

Transforming food systems to deliver healthy, sustainable diets—the view from the world’s science academies



The most recent annual review by the Food and Agriculture Organization, the International Fund for Agricultural Development, The United Nations International Children’s Emergency Fund, the World Food Programme, and WHO¹ discloses a continuing rise in the absolute number of undernourished people worldwide. Other nutrition targets are also being missed and the review notes that climate extremes and variability are threatening to reduce and reverse previous gains made in food security. Poor diet is a factor in a fifth of deaths around the world.²

In a previous Comment,³ we introduced a project done by the InterAcademy Partnership (IAP)—a global network of science academies—that sought to bring together four regional academy networks from Africa, Asia, the Americas, and Europe, so as to provide new impetus to the analysis of shared opportunities and challenges in food and nutrition security and agriculture. This project covers malnutrition in all of its forms: undernutrition and micronutrient deficiencies, and overweight and obesity. Our global focus derived from three key perspectives framing the overall scope: (1) the role of science in strengthening and safeguarding international public goods, that is, those goods and services that have to be provided on a scale that is beyond the effort of individual countries; (2) the need to clarify and tackle international environmental and institutional risks, and prevent transmission of these risks; and (3) the Sustainable Development Goals (SDGs), which provide an essential policy framework, but need underpinning by scientific endeavour to elucidate their complexities and interactions. Scientific research has already contributed greatly to the efficiency of agriculture and food systems,⁴ but much more is needed from across the scientific disciplines. Technical and social understanding of the opportunities and risks should be concurrent.

Since the publication of the previous Comment, the four regional academy network reports have been completed. These reports, together with feedback from the wider scientific community on our progress—documented in *The Lancet Planetary Health*³ and elsewhere—have served as a rich resource for our

completion of a fifth global analysis and synthesis report. This report was published in November, 2018, and advises on those matters that should be addressed in collaborative and interconnected ways. The objectives for global sharing and coherence bring challenges for the science and innovation communities, but also mandate a reform of policy making to enable food systems to deliver sustainable healthy diets for all.

We are aware, of course, that many other fine reports are available on the issues that IAP covers. Why, then, despite advances in the natural and social sciences, do the risks for food and nutrition security continue to increase? The challenges for the functioning of food systems are complex and require transformative solutions that systematically use the knowledge that is already available, together with filling knowledge gaps by new research. We see that the potential power of the IAP contribution in providing added value to the large body of work already undertaken by others—both in terms of scholarship and in translating precepts to practice—resides in the distinctive features of the project, in multiple respects. These novel project attributes include: (1) representing the combined global resources of more than 130 academies of science and medicine to provide evidence-based advice; (2) being inclusive, based on regional expertise across multiple scientific disciplines, together with its emphasis on the central importance of basic research; (3) capitalising on core values of academies in their being free of vested interests, having open processes, and being accountable; (4) use of a common starting point on priority themes, to bring order to a wide diversity of evidence, and then integrating conclusions to link national, regional, and global perspectives; (5) taking a food systems approach to encompass all of the steps involved from growing food through to its processing, trading, and consumption; (6) recognising that setting priorities for increasing agricultural production should take account of the pressures on other vital natural resources, particularly water, soil, and energy;⁵ and (7) identifying when consensus on controversial issues arises, or when further work is required to clarify and resolve differing views, while

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For more on the **four regional reports of the InterAcademy Partnership** see <http://www.interacademies.org/37646/Food-and-Nutrition-Security-and-Agriculture>

Panel: Recommendations from the InterAcademy Partnership on international scientific priorities for food and nutrition security

Developing sustainable diets by taking an integrative food systems perspective to deliver health and wellbeing, linked to transformation towards the circular economy and bioeconomy

Research priorities include new opportunities in food processing and reduction of food losses, and for ensuring international market resilience.

Enabling transformation to a healthy diet and good nutrition

Research priorities include how to influence consumer behaviour and private sector actions towards healthy food choices, and delineating and quantifying health co-benefits of climate change mitigation.

Understanding food production and utilisation issues, covering considerations of efficacy, sustainability, climate risks, and diversity of resources

Research priorities include assessment of new farming structures, and options for neglected and new food and feed sources.

Capitalising on opportunities coming within range in the biosciences and other rapidly advancing sciences

Research priorities include improving plant and animal breeding techniques, and clarifying how technology can augment precision agriculture.

Addressing the linkages between food, nutrition, energy, water, and health

Research priorities include assessments of trade-offs between different ecosystem services, and the management of transboundary risks.

Promoting activity at the science–policy interfaces and reconciling policy disconnects

For example, in relation to the transregional challenges for capacity building in the generation and sharing of research, the promotion of public–private partnerships, and the introduction of flexible and proportionate regulation of innovation.

Consolidating and coordinating international science advisory mechanisms

Forming an international panel for food and nutrition security and agriculture could support international governance mechanisms and evidence-based policy formulation within a coherent strategic framework.

For more on the Intergovernmental Panel on Climate Change 2019 report see <http://www.ipcc.ch/report/sr2/>

For more on the Science 20 Summit in Argentina see <http://www.s20argentina.org/documents/>

For more on the World Health Summit see <https://www.worldhealthsummit.org>

embracing diversities in agriculture and food systems and in political systems.

Our fifth report’s detailed global recommendations are summarised briefly in the panel: in our set of reports we also discuss the essential interactions required between regional and global policy makers. The core global priorities for generating and using scientific opportunities cover: sustainable food and nutrition systems; transformation to healthy diets; food production and usage issues; interconnections between food, energy, water, and health; and augmenting effective interaction at the science–policy interfaces, including through international science advisory mechanisms. In addition to the specific priorities listed in the panel, cross-cutting priorities are evident for capacity building and collaboration in science. Agriculture and food systems are vital for achieving the SDGs, and

any engagement between the scientific community, policy makers, and other stakeholders needs to inspire, coordinate, and scale-up commitment to regional and transregional research and innovation, and to mobilise resources generally needed for such research and innovation. Academies understand that there is a collective imperative among the scientific community to be more ambitious in identifying and using the scientific opportunities for systems in transition in an uncertain and increasingly connected world.

For example, increasing forecasts are being made of the various negative effects of climate change on food systems, necessitating the introduction of climate-smart agriculture. However, agriculture itself contributes substantially to negative environmental effects and climate change.⁶ Mitigating this contribution depends on the introduction of climate-smart food systems but also on efforts to influence consumer behaviour associated with excessive greenhouse gas emissions from agriculture, and to reduce food waste. Changing dietary patterns that are problematic, particularly in terms of overconsumption of calories and excess intake of meat products, could bring co-benefits to health and well-being, the climate, and other ecosystem-dependent services. Giving these issues higher prominence is essential in international discussions of the SDGs—eg, in the 2019 UN High-Level Political Forum on SDG 13 (climate action). The Intergovernmental Panel on Climate Change report, also forthcoming in 2019, on climate change and land, which includes discussions on food security and greenhouse gas fluxes in terrestrial ecosystems, is anticipated to be an important milestone in attracting political attention.

What’s next? Our aim has been to make our recommendations policy-relevant but not overly policy-prescriptive. Academies and their networks remain highly committed to using the outputs from our work in debates with the wider science and policy communities, in exploring how to identify, characterise, and provide sustainable healthy diets. Recently, the project regional outputs were communicated to a meeting organised by the Science 20 (also known as S20) group as part of the G20 discussion hosted by Argentina, the G20 president for 2018. We are currently active in capitalising on additional opportunities (for example in the 2018 World Health Summit to stimulate discussion and action across sectors and we welcome feedback on the issues covered and on new directions that could be pursued.

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