Agriculture & Food Systems to 2050 - Global Trends, Challenges and Opportunities

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CGIAR | Independent Science and Partnership Council

November 2018 Brief Number 72

The overarching question that *Agriculture & Food Systems to 2050* (World Scientific, 2018) seeks to address is: **How should agricultural research and policy re-orient itself to address the 'perfect storm' of global threats and opportunities facing our planet?**

The volume, comprised of 18 chapters authored by leading experts in foresight, explores threats as well as opportunities for the global agricultural and food systems between now and 2050. Their analysis is organized into four sections—each of which focuses on a key dimension of the 'perfect storm'. These are food system threats and challenges; technological innovations and disruptive futures; agricultural transformation, bioeconomy and sustainable resource use; and food systems policy futures. The synthesis chapter brings together key messages and an assessment of opportunities in agricultural research for development. Some key headlines include:

i. **Rapid urbanization, income growth**, and the consequent rising demand for food—in terms of both quantity and diversity—provide a new growth opportunity for the agricultural sector in developing countries. This implies a **shift from 'agriculture as a way of life' to 'agriculture as a business'** for smallholder farmers in developing countries.

ii. **Disruptive technological breakthroughs** are most likely to impact resource use efficiency, such as for renewable energy and water resources, and post-harvest operations for enhancing shelf life, quality and safety. Many such breakthroughs are likely to come from the private sector. Technologies for enhancing food quality and safety and reducing waste will improve farmers' market integration, especially for products targeted to the urban food value chains.

iii. The **rise of obesity and non-communicable diseases (NCDs)** in developing countries needs urgent attention. Diversifying from the current focus on staple grains toward a nutrition-sensitive food system can help address the double burden of malnutrition.

iv. We are just beginning to understand the **potential impacts of climate change on the rural poor** and a rich research agenda is needed to address this. Little is known of the adverse impacts of climate change on the crops and resources that have been traditionally important to the poor, such as millets, roots, and tubers, and crops of emerging significance, such as fruits and vegetables, livestock, and fish.

v. **Improved understanding of hydrological and biogeochemical cycles** could help to improve soil nutrient balance, and water and nutrient use efficiency—which is key to achieving climate change adaptation and mitigation, and sustainable agricultural development.

vi. **Adaptation of transformative innovations and modern science tools** with 'big data', ICT, and precision agriculture to smaller scales in developing countries is a major challenge for research and technology design, but has considerable potential to generate high returns towards sustainable intensification.

vii. The continued **amalgamation of bioscience companies and the food industry** can transform power relations in ways that could hamper access to technology for the poor. This implies a new role for public sector agricultural research—focusing in areas of market failures, where private sector investments are limited.

viii. **Food systems thinking** can help identify synergies and trade-offs between the SDGs, and indicate leverage points for policies and interventions.

Access the book on World Scientific:
https://www.worldscientific.com/worldscibooks/10.1142/11212

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