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Uncertain times require new thinking for agri-food science to ensure food security and nutrition for all☆,☆☆

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ABSTRACT

For over six decades, international policy has enabled agricultural products to move relatively easily across national borders. Currently, however, the landscape is changing. Deglobalization and the erosion of multilateral principles threaten international food supply chains while climate change is increasingly undermining production. In addition, today's food systems contribute to major environmental and human health problems. The global agri-food research agenda must adapt quickly to these realities. Here we propose that a new research agenda be established based on three principles to help respond to challenging times, promote human rights, sustain gains made in the past, and support greater positive impacts in the future. Principle one – a strengthened commitment to community engagement. Principle two – better supporting interdisciplinary systems thinking. Principles three – combatting misinformation by enabling enhanced public communication. We believe that

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today's crises present an opportunity to establish the foundations of a food system transformation that is more equitable, transparent, sustainable, and democratic.

For over six decades, international policy has helped enable many agricultural products to cross national borders with relative ease. During this time, the agriculture research agenda focused on boosting the yields of our primary crops and livestock (Evenson & Gollin, 2003). This has enabled calorie and protein supplies to rise per capita (FAO, 2025) while food prices have declined as a percentage of household income (Ritchie et al., 2023).

Currently, however, this landscape is changing due to a host of environmental and socio-economic disruptions. Trade wars suggest we may be in a period of "deglobalization" that threatens international supply chains (James, 2018) and climate change is increasingly undermining food production. In addition, today's food systems contribute around 1/3 of all human induced greenhouse gas emissions and most major public health challenges are linked with unhealthy diets (Willett et al., 2019). There is a mounting recognition, therefore, that food systems are responsible for major environmental, social, and health problems (Unger, 2022) and that transforming food systems will help address what has been described as three pandemics: undernutrition, obesity, and climate change (Swinburn et al., 2019).

The global agri-food research agenda must adapt to these new realities and adopt a paradigm that explicitly addresses these challenges. However, this mission is hampered by both limited public funding and a rising public distrust of science. While public engagement with science has strong geographic and demographic nuances, in general, a gap is opening between technical knowledge on one hand and public perceptions on the other. This is one factor that creates additional barriers to the translation of research into policy, practice, and behaviour (Tyson & Kennedy, 2024).

Here, we propose three principles to help frame a new research agenda so that global agri-food research can meet the emerging challenges facing global agrifood systems.

Principle one – a strengthened commitment to community engagement. Despite significant impact on global food production, much of the last two generations of research focused on technological solutions without adequately engaging with producers, Indigenous communities and other often marginalized stakeholder groups. This has resulted in a mismatch between local needs and proposed solutions and has led specific stakeholders (most notably Indigenous peoples, youth, and women) to become economically marginalized from mainstream food production. To move forward, agri-food researchers must better engage with multiple communities as co-innovators, not simply beneficiaries. This must involve explicitly including traditional and local knowledge as legitimate forms of evidence alongside conventional science and technologies. By engaging with a broad range of communities as research partners, locally appropriate innovations will be more readily designed and deployed to solve food security and nutritional challenges (Zurba et al., 2025). An example of how to operationalize this principle might be found in the concept of "free prior and informed consent" (FPIC). FPIC is a framework that attempts to ensure all stakeholder groups are meaningfully engaged with before development projects are embarked upon (Schulz, 2019).

Principle two – better supporting interdisciplinary systems thinking. While discipline-specific work is appropriate to solve some problems, more global agri-food research should adopt a multidisciplinary systems approach. Rather than only focussing on narrowly defined challenges, such as the effects of drought on commodities, research needs to also explore the simultaneous impacts of concurrent challenges and interrogate how interacting problems may affect different communities and stakeholders. Given that food insecurity and inadequate nutrition are complex and multidimensional problems, researchers must be trained and encouraged to collaborate in multi- or trans-disciplinary clusters. It is only when crop and animal scientists, food scientists, and nutritionists work together with social scientists who focus on legal, cultural, ethical and/or policy aspects of food systems that we will have the evidence needed to transform food systems. An illustration of such a process might include the "food system dialogs" conducted in the lead up to the 2022 UN food system summit. In total, there were over 1000 of these dialogues that engaged with over 100,000 participants and acted as a forum to bring diverse food system actors together to debate solutions (Dialogue gateway (2025). Retrieved from: https://summitdialogues.org/ (Accessed, July 7, 2025).). In addition to promoting the first principle, the food system dialogue approach illustrates one methodological toolkit that can be used to foster more interdisciplinary systems thinking.

Principle three – combatting misinformation by enabling enhanced public communication. Given trends towards political polarization, the rise of social media, and a general lack of trust in expertise, scientists and researchers have a vital role to play in combatting misinformation and informing public debates. We must do this by both committing ourselves to rigorous, transparent and peer reviewed standards and by better prioritizing engagement and communication with non-academic audiences. Enabling researchers to develop the capability, motivation, and skills to communicate more effectively with non-academic audiences will require a cultural shift. Such a shift needs a range of strategies that will include creating new training opportunities for researchers at all career stages to become better communicators. Equally, we must embark on a process of changing how universities and research institutes evaluate researchers for promotion so that institutions better recognize researchers' role in contributing to public debates.

None of the ideas presented here are new. Nor were these ideas developed specifically with the current challenges of deglobalization in mind. Indeed, a range of organizations have articulated the need for a similar approach for many years. This includes the World Commission on Dams, which was active 25 years ago and attempted to institutionalise the ideas around free, prior, and informed consent (Schulz, 2019). A second example comes from the European Commission's High Level Expert Group on food systems that provides a blueprint for translating science and societal engagement into practical policy advice (Webb et al., 2022). In a similar vein, the Global Panel for Agriculture and Food Systems for Nutrition (GLOPAN)'s report on how to build the resilience of food systems in Africa also provides an illustrative example of how "top down" donor led projects can be matched with bottom-up community engagement to develop practical suggestions on how to transform food systems (GLOPAN, 2025).

As we awake to the new challenges of the 21st century, we must recognize that one of the defining needs of our generation is to devise food systems that promote human rights, guarantee food security and nutrition for all, and sustain natural resources. If we fail in this task, then the future looks very bleak. However, whilst the current moment has created very serious challenges, we also believe that within today's crises lies an opportunity to frame a new research agenda that is fit for the future. We believe that it is time to implement the principles outlined here to inform this new research paradigm.

Credit statement

All authors were equally involved in developing the content of this commentary based on their work with the HLPE-CFS. The lead author (Evan Fraser) provided overall editorial control in close consultation with all the authors listed.

Data availability

No data was used for the research described in the article.

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