BUILDING RESILIENCE FOR FOOD & NUTRITION SECURITY

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STRENGTHENING CAPACITY FOR RESILIENT FOOD SYSTEMS

APPROACHES AND RESEARCH GAPS

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In the wake of the food and financial crises of 2007–2008 and 2011, building resilient food systems to achieve food security for all has become one of the top goals of the development agenda. Resilient food systems are those in which "people, communities, countries, and global institutions prevent, anticipate, prepare for, cope with, and recover from shocks and not only bounce back to where they were before the shocks occurred, but become even better off."[1] Resilient food systems can help countries transition from a relief stage to a development path. However, despite widespread agreement on the importance of food security, we lack a systematic understanding of how to build capacity for resilient food systems as well as which approaches to building capacity work and why.

This brief introduces a model that seeks to delineate the key capacity components of a resilient food system. It also develops a typology based on a country's capacity to create, manage, and utilize human resources for a resilient food system that suggests a systematic method for prioritizing investments in capacity building across countries. Taken together, such a framework facilitates an exploration of what we know and don't know about developing capacity for resilient food systems.

THE MODEL

A food system is the process by which institutions, organizations, and individuals transform inputs into food and nutrition outcomes. Our proposed model envisions this system as having three subsystems—*policy*, *institutional*, and *production.*

Policy Subsystem

A policy system with strong capacity can yield policies and programs that enable farms and markets to be more resilient. These outcomes depend on analytical capacity to anticipate and prevent potentially adverse events, and to recognize and respond to the various ways in which they might affect food security. Policy processes should be evidence based, participatory, transparent, open, and democratic for effective policymaking. Communities should be empowered to create and enact contingency plans for small-scale shocks when sufficient local capacity is left intact, and to call for—and help implement—external support for larger, communitywide shocks. The policy system is also responsible for developing social safety nets for vulnerable populations.

Markets, Trade, and Institutional Subsystem

The markets, trade, and institutional subsystem affects the capacity to transfer food from producer to consumer. This system includes government agencies; regulatory organizations; data collection systems; and the laws, regulations, and policies that govern how markets function. These entities can control how food systems are affected by adverse events, for example by buying excess grains or releasing food stocks. They can also detect and mitigate potential food safety–related disasters (such as by testing for bacterial contamination and implementing food recalls) and provide data to farmers and agribusinesses for day-to-day decisionmaking. Markets, trade, and institutional systems also implement the laws and programs developed by the policy system, deciding how, when, and what resilience-related policies should be developed at the macro level.

Production Subsystem

A resilient food production system must have the technical capacity to adapt to physical and environmental changes in agriculture. It must also include a strong research and innovation mechanism that can build on the information from markets, trade, and institutions to develop specific tools, technologies, or practices best suited to anticipated adverse effects. A strong extension system connects these research innovations to the farmers' fields where they are needed and, conversely, communicates the challenges and ideas of farmers back to the research community for further investigation. While a resilient food production system can withstand adverse events on its own, many challenges may also require policy intervention or support. Hence, larger challenges faced by the production system must also be communicated to the policy system for overall enhanced resilience.

What Capacities Are Needed to Develop a Resilient Food System?

Capacity has three dimensions—*individual*, *organizational*, and *system*—that are subject to political and socioeconomic factors.

Individual capacity comprises one's awareness and understanding of a particular situation, issue, or area; technical ability to react, predict, analyze, or solve in a critical way; and personal motivation to apply oneself to the task at hand. Individual capacity can include the capacity to write policy that reflects potential adverse events, to research and develop resilient varieties of food, and to negotiate and resolve conflict. The specific capacities needed will depend on what organizations and systems are weak and what potential shocks and threats to the food system exist.

O*rganizational capacity* can be delineated through five capabilities:[2] (1) the capability to act and commit, which addresses the importance of an organization's ability to set goals and to outline steps and processes to achieve these goals;

(2) the capability to address how an organization obtains and allocates resources to meet its objectives; (3) the capability to adapt and self-renew under changing external circumstances; (4) the capability to relate to external stakeholders, that is, how the organization interacts, communicates, cooperates, and works with other organizations and entities; and (5) the capability to achieve coherence, which refers to an organization's leadership and management.

The final dimension is *system capacity,* which is sometimes referred to as the enabling environment or institutional capacity.[3] Characteristics of strong system capacity include good governance, inclusive policy processes, transparency, democratic processes, cooperation, open access to information, coordination, and evidence-based decisionmaking. System capacity includes the level of participation of and cooperation among public, private, and nonprofit organizations in various elements of a food system.

TYPOLOGY OF COUNTRIES BY HUMAN CAPACITY

To understand where capacity bottlenecks exist in different countries, Babu and Dorosh constructed a typology of countries based on aspects of human capacity in relation to food policy research.[4] We adapt this typology using data from the International Food Policy Research Institute's Agricultural Science and Technology Indicators (ASTI) database to understand where human capacity may constitute a bottleneck in the context of developing a resilient food system.

Our first of two classifications is the ability to create human capacity for a resilient food system. This reflects a country's investment in educating its citizens to effectively contribute to its food security. The indicator we use to estimate this capacity is ASTI's full-time equivalent public agricultural researchers per million people economically engaged in agriculture. The second classification reflects a country's commitment to nurturing its human capacity to contribute to food security. Providing sufficient financial incentives to entice agricultural researchers to work in the public sector is a common managerial strategy; hence, we use ASTI's public agricultural research spending as a share of the country's agricultural gross domestic product to indicate this capacity. We divide each indicator into three levels—low, medium, and high—to indicate different levels of capacity. The resulting typology (Table 1) differentiates countries based on their capacity level (Groups 1, 2, and 3) and could be used to prioritize capacity-building needs across countries. Because this table is solely for illustrative purposes, we present only a small number of countries.

Group 1 countries are characterized by low scoring for both variables. Group 2 includes those with a low score for one capacity and at least a medium score for the other capacity; these countries could be considered as transitional—countries undertaking some type of investment to improve their human capacity management. Group 3 includes countries that achieved at least a medium score for both capacities. Such a typology may also be used as a method to prioritize capacity-building investments across countries.

What Capacities Are Common to What Groups of Countries?

Based on the above framework for understanding the capacity for resilience, we now discuss capacity strengths and weaknesses faced by countries with differing levels of resilience capacity. We hypothesize that countries with low resilience capacity can graduate to a higher level of resilience capacity (corresponding to a higher level of food security) with an appropriately targeted capacity-building strategy.

Table 1 A typology of countries based on their capacity to create human capacity and to maintain and effectively utilize human capacity for a resilient food system

Capacity to create human capacity for a resilient food system	**Capacity to maintain and effectively utilize human capacity for a resilient food system**		
	Low	*Medium*	*High*
Low	Bangladesh Guatemala Nepal Laos Zambia Togo	Benin	Uganda
Medium	Vietnam Honduras	Mali	
High		Nicaragua	South Africa

Source: Authors' calculations using ASTI data from IFPRI (2013)[5] using methodology explained in Babu and Blom (2014).[6]
Legend: Group 1 countries; Group 2 countries; Group 3 countries.

Group 1 countries, which were found to have low capacity to create human capacity as well as low capacity to utilize and maintain human capacity, are the most vulnerable and hence the most in need of capacity-building support. They are hypothesized to be heavily constrained by weak policy system capacity, weak governance, mismanagement of resources, and ineffective regulatory institutions. Research supply in these countries often exceeds demand for policymaking, and international donors and agencies may often play a disproportionate role in guiding the policy agenda.[7] There may be strong academic institutes and profitable agribusinesses, but they likely operate independently of the policy agenda.[8] The production system is typically characterized by subsistence farmers and some private companies.

Group 2 countries are in various and divergent stages of transition in terms of resilience capacity. Their strengths and weaknesses pose different challenges and opportunities for increasing resilience. There are likely hidden gaps in capacity that emerge when a shock hits. Conducting a capacity-needs assessment is especially important in these countries because it will identify the areas where capacity is bottlenecked, and even small investments in capacity building may be able to yield large returns in terms of resilience capacity. Often the main obstacles lie within public institutions and government capacity.[9]

Group 3 countries exhibit the highest levels of resilience capacity. They are hypothesized to be more likely to have food and nutrition warning systems, to be connected to environmental monitoring systems, and to have sufficient national statistical capacity to monitor how shocks impact food security and whether policy solutions have addressed or mitigated shocks. Organizational capacity across all subsystems is expected to be strong. Advocacy organizations are likely to voice opinions through formal feedback systems. Production systems are expected to be better connected and better serviced than in the other two groups; both public and private researchers and extensionists work in the value chain to improve resilience. There may be underutilized resources,

bureaucratic challenges, and some disconnect between subsystems, but basic resilience capacity is evident.[10] Increasing awareness of different types of shocks, how and why they should be addressed differently, and the analysis needed to devise these strategies might be a potential entry point for capacity strengthening in these countries.

CAPACITY-DEVELOPMENT APPROACHES AND RESEARCH GAPS

In the longer paper, we used our framework to review past approaches to food system capacity development in developing countries and identified factors contributing to successful approaches. We looked at selected experiences of development organizations, partners, and donors, and we assessed the various approaches by the type of capacity they intend to build: individual, organizational, network, or system capacity in the context of resilience for food security. Table 2 presents examples of some of these capacity-building strategies.

Our review of the literature revealed gaps in knowledge surrounding the success of the above capacity-building strategies in the context of strengthening food system resilience. Here we identify several of the areas requiring further study:

- Economic evaluations of different capacity-building strategies, especially to identify the most cost-effective approaches to building capacity at the individual, organizational, and system levels and to determine the economically optimal level of investment in resilience capacity building
- Understanding the coordination capacity and interdisciplinary knowledge required to address shocks and threats that affect multiple sectors
- Assessment of different organizational capacity–building approaches to improve allocation, management, and utilization of resources
- Methods for improving governance capacity that enable decentralized decisionmaking and facilitate participation in policymaking by governmental and nongovernmental actors at national, subnational, and local levels

These gaps indicate that given the possibly increasing vulnerability of developing countries to shocks, further research and action are needed to understand, develop, manage, and utilize individual, organizational, and policy-system capacities for strengthening the resilience of food systems in developing countries.

Table 2 Summary of capacity-development approaches for building resilient food systems

Individual	Organizational	Networks of organizations	Enabling environment
• Training (short-term, long-term) • Workshops • Study tours • Tool kits / handbooks • Practitioners' guides • Twinning approach or exchange programs • ICT (e-learning, portals, open education) • Kiosks or advisory service centers • Writeshops or joint writing sessions • Partnership or collaborative programs • Peer learning events • Participatory research • South-South learning workshops • Research grants	• Technical assistance • Training • International best practices • Participatory institutional analysis • Study tours • Partnerships (exchange scholars, exchange students) • South-South learning • Supporting regional networks • Supporting centers of excellence • Participatory M&E • Training on organizational management • Visiting research programs	• Technical assistance for platforms, networks • Supporting regional networks • Documentation and sharing of good practices	• Media campaigns • Public awareness campaigns • CD support for policy and social analysis • CD support for institutional analysis • Training for media • CD support for advocacy • Learning/ workshops for policymakers and decision-makers • Policy networks

Source: Ragasa et al. (2010).[11]
Notes: CD = capacity development; ICT = information and communication technology; M&E = monitoring and evaluation.

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NOTES

[1] Definition developed by the International Food Policy Research Institute (IFPRI) 2020 Conference Policy Committee for the 2020 conference "Building Resilience for Food and Nutrition Security," May 15–17, 2014, Addis Ababa, Ethiopia.

[2] H. Baser and P. Morgan. 2008. *Capacity Change and Performance.* Discussion Paper 59B. Maastricht, Netherlands: European Center for Development Policy Management.

[3] For institutional capacity, see Baser and Morgan 2008. For definitions of formal and informal institutions, see D. North. 1990. *Institutions, Institutional Change, and Economic Performance.* Cambridge, UK: Cambridge University Press.

[4] S. C. Babu and P. Dorosh. 2013. *Measuring Food Policy Research Capacity: Indicators and Typologies.* Discussion Paper 01263. Washington, DC: IFPRI.

[5] IFPRI. 2013. *2012 Global Food Policy Report*. Washington, DC.

[6] S. C. Babu and S. Blom. 2014. *Capacity Development for Resilient Food Systems: Issues, Approaches, and Knowledge Gaps*. 2020 Conference Paper 6. Washington, DC: IFPRI.

[7] T. Owens, J. Hoddinott, and B. Kinsey. 2002. "Ex-ante Actions and Ex-post Public Responses to Drought Shocks: Evidence and Simulations from Zimbabwe." *World Development* 31 (7): 1239–1255.

[8] V. Rhoe, S. Shantharam, and S. Babu. 2002. "Institutions and Institutional Capacity for Biotechnology: A Case Study of India." In *Economic and Social Issues in Agricultural Biotechnology*, edited by R. E. Evenson, V. Santaniello, and D. Zilberman, 269–285. Wallingford, UK: Centre for Agriculture and Biosciences International.

[9] D. A. Rondinelli. 2002. *Reinventing Government for the 21st Century: State Capacity in Globalizing Society*. West Hartford, CT, US: Kumarian Press; Babu and Dorosh 2013.

[10] R. A. Mashelkar. 2003. "Nation Building through Science and Technology: A Developing World Perspective." Zuckerman lecture, The Royal Society, London, June 11.

[11] C. Ragasa, S. Babu, and J. Ulimwengu. 2014. "Institutional Reforms and Agricultural Policy Process: Lessons from Democratic Republic of Congo." *Agricultural and Food Economics,* forthcoming.

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