

## FOOD

# Do we need a new science-policy interface for food systems?

Credibility, legitimacy, and diversity of knowledge are critical

By Esther Turnhout<sup>1,2</sup>, Jessica Duncan<sup>3</sup>, Jeroen Candel<sup>4</sup>, Timo Y. Maas<sup>5</sup>, Anna M. Roodhof<sup>3</sup>, Fabrice DeClerck<sup>6,7</sup>, Robert T. Watson<sup>8</sup>

Food systems require urgent transformations to meet multiple demands of food and nutrition security, justice, livelihoods, biodiversity conservation, and climate change mitigation and adaptation. These transformations require knowledge on the multiple dimensions of food systems (e.g., production, trade, consumption, culture, human and animal health, livelihoods and employment, food waste, and environmental sustainability), as well as a mechanism to translate these insights and analyses into governance processes. Drawing on the role of the Intergovernmental Panel on Climate Change (IPCC) in global climate policy, an equivalent platform has been proposed to support food system transformations (1). These calls have gained momentum in the context of the upcoming United Nations Food Systems Summit (FSS) (2). We reflect on the science-policy landscape for food systems and discuss requirements for and challenges of a science-policy platform, focused on addressing social, cultural, and political dimensions of food and challenges in food systems governance.

Our analysis is relevant for the current processes around the FSS, where critical voices have pointed to risks of undue corporate influence of the Summit and a dominance of techno-optimist approaches and solutions (3, 4). These concerns demonstrate the need to ensure equity and justice in the inclusion of scientific, local, and Indigenous knowledge systems and in the participation of actors from civil society, the private sector, and governments.

<sup>1</sup>Section of Science, Technology, and Policy Studies, University of Twente, Enschede, Netherlands. <sup>2</sup>Forest and Nature Conservation Policy Group, Wageningen University, Wageningen, Netherlands. <sup>3</sup>Rural Sociology Group, Wageningen University, Wageningen, Netherlands. <sup>4</sup>Public Administration and Policy Group, Wageningen University, Wageningen, Netherlands. <sup>5</sup>PBL Netherlands Environmental Assessment Agency, The Hague, Netherlands. <sup>6</sup>OneCGIAR, Montpellier, France. <sup>7</sup>EAT Forum, Montpellier, France. <sup>8</sup>Department of Environment, University of East Anglia, Norwich, UK. Email: e.turnhout@utwente.nl

## THE GLOBAL FOOD SYSTEMS SCIENCE-POLICY LANDSCAPE

There is no shortage of organizations and initiatives dedicated to the synthesis and assessment of knowledge around food systems for policy purposes. These include applied research organizations such as the reformed One CGIAR, assessment processes such as the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), the EAT-Lancet Commission, and the High-Level Panel of Experts (HLPE) to the UN Committee on World Food Security (CFS). Moreover, aspects of food systems are covered by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), the IPCC, and the expert bodies of the Codex Alimentarius Commission.

A recent report commissioned by the European Commission reviewed the global food systems landscape and concluded that current organizations and initiatives provide valuable contributions to bridging gaps between knowledge and policy-making (5). Nonetheless, it identified a need for integration and coordination, in addition to filling gaps in knowledge related to, for example, the political economy and sustainability dimensions of food, as well as options for transforming food systems (5). By underscoring the importance of global knowledge synthesis for food systems transformations, the report illustrates a mode of reasoning identified in other policy domains where the science-policy interface is put forward as a solution to improve governance (6). Although this reasoning can be intuitively appealing, we raise two critical questions to consider as part of any decision-making process about whether and how to improve the food systems science-policy interface: How can a food systems platform ensure legitimate and credible knowledge?; and how will it be able to support actual improvements in food systems governance?

## ENSURING CREDIBLE AND LEGITIMATE KNOWLEDGE

There is increasing consensus that inclusive and participatory approaches to

knowledge production can support the credibility and legitimacy of knowledge. This is particularly important for the case of food systems science and knowledge. Although science can provide clarity on global guardrails to guide policy on health, climate, and environment, the IAASTD has made evident that food systems science and knowledge involve tensions and contestations, among others, about the potential contributions and risks of technologies like genetically modified organisms, pesticides, trade agreements, agroecology, and organic farming to desired food system outcomes (7). It is important to recognize that these contestations are characterized by competing understandings not only of what policy options are effective and legitimate but also of what knowledge is seen as relevant and credible. That is, they are not simply controversies over competing values or interests; they are knowledge controversies (8).

Although there is no doubt about the value of science, the persistence of knowledge controversies underscores the importance of including plural forms of knowledge from natural science, social science, and humanities disciplines, as well as from Indigenous and local knowledge systems. A key task of global platforms lies in organizing the rigorous, independent, and expert-led synthesis and assessment of this knowledge without a priori privileging science. Put differently: We need a knowledge-policy interface, not just a science-policy interface.

However, ensuring pluralism is not an easy task in view of current inequities between knowledge holders, particularly geographical differences in scientific capacities, access, and resources, and differences between industry-funded versus civil society-oriented research efforts. In this regard, IPBES is often seen as an example of a mechanism that has taken explicit steps to ensure this inclusion and diverse participation (9), and this has been of key importance to the authority and relevance of its assessments. The HLPE, which develops evidence-based analyses and advice at the request of the CFS, similarly calls for the representation of diverse knowledges (10). Notably, the HLPE pays explicit attention to controversies to explore how diverse knowledges can enrich understanding of problems, solutions, tensions, and trade-offs (10). The HLPE's Global Narratives report offers an example that explicitly discusses controversial areas, such as sustainable intensification and Climate Smart Agriculture, and identifies and assesses diverse knowledge claims from plural knowledge systems (11).

## SUPPORTING IMPROVED FOOD SYSTEMS GOVERNANCE

Improving the knowledge-policy interface only makes sense if it can actually contribute to the needed transformations in food systems. This is an urgent issue in view of the challenges of global food governance, which include a lack of coordination, conflicting interests between stakeholders and member states, and a general failure to ensure equitable access to sufficient and healthy diets, improve livelihood opportunities for food producers and processors, and contribute to sustainability (12).

Experiences from IPBES and IPCC show that political buy-in and uptake are facilitated by the joint negotiation by governments of the assessments' summaries for policy-makers. The 2019 IPBES Global Assessment made global headlines, and the IPCC's repeated messages over many years have contributed to raising awareness and changing discourse and policy. However, challenges remain in informing and supporting concrete actions by public and private decision-makers across levels and scales (13). The pluralist approach suggested in the previous section is key to securing relevance for and uptake by a diversity of actors in government, civil society, and the private sector, all of whom play vital roles in food systems governance (14). In other words, and expanding further on the notion of the knowledge-policy interface, what is needed might be better called a knowledge-governance interface.

The CFS and the HLPE offer an example with procedures comparable to those of IPBES and the IPCC in the sense that HLPE reports form the basis for the joint negotiation of policy recommendations. Notably, the CFS has offered participation rights to relevant stakeholder groups, including from civil society and the private sector. This means that member states and participants are active in negotiations, including those concerning knowledge and assessment, and, with varying degrees of influence, in the contextualization of policy outcomes (11). Analysis of the ongoing national food system dialogues of the FSS could illuminate whether this other model can effectively engage diverse actors and enhance the credibility, legitimacy, and actionability of options and pathways.

Moreover, the IPCC and IPBES inform specific multilateral conventions and also address specific requests from these conventions. This adds weight to the assessments that are produced and pushes the scientific community to produce "demand-driven" research that has specific value to decision-making. Apart from binding regulations related to the trade of food me-



diated through the World Trade Organization (WTO), there is no dedicated global convention for food systems.

Improving the knowledge-governance interface requires not just improving science and knowledge, but also improved coordination of governance. This can involve coordination between international organizations such as the CFS and WTO, as well as the development of dedicated international food systems regulations (15). For example, the UN Framework Convention on Climate Change and the Convention on Biological Diversity could include targets and actions to promote food systems sustainability. The fragmentation of food systems governance means that it is currently unclear what governance processes a food systems platform will inform and how governments and other intended policy and societal audiences will be engaged. If there is no real perspective on improved governance, this will ultimately undermine the utility and effectiveness of a food systems platform.

### AN IPCC FOR FOOD?

As we have discussed so far, efforts to strengthen the food systems knowledge-governance interface require improved coordination of knowledge as well as governance, and a participatory and pluralist approach to both.

Creating a new food systems platform following the models of the IPCC and IPBES is a potential option to meet these objectives. However, this model involves considerable challenges. For one, it will likely take several years of intergovernmental negotiations before assessment work could start, and the costs of such a platform are also substantial: an estimated USD 5 to 8 million per year. Second, close engagement with governments and stakeholders will be needed to ensure that the platform is demand-driven; supports the interaction between knowledge, policy, and action; and maintains independence, legitimacy, and credibility.

Despite the tremendous efforts of IPCC and IPBES in accomplishing these goals, there is also a potential limitation per-



Food systems touch on many aspects of human life, such as this market in Saint-Louis, Senegal, and require aligned actions to achieve global goals.

can contribute to this. Recent policy negotiations have left many actors questioning its effectiveness. Moreover, the HLPE relies on a much smaller number of scientists than IPBES or IPCC and needs increased funding and capacity to integrate available knowledge.

Another option, and a potential way to make progress on this issue, is the organization of a food systems assessment. This would contribute to the coordination and synthesis of knowledge without the high costs and lengthy negotiations involved in creating a new platform. To ensure relevance and uptake, the assessment could be called for and overseen by an existing intergovernmental body such as the UN General Assembly or the FAO Council and could create organizational roles for the CFS and HLPE. In this option, care must be taken to ensure participation and inclusion of diverse stakeholders and forms of knowledge. Throughout the process, a clearer picture could emerge on what further institutional steps can be taken, whether to create a new platform, strengthen the HLPE and the CFS, or take some other approach.

### NO SILVER BULLET

There is no silver-bullet solution that will be able to address current challenges in food systems knowledge and governance. Efforts to coordinate knowledge can be valuable, but only if these efforts ensure the legitimacy and credibility of knowledge, and when they can contribute to urgently needed improved global food governance. Although creating a new platform can be appealing, we offer three issues for careful consideration.

First, we have to consider what is already in place. In many ways, the CFS and the HLPE are well positioned to fulfill the role of a food systems knowledge-governance interface. We need to consider what challenges they face and why, and how these challenges can be overcome. Without such reflection, a new platform or assessment will likely reproduce these same challenges.

Second, if pluralism, equitable participation, and inclusion of diverse forms of knowledge cannot be ensured, a new platform could do more harm than good. In this scenario, a new platform would risk promoting a narrow and regressive understanding of food systems issues and knowledge and risk acting as an obstacle for the needed transformations.

Third, we must recognize that effective governance cannot be reduced to scientific input. Fostering a just and sustainable global

food system requires commitment, political will, and the participation of governments and stakeholders. The implicit suggestion in many science-policy interface initiatives that the synthesis, assessment, and communication of knowledge will strengthen governance in and of itself is misguided and overly simplistic, and it risks detracting attention away from actual policy action. Any existing or new science-policy platform will have to carefully navigate these political dimensions by putting inclusion, justice, and equity center stage. ■

### REFERENCES AND NOTES

1. J. Von Braun, M. Kalkuhl, "International science and policy interaction for improved food and nutrition security: Toward an International Panel on Food and Nutrition (IPFN)," ZEF working paper series nr 142, University of Bonn, Center for Development Research (ZEF), Bonn (2015). [www.econstor.org/bitstream/10419/142725/1/837872839.pdf](http://www.econstor.org/bitstream/10419/142725/1/837872839.pdf).
2. L. Fresco, "To feed a growing world, we need to change our food systems now," World Economic Forum (2020). [www.weforum.org/agenda/2020/11/how-to-create-sustainable-food-systems/](http://www.weforum.org/agenda/2020/11/how-to-create-sustainable-food-systems/).
3. M. Canfield, M. D. Anderson, P. McMichael, *Front. Sustain. Food Syst.* **5**, 1 (2021).
4. B. Burlingame et al. Open Letter: Food systems science-policy interface: don't reinvent the wheel, strengthen it! HLPE, Rome (2021). [http://www.fao.org/fileadmin/templates/cfs/Docs2021/Documents/SPI\\_for\\_Food\\_Systems\\_-\\_No\\_need\\_to\\_reinvent\\_the\\_wheel\\_HLPE\\_Open\\_Letter\\_20\\_May\\_2021.pdf?fbclid=IwAR2eL\\_qnbcxHsutjS0cRsV4UrhCArplxdv-i7qtmAAWpSzVJaKgJGDYlhrQ](http://www.fao.org/fileadmin/templates/cfs/Docs2021/Documents/SPI_for_Food_Systems_-_No_need_to_reinvent_the_wheel_HLPE_Open_Letter_20_May_2021.pdf?fbclid=IwAR2eL_qnbcxHsutjS0cRsV4UrhCArplxdv-i7qtmAAWpSzVJaKgJGDYlhrQ).
5. European Commission, "Recommendations to the United Nations' Food Systems Summit Scientific Group from the European Commission's High-Level Expert Group to assess needs and options to strengthen the international Science Policy Interface for Food Systems Governance" (2021). [https://ec.europa.eu/info/sites/default/files/research\\_and\\_innovation/research\\_by\\_area/documents/hleg\\_recommendation\\_to\\_the\\_unfss\\_scientific\\_group\\_web.pdf](https://ec.europa.eu/info/sites/default/files/research_and_innovation/research_by_area/documents/hleg_recommendation_to_the_unfss_scientific_group_web.pdf).
6. E. Turnhout, K. Neves, E. de Lijster, *Environ. Plan. A.* **46**, 581 (2014).
7. IAASTD 2008a. "Executive summary of the synthesis report" (IAASTD, 2008). <https://www.globalagriculture.org/fileadmin/files/weltagrabericht/IAASTDBerichte/IAASTDExecutiveSummarySynthesisReport.pdf>.
8. E. Turnhout, W. Tuinstra, W. Halffman, Environmental Expertise: Connecting Science, Policy and Society (Cambridge Univ. Press, 2019).
9. I. Diaz-Reviriego, E. Turnhout, S. Beck, *Nat. Sustain.* **2**, 457 (2019).
10. J. Duncan, P. Claeys, *Food Secur.* **10**, 1411 (2018).
11. HLPE, "Food security and nutrition: Building a global narrative towards 2030," a report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome (2020). <http://www.fao.org/3/ca9731en/ca9731en.pdf>.
12. J. J. L. Candel, *Food Secur.* **6**, 585 (2014).
13. T. Y. Maas et al., *Environ. Sci. Policy* **123**, 210 (2021).
14. W. Pearce, M. Mahony, S. Raman, *Environ. Sci. Policy* **80**, 125 (2018).
15. R. Vos, "Thought for food: Strengthening global governance of food security," Committee for Development Policy, CDP background paper nr. 29, New York (2015). [https://www.un.org/en/development/desa/policy/cdp/cdp\\_background\\_papers/bp2015\\_29.pdf](https://www.un.org/en/development/desa/policy/cdp/cdp_background_papers/bp2015_29.pdf).

### ACKNOWLEDGMENTS

The authors declare ongoing and past engagements with several of the science-policy platforms mentioned. These include the study and analysis of CFS and HLPE (J.D.) and IPBES (E.T.), and expert and other roles in EAT-Lancet (F.D.C.), IAASTD (R.T.W.), IPCC (R.T.W.), IPBES (F.D.C., R.T.W., E.T.), CFS (J.D., F.D.C.), and the UNFSS (F.D.C.).

10.1126/science.abj5263

taining to pluralism and legitimacy. The experience of IPCC and IPBES shows that governments have been restrictive in allowing the participation of stakeholders from science, the private sector, or civil society in decision-making roles in the platform, including decisions about what assessments will be undertaken and other components of the program of work, or the negotiation of platform products. Governments thus have a deciding role in what and whose knowledge needs will be met and how. If repeated in a new food systems platform, this may affect the credibility and legitimacy of assessments, as well as their relevance for and uptake in governance processes.

In this respect, the participatory mechanisms of the CFS and the HLPE provide alternative models to enhance pluralism in the production of assessments, as well as in their use and uptake (4). Both are not without challenges and limitations of their own. Intergovernmental negotiations are often frustrating and lengthy, and the open and participatory approach of the CFS

## Do we need a new science-policy interface for food systems?

Esther Turnhout Jessica Duncan Jeroen Candel Timo Y. Maas Anna M. Roodhof Fabrice DeClerck Robert T. Watson

*Science*, 373 (6559), • DOI: 10.1126/science.abj5263

### View the article online

<https://www.science.org/doi/10.1126/science.abj5263>

### Permissions

<https://www.science.org/help/reprints-and-permissions>

Use of think article is subject to the [Terms of service](#)