hunger* targets show stagnation or regression (UN 2025).

Future research will continue to be at the forefront of this fight against food insecurity and malnutrition in Sub-

Saharan Africa. As highlighted in the 2025 State of Food Security and Nutrition in the World, ‘evidence-based policies are essential to end hunger (SDG Target 2.1) and all forms of malnutrition (SDG Target 2.2), especially among children and youth, women, and vulnerable populations’ (FAO et al. 2025, 5). To achieve these objectives, evaluating food security and nutrition interventions—both to understand what works and to mitigate the negative effects of environmental vulnerability—can make a difference (FAO et al. 2025).

However, producing food security and nutrition evidence is not enough; this evidence must be granular and specific through the use of targeted data collection, management, analysis and dissemination across food system actors (HLPE 2024). Our rapid evidence assessment allows us to identify three directions for this future research: filling evidence gaps, increasing consideration for vulnerable contexts and population groups, and tackling methodological flaws.

## Future research should aim to fill evidence gaps

To better inform the design and implementation of these interventions, future research will need to contribute to expanding the size, focus and quality of this body of evidence. Limited evidence on interventions addressing food environments and consumer behaviour restricts our understanding of their roles within

broader food systems. Future research should explore these areas in depth to assess how they complement well-established food supply interventions.

Researchers should also broaden outcome measurement beyond food access and use to include agency,

stability and sustainability. By investigating the potential synergy effects of combined approaches across food systems and nutrition pillars, researchers can inform more holistic and integrated food system strategies that are able to address the complexity of food security and nutrition challenges.



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## Future research should emphasise vulnerable contexts and population groups

Current research is insufficient to understand how ICSSC interventions affect the most vulnerable contexts or population groups.

To strengthen this body of evidence, more comprehensive and longitudinal studies are also needed, which track interventions from pre-implementation through extended post-intervention periods. Such designs are critical to capturing the evolving impacts of programmes, especially in the face of unpredictable climate shocks.

other vulnerable groups—such as persons with a disability, livelihood levels, and indigenous communities—would benefit from evidence highlighting the differentiated effects of interventions on these groups.

- At the *country level*, more evidence is needed in the most environmentally vulnerable contexts, particularly in southern and central Africa, where evidence remains scarce. As the quantitative evidence already revealed a variation in intervention effects according to environmental vulnerability, new evidence from the most affected contexts will allow for more informed food-system resilience policies. It will need to be combined with the development of research practices in the most challenging contexts.

- At the *individual level*, the targeting of vulnerable and marginalised groups by interventions must be reflected in the outcome data. Although interventions target groups such as women and girls, children and youth, or displaced populations, more disaggregated analysis is required to identify differential impacts and to tailor interventions accordingly. In addition,

Addressing these gaps through heterogeneity analysis will enhance the equity and utility of research findings, enabling policymakers to design more targeted and inclusive strategies. Ultimately, generating more nuanced and disaggregated evidence will not only improve the effectiveness of food security and nutrition interventions, but will also advance social justice by ensuring that the needs of the most disadvantaged are fully recognised and addressed.

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## Future research should tackle methodological flaws to increase confidence in findings

Many studies suffer from methodological limitations, including risks of contamination and spillover bias. The food security and nutrition sector reflects wider patterns observed in other sectors: for example, across 100 Cochrane reviews, just 6% of randomised controlled trials were rated as low risk of bias, while 61% of trials were rated as high risk of bias (Jørgensen et al. 2016), and 10% of non-randomised

studies were rated as low risk of bias (Igelström et al. 2021). Improving study designs to minimise spillovers and crossovers is needed, whether through geographic separation, cluster randomisation, or, where necessary, explicit adjustment for spillovers during analysis.

Beyond refining quantitative approaches, adopting mixed-methods designs will contribute to capturing both quantitative and qualitative

evidence. Such approaches are particularly valuable for understanding how interventions influence food system resilience and why they succeed—or fail—under different environmental and socioeconomic conditions. In this way, mixed-methods research not only enhances the robustness of findings but also ensures that the resulting evidence is more relevant and actionable for policymakers and practitioners.

## About this brief

This brief is based on the report, *Development cooperation for food security and nutrition: Rapid evidence assessment on the effects of information, capacity strengthening, and behaviour change interventions on food security, nutrition, and environmental food system resilience in Sub-Saharan Africa*. The brief is authored by Etienne Lwamba, Ingunn Storhaug, Suvarna Pande, Pierre Marion, Diana Cordova-Aruaz, Shannon Shisler, Esteban J. Quiñones, Cornelia Roemling, and Anna Sting. They are solely responsible for all content, errors and omissions. The brief is commissioned by DEval. It was designed and produced by Akarsh Gupta and Mallika Rao.

## References


- AGRA. 2021. *Africa Agriculture Status Report: A Decade of Action: Building Sustainable and Resilient Food Systems in Africa*. Nairobi, Kenya: Alliance for a Green Revolution in Africa (AGRA). [https://vcda.afdb.org/en/system/files/attachments/A-Decade-of-Action\\_-\\_Building-Sustainable-and-Resilient-Food-Systems-in-Africa.pdf](https://vcda.afdb.org/en/system/files/attachments/A-Decade-of-Action_-_Building-Sustainable-and-Resilient-Food-Systems-in-Africa.pdf).
- Barr, Stewart, Andrew Gilg, and Gareth Shaw. 2011. "Helping People Make Better Choices": Exploring the Behaviour Change Agenda for Environmental Sustainability." *Applied Geography* 31 (2): 712–20. <https://doi.org/10.1016/j.apgeog.2010.12.003>.
- De Steenhuisen Piters, Bart, Emma Termeer, Deborah Bakker, Hubert Fonteijn, and Herman Brouwer. 2021. *Food System Resilience - Towards a Joint Understanding and Implications for Policy*. Wageningen University. <https://edepot.wur.nl/549244>.
- FAO. 2021. *Resilient Food Systems – A Proposed Analytical Strategy for Empirical Applications*. The State of Food and Agriculture. Food and Agriculture Organization of the United Nations (FAO). Rome: Food and Agriculture Organization. <https://doi.org/10.4060/cb7508en>.
- FAO, AUC, United Nations Economic Commission for Africa (ECA), and WFP. 2023. *Africa - Regional Overview of Food Security and Nutrition 2023*. Accra: FAO, AUC, ECA, and WFP. <https://doi.org/10.4060/cc8743en>.
- FAO, IFAD, UNICEF, WFP, and WHO. 2025. *The State of Food Security and Nutrition in the World : Addressing High Food Price Inflation for Food Security and Nutrition*. Rome. <https://openknowledge.fao.org/server/api/core/bitstreams/483f5991-a2f3-4d8f-8456-4cbdccc229b60/content>.
- Food Security Information Network (FSIN) and Global Network Against Food Crises (GNAFC). 2025. *2025 Global Report on Food Crises*. Rome: FSIN and GNAFC. <https://www.fsinplatform.org/grfc2025>.
- Global Panel on Agriculture and Food Systems for Nutrition. 2025. *Building Resilience and Enhancing Nutrition in Africa's Food Systems*. <https://www.glopan.org/brief/africareilience/>.
- Harris, Jenileigh, and Emily J. Spiegel. 2019. *Food Systems Resilience: Concepts & Policy Approaches*. Center for Agriculture and food systems. [https://www.vermontlaw.edu/wp-content/uploads/2024/07/Food-Systems-Resilience\\_Concepts-Policy-Approaches.pdf](https://www.vermontlaw.edu/wp-content/uploads/2024/07/Food-Systems-Resilience_Concepts-Policy-Approaches.pdf).
- Hiller, Nora, Faustine Bas-Defossez, and David Baldock. 2021. *Building Blocks for Food System Resilience in Europe*. Institute for European Environmental Policy (IEEP). <https://ieep.eu/wp-content/uploads/2022/12/IEEP-2021-Policy-report-Building-Blocks-for-Food-System-Resilience.pdf>.
- HLPE. 2024. *Strengthening Urban and Peri-Urban Food Systems to Achieve Food Security and Nutrition in the Context of Urbanisation and Rural Transformation*. HLPE Report 19. Rome: CFS HLPE-FSN. <https://openknowledge.fao.org/server/api/core/bitstreams/cf8cd142-ccb6-4e81-8764-c8fbc291ce1b/content>.
- IFPRI. 2024. "Global Report on Food Crises - Africa South of the Sahara Region." Accessed April 24, 2025. <https://ssa.foodsecurityportal.org/node/2776>.
- Igelström, Erik, Mhairi Campbell, Peter Craig, and Srinivasa Vittal Katikireddi. 2021. "Cochrane's Risk of Bias Tool for Non-Randomized Studies (ROBINS-I) Is Frequently Misapplied: A Methodological Systematic Review." *Journal of Clinical Epidemiology* 140 (December): 22–32. <https://doi.org/10.1016/j.jclinepi.2021.08.022>.
- Jørgensen, Lars, Asger S. Paludan-Müller, David R. T. Laursen, et al. 2016. "Evaluation of the Cochrane Tool for Assessing Risk of Bias in Randomized Clinical Trials: Overview of Published Comments and Analysis of User Practice in Cochrane and Non-Cochrane Reviews." *Systematic Reviews* 5 (May): 80. <https://doi.org/10.1186/s13643-016-0259-8>.
- Kabato, Wogene, Girma Tilahun Getnet, Tamrat Sinore, Attila Nemeth, and Zoltán Molnár. 2025. "Towards Climate-Smart Agriculture: Strategies for Sustainable Agricultural Production, Food Security, and Greenhouse Gas Reduction." *Agronomy* 15 (3): 565. <https://doi.org/10.3390/agronomy15030565>.
- Kohrt, Brandon A., Amit S. Mistry, Nalini Anand, Blythe Beecroft, and Iman Nuwayhid. 2019. "Health Research in Humanitarian Crises: An Urgent Global Imperative." *BMJ Global Health* 4 (6): e001870. <https://doi.org/10.1136/bmjgh-2019-001870>.
- Moore, Elsie, Erin Biehl, Meg Burke, Karen Bassarab, Caitlin Misiaszek, and Roni Neff. 2025. *Food System Resilience: A Planning Guide for Local Governments*. Johns Hopkins Center for a Livable Future.
- OECD. 2025. *Practical Approaches to Develop Resilience Strategies for Food Systems*. OECD Food, Agriculture and Fisheries Papers. 217th ed. OECD Food, Agriculture and Fisheries Papers. Organisation for Economic Co-operation and Development (OECD). <https://doi.org/10.1787/caa2b274-en>.
- Ofofu-Ampong, Kingsley, Wuletawu Abera, Anna Müller, Samuel Adjei-Nsiah, Richard Boateng, and Bryan Acheampong. 2025. "Framing Behaviour Change for Sustainable Agriculture: Themes, Approaches, and Future Directions." *Farming System* 3 (1): 100123. <https://doi.org/10.1016/j.farsys.2024.100123>.
- Sami, Neha. 2024. "Rethinking Research Practices from the Global South." *Geographica Helvetica* 79 (3): 263–69. <https://doi.org/10.5194/gh-79-263-2024>.
- Toromade, Adekunle Stephen, Deborah Aanuoluwa Soyombo, Eseoghene Kupa, and Tochukwu Ignatius Ijomah. 2024. "Reviewing the Impact of Climate Change on Global Food Security: Challenges and Solutions." *International Journal of Applied Research in Social Sciences* 6 (7): 1403–16. <https://doi.org/10.51594/ijarss.v6i7.1300>.
- UN. 2025. *The Sustainable Development Goals Report 2025*. New York: United Nations (UN). <https://unstats.un.org/sdgs/report/2025/The-Sustainable-Development-Goals-Report-2025.pdf>.
- Verma, Krishan K., Xiu-Peng Song, Aradhna Kumari, et al. 2025. "Climate Change Adaptation: Challenges for Agricultural Sustainability." *Plant, Cell & Environment* 48 (4): 2522–33. <https://doi.org/10.1111/pce.15078>.
- Wolbers, Jeroen, Sanneke Kuipers, and Arjen Boin. 2021. "A Systematic Review of 20 Years of Crisis and Disaster Research: Trends and Progress." *Risk, Hazards & Crisis in Public Policy* 12 (4): 374–92. <https://doi.org/10.1002/rhc3.12244>.
- Wordsworth, Russell, Colin Michael Hall, Girish Prayag, and Sanna Malinen. 2021. "Critical Perspectives on Disaster and Crisis Research: Revealing and Responding to Vulnerability." *In Research in Times of Crisis: Research Methods in the Time of Covid-19*, edited by Aaron D. Hill, Jane K. Lê, Aaron F. McKenny, Paula O'Kane, Sotirios Paroutis, and Anne D. Smith, vol. 13. Emerald Publishing Limited. <https://doi.org/10.1108/S1479-838720210000013008>.
- WMO. 2025. *State of the Climate in Africa 2024*. Geneva: World Meteorological Organisation (WMO).



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