THE KNOWLEDGE LAB ON CLIMATE-RESILIENT FOOD SYSTEMS

Food systems fundamentally influence the environment of the planet, the livelihoods of billions of people (including most of the world's poor), and the nutrition of every human being. Robust food systems can serve as catalysts for achieving the Sustainable Development Goals, but their current weaknesses are a major source of vulnerability to a variable and changing climate.

IFPRI's Knowledge Lab on Climate-Resilient Food Systems will identify and deploy innovative approaches to achieving resilient food systems in a context of climate change. The Knowledge Lab, an integral element of IFPRI's strategic focus on fostering a sustainable food supply, rests on three operational pillars: building expertise, collaborative research, and partnerships for impact.

1 TWO-WAY INTEGRATION OF EXPERTISE

The Knowledge Lab recognizes the remarkable accumulation of human and institutional capacity that has occurred throughout the Global South over past decades. It seeks to build upon and buttress the growing capabilities of these individuals and institutions. IFPRI houses best-in-class models for evaluating the impacts of climate change on food systems; an unparalleled concentration of experience in integrating gender into research, policy formation, and program implementation; and skills in deploying big data. These capabilities will be "crowded in" by applying best practices in knowledge sharing, including innovative approaches such as South–South virtual exchanges and new distance-learning techniques. Integrating the expertise of diverse stakeholders will promote collective growth in capabilities and provide a more robust base for addressing climate change and other long-run challenges.

2 A HIGH IMPACT COLLABORATIVE RESEARCH PROGRAM

Collaborative research is the best means to cement specific skills, the most effective route to generating relevant information, and the best approach to inform policy decisions that result in progressively more resilient food systems. The Knowledge Lab will conduct collaborative research in three promising areas:

- **_Leveraging advanced technologies._** IFPRI has focused on science, innovation, and technology policy to achieve development objectives since 1975. Two examples illustrate the opportunities that are emerging to transform food systems. First, remote-sensed and other big data are opening new possibilities in precision agriculture, agricultural statistics, early warning systems, crop procurement, land use and land use change, measuring urbanization, rural finance, and much more. These technologies enable improved decisions at all levels by providing the right information sets to the right decision makers—such as farmers, traders, processors, bankers, bureaucrats, and politicians—at the right times. Second, dramatic declines in the cost of solar and wind power generation offer unprecedented possibilities for rapid rural transformation with benefits for _production_ via irrigation, cold storage, and processing; _nutrition_ via enhanced availability of nutrient-dense foods such as livestock products, fruits, and vegetables; and _health_ via improved water and sanitation.

- **_Facilitating social change._** Technology alone cannot generate resilience. Households and communities, as well as the institutional environments in which they function, play fundamental roles in the adoption and effectiveness of new technologies. IFPRI and its national and local partners have co-designed a series of resilience-support tools focused on changing perceptions and incentives to increase community engagement in longer-term risk management, sustainability, and resilience. For example, without collective engagement, inexpensive solar-powered pumping risks excessive groundwater depletion. This research area

The Knowledge Lab and the SDGs

IFPRI's Knowledge Lab will strengthen the abilities of research and implementation partners, policy makers, and investors to generate knowledge and new technologies that enhance resilience at local and national levels. The Knowledge Lab will promote beneficial outcomes for the poor and vulnerable and will directly contribute to several Sustainable Development Goals: 1 (no poverty), 2 (zero hunger), 5 (gender equality), 6 (clean water and sanitation), 7 (affordable and clean energy), 11 (sustainable cities and communities), 13 (climate action), 15 (life on land), and 17 (partnerships for the goals).

will engage with grassroots organizations that focus on risk management, gender roles, and inequality to directly reach poor women and men and vulnerable youth populations. IFPRI is also a leader in the design, implementation, and evaluation of social protection programs—documenting what works and what doesn't will be an important element of this research area. Evidence indicates that social protection programs can not only provide a safety net that protects households from negative shocks, but also create a platform from which households build a more robust and prosperous future.

- ***Assessing country resilience.*** IFPRI houses unique, multidisciplinary modeling capabilities to provide insight on increasing food systems' resilience at the national level by evaluating alternative investments, policies, and strategies from economic, environmental, and social perspectives. Because trade, migration, and climate change, as well as strategies to address these, shape and interact with country policies, countries must also be aware of dynamic global contexts. IFPRI maintains a set of linked climate, water, crop, and economic models—labeled IMPACT—that capture the global agricultural sector, with an emphasis on developing regions. The IMPACT suite provides best-in-class insights on the implications of changes in global drivers for national food systems.

3 PARTNERSHIPS FOR IMPACT

IFPRI's Knowledge Lab is establishing clear paths to impact by engaging with innovative, trusted partners from the outset. For example, the Knowledge Lab is partnering with organizations whose skills and experience enable deployment of emerging technologies in fields such as remote-sensed information feeding into video-based agricultural extension. With respect to social change, the Knowledge Lab is building on IFPRI's prior engagement with nongovernmental organizations that are applying community-based approaches to cope with common property problems such as sustainable use of groundwater. To promote country resilience, the Knowledge Lab is building relationships with financiers and companies to design resilience-enhancing investments that attract private sector finance.

Outcomes

The efforts of the individuals and institutions supported by IFPRI's Knowledge Lab will make significant contributions to improving key indicators of food system resilience. The result will be improvements in human welfare, more rapid agricultural growth and transformation, reduced reliance on food assistance, better nutrition, less environmental degradation, and greater equality.

More on IFPRI and the Knowledge Lab

IFPRI is a leading global research organization in international development and food and resource economics, with approximately 600 employees working in more than 50 countries. Established in 1975, IFPRI maintains a deep reservoir of trust built up through long-term partnerships with countries in the Global South. Drawing on these relationships, IFPRI offers unique capacities to: (1) address multifaceted problems and connect local issues to global problems; and (2) convene and unite actors from government, the private sector, universities, think tanks, nongovernmental organizations, and civil society, along with international institutions and development agencies.

IFPRI is a research center of CGIAR, a worldwide partnership engaged in agricultural research for development. To learn more about the Knowledge Lab, please contact Channing Arndt, director of the Environment and Production Technology Division at IFPRI, at **c.arndt@cgiar.org** or visit our webpage.

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