

RESILIENCE FOR FOOD AND NUTRITION SECURITY

Edited by
Shenggen Fan,
Rajul Pandya-Lorch, and
Sivan Yosef

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The International Food Policy Research Institute (IFPRI), established in 1975, provides research-based policy solutions to sustainably reduce poverty and end hunger and malnutrition. The Institute conducts research, communicates results, optimizes partnerships, and builds capacity to ensure sustainable food production, promote healthy food systems, improve markets and trade, transform agriculture, build resilience, and strengthen institutions and governance. Gender is considered in all of the Institute's work. IFPRI collaborates with partners around the world, including development implementers, public institutions, the private sector, and farmers' organizations.

About the IFPRI 2020 International Conference — Building Resilience for Food and Nutrition Security

The international conference “Building resilience for Food and Nutrition Security,” held in May 2014 in Addis Ababa, Ethiopia, was designed to inform, influence, and catalyze action by policymakers, nongovernmental organizations, the private sector, educators, researchers, and communities themselves to incorporate resilience into the post-2015 agenda and improve policies, investments, and institutions to strengthen resilience so that food and nutrition security can be achieved for all. Experts and practitioners from the resilience and vulnerability communities, as well as food and nutrition security, agriculture, humanitarian, and related development sectors came together to assess emerging shocks that threaten food and nutrition security, discuss approaches and tools for building resilience, identify knowledge and action gaps, and set priorities for action on this critical issue. For more information on the conference and its associated activities and products, go to www.2020resilience.ifpri.info.

IFPRI and its 2020 Vision Initiative appreciate the generous support of and active engagement with the consortium of partners for the 2020 Conference.



In partnership with the African Union Commission, IFPRI and its 2020 Vision Initiative are proud to contribute to the 2014 Year of Agriculture and Food Security in Africa.

This book is based on the peer-reviewed briefs prepared for the conference.

Resilience for Food and Nutrition Security

An IFPRI 2020 Book

Edited by Shenggen Fan, Rajul Pandya-Lorch, and Sivan Yosef

A Peer-Reviewed Publication

International Food Policy Research Institute
Washington, D.C.

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International Food Policy Research Institute
2033 K Street, NW
Washington, DC 20006-1002, USA
Telephone: +1-202-862-5600

DOI: <http://dx.doi.org/10.2499/9780896296787>

Library of Congress Cataloging-in-Publication Data

Resilience for Food and Nutrition Security / edited by Shenggen Fan, Rajul Pandya-Lorch, and Sivan Yosef. — First edition.

pages cm

Includes bibliographical references.

ISBN 978-0-89629-678-7 (alk. paper)

1. Food security. 2. Nutrition policy. I. Fan, Shenggen. II. International Food Policy Research Institute.

HD9000.5.S698 2014

363.19'2 — dc23

2014033575

Cover design: Julia Vivalo

Project manager: Patricia Fowlkes

Book Layout: David Popham and Lucy McCoy

International Food Policy Research Institute, Washington, DC

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Abbreviations and Acronyms

ADCRMP	Al-Dhala Community Resource Management
AGIR	Global Alliance for Resilience Initiative
ASTI	Agricultural Science and Technology Indicators
BEE	Black Economic Empowerment
CCT	conditional cash transfer
CM-DRR	community-managed disaster risk reduction
CRF	Catholic Relief Services
CSO	civil society organization
DFID	Department for International Development
DPRDP	Dhamar Participatory Rural Development Project
DRM	disaster risk management
FAO	Food and Agriculture Organization of the United Nations
FARMD	Forum for Agricultural Risk Management in Development
FCS	Food consumption score
G-8	Group of Eight Countries
G-77	Group of Seventy-Seven
GRAD	Graduation with Resilience to Achieve Sustainable Development
HKI	Helen Keller International
IBLI	Index-based livestock insurance

ICTS	information and communication technologies
IDPS	internally dispersed persons (IDPs)
IFAD	International Fund for Agricultural Development.
IFPRI	International Food Policy Research Institute
IPCC	Intergovernmental Panel on Climate Change
LEWS	Livestock Early Warning Systems
LINKS	Livestock Information and Knowledge System
M&E	monitoring and evaluation
NFSS	National Food Security Strategy
NGO	nongovernmental organization
NSP	Nutrition Surveillance Program
OECD	Organisation for Economic Co-operation and Development
PARIMA	Pastoral Risk Management Project
PRIME	Pastoralist Areas Resilience Improvement and Market Expansion
PSNP	Productive Safety Net Programme
R&D	research and development
REGLAP	Regional Learning and Advocacy Programme for Vulnerable Dryland Communities
RIASCO	Regional Inter-agency Standing Committee
SSA	Africa south of the Sahara
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commissioner for Refugees
WFP	World Food Programme
WTO	World Trade Organization

Preface

Economic shocks including food price shocks, environmental shocks, social shocks, political shocks, health shocks, and many other types of shocks hit poor people and communities around the world, compromising their efforts to improve their well-being. As shocks evolve and become more frequent or intense, they further threaten people's food and nutrition security and their livelihoods. How do we help people and communities to become more resilient, to not only bounce back from shocks but to also to get ahead of them and improve their well-being so that they are less vulnerable to the next shock? How do we get better at coping with—and even thriving—in the presence of shocks?

In May 2014, IFPRI and its 2020 Vision Initiative organized an international conference “Building Resilience for Food and Nutrition Security” in Addis Ababa, Ethiopia. About 800 people from communities who work on resilience and vulnerability, as well as food and nutrition security, agriculture, humanitarian, and related development sectors came together to assess emerging shocks that threaten food and nutrition security, discuss approaches and tools for building resilience, identify knowledge and action gaps, and set priorities for action on this critical issue. This book brings together the peer-reviewed background briefs prepared for the conference along with an introductory chapter that provides an overview of the key issues and a concluding chapter that identifies the key knowledge gaps and highlights the policy and program actions needed to address specific shocks.

We hope this book will inform, influence, and inspire individuals and organizations to improve the policies, programs, and institutions needed to strengthen resilience so that food and nutrition security can be achieved for all.

Shenggen Fan, Director General

Rajul Pandya-Lorch, Chief of Staff and Head,
2020 Vision Initiative in the Director General's Office

Sivan Yosef, Senior Program Manager in the Director General's Office

Acknowledgments

The chapters in this book were originally commissioned as background papers and briefs for the IFPRI 2020 Conference on “Building Resilience for Food and Nutrition Security,” which took place on May 15-17, 2014, in Addis Ababa, Ethiopia.

We are deeply grateful for the generous support of and active engagement with the consortium of partners for the 2020 Conference that made this book possible: CGIAR Research Program on Agriculture for Nutrition and Health (A4NH); CGIAR Research Program on Policies, Institutions, and Markets (PIM); Technical Centre for Agricultural and Rural Cooperation (CTA); Royal DSM; DuPont Pioneer; Farming First; German Federal Ministry for Economic Cooperation and Development (BMZ) with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH; International Fund for Agricultural Development (IFAD); International Livestock Research Institute (ILRI); Irish Aid; The Rockefeller Foundation; Resilience Learning Consortium; UPL Limited; and the United States Agency for International Development (USAID).

We express our sincere appreciation to the authors of the chapters for their pioneering contributions that have enriched our knowledge base and contributed to a more informed policy and practitioner discourse on how to build resilience for food and nutrition security at local, national, regional, and global levels.

All of the conference papers and briefs were peer-reviewed by IFPRI’s independent Publications Review Committee. We thank the Committee and its chair, Gershon Feder, for the careful and timely reviews.

Finally, we warmly thank our colleagues for their support throughout the preparation of this book and the underlying papers and briefs: Djhoanna Cruz, Patricia Fowlkes, Heidi Fritschel, Michael Go, Vickie Lee, Lucy McCoy, Andrea Pedolsky, David Popham, Julia Vivalo, and Laura Zselezcky.

INTRODUCTION

Shenggen Fan, Rajul Pandya-Lorch, and Sivan Yosef

The concept of resilience is gaining traction in the development field. As a framework, resilience presents a systems-oriented way of coping with shocks, which disproportionately affect the world's poorest and most vulnerable people. While resilience has been used effectively within ecology, psychology, and engineering, and more recently by humanitarian workers and nongovernmental organizations, resilience within the context of development, and more specifically against the backdrop of food and nutrition security, is still a nascent concept. This “newness” offers us a unique opportunity to shape the resilience agenda, considering how to define it, frame it, measure and evaluate it, and put it into practice.

This book contributes to the body of knowledge on resilience within the context of food and nutrition security. It reviews the conceptual links among resilience and food and nutrition security, hones in on the challenges and opportunities for building resilience against a wide range of shocks, explores how different actors and groups, including communities themselves, build the capacity to be resilient, and adds to the debate on how to measure resilience. It also clarifies what we know and what we do not yet know about resilience. It is our hope that this book can inform, influence, and catalyze action by individuals, organizations, and governments to fill these knowledge and action gaps, and improve policies, investments, programs, and institutions to strengthen resilience so that food and nutrition security can be achieved for all.

Coping with a World of Shocks

Poor countries and communities and vulnerable people are being hit by a range of shocks—economic shocks such as volatile food prices and financial crises; environmental shocks such as climate change and erratic weather patterns; natural disasters such as floods and earthquakes; and social and

Some sections of this chapter draw on the 2020 Conference Brochure (<http://www.ifpri.org/publication/building-resilience-food-and-nutrition-security>) and the 2020 Conference Synopsis (<http://www.ifpri.org/publication/building-resilience-food-and-nutrition-security-highlights-2020-conference>).

political shocks such as conflicts and violence. Recent evidence suggests that some of these shocks have become more frequent and/or more severe and are projected to continue to do so in the coming decades, affecting the food and nutrition security of people, especially poor people, around the world (Chapter 2, Zselezky and Yosef).

Approximately 1.5 billion people now live in areas of conflict (World Bank 2011). Conflict and the displacement it causes, both internally and to neighboring countries, destroy the physical and human capital that allows for a healthy food system and resilient communities. While the total number of refugees has remained at about 10 million, the number of internally displaced people has increased by almost a third since 2007 to more than 17 million by 2012 (UNHCR 2012). These population shifts place pressure on developing countries' food production and availability, and threaten household-level nutrition security.

Growing evidence points to a changing climate, marked by rising global temperatures and rising sea levels (IPCC 2013). Although the global community has expressed a goal of keeping the global average temperature increase to less than 2 degrees Celsius, the world is on track to exceed that threshold, perhaps by a significant margin. This means more frequent and severe shocks, more stresses on agricultural systems, and greater challenges to resilience. Climate change is expected to lead to declines in major staple crops such as wheat, maize, and rice, possibly increasing stunting rates among vulnerable populations (Wheeler and von Braun 2013; Lloyd, Kovats, and Chalabi 2011).

Natural disasters pose a continuing threat. In some areas, such as tropical countries, flooding is projected to increase, even alongside droughts (Westra, Alexander, and Zwiers 2013). Hurricanes are also projected to become more severe as sea surface temperatures rise (Webster et al. 2005). Population booms in cities, some of which lie along plate boundaries, mean that earthquakes may devastate larger numbers of people in the future (Bilham 1995). The poorest households tend to live in areas with degraded land, highly variable weather, and frequent weather shocks. These households also often have low rates of adopting sustainable land management practices and coping actions after weather shocks like floods and droughts.

Food price spikes have also affected food and nutrition security in recent years. Whereas food prices over the 20th century showed a declining long-term trend, since 2007 world food prices have spiked several times. The world is particularly vulnerable to food price spikes now because export

markets for staple commodities are highly concentrated, stocks of maize and wheat have been at historically low levels, and timely information on food production and stocks is lacking. Prices of food and fossil fuels have become linked in international markets, and significant shares of food crops have been diverted for use as biofuel feedstock (Zhang et al. 2013). High and volatile food prices have been blamed for raising domestic consumer prices and reducing food consumption among net food buyers in developing countries. Food price shocks are especially hard on poor people, who typically spend a large share of their income on food. Higher food prices could potentially benefit smallholder farmers and agricultural wage laborers in the long term through increases in supplies and higher agricultural wages (Vancampenhout, Pauw, and Minot 2013; Jacoby 2013). But smallholders must have access to inputs, markets, financing, and extension services to benefit from higher (and stable) food prices.

At the household level, health shocks are often a key factor driving people into poverty. Even small shocks, such as illness or accidents, can lead to food and nutrition insecurity for households. Even well-off households can fall into a “medical poverty trap,” in which they are impoverished by the combination of ill health and indebtedness from high health care costs. Chronic malnutrition, especially in young children, can have drastic lifelong effects on productivity, cognitive functioning, and health (Hoddinott et al. 2013).

Why Should We Talk about Resilience Now?

It is clear that we need to find ways to cope, and even thrive, in the face of shocks. Humanitarian activities in response to shocks have saved lives, but in many cases they have done little to help communities withstand the next shock that comes along (Headey and Kennedy 2012). At the same time, longer-term development activities designed to ensure food and nutrition security, reduce poverty, and promote growth have done little to incorporate responses to inevitable shocks, and at times may even exacerbate vulnerabilities.

Now is an opportune time to use resilience to achieve development goals. As the 2015 deadline for the Millennium Development Goals approaches, the development community is considering new Sustainable Development Goals to guide aid and investment priorities and actions. The concept of resilience seems to offer promise as a way not only to address the challenges raised by shocks, but also to link short-term humanitarian efforts with longer-term development activities and to ensure

that long-term development programs consider short-term vulnerabilities. Various agencies and nongovernmental organizations are weighing how a resilience agenda would fit into their work. Poor and middle-income countries are taking a close look at how they can improve resilience. Yet many questions remain about how to incorporate resilience as a development goal. This volume contributes to addressing these questions.

More than Bouncing Back

Building resilience means helping 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. This volume places this definition against the backdrop of food and nutrition security. Food and nutrition security are, in themselves, important elements of individual resilience, but they can also enhance the resilience of whole economies by enhancing the health and productivity of individuals. At the same time, food and agricultural systems themselves need to be resilient to shocks, both large and small, to help preserve food availability and access even when disaster strikes. How can we create a food and agricultural system that contributes to human resilience through food and nutrition security and is itself resilient to shocks?

The book begins by reviewing the trends in frequency and intensity of global shocks during the past few decades to determine which shocks have increased, which have remained static, and which have actually decreased on the global scale (Chapter 2, Zselezky and Yosef). Chapter 3 (Hoddinott) then presents the conceptual linkages among resilience and food and nutrition security, probing whether resilience truly adds new understanding to development theory and practice, and discussing implications for measurement and for policy.

The volume then delves into specific shocks. Chapter 4 (Fan and Brzeska) looks at food price spikes and volatility, reviewing the latest literature and developments related to actions taken in preventing and managing these types of shocks, and identifying future actions to build a more resilient global food system. Chapters 5-9 tackle conflict. Breisinger et al. (Chapter 5) select four conflict-affected countries as case studies for their exploration of the impact of conflict on food security and the potential of different program-level interventions for enhancing resilience to conflict. Chapter 6 (Mabiso et al.) reviews the impact that refugees have on food security and resilience in hosting communities. In Chapter 7, Ecker hones in on Yemen, describing two development projects and their potential role in reducing the

risk of civil conflict by increasing the opportunity cost of participating in conflict. Chapter 8 (Calderone, Headey, and Maystadt) takes on the complex relationship among climatic shocks, conflict, household and community resilience, and policy interventions that can break this downward spiral into vulnerability, especially among pastoralists in the Horn of Africa. In Chapter 9, Little and McPeak explore pastoralism more comprehensively, assessing the challenges pastoralist communities face and the adaptation strategies they undertake in the face of weather- and conflict-related shocks.

The book continues on to weather-related shocks. Chapter 10 (Ceballos and Robles) analyzes some of the adverse effects that climate variability has on rural communities and economies, and outlines the different insurance mechanisms that can potentially help increase resilience to weather risks. Kosec et al. (Chapter 11) probes the extent to which weather shocks affect individuals' aspirations, that is, what people expect and hope to achieve for themselves and their families in terms of income, assets, education, and social status.

Nutrition security is a vital contributor to resilience and in turn is very vulnerable to being compromised by shocks. Chapter 12 (Alderman and Walker) looks at the conceptual links between nutrition and resilience, stressing the role of nutrition interventions, especially those geared toward early child development. In Chapter 13, Dufour, Kauffmann, and Marsland identify synergies between nutrition and resilience concepts, clarifying the role of food and agriculture in each of these agendas and putting forth suggestions for applying a nutrition lens to resilience programming.

The building blocks of resilience are the systems and institutions that can help people prepare for and adapt to shocks. Chapter 14 (Babu and Blom) explores this concept, introducing a model that clarifies the capacity components of a resilient food system, and presenting a typology based on a country's capacity to create, manage, and use human resources. In Chapter 15, Davis, Babu, and Blom conceptualize the capacity needs of resilience-focused extension and advisory services that increase rural and farming households' access to tangible and intangible resources, such as agricultural inputs and knowledge.

Some groups of people are excluded from markets, social protection programs, asset ownership, political decisionmaking, and other services and activities that contribute to building resilience. Chapters 16 and 17 look more closely at the challenges faced by excluded populations. Von Braun and Thorat (chapter 16) examine the relationships between exclusion and resilience, identifying opportunities for overcoming exclusion and thereby strengthening the resilience of the poor. Kumar and Quisumbing (Chapter 17) focus on one of

these vulnerable groups, women, in their review of the differences between men's and women's exposures to risk, vulnerability to shocks, and adaptation and coping mechanisms.

Even people who are, by definition, poor have certain resources and capacities they can bring to bear to improve their own well-being. Chapter 18 (Bernier and Meinzen-Dick) looks at the role of social capital and social networks, in the form of local-level organizations, in helping people build up and maintain their own resilience. In Chapter 19, Frankenberger et al. take this concept further to review the innovative strategies employed by various non-governmental organizations in designing and implementing potentially effective resilience programming.

Finally, policymakers and development practitioners are eager for guidelines on how to measure resilience as a way to help them design policies and programs more effectively. Chapter 20 (Barrett and Headey) presents a proposal for a new multicountry system of sentinel sites to undertake long-term, high-frequency measurement and analysis of individual, household, and community resilience in the world's most vulnerable regions.

The Way Forward

A recurring theme throughout the book is that there is still much to learn about how individuals, households, communities, countries, and institutions—both formal and informal—become and remain resilient to shocks. These knowledge gaps on the resilience agenda in food and nutrition security are pointed out throughout the book and explicitly drawn out in the concluding chapter (Chapter 21, Fan et al.), as are policy and programmatic recommendations for public and private sector.

As we look ahead to a future of continuing and even increasing shocks, we face an urgent need to predict shocks, prepare for them, and devise strategies for ensuring resilient agricultural and livelihood systems, institutions, and policies—at the community, national, and global levels. We hope that this book contributes to a growing worldwide effort to define, measure, and practically apply a resilience framework to on-the-ground development initiatives, so we can achieve food and nutrition security for all.

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ARE SHOCKS BECOMING MORE FREQUENT OR INTENSE?

Laura Zselezcky and Sivan Yosef

Policymakers, practitioners, and researchers frequently cite an increase in shocks around the world as a reason for focusing on resilience. But have shocks actually increased or become more severe and far-reaching? What does the landscape of shocks look like?

Shocks are external, short-term deviations from long-term trends—deviations that have substantial negative effects (which may be short-lived or long lasting) on people's state of well-being, level of assets, livelihoods, safety, and ability to withstand future shocks. Many shocks are unexpected, but in some cases, such as drought or conflict, the shock may be expected year after year although the individual, community, or system lacks the resilience to prepare for or mitigate it. In other cases, such as climate change, the general shock could be expected but the effect on a particular individual, community, or area could be unexpected.

This brief examines five types of shocks—conflicts, natural disasters, climate change, food price volatility, and health crises—as they relate to food safety and agriculture. It assesses their frequency, severity, or both during the past few decades as part of a selective, nonsystematic review.

Conflicts

While the number of conflicts worldwide has, in general, decreased or remained stable since World War I, and the number of battle-related deaths has decreased, different forms of conflict may cause concern for future trends. Moreover, the costs of conflict—on human capital, economic growth, poverty reduction, and more—continue to exact a heavy toll on countries around the world.

Overall, the years 2000 to 2009 experienced the least conflict as a decade since the 1970s, (Themnér and Wallensteen 2013) though many conflicts

that persist are related to previous conflicts. All civil wars initiated after 2003 were resumed from previous civil wars, and 90 percent of conflicts since 2000 have been in countries that have already experienced a civil war (World Bank 2011). The nature of conflict has changed over the decades; the number of wars—conflicts leading to particularly high numbers of fatalities—has decreased by nearly 50 percent from the 1980s to the first decade of this century, and battle-related deaths have decreased by 76 percent since 1989 (Human Security Research Group 2012). However, conflicts in which external governments provide military support to one of two interstate warring parties are on average twice as deadly as similar conflicts without external intervention and account for a growing number of the world's active conflicts, increasing from 12 percent during 1950–1989 to 16 percent during 2000–2008 (Human Security Research Group 2012). While conflicts are not increasing, the deadly nature of more internationalized conflicts may be a concerning trend for the future.

Natural Disasters

Drought

There is not much agreement on historical drought trends. Some point measurement-based and climate and hydrological model-based studies suggest that the number of droughts has been increasing during the past few decades, although the former lack sufficient geographic coverage to offer strong conclusions. A few observation- and satellite-based studies have found subtle drying trends during the past 20–30 years in such regions as the southern United States and central South America, but disagree on all other regions (Dorigo 2012; Damberg and AghaKouchak 2013). Still other research has found little change in the total area affected by drought during the past 60 years (Sheffield, Wood, and Roderick 2013). The latest Intergovernmental Panel on Climate Change (IPCC) report indicates that the frequency and intensity of droughts are likely to have increased in the Mediterranean and West Africa and to have decreased in central North America and northwest Australia since 1950. The report notes a high confidence that drying in the Mediterranean, southwestern United States, and southern Africa is likely as global temperatures increase under climate change (IPCC 2013). While global data on the direct impacts of drought on food security, such as the effect of water scarcity on crop yields, are scarce, examples of the secondary effects of drought, such as food price spikes triggered by restrictive trade policies and panic purchases following a drought, suggest a serious impact on food security (Kallis 2008).

Floods

Studies that look back at the past few decades show an increase in global precipitation and runoff, which greatly contribute to flooding. One study found an increase in rainfall extreme averages globally during the past 30 years as well as an estimated 7 percent increase in extreme rainfall intensity for every 1°C increase in global atmospheric temperature. The strongest increases were found in tropical countries, which tend to be some of the poorest in the world, though most weather stations saw an increase. These authors expect more frequent flooding around the world (Westra, Alexander, and Zwiers 2013). Other studies support these general conclusions, finding that annual extreme precipitation events have been increasing in frequency (Alexander et al. 2006) or that northern high latitudes face an increased risk of big floods (Milly et al. 2002). Indeed, higher latitudes and the equatorial Pacific Ocean are likely to see an increase in annual mean precipitation by 2100, while mid-latitude and subtropical dry regions will receive less (IPCC 2013).

Hurricanes/Cyclones

Whether hurricanes or cyclones have increased in frequency is inconclusive, due to large fluctuations every year and decade as well as scarce historical data for many ocean basins. Many studies, especially those relying on climate models, offer conflicting results on storm frequency. Research suggests, though, that the *intensity* of these storms may have increased during the past few decades. One study showed that the strongest types of hurricanes—category 4 and 5—doubled between the 1970s and 2010, while the number of weaker hurricanes has remained constant (Webster et al. 2005). Another study found a large increase in the amount of energy expended by storms between 1975 and 2005, due to longer storm lifetimes and greater intensities, a record that is highly correlated with sea surface temperatures (Emmanuel 2005). As sea surface temperatures increase, as expected due to climate change according to the latest IPCC report (IPCC 2013), storms may become stronger and more destructive, posing a threat to developing and industrialized countries alike.

Earthquakes

Earthquake frequency has seemingly remained somewhat constant since record keeping began. A more pertinent question is whether earthquakes are causing more fatalities. One study found that the average annual number of fatal earthquakes has been increasing throughout the 20th century, an increase attributed to population growth and increasing urbanization (Nichols and Beavers 2008). Other research has found that the fatality rate of earthquakes is falling due to

better infrastructure and health services (Daniell 2013). Looking to the future, the frequency of earthquakes with fewer than 5,000 fatalities can be reliably predicted, while those with more than 30,000 are too irregular for reliable predictions, even though they account for most of the fatalities. However, as the world urbanizes, earthquakes are more likely to hit some of the world's largest cities, which are located along plate boundaries. Eighty percent of these at-risk cities are in the developing world (Bilham 1995).

Climate Change

Climate change is any variation in climate by magnitude, frequency, or persistence, over a period of time, usually a few decades or longer (IPCC 2013). The warming of the world's climate is "unequivocal" and "human influence on the climate system is clear" (IPCC 2013). During each of the past three decades, surface temperatures have been higher than in the previous decade; the pH level of ocean surface water has decreased by 0.1 from preindustrial times; and the levels of carbon dioxide and methane now surpass preindustrial levels by 40 percent and 150 percent, respectively (IPCC 2013). These trends are projected to continue or even worsen.

Climate change may benefit some farmers while devastating others. In areas with plentiful precipitation, warmer temperatures can lengthen the growing season, reduce frost damage, and enlarge plants' root surface area. In arid and semiarid regions, warmer temperatures may worsen droughts, exacerbating heat stress on crops and reducing yields (St. Clair and Lynch 2010). Indeed, climate change may worsen food insecurity in regions that are already food insecure, such as Africa and South Asia, with the worst yield losses occurring in maize, millet, sorghum, and wheat (Wheeler and von Braun 2013; World Bank 2009). If temperatures rise by 2.2°C–3.2°C, at the lower range of the business-as-usual scenario, global wheat and maize yields are projected to decline by 14–25 percent and 19–34 percent, respectively, from 2000 to 2050 (Deryng, Sacks, Barford, and Ramankutty 2011). These projections are supported by historical trends: each degree-day above 30°C in the period 1980–2008 reduced maize yields in Africa by 1 to 1.7 percent (Lobell, et al. 2011).

The effect of climate change on food security will depend on factors such as mitigation efforts, income, and population growth. An optimistic scenario, with strong income growth and perfect mitigation, is projected to lead to a 37 percent decline in the number of malnourished children in poor countries (Nelson 2010). But more pessimistic scenarios have been estimated to increase child malnourishment in low-income countries by 18 percent and increase

severe stunting by 23–55 percent in Africa and 61 percent in South Asia (Lloyd, Kovats, and Chalabi 2011).

Food Price Volatility

The world has seen two major food price crises during the past six years. Local and international staple commodity prices rose steadily in 2006–2007 and then sharply early in 2008. They decreased significantly by the end of 2008 but then rose again in 2010, with another, less pronounced peak in February 2011 (Torero 2012). Prices remain high, second only to the heights reached in the 1970s. International prices of grain, including maize, rice, and wheat, were significantly more volatile in 2007–2010 than in 2003–2006. Going back even further, the volatility of international rice and wheat prices doubled from 1980–2006 to 2007–2010 (Minot 2013).

Studies have probed how much international price volatility is transmitted to regions and countries. A study of 11 countries in Africa found that although national-level food price volatility is high, it has not increased during the past few years (Minot 2013). Another study suggested that the 2008 crisis may have increased the total global undernourished population by some 63 million people (Tiwari and Zaman 2010). The factors believed to have contributed to international price volatility, including increased biofuel production, weather shocks, and speculation, are still at work, suggesting that volatility is likely to continue at least until the end of the next decade (Headey and Fan 2010).

Health Crises Related to Food Safety and Agriculture

The transmission of pathogens from animals to humans, or through contaminated food or water, is often the cause of health crises related to food safety and agriculture. These pathogens create public health threats when ecological, social, and biological factors—such as increased density and movements of human and animal populations, changes in farming systems, or climate change and variability—compound one another (Bett 2011).

Zoonotic diseases—those that can be transmitted from animals to humans—account for 60.3 percent of emerging infectious diseases and are significantly increasing (Jones 2008). Some sources estimate one billion cases of endemic zoonoses, causing millions of deaths, each year (Karesh 2012). Zoonotic diseases can be devastating to a poor household whose livelihood depends on livestock, such as when its animals die from these diseases or a family member responsible for the care of livestock falls ill (Catelo 2006).

Mycotoxins, the highly toxic natural byproducts of molds that grow on crops—and build up in response to a variety of factors including drought, high rains, or high moisture—also pose a threat to human and animal health and may continue to do so as the climate changes. High incidences of aflatoxins, common carcinogenic mycotoxins, have been reported in years following severe droughts in semiarid countries such as parts of Kenya, while warm countries may experience dangerous levels of them with rains at or near harvest (Shiferaw, et al. 2011).

Concluding Remarks

Although this brief does not represent an exhaustive review of shocks, the evidence suggests that while some shocks have not increased, others have become more severe or intense and will continue in this direction in the near future. A more robust and higher-quality body of evidence can inform policy decisions to help vulnerable populations better prepare for future shocks. Investments are also needed in continued monitoring and tracking of shocks, as well as in new tools and methods to improve detection and ensure frequent transmission of information.

Many of the trends described above suggest that poor people will be among those hit hardest. Investments are needed in early warning systems, infrastructure, education, and sustainable agriculture to enable these populations to prepare for and withstand shocks. As countries, institutions, communities, and individuals assess their capacity to predict, prevent, and recover from these shocks, they will also need solutions that bring together policy action, innovative technologies, and social support programs.

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LOOKING AT DEVELOPMENT THROUGH A RESILIENCE LENS

John Hoddinott

Recurrent humanitarian crises have led many development actors to begin thinking differently about development issues. Rather than placing humanitarian assistance, governance, food security and nutrition, economic development, and other topics in separate silos, many are using the concept of *resilience* to join up their myriad activities. Constas, Frankenberger, and Hoddinott (2014) wrote, “In a world where conventional approaches to dealing with humanitarian aid and development assistance have been questioned, resilience has captured the attention of many audiences because it provides a new perspective on how to effectively plan for and analyze the effects of shocks and stressors that threaten the well-being of vulnerable populations.” Despite the promise and hype of resilience, or perhaps because of it, a backlash has already begun. Does it really add new and useful understanding to development theory and practice, or is it merely more development jargon? This chapter addresses this concern through an overview of what resilience means and how it is conceptualized before discussing implications for measurement and for policy.

Resilience: Definition and Conceptual Frameworks

The word *resilience* comes from the Latin word *resilire*, which means “to rebound or recoil.” Its earliest usage was in 19th-century shipbuilding, and it is used extensively in civil and mechanical engineering. Starting in the 1970s, researchers in the fields of ecology and psychology began to explore the notion of resilience. In ecology, resilience was described as the amount of disturbance a system can absorb before shifting into an alternative state (Holling 1973). Others focused on the speed of return to a preexisting equilibrium following a perturbation or shock. Around the same time, psychologists also began exploring the notion of resilience, developing scales of resilience that captured notions such as self-efficacy, attitudes toward

change, realistic sense of control, patience, ability to engage the support of others, secure attachments, and optimism.

Several authors have documented the evolution of discourse on resilience in development (Bene et al. 2012; IFPRI 2013). The myriad definitions that now exist share common elements with work in other fields and with each other. All emphasize that resilience is an ability to respond to transitory adverse events (shocks) or more persistent adverse trends (stressors). Resilience can be applied at different levels of aggregation: individuals (as in the psychological literature), households, communities, organizations and systems (as in the ecology literature), or states. Finally, all have a temporal focus, putting greater emphasis on the potential long-term adverse consequences of shocks. Drawing on these commonalities, Conostas, Frankenberger, and Hoddinott (2014) offered the following definition: “Resilience is the capacity that ensures adverse stressors and shocks do not have long-lasting adverse development consequences.”

The plethora of conceptual frameworks for resilience also share common components. These include highlighting the broader environment in which a household (or individual or some other unit of observation) resides; the resources available to that household; how that household uses those resources; how the economic returns on those uses are affected by shocks that household experiences; and how the outcomes of those uses lead to consumption of food and other goods and services, savings, health and nutrition status, and other such outcomes.

With these ideas in mind, consider Figure 3.1. It uses a measure of food security called the food consumption score (FCS), but we could easily substitute some other measure of food security or nutritional status. Figure 3.1 graphs two elements of the FCS for six households, its initial level shown by the dark rectangles, and its range or variability shown by the horizontal lines going outward from each rectangle. The initial value reflects the settings of and resources available to households as well as their livelihood strategies and any shocks that may have occurred. As shown in Figure 3.1, four households (A, C, E, and F) are food secure (their FCSs lie to the right of the minimum FCS vertical line) and two (B and D) are food insecure (their FCSs lie to the left of the minimum FCS vertical line). The range gives us an indication as to how shocks of different types and severity will affect food security, given these settings, resources, and activity choices. Given the range of possible FCS values observed for these households, five households (A, B, C, D, and E) are vulnerable to becoming food insecure.

Suppose that an adverse shock occurs, causing the FCS for all households to fall, or as shown by the arrows in Figure 3.2, to shift leftward along the black horizontal lines. Differences in the magnitude of these shifts reflect differences in how households are affected by this shock. The FCS for each household is given by the diamond shape. Five households are now food insecure.

Figure 3.3 describes the food security status of each household after the shock has passed. FCSs are now denoted by circles with a wavy fill pattern, with the direction of change in FCS from that shown in Figure 3.2 denoted by the open-filled arrows. In three households (A, D, and F), the FCS returns to the level observed in Figure 3.1; in fact, in the case of household F, the FCS now exceeds its initial level. In two households, B and D, there is partial recovery from the shock, but in Figure 3.3 the level of FCS is still less than that observed in Figure 3.1. Finally, the food security situation for household E has continued to deteriorate, with its FCS now lower than it was in Figures 3.1 and 3.2.

Taking this sequence of figures together, households A and F would appear to be resilient—they were able to recover and return to their preshock level of FCS. Households B and C exhibit some resilience inasmuch as their FCS partially recovers. Note that while household D recovers, and in this

FIGURE 3.1 Initial food security outcomes for six households

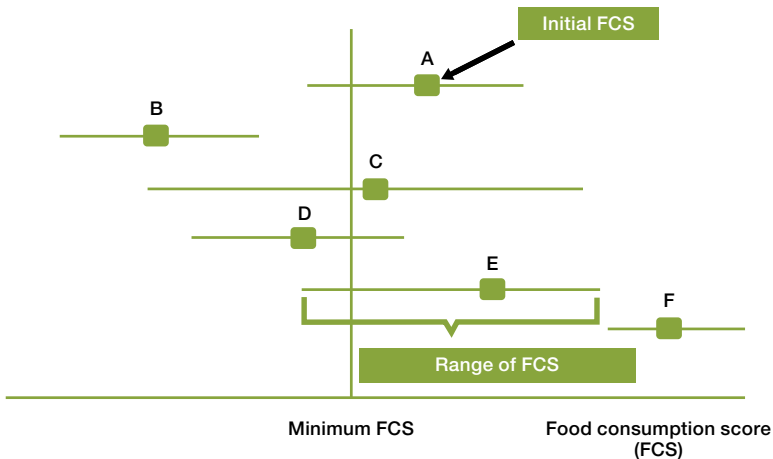
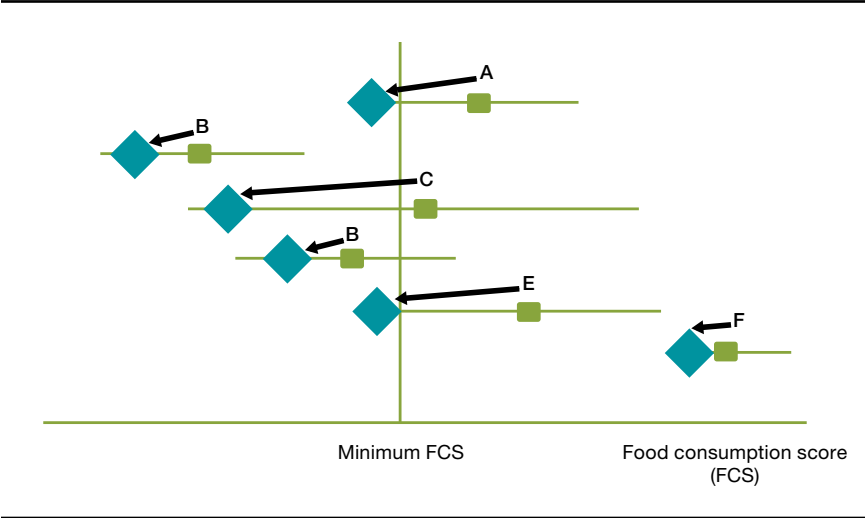
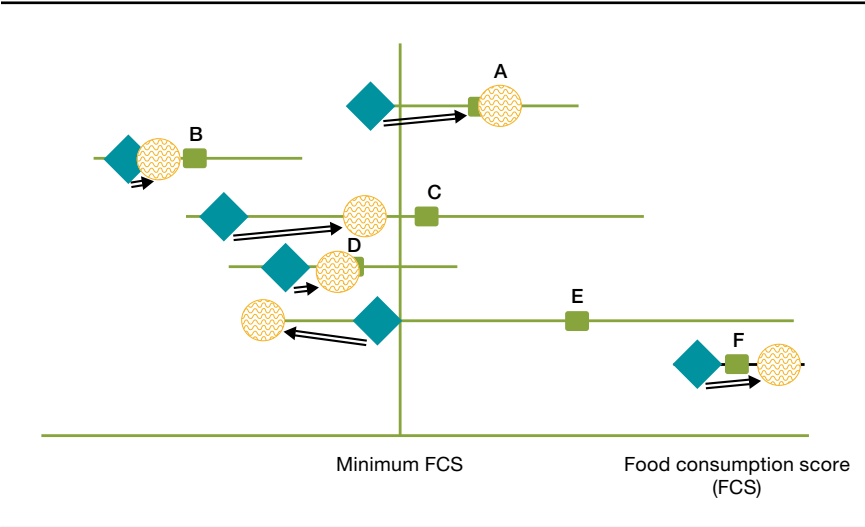


FIGURE 3.2 Food security outcomes for six households following an adverse shock



Source: Author.

FIGURE 3.3 Food security outcomes for six households during recovery



Source: Author.

sense is resilient, its level of food security remains below the minimum FCS. Household E exhibits no resilience.

Note that resilience is not merely the converse of vulnerability. Vulnerability is the “likelihood that at a given time in the future, an individual will have a level of welfare below some norm or benchmark” (Hoddinott and Quisumbing 2010). Work on vulnerability and work on resilience do share common features. Both emphasize that households and individuals are strongly affected by the settings they find themselves in. Both give prominence to the asset holdings of households. Both resilience and vulnerability emphasize that the conjunction of settings and assets determines livelihood strategies and that these strategies are both affected by and respond to shocks and stressors. However, vulnerability research focuses on the question, “Will shocks push people into poverty?” Work on resilience asks, “Do shocks or stressors have *long-term* adverse consequences?”

Implications for Measurement

Measures of resilience must distinguish between the *ex ante* (preshock) capacity of resilience and the *ex post* time path of the outcome (food security, nutrition, and so on) after the shock has occurred. Collection and analysis of the *ex post* time path can draw heavily on existing metrics. For example, in the case of undernutrition, we could track weight for height and height for age, assessing the timing and severity of their fall and the length of time it takes to recover from the shock.

Most attention has focused on measuring *ex ante* capacity to be resilient. Much of this work aims to construct a resilience index, which typically takes the form of a scale aggregating across a set of diverse assets, livelihood activities, and outcomes. Alternatively, some indexes could be based on responses to questions regarding households’ perceptions of their resilience. Measures of resilience capacity are still in their infancy. Work on them must grapple with several difficult problems.

Resilience capacities are setting and shock/stressor specific. If a household is resilient to one type of shock, it does not follow that the household is resilient to all shocks. As an example, consider two rural households. In one, livelihoods are derived from farming activities; in the second, the household receives wage income from a member’s employment as a government schoolteacher. The schoolteacher’s household may be more resilient to a climatic shock, say a flood, than the farming household. But if there is an economic or governance shock that causes governments to stop paying teachers, the farming household is less likely to be affected.

Much of the work done on resilience indexes focuses on levels of assets. These are important, but so too are the returns on assets. A single drought does not necessarily destroy land as an asset, but it does dramatically diminish the income generated from land; further, the relationship between assets and resilience may be nonlinear and therefore difficult to capture in a single index. An earlier literature on the economics of famines offers an additional caveat. A focus on assets risks ignoring nonmarket entitlements—which include not just aid and welfare transfers but also the complex social relationships that exist between households and that may be important components of resilience.

There is a difficult question of whether welfare weights should be attached to these indexes. Suppose we wish to assess the success of an intervention designed to increase resilience capacity. Do we ascribe equal weight to increasing the resilience of any household or do we put more weight on improving the resilience of less advantaged households? How do we make these weights gender sensitive? Determining these weights and how they are applied is not straightforward.

Two further points are worth noting. Much of the focus on measurement has been on the resilience capacity of individuals or households. But resilience can also be thought of in terms of institutions, governments, informal social protection mechanisms, or more generally, systems, and there has been much less work on measuring resilience at these levels. Last, any proposed measure should be subjected to tests of validity and reliability; in the case of measures of resilience capacity, we are also interested in understanding their predictive power. As yet, there is little work in these areas.

Implications for Policy

In a number of development agencies, resilience has emerged not so much as a new conceptual construct but rather as an organizing framework that integrates humanitarian and development efforts. As an organizing framework, there is scope for taking it further. Efforts to mitigate and adapt to climate change are one example. While current development discourse treats them as a distinct activity, using resilience as an organizing framework is a means of mainstreaming them in broader development efforts. Work on strengthening informal and formal collective action, including work on governance, also becomes integrated into a broader development effort. Shifting from a focus on vulnerability to one on resilience emphasizes the positive over the negative or maladaptive. But if the contribution of resilience to development policy and practice is merely rhetorical, it is not clear that it is worth all the attention it currently receives. There are, however, other implications of looking at food security and nutrition or indeed broader development objectives through a resilience lens.

In psychology and ecology, people and species do not live in isolation. Rather, they are part of a broader social or ecological system. Indeed, in the child psychology literature, the ability of children to access a supportive network is often seen as a core element of their resilience. With some exceptions, many current development efforts bypass systems and instead focus on individuals. Given how difficult it can be to work within existing systems such as government structures, bypassing them means that when called upon in time of need, such systems themselves are not resilient. Rather than assisting affected households and individuals in bouncing back more quickly, they crumble. So one implication of an approach to development grounded in the notion of resilience is increased attention to systems, especially governance. That said, systems do not and should not work in isolation, either. Rather, increased attention to resilience implies thinking holistically about development interventions. Ethiopia's Productive Safety Net Programme provides a good example.

Resilience focuses attention on the idea that short-term shocks are malign not just because of their immediate effects but also because of their adverse long-term consequences. This idea is especially important in the context of addressing chronic undernutrition, given the compelling body of evidence showing that not only do shocks and stressors such as civil war and drought have immediate effects on preschool children's nutritional status but that these effects persist into adulthood. In turn, this idea takes us to a final implication of a resilience lens on development. Children in households with greater resilience are likely to be better nourished and better schooled; in turn, as adults, these children will likely be more resilient to the shocks and stressors they face. A resilience lens gives especial importance to human capital formation (health, schooling, nutrition) as a means of building sustainable resilience; it creates a virtuous circle of development.

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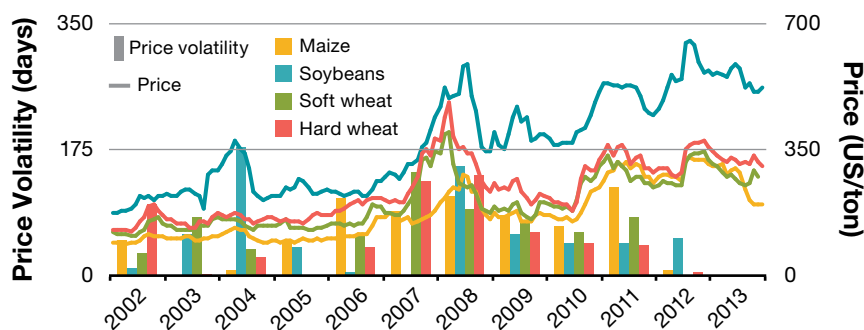
LOWERING FOOD PRICE SPIKES FOR A RESILIENT FOOD SYSTEM

Shenggen Fan and Joanna Brzeska

Volatility and spikes in global food prices can have large and diverse impacts on the welfare of poor people, particularly their food and nutrition status (Anríquez, Daidone, and Mane 2013). Although high and volatile price levels have subsided in recent years, the international community should not become complacent (Figure 4.1). The complex set of concurrent factors behind the recent food price crises in 2007–2008 and 2011—including diversion of crops for biofuel, extreme weather events, low grain stocks, and panicky trade behaviors—are still present or have the potential to reemerge. An important component of improving the stability of the global food system is to reduce price spikes and volatility that can destabilize future food availability and accessibility.

The objective of this chapter is to review the latest literature and developments related to actions taken in preventing and managing food price spikes

FIGURE 4.1 Food price volatility and spikes, 2002–2013



Sources: Data from IFPRI (2014) and FAO (2014).

Notes: Price spikes refer to a steep rise in prices over a short period, whereas volatility is defined as a high dispersion of prices around the average market price. See von Braun and Tadesse (2012).

This chapter was originally published as *Building a Resilient Global Food System by Lowering Food Price Spikes and Volatility*, 2020 Conference Brief (Washington, DC: International Food Policy Research Institute, 2014).

and volatility and to identify future actions to build a more resilient global food system (Table 4.1).

Areas of Progress

Increased Investment in Agriculture, Food, and Nutrition

Investments in agriculture are an especially effective and equitable tool to enhance food security by reducing food prices and increasing output (Fan et al. 2008). Falling investment levels in agriculture throughout the developing world during the 1980s and 1990s have been reversed in recent years. Since 2008, the Group of Eight countries (G-8) has launched a series of global financial commitments toward improved food and nutrition security, including US\$22 billion under the L'Aquila Food Security Initiative and, more recently, US\$4.15 billion under the Global Nutrition for Growth Compact. However, two years after the conclusion of the L'Aquila Initiative, donors have disbursed only three-fourths of their commitments (G-8 2012).

Country- and regional-level investment toward agricultural development has also been on the rise in recent years. Agricultural public investment in Africa increased by an average of 7.4 percent per year between 2003 and 2010 (Benin and Yu 2013). China doubled its spending on agricultural research and development (R&D) between 2000 and 2008 (and increased it by 50 percent between 2009 and 2010) and has prioritized agricultural investment and modernization in its strategic plans since 2012. Similarly, Brazil has increased its farm budget to expand warehouse capacity and subsidize agricultural insurance and loans—but this policy needs to be closely monitored because subsidized interventions can often be economically distortive and unsustainable (Murphy 2013).

TABLE 4.1 Progress of proposed actions to build resilience against food price volatility and spikes

Proposed Action	Progress
Increase investment in agriculture, food, and nutrition	√
Decrease use of trade restrictions	√
Elevate levels of national stocks and develop regional reserves	√
Mitigate food-fuel competition	X
Eliminate distortionary and costly price support policies	X
Promote equitable growth and strong social protection	X
Support climate-change adaptation and mitigation activities	X

Source: See Fan, Torero, and Headey (2011).

Decreased Use of Trade Restrictions

Distortionary trade policies intended to insulate domestic markets from international food price fluctuations contributed to tighter agricultural markets (by reducing production incentives among agricultural producers) and induced panic purchases in 2007–2008, exacerbating already high prices (Anderson and Nelgen 2012). Since 2009, trade restrictions have been on the decline. According to a recent report, approximately half of the 71 examined developing countries used export bans in 2007–2008 (predominantly in Africa and Asia), but this number fell to around 20 percent in 2011–2012 (Demeke 2014). Multilateral platforms have offered the opportunity for countries to agree on trade guidelines that do not aggravate food prices, including the long-sought-after agreement to ease trade barriers and costs for all types of trade at the Ninth World Trade Organization (WTO) Ministerial Conference in Bali.

Increased National Stocks and Regional Emergency Reserves

Food production systems (especially food prices) can be more sensitive to supply and demand shocks when food stocks are low (Bobenrieth, Wright, and Zeng 2012). In the years leading up to volatile food prices in 2008, demand growth outstripped food supply, resulting in declining stock levels; but recent global cereal stocks have been on the rise, with 2013–2014 stocks forecast to reach their highest value in more than 10 years (FAO, various years).

Some progress has also been made in developing regional grain reserves to help maintain healthy food stocks and mitigate the negative impact of food production shocks on food prices. The Association of Southeast Asian Nations plus Three (China, Japan, and South Korea) officially launched its Emergency Rice Reserve in 2013 as a permanent mechanism to keep its rice markets flexible during times of natural and man-made shocks. Meanwhile, the Economic Community of West African States has taken preliminary steps to establish a regional food reserve for West Africa during emergencies and as part of social safety net programs.

Areas of Stagnation And Regression

Distortionary and Costly Price Support Policies

Another policy response to recent high price volatility was the introduction (or expansion) of price support policies, such as input subsidies alongside output and consumer price subsidies, to protect producers and consumers against fluctuating commodity prices and increase domestic food production. However, such national interventions can lead to resource misallocation and

price instability, and in the long term their costs often exceed their benefits (compared with public investments in R&D and infrastructure) (Jayne and Rashid 2013).

Most of the price support policies introduced or expanded during the 2008 food crisis have remained in force (Demeke et al. 2014). These policies have been especially popular in Asian countries, where price support measures date back to the Green Revolution in the 1970s. In recent years, China and India have increased support policies toward agriculture, focusing on boosting agricultural production for self-sufficiency (OECD 2013). Moreover, Thailand, the traditional leader in rice exports, introduced a policy of guaranteeing farmers' prices at above-market levels, resulting in higher rice prices and reduced rice exports in Thailand. Since 2013, the United States and the European Union have adopted agricultural policies that reaffirmed their support of domestic agricultural production, which could potentially stifle agricultural development in other countries and increase the risk exposure of the global food system by limiting food production to a few countries (Bureau, LaBorde, and Orden 2013).

Mitigating Food-Fuel Competition

Biofuels contribute to spikes in food prices: rising oil prices have been shown to increase demand for biofuels (underpinned by government mandates/subsidies), shifting agricultural production toward biofuel feedstock (Zhang et al. 2013). Concerns that biofuels endanger food security have driven a number of countries, such as China and India, to support the development of advanced biofuels produced from nonfood crops or the nonedible parts of crops. However, recent efforts to limit the use of crop-based biofuels by the European Union (the third-largest producer of biofuels) have been delayed (most likely until 2015). In the United States (the largest biofuel producer), funding toward the development of advanced biofuel technologies was reduced under the 2014 Farm Bill. These actions have the potential to thwart the momentum behind the long-term development of the next generation of (nonfood) biofuel technologies (EurActiv 2013).

Exclusive Growth and Limited Social Protection

Developing countries in Asia and in Africa south of the Sahara (SSA) experienced strong economic growth in the years leading up to and following the economic slowdown in 2008. However, rising inequality in the two regions has weakened the conversion of this growth into improved food security and poverty reduction, likely due to factors such as high initial inequality,

low agricultural growth compared with other sectors, and uneven access to and spending on social services (World Bank 2013). In India and China, for example, rural-urban and regional income disparities appear to be on the rise (Balakrishnan, Steinberg, and Syed 2013).

With many of the world's poorest people—who are typically net buyers of food—bypassed by economic progress, social protection interventions are an important countercyclical tool to help vulnerable households address current and future vulnerabilities. Such programs—including food transfers and school feeding—have gained momentum during the last decade in many developing countries (World Bank 2013). Yet large segments of the population throughout the developing world remain without social protection, ranging from 76 percent in SSA to 42 percent in Latin America and the Caribbean (World Bank 2014). Moreover, current social protection initiatives are often characterized by fragmentation and duplication (Banerji and Gentilini 2013).

Inadequate Climate-Change Adaptation and Mitigation Activities

Food production systems are both a cause and a casualty of increasing climate change, significantly contributing to global greenhouse gas emissions but also vulnerable to more extreme weather patterns (Beddington et al. 2012). Climate-smart agriculture has had a low-key presence within the ongoing United Nations Framework Convention on Climate Change (UNFCCC) process. During the UNFCCC's 2013 meeting in Warsaw, participants could not reach an agreement on including agriculture in official negotiations—due to opposition from developing countries—and so deferred negotiations to future meetings (G-77 2013).

At the same time, evidence from several African countries, for example, indicates that farmers' use of climate-change adaptation and mitigation strategies is low, with farmers often more influenced by their perception of short-term livelihood gains than long-term yield benefits (Silvestri et al. 2012). Other constraints may include insufficient access to inputs and rural services (such as credit and information) as well as insecure property rights.

Pathways to Building Resilience to Volatile and High Food Prices

Despite some improvements since the food price crises in 2007–2008 and 2011, much more remains to be done to strengthen the resilience of the global food system to future price spikes and volatility through the right mix of innovative policies.

Promote mutually beneficial trade. To maintain the stability of food markets, governments should avoid distortionary and destabilizing trade policies (especially during times of high food prices). There is considerable scope for governments to agree multilaterally to seek restraints on variable trade restrictions under the current round of WTO negotiations.

Reduce biofuel-food competition. Policy initiatives that alleviate biofuel-related pressures on food prices and food security include removing measures that encourage the use of food crops for fuel production. Research should focus on developing advanced biofuels that use nonfood crops, the non-edible parts of food crops, or crops grown on marginalized lands that are appropriate for adoption in developing countries, especially by smallholders. Governments should also explore diverse energy policies, including the flexible use of biofuel mandates.

Establish and expand regional and global food grain reserves. Such reserves provide mechanisms for short-term relief during food-related emergencies. Transparent, accountable, and well-defined operational policies and institutional channels are essential for the effective and nondistortionary functioning of such mechanisms, combined with comprehensive early warning and market information systems.

Increase adoption of climate-smart technologies and practices. A “triple-win” approach to climate change within the agricultural sector would focus on productivity-enhancing climate-change mitigation and adaptation solutions accessible to all farmers, including smallholders. Increased investment in agricultural R&D is needed to develop new varieties of drought- or flood-tolerant crops, focusing especially on the climate-related constraints.

Invest in productive and cross-sectoral social safety nets. Better-targeted, more productive, and flexible social protection policies are needed to minimize the impact of short-term shocks and offer long-term opportunities to escape food insecurity and poverty. New country-specific approaches, such as cross-sectoral initiatives that combine social protection, nutrition, and agricultural productivity interventions using modern technologies, should be explored—especially targeting vulnerable segments of the population and the most food-insecure regions.

Develop market-based price stabilization. Private institutions, governments, and donors should collaborate to support the design of innovative and flexible market-based price stabilization tools (such as hedging funds and futures markets), paying attention also to the needs of smallholders. These innovative tools can potentially limit the risk exposure of producers and calm volatile markets without the distortionary effects and high costs of current

price support measures, but they should be better regulated to limit excessive speculation on food commodities.

Going Forward

Building the resilience of developing countries and their vulnerable populations to volatility in food prices is an important component of a comprehensive strategy to help these populations manage a myriad of future man-made and natural shocks to their already fragile livelihoods. Some progress has been made in key areas such as agricultural investments, open trade, and regional grain reserves, but effective actions are still lagging in regard to biofuels, market-based price stabilization, climate change, and inclusive economic growth. National and international stakeholders need to devote urgent attention to these lagging areas and make further progress in the other key areas.

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FOOD SECURITY POLICIES FOR BUILDING RESILIENCE TO CONFLICT

Clemens Breisinger, Olivier Ecker, Jean-François Maystadt,
Jean-François Trinh Tan, Perrihan Al-Riffai, Khalida Bouzar,
Abdelkarim Sma, and Mohamed Abdelgadir

Food Insecurity as a Cause and Consequence of Conflict

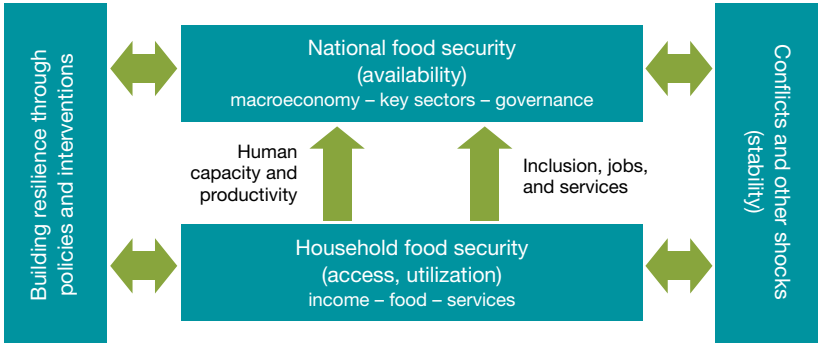
“Most wars of the late 20th century and early 21st century are ‘food wars,’ meaning that food is used as a weapon, food systems are destroyed in the course of conflict, and food insecurity persists as a legacy of conflict” (Messer and Cohen 2006).

One and a half billion people still live in fragile, conflict-affected areas. People in these countries are about twice as likely to be malnourished and to die during infancy as people in other developing countries (World Bank 2011). This outcome is often a direct consequence of conflict: conflict reduces food availability by destroying agricultural assets and infrastructure. Conflict also often destroys physical infrastructure and increases the security risks associated with accessing food markets, thus driving up local food prices. This negative impact on food availability is accompanied by conflicts’ detrimental impacts on household-level food security, particularly on key determinants of food insecurity such as nutrition, health, and education.

Food insecurity is not only a consequence of conflict but can fuel and drive conflicts, especially in the presence of unstable political regimes, a youth bulge, stunted economic development, slow or falling economic growth, and high inequality (Brinkman and Hendrix 2011; Pinstrup-Andersen and Shimokawa 2008). In particular, increases in food prices have greatly increased the risk of political unrest and conflicts. The 2007–2008 global food crisis sparked rioting in 48 countries, and food insecurity at the national and household levels is a major cause of conflict in Arab countries, which supports the widely held view that food insecurity has been among the crucial causes of the Arab awakening (Maystadt, Trinh Tran, and Breisinger 2014). One of the key

This chapter was originally published as *Building Resilience to Conflict through Food-Security Policies and Programs: An Overview*, 2020 Conference Brief (Washington, DC: International Food Policy Research Institute, 2014).

FIGURE 5.1 The conflict resiliency–food security framework



Source: Authors' illustration based on Ecker and Breisinger (2012).

explanations for this “Arab exceptionalism” is that all Arab countries are *net food importers* and the vast majority of people in them are net food consumers.

To conceptualize these links between conflict and food security, Figure 5.1 presents a framework for building resilience to conflict. Such resilience is defined as “helping countries and households to prevent, anticipate, prepare for, cope with, and recover from *conflicts*, and not only bounce back to where they were before the *conflicts* occurred but become even better off” (adapted from the IFPRI 2020 policy consultation definition).¹ In this framework, conflicts are one type of shock that hits food security at both the national and household levels. The framework emphasizes that specific conflicts often occur together with other shocks (for example, other conflicts, natural disasters, price shocks, and so on). The interdependencies between shocks (such as droughts occurring in the context of conflict) often lead to “complex emergencies.” Resilience at the national level is mainly built through policies and interventions and is a precondition for household-level resilience. Household resilience can be further enhanced through programs sponsored by governments or international partners.

Given that resilience-enhancing food-security policies and programs are highly context specific, we have chosen four conflict-affected countries as case studies. One country is a lower-income country (Somalia) and three are lower-middle-income countries (Egypt, Sudan, and Yemen). Yemen and

¹ More information is available at www.2020resilience.ifpri.info/about/.

Egypt are examples of “complex emergencies”—that is, both countries have experienced a series of economic shocks that may have contributed to conflict. In those two cases, we focus on describing conflict’s impact on food security and present selected policy reform options. The other two countries (Sudan and Somalia) have been in conflict for many years. In those cases, we focus on the local-level causes of conflict and program-level interventions for enhancing conflict resilience.

Yemen: Building Resilience to Conflict through Better Governance and Improved Food Security

Yemen has seen a variety of conflicts over the past decade, including the Houthi insurgency in the north of Yemen, Al Qaeda–linked activities, and a movement in the former South Yemen demanding more autonomy or even independence. As a consequence, an estimated 41 percent of Yemenis were directly affected by conflict in 2013 (CRED 2013). The country was also hit by a series of economic shocks, including the triple global crises in 2007–2008 and the food price spike in 2011. The positive relationship—mainly resulting from the influx of internally displaced people, price surges, and severe fuel shortages—between the levels of conflict in 2011 and food insecurity in Yemen has been confirmed.

Building resilience to conflict in Yemen will mean the country not only bounces back from the 2011 conflicts but becomes better off than before. To support this process and enhance conflict resilience in Yemen, the country has a National Food Security Strategy (NFSS) in place with the following seven-point action plan:

1. Reform petroleum subsidies to benefit the food insecure
2. Improve the business climate to foster economic growth and job creation
3. Reduce the production and consumption of *qat*, a stimulating drug, and foster agricultural growth
4. Improve food-security risk management
5. Implement the water sector strategy
6. Target public investments and improve service provision
7. Launch high-level awareness campaigns

Implementing the NFSS will require not only financial support from international partners but also strong Yemeni institutions capable of managing and coordinating multisector policies and investments. Positive steps

in that direction were recently taken with the establishment of the Yemeni Food Security Supreme Council in May 2013 and the related Technical Food Security Secretariat in September 2013.

Egypt: Building Resilience to Conflict through Food Policy Reform

When the revolution in Egypt started in January 2011, “bread,” “dignity,” and “social justice” were among the widely chanted slogans on Tahrir Square and beyond. While few observers had anticipated a revolution, the economic and food-security situation, which had been deteriorating since 2005 because of worsening poverty and a succession of crises, may have indicated looming upheaval. One key government response in Egypt (and other Arab countries) has been scaling up subsidies. While food subsidies play an especially important role in protecting the poor from even steeper poverty increases, they also contribute to rising fiscal deficits and may have contributed to the double burden of malnutrition.

Given the current economic climate and fragile security situation, in which government resources are constrained and rising poverty has meant growing food insecurity and nutrition challenges, politically feasible subsidy reform options may include the following (Breisinger et al. 2013):

1. Improve supply chain efficiency
2. Improve targeting
3. Use targeted transfers and nutrition interventions to complement and substitute for subsidies

Increasing the subsidy system’s efficiency can free up urgently needed resources that can be invested in more targeted food-security and nutrition interventions as well as job-creating initiatives in poorer areas. This in turn may help create more opportunities, especially for young people, thus reducing the motivation to participate in conflict. However, Egypt’s history and that of other countries suggests that changing the subsidy system can meet significant resistance and stir conflict and uprisings. Therefore, educating the public and managing expectations about subsidy reform could be critical for success. In addition, a monitoring and evaluation system is needed to inform decision-making, and policymakers need to learn and adjust accordingly during the reform process. Finally, subsidy reform is likely to be most successful when viewed in the broader context of resilience and integrated into a national strategy for development and food security.

Somalia: Drought, Livestock Price Shocks, and Civil War

Somalia has been frequently described using such terms as *state failure*, *anarchy*, and *warlord economy*. Although violent conflicts have occurred all over the country over the past two decades, the most recent conflict outbreaks have taken place in the central and southern parts and in particular in the Bay and Hiiraan regions. Those regions, where the Islamist Al Shabab militia has been active, are also where food insecurity reportedly has been most acute after the intense and destructive droughts of 2011. Research confirms that droughts fuel conflict in Somalia. An increase in temperature anomalies and drought length by 1 within-region standard deviation increases conflict likelihood by 62 percent (Maystadt and Ecker 2014). At the same time, people's motivation to participate in conflict in Somalia is often driven by economic forces. An increase in temperature and drought by 1 within-region standard deviation decreases cattle prices (a major income source for many households) by about 4 percent, which in turn results in a 72 percent increase in the likelihood of conflict. The expected change in climate will worsen the situation.

Improving households' resilience to conflict in Somalia requires urgent action to strengthen people's resilience to extreme weather shocks. Climate change adaptation needs to be considered an integral part of conflict-prevention strategies. Alternative income sources and therefore economic growth and diversification are needed, in addition to social protection mechanisms. Yet the lack of national governance currently limits the range of feasible policy options, particularly options for public safety-net measures through national income redistribution. Feasible short- to medium-term resilience-building options may include improvements in the functioning of local livestock markets, for example through expansion of communication networks and services, realized by the private sector with the support of international development partners. Better integrating and diversifying Somalia's meat supply chain through investments in road infrastructure, slaughterhouses, and cold-storage warehouses is another option. Introducing and expanding credit and insurance markets may also help herders cope with droughts. Finally, herders may need financial and technical support to acquire more drought-resistant and earlier-marketable animals in order to be better prepared for more frequent and intense droughts in the future.

Sudan: Climate Change, Natural Resources, and Local Conflicts

Sudan has a history of repeated conflict events starting well before its independence. In addition to a national civil war between the north and the south,

local conflict events multiplied within Sudan and South Sudan. Resource exploitation, once a source of warfare financing, became a warfare objective in itself. Ethnic tensions that have evolved into local or regional conflicts increasingly seem to be linked to environmental factors and natural resources, especially oil and gas reserves, Nile waters, hardwood timbers, rangeland, and rainfed agricultural land. Pastoralist and agropastoralist communities have also been increasingly under pressure as a result of dynamic population growth and more frequent and intense droughts. Research confirms the relationship between temperature shocks and interpersonal violence in Sudan. A change in temperature anomalies by 1 standard deviation increased the frequency of violent conflict by 32 percent. Furthermore, the risk of conflict in Sudan is expected to increase by a range of 24 to 31 percent by 2030 due to changes in the climate. Competition between herders and farmers over natural resources, and in particular over water availability, also exacerbates the strong relationship between temperature shocks and violence in Sudan and South Sudan (Maystadt, Calderone and You, forthcoming).

Building resilience to weather shocks and conflict in Sudan and South Sudan requires investing inside and outside the livestock sector in order to promote sustainable livestock-sector development and income diversification. This includes (1) strengthening the productive sectors, (2) improving basic social services, and (3) establishing productive safety nets. Productive sectors and livelihood diversification can be promoted by government policies or donor interventions that support education and skills training; access to credit; agricultural intensification; and access to markets, especially livestock markets, and to information through transportation, market, and communication infrastructure. Provision of basic services (health, education, security) can contribute to peace building and longer-term resilience. Finally, establishing productive safety nets involves providing predictable income sources to vulnerable households through cash transfers, food transfers, or paid labor within a public works program.

Key Lessons from Case Studies and Directions for Further Research

Building resilience to conflict requires country-specific policies and a state that includes its citizens in the decisionmaking processes and provides adequate services. However, several general lessons emerge from the four case studies:

- Conflicts often accompany and are related to other shocks such as economic crises, price shocks, and natural disasters. Such interdependencies among shocks often lead to “complex emergencies” and need to be considered in policy and program design.
- Increasing subsidies is a favored policy measure in times of crisis, helping keep poverty and food insecurity levels lower than they would otherwise be. However, such measures do not qualify as resilience building because they are not expected to help countries become better off.
- Climate change adaptation should be an integral part of conflict prevention and food-security strategies, partly because climate change is expected to significantly increase the likelihood of future conflict.
- Alternative income sources and therefore economic growth and diversification are crucial to building resilience to conflict in particularly vulnerable pastoralist and agropastoralist areas. Also, price information systems, the introduction and expansion of credit and insurance markets, and geographic targeting of social safety nets may help people better cope with droughts and related price shocks.
- Building functioning and effective institutions is essential to building resilience to conflict. Lack of national governance often limits the range of feasible policy options. Reducing corruption and improving accountability and transparency is critical in addressing issues that exacerbate tensions and lead to conflicts.

Finally, several important knowledge and research gaps remain in the context of conflict resilience. Significant questions related to conflict resolution and the political economy of conflicts are not well understood. Given the high costs to economic development, we need to better understand how to help some countries escape the vicious circle of violence. Further, very little is known on how best to contain the escalation of violence from low intensity to high intensity. The vulnerability of some groups (for example, pastoralist communities) also raises the question of social protection interventions’ efficiency as far as supporting those most in need and strengthening the sustainability of long-term recovery. Additional implementation challenges may relate to integrating returnees (either refugees or internally displaced persons) and ex-combatants. Interventions need to be sensitive to the potential conflicts among these different groups, and they need to be designed in ways that promote reintegration and postconflict reconciliation, rather than contribute to new conflicts.

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RESILIENCE FOR FOOD SECURITY IN REFUGEE-HOSTING COMMUNITIES

**Athur Mabiso, Jean-François Maystadt, Joachim Vandecasteele,
and Kalle Hirvonen**

Every year thousands of people flee their country or region of origin due to civil unrest. In 2012, the population of refugees throughout the world was estimated at almost 10 million, and the number of internally dispersed persons (IDPs) was nearly double that, at 18 million (UNHCR 2012). The majority of forced migrants were hosted in developing countries, with about 70 percent of the world's refugees having been in exile for more than five years. While the total number of refugees did not grow significantly between 2007 and 2012 (from 9.68 million to 9.88 million), the refugee population in Africa south of the Sahara (SSA) increased by 20 percent (from 2.27 million to 2.75 million), driven largely by drought-related emergencies and armed conflicts in the Horn of Africa and West Africa. A recent surge of forced migration outside of SSA has also occurred, driven by flows of more than 2.4 million refugees from Syria into Egypt, Iraq, Jordan, Lebanon, or Turkey (Zetter et al. 2014).

Refugees interact with their host economies in various ways and can have far-reaching consequences on their local hosts. One negative consequence—the one most often cited—is the threat that refugees pose to the food security of host countries. Because civil wars can be long lasting, most refugees are likely to reside in host countries for protracted periods, implying significant long-lasting impacts on host communities and their food security.

Furthermore, most refugees are hosted in neighboring countries that do not necessarily enjoy better economic conditions and often may be struggling with preexisting food insecurity. The weakness of the host economy may place a further burden on the host populations and erode their ability to withstand shocks and achieve food security over time.

Little is known definitively, however, about the actual consequences that refugees have on food security and resilience in hosting communities. This chapter demonstrates why the relationship is not as clear-cut as it seems at first blush; presents an overview of the findings of Mabiso and colleagues (2014), who have reviewed the evidence that does exist on food security and resilience for hosting communities in protracted refugee situations and drawn implications for policymakers; and highlights key research gaps that offer promising areas for future research.

The Complex Relationship between Refugee Hosting and Food Security

At the World Food Summit in 1996, the heads of states and governments or their representatives declared that “major refugee movements can cause food-security problems both among the refugees themselves and in the receiving areas (FAO 1996).”¹

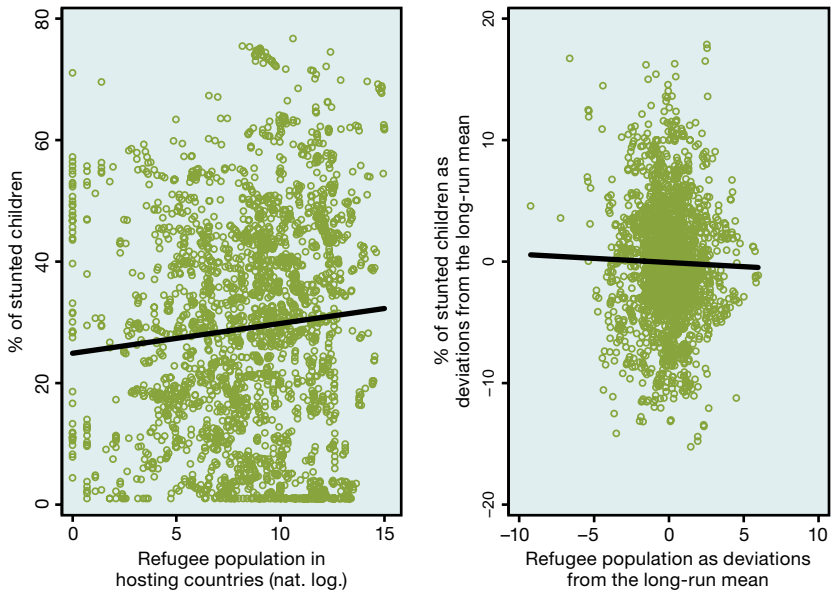
Developed countries have responded to the severity of refugee situations by allocating humanitarian aid—either to the country of origin, in the hope of addressing the root causes of forced migration; to the refugee host country, as an act of burden sharing; or to both. Paradoxically, both proponents and opponents of providing humanitarian assistance blame refugees for being a burden on their host country.

Such claims might be based on cross-country correlations between food security and refugees, which show that countries that receive a high number of refugees largely coincide with areas facing deteriorating food security. The data displayed in the left panel of Figure 6.1 suggest that hosting refugees is positively related with the prevalence of child stunting during the period 1960–2008.

It is not surprising, however, that we find a strong association between refugee hosting and negative socioeconomic outcomes, because the overwhelming majority of refugees are hosted by neighboring states that are also developing countries. Since this correlation tells us little about the causal impact of refugees on the food security of the hosts, we need more refined analysis. The right panel of Figure 6.1 shows the correlation of the residuals of refugee population and the incidence of malnutrition in the host country, using country-demeaned values of each variable. This approach removes all unobserved effects that are fixed over time for each country (geographic

¹ Food security was defined as a situation “when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.” (FAO 1996, n.p.).

FIGURE 6.1 Correlation between child stunting and natural logarithm of refugee population, 1960–2008



Source: Based on calculations of Mabiso et al. (2014), using refugee population data from UNHCR and child stunting data from World Bank.

location, historical ties, and so on). With this more nuanced approach, the positive correlation between the refugee influx and food security disappears.

It is important to note, however, that without further investigation at a more disaggregated level, it is difficult to assess whether the phenomenon uncovered in the right panel of Figure 6.1 points to a lack of systematic evidence of the impact of refugee inflows on the food security of the local hosts or to a standard aggregation problem. This is because the impact of refugees is likely to be diluted in national statistics and cross-country analyses.

Taking Stock of the Evidence

What exactly do we know about the relationship between refugee populations and food insecurity? In their selective interdisciplinary literature review, Mabiso and colleagues took stock of the existing evidence and drew policy insights to move forward the agenda on food security and resilience in protracted refugee situations. The authors found that refugees interact in a complex way with their host community and, in turn, affect food security through various direct and indirect channels.

For example, refugee inflows put pressure on the health system of the host community inasmuch as refugee movements may be associated with the spread of communicable diseases (Kalipeni and Oppong 1998), especially malaria (Kazmi and Pandit 2001; Montalvo and Reynal-Querol 2007). If refugee inflows increase the prevalence of communicable diseases, this is likely to lower the agricultural productivity and earnings of host households and may also increase healthcare costs, thereby suppressing food availability and access in refugee-hosting areas.

The role of markets for labor and goods as adaptation mechanisms is critical in refugee settings. While these markets can have a positive impact on food security, they can also have negative impacts for some subgroups of the host community. The positive impacts of these market-based mechanisms depend on the ability of local producers to respond to increased demand (in particular for food), the ability of traders to engage in trade (of both food and nonfood not produced locally), and the potential for learning and transfer of technical skills between refugee and host-community labor.

Evidence provided on the impact of refugees on the hosting communities in Tanzania and Kenya are cases in point (NORDECO 2010; Maystadt and Verwimp, 2014). As a result of the refugee presence, the markets moved closer to the local Tanzanian farmers, who then benefited from better access to trade opportunities. Furthermore, land availability in the northwestern part of Tanzania facilitated the expansion of agricultural production. Finally, the non-farm sector also benefited from the increased demand from national and international humanitarian workers, although at the cost of driving the existing petty businesses out of the market due to fiercer competition. In Kenya, pastoralists have also taken the opportunity to sell livestock products to the refugee camps. Moreover, trade and employment opportunities have also emerged around the Dadaab camps in Kenya. Road infrastructure investments seem to have been a driving force in improving market efficiency.

However, market-related development gains are not necessarily equally shared among the hosting population and over time. For one, the inflows of refugees are likely to have profound consequences on the distribution of socioeconomic outcomes among the host population. Overall, a number of factors (age, gender, class, occupation, and so on) determine the impacts on local households; they are also likely to determine the distribution of impacts, whether positive or negative, among the host population. In many settings, large refugee inflows are associated with increased demand from humanitarian workers and the refugees themselves, causing food prices to increase sharply (Alix-Garcia and Saah 2010; Werker 2007). As net consumers of food absorb a negative effect due to higher

prices, farmers who produce a surplus then benefit from an increased demand for agricultural products in local markets.

In terms of case studies, in Tanzania and Uganda the overall net impact was claimed to have been positive and persistent over time (Maystadt and Verwimp 2014; Kreibaum 2014) but with major distributional consequences that require careful consideration in relation to refugee policy. Alix-Garcia and Bartlett have also highlighted similar distributional impacts in the case of IDP flows in Darfur (2014), but found evidence of a negative, though short-lived, overall impact. Nonetheless, the different context (rural versus urban settings) and the importance of land availability to increase agricultural production and productivity may constitute a major explanation for the different study results.

All in all, it may be useful to differentiate between distributional impacts in terms of economic and social impacts of refugee inflows on host communities. The evidence suggests that poorer households in the host community are likely to benefit from increased public goods and services, such as health infrastructure, yet they may fare less favorably in terms of market-based economic opportunities that arise from the inflow of refugees. Those households who initially have access to some capital—whether physical (such as land, housing, and livestock), human (education and health), or social (community ties and leadership)—are in a better position to capitalize on the economic benefits while minimizing the negative effects of an influx of refugees in their community. The likely result is that better-off households enter more rewarding economic activities (new businesses or work in the humanitarian sector, for example) or profitably expand existing activities, including agricultural production, while the worse off struggle in poverty (such as landless agricultural laborers competing with cheap refugee labor). Therefore, policymakers could consider the potentially ameliorating impacts of safety-net policies targeted at the poor of the host community while researchers could undertake impact evaluations of alternative safety-net interventions in host communities to inform policy.

There is also a need to recognize the interdependencies between refugees and their hosts, including within the years after the refugees have left the host areas. Households and local communities may need some time to adjust to population shocks associated with refugees, both the sudden influx at the beginning and then the gradual or sudden departure of refugees to their countries of origin. In the short run, environmental degradation and disease propagation are certainly risks that need to be controlled for. The risk of violence and crime cannot be understated. However, in the long run, humanitarian

assistance should pave the way for development efforts. In particular, development efforts may have an opportunity to capitalize on investments—such as the improved road infrastructure and social networks formed during the refugee situation—by, for example, fostering trade between the repatriated refugees and host communities.

Moving the Research Agenda Forward

In sum, our understanding of the impact of refugees on host communities is mainly based on the health channel and the markets for goods and labor. However, our broader understanding of food security in these refugee situations is still weak. We need to push the research agenda forward in several directions. Below are some key areas in which further research is needed.

Consider More Integrative Research

A more comprehensive view is needed, one that extends beyond the health focus. There are multiple and indirect channels through which refugees can affect food security in host communities. The impacts are also likely to change over time and space, and they have important distributional consequences. This complexity calls for more complementary and integrative research approaches, including the innovative use of qualitative and quantitative research methods.

Invest in More Case Studies

More case studies are needed to shed light on challenges encountered in other regions—such as Syrian refugees in Iraq, Jordan, Lebanon, or Turkey as well as Afghan refugees in Pakistan. Case studies could also clarify the differential impact that could be hypothesized between refugees and IDPs. Yet another area worth exploring is that of case studies on other refugee accommodation types, such as camps versus self-settlement approaches.

Undertake Deeper Analysis of Policy Options

More evidence is needed on the impact on food security of the three main solutions to protracted refugee situations advanced by the United Nations High Commissioner for Refugees (UNHCR) and its partners: *voluntary repatriation*, *local integration*, and *resettlement*. These three policy options involve unique challenges—none is a one-size-fits-all solution. Weighing the costs and benefits of each policy option and the respective impacts on food security requires a better understanding of the general impacts of these options on both the host population and the refugees' countries of origin. We also

need to open the door to recently proposed hybrid approaches to dealing with the food-security problem in refugee situations and more explicitly incorporate the concept of resilience and the notion of transitioning from refugee assistance to development. For instance, little is known about the relative efficiency of different interventions, such as conditional or unconditional cash, voucher, or food transfers, or their combination, in protracted refugee situations. Similarly, the impacts of infrastructure investments that take place in refugee situations and their implications for food security in the long run need to be understood to inform the possible approaches to linking humanitarian aid and development.

Examine Interactions of Refugees and Local Hosts

Given the importance of the quality of interactions between refugees and hosts in determining the impact on the hosting communities, we need a better understanding of the social interaction and perceptions between refugees and local hosts as well as the disparities between the two groups. This understanding could suggest innovative ways to employ local integration as a viable policy option. For example, the resting point along the continuum of trust or social cohesion versus tension has been reportedly affected by structural changes in the local economy induced by refugee inflows and associated humanitarian interventions and government policies. Understanding how social constructs such as mistrust or tensions may change due to the advent of refugees and associated policies or interventions can be integral in enhancing resilience to conflict in the local communities and, hence, food security.

Better Align Incentives

From a more practical point of view, we need to better align the incentives of policymakers, practitioners, and researchers. The urgent nature of humanitarian activities often conflicts with time and control requirements that are inherent in high-quality research. Preparation of fast-track research in close collaboration with implementing partners (the World Food Programme and UNHCR) would be programmatically favorable but may not yield the needed rigor for empirical evidence to better inform policies and programs in the long run. Thus greater collaboration between researchers and practitioners is needed. This requires strong institutional partnerships to enable collaboration and long-term commitment by all stakeholders. Such cooperation is urgently needed if significant improvements are to be realized in enhancing resilience and transitioning from humanitarian refugee assistance to development.

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RESILIENCE FOR FOOD SECURITY IN THE FACE OF CIVIL CONFLICT IN YEMEN

Olivier Ecker

Food and nutrition insecurity is a consequence and a driver of civil conflict (Breisinger et al. 2014). War and civil unrest reduce household incomes and employment opportunities through economic recession; cause losses in people's purchasing power from price inflation; and restrict food availability, access, and utilization through disruption of infrastructure (World Bank 2011). In turn, low per capita income and poverty (Collier and Hoeffler 1998; Blattman and Miguel 2010), youth unemployment (Urdal 2006), and social and economic inequality (Collier, Hoeffler, and Söderbom 2006; Stewart 2000)—often combined with poor governance, population pressure, and rough terrain (Fearon and Laitin 2003)—are factors driving civil conflict. Recently, food and nutrition insecurity has been identified as another main driver of civil conflict globally (Pinstrup-Andersen and Shimokawa 2008) and even more so in Arab countries (Maystadt, Trinh Tan, and Breisinger 2014). Specifically, rising international food prices were reported to have significantly increased the incidence of antigovernment demonstrations, riots, and civil conflict in low-income countries in the past (Arezki and Brückner 2011).

Events in more recent history seem to confirm the role of food and nutrition insecurity as a catalyst for political instability and conflict. Food protests and riots broke out in 48 countries as a result of record food price spikes during the global food price crisis in 2007–2008 (Brinkman and Hendrix 2011). Global food prices spiked again in 2010–2011. People's dissatisfaction about their governments' inaction to cope with rapidly increasing food insecurity, deteriorating living standards, growing inequality, and high unemployment—combined with general disaffection with state governance—led to mass protests and civil unrest in several Arab countries that cumulated in major political uprisings—known as the “Arab awakening” (Breisinger, Ecker, and Al-Riffai 2011; Breisinger et al. 2012). The civil disobedience and violent uprisings

This chapter was originally published as *Building Resilience for Food and Nutrition Security in the Context of Civil Conflict: Experiences from Rural Development Programs in Yemen*, 2020 Conference Brief (Washington, DC: International Food Policy Research Institute, 2014).

resulted in substantial policy reforms (Bahrain, Jordan, Morocco), government overthrow (Egypt, Tunisia, Yemen), or lasting civil war (Syria).

In the postrevolution Arab countries, extensive policy reforms and development programs that tackle the underlying causes of the current political crises—including food and nutrition insecurity—are urgently needed to regain stability and hence enable sustainable development. Indeed, experiences from other world regions suggest that countries in political transition are at particular risk of (re)entering civil conflict (Collier and Rohner 2008; Hegre et al. 2001). Conflict prevention and reduction requires tackling the factors that motivate people to participate in or support conflict-related activities. These factors can be classified into two categories, those relating to grievances and those relating to opportunities (Collier and Hoeffler 1998; Collier and Hoeffler 2004). Grievances include aspects of social and economic inequality; discrimination and repression of certain population groups due to social status, ethnicity, and religious affiliation; and lack of political rights. However, civil conflict can also offer new, atypical opportunities for the individual. A growing body of evidence suggests that people's incentives to engage in conflict are mostly explained by economic behavior rather than by grievances (Blattman and Miguel 2010; Collier and Hoeffler 2004). The deciding factor in an individual's behavior is his or her current socioeconomic condition relative to the expected gain or loss from conflict engagement (either directly as fighter or indirectly as supporter)—or, in economic terms, the opportunity costs of conflict participation (Brückner and Ciccone 2010; Maystadt and Ecker 2014). Such self-seeking behavior tends to be more distinct in the context of widespread poverty and food insecurity and to be amplified in times of unusual hardship—when experiencing serious purchasing power losses from economic shocks such as during food price crises, for example—and facilitated by absent state order.

Food and Nutrition Insecurity and the Risk of Civil Conflict in Yemen

Yemen experienced a succession of economic and political crises in the recent past that led to a significant increase in poverty, food insecurity, and malnutrition. Even before the 2007–2008 global food price crisis, Yemen had one of the highest poverty rates in the Arab world. Although high global fuel prices led to oil-driven economic growth in 2008, growth did not trickle down to the poor, and the following global financial crisis slowed growth sharply in 2009. The poverty rate increased from 34.8 percent in 2006 to an estimated 42.8 percent in 2009 (Breisinger et al. 2011).

The rapidly worsening economic situation and deterioration in people's living standards, in combination with government inability to effectively address Yemen's economic and social challenges, sparked civil unrest. In the spring of 2011, mass protests demanding better governance, political voice, and fair economic opportunities evolved into deadly violent clashes (WFP 2012). The revolution quickly spread throughout the country, adding to ongoing conflicts including the insurgency of the Houthi rebels in the northwest, a secessionist movement in the south, and the emergence of Al Qaeda in the Arabian Peninsula (AQAP). The end of the revolution was initiated with a resolution of the government and the signature of a power transition agreement in November 2011 (World Bank et al. 2012), but political instability and insecurity remain, and terrorist attacks have continued since then. Nonetheless, Yemen has undergone an ambitious political transition process with the outcomes not yet in sight. There is a notion that the ongoing political transition has overshadowed the humanitarian crisis and diverted attention from addressing the socioeconomic causes underlying the current political instability.¹

The 2011 political crisis sent shock waves through Yemen's already fragile economy and society that likely further reduced the opportunity costs of conflict participation. The national gross domestic product contracted by almost 11 percent in 2011, and the poverty rate increased to an estimated 54.4 percent (World Bank et al. 2012). Consumer price inflation—especially for food and fuel—was the foremost shock to household welfare in the revolution year (WFP 2012). In October 2011, the year-on-year inflation of the consumer price index (CPI) stood at about 25 percent, again reaching its historical peak from 2008.² The 2011 Comprehensive Food Security Survey (CFSS) of the World Food Programme (WFP) suggested that high food prices affected household welfare in 90.2 percent of all households, and high fuel prices affected 41.3 percent. As a result, 56.1 percent suffered from lack of food or money to purchase food, and 25.4 percent had to reduce the number of meals eaten per day. The proportion of food-insecure households

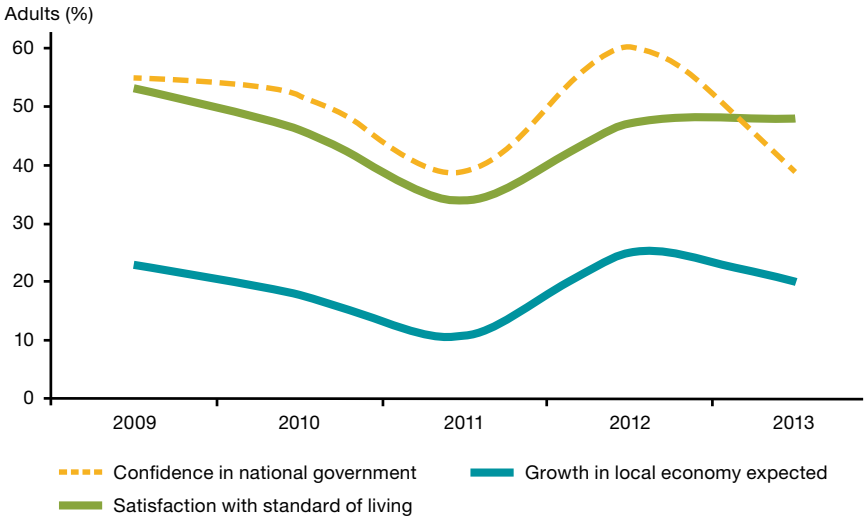
1 See, for example, United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA). 2013. "Yemen: Efforts to Bring Stability Could Fail Unless Basic Needs Are Met, Warns UN." Top Stories Search, July 15. www.unocha.org/top-stories/all-stories/results; UN-OCHA. 2013. "Interview: 'There Will Be No Stability if We Don't Also Deal with the Underlying Causes of the Current Crisis.'" Top Stories Search, September 25. www.unocha.org/top-stories/all-stories/results.

2 Own estimation based on unpublished CPI data from Yemen's Central Statistical Organization.

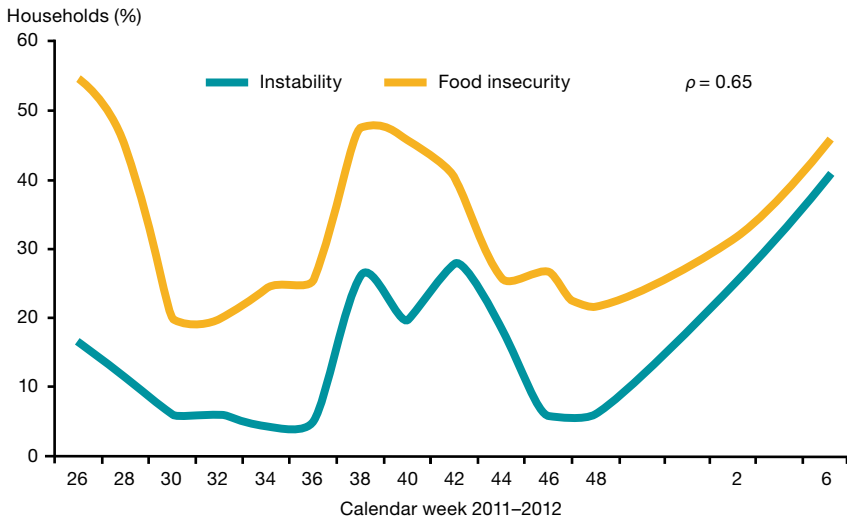
(measured based on WFP’s food consumption score) increased from 31.5 percent in late 2009 to 44.5 percent in late 2011. And the prevalence of child wasting—identifying acute child malnutrition—shot up by more than one-fifth within only one year, to an extreme of 15.9 percent in late 2012 (from 13.0 percent in late 2011) (WFP 2012; IPG-IG et al. 2013).

Perception-based survey data by Gallup reveal a close co-movement of people’s confidence in the national government, expectations of economic recovery, and personal standard of living in Yemen, and strikingly reflect the country’s political and economic instability over the past five years (Figure 7.1). The political and socioeconomic conditions deteriorated during the two years prior to the 2011 uprising and reached their low in that year. With new hopes after the transition of state power, optimism for improved governance and economic recovery became more common in 2012, but 2013 estimates indicated a tendency toward a drop back into recession and hence pointed to Yemen’s current fragility. Moreover, data from a small-scale, high-frequency household panel survey by the United Nations Children’s Fund (UNICEF) confirmed that political instability and household food insecurity are indeed closely associated, especially among vulnerable population groups (Figure 7.2).

FIGURE 7.1 People’s perceptions of political and economic conditions in Yemen, 2009–2013



Source: Data from Gallup (2014).

FIGURE 7.2 Association between political instability and household food insecurity in Yemen, 2011–2012

Source: UNICEF (2012).

Note: The 2 last rounds of the panel survey were administered in 2012 and conducted every 4th week, instead of every 2nd week in 2011.

Experiences of Building Resilience from Rural Development Projects

Development programs and projects can contribute to reducing the risk of civil conflict by increasing the opportunity costs of conflict participation and supporting the removal of social grievances. Reducing chronic food and nutrition insecurity, improving employment and income generation, and enhancing resilience to economic and natural shocks through the accumulation of productive assets, for example, seem critical. However, project implementation in times of political instability is often challenged by insecurity for project staff and beneficiaries, and possibly complicated by social tensions in the project area. Projects that have faced this dilemma and consistently continued on-the-ground operation can provide important lessons for building resilience to civil conflict and scaling up of development investments under unstable political conditions. Two examples of such projects are the Dhamar Participatory Rural Development Project (DPRDP) and the Al-Dhala Community Resource Management Project (ADCRMP), both funded by the International Fund for Agricultural Development (IFAD) (Box 7.1; Table 7.1). Both projects targeted poor, rural communities in Yemen's rugged mountains, which are among the most

BOX 7.1 Description of project examples**Dhamar Participatory Rural Development Project**

DPRDP aimed to improve the food security of subsistence farmers, to increase family incomes, and to improve the living conditions of small farm households and village communities in Dhamar governorate. The two main project components were (1) community development and (2) agriculture and rural livelihood development and environment. Activities under the first component included establishing and strengthening community organizations to engage in the project's participatory development processes; adult literacy classes and life-skills training predominantly for women; and construction of community infrastructure for safe drinking water, education, health, and transportation. Activities under the second component included forming natural resource user and agricultural producer associations, establishing village-based agricultural extension services, introducing improved agricultural inputs and techniques, construction and rehabilitation of water storage and irrigation systems, establishing rural financial services, and developing the coffee and honey value chains.

IFAD supervisors considered the implementation of all project components satisfactory, although only 64 percent of 2011 project targets were met, mostly because implementation in 2011 was seriously impeded by instability and insecurity in some parts of the project area (including road blocks, carjacking, and community disputes) and by lack of or high costs of fuel and materials. Comparisons between Results and Impact Management System (RIMS) survey data from 2006 (at baseline) and 2012 (at completion) suggest that household asset wealth and—against the national trend for rural Yemen—food and nutrition security significantly improved among the beneficiaries (all estimates based on RIMS survey data are own estimates). Household asset wealth (measured by a composite index) increased by 16.2 percent on average. The proportion of households who experienced chronic or seasonal hunger in the year prior to the survey dropped from 50.2 percent in 2006 to 9.0 percent in 2012, and the average length of the hunger season decreased from 6.1 to 3.5 months. The prevalence of child wasting declined at an average annual rate of 1.4 percentage points (from 20.3 percent to 11.7 percent), whereas it increased by 0.6 percentage points across all of rural Yemen (from 13.4 percent in 2005 to 17.5 percent in 2012) (own estimates from 2005–2006 Household Budget Survey data and IPC-IG et al. 2013). However, the data do not allow attribution of all of these positive changes to project activities because a suitable control group was not available for a rigorous impact study.

Yet the perceived successful implementation of the first component has attracted particular attention and made DPRDP an IFAD flagship model for community development in Yemen. According to IFAD's supervision report, the project introduced a participatory development approach in communities inexperienced with development assistance under politically unstable conditions, which enabled the beneficiaries—through their social organizations—to make decisions regarding the type and size of project interventions. This approach required that project implementers build strong working relationships with local communities and stakeholders for such purposes as selecting beneficiary communities and promoting community-based decisionmaking. According to the supervision report, the project gave top priority to vulnerable and marginalized groups (especially the poor and women) in targeting interventions and was deemed to be conducive in overcoming prevailing social constraints. The beneficiaries, particularly in remote areas, are reported to believe that the project made their voices heard and contributed to social cohesion and inclusion. This approach may have been a reason why on-the-ground activities could continue throughout the turmoil year of 2011.

Al-Dhala Community Resource Management Project

ADCRMP aims to support sustainable and equitable growth of rural living standards and greater livelihood security for vulnerable households in remote and isolated communities in Al-Dhala governorate through better management of their resource base. The three main project components are (1) community development, (2) land and water resource management, and (3) agriculture and livelihood development. The community development component is designed following the perceived successful example of DPRDP and is believed to respond even more to the beneficiaries' needs, such as for female-supportive household assets and road infrastructure development. The second component gives top priority to water-related activities and construction of individual household-level water reservoirs, inasmuch as rain—the only source of water—has become scarce and irregular in recent years. Activities under the third component include technical and financial support for livestock development and rangeland improvement, apiculture, crop production improvement, community-based microfinance, and off-farm employment.

IFAD supervisors report that the project has exceeded its plans in all years since 2009—including during 2011, despite its location in a governorate characterized by extreme insecurity and political volatility. Comparisons between RIMS survey data from 2008 (at baseline) and 2013 suggest that household asset wealth and—as in DPRDP, against the national trend for rural Yemen—food and nutrition security significantly improved among the ADCRMP beneficiaries. Household asset wealth increased by 12.9 percent on average. The proportion of households who experienced chronic or seasonal hunger in the year prior to the survey declined from 25.2 percent in 2008 to 14.2 percent in 2013, and the average length of the hunger season decreased from 6.1 to 3.0 months. The prevalence of child wasting declined at an annual rate of 0.7 percentage points (from 20.7 percent to 17.2 percent). However, as in the case of DPRDP, the data do not allow attribution of all of these positive changes to project activities because a suitable control group was not available for a rigorous impact study.

According to IFAD's supervision report, the beneficiaries perceive that the single most important achievement of the project has been the construction of rainwater harvesting tanks for drinking water, which have helped households obtain much-needed potable water and significantly reduced the burden on women and girls. IFAD project supervisors note that the beneficiary contribution has been particularly high for the domestic water systems (at an average of around 60 percent) and further increased in 2011, indicating the value of this investment to the beneficiaries and their fear of project suspension or cancelation. This and other investments in household assets are believed to have enhanced household resilience against drought-caused and conflict-related crises—considering that evidence from other countries points to drought as a driver of civil conflict (for example, Maystadt and Ecker 2014). Moreover, the IFAD supervision report suggests that—through the community development component—the participatory and demand-driven approach applied in planning and implementation of ADCRMP has created the project's positive reputation in and outside the beneficiary communities. IFAD officers believe that the project outcomes, in combination with the established strong and respect-based relationship with local communities and stakeholders, are key for being able to successfully operate under the difficult security conditions in the governorate.

Source: Based on: Supervision Report: Dhamar Participatory Rural Development Project. Sana'a, Yemen. IFAD (2012a); Supervision Report: Al-Dhala Community Resource Management Project. Sana'a, Yemen. 2012.

TABLE 7.1 Overview of project examples

Descriptor	DPRDP	ADCRMP
Start (implementations)	2004 (2007)	2007 (2009)
Completion	2012	2014
Direct beneficiaries	26,000 households	15,600 households
Total cost	US\$24.4m	US\$22.8m
IFAD loan	US\$15.6m	US\$14.3m

Source: IFAD (2014)

Notes: ADCRMP = Al-Dhala Community Resource Management Project; DPRDP = Dhamar Participatory Rural Development Project; IFAD = International Fund for Agricultural Development.

economically marginalized parts of the country and are directly affected by civil conflict (Table 7.2).

Discussion

Development projects such as DPRDP and ADCRMP may contribute to reducing the risk of civil conflict in rural Yemen through increasing the opportunity cost of conflict participation. The projects may achieve this effect by improving food and nutrition security, enhancing farm and off-farm income opportunities, and investing in human capital formation, as well as through alleviating grievances within the project area by adopting a participatory, demand-driven approach and supporting social inclusion and cohesion. It is likely that strong relationships with local communities and stakeholders are important for enabling successful project operations on the ground, particularly under conditions of severe political instability and insecurity.

Certainly there are concerns that further escalation of civil conflict will disrupt already achieved development progress—such as in Al-Dhala governorate (UN-OCHA 2014)—and make interventions in even more parts of Yemen impossible. And indeed, data on people's perceptions provide some evidence for growing dissatisfaction with the current political and economic

TABLE 7.2 Prevalence of conflict incidences in project areas (% of households)

Conflict status	DPRDP (2012)	ADCRMP (2013)
Peace in own and surrounding communities	80.8	53.4
Violent conflict in own and surrounding communities	13.6	32.2
Peace in own community but violent conflict in surrounding communities	1.2	13.8

Source: IFAD (2012; 2013).

conditions (Figure 7.1). However, this situation also calls for urgent economic policy reforms and large-scale development interventions that address the causes underlying the current crisis (in addition to the existing humanitarian emergency assistance essential for mitigating the crisis impact). At the policy level, more effort needs to be made in this direction without neglecting the ongoing political transition process. At the program level, successful interventions urgently need to be scaled up, utilizing the experiences from recently completed and ongoing projects. An encouraging example seems to be the IFAD-funded Rural Growth Program that is scheduled to start in 2014 and will have a strong community development component, following the DPRDP and ADCRMP approach.

In addition to the absence of control groups, which prevented a reliable attribution of social and economic benefits to the IFAD-funded project interventions, this study has at least two other shortcomings that are rooted in data limitations: First, the currently available data do not allow for establishing causality between recent civil conflict and food and nutrition insecurity in Yemen in a methodologically rigorous manner. Second, appropriate household survey data for analyzing which specific policies and program components are most effective to enhance resilience to civil conflict through improving food and nutrition security and other socioeconomic drivers are still inaccessible. Because more appropriate data are forthcoming, addressing these shortcomings is left for follow-up work.

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RESILIENCE TO CLIMATE-INDUCED CONFLICT IN THE HORN OF AFRICA

Margherita Calderone, Derek Headey, and Jean-François Maystadt

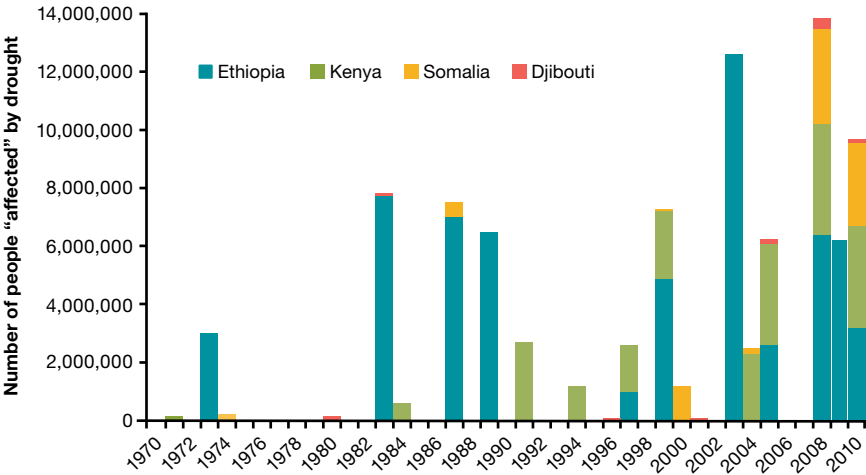
The interaction between climatic shocks and conflict has long been thought to have negative effects on vulnerable communities. Climatic shocks are considered to be one of the root causes of conflict, especially in resource-constrained settings. At the same time, conflicts tend to exacerbate existing vulnerability, leading to poverty-conflict traps at the household, community, and national levels. Large parts of the Horn of Africa—including Djibouti, Ethiopia, Kenya, and Somalia—are susceptible to these types of traps, with Somalia epitomizing the complex links among climatic shocks, conflict, and weak governance. Worse, climate change and continued population growth already appear to be producing more frequent catastrophic events in the Horn, with disastrous consequences in arid and semiarid lowland areas (Figure 8.1).

Recent research sheds new light on the relationships among climatic shocks, conflict, household and community resilience, and policy interventions that can break the vicious climate-conflict cycle. This chapter reviews this research and outlines its implications for regional development strategies, with special attention to pastoralist populations, who appear to be increasingly vulnerable.

Climatic Shocks, Conflict, and Resilience

A large and growing empirical literature has identified a strong relationship between warming and civil war in Africa. A comprehensive meta-analysis of this literature by Hsiang, Burke, and Miguel examined 60 of the most rigorous quantitative analyses—many of them conducted in Africa—and found causal evidence linking climatic events to human conflict (Hsiang, Burke, and Miguel 2013). This literature sheds little light on the mechanisms linking climate shocks to violence, however.

FIGURE 8.1 Estimates of the number of people in arid and semiarid lowlands adversely affected by droughts, 1970–2010



Source: Estimates from Headey, Taffesse, and You (2012), based on data from CRED.

Newer research reveals more about these mechanisms in East African contexts. First, Maystadt and Ecker (2014) found that in Somalia, drought incidence and length are causally related to regional and temporal variations in violent conflict outbreaks through the mechanism of livestock price shocks. They hypothesized that livestock price shocks drive drought-induced conflicts by reducing the opportunity costs of participating in conflicts. The strength of the relationships between drought and conflict is sizable, suggesting that climate change in this region, without offsetting interventions, will exacerbate the risk of conflict.

Second, Maystadt, Calderone, and You (forthcoming) found that temperature anomalies strongly affect the risk of conflict, which is expected to increase by 24 to 31 percent under a median climate change scenario. They also emphasized the greater vulnerability of areas with more pastoralists, less irrigation, and greater distance to local markets. Climate change and population growth have increased the stress on water and feed resources, while various institutional factors have constrained pastoralists' mobility and limited their political representation (Headey, Taffesse, and You 2012).

Policy Options for Increasing the Resilience of East African Pastoralists

Climatic shocks, then, are an important cause of conflict, and climate change is likely to exacerbate the risk of conflict. We cautiously outline different policy options under the following categories: conflict prevention and mitigation, emergency assistance and safety nets, interventions to reduce ex ante and ex post exposure to climatic shocks, and broader development efforts aimed at building longer-term resilience.

Conflict Prevention and Mitigation

While climatic shocks generally tend to increase the risk of conflict, this effect varies tremendously, with the main mediating factor likely being institutional arrangements. Strengthened dispute resolution mechanisms and sound natural resource management in fragile states might significantly help to reduce the risks of conflict and violence. Blattman, Hartman, and Blair (forthcoming) offer evidence in favor of improving local dispute resolution systems in African countries with weak rule of law. They evaluated an education campaign promoting informal negotiation and mediation to help parties reach self-enforcing bargains faster than courts could. In treated communities, land disputes were 29 percent less likely to remain unresolved at the end of the year, and property destruction decreased by 32 percent (ACCORD 2011; Ochieng Odhiambo 2012).

Improved natural resource management could help prevent disputes from even starting (Ochieng Odhiambo 2012; Stites, Fries, and Akabwai 2010). A recent study of pastoralists from southern Namibia suggested that resource scarcity increases the occurrence of harmful behavior but that communities in resource-scarce areas still seem ready to cooperate when substantial net gains can be realized (Prediger, Vollan, and Herrmann 2013). Accordingly, a rising number of policy-oriented institutes recommend creating local committees to manage water and forage resources.

Emergency Assistance and Conditional Safety-Net Programs

Another strand of the literature examines food and cash aid programs' effectiveness in helping rural populations cope with both climate and violent shocks. In famine and postconflict situations, food assistance has traditionally been the most common safety net program. However, outside of its humanitarian role, there is widespread skepticism regarding its possible influence on incentives to

work, on local food prices, and on crowding out of private transfers. Gilligan and Hoddinott (2007) examined the impacts of food assistance in Ethiopia after the 2002 drought and found that it played an important role in improving food security and household well-being in the short run. Using panel data on Ethiopian and Kenyan rural groups, Lentz and Barrett (2005) suggested that food-for-work programs worked effectively for pastoralists without affecting private transfers in any meaningful way. Sulaiman (2010) evaluated a transfer program in South Sudan and reported a significant negative impact on per capita household income (though largely through a decline in child labor) but positive effects on school enrollment for girls and housing quality.

Nevertheless, traditional food aid programs have been criticized as slow and costly. Donors and governments therefore increasingly distribute cash as a substitute for or complement to food transfers and also look to move away from ad hoc humanitarian assistance toward more regularized (and conditional) social safety nets. Macours, Premand, and Vakis (2012) suggested that conditional cash transfers can help households manage weather risks—especially when combined with productive investment grants to help them diversify their economic activities. Mude, Ouma, and Lentz (2012) showed that cash transfers can be successful even in remote and infrastructure-deficient pastoral parts of Kenya, as long as the intervention is supported by an informed program design. One of the largest and longest-running conditional transfer programs—the Productive Safety Net Programme (PSNP) in Ethiopia—has been praised for its capacity to build resilience at the household, community, and state levels. Recipients have seen increased food security and livestock ownership, and the program has helped build up local governance capacity and created improved infrastructure (Gilligan, Hoddinott, and Taffesse 2009). However, extension of the PSNP from the Ethiopian highlands to more pastoralist lowland areas has faced challenges, such as inadequate training of implementers, difficulty in reaching a dispersed population amid poor infrastructure and security concerns, and the potential conflict between programs that target the poor and traditional structures such as clans and sharing norms (Sabates-Wheeler, Lind, and Hoddinott 2013). Hence, there is a need to rethink the design of safety net programs in pastoralist areas.

Reducing Ex Ante and Ex Post Exposure to Weather Shocks

Pastoralist communities accept periodic droughts as a feature of their region, and their nomadic livelihoods have historically been adapted to this climatic setting. Nevertheless, covariate weather shocks, coupled with increasing resource scarcity as a result of population growth and institutional constraints

to mobility, are widely perceived to have made traditional coping mechanisms less effective (Flintan 2011; Headey, Taffesse, and You 2012). These mounting constraints make it even more important to explore ways to cope with droughts through either *ex ante* interventions (early warning systems) or *ex post* interventions (weather insurance).

Mobility is the most important pastoralist means of coping with drought: local variations in rainfall and feed availability allow pastoralists to move herds to greener pastures (Headey, Taffesse, and You 2014). However, space to move herds appears to be diminishing. One widely discussed constraint is land enclosures, with both pastoralists and more sedentary farmers (sometimes from outside) increasingly fencing off previously communal grazing lands (Flintan 2011; ILRI 2010). Another is bush and pest encroachment, particularly the shrub *Prosopis juliflora*. Still another is mounting risk of inter-ethnic conflict over grazing resources. These complex problems require a mix of interventions, both local and national, both legislative and administrative, in the areas of rangeland management, conflict resolution, and improved land and water management.¹

With mounting constraints on where pastoralists can move, more effective early warning systems may offer greater benefits. Herders have shown that they can rationally revise their expectations and that they strongly prefer early resolution of uncertainty (Lybbert et al. 2007; Lybbert and McPeak 2012). These findings are consistent with the well-documented ability of pastoralists to proactively prevent herd destruction through a variety of mechanisms: herd migration, changes in herd composition, market sales, and increased use of fodder (Headey, Taffesse, and You 2014). The early resolution of uncertainty, coupled with the costliness of migration mistakes during the dry season as watering points decrease in number, points to the benefit of improving forecasts and their dissemination, through means similar to the Livestock Early Warning Systems (LEWS) and the Livestock Information and Knowledge System (LINKS).

Finally, recent years have seen considerable experimentation with index-based insurance, including livestock insurance in pastoralist areas. Chantarat and colleagues (2012) studied a novel index-based livestock insurance product's use among pastoralists in northern Kenya, where formal insurance markets are effectively absent. Based on simulation results, the authors found that

1 For a good discussion, see P. D. Little, R. Behnke, J. McPeak, and G. Gebru. 2010. *Policy Options for Pastoral Development in Ethiopia*. Pastoral Economic Growth and Development Policy Assessment, Ethiopia, Report 3. London: UK Department for International Development.

the product could remove 25 to 40 percent of livestock mortality risk. Janzen and Carter (2013) took advantage of a payout on this same insurance product, induced by the 2011 drought, to analyze the impact of the product on consumption and assets. They suggested that insured households were on average 36 percentage points less likely to anticipate drawing down assets and 25 percentage points less likely to anticipate reducing meals than their uninsured counterparts. Nevertheless, weather index insurance has encountered many challenges and still faces a number of uncertainties over issues such as persuading farmers and pastoralists to try the product, managing public-private partnerships, and understanding the long-term behavioral impacts of insurance availability (such as moral hazard).

Broader Development Efforts as Longer-Term Resilience Building

Those who argue that vulnerability to shocks can be decreased primarily with sound and comprehensive development strategies generally call for long-term interventions aimed at strengthening local institutions and market functioning. For example, Headey, Taffesse, and You contended that education and infrastructure can attract people into nonpastoralist livelihoods, reducing their exposure to drought (2014). Improving the human capital of vulnerable households can have far-reaching effects, such as lower fertility rates, better health and nutrition outcomes, higher and more robust incomes, and improved gender equity. In addition, the age structure of pastoralist communities is young, so large investments in education could have sizable impacts within a generation. Although Headey, Taffesse, and You (2014) acknowledged the challenges of delivering quality education to seminomadic and highly conservative pastoralist communities, demand for education is increasing in these communities and recent decades have seen promising new experiments with boarding schools, mobile schools, and long-distance learning.

The same authors (Headey, Taffesse, and You 2014) were somewhat less enthusiastic about the potential for irrigation in lowland areas of eastern Africa. Although irrigation expansion could in principle create viable livelihoods for as much as 11 percent of the projected 2020 population, this upper-bound estimate is based on optimistic and unlikely cost assumptions. In addition, it is unclear how much pastoralists themselves, as opposed to outside farming groups, benefit from irrigation investments.

Commercialization efforts could address the market failures often present in pastoralist areas, including uncompetitive markets, imperfect information, and incomplete insurance markets. Large-scale droughts are

particularly harmful since they lead to sharp reductions in livestock prices, making commercial destocking unattractive, especially in less competitive settings. A number of remedies have been proposed, including improved livestock marketing information systems (such as LINKS) based on mobile technology, auctions instead of relatively uncompetitive spot markets, improvements in transportation infrastructure, and expansion of emergency destocking interventions.²

Finally, institutional reforms might be the most effective way to decrease long-term vulnerability in the Horn of Africa (Ericksen and Lind 2009; Seipt et al. 2013; Turner et al. 2012). Pastoralist groups have historically been marginalized in high-level decisionmaking. Efforts to empower them in national decisionmaking processes could significantly alter this unfortunate status quo. Such efforts have already met with some success in eastern Africa, particularly in Kenya.

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2 For a review, see J. McPeak, P. D. Little, and C. R. Doss. 2011. *Risk and Social Change in an African Rural Economy: Livelihoods in Pastoralist Communities*. London: Routledge.

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RESILIENCE AND PASTORALISM IN AFRICA SOUTH OF THE SAHARA

Peter D. Little and John G. McPeak

The recent popularity of the term *resilience* in the development discourse concerning arid and semiarid lands in Africa can be traced to two major international issues. The first is climate change, concerned with how to build resilient communities in the face of increasingly extreme weather events. The other is recurrent humanitarian crises, especially traced to the most recent drought- and conflict-induced 2011 disaster in the Horn of Africa. Both of these phenomena have strong relevance for African pastoralism, which many climate-change models show will be strongly impacted. (Thornton et al. 2009). The objectives of this chapter are to summarize (1) applications of a resilience framework for pastoralism, (2) key challenges to resilience among pastoralists, (3) local responses and initiatives, and (4) conclusions and development implications. The chapter draws on research findings and data from northern Kenya and southern Ethiopia gathered for the Pastoral Risk Management Project (PARIMA) (McPeak, Little, and Doss 2012), as well as studies from elsewhere in Africa.

Applications to Pastoralism

Recent approaches to understanding dryland economies encompass the idea of “bounce back,” the capacity to prepare for, cope with, and recover from different types of shocks without significant welfare loss or derailment of trajectories of welfare improvement.

There are at least three reasons why resilience should appeal to researchers and practitioners in the context of pastoralism:

- It supports the notion of bounce back in the boom/bust drought cycles so prevalent in pastoralist areas.

- It complements the “disequilibrium ecology” paradigm, which incorporates ideas of resilience, especially in its focus on adaptations to unstable climate and ecological regimes.
- It is consistent with notions of flexibility and mobility that are so critical in pastoralism.

Key Challenges to Resilience

Five key challenges threaten the resilience of pastoral systems. The first is loss of land due mainly to encroachment of neighboring agriculturalists and farming by herders themselves; to development of irrigation, tourism, and conservation programs in key dry-season grazing and watering zones; and to land investments (“land grabbing”) by outside investors. The loss of key resources, especially of dry-season grazing areas and watering points, will probably be the greatest challenge to mobile pastoralism in the next 25 years, according to current research (Homewood 2010; Behnke and Kerven 2011). This process concentrates pastoralists and their animals onto less productive rangelands, undermining their economic welfare (Little et al. 2010).

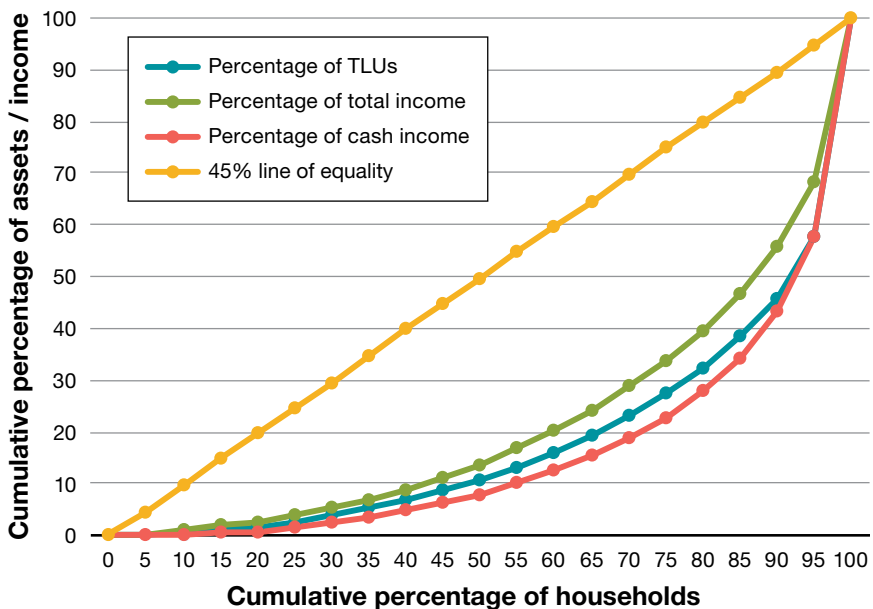
A second major challenge for pastoralism is endemic conflict and violence that disrupt markets and increase vulnerability during droughts. For much of the past three decades, for example, the pastoral areas of northern Kenya have experienced a series of political conflicts and violence that have displaced pastoralists from their homes and created pockets of unused rangelands. Moreover, armed conflicts in neighboring Somalia and Sudan have accelerated the flow of arms into the region, further disrupting local grazing patterns and livelihoods. Similar scenarios occur throughout the rangelands of Africa.

A third challenge is increased population and settlement. There are roughly 23.4 million pastoralists in the Horn of Africa (including Kenya), or about 14.8 percent of the region’s population (Simpkins 2004). Three factors need to be disentangled in this respect: population growth in pastoral areas, settlement of livestock keepers, and immigration by people from outside the pastoral areas. Certain studies show successful absorption of added population through intensification (supplemental feed, crop residues, and intensive grazing strategies), but others suggest increased overgrazing and reduced pastoralist welfare (Moritz 2010; Coppock et al. 2011). For example, in the Sahel region of West Africa, more settlement and population have brought more intensive grazing (including night grazing) and labor use, with a growing integration of pastoral livestock and crop farming (Ayantunde et al. 2008).

A fourth issue is the question, “Resilience for whom?” Pastoralist households are highly differentiated by wealth, a process that has seemingly accelerated during the past 25 years. For instance, the PARIMA data show that the wealthiest 10 percent of herd owners control about 46 percent of aggregate tropical livestock units, while the poorest 20 percent control less than 3 percent, with a similar pattern of inequality in control over cash income and total income, where the cash value of all home-produced and consumed goods is added to cash income (Figure 9.1). This level of wealth differentiation affects how different households (poor, middle, or better-off) respond to market opportunities and their capacity to recover (resilience) after droughts. It also can result in significant movements of poor pastoralists, whose livestock holdings are too low to maintain a pastoral livelihood, out of pastoralism and into high-risk rainfed farming and environmentally destructive activities such as charcoal making, which can compete with and impact the sustainability of pastoralism itself.

Finally, climate variability and change is a challenge to resilience in pastoralist areas. Pastoralists have always dealt with climatic uncertainties and variability,

FIGURE 9.1 Income and asset distribution, southern Ethiopia and northern Kenya



Source: McPeak, Little, and Doss (2012), 93.

Note: TLU = tropical livestock unit.

and extreme climatic events will continue to affect them. Despite considerable uncertainty over the direction of climate change in the region’s drylands, extreme events (either prolonged drought or flood) already have had major impacts on pastoral livelihoods and markets, as witnessed most recently in 2011.

What Enhances Resilience

So what contributes to resilience among pastoralists?

Mobility. Mobility is herders’ key strategy under conditions of high risk and uncertainty. Due to highly variable spatial and temporal distribution of rainfall and related vegetation conditions, herders must be flexible in the movement of their animals. Accessing diverse grazing and water resources allows herders to ensure the survival and reproduction of their livestock (Table 9.1), and also improve animal productivity and hence milk production for local consumption.

Access to critical patches. Rangelands are characterized by “patches” of high ecological value alongside large expanses of marginal range and shrub lands. Because of the uneven nature of dry landscapes, herders often move their animals to capture variations in forage and water availability. Such variations can occur due to differences in elevation or at a given elevation due to localized rainfall (or both effects combined). The value of these patches is especially revealed during dry seasons and droughts, when herds can be decimated in three to four months. How herders manage access to these valuable sites during critical intervals in the year determines the sustainability of the pastoral system as a whole. Consequently, much of the conflict and insecurity in pastoral areas stems from competition over access to these resource patches.

TABLE 9.1 Herder mobility and drought impacts, 2000–2002

	Average per capita livestock (TLUs) 2000–2002	% decline March– December 2000	Average # of watering points used each quarter	% of households relying on mobile satellite camps
Kargi	7.0	0	3.3	88
North Horr	3.6	–24	1.7	45
Logologo	2.5	–46	2.0	91
Sugata Marmar	1.1	–33	1.3	28
Dirib Gombo	1.0	–79	1.1	46
N’gambo	0.6	–50	1.5	1

Source: Little et al. (2008), 599.

Notes: TLU = tropical livestock unit; in column 2, “% decline” refers to reductions in livestock; in column 4, “mobile satellite camps” refers to units of herders that move periodically during the year with their livestock based on climate and vegetation conditions.

Markets and food security. Concerns about markets and food security figure prominently into pastoralist resilience. Herders need to maintain market linkages to sell livestock and to buy essential grains, because they do not produce adequate cereals but consume them daily. As is well established in the literature, herds are not sufficiently large for most pastoralists to survive on direct consumption of livestock products (McPeak and Little 2006). At the onset of an unusually low-rainfall period, a herder might assume the worst-case scenario and unload animals on the market. If many others follow the same logic, the selloff reduces prices even beyond the reduction generated by the animals' loss of condition due to poor grazing conditions. At the same time, grain prices may increase due to increased demand and, in a widespread drought, tight supply. As McPeak, Little, and Doss (2012) pointed out, "there is large variability not only in the prices for livestock that pastoralists sell [especially during droughts] but also in the prices of the goods they buy." During a drought, not only do prices for livestock decline, but the variation around the mean also shows more volatility than in nondrought years (McPeak, Little, and Doss 2012).

Livelihood diversification. Our findings indicate that the most successful households diversify their livelihoods, combining access to the livestock economy and to the cash economy. Overall, households rely on nonlivestock-related activities and sources to obtain more than a third of their total income in the PARIMA data.

Effective governance. Effective governance and local empowerment are critical factors for resilience. The persistent dilemmas of land alienation, insecurity, and access to services and infrastructure reflect deeper-seated problems of governance and political marginalization. The strong inverse relationship in rural Kenya between government-provided services and infrastructure investment on the one hand, and poverty levels on the other, for example, signals a mutually reinforcing relation wherein poorer areas such as the arid and semiarid lands lose out in the political competition for scarce resources at the same time that the resulting infrastructure and services deficiencies ensure these locations' poverty in the future.

Pastoral Responses and Development Initiatives

Herd composition. Diversifying herd composition is one way in which pastoralists respond to changing environmental conditions and enhance resilience. As perennial grasses become scarcer due to changing environmental conditions, bans on bush burning, or stocking pressure, herders adapt by increasing the share of hardier, browse-dependent goats and camels. They also may adopt

breeds of any of these species that are either more drought resistant, more marketable, or more adapted to value-added finishing.

Intensification of production. Another adaptation strategy is changing production techniques. In some areas, we see herders creating enclosures to use for value-added finishing for markets. Purchased fodders and other supplemental feeds can be used both in “normal” times as part of a marketing strategy and in drought periods as a means of protecting the core breeding herd or, in some cases, amassing herds from other herders who are selling livestock at very low prices.

Drought cycle management. The most prominent example of such management is the framework developed by the Livestock Emergency Guidelines and Standards, which provides a clear checklist of key warning indicators and associated action plans.

Regional cross-border coordination. A theme related to advance planning is the recognition that the production and political context of such planning is often multiethnic and involves communities in different countries. Through migration, herders can establish protocols with neighbors for contingent and reciprocal rights to key rangeland resources, transhumance corridors, and markets.

Index-based livestock insurance (IBLI). Recent work in rangeland areas has illustrated that IBLI is a viable concept from a technical point of view in East Africa. Given remote-sensed data on rangeland conditions over time and spatially and temporally explicit information on herd mortality over time, it is possible to predict covariate mortality rates using real-time remote-sensed data. Currently, IBLI products are in the pilot phase and donors are working to address the major challenge of creating informed demand through extension messaging. The most daunting question is whether private-sector insurers can identify a sustainable business model for IBLI to become a profitable commercial product that also benefits their livestock-owning customers.

Conclusions and Development Implications

In spite of the challenges, it is important to think about what a successful (resilient) pastoralist system looks like now and what it might look like in 10–15 years. Our findings suggest that the key indicator of drought resilience, bounce back, is useful to differentiate those who do and do not recover from a weather-related shock. However, the indicator needs to be coupled with a concept like that of a poverty trap, which draws attention to not just recovery but recovery to a different level of welfare.

While resilience importantly stresses that things should not deteriorate, we would argue that the challenge of development in pastoral areas is to ensure that things improve. What we are aiming for is reduced poverty, improved

living standards, and reduced vulnerability. Resilience as a core concept is better viewed as one objective among others rather than *the* objective of development efforts.

Several development initiatives hold the promise of assisting pastoral households and communities to plan for, cope with, and recover from frequent shocks. These are among the most important:

- **Drought cycle management:** Having a specific feasible plan with triggers, responses, and multiple dimensions is preferable to launching an appeal for external assistance after a crisis hits.
- **Index-based livestock insurance:** Pilot projects indicate that insurance products could be applicable for livestock producers. However, designing effective extension efforts to ensure that buyers fully understand the products remains a challenge, and it is unknown whether there is a viable business model for IBLI as a self-sustaining commercial product.
- **Safety nets:** Safety nets in pastoral areas reflect a worldwide movement toward social protection for vulnerable populations. Two kinds of nets are needed: a safety net to prevent households from falling into poverty and a cargo net to pull people up out of poverty.
- **Asset and livelihood diversification:** Livestock and livestock raising are the key to livelihoods in pastoral areas and will remain so. As populations grow, however, there will be an increasing need to build alternative livelihood strategies around livestock production and trade in dryland areas. This transition needs to be guided, inasmuch as desperation-driven diversification strategies (fuelwood harvesting and charcoal production) can undermine the livestock production system rather than enhance it.

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INSURANCE OPPORTUNITIES AGAINST WEATHER RISKS FOR THE RURAL POOR

Francisco Ceballos and Miguel Robles

As climate variability gains prominence in the international policy agenda, public and private sectors alike are increasingly considering strategies to cope with its economic and social consequences. In turn, the general public—faced with a growing number of extreme weather events and natural hazards—is beginning to demand concrete action. One sector where climate variability and its associated risk have the most damaging impact is the rural economy,¹ in particular smallholder farmers. This chapter outlines some of the adverse effects that climate variability has on the rural economy and describes how different insurance mechanisms can contribute to reducing vulnerability and increasing resilience to weather risks.

Weather and the Rural Sector

Agricultural production and its associated value chains are at the center of rural economies. In both developed and developing countries, agricultural production is directly tied to weather variables such as rainfall, temperature, humidity, and wind. When extreme weather conditions occur, agricultural production typically suffers and in some cases may be lost completely.

Year after year, unexpected weather extremes are a constant in several regions of the globe, with devastating effects on agricultural production and rural livelihoods. Prolonged droughts in the Horn of Africa and US Midwest, extensive floods in the Philippines and North India, abnormally low temperatures in Japan and the United States, and heat waves in Australia and Europe are recent examples. In addition, some extreme weather events allow pests and diseases to flourish, potentially crippling agricultural production over vast regions.

¹ For quantitative estimates of the impact of climate change on agriculture, see Nelson et al. (2013).

Negative weather events constitute a major source of risk² for agricultural producers, who may experience income reduction due to crop and animal losses. These effects are often transmitted to other actors in the agricultural value chain (traders, wholesalers, processors, suppliers), with linkages to financial markets (through loan defaults, illiquidity, and so on). Furthermore, spillovers from large weather shocks impact the nonfarming sector through depressed local demand, dampened economic activity, and price increases due to a lower local food supply. Finally, extreme weather events may destroy local infrastructure (roads, bridges, warehouses, schools, health facilities), causing additional damage to the rural economy.

Weather and the Rural Poor

While weather extremes and climate variability negatively impact many rural actors, the rural poor are the most vulnerable group. In developing countries, the livelihoods of the rural poor depend largely on small-scale, subsistence farming activities. In addition, large weather shocks can depress rural nonfarm activities that represent an important income source for the landless and a fallback alternative for farmers. Thus, weather risks can have a disproportionate negative impact on the incomes and well-being of the rural poor, an impact compounded by their limited capacity to cope with these risks. Faced with a reduction in current income due to a transitory weather extreme, and lacking proper financial instruments to smooth this shock (insurance, savings, or credit), the poor often must resort to costly and limited coping strategies. Thus a temporary weather shock might turn into a long-lasting—or even permanent—wealth shock that may push households into a poverty trap. For instance, they may be forced to choose between liquidating a fraction of their productive assets (such as livestock, tools, or land)—compromising their future growth potential—or reducing current consumption—putting the burden on future human capital development, particularly that of young children in the household (Dercon and Hoddinott 2004; Barrett and McPeak 2006).

Traditional Risk-Coping Strategies

In this context, rural households have traditionally resorted to a number of informal risk-coping mechanisms. Examples of these include holding savings

² While irrigation, improved seeds, and enhanced farming practices can be used to reduce the dependence of crop and animal production on local weather realizations, a considerable fraction of residual risk remains.

(either in cash, in kind, or through semiliquid assets), borrowing from informal sources, income transfers within a social or family network, and income diversification—both by diversifying agricultural activities and by mixing agricultural and nonagricultural labor. Most of these strategies, however, are costly and have limited risk-mitigation potential. For instance, loans or gifts from other households have the potential to protect from idiosyncratic shocks (that is, unexpected losses that affect a reduced number of households within a locality or social network) but are ill suited to protect against systemic (or common) shocks, which affect most households in a given region and thus undermine their capacity to support each other. Informal savings are perhaps too costly for a population that likely should invest its resources in assuring adequate food intake for household members, in human capital improvements, and in productive opportunities. In addition, diversification strategies may come at an efficiency cost—that is, they may impede rural farmers from capturing the full range of benefits from specialization or keep them from investing in risky capital and technology with higher expected incomes.

Formal Weather Insurance Mechanisms

Formal risk-sharing mechanisms take advantage of the fact that in a large enough population, only a *fraction* of individuals may suffer a negative risk shock. For example, in a given year only a small fraction of drivers are involved in car accidents. By pooling risks within a large population, formal insurance programs can provide an efficient risk-sharing mechanism in which all contribute with premiums but only those who experience a loss get compensated. Furthermore, because insurance markets can pool risks across a broad scope of activities and large geographic areas, they can lower the costs of dealing with systemic risks through diversification. The most common type of insurance is known as indemnity insurance, whereby compensations rely on identifying specific losses and indemnifying the individual against them.

While in theory the same principles should be applied to weather risks and rural populations, the reality is that most countries lack standard indemnity agricultural insurance markets (with the exception of certain developed countries or large subsidized systems in a few developing ones, usually involving considerable public intervention). Multiple-peril crop insurance, for example, which can protect against any source of risk affecting yields, has been unsuccessful commercially without large subsidies. Single-peril crop insurance, which covers against a specific factor affecting the crop (such as hail or wind), has had more success, though it has been developed only at modest scales (Smith and Goodwin 2010).

There are a number of reasons why agricultural indemnity insurance has failed to expand successfully in developing countries. Possibly the most important is that among small farmers the costs of loss verification, which typically requires a site visit, can be considerable relative to the sum being insured, especially if rural infrastructure is inadequate. Moreover, the lack of formal financial service networks and legal records may add to the cost of premium collection and compensation disbursement. Second, indemnity insurance is prone to significant information asymmetry problems such as adverse selection (whereby only the most at-risk farmers purchase insurance) and moral hazard (whereby an insured farmer may not exert optimal effort to reduce risk or mitigate its impact) (Hazell, Pomareda, and Valdes 1986). Both of these problems generally result in an increased cost.

Index-Based Insurance, a Formal Insurance Opportunity for the Rural Poor

As a result of these market failures, an increasing trend has been to explore an alternative type of weather insurance product for smallholder farmers (Hazell et al. 2010). Under weather *index* insurance, a somewhat recent innovation that is possibly more suitable for rural areas in developing countries, farmers get a prespecified compensation according to the value of a particular weather variable (the index).³ For instance, an index insurance product against drought would pay farmers when rainfall (as measured at a specific weather station or by satellite) is below a certain predefined “trigger,” generally with higher payments for lower rainfall. The key assumption is that by carefully selecting a weather index one should be able to estimate agricultural losses with a sufficient level of confidence.

Some regard index-based insurance as having great potential to reach smallholder farmers in developing countries because (1) payouts are based only on publicly observed data (the index), drastically reducing loss verification costs; (2) adverse selection and moral hazard problems are minimized;⁴ and (3) compensations can be automatically determined and thus disbursed quickly to farmers. This makes insurance easier and cheaper to

3 A slightly different type of index insurance, area-yield insurance, does not rely on a weather variable as its index but instead focuses on whether the average yield over a specified area is above or below a threshold.

4 Since losses are not assessed directly but only through the value of an objective index, the farmer's effort does not affect the probability of a payout—thus moral hazard considerations are dealt with. Additionally, because the probability of a payout is assessed objectively from the historical values for the index, the insurance company should not be concerned about which type of farmer buys this insurance—thus adverse selection is dealt with.

administer, and thus potentially more affordable for the rural poor. These characteristics of index insurance have attracted donors and governments alike. In the past 15 years many international organizations, researchers, and microfinance institutions have conducted pilots in developing countries to demonstrate index insurance advantages and learn best implementation practices, with the hope that private insurers would eventually scale these pilots up (Hazell et al. 2010).

There have been a number of seemingly successful implementations of index insurance. In India alone, more than nine million farmers purchase these hedging products to insure against weather risk (Clarke et al. 2012) although this can be partly explained by the fact that agricultural insurance is mandatory in order to gain access to agricultural loans subsidized by the government. In the United States, a large federal index-based insurance program protects farmers against a variety of weather risks, although the system is highly subsidized. Other examples include the R4/Horn of Africa Risk Transfer for Adaptation program in Ethiopia and Senegal, and Kilimo Salama in Kenya and Rwanda, with relatively more modest yet significant take-up rates.

More generally, however, index insurance pilots in developing countries have repeatedly experienced low take-up, perhaps due to lack of trust in the insurance company, lack of understanding of the product, liquidity constraints, or crowding out of insurance by implicit public guarantees (governments providing emergency relief in the case of an adverse weather event) (Matul et al. 2013). While all of these mechanisms are also applicable to traditional indemnity insurance, index insurance suffers from one disadvantage: basis risk. This risk arises due to an index's inadequacy to perfectly capture the individual losses of an insured farmer, which can be related to a number of factors. First, the index is generally measured at a local weather station (or through not-fully-accurate satellite imagery) and not at the farmer's plot. Second, a simple weather index cannot capture the interplay of weather variables (temperature, rainfall, humidity, evapotranspiration, winds, and the like), nor can it account for variability in crop variety, soil quality, and farming practices. Third, other, nonweather events may impact crop growth, such as pests and diseases. Hence, there is a chance that a farmer, after having paid the premium, will not get a compensation even after experiencing a loss. On the other hand, it is also possible that without experiencing a loss a farmer may get a compensation.

Importantly, index-based products require data infrastructure as a precondition to their development. Sufficiently long historical time series are needed

to estimate the probabilities of the weather index with an acceptable degree of confidence, and to assess the plausibility and appropriateness of a specific weather index. But data availability is a crucial problem in developing countries, where index insurance may hold the largest development potential—a problem that can be seen as a historical failure to provide a public good.

While some data limitations can be increasingly ameliorated with remote sensing innovations via satellites (with an increasing number of satellite products spanning more than three decades of consistent data), indirect measurement of weather variables is inevitably imperfect, and its appropriateness relies on a number of factors specific to each intended application.⁵

Recent Innovations and Future Actions

Index insurance has potential as a formal and efficient risk management tool for farmers in developing countries, but its limitations have to be addressed. To reduce its complexity and to adjust better to farmers with different risk profiles, a team at the International Food Policy Research Institute has proposed a novel approach. The idea is to offer an array of products (“weather securities”), each with a simple payout structure: fixed compensation linked to a single trigger for the index. Under this approach, a farmer could create a portfolio of products (with different triggers, calibrated to protect against weather events of various intensities, and for different coverage periods) to suit his or her individual crop risk profile. Evidence from pilots suggests that farmers may value this simplicity and flexibility.⁶

To minimize basis-risk problems, focus could shift from insuring individual farmers to insuring so-called aggregators, such as farmer associations or pregroups (de Janvry, Dequiedt, and Sadoulet 2014; Dercon et al. 2014) and microfinance institutions. For instance, an institution holding a significant portfolio of agricultural loans may be interested in insuring it against severe systemic shocks that may otherwise result in large loan write-offs. An advantage of such a system would be that individual (idiosyncratic) negative and positive basis risks could be largely offset by each other in the aggregate portfolio. Another proposal to minimize basis risk is to add “gap insurance” as a second tier of *indemnity* insurance—which would kick in only if the broader index product had not triggered. A related idea is “multi-scale area yield insurance,” (Elabed et al. 2013) under which a product would combine

5 For an example of alternative methods to estimate rainfall, see Maidment et al. (2013). For an insurance application, see Chantarat et al. (2013).

6 A pilot application of this approach in India can be found in Hill, Robles, and Ceballos (2013).

two area-yield indexes measured at different geographic levels: a broader geographic index with a higher trigger and a local index with a lower trigger. Payouts would happen when both indexes are below their corresponding triggers. Finally, the increasing affordability of automatic weather stations and the expanding technologies (satellites) for remote sensing of weather variables and crops' growth have the potential to result in products with reduced basis risk in the near future.

Another line of action is related to the state's traditional role as a risk absorber of last resort. As mentioned above, once a major weather shock hits, it is fairly common for national, regional, or local governments to give in to the pressure for emergency assistance. Therefore, it seems natural to insure these agencies against weather risks. Upon the occurrence of an extreme weather event, then, an insured agency or local government would receive a direct payout to implement emergency relief and food safety programs. Such arrangements are already being implemented in developed countries and expanding into developing countries, particularly those prone to natural catastrophes (Hazell et al. 2010).

In sum, formal weather index insurance holds the potential to directly contribute to the resilience of the rural poor in developing countries by protecting them against increasingly probable weather extremes. Evidence from several insurance pilot programs shows that while this potential is real, additional work and innovations are needed to produce a sustainable expansion of efficient agricultural insurance markets in developing countries. Now there is great body of expertise and professionals from both public and private institutions who are actively engaged in bringing in innovations, improving index products, and finding effective ways to scale up insurance programs. By supporting the implementation of innovative weather insurance pilot programs aimed at addressing past challenges, policymakers can actively contribute to the resilience of the rural poor facing weather extremes and provide them with much-needed opportunities to escape poverty.

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PROMOTING ASPIRATIONS FOR RESILIENCE AMONG THE RURAL POOR

**Katrina Kosec, Huma Khan, Alemayehu Seyoum Taffesse,
and Fanaye Tadesse**

There is wide recognition that building the resilience of the rural poor requires helping the affected recover from shocks such as negative weather shocks. Myriad investments and policies respond to such shocks by helping the poor rebuild their assets and prior livelihoods. However, new research from the International Food Policy Research Institute (IFPRI)¹ suggests that individual welfare is also intimately tied to what an individual aspires to achieve in the future—that is, a person’s aspirations in realms such as income, assets, education, and social status. It is less clear how weather shocks affect the aspirations of the poor, and what role—if any—policy can play in promoting resilient aspirations following shocks.

To aspire means to seek to attain or accomplish a particular goal. Aspirations play an important role in everyday decisionmaking. They help determine whether individuals make investments to better themselves economically and socially, and whether they engage in potentially profitable economic risk taking. As a result, having high aspirations can improve the resilience of the poor in the face of increasingly common weather shocks.

A growing body of research also suggests that negative weather shocks may dampen long-term economic prospects for the poor. Individuals exposed to adverse weather shocks invest less in education and health than those not so exposed. Furthermore, adverse weather conditions have been linked with reduced survival probabilities of girls, more birth defects, a decrease in life expectancy, and even increased political violence.

These findings hint at a relationship between adverse weather shocks and aspirations. Weather shocks may lead to changes in individuals’ everyday

1 These include IFPRI studies in rural Pakistan and Ethiopia, whose references can be found in notes 2 and 3.

realities—such as their health or the levels of violence and instability in their communities—which can negatively affect aspirations. Further, lower aspirations may help explain reduced productive investments following shocks. Such a feedback loop would have major implications for resilience.

New IFPRI research on rural Pakistan² suggests that adverse weather shocks indeed lower the future-looking aspirations of the poor. This finding is consequential because it suggests a double burden of such shocks: they deplete the income and assets of the poor today while also contributing to lower aspirations for (and thus investments in) the future. This double burden demands a double role for resilience strategies: to restore the livelihoods of the poor today while also raising aspirations for the future. These findings are consistent with IFPRI research in rural Ethiopia³ on the formation and impact of aspirations. The various IFPRI studies suggest that the poor suffer from especially low aspirations, and having higher aspirations may reduce poverty and improve resilience by leading to greater productive investments.

Understanding Aspirations

Aspirations can be understood as forward-looking goals or targets (or boundary states) and a preference to attain or realize them. IFPRI research on aspirations in Ethiopia and Pakistan suggests that aspirations have two basic features relevant to well-being in general, and to poverty and resilience in particular. First, aspirations seem to influence the choices individuals make in relation to their future. More precisely, aspirations (and other preferences) combine with beliefs and constraints (and possibly other factors) to determine these choices. Second, aspirations are dependent on context and subject to change. They reflect individual and collective experiences, and socioeconomic and institutional circumstances. Moreover, they will likely change with the appearance of new alternatives or with the increased (or reduced) salience of some aspects of existing alternatives.

Preliminary evidence suggests that aspirations and poverty are strongly linked. Poverty can lead individuals to hold beliefs, aspirations, and other preferences that diminish the significance of some features of the environment and magnify others. If an individual believes that she has little, if any, ability to impact her own well-being, then she has inadequate incentives to become informed about or explore pathways to better well-being. Moreover,

2 All references to IFPRI research in rural Pakistan refer to Kosec and Mo (2014).

3 All references to IFPRI research in Ethiopia refer to the following sources: (1) Bernard, Taffesse, and Dercon (2008); (2) Bernard and Taffesse (2012); (3) Bernard, Dercon, and Taffesse (2011); and (4) Bernard et al. (2014).

she has little motivation to allocate resources to do so. The set of beliefs about her inability to bring about positive change and her correspondingly limited aspirations therefore remain unrevised. Thus, while information, credit, insurance, and other resources and opportunities may be available (albeit with some cost), they remain unexploited because they are not motivationally salient. As a consequence, poverty is perpetuated.

The above characterization implies that aspirations can differ significantly across individuals; due to these differences, capturing the aspirations of different individuals with a comparable measure can be challenging. While there are potentially many dimensions in which an individual could aspire, income, wealth, educational attainment, and social status capture a large and important share of poverty-related aspirations. These four components have been used by different studies, including the IFPRI studies of aspirations in Ethiopia and Pakistan, to construct an index that measures the aspiration levels (and thus captures the heterogeneous preferences) of individuals.⁴ The index uses respondents' reported *desired* levels of achievement in these four dimensions, normalized against district-average responses for each dimension.⁵

As noted above, aspirations so measured motivate action. This link has been most studied in relation to occupational choice and educational attainment. Recent studies in rural Ethiopia and Pakistan have provided further evidence on the role of aspirations. A few preliminary findings are worth highlighting:

1. Using seven rounds of panel data, IFPRI research in Ethiopia explored the formation of aspirations. The studies found that slower household income growth, slower average income growth of neighbors, and higher poverty (measured by the number of rounds during which a household is below a given poverty line) are all associated with lower aspirations.
2. Another IFPRI research paper on aspirations in Ethiopia investigated the link between the degree to which individuals feel able to control their life outcomes, their aspirations, and their choices. It found that having a higher degree of such perceived control is correlated with higher reported aspirations, higher children's (both boys' and girls') school enrollment,

⁴ Along with the studies in Pakistan and Ethiopia, the index has been used by Beaman et al. (2012).

⁵ Specifically, respondents with an aspiration level above their district's average had a positive value on the normalized outcome, while those with a level below the average had a negative value. Furthermore, the researchers used individual-specific weights reported by each respondent (specifically, the share of importance the individual placed on each of the four dimensions) to calculate a weighted average of the four normalized outcomes. The result was a measure of individual aspiration levels that captured preferences of heterogeneous individuals.

superior nutritional outcomes (expressed as fewer underweight children in the household), and greater application of chemical fertilizers.

3. The findings of a randomized field experiment conducted in Ethiopia to rigorously measure aspirations, ascertain their determinants, and study their role in affecting future-oriented behavior suggested the importance of personal and vicarious experiences in increasing an individual's aspiration level. Individuals in a remote district in rural Ethiopia were randomly invited to watch documentaries about people from similar communities who had succeeded in agriculture or a small business without help from the government or nongovernmental organizations. A placebo group watched an Ethiopian entertainment program, while a control group received no intervention at all. Six months later, aspirations had improved among treated individuals but did not change in the placebo or control groups. Documentary viewers also increased their savings, their children's enrollment in school, and spending on their children's schooling, suggesting that aspirations *can* be influenced with effective interventions.
4. Similarly, a study of the rural poor in Pakistan suggested that having higher aspirations is correlated with a number of specific behaviors that reflect underlying efforts on the part of individuals and households to improve their future livelihoods. Preliminary results from this study suggested that a 1 standard deviation increase in aspirations was associated with a number of future-oriented decisions and behaviors: a 6 percent increase in seed expenditure per acre of cultivated land, a 25 percent increase in cash loans outstanding as a share of expenditures, and a 10 percent increase in the probability that the household operates a non-agricultural enterprise. Agricultural households with greater access to credit and diversified income sources are better poised to cope with the negative impacts of a natural disaster, suggesting that raising aspirations is an integral part of ensuring resilience.

The Effect of Weather Shocks on Aspirations: The Case of Pakistan's 2010 Floods

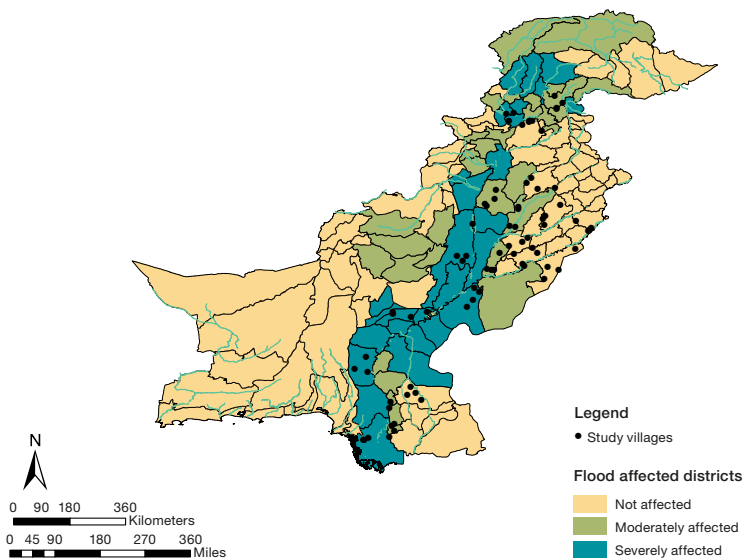
Recent evidence from rural Pakistan has suggested that adverse weather shocks have a strong and negative impact on the future-oriented aspirations of the poor. The study focused on Pakistan's 2010 monsoon-season (June–September) rainfall, which put a full fifth of the country under water and was described as the worst flooding experienced in more than 80 years

(BBC 2010). The floods affected 20 million people, destroying an estimated crop value of US\$1 billion (IFRCRCS 2011). The map in Figure 11.1 shows which districts of Pakistan experienced moderate, severe, or no flooding as of August 2010 (UNOCHA 2010). The map also plots the locations of 76 villages in which 2,090 households were surveyed as part of an IFPRI survey conducted during March–April 2012. Of these villages, 21 percent were in severely affected districts and 23 percent were in moderately affected districts.

The Pakistani case is emblematic of adverse weather shocks throughout the developing world. Climate change promises only to increase the likelihood of such extreme weather events—making understanding the impacts of Pakistan’s 2010 floods on aspirations relevant for many other developing-country contexts.

Given prevailing long-term rainfall patterns across different regions of Pakistan, heavy 2010 monsoon-season rainfall was more expected in some areas than in others. The IFPRI study captured the exogenous

FIGURE 11.1 District-level effects of floods in Pakistan, August 2010



Source: UNOCHA (2010).

aspirational impacts of extreme 2010 monsoon-season rainfall by examining how much more rainfall than is normal (over the last 30 years) for a given village fell during the 2010 monsoon season (Hidalgo et al. 2010; Hsiang, Burke, and Miguel 2013). The study effectively compared aspiration levels in villages in the same district and with similar long-term rainfall histories, but where one village had a relatively large 2010 monsoon rainfall shock relative to what was expected given the last 30 years of farmers' experience.

The study suggested that one and a half years later, Pakistan's 2010 floods had a significant negative impact on aspiration levels, as measured by the aspirations index. Individuals experiencing rainfall levels 1 standard deviation higher than the mean had aspiration levels 0.15 standard deviations lower than the mean. Further, these negative impacts on aspirations were not uniform. They fell almost entirely on the bottom three quintiles of per capita expenditures, while the aspirations of the top 40 percent were unaffected.

The aspirations of individuals who were part of land-cultivating households and those reliant on agricultural wage labor were especially hard hit by the floods; the aspirations of individuals dependent on rural nonfarm work were unaffected. Further, among land-cultivating households, those with rainfed agriculture were hardest hit; the aspirations of those with access to irrigated agriculture were unaffected. Individuals from households with nonagricultural enterprises were significantly less affected than those without. Finally, those with relatives outside their district (informal risk-sharing networks) were significantly less negatively affected. In short, those most exposed to weather-related risk saw their aspirations most negatively affected by the floods.

The study also presented suggestive evidence that the floods lowered aspirations through several cognitive channels—especially the sense of control individuals feel that they have over their lives. Members of flood-affected households felt more fatalistic, which IFPRI research in Pakistan and Ethiopia has shown to affect future-oriented behaviors and investments. When individuals feel they have less control over their lives, they aspire to achieve less. This pattern suggests an important role for public policy—not only in Pakistan, but in any developing country vulnerable to the effects of climate change and natural disasters—in reducing fatalism and thus raising aspirations in the wake of negative shocks.

Can Policy Raise Aspirations?

Considering the apparent negative effects of weather shocks on individuals' aspirations for the future, it is important to find ways in which policy can mitigate negative effects and ensure that those experiencing such shocks do not fall into a poverty trap. How can we influence individuals' aspirations? The IFPRI studies from Ethiopia suggested the importance of working with and through personal and observed experiences in increasing an individual's aspiration level.

Similarly, the study in rural Pakistan suggested that social protection programs can play an important role in mitigating the negative effects of shocks on aspirations and, thereby, on individual welfare. Following the 2010 floods, the government of Pakistan provided flood relief through the Citizen's Damage Compensation (Watan Card) Program. The program provided three staggered cash payments to households in flood-affected villages during 2010–2011. The study found that a 1 standard deviation increase in 2010 rainfall deviations from the mean led to a 0.25 standard deviation decrease in aspirations in villages *without* the Watan Card Program. However, in similarly flooded villages *with* the program, the same increase in rainfall led to a statistically insignificant and far smaller 0.03 standard deviation decrease in aspirations (one-eighth the size). The results suggest that the presence of a flood relief program may help mitigate the negative impacts of a flood shock. In short, social protection may raise the welfare of the poor today while also protecting their aspirations for the future.

To turn existing knowledge into policy, we need to look at the merits and demerits of different policy options. For instance, what is the most effective way to raise aspirations through exposure to success stories? How do targeted documentaries, street theater, puppet shows, and aspirations training sessions compare, and how does their effectiveness vary across contexts? How do they compare with mass media interventions? Further, what methods other than exposing individuals to success stories can raise aspirations? How does targeted social protection in response to specific negative economic shocks (like a natural disaster) compare with more run-of-the-mill social protection programs targeted at the poor? Additional research is needed on the relative impacts and cost-effectiveness of different policy options aimed at raising aspirations. Furthermore, more research is needed on how aspirations interact with development goals such as the take-up of productive investment opportunities that can improve the resilience of the poor. Such knowledge could open new channels for making development programs and social protection policies more effective.

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IMPROVING RESILIENCE TO NUTRITIONAL SHOCKS

Harold Alderman and Susan Walker

Shocks and Malnutrition

Although undernutrition is trending downward globally, 165 million children in low-income countries were stunted (that is, had low height for age) in 2011; others suffered from deficiencies in micronutrients. Overall, undernutrition contributed to 3.1 million deaths in 2011 (Black et al. 2013). This burden reflects underlying conditions of poverty, limited access to health and sanitation, and insufficient time and information for adequate childcare. In addition to being consequences of these protracted obstacles, malnutrition rates are also heightened by climatic, political, and economic shocks.

For example, drought and civil unrest (independently as well as jointly) contributed to increased stunting in Zimbabwe, and subsequently this stunting led to reduced schooling (Alderman, Hoddinott, and Kinsey 2006). Moreover, even a modest rain shortfall, far less dramatic than those that generate international attention, may result in reduced linear growth and schooling (Maccini and Yang 2009). Nor are these negative outcomes confined to conflict- and drought-affected economies; the incidence of low birth weight increased with the economic contraction in Argentina in 2001–2002, with both contraction of gross domestic product and reduced health expenditures per capita independently explaining this outcome (Cruces, Gluzmann, and Lopez Calvo 2012).

Addressing the Acute Crisis of Undernutrition

One of the first signs of undernutrition observed in crises is an increased rate of wasting, defined as low weight for height but also monitored in terms of upper-arm circumference. A child who is severely wasted has a compromised immune system and a heightened risk of dying young. Fortunately, there have been recent strides in managing acute malnutrition by offering nutrient-dense, lipid-based supplements to assist in rehabilitation (Bhutta et al. 2013). Often such supplements are distributed at the community level,

reducing the cost of the response compared with rehabilitation at clinics and lowering the risk of infections. Still, the care needed to prevent mortality among severely wasted children is appreciable. New approaches to the prevention of wasting in emergencies are being sought, often using prepared supplements similar in composition but smaller in size than those used for rehabilitation. These supplements are designed to be distributed to children within packages of family food assistance during droughts and similar emergencies. While lipid-based supplements have been shown to be cost-effective for treating acute malnutrition, there is less evidence on their role in preventing malnutrition. In one study from Haiti conducted during a period of economic hardship, generalized distribution proved more effective than targeting the children who were malnourished (Ruel et al. 2008). Beyond the issues of supplement composition and targeting, the success of an emergency response remains largely a matter of rapidly establishing an efficient delivery system.

Recovering from a Nutritional Shock: Can Interventions Promote Catch-Up Growth?

Worldwide child growth patterns based on cross-sections of age cohorts reveal early deterioration of linear growth rates in children less than 6 months old in low- and middle-income countries. This decline continues until 24 months, after which undernutrition rates apparently level off (Victoria et al. 2010). This evidence, supported by prospective studies of cohorts in five countries, prompts an emphasis on addressing undernutrition in the period between conception and the child's second birthday, often referred to as the first 1,000 days. Interventions in this period are a priority to promote optimal growth and prevent stunting (Bhutta et al. 2013) and may render populations more resilient to shocks. The most effective strategies to achieve growth recovery from stunting (as opposed to wasting) during early childhood are not yet defined. Nonetheless, the early years in a child's life, when growth velocity is at its highest, provide the best opportunity for preventing undernutrition.

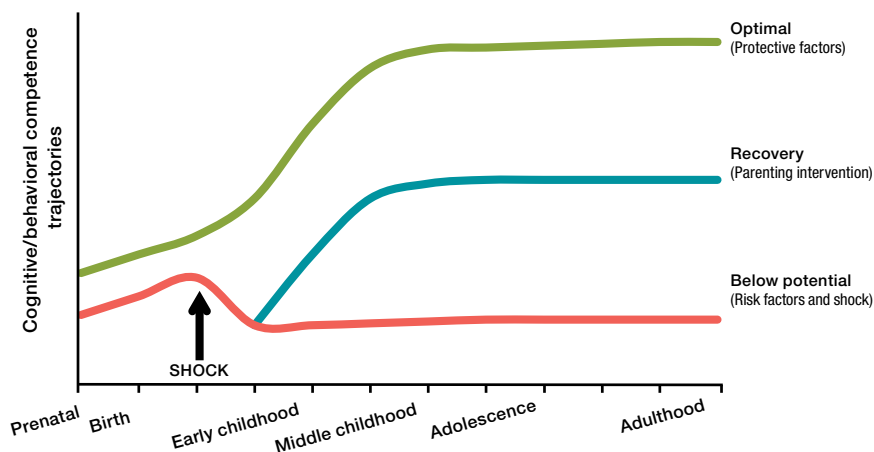
Debate persists on whether a child who becomes stunted during his or her first two years has appreciable potential to catch up in height relative to peers later in childhood (Prentice et al. 2013). For example, studies with the Young Lives data (a longitudinal set of cohort surveys of about 2,000 children per country born in 2001 in Ethiopia, Andhra Pradesh state in India, Peru, and Vietnam) indicated that there is considerable malleability in stunting as children age, even without any major changes in the economic or environmental conditions in which the child resides (Crookston et al. 2013). Still, even

if catch-up growth in height is more common than had been believed earlier, it is not yet known what interventions are able to promote such improvements. Some programs have facilitated catch-up growth, such as one in India in which school feeding apparently reversed the impact of stunting attributable to a severe drought (Singh, Park, and Dercon 2014). However, there are few similar studies from which one can generalize or recommend best practices for cost-effective, low-risk approaches to reversing stunting. The risk comes not only from concentrating resources where the returns are still unknown but from the possibility that obesity may be increased if programs attempt to promote growth on a small frame.

What consequences are expected for a survivor of a drought or economic slowdown if she or he remains stunted? How much catch-up growth matters when an individual becomes an adult depends, in part, on the economic environment. Physical stature is still critical in activities in which strength contributes to productivity and is also important in reducing complications of pregnancy. However, employment opportunities are increasingly skills intensive. In such employment, schooling and cognitive capacity may be more important than physical strength. This is especially true as women enter the nonagricultural labor force (Pitt, Rosensweig, and Hassan 2012). Thus, regardless of whether stature can be enhanced by interventions, if gains in schooling and intellectual ability can be delinked from catch-up growth in stature, the impact of a nutritional shock can be reduced.

Limiting the Long-Term Consequences of Early Malnutrition

While cognitive and socioemotional development is subject to many of the same risks as overall nutritional status, interventions, particularly at critical ages, can offset many—albeit not always all—of the negative consequences of such shocks. Interventions reaching disadvantaged children exposed to chronic nutritional and psychosocial risks can promote development and are an important strategy to prevent loss in children's potential and subsequent impact on national development (Engle et al. 2011). Such strategies are particularly needed in countries with chronic high levels of stunting and may also help to reduce the additional impact of deteriorating nutrition and increased psychosocial risks associated with conflicts and natural disasters. Although experts promote inclusion of early childhood activities in emergency situations (UNICEF 2010), there remains a need for information on effective approaches to reducing the shorter-term impact of shocks on development. Limited information suggests that integrating group-based stimulation for mothers and infants

FIGURE 12.1 Risks and resilience in early child development

Source: Adapted from Walker et al. (2011).

benefits child learning environments and maternal responsiveness (Morris et al. 2012).

Figure 12.1 illustrates the potential for programs that improve parent-child interaction and learning environments to benefit the development of children experiencing nutritional deficiencies, either chronically or as a result of nutritional shocks. The stylized shock is assumed to be more severe for children in households that already have relatively high risks of malnutrition. These children can, however, recover in part with additional assistance. A comprehensive, long-term study in Jamaica found evidence for such a partial recovery. The program studied provided food supplements as well as psychosocial stimulation to stunted children aged 9–24 months for two years through weekly home visits by community workers. Food supplementation had only a modest impact on physical growth, which was no longer apparent by 7 years of age, with some recovery from stunting evident in all children regardless of intervention group (Walker et al. 1996). In contrast, supplementation and stimulation, individually and together, led to improved cognitive skills in early childhood (Grantham-McGregor et al. 1991), and long-term follow-up studies showed that stimulation yielded sustained cognitive benefits and improvements in educational attainment, social behavior, and income in young adulthood (Walker et al. 2011; Gertler et al. 2013).

Similarly, in Bangladesh, psychosocial stimulation with or without modest food supplements (150–300 Kcal/day) given to severely underweight

children 6–24 months old upon discharge from the hospital had an impact on mental development and a small impact on weight for age, but there were no synergistic effects (Nahar et al. 2012). That is, any advantage of having programs provide both nutritional supplements and stimulation is likely to come from administrative savings in joint service delivery and not from the interaction of the forms of assistance. The benefit of stimulation on the development of undernourished children is a highly consistent finding, suggesting that including psychosocial stimulation in programs that respond to undernutrition, whether resulting from shocks or not, would yield improvements in children's development and longer-term returns on education. Further, integrating nutrition and stimulation interventions does not compromise the impact of the individual program components (Grantham-McGregor et al. 2014).

Cost considerations may be a limiting factor in taking such evidence from small programs to a wider scale, especially when a climate or financial emergency puts a substantial portion of the population at risk. The programs that are most closely studied have shown improvements among children who receive frequent home visits over several months. Although such interventions likely yield attractive benefit-to-cost ratios, especially over the longer term, this approach may be more manageable in terms of capacity constraints when the number of at-risk children is relatively small. More evidence is urgently needed on the effectiveness of other delivery models that use existing infrastructure and services where possible, such as a series of group sessions to provide opportunities to learn and practice responsive, stimulating care. These types of delivery mechanisms may be more practical when a larger number of children are not reaching their potential, especially when those numbers spike following a drought or economic crisis.

Stimulation and childcare influence socioemotional development as well as cognitive skills. Economists recognize that both categories of skills are rewarded in wages and in entrepreneurial activities, and both areas of development benefited in the Jamaica study. The early childhood years are particularly important for brain development and in laying the foundations for cognitive and social-emotional skills. The time frame during which this groundwork is established is not confined to the first 1,000 days that are the focus of many nutrition programs, a fact that has implications for program design. Established programs and services, such as growth promotion, well-baby clinic visits, and vaccination programs in the first one to two years of life promote child health and nutrition and provide opportunities for integrating stimulation programs to benefit development. There remains,

however, a particular need for programs in the window after this age through to the age for initiating preschool and beyond.

Children who attend preschool generally have better cognitive and early academic outcomes than those who do not attend, with greater benefits for children who were more disadvantaged at enrollment. At national levels, preschool attendance rates are associated with reduced disparities in educational outcomes between groups of higher and lower socioeconomic status (Engle et al. 2011). However, preschool enrollment is less universal than is primary enrollment and, particularly where overall rates are low, is skewed toward the relatively well off, in part because of a larger role for private providers in preschools than at other levels of education (Alderman 2011). Therefore, there may be a greater role for demand-side interventions, such as conditional cash transfers, to encourage preschool participation than for interventions that target schooling at later ages. More generally, responding to the impact of shocks on schooling choices, including those mediated by health and nutritional setbacks, is a way for social policies to work toward ensuring that stunted children are not uneducated children as well. Attention to early development through enhancing parental competencies to facilitate children's development, combined with more equitable access to quality preschool education, can reduce inequalities in cognitive and social skills for young children affected by shocks and thereby limit the longer-term impact of such shocks.

Concluding Comments

Nutrition interventions need to begin prenatally and continue during the first two years of life. Child development interventions also need to begin early, within the first two years. But they must also be continued up to and through school age. While the early years are the most effective time for establishing a foundation for later education and development, there are times that households are overwhelmed and a child falls behind. It is clear, however, that disadvantaged children benefit from additional stimulation and that programs that target psychosocial development help them to make up deficits. The earlier interventions dominate in terms of efficiency, but when these are insufficient or lacking, later interventions are needed for equity.

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ENHANCING THE LINKS BETWEEN RESILIENCE AND NUTRITION

Charlotte Dufour, Domitille Kauffmann, and Neil Marsland

This chapter attempts to bring together the thinking on nutrition and resilience, to clarify the role of food and agriculture in each of these agendas, and to define potential synergies between nutrition and resilience concepts and programs.

Indeed, nutrition and resilience are strongly interlinked: nutrition is both an input to and an outcome of strengthened resilience. Reducing malnutrition is crucial to strengthening resilience because well-nourished individuals are healthier, can work harder, and have greater physical reserves; households that are nutrition secure are thus better able to withstand external shocks. Conversely, households that are most affected by shocks and threats face the greatest risk of malnutrition; (Dufour and Egal 2012; Justino 2012) thus, strengthening resilience is essential to efforts to reduce malnutrition.

This chapter focuses on food and agriculture, but some of the concepts and recommendations may be of interest to other sectors. It is based on a longer discussion paper (FAO 2014a), which was written with the following objectives:

1. To describe the common ground between approaches designed to improve nutrition and those aimed at strengthening resilience, and to highlight how the growing attention to resilience represents an opportunity to engage in more effective nutrition programming;
2. To discuss what a nutrition lens can bring to resilience programming in order to maximize the nutritional outcomes of resilience programs in the context of the food and agriculture sector;
3. To highlight issues that require greater clarification and evidence, and where more research and debate is needed.

This chapter is not a review of scientific evidence. Building the evidence of the benefits of linking nutrition and resilience will require, on the one hand, strengthening published evidence of the nutritional impact of food security and social protection programs (Ruel and Alderman 2013) and, on the other hand, fine-tuning methods for measuring resilience and their adoption by field programs. Rather, this chapter proposes a rationale and opportunities for bringing together the nutrition and resilience agendas based on practitioners' field experience, while recognizing the need for operational research to refine these recommendations.

Understanding the Concepts of Nutrition and Resilience in the Food and Agriculture Sector

The Multiple Causes of Malnutrition and the Role of Agriculture

Malnutrition refers to an abnormal physiological condition caused by deficiencies, excesses, or imbalances in the energy, nutrients, or both necessary for an active, healthy life. The term encompasses undernutrition, overnutrition, and micronutrient deficiencies. The focus of this chapter is on undernutrition and micronutrient deficiencies.

It is crucial to recognize that the determinants of malnutrition are multi-sectoral. In this regard, the conceptual framework of malnutrition developed by UNICEF identifies three levels of interrelated causes of undernutrition: immediate causes (disease and inadequate food intake), underlying causes (household food insecurity, poor caring practices, and poor access to health and sanitation services), and basic causes (causes related to the political, social, economic, and ecological context) (UNICEF 1990).

Fighting malnutrition in a comprehensive way requires adopting approaches that combine short- and long-term actions, as well as fostering linkages between curative and preventive aspects of humanitarian and development interventions. This suggests that the existing dichotomy between “emergency” and “development” presents severe limitations from a nutrition perspective.

Many efforts have been made recently to break the silos between the food-security, nutrition, and livelihoods sectors and to promote a global and comprehensive approach that includes both nutrition-specific interventions (interventions that address the immediate causes of malnutrition) and nutrition-sensitive interventions (those that address underlying and basic causes of malnutrition and avoid negative impacts on nutrition) (Bhutta et al. 2008).

Agriculture has a key role to play in both nutrition-specific and nutrition-sensitive interventions. It can improve people's diets by increasing the availability, affordability, and consumption of diverse, safe, and nutritious foods and diets aligned with dietary recommendations and environmental sustainability.

Resilience and the Food and Agriculture Sector

Building on existing definitions and its experience of supporting agriculture-based livelihoods, the Food and Agriculture Organization of the United Nations (FAO) has proposed a definition of resilience that specifies the relevance of this concept to the food and agriculture sector: "Resilience is the ability to prevent disasters and crises as well as to anticipate, absorb, accommodate, or recover from them in a timely, efficient, and sustainable manner. This includes protecting, restoring, and improving food and agricultural systems under threats that impact food and nutrition security, agriculture, and food safety/public health" (FAO 2013).

Resilience, as defined by Béné and colleagues (2012), has three dimensions, namely absorptive capacity, adaptive capacity, and transformative capacity. Absorptive capacity refers to coping skills by which households and communities buffer themselves or moderate the impact of shocks to persist with their existing way of life. Adaptation, a term now often used in the context of climate change, refers to incremental adjustment to the impacts of a stress (for instance, adjusting planting schedules or shifting to drought-resistant crops), while transformation refers to the ability to create a fundamentally new system (or way of life) when conditions require it. The concept of resilience is leading humanitarian and development organizations to review the way they design their programs, in particular by developing integrated strategies composed of various interventions designed to strengthen households' absorptive, adaptive, and transformative capacities (FAO 2012).

Nutrition and Resilience: The Common Ground

At the programming level, the concepts of nutrition and resilience clearly share key principles. Effective resilience and nutrition programming both require the following:

- **A systemic approach (multisectoral, multilevel, and multistakeholder).** Both the nutrition and the resilience of an individual or community result from a combination of interlinked factors that can be influenced across various sectors, at different levels, and by a wide range of stakeholders. Consequently, there is no one sector or one response option that

can effectively and sustainably build resilience and tackle malnutrition. Resilience and nutrition demand thinking across silos.

- **A twin-track approach, linking emergency and development.** Fighting malnutrition in a comprehensive way and strengthening resilience require addressing acute needs in emergency situations and crises alongside investing in long-term responses to tackle the root causes of vulnerability and malnutrition.
- **A context-specific approach.** A successful nutrition or resilience-building intervention in one country or livelihoods zone may not be replicable in another context. An in-depth understanding of populations' and individuals' existing coping mechanisms, food systems, and nutrition needs, as well as environmental and social synergies, is a key starting point to contextualize the intervention.
- **Strong local, country, and regional ownership and political leadership.** Political leadership is a prerequisite for successful complex programs requiring multisectoral, multilevel, and multistakeholder approaches. A strong political leadership enables creation of a favorable policy environment and facilitates integration of resilience-building and nutrition programs across ministries (agriculture, health, trade, and so on).

The resilience agenda therefore represents an opportunity to improve the way nutrition programs are designed, funded, and implemented through addressing the root causes of malnutrition and food insecurity as well as the symptoms. The reverse is also true: the use of nutrition tools and approaches can support resilience programming.

Maximizing the Nutritional Impact of Resilience Programming

Applying a Nutrition Lens to the Concept of Resilience in the Food and Agriculture Sector: A People-Centered Approach

In the food and agriculture sector, the concept of the “micro level” often goes no further than the household as a unit of analysis, overlooking the individual level. Although analyzing and addressing resilience at the household level is necessary, it is important to bear in mind that the nutritional needs of individuals within a household differ.

Focusing on individuals. Adopting a nutrition lens to view resilience is an invitation to put the individual back at the center of the system and

to analyze the food system in terms of its ability to provide the right food at the right time to the right individuals. This view entails paying specific attention to individuals who are most vulnerable to malnutrition and requires that resilience programming place greater importance on the type of food available and the way food is prepared, utilized, and shared between individuals within the household.

Viewing absorptive, adaptive, and transformative capacities with a nutrition lens. From a nutritional perspective, an individual or household could be said to have a high absorptive capacity if, in the face of a shock, negative nutritional coping strategies are not very common. High adaptive capacity could mean being able to access foods that meet nutritional requirements from sources that are more reliable in the face of climate change. High transformative capacity might refer to being able to fundamentally alter the sources and types or varieties of food in the face of a crisis while maintaining or improving nutritional status.

Applying a Nutrition Lens to Resilience Programming in the Food and Agriculture Sector

This section builds on the four pillars of FAO's Resilience Strategy (FAO 2014b) to provide operational recommendations for enhancing the nutritional impacts of approaches designed to increase resilience to food and agricultural shocks.

Pillar 1: Enable the Environment

The question here is how the legislative and policy environment can be strengthened in order to maximize the nutritional impact of measures designed to improve resilience. The following opportunities can be seized:

- **Convincing policymakers of the case for nutrition-sensitive resilience measures.** Policymakers concerned with resilience building must be made aware of the social, economic, and human costs of undernutrition. This awareness will increase the likelihood that nutritional considerations are fully taken into account in the development of policy, program, and coordination frameworks for disaster risk management (DRM) and food security.
- **Integrating nutrition in resilience/DRM planning and supporting synergies with food-security and nutrition policies, strategies, and coordination mechanisms.** Explicit nutrition objectives should be included in resilience and DRM policy frameworks as

a means of ensuring that the needs of vulnerable individuals and groups are addressed and that resilience-building and DRM programs do not have negative impacts on nutritional status. Furthermore, there are opportunities to build stronger links between, on the one hand, development-oriented multisectoral policy support and coordination initiatives on food security and nutrition (such as those supported through the Scaling Up Nutrition [SUN] movement) and, on the other hand, more emergency-related coordination bodies (such as the Nutrition and Food Security Clusters) and initiatives related to DRM and resilience at national, regional, and global levels. In Niger, for example, the Nutrition Working Group (led by the Ministry of Health's Nutrition Department and composed of UN agencies and nongovernmental organizations) deals with nutrition in both emergency and development contexts, and advises both the High Commission on the 3N Initiative (les Nigériens Nourissent les Nigériens)—a high-level and multisectoral initiative on food security and nutrition, and the newly formed Technical Working Group on Resilience (Personal communication 2014).

- **Using nutrition as an enabling entry point for gender-sensitive resilience-enhancing measures.** Adopting a nutrition lens (that is, asking who is most at risk of malnutrition and why) can be a neutral and practical entry point for gender-sensitive and equitable resilience programming. By orienting activities toward household food security and nutrition (for example, supporting women to grow vegetables for nutrition purposes, introducing labor-saving technologies to enhance women's availability for child care, and so on), one can address power relations, distribution of domestic chores, and women's access to productive resources without having to emphasize these subjects overtly. For example, several nongovernmental organizations working in conservative areas of Afghanistan targeted food assistance, supplementary feeding programs, and income-generation activities—associated with literacy classes and health and nutrition education—toward women. The main objective of these programs was to improve household food security and child nutrition, but many women involved in them also reported that bringing home food or income and being able to seek better care for their children raised their status and enabled them to take greater part in decisionmaking in their households.

Pillar 2: Watch to Safeguard

Greater integration of nutrition-related information in food and agricultural information systems has several benefits in terms of better monitoring of threats, situation and context analysis, and causal analysis. All of these attributes are beneficial for supporting resilience planning in the food and agriculture sector.

Early warning. Diet-related coping strategies may be early indicators of a pending crisis. People may not wait until food is in short supply before they begin to change their behaviors. Thus changes in consumption behavior not only reflect current status but may also reflect the best judgment of household decisionmakers about the foreseeable future. Including indicators of food consumption, such as dietary diversity and number of meals, in early warning systems can therefore increase their ability to detect forthcoming shocks and pinpoint the households or livelihood groups at greatest risk (Maxwell and Caldwell 2008).

Situation assessment and surveillance. Nutrition indicators should be part of the key indicators to measure resilience when conducting a situation analysis. Nutritional status (especially stunting) is an indicator of the erosion of people's resilience and of greater vulnerability. Monitoring nutritional trends over time also helps researchers understand how various shocks and threats impact households' and individuals' well-being.

Nutrition causal analysis as a key for situation analysis. An understanding of the causes of malnutrition in different livelihood groups provides the background against which to analyze early warning indicators and anticipate impact on specific groups. In particular, malnutrition problem trees¹ provide a useful framework for identifying relevant indicators and sources of information when designing food-security and nutrition early warning and surveillance systems (FAO 2014c).

Pillar 3: Apply Disaster Risk–Reduction Prevention, and Pillar 4: Prepare and Respond

Activities under Pillar 3 are designed to reduce the risk of being exposed to a shock and mitigate its impact should the shock arise, while activities under Pillar 4 are designed to ensure that the response to the shock is adequate, timely, and effective. Pillars 3 and 4 correspond to different stages of the resilience programming cycle, but they are presented together because the

1 A participatory methodology for doing a causal analysis of malnutrition, whereby causes of malnutrition are classified and sequenced as roots or branches in a tree.

recommendations for making prevention, preparedness, and response activities more nutrition sensitive are similar.

KEY ENTRY POINTS FOR NUTRITION-SENSITIVE PROGRAMMING

TO BUILD RESILIENCE

Using nutrition indicators and data for identifying vulnerable groups and targeting in

- prevention and DRR—target prevention activities to groups who face chronic problems with food security, health, or both, or are exposed to regular nutrition-related shocks;
- preparedness and contingency planning—anticipate which groups risk being hardest hit by a given shock or threat; and
- postdisaster response—use indicators such as food consumption data to effectively identify which groups need urgent help.

Causal analysis of malnutrition through analyzing the contributing factors affecting nutritional status. This analysis can be done by constructing problem-and-solution trees to better understand the problems/causes and solutions/interventions for malnutrition within different livelihood groups. This methodology is a practical and user-friendly way to build a response framework that includes both curative and preventive interventions from various sectors, and it is thus useful for designing resilience programs aiming to improve food security and nutrition (FAO 2014c).

Making nutrition an explicit objective and monitoring progress toward it through measuring the nutritional impact of resilience-building programs using a set of indicators. For example, indicate a reduction in the prevalence of stunting, wasting, and so on, as an objective. Food and agriculture interventions should, among other objectives, aim to improve diets, and the interventions' nutritional impact can thus be assessed with indicators such as dietary diversity.

EXAMPLES OF NUTRITION-FRIENDLY RESILIENCE PROGRAMMING

Nutrition education to address the three dimensions of resilience (coping, adapting, and transforming) and to empower households through²

- improving feeding practices, which contributes to prevention of undernutrition as well as increased human capital;

2 See more information on the role of nutrition education, reviews and evidence, and key issues for implementation in McNulty (2013).

- helping households in their decisionmaking on what foods to produce and purchase, and how to store, process, prepare, and consume them for optimal nutrition; and
- linking food and agriculture programs to other sectoral interventions, namely health, water and sanitation, and education.³

Diversification of food intake and livelihoods as a nutrition-sensitive risk-reduction intervention to

- contribute to the prevention of both chronic and acute malnutrition through direct consumption, and contribute to income generation through growing more nutritious crops, and
- reduce vulnerability to shocks through providing people with more opportunities to diversify their food production, livelihoods, and thereby, economic alternatives (Save the Children 2012).

Linking food and agriculture interventions with social protection measures for improving nutrition and strengthening resilience. For example, providing families with either cash, food, or livelihood alternatives may be the best solution to protect the families' nutritional status when they cannot afford to buy nutritious food or cannot access health care. By protecting assets and livelihoods, social protection programs can be used for prevention, preparedness, and response. In times of crisis, social protection programs should indeed be scaled up and targeted to the most shock-affected areas to reduce acute and long-term negative effects of the crisis and strengthen capacities for nutritional resilience (Save the Children 2009).

Linking food and agriculture to health, water and sanitation, and education for enhanced nutritional impact through joint situation and response analysis and joint or harmonized targeting, as well as aligning delivery mechanisms of programs that address other determinants of malnutrition, to ensure that communities and households are reached with a complementary set of interventions. Several initiatives are underway to improve multisectoral planning, such as the joint resilience strategies between FAO, the World Food Programme, and UNICEF in Somalia, Uganda, and Ethiopia. And the experience of joint nutrition programs supported by the United Nations Development Programme/Spain Millennium Development Goals Achievement Fund showed that though joint programming is challenging and entails significant transaction costs, a majority

3 For an example of how nutrition education was used to improve multisectoral collaboration, see Dufour (2007).

of participating staff recognized that joint programming was essential to address a multisectoral topic such as nutrition (Perez Zaldivar 2013).

Conclusion: Remaining Challenges of Bringing a Nutrition Lens to Resilience Programming

Challenges remain in transforming these opportunities into action. While the discourse on resilience has been gaining ground, capacities to operationalize the concept at the field level remain weak. Similarly, translating the growing commitment to nutrition into action is held back by limited capacities for multisectoral nutrition programming and for mainstreaming nutrition into other sectors, including agriculture.

Effective capacity development, improved programming, and mobilization of financial and human resources will require developing the evidence base regarding which strategies are most effective to simultaneously strengthen resilience and improve food security and nutrition. The operational recommendations presented in this paper are based on past field experience as well as conceptual considerations, but more practical and operational research is required to test their feasibility and effectiveness in a variety of contexts.

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BUILDING CAPACITY FOR RESILIENT FOOD SYSTEMS

Suresh Chandra Babu and Sylvia Blom

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 chapter 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*.

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.

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, community-wide 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.

Organizational capacity can be delineated through five capabilities (Baser and Morgan 2008): (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.² 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 (Babu and Dorosh 2013). We adapt this typology using data from the International Food Policy Research Institute's Agricultural Science and Technology Indicators (ASTI) database

2 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.

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 14.1) 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

TABLE 14.1 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 Laos Nepal Togo Zambia	Benin	Uganda
Medium	Honduras Vietnam	Mali	
High		Nicaragua	South Africa

Source: Authors’ calculations using ASTI data from IFPRI (2013) and using methodology explained in Babu and Blom (2014).
Legend: ■ Group 1 countries; ■ Group 2 countries; ■ Group 3 countries.

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.

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 (Owens, Hoddinott, and Kinsey 2002). There may be strong academic institutes and profitable agribusinesses, but they likely operate independently of the policy agenda (Rhoe, Shantharam, and Babu 2002). 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 (Rondinelli 2002).

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 (Mashelkar 2003). 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 14.2 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

TABLE 14.2 Summary of capacity-development approaches for building resilient food systems

Individual	Organizational	Networks of organizations	Enabling environment
<ul style="list-style-type: none"> • 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 • Writing workshops or joint writing sessions • Partnership or collaborative programs • Peer learning events • Participatory research • South-South learning workshops • Research grants 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Technical assistance for platforms, networks • Supporting regional networks • Documentation and sharing of good practices 	<ul style="list-style-type: none"> • 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 decisionmakers • Policy networks

Source: Ragasa et al. (2014).

Notes: CD = capacity development; ICT = information and communication technology; M&E = monitoring and evaluation.

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.

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BUILDING THE RESILIENCE OF SMALLHOLDERS THROUGH EXTENSION AND ADVISORY SERVICES

Kristin Davis, Suresh Chandra Babu, and Sylvia Blom

Smallholder farmers and rural producers are among the populations most vulnerable to climatic shocks and weather-related disasters, and their vulnerability is compounded by market fluctuations, poor governance, conflict, and disease. Extension and advisory services (Sulaiman and Davis 2012)¹ may provide an opportunity for strengthening the resilience of rural and farming households by increasing their access to tangible and intangible resources, such as inputs and knowledge. More generally, extension and advisory services may be able to play a critical role in promoting agricultural and rural development and improving the resilience of the sector as a whole.

The assumption underlying this hypothesis is that farmers lack the knowledge, resources, or both to adequately prevent, anticipate, prepare for, cope with, and recover from shocks. Extension and advisory services may be able to rectify this information asymmetry, or knowledge inequality, by providing or facilitating access to a variety of assets. These services could also promote resilient agricultural systems by relaying farm-level challenges and potential solutions to policymakers in a timely manner to enable them to make better-informed policy decisions.

Although there is an increasing base of literature on extension and advisory services, their role in building resilience in particular has not yet been explored empirically. The literature on resilience in general is itself only in the nascent stage. However, past intervention efforts that attempt to move

¹ For the purposes of this chapter, extension and advisory services are defined as “all the different activities that provide the information and services needed and demanded by farmers and other actors in rural settings to assist them in developing their own technical, organizational, and management skills and practices so as to improve their livelihoods and well-being.” Extension services can be provided by the public, private, or civil society sectors.

from emergency responses to long-term development indicate that without well-capacitated systems for implementing interventions, such a transition could be difficult (Omamo 2004).

This chapter explores the sustainable-livelihoods framework to conceptualize the capacity needs of resilience-focused extension and advisory services. It indicates where to move the policy and research agenda forward with regard to the role of extension and advisory services in building resilience.

Background

Extension and advisory services in rural areas are challenging even under normal circumstances: They must be provided consistently throughout a country, even in remote areas and despite limited incentives for providing them efficiently. Monitoring and evaluating the quality of the services provided requires substantial resources. Extension and advisory services are subject to the “triple challenge” of market, state, and community failure (World Bank and IFPRI 2010). Already underresourced, the services often face difficulties in adding new responsibilities for their staff without the requisite training, incentives, and resources.

Extension and advisory services today are viewed from a broad systems perspective, which focuses on the roles and capacities needed at individual, organizational, and system levels to address current challenges (Sulaiman and Davis 2012). In addition to the traditional role of promoting agricultural innovation and technology adoption, these services now must deal with myriad issues, including human nutrition, risk and disasters, climate change adaptation, and rebuilding after emergencies. These issues present additional challenges not only to the extension workers but especially to the farmers themselves. We hypothesize that the capacity of extension and advisory services to provide preventive measures or coping mechanisms to address these issues is a critical component of resilience.

If these challenges can be overcome, extension and advisory services may be able to aid in enhancing the resilience of farmers in several ways. One way is by acting as a coordinating body for multiple support organizations as well as by providing more relevant services. A strong extension and advisory system is well positioned to coordinate multiple groups at various stages of a shock because of its linkages at local, subnational, and national levels. Due to its potential access to timely information, the system can identify relevant actors with whom to work to ensure that intervention strategies are harmonized, relevant, effective, and timely. In this way, short-term emergency responses can be harmonized with long-term resilience-building strategies. From the service

angle, another possible way extension and advisory services could enhance farmers' resilience is by providing information and knowledge regarding weather and climate change, market prices, regulatory structures, quality standards, and consumer demands so that farmers can make informed decisions (Christoplos 2010). The services could also help identify the households most vulnerable to shocks and develop a database of those who need external assistance so that they can be cost-effectively targeted. However, such roles of extension and advisory services critically depend on how effectively the extension system is funded, organized, and implemented.

Possible Roles and Modalities for Extension and Advisory Services Support

The thinking on the use of extension and advisory services to build resilience is fairly recent. There is thus no empirical evidence looking at the role of these services in strengthening resilience. However, some cases in the gray literature provide pointers as to what this role can be. After examining the literature from the sustainable-livelihoods framework, we will discuss cases that show how extension and advisory services can strengthen resilience under this framework.

The sustainable-livelihoods framework helps show how extension and advisory services can build resilience. The framework describes five types of assets or capital: human (for example, education or health), natural (land), economic/financial (access to credit), physical (infrastructure), and social (community networks) (Carney 1998). The values of these assets depend on the existing institutions and systems as well as the vulnerability context. Extension and advisory services can contribute to enhancing each of these assets, especially human capital. We hypothesize that extension and advisory services can be particularly valuable in building resilience when lack of information is the binding constraint on farmers' resilience.

Strengthening Human Capital through Extension and Advisory Services

Specific examples from the literature suggest that human capital development in the form of education and training for smallholder farmers could be critical for resilience. This assumption underlies existing curricula to teach farmers how to deal with risk. For instance, the Forum for Agricultural Risk Management in Development (FARMD) group of the World Bank recently developed a series of learning materials for coping with risk and uncertainties regularly faced by farming communities (FARMD 2014). Such curricula can

be adapted by advisors who are working with farmers on issues of production, price, financial, legal, and other risk factors.

In studying water management and farming systems in Australia, Nettle and Paine found that extension/advisory professionals can help strengthen resilience by improving their own human capital and utilizing the social capital of their farmer networks. They found that advisors can learn from farmers about developing resilient farms; further, they suggested that advisors need stronger capacity (human capital) to represent farmers' adaptability systems to policymakers and industry stakeholders and to "broker" decisions that meet all stakeholders' needs (Nettle and Paine 2009). Spielman and colleagues (2008) argued that traditional agricultural education and training systems need to expand their repertoire to contribute to stimulating agricultural innovation. They also suggested that systems should build capacity to facilitate the efficient transfer of these innovations across the system—a crucial component of resilience.

In 2002, following Sierra Leone's civil war, the government and development partners developed a farmer field school initiative to support agricultural production and improve the country's food security. The initiative was intended to simultaneously train farmers and strengthen rural institutions—both governmental and nongovernmental. It was administered by the Ministry of Agriculture, Forestry, and Food Security as well as by nongovernmental organizations (NGOs). As part of strengthening the human and social capital of farmers as well as rural institutions, the schools trained more than 75,000 Sierra Leoneans, who have likely contributed to rebuilding farmer-based organizations (FAO 2010).

Several development agencies have developed pilot programs to determine farmers' binding constraints in becoming resilient. One such program is the Agro-pastoral Field Schools program in Uganda. It assumes that resilience can be built through a two-tiered approach, whereby groups of farmers participate in the traditional "cyclical" learning programs with extension agents to enhance household-level resilience, and communities are offered opportunities to engage in broader efforts, such as early warning systems, watershed management, and community animal health. It aims to support human capital through group learning, natural capital by promoting biodiversity efforts, and financial capital by teaching saving skills (Okoth et al. 2013). Although there has not yet been a rigorous evaluation of the performance and cost-benefit merits of this approach, it provides some idea of how extension and advisory services can build resilience through promoting different types of capital.

Potential Roles of Extension and Advisory Services in Specific Areas

In addition to looking at extension and advisory services from the perspective of the five types of capital, we also examined literature focused on potential roles that the services can play in specific areas.

Seed and input provision are often a part of humanitarian responses in postdisaster and postconflict situations. If they have acquired such knowledge through prior presence on the ground, extension/advisory agents can play a role in informing providers of what inputs are appropriate in the affected areas and which ones could be locally sourced. Extensionists can also help farmers learn how to use new varieties. As an intermediary institution, with knowledge of markets and natural resource management regimes, extension and advisory services can in theory help to ensure that agricultural rehabilitation programs are relevant and sustainable. These services may often be the only agencies operating in rural areas that are able to assist after a disaster (Christoplos 2010). For example, Malawi's Starter Pack Scheme distributed packages of high-yielding seeds and fertilizer to farmers to help them overcome the country's drought-prone conditions. The program relied on extension agents to register farmers and distributed the packs via NGO-run distribution centers (Longley, Culter, and Thompson 1999).

Regarding climate change, a core challenge for extension and advisory services in the future is shifting from providing "packages" of technological and management advice to supporting farmers with the skills and information they need to make informed decisions. Climate change increases not only year-to-year but even day-to-day variability. Farmers thus need high-frequency access to weather data as well as training in how to interpret the data and adapt their farming practices as necessary (Cooper et al. 2008). Some will also need access to new technologies and management options in areas where climate change or other shocks or stresses render their existing farming systems unviable (Davis 2009).

Information-sharing tools such as information and communication technologies (ICTs) are another area at the nexus of these services and resilience. Farmers' exposure to risk and uncertainty is often aggravated by lack of information about weather, inputs, farm management practices, or market prices; this lack of information can have an adverse impact on crop production and income. Hence, a farmer who receives quality, up-to-date information and has the ability to use it may be able to lessen the effects of these risks (Meera et al. 2012). Mobile-based information services can influence the behavior pattern of farmers, which can in turn facilitate the dissemination of information and

the adoption of improved techniques, leading to better yields. Information about weather and prices could potentially help farmers reduce their production and market risks (Aker 2011).

While information sharing and the use of tools such as ICTs can potentially reduce risks, *mechanisms such as weather insurance* can compensate for risks that have occurred (Davis and Sulaiman 2013). Extension and advisory services can possibly play a brokering and facilitation role in new insurance options. For mitigating risk, extension services can link up different stakeholders, including smallholders, researchers, insurance providers, input dealers, and other market players.

Tentative Policy Directions to Strengthen Extension and Advisory Services for Improved Resilience

The literature reviewed above provides insights into several potential policy and program options for building resilience through extension:

1. *Build individual, organizational, and system capacity to deal with risk and change.* Too often capacity has been focused at the individual level, not considering the need for organizational and system-level capacity. There is a critical need for assessing capacity requirements at all levels in order to develop a comprehensive strategy for capacity-development investments.
2. *Consider long-term sustainability.* Extension services are often pulled in different directions by political pressure and donor preferences. Building capacity for resilience-oriented systems requires shifting from the project approach to building sustainable institutions that anticipate shocks and contextualize interventions to meet the specific needs of the communities affected by them. What is needed is long-term political commitment to extension and advisory services.
3. *Use ICTs to communicate information to reduce and prevent risk.* ICTs are not a silver bullet and are not very useful without institutions and reputable information sources. However, they have the potential to quickly and cheaply share information that can strengthen resilience.
4. *Use intervention plans and programs* such as weather insurance, once it is proven viable, to compensate for shocks that have occurred. Extensionists must play an honest brokering role to link smallholders to such options. This process will require building institutional capacity of extension and advisory services to anticipate shocks and adapt existing programs that enable farmers to respond to and bounce back from a shock.

5. *Develop policies* that define the role of extension and advisory services in assisting smallholders to become more resilient. Governments should devise holistic policy frameworks for enhancing resilience that entail various complementary services, investments, and safety nets. Developing such a policy framework will require continued learning from communities that face frequent shocks, including how they deal with them and what adjustments are needed to reduce their impact. This framework can place communities on a dynamic long-term development path.

Knowledge Gaps: What Research Is Needed Going Forward?

There are major empirical gaps with regard to the role of extension and advisory services in building the resilience of rural and farming communities. Thus this chapter focuses on potential roles suggested through the gray literature. Research is needed to validate these ideas in order to generate more specific policy recommendations on the role of extension and advisory services in strengthening resilience, especially in postconflict and natural disaster-prone areas. As identified in the conceptual framework, research is needed on the role of different types of capital and how extension and advisory services can strengthen resilience through each type. This understanding is important because often different systems support or promote human, financial, physical, social, and natural capital. How can these systems be better coordinated to provide all of the different assets required by smallholders for increased resilience? What is the role of extension in this coordination, if any? Other research questions include the following:

- What are the core competencies needed by extension agents to support smallholder resilience?
- How can one identify capacity gaps at the country level?
- How can the capacity of extension and advisory services be efficiently built to simultaneously address key resilience challenges in the agriculture sector?
- What delivery models have been effective at building the resilience of smallholders?
- How can we ensure that extension and advisory services are flexible and adaptive in the face of many different types of shocks?
- Are more holistic programs more effective at building resilience?

- How can extension and advisory services coordinate disaster relief efforts with long-term resilience-building programs?

Concluding Remarks

There is a critical need for understanding the potential role of extension before, during, and after a shock. Furthermore, there is a need to undertake empirical analyses to provide specific insights for designing policies and programs that will enable extension and advisory services to be more effective, efficient, and impactful, especially in terms of building the resilience of farming households. The importance of assessing individual, organizational, and system-level needs of extension and advisory services in the context of resilience can hardly be overemphasized.

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POLICY IMPLICATIONS OF EXCLUSION AND RESILIENCE

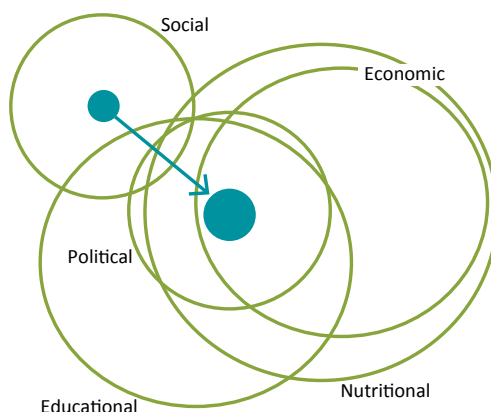
Joachim von Braun and Sukhadeo Thorat

Resilience is a desirable capability of people to deal with shocks without significant loss of livelihood, health, and nutrition. Resilience is impaired by exclusion and other forms of discrimination. Exclusion is part of a larger set of causal factors that determine marginality, which is a root cause of poverty and inequality. It is a global phenomenon, not just one of developing countries, and is fundamentally a human rights issue. Overcoming exclusion involves a complex political agenda with legal, cultural, social, economic, technological, and governance dimensions. Social psychology and behavioral issues need to be considered as well. The purpose of this chapter is to assess the relationships between exclusion and resilience, and to identify opportunities for overcoming exclusion and thereby strengthening the resilience of the poor. To address these complex issues in a brief chapter cannot do much more than raise key issues and suggest broad sets of policy actions. A few examples will illustrate symptoms, causes, and points of entry for action.

Linkages between Exclusion and Resilience

Because the concepts of exclusion and resilience are multifaceted, definitional clarity is in order.

Exclusion: The invention of the term *social exclusion* is attributed to René Lenoir (1974), who defined it as a rupture of social bonds. Amartya Sen (2000) introduced social exclusion to recent development thinking, defining it as a relational deprivation of individuals, groups, and communities of people from rights and from participation in and access to opportunities, resources, and activities that are normally available to members of society (de Haan 1999). People are often excluded in different spheres at the same time, for instance in economic, social, nutritional, educational, and political spheres (Figure 16.1). Sen made a distinction between

FIGURE 16.1 Exclusion as part of the dimensions of marginality

Source: von Braun and Gatzweiler (2013).

Note: Enhanced resilience requires capabilities of people and communities to reposition themselves from the margins more to the centers of relevant development domains. The dark circles depict an initial, more marginalized position of a person or people (on the left) and a less marginalized position (on the right).

unfavorable exclusion and unfavorable inclusion, whereby the former refers to denial of rights to a group due to its identity that others enjoy, and the latter refers to inclusion but under unequal terms. Unfavorable exclusion is also captured in the concept of market discrimination developed by Becker in the mid-1950s (Becker 1957; Arrow 1971). Both exclusions, however, have negative consequences for the excluded groups. Sen also refers to active exclusion, the result of a deliberate policy or law, and passive exclusion, caused without deliberate attempt—both resulting in marginalization. Further distinction is drawn between exclusion of a social group and exclusion of individuals. In this discussion, we refer to exclusion as a situation wherein persons with attributes or productivity similar to those of others in different groups are treated differently due to ascribed characteristics, such as social or cultural identity.

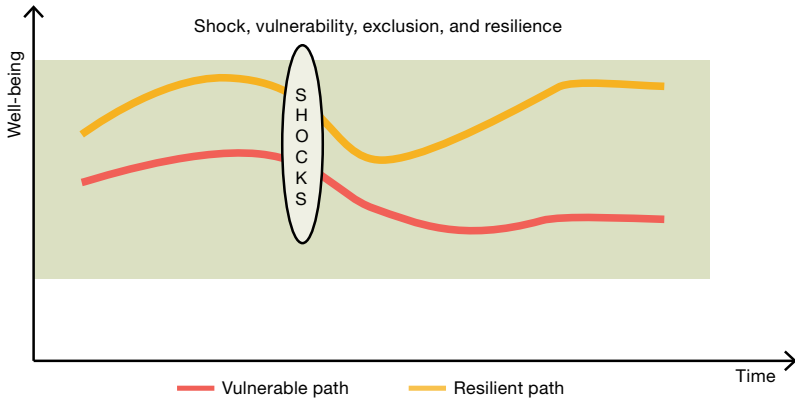
Exclusion-induced marginality: We are concerned about exclusion because it has negative social and economic outcomes, including reduced resilience. Exclusion entails costs to societies as a whole, and in particular to the excluded themselves. Insofar as exclusion entails identity-based denial of equal rights—economic, social, and political—to a group, it deprives group members

of opportunities for livelihoods that others enjoy. Denial of economic rights may result in low capacity to build assets, low employment, low skills and education, and consequently low earnings and high poverty. Restrictions on equal civic rights and participation in governance add to marginalization. Exclusion from market and nonmarket institutions results in a low rate of improvement compared with counterparts from nonexcluded groups and, hence, persistent disparities in human development between the excluded group and others (World Bank 2013). However, the channels of causation differ between the excluded poor and the nonexcluded poor. The nonexcluded poor experience general factors that cause lack of access to resources, whereas the excluded poor experience social identity–based exclusion from market and nonmarket exchange, which comes on top of the general factors and adds to the marginalization. Such identity-based social exclusion may be due to race, color, ethnicity, religion, social origin (such as caste), gender, occupation, region, nationality, or other group characteristics. These differences in the causes of poverty have policy implications insofar as group exclusion will require group-specific policies in addition to general poverty-reduction policies.

Resilience: Though the concept of resilience has evolved considerably since Holling’s (1973) seminal paper, the concept remains different for different people, disciplines, and institutions (Silver 1995; Walker et al. 2004). Resilience is the capacity of individuals and groups to anticipate, prevent, adapt to, cope with, and recover from shocks and stressors. Resilient individuals, groups, or communities tend to share the characteristics of having sufficient physical, financial, human, and social assets to absorb, adapt to, and transform shocks.

Relationships between resilience and exclusion: Exclusion quite often erodes the resilience capacity of social groups. Exclusion also brings about unequal access to public services, making excluded people’s efforts to overcome shocks more difficult than those of their counterparts from nonexcluded groups. Moreover, resilience and exclusion are in a vicious dynamic relationship over time. Typically, social exclusion perpetuates the effects of shocks and thereby undermines resilience. The socially excluded groups may collapse or converge to a worse-off steady state after disruptions, taking a protracted time to recover from shocks. As illustrated in Figure 16.2, the socially excluded groups, who are poorer than their societal counterparts and are discriminated against in access to public services, move along a vulnerable development trajectory, while their societal counterparts move along a more resilient development trajectory over time (Burchardt and Huerta 2009). Members of a socially excluded group are in a particular dilemma between “exit, voice, and loyalty,” the concepts developed

FIGURE 16.2 Resilience of more vulnerable and less vulnerable groups, where higher vulnerability may be caused by exclusion (stylized)



Source: Authors.

by Hirschman (1970) in his seminal book. *Exit* from the group may be impossible, for instance in the case of racial discrimination; *voice* may be impaired due to political discrimination; and *loyalty* may inhibit exiting in traditional ethnic communities. Such situations may lead to attempts by the excluded social group to initially focus on internal strengthening until it gathers sufficient organizational power and voice to facilitate wholesale change, such as the political transformation in Bolivia in the past decade (Postero 2007).

This situation suggests the need to build the resilience capacity of excluded groups and communities. This could be done by enhancing their access to early warning systems and to human, social, financial, and physical capital, as well as by insuring them against shocks (for instance, through weather insurance for poor smallholder farmers). Importantly, in the case of excluded groups, resilience capacity needs to be enhanced by providing legal safeguards as well as positive measures against exclusion to ensure non-discriminatory access to programs and public services that protect against shocks. Tables 16.1 and 16.2 present key aspects of exclusion and its consequences, together with the corresponding resilience characteristics and examples of potential social policy options that could help reduce exclusion and enhance resilience. Some of the proposed remedial policies, such as mandated procurement quotas of goods and services from excluded groups by public entities, may initially have a cost in terms of efficiency, which

TABLE 16.1 Aspects of exclusion and policy options for overcoming exclusion to enhance resilience

Types of exclusion	Nature of exclusion	Consequences and implications for resilience characteristics	Policy frameworks and measures to address exclusion
Groups are socially excluded based on these factors:			
• Ethnicity	• Denial of equal rights in the past, with continuation of denial in some forms in the present	• Limited ownership of assets, agricultural land, and private enterprises	• Constitutional provision for equality and nondiscrimination
• Race	• Impaired freedoms	• Low productivity and income among farmers and nonfarm enterprises	• State obligation through constitution for policies to overcome consequences of exclusion
• Caste	• Reduced access to markets (labor, land, capital, inputs)	• Poor human resources	• Laws against discrimination
• National minority status	• Reduced access to publically provided services such as education, health, water, electricity, food	• Poor social capital and social networks	• General policies of economic, educational, and political empowerment
• Religion	• Reduced access to government programs	• Low employment	• Targeted social transfers and safety nets
• Gender	• Lack of participation in governance and decisionmaking	• High dependence on wage labor	• Affirmative action or preferential policy in education, employment, enterprises, and other spheres
• Disability	• Reduced access to steps taken by government to overcome the impact of natural and other shocks and calamities	• Increased poverty, vulnerability	• Enforcement of civil rights
• Geographic remoteness		• Less resilience because of low access to assets, low employment	• Right to association (for example, trade unions)
		• Less political participation and influence on policy and monitoring	• Freedom of speech and media
		• Limited capacity to insure	• Decentralization (political, fiscal, administrative) and fair share of policymaking and monitoring to excluded groups at local level
		• Less protection against shocks due to discrimination in public measures to overcome shocks	• Equal representation of excluded groups in policy, administration, and monitoring

Source: Authors.

TABLE 16.2 Specific features of aspects of exclusion and policies for enhanced resilience

Sphere of exclusion	Nature of exclusion	Impact on resilience characteristics	Specific policies
(1) Private Enterprises (a) Farming—constraints to undertake farming	<ul style="list-style-type: none"> • Discrimination in access to farm inputs and in sale of farm output 	<ul style="list-style-type: none"> • Low use of inputs, high costs, and low profits • Low income and high poverty • Reduced adaptive resilience capacity to shocks and stressors • High indebtedness • Vulnerability to shocks 	<ul style="list-style-type: none"> • Legal safeguards against discrimination in input and product markets • Procurement of some products by the government and private sector for farmers of excluded groups • Targeted credit facilities
(b) Private enterprises and businesses—constraints faced by excluded group	<ul style="list-style-type: none"> • Discrimination in seeking various services and inputs necessary for production and in business • Low initiative 	<ul style="list-style-type: none"> • High cost, low profit, probability of losses • Low income and high poverty • Less capacity to face contingencies and shocks 	<ul style="list-style-type: none"> • Legal safeguards against discrimination • Policy to overcome discriminatory constraints faced by excluded groups in setting up business • Procurement by government and private sector from excluded groups • Targeted access to finance
(2) Employment	<ul style="list-style-type: none"> • Exclusion from opportunity to be employed • Differential access to employment • Wage discrimination, particularly in private sector • Fewer opportunities for training and learning on the job 	<ul style="list-style-type: none"> • Low employment • Low wage earning 	<ul style="list-style-type: none"> • Legal safeguards against discrimination in employment and wages • Affirmative action policy in employment • Human resource development for excluded
(3) Assets	<ul style="list-style-type: none"> • Discrimination in agricultural land market, restrictions on purchase of land • Discrimination in starting nonfarm enterprises 	<ul style="list-style-type: none"> • More households without assets • High landlessness • More dependence on casual wage labor, which enhances vulnerability and decreases capacity to deal with shocks and stressors 	<ul style="list-style-type: none"> • Policy of land redistribution for excluded • Policy of promoting private enterprise and business for these groups
(4) Education	<ul style="list-style-type: none"> • Denial of access to education • Costly vocational and professional education • Discrimination within educational institutions 	<ul style="list-style-type: none"> • Lack of interest in education due to discrimination • High dropout rate, low cognitive ability and learning • Limited human and physical capacity • Lowered aspirations • Social and psychological self-exclusion 	<ul style="list-style-type: none"> • Socially inclusive education • Explicit inclusion of women and girls • Financial support for professional and vocational education for the excluded groups

Sphere of exclusion	Nature of exclusion	Impact on resilience characteristics	Specific policies
(5) Health and health-related services	<ul style="list-style-type: none"> • Lack of access to costly private services • Discriminatory access to public and private health services 	<ul style="list-style-type: none"> • Poor health, high child mortality • Loss of employment due to illness • Indebtedness due to borrowing, aggravating poverty situation 	<ul style="list-style-type: none"> • Targeted public health service for excluded groups • Comprehensive coverage of health insurance • Legal safeguards against discrimination in health services
(6) Civic amenities, water, electricity, housing	<ul style="list-style-type: none"> • Poor availability of civic amenities in localities and houses • Discrimination in supply of civic services • Segregation 	<ul style="list-style-type: none"> • Poor health, high incidence of diseases 	<ul style="list-style-type: none"> • Comprehensive programs to supply civic amenities to the localities of excluded groups • Legal safeguards against discriminatory access
(7) Community and political decisionmaking processes and related access to information and resources	<ul style="list-style-type: none"> • Elite capture of political powers • Elite capture of fiscal and services resources • Policies less favorable to excluded groups 	<ul style="list-style-type: none"> • Frustration with being excluded, leading to aggression, extremism, and discontent • Unequal distribution of public goods • Unequal distribution of natural resources (land, water, forests) 	<ul style="list-style-type: none"> • Fair and adequate representation in political bodies • Quota systems/proportional representation • Targeted information and communications to excluded groups • Capacity enhancement for meaningful participation by the excluded in decision-making
(8) Civil rights and freedom	<ul style="list-style-type: none"> • Denial of civil rights, formally and informally through discrimination 	<ul style="list-style-type: none"> • Lack of citizenship • Lack of freedom 	<ul style="list-style-type: none"> • Laws against discrimination in civil rights
(9) Territory and social sphere	<ul style="list-style-type: none"> • Isolation, segregation in localities • Difficult areas to live in 	<ul style="list-style-type: none"> • Less social capital • Low development of region 	<ul style="list-style-type: none"> • Policies for integration • Regional plans for development of areas where excluded groups live

Source: Authors.

should be considered when searching for optimal anti-exclusion policies. Moreover, appropriate timing of phasing in and phasing out such remedial policies requires careful consideration to avoid misallocation of resources in the long run, including unintended locking in of the erstwhile excluded in subsidized, low-return employment.

Insights from economic theories on discrimination have shaped policies. Early theories of discrimination by Becker (1957) and by Arrow (1971)

asserted that discriminatory practices and imperfect information are the source of labor market discrimination and suggested that fair competition and perfect information will erode labor market discrimination. The persistence of discrimination, however, points to the significance of noneconomic factors, such as norms, identity, customs, and social categories for economic and social outcomes (Akerlof and Kranton 2010; World Bank 2013; Stark 2006). More recently, the World Bank noted the slower improvement in human development of excluded groups compared with their counterparts from the “rest” of society, the persistence of exclusion and discrimination faced by the former in market and nonmarket exchanges, and the related lack of opportunities (World Bank 2013).

Three problems of excluded groups have been recognized, namely (1) less ownership of assets and poor human resources due to exclusion in the past and continuation of the discrimination in the present in some forms, if not all; (2) slow improvement in human development compared with others; and (3) persistence of a gap in human development between the excluded and the “rest.” Specific sets of policies have been used globally, but with variations, in countries where the problem of excluded and indigenous groups persists. These policies take various names in different countries, like “equal opportunity” policies in the United States, “fair employment” policies in Northern Ireland, “reservation” in India, “special measures” in Japan, “New Economic Policy” in Malaysia, and “affirmative action” policies in many other countries.

Notwithstanding the differences in the strategies and methods across countries, some common threads run through all of them: (1) equality in law and legal safeguards against discrimination, (2) policies to improve access to assets and human resources, and (3) affirmative action policies for fair access to education and employment. Legal safeguards against discrimination are intended to provide equal opportunities to excluded groups and safeguards against discrimination. But such legal safeguards have their limitations in terms of correcting the impact of past exclusion. Therefore several countries have used policies to “compensate” for losses in physical and human capital due to denial in the past. However, often the continuation of discrimination in the present in some form limits participation of excluded groups in development, and therefore “legal and compensatory measures” are supplemented by affirmative action policies to ensure fair share in employment, education, governance, and other spheres.

Country Experiences and Lessons

A few country cases will illustrate the diversity of exclusion patterns and the policy measures implemented to address them.¹ While we can note an increased level of effort by these governments to address the broader exclusion problems, much remains to be done about inclusion of the marginalized poor. We focus on a set of large and emerging economies with a strong potential for overcoming exclusion, all of which have taken action to overcome exclusion, but with varying degrees of success. Implicitly there are lessons for low-income countries from these countries.

Social exclusion in **India** is to a large extent determined by a group's social and ethnic origin. The excluded groups of low-caste untouchables and indigenous tribal populations have suffered from social exclusion. While the former suffered from intense discrimination and denial of rights, the latter faced physical and social isolation. Besides these two groups, there is a third one called "other backward classes." This group, unlike untouchables, does not face exclusion and isolation associated with untouchability but does experience discrimination and is educationally and socially less developed (Thorat 2013). For the purpose of government policy, these three groups are designated as "scheduled castes," "scheduled tribes," and "other backward classes." These groups lag behind with respect to human development indicators such as access to resources, education, and employment, including civil rights, and the poverty among them is relatively high compared with their counterparts from high-caste and nontribal groups (Thorat 2013).

Since independence in 1947, India has recognized these groups' exclusion-induced marginalization and used a threefold strategy to combat it: laws against caste and gender discrimination; measures to improve ownership of capital assets, which include distribution of agricultural land and special financial support to set up enterprises and business; and an affirmative action policy in government educational institutions, public employment, public housing, and the legislature. In 2008, the private sector also accepted an affirmative action policy on a voluntary and self-regulatory basis, which includes four E's: steps in education, employability, entrepreneurship, and employment. For the scheduled tribes, since they live in concentrated areas, the three policies are supplemented by a policy of securing the land and forest rights and developing infrastructure in tribal regions.

1 On the complex matter of measuring ethnic diversity see Evers (2014).

These group-focused policies are used as measures in addition to the general policies of growth and poverty alleviation. Affirmative action has brought improvement in the education level and in participation in public employment and political governance, and it has helped to reduce poverty (Thorat and Dubey 2011). However, the rate of improvement in the human development and nutrition indicators and in poverty reduction is slow, especially regarding women, and the gaps persist. One reason for the persistence of gaps may be limited coverage by the affirmative action policy, which is confined to the government sector, accounting for only about 20 percent of total employment; the remaining 80 percent of jobs, in the private sector, are excluded from quotas. Additionally, half-hearted enforcement of the affirmative action policy in some spheres is also a reason for slow improvement.

China officially recognizes the Han majority and 55 different minorities. Most ethnic minorities, which account for about 8 percent of the Chinese population, typically share a common history. These minorities are different from Han in many important aspects, including culture and religion, language and education, geographic location, and means of sustenance. The ethnic minorities are mainly concentrated in western China.

Under its constitution and laws in 1949, the People's Republic of China provided equality among all ethnic groups in social life and government activities. For the ethnic minorities, China has used a dual policy: an area-focused general policy of economic development of ethnic regions and a preferential or affirmative action policy for persons from ethnic minorities. The preferential policies for minorities include education, local and national governance, and other spheres. Minority persons can benefit from preferential policies, such as easier entrance into college and exemption from the rigid population policy. At the regional and subregional levels, areas with high concentrations of ethnic minorities have special political and administrative status. Five autonomous regions at the province level, 76 autonomous areas at the prefect level, and 699 autonomous administrative units at the county level are given special status. The administrative structures with elements of self-government make it possible for different levels of the government to support ethnic minorities by lowering taxes and providing budgets for public expenditure (Gustafsson and Sai 2009). The affirmative action policies are combined with the general policies of infrastructure and economic development and with poverty-alleviation programs at the level of ethnic regions.

However, despite these positive changes, the ethnic minority regions perform worse with respect to poverty reduction and other human development indicators compared with the Han majority population (Ouyang

and Pinstrup-Andersen 2012). This gap seems to be mainly due to high initial inequalities and the difficulties associated with the inhospitable geographic situation in the western regions where minorities are concentrated. At a broader scale, implicit exclusion was the consequence of lack of infrastructure and restrictions on rural out-migration. The underinvestment in rural areas in combination with migration restrictions has fostered both the marginality and the large rural-urban disparities. Recently the extreme poverty has been quite effectively addressed by infrastructure buildup and the evolution of social policies, especially in rural areas, closely connected to China's economic growth (Zhu 2014). Specifically, the Chinese government extended the *Di Bao* (minimum livelihood guarantee) program to the entire rural sector, enhanced agricultural policies, and stepped up rural socioeconomic development efforts. Transition from an emergency relief and basic needs program to an inclusive social protection system is in progress, aligning the poverty reduction programs for the rural poor with efforts in urban areas, including the fast expansion of health insurance coverage in rural areas.

Mexico has a large indigenous population with a much lower quality of living than the rest of the country. Education and civic amenities such as drinking water and electricity are inadequately available. Poor education levels reduce access to employment. Lack of education is particularly high among indigenous people and females (Hall and Patrinos 2004; de la Peña 2011). The constitution, however, prohibits discrimination associated with ethnic or national origin, gender, age, and religion.

The laws, in principle, provide safeguards against social exclusion and discrimination, and the government has developed legal safeguards to ensure indigenous rights and set up an indigenous rights department. The legal protection measures are supplemented with affirmative action policies to ensure material equality, including representation by indigenous people, particularly women, in state politics and political parties. In the past two decades conditional and unconditional transfer programs have become widespread. Mexico initiated conditional cash transfers (CCTs) in the 1990s. The well-known program *Oportunidades* (earlier called *Progresa*) transfers cash income directly to the beneficiaries, conditioned on their children's and youth's school enrollment and regular attendance, as well as regular health checkups of the entire household and regular attendance at information sessions on nutrition and healthcare. Centrally determined rules on the targeting of communities and households do not leave discretion to local governments.

One would expect that a uniform transfer program like *Oportunidades* would benefit the marginalized and excluded relatively more, but whether it

actually is effective in overcoming exclusion and strengthening resilience is not clear. *Oportunidades* has successfully contributed to reducing household members' incidence of illness. The number of calories beneficiaries get from vegetables, animal products, grains, fruits, and other sources has increased by about 7 percent, and child stunting has decreased (Skoufias 2005; Adato and Hoddinott 2010). But despite the improved human-capital indicators, which will have positive impacts on resilience, overall income poverty and inequality have not declined in Mexico since the program started, nor have regional inequality and related exclusion patterns (CONEVAL 2009).

Indirect dynamic effects of CCTs, including corruption, might play significant roles not captured in randomized controlled experiments. A first such effect is that a locally focused, decentralized cash transfer program sends a disincentive for labor migration (Levy 2008). Social protection, in combination with social security and *Oportunidades*, may have been leading to a larger informal sector with lower wages and lower productivity. Social policy reform has to be carried out simultaneously with fiscal and labor market reforms. Another important implication of CCT programs is their impact on social mobilization at the local level. The impact of *Oportunidades* on civil society initiatives—defined as density of civil society organizations (CSOs), paying special attention to women's CSO activities—was found to be a reduction in CSO group formation (Grimes and Wängnerud 2010). Apparently, CCTs need to be accompanied by other policy actions to strengthen civil society.

South Africa is a case wherein the majority population suffered from exclusion in multiple spheres, resulting in marginality. With the end of apartheid in 1994, South Africa attempted to deal with the consequences of exclusion for the black African population through an affirmative action policy and a program called Black Economic Empowerment (BEE). It began with a bill of rights inserted in the 1996 constitution. In the constitution and law, discrimination on any grounds is considered illegal, and the state has an obligation to promote equal development. Affirmative action in hiring, promotion, university admission, and awarding of government contracts is specifically mentioned. Representation of all people in public administration is included in affirmative action policy. This policy also includes preferential entry into public and private employment, which is backed by the Employment Equity Act of 1998 and monitored through the Commission for Employment Equity.

In the private sector, one of the most important policies is enhancing the ownership of private enterprise through BEE, with several facilities to enable the startup of enterprises. In political representation, particular attention is

given to ensuring at least a 30 percent quota for women. The BEE program has come under criticism that it arguably has led to the emergence of a small, rich black business class without addressing the poverty of the majority of the black population (Batshaw and Goldberg 2005; Edigheji 1999a). There is increasing demand to switch over from the minimalist approach of the BEE to a maximalist approach with a focus on the collective empowerment of the majority of the black population. Thus, while some suggest that the affirmative action policy has brought significant gains to the black population (Edigheji 1999b), the unequal distribution of these gains has led to demands for a more inclusive approach.

Malaysian society has historically been heterogeneous, not only polarized along cultural, racial, and religious lines but with an evident divide in many facets of society. The ethnic divide coincided with economic divisions, with Chinese dominating the modern sector of the economy in urban areas while Malays were mostly engaged in agriculture in rural areas. Like blacks in South Africa, the Malays are a majority ethnic group that has lagged behind the Chinese in many respects.

The polarization of Malaysian society along economic and ethnic lines fueled riots in 1969 (Faaland, Parkinson, and Saniman 2003). Thereafter, the Malaysian government developed the New Economic Policy in 1970 with a goal of poverty reduction for all but with an emphasis on reduction of ethnic economic imbalances through preferential treatment of Malays. A major component of the New Economic Policy was affirmative action for Malays in the private and government sectors, including a massive push for higher and professional education for Malays, as well as preferred entry into public and private employment. But possibly more important was a policy to increase Malay ownership of private enterprises (Jomo and Hui 2009; Gomez 2003; Edigheji 2008) by providing licenses and other facilities for setting up industries.

This latter policy also included measures to increase Malay ownership of equity capital in national and foreign companies through setting up a national equity corporation (called Permodalan Nasional Berhad) to supply finances to Malays, particularly to the relatively poor classes, such as housewives, farmers, and laborers, to hold shares in national and foreign companies (Edigheji 2008). As a result of this policy, the proportion of Malays who own shares increased from 7 percent in 1970 to about 25 percent just after the turn of the millennium. Such ownership confers participation in management and a share in corporate income. The proportion of Chinese who own shares also increased, reaching 42 percent in the 1990s, up from 34 percent and exceeding the policy target by 6 percent (Haque 2003). It is

interesting to note that the Permodalan Nasional Berhad policy approach was carefully observed internationally and later adopted by South Africa (Haque 2003).

The overall effect of the new policy was improvement in the life of Malaysians, with poverty declining from about 49 percent in 1970 to 15 percent in 1990. Unemployment declined to a minimum level, and infant mortality declined from 45 per thousand in 1970 to 12 per thousand in 1994. However, the policy reform's impacts are debated even today. While the major goal of reducing imbalances and achieving poverty reduction in combination with accelerated growth were clearly positive outcomes, these overall achievements were not without adverse other developments, such as increased intra-ethnic inequalities and the emergence of a small, politically powerful, and disproportionately wealthy Malay elite. Some also argue about brain drain due to emigration of skilled non-Malays and weak human capital in the labor force, as well as elusive national unity (Gomez and Saravanamuttu 2012).

To come to a balanced assessment of affirmative action policies' achievements and problems, one would need to work from scenarios of viable alternatives. Such research would present challenging complexity. Also lacking are comprehensive assessments that segment early and late effects in evaluating affirmative action, which would appropriately address when affirmative action policies should be phased out, especially when adverse side effects might become more significant.

Concluding Thoughts

Insights from theories and empirical research indicate that noneconomic factors, namely norms, identity, and social category, matter for decisionmaking and economic outcomes. Empirical evidence confirms that excluded groups and communities face identity-based exclusion from opportunities in market and nonmarket exchange and in social and political processes, resulting in high poverty and marginalization. Exclusion also affects economic growth. A narrow focus on building the resilience of the excluded is not enough. A combination of legal, economic, social, and cultural policies is needed.

Insights from economic theories of discrimination indicate that improving market competitiveness might reduce discrimination but has limitations in fully overcoming exclusion. Therefore in addition to general pro-poor policies, including policies for making the markets and information work for excluded groups, countries with a sizable presence of excluded groups should use group-specific affirmative action policies to address poverty and marginalization of excluded groups.

Countries have used specific policies and instruments to address the problem of discriminated-against groups. The policies and measures mainly include (1) provisions in the constitution against discrimination and for equal rights, laws against discrimination, policies for empowerment in asset ownership and human resource development, and fair representation in political governance through affirmative action policies; (2) policies for development of regions with concentrations of ethnic minorities; and (3) combined use of general policies of economic empowerment and group-specific affirmative action policies.

While these policies have yielded positive results in many countries, they also provide lessons for further improvement. Evidence shows that the rate of improvement in the human development of excluded groups is slower than in their counterparts from nonexcluded groups, and often the gaps between the two are persistent. The reasons for this stickiness of gaps are context specific and may be rooted in cultural and aspirational factors. There is a need to provide legal safeguards in many unprotected spheres, such as discrimination in education and health institutions and in government programs, as in India.

Affirmative action policies have been designed to include large parts of the population in some countries, sometimes the majority, such as in South Africa from the 1990s until today and in Malaysia since the 1970s. In some countries these policies tended to benefit a small group and develop intra-group inequalities. There is a need to develop general and affirmative action policies that are more inclusive, particularly of the most marginalized among the excluded groups.

Exclusion can drastically reduce resilience against shocks and uncertain events. Resilience is high if people have assets to fall back on. Also, proper human capabilities enable people to look for alternatives when unfavorable events occur. Exclusion restricts access to assets and the capacity to face shocks. Therefore exclusion needs to be tackled by improving access to assets. The likely discrimination in access to supportive measures during disasters, such as floods and earthquakes, and during economic crises, such as high inflation, recession, or financial crises, aggravates the situation of excluded populations compared with their counterparts. For example, the Dalit in India faced discrimination in accessing government and civil society support during two earthquakes and a tsunami. Therefore special supportive measures are needed to ensure nondiscriminatory access and to build resilience.

Achieving more resilience of the excluded in general requires overcoming exclusion in the first place. Ways to achieve this goal, aside from enforcement of equal rights legislation, include enhancing capabilities through ownership of assets and development of human resources. But for the marginalized poor, direct public

investment in resilience, such as basic health and nutrition and civic amenities, needs to come first in order to build the capabilities to engage for inclusion.

It is rare for the excluded to participate in policymaking and in implementing programs for resilience. Therefore their participation in policymaking and monitoring must be boosted in order to design and implement effective policies. Similarly, developing self-organization among excluded groups is useful to improve access.

The causes and consequences of exclusion are quite well understood. Knowledge gaps relate more to identification of points of entry for action, and to best fits of action for local and national circumstances, as exemplified in the country experiences.

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GENDER AND RESILIENCE

Neha Kumar and Agnes Quisumbing

Households in developing countries use a variety of mechanisms to cope with shocks, such as drawing down assets, accessing capital markets, reallocating labor, and receiving private or public transfers. Whether these mechanisms enable them to manage risk in the long term and to become more resilient, however, may depend on both the context and the specific household circumstances, particularly the household's asset endowments. Studies on risk and vulnerability have shown that in general, poorer households are less able to guarantee their basic needs when faced with negative unexpected events, often disposing of assets to assure consumption, but with negative consequences for future well-being. Similarly, the literature on assets and poverty traps suggests that households with very low levels of assets may be trapped in a low-level equilibrium, from which escape from long-term poverty is difficult.¹ Despite the growing recognition that effective social protection is important to help poor and vulnerable households avoid long-term descent into poverty, there is still relatively little awareness of the differential vulnerabilities of men and women within those households. Men and women may be exposed to different types of risk because of a combination of biological, economic, and cultural factors, including gender roles—the socially determined relationships between women and men. Men and women may also have different ways of insuring against and coping with risk. Understanding differential exposure and response to shocks is key to helping men and women become more resilient in the face of risk and uncertainty.

This chapter attempts to unpack the relationship between gender and resilience by reviewing the evidence on men's and women's differential exposure to risk and the differential impact of shocks on men and women,

1 See the July 2013 issue of *The Journal of Development Studies*, which has a special section on poverty traps and asset dynamics.

and by examining the different types of mechanisms that men and women use to cope with and insure against risk. In reviewing these mechanisms, we assess whether they contribute to building resilience and we suggest gender-sensitive insurance mechanisms that will allow men and women alike to manage and cope with risk and vulnerability.

Do Men and Women Face Different Risks, and Do Shocks Affect Men and Women Differently?

Men and women face different risks throughout the life cycle. Although mortality and morbidity risk is higher for male infants, biological factors related to menstruation, pregnancy, and lactation increase women's and girls' risk of experiencing micronutrient malnutrition and poor health during their reproductive years (FAO 2000). Adolescent girls, owing to their youth and low social status in many societies, are at risk of early marriage or risky sexual behavior during a critical period for investment in their own human capital (Chen, Dunne, and Han 2006). Gender roles in agriculture also influence the different occupational hazards men and women face.²

Men and women may also have different capabilities to manage risk and cope with shocks. It is commonly perceived that women may be less able than men to cope with and overcome crises because they have less access to and control over resources and because they experience gender-based vulnerabilities, including extensive time burdens; threats or acts of violence; and limited legal benefits and protections, decisionmaking authority, and control of financial resources (Quisumbing et al. 2008). In the face of crisis, women are more likely than men to lose assets and formal-sector jobs, and their workloads, both at home and in the informal sector, increase more dramatically than men's (Quisumbing et al. 2008). A recent empirical analysis of 141 countries from 1981 to 2002 found that natural disasters lower the life expectancy of women more than that of men (Neumayer and Plümer. 2007).

Evidence on the differential exposure or vulnerability to shocks by gender comes from studies that compare differences *across* male- and female-headed households as well as those that compare differential exposure and impact of shocks on men and women *within* the same household. We find, for example, that in Ethiopia and Bangladesh, controlling education, household size, asset holdings, and size of land owned, among other factors, female-headed households are more likely to report experiencing a reduction in living standards or asset holdings

2 For a review of different risks that men and women face with implications for their health and nutritional status, see Harris (2014).

as a result of the 2007–2008 food price increases (Kumar and Quisumbing 2013). However, the drawback of studies that use headship as a proxy for gender differences is that they do not examine what happens to men and women *within* households. Another issue with these studies is that female-headed households are intrinsically different from male-headed households in terms of observable as well as unobservable characteristics, arising from the very same processes that make a household male- or female-headed. Therefore, differences between male- and female-headed households may reflect these differences along with the difference in gender of headship.

Whether men and women face different risks would be irrelevant for policy if households shared the same preferences, pooled resources, and shared risk equally within the household. However, accumulating evidence from Côte d'Ivoire, Ethiopia, Kenya, and Ghana suggests that risk is not shared equally within the household. In Ghana, transitory incomes earned by different members of the household have different effects on household expenditure patterns, implying that household members do not completely offset each other's risk (Doss 2001). In Ethiopia, illness has different effects on men's and women's nutritional status, as measured by body mass index. Individuals are generally able to smooth consumption over time when faced with shocks to household and individual incomes in most of the Ethiopian highlands. However, in poor households in the south of Ethiopia, where customary laws on settlement at divorce are biased against women, women fare worse when faced with unexpected illness (Dercon and Krishnan 2000). A preliminary study in Côte d'Ivoire also rejected the hypothesis that shocks do not affect household expenditures. Conditional on overall levels of expenditure, the composition of household expenditure is sensitive to the gender of the household member benefiting from better-than-average rainfall: rainfall shocks associated with high yields of women's crops shift expenditure toward food (Duffo and Udry 2004). Spouses may also look outside the household for insurance mechanisms, such as in Ghana (Goldstein 1999). It is argued that women pool their risk with other women in the village while men have a wider and less defined risk pool. Indeed, transfers from the spouse and the extended family seem not to be responsive to shocks, but those from nonfamily friends are.

Although this literature has documented that shocks affect men and women differently, evidence on how shocks affect men's and women's asset holdings is relatively scarce. Yet attention to assets arguably is important, because assets significantly affect future income streams, consumption, and well-being. Selling off assets to cope with shocks may reduce resilience in the long term.

Gender roles affect the stock, amounts, and types of assets that men and women own, whether individually or jointly, and the extent to which these

asset stocks are affected by shocks. Our ongoing work in Bangladesh and Uganda shows different patterns of household and individual asset ownership (Quisumbing, Kumar, and Behrman 2011). In Bangladesh, most household land is owned by the husband, but the bulk of nonland assets are jointly held by husband and wife, although husbands exclusively own a large percentage of durable assets in the household. Wives are the sole owners of only a very small proportion of household assets. In contrast, in Uganda, the largest proportion of nonland assets is held by the husband (head), followed by jointly owned nonland assets. Similar to Bangladesh, a very low fraction of household assets is owned by the wife alone. Households in Bangladesh and Uganda face shocks owing to droughts, floods, and food price increases, and also illness and death. However, we find that although many shocks are similar in both countries, their impacts differ. The small impact of weather-related shocks on wives' assets in Bangladesh may reflect lower direct exposure to agricultural risk because Bangladeshi women rarely cultivate land independently, combined with effective targeting of emergency assistance as well as the low level of women's ownership and control of agricultural assets. On the other hand, illness has a large negative impact on wives' landholdings in Bangladesh, while the impact of the death of a family member is borne largely by husbands' nonland assets. The differences in the relative impact of the shocks, and their impacts on different types of assets depending on whether they are owned by men or women, show that responses to shocks are context specific and that *gendered* responses to shocks are even more so.

Coping with Shocks through the Gender Lens

In this section we discuss coping mechanisms and how each mechanism can have gendered implications. We can think of coping strategies as *ex ante* (whereby the household prepares for a future shock) or *ex post* (whereby the household reacts to a current shock). When a household is unable to undertake *ex ante* coping strategies or when these are insufficient, individuals are forced to undertake *ex post* coping. Both *ex ante* and *ex post* coping can have long-term gendered consequences.

Adjusting consumption patterns: There is evidence that when faced with economic shocks, poor households adjust their consumption patterns. They do so by eating less and eating poorer-quality (less-preferred) foods. Within the household it has been shown that women often end up absorbing such shocks (Holmes, Jones, and Marsden 2009). Women can be more vulnerable to such dietary shortfalls depending on their age, pregnancy/lactation status, and so on (FAO 2000). Comparisons

across male- and female-headed households show that female-headed households are more susceptible to a shock like the rise in food prices and tend to eat less-preferred foods and cut back on quantities served (Kumar and Quisumbing 2013). Such coping strategies, especially for pregnant and lactating women, can have adverse long-term consequences for children in terms of nutrition and cognitive development as well as for economic outcomes, and thus they do not improve the resilience of households (Alderman, Hoddinott, and Kinsey 2006). To the extent that women often resort to these mechanisms it is important that social safety net policies be mindful of the possibility that coping strategies may have long-term effects on the nutritional status of children and thereby reduce resilience.

Labor supply, migration, and remittances: Shocks can also induce households to increase their labor supply in order to compensate for the increased expenditure or reduced income caused by the shock (Berloff and Modena 2009). In some contexts there are cultural barriers and barriers associated with gender roles that restrict women from entering the labor market. Even when women can enter the labor market, multiple factors do not work in their favor. There is a gender wage differential in labor markets in a large part of the developing world (whereby women get a lower wage for the same job) and women are often subject to sexual and physical abuse (Garcia, Hernadez, and López-Nicolàs 2001; Hinks 2002). Increased labor supply by women in response to a shock, whether in the local labor market or outside, can have important implications for children in these households, particularly for adolescent girls, who then have to take on domestic responsibilities (FAO 2008; Holmes, Jones, and Marsden 2009).

Migration is another coping strategy often used if the local labor market opportunities are not sufficient or perceived benefits from migration outweigh the costs of entering the market locally. Migration may increase resilience for both origin households and migrants. People may move not only to pursue better opportunities but also to escape economic, political, or social distress. Migration benefits the origin household not only because of potential remittances but more immediately because there is one less mouth to feed during hard times. The family's choice of a migrant is gendered, with families investing in different children's migration. Because women are more likely than men to leave their natal villages to marry in many countries, marriage, as well as marriage-related migration, has a prominent role in resilience.³ In Bangladesh, brides from households that are more pro-

3 See the classic article M. Rosenzweig and Stark (1989).

tected from floods due to the construction of an embankment are more likely to marry wealthier husbands and command larger dowries, and less likely to marry their cousins (Mobarak, Kuhn, and Peters 2013). In rural India, where women migrate for marriage but men are lifetime residents in the household and village, daughters-in-law living in the village and daughters of the household head who have married and moved to their husbands' village link families of origin and destination in mutual aid arrangements (Rosenzweig 1993). However, whether maternal migration has adverse impacts on children may be context specific: in Nicaragua, there is evidence of a positive relation of mothers' seasonal migration and children's outcomes (Macours and Vakis 2010).

While remittances may be used to smooth consumption, there is also evidence that they are used to facilitate a transition out of agriculture, whether through encouraging more diverse livelihoods or through financing the education of children in the origin households, both of which can build resilience for rural households (Davis, Carletto, and Winters 2010). The impacts of these remittances can be gendered: in El Salvador, additional income derived from migration increases girls' education and reduces women's labor supply but does not affect activity choices for males 14 years or older (Acosta 2006). While there is yet limited evidence that the *use* of remittances varies according to the gender of the remitter, there is robust evidence that parents rely differently on children of different sexes for support. In the Dominican Republic and the Philippines, where parents rely more on migrant daughters than sons for remittances, remittances are more likely to come from daughters (de la Briere, et al. 2002; Lauby and Stark 1998). Filipino migrant daughters are more likely to send home a larger portion of their earnings if they experience positive income shocks, compared with sons (Quisumbing and McNiven 2010). Evidence from Thailand also suggests that female migrants tend to behave more altruistically than males (Vanwey 2004).

Migration can have important gender implications with regard to not only the decision to migrate but also the consequences of migration in the event that migrants face unsafe working environments, which can exaggerate their vulnerabilities (Singh 2007). Migrant workers are vulnerable due to the obstacles they face in securing alternative employment, their social isolation, and their lack of language skills and financial resources. Although both male and female migrants may be vulnerable, females are more so: the vast majority of workers subjected to sexual harassment are women, particularly those in nontraditional jobs and predominantly male environments, and women who work for male supervisors have been found to be more likely to be subjected to

harassment (McCann 2005). Moreover, because women are overrepresented among those who seek employment opportunities abroad as a means of survival as jobs disappear in their countries of origin, it is not surprising that women make up the vast majority of trafficked persons. Recent estimates from the US State Department place the figure at 80 percent (Chuang 2006).

Asset accumulation: Assets can serve as a buffer when households face economic shocks. Assets can be used to smooth consumption and prevent households from potential long-term impacts of shocks. Therefore asset accumulation is an important *ex ante* risk-coping strategy. The poverty traps literature suggests that a very low initial level of assets can trap households in long-term poverty (Carter and May 2001). Linking the asset poverty trap literature to the literature on gender gaps in asset ownership, and drawing on the evidence that resources within households are not always pooled, we can argue that women, who on average own or control fewer assets than men (Deere and Doss 2009), are more susceptible to being trapped in poverty when faced with shocks. In the case of marital dissolution owing to death or divorce, women's lower asset stocks could leave households being maintained by women at higher risk of poverty. Men and women also prefer and tend to own and accumulate different types of assets (Quisumbing 2011). For example, women are more likely to hold assets that are more liquid, such as jewelry or small poultry, which are also more likely to be sold to smooth consumption (Antonopoulos and Floro 2005; Frankenberg, Smith, and Thomas 2003). Social ties and networks can have implications for asset growth as well, increasing the ability to borrow without having to draw down assets. In Bangladesh, where women own fewer assets than men, interventions that build women's social capital by working through women's groups also help them accumulate physical assets (Quisumbing and Kumar 2011).

Savings, credit, and insurance: Access to financial services can affect the ability of rural households to save and take loans, an effect that can have implications for coping strategies. A review of microfinance in Africa south of the Sahara found positive impacts on savings levels, short-term asset accumulation, health, food security, and women's empowerment (van Rooyen, Stewart, and de Wet 2012). There is also evidence that women utilize borrowed funds for more productive purposes than men (Pitt and Khandekar 1998). Access to formal insurance can prove to be an important coping mechanism as well. In the developing world, various types of insurance products can be useful—life insurance, medical insurance, and agricultural insurance to name a few. Insurance programs, in general, aim to protect the insured individual from the potential negative effects of exposure to shocks. Thus, by

definition, these programs are meant to increase resilience. Because women are more vulnerable to health-related shocks (whether to their own health or to that of a household member) and death of a spouse, and because evidence suggests that women's assets are drawn down to cope with illness shocks, it has been argued that comprehensive health and life insurance can assist women in coping with these shocks better (Banthia et al. 2009). However, the main challenge has been in designing effective insurance programs that are both operationally feasible and affordable. Many agricultural insurance programs are designed without paying attention to gender differences (Fletschner and Kenney 2011). Recent preliminary work on agricultural insurance in Bangladesh suggests that women may be interested in buying agricultural insurance products (Kumar 2014). First, women are just as likely as men to purchase agricultural insurance. Second, financial literacy and understanding of the insurance product are important factors affecting uptake. Women are at a disadvantage as compared with men when faced with an insurance purchase decision because of the gender differential in education. Third, marketing insurance through groups can be beneficial for women—through positive spillovers from higher levels of understanding and financial literacy—and preliminary evidence suggests this does not necessarily result in the group decision's being influenced by a few.⁴ Fourth, when provided with insurance products against risks that are more relevant to women (life insurance for their spouse) they will opt to insure against them.

Social protection: Many national governments (with help from international donor agencies) have set up safety nets to protect chronically poor households from shocks. Because shocks can exacerbate gender inequities (for example, in terms of nutritional status), social protection programs need to be sensitive to gender in their design in order to have gender-equitable effects. Ethiopia's Productive Safety Net Programme (PSNP), which was implemented in 2005, had a gender-sensitive approach. Beneficiary households were targeted using a community-based consultation process that included participation of women to identify the truly poor households. Female-headed households, in which labor is often scarce, were selected into receiving Direct Support, the unconditional transfer component of the PSNP (Coll-Black et al. 2012; R. Holmes and N. Jones. 2011.). PSNP tried to address women's needs by constructing water and fuelwood resources at the community level and allowing women

⁴ While marketing through groups, one may fear that the group decision is made by a select few. However, our work in Bangladesh shows that the group decision does not deviate from the individual decision.

participants in workfare programs to switch to Direct Support when pregnant or lactating (to reduce their time burden) (Holmes and Jones 2011). Another key objective of the PSNP was to help beneficiaries build their asset stock and improve resilience toward shocks, of benefit to households with low asset levels and women-headed households, which tend to start up with a lower level of assets and to be at greater risk of asset depletion (Berhane, forthcoming).

Policy Implications

The preceding discussion shows that different shocks and coping mechanisms can affect men and women in different ways. Policymakers should be mindful of these gendered nuances when designing resilience-enhancing programs. We offer the following insights from our review of the evidence:

- Women, on average, own and control fewer assets than men and are therefore more susceptible to being trapped in long-term poverty, particularly if they need to support their families on their own or if resources are not shared within the household. They may also be prone to using consumption adjustment strategies that have negative long-term impacts, such as distress sale of women-owned assets or sacrificing their own and their families' health and nutritional status. Interventions should therefore be designed to give women a head start in the process of asset accumulation, enabling them to accumulate assets in their own right as well as to save during good times. This means that providing women access to a whole range of financial instruments—both savings and credit—is important.
- Because the demands on women's time are already quite high, safety nets designed to pull households out of poverty should consider providing unconditional transfers to chronically poor female-headed households or pregnant/lactating women (as did PSNP) to assist them in coping with shocks while building assets and thereby increasing resilience toward future shocks. Conditional cash transfers tied to conditions that are easily met by women and female-headed households—such as those conditioned on children's school attendance or on regular visits to health clinics—can also work toward building resilience.
- Migration can have positive or negative consequences for households of migrant men and women depending on the context. However, ensuring the safety of migrants themselves remains an important policy issue, particularly for women migrants, who are in greater danger of being

subjected to trafficking. Provision of accurate information regarding migration prospects and ensuring that migrants have safe work environments and efficient mechanisms for sending remittances are measures that can help male and female migrants alike. But assuring a safe work environment and adequate legal protection is especially important for female migrants, who may face increased risk of gender-based violence outside their own communities.

- There is clearly a case for insurance that meets men's and women's needs, but we know very little about the demand for such products and willingness among insurance companies to actually provide these products. More exploratory work is needed on designing insurance products that are tailored for men's and women's different needs.

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SOCIAL CAPITAL AND RESILIENCE

Quinn Bernier and Ruth Meinzen-Dick

People have always faced shocks and have devised a variety of institutional responses to cope with, recover from, and prevent future impacts. Central to these shocks and this coping capacity, but often underexplored, is the role of social capital. Social capital includes “features of social organization, such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam 1995) and can serve as an asset for communities, enabling them to engage in and benefit from collective action and cooperation. While social capital takes many forms, of particular interest here are local-level organizations and less formal social networks.

Having long played a role in individual, household, and community risk-smoothing and risk-sharing practices (Fafchamps and Lund 2003), social capital has also been identified as a vital component of adaptive capacity (Adger 2003) as well as a key factor contributing to post-disaster recovery (Nakagawa and Shaw 2004). Practitioners often assume that the poor, who lack other assets, can develop, acquire, and utilize social capital instead; however, as many studies have illustrated, the poor face significant challenges in building and using this resource (DiGregorio et al. 2013). Moreover, social capital by itself may not be sufficient to encourage proactive adaptive behaviors and changes; external interventions may be needed to strengthen indigenous associations and support for resilience. However, clearly understanding local-level social capital is necessary for such interventions to effectively engage with, and not erode, effective local responses. This chapter explores how local forms of social capital can contribute to resilience and how policy interventions can build up, support, and deepen these connections.

Community-based Organizations

Community-based organizations are local groupings of individuals that can be either informally organized or formally registered. While some community-based organizations are founded through outside

interventions, many have originated through local initiative. These organizations can undertake a wide variety of tasks, such as managing shared natural resources, collectively marketing agricultural goods, offering credit, or performing civic and religious functions. Within these groups a diversity of arrangements exists, from those with more formal codified rules to informal organizations that depend on social enforcement mechanisms. However, all are based upon bonds of trust and interpersonal relationships.

Community-based organizations can play a role in building local-level resilience by helping to manage risk and smooth consumption, facilitating the adoption of new agricultural technologies, helping smallholders to access markets, increasing access to external funding and knowledge, encouraging bonds of trust and collaboration between members, sharing information among members, imparting new skills, diversifying income sources, building up asset and capital ownership, or managing conflict. However, while local groups may facilitate the accumulation of assets and help members accrue various capitals (economic, social, political), they may operate on unequal terms, with barriers that exclude vulnerable members of the community through restrictions based on sex, religion, caste, or other socioeconomic divisions. Moreover, the risk-sharing nature of these forms of local collective action is often limited to dealing with idiosyncratic shocks, such as illness or death, as opposed to more widespread covariate risks, such as crop failures from droughts or floods. With predicted climate changes, dealing with covariate risks will be increasingly important.

Ethiopian Iddirs

Ethiopian *iddirs* are one example of local organizations that can help to build resilience at the individual and community levels. Iddirs are burial societies or funeral organizations in which members meet monthly and contribute a small payment. They are formally organized, with written records of contributions and payments. Upon death of a member, they make a payment to surviving family members. In some parts of Ethiopia, iddirs have expanded to cover additional shocks that prove to be harmful to members, such as providing health insurance or offering cash or loans in the case of fire, loss of livestock, destruction of houses, weddings, illness, and harvest loss.¹

Iddirs help to reduce the impacts of idiosyncratic shocks by covering costs of illness and expenses associated with burials, which have been demonstrated to be two key events that keep families in poverty (Krishna 2004; Krishna et al. 2004). Moreover, iddirs build and deepen the bonds of trust and

1 Our discussion of iddirs is based on Dercon et al. (2012).

reciprocity in the community. However, iddirs seem most suited to deal with idiosyncratic shocks—and only for their members (not the entire community). The expanding role of iddirs to cover other shocks demonstrates an ability to evolve to address additional concerns, but overall, the organizations seem to offer services that are mainly reactive in nature—and limited to defined geographic areas. By relying on local assets and capacities, iddirs do little to build the capacities of communities, households, and individuals to proactively adapt to a changing environment and address larger structural constraints.

Policy Implications

The question for policy, then, is how to fill the gaps that community-based organizations are not able to address, particularly in terms of adaptive and transformative capacities, dealing with covariate risks, and coverage of the socially marginalized.

The adaptive comanagement of natural resources offers one example of how higher-level organizations can support and work with local-level organizations. In adaptive comanagement, higher-level organizations support and strengthen the ability of local users to manage their resources, paying particular attention to their capacity needs and their ability to respond to and cope with uncertainty and change (Armitage et al. 2008; Plummer 2013). Adaptive comanagement processes develop over time, changing in response to lessons learned and adapting to changes in the context and environment.

However, engaging with community groups can at times run the risk of co-opting them or diverting them from their original goal. When higher-level institutions work with local groups, they must recognize and assess the possibility of expanding the community groups' ability to engage effectively in the required capacities, while remaining ready to intervene when a different mechanism can be more effective. Moreover, if external resources are to be channeled through community groups, such as in response to a disaster, it is important to examine who will receive the benefits and who will be excluded.

The role of community groups, and their ability to contribute to local-level resilience, may also be increased by collaborative and participatory approaches that support communities in identifying and implementing solutions themselves. Action research interventions that facilitate the engagement of communities have been successful in bringing about transformative and structural changes that include modifications in social norms, new legislation, and increased power and capacities at the local level to manage projects (German et al. 2012; Ratner, Halpern, and Kosal 2011; Ratner et al. 2013).

Social Networks

Social networks are ties, not bounded by organized groups, that facilitate the informal exchange of information, materials such as seeds or fertilizer, or resources. Such ties can include kinship, ethnic, religious, friendship, or client-patron relationships. Social networks are important to consider in any discussion of resilience, for they describe with whom and how individuals interact, and also affect the distribution of resources. Social networks can have a positive impact on the adoption of new technologies and the distribution of information and resources. However, not all social networks contribute toward resilience; some client-patron relationships provide short-term coping capacity at the expense of long-term adaptive or transformative capacities, further deepening power dependencies and inequalities. Furthermore, social norms and patterns of behavior dictate who is included in social networks, which can lead to unequal opportunities between men and women. Similar claims can be made along socioeconomic lines as well.

Within kinship networks, moral obligations of reciprocity and sharing are supported by customs and norms, and may allow individuals to claim and receive assistance in times of need. These expected behaviors and the social pressures for redistribution among kin provide a form of safety net (coping capacity) as well as connections and opportunities (funding and information) for livelihood diversification that contribute to adaptive or even transformative capacity. However, they may also reduce incentives to advance if the benefits must be shared with others, perhaps resulting in socially suboptimal outcomes or in evasive or less-than-honest sharing among communities and individuals (Di Falco and Bulte 2013).

Migration, as both a response and an adaptation to shocks, creates, disrupts, and expands social networks, with both positive and negative implications for the resilience of individuals and communities. Through migration, individuals whose social networks include out-migrants gain access to outside resources, can diversify income through remittances, gain knowledge, and spread risk across larger scales, increasing the diversity of their networks. Yet migrant-sending households are necessarily investors, often sacrificing some of their household labor, which leads to a decrease in the intensity of farming operations back home and may contribute toward a disintegration of local governance and community organizations, with reduced access to natural resources and livelihood options for the remaining community members.

Philippine Migrant Networks

Survey evidence from the Philippines suggests that households employ a variety of different types of networks to deal with various economic and social issues.² Virtually all households in a survey in Bukidnon reported at least one person on whom they could rely for help in various manners. Of the various types of networks, 75 percent of households reported a network for smoothing economic losses, 69 percent for getting price information, 58 percent for assistance with family problems, 53 percent for care of the house, and 48 percent for technology adoption. The size of these networks did not depend on the number of groups that an individual belonged to but was correlated with human and physical capital, including education and asset level. This study found that migrant networks and local social capital acted as substitutes for each other and that sons and daughters played different roles in social and economic networks, due to the ways in which boys and girls are socialized: daughters are socially obligated to support parents and families and, by virtue of living elsewhere, serve as important sources of information for new technologies and prices, while sons, who live in separate households within the village, are more likely to engage in agricultural production themselves and may be seen as a local source of technology information for parents.

The authors of the Bukidnon study found that households that experienced more negative shocks between 1984 and 2002 belonged to more groups in 2003, which is consistent with the hypothesis that groups perform an insurance function. There was statistically weaker evidence that the number of shocks experienced after 1984 increased the number of persons to whom a household could turn for assistance in 2003. Households relied on preexisting personal relationships for economic networks.

In this study as well, remittances appeared to have a consumption-smoothing function. A greater number of cumulative shocks up to 2002 increased the likelihood of receiving remittances and increased the amounts received. A daughter's education also increased remittance receipts, which indicates that "households' risk management strategies involve investing not only in local networks but also in migrant kin networks" (Quisumbing, McNiven, and Godquin 2012).

These networks appear to build coping capacity for households, enabling them to respond to shocks and smooth consumption. However, in terms of adaptive capacities, they suggest that there are trade-offs. Households must make investments to send migrants, potentially reducing the amount of labor

2 This section is based on Quisumbing, McNiven, and Godquin (2012).

at home. Migrant networks, and social networks in general, help their members connect to information sources and resources, potentially building adaptive capacity. These outside resources may diversify against local shocks and encourage proactive investment, initiate a learning process, and enable the accumulation of human capital through education. However, the social dynamics of relying on daughters and investing in migrant capital at the expense of local social capital may limit the exposure of households to new ideas at the local level. In order to ensure greater investment in productive enterprises, and possibly transformative capacities, governments should make efforts to provide opportunities and incentives that enable and encourage remittance-receiving individuals to invest in activities that will reduce vulnerability to shocks, economic or climatic.

Overall, social networks prove to be an important mechanism for coping and, through the addition of migrant networks, for bringing in additional resources. However, there is a risk that because individuals are not able to draw on the same resources through their social networks, relying on these networks for resilience may increase social inequalities. In addition, severe communitywide shocks may overwhelm the capacity of social networks to respond and function.

Policy Implications

At a policy level, interventions to strengthen social capital must take into account the context and scope of social networks, inasmuch as the different types of social networks have different uses and strengths.

First, those implementing project and policy interventions must understand and appreciate the function of the social networks that the interventions employ, recognizing who is included, who is excluded, and what types of information and knowledge are passed along.

Second, project and policy interventions that improve interactions between individuals, communities, and outsiders can help to facilitate the development of social networks. Establishing forums to exchange ideas and new technologies can make important contributions. Obviously, these interactions must be sensitive to the gender and resource nature of these networks. The literature on social learning suggests various techniques that can be used to help deepen and encourage knowledge and feedback among communities.

Third, to harness the resources and potential of social networks, governments and policymakers should ensure that institutions and incentives are in place for the productive use of resources and for allowing remittances to complement government and donor expenditures and investments.

Conclusions

External policies or project interventions designed to promote resilience at the community level do not operate in a vacuum. Locally occurring forms of social capital, including groups and networks, play an important role in building the resilience of rural communities to confront shocks. Policymakers must at least recognize the importance of social capital as an asset and consider different ways in which existing forms of social capital interact with, strengthen, or compete with policy initiatives and programs. These efforts must be driven by both a desire to understand the context-specific forms of local social capital and a commitment to do no harm. This effort requires building on the existing forms of social capital and offering additional resources and support, in particular focusing greater efforts on strengthening the adaptive and transformative capacities of communities and individuals. However, policymakers must recognize the limitations of local social capital, which may not be effective in mobilizing resources that are outside of communities or in responding to widespread shocks, and may therefore require assistance to access and utilize these necessary resources to build resilience. Researchers should work to expand understanding of how social institutions respond to external programs, especially in the context of shocks. A particularly important research gap in this context is how different types of local organizations and social networks interact with the programs of governments or nongovernmental organizations and how they serve—or exclude—men and women, rich and poor, especially in times of crisis.

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HOW NGOs APPROACH RESILIENCE PROGRAMMING

Timothy R. Frankenberger, Mark A. Conostas,
Suzanne Nelson, and Laurie Starr

Resilience is more than the ability of a system (such as a household or community) to bounce back to its predisaster state. Rather, a more integrated and holistic definition suggests that resilience is the ability to withstand (absorb) shocks and stresses, as well as the ability to adapt to dynamic conditions and put in place mechanisms that enable longer-term, systemic responses to the underlying causes of vulnerability (Barrett and Conostas 2013). The definition adopted for the purposes of this chapter is the one developed by the Resilience Measurement Technical Working Group: “Resilience is the capacity that ensures adverse stressors and shocks do not have long-lasting adverse development consequences” (Conostas, Frankenberger, and Hoddinott 2014).

Over the past five years, considerable work has gone into the development of conceptual frameworks of resilience that help users understand how shocks and stresses affect livelihood strategies and household well-being, and help identify the key leverage points to be used in a theory of change, which in turn informs programming designed to enhance resilience. A resilience framework integrates livelihoods, disaster risk reduction, and climate change adaptation approaches into a single assessment framework. Thinking on resilience has evolved from characteristics-based or outcome-based approaches to a focus on capacities. Building the resilience of individuals, households, communities, or higher-level systems to deal with shocks and stresses requires improving absorptive, adaptive, and transformative capacities, which are distinct but interrelated, are mutually reinforcing, and exist at multiple levels.

This chapter seeks to enhance our understanding of resilience processes, activities, and outcomes by examining initiatives to enhance resilience capacity that are designed and implemented by nongovernmental organizations (NGOs). It reviews the theories of change and approaches developed by

various NGOs that support their resilience programs and the means by which NGOs are measuring program outcomes and impact. The chapter also identifies challenges, potential opportunities, and recommendations for improving resilience programming by NGOs.

Programming

A number of principles from the theoretical literature (Barrett and Constanas 2013) are embedded in the resilience programming done by many NGOs. The extent to which a given NGO intervention is said to use a resilience perspective to address the challenges of poverty, food insecurity, health, or other well-being outcomes can be judged in relation to these five principles:

- **Focus on shock dynamics:** Efforts to enhance resilience require an understanding of the type of shock(s) *and* the effects of the shock(s).
- **A multidimensional capacity:** Resilience is a multidimensional capacity that draws on human, social, economic, physical, ecological, and programmatic (for example, safety nets) resources, the optimal configuration of which varies by type of shock, level of aggregation, context, and target population.
- **Resilience functions:** Preparing for and responding to a particular type of disturbance or configuration of disturbances may require different types of absorptive, adaptive, and transformative capacities.
- **Outcome-indexed capacities:** Resilience should be indexed to a given well-being outcome, and the specific capacities drawn upon may vary depending on the outcome of interest (for example, health, food security, poverty).
- **A multilevel and systems-based approach:** Resilience is observed at a given level (such as household or community) but is understood as a multilevel construct. Interventions should be sensitive to nested dependencies between levels (for instance, households and communities, communities and regions).

Other common themes and approaches emerging from NGO initiatives to build resilience capacity include comprehensive risk analysis, integrated and holistic approaches, regional resilience strategies, an emphasis on complementary partnerships and knowledge management within these relationships, and a social capital focus.

NGO approaches to resilience programming are as diverse as the regional, national, and local contexts in which they are implemented, and they typically either focus on a specific vulnerable population and a specific shock or on integrating, sequencing, and layering activities so that they support and protect core programming goals (for example, food and nutrition security, poverty reduction) that contribute to building resilience through improved absorptive, adaptive, and transformative capacity. Examples of projects implemented by NGOs and focused on building resilience include these:

- **Pastoralist Areas Resilience Improvement and Market Expansion (PRIME):** A consortium of NGOs led by Mercy Corps implements the PRIME project in Ethiopia, which employs integrated, layered, and sequenced cross-sectoral initiatives (such as nutrition, early warning systems, and skills transfer including literacy and numeracy) that support and protect core programming activities (market linkages) and strengthen household resilience through their increased absorptive, adaptive, and transformative capacities.
- **Productive Safety Net Programme Plus / Graduation with Resilience to Achieve Sustainable Development (PSNP Plus / GRAD):** Building on PSNP Plus, a CARE-led consortium of NGOs implements the GRAD program, which is designed to build adaptive capacity by focusing on vulnerability in food-insecure regions that are affected by climate change. Though PSNP Plus predated “resilience” per se, it used integrated, sequenced, and layered cross-sectoral initiatives that focused on underlying structural causes of food insecurity and contributed overall to enhanced resilience capacity.
- **Concern Worldwide:** In the Horn of Africa and the Sahel, Concern is using a five-step process that emphasizes multisector programming to strengthen community resilience to food and nutrition crises (Concern Worldwide 2013). As part of this process, Concern conducts extensive analysis of the key challenges and limitations communities face in achieving food and nutrition security and in protecting themselves from future risk. Concern’s integrated, holistic approach to resilience programming focuses on five key pathways to enhancing absorptive, adaptive, and transformative capacities.
- **Welthungerhilfe:** Though not designed as a “resilience” program per se, Welthungerhilfe’s project in Haiti is a good example of how long-term, integrated programming that combines addressing the underlying root

causes of food and nutrition insecurity with the use of timely and flexible funding mechanisms for emergencies can strengthen the resilience of smallholder farmers to food and nutrition shocks (von Grebmer et al. 2013). Welthungerhilfe used a holistic approach to improve the absorptive and adaptive capacities of communities to anticipate and minimize risks and to cope with and recover from natural disasters.

- **Catholic Relief Services (CRS):** CRS's strategy for building resilience capacity integrates elements of emergency response, disaster risk reduction, climate change adaptation, and livelihoods approaches to help vulnerable households and communities plan for and cope with shocks. CRS's approach to resilience programming relies heavily on comprehensive (for instance, multihazard, multisector) analysis of vulnerability to risks and shocks, and it promotes community-managed disaster risk reduction (CM-DRR) to build the absorptive, adaptive, and transformative capacities of communities.
- **Secure Africa's Future:** World Vision's Secure Africa's Future project in Tanzania offers a good example of a cross-sectoral, long-term approach to building resilience to economic and climatic shocks that focuses on three critical pillars of rural livelihoods: smallholder farming, natural resource management, and social safety nets. As a whole, the integrated and sequenced activities offer good potential for improving farmers' absorptive and adaptive capacities.

Measurement

The ability to measure the relationship represented by resilience (that is, the relationship between shocks, responses, and future states of well-being) requires that a number of substantive and structural features be present. Substantive features consist of initial- and end-state, disturbance, and capacity measures. Structural and methodological features highlight how data will be collected: the scale of measurement (individual, household, community, or systems), the temporal aspects of measurement (frequency, specific timing, and duration), and the type of measurement (objective, subjective, qualitative, quantitative). In terms of common practice among NGOs, all of the organizations collect information on the initial and subsequent states (the outcomes of interest) and some collect information on disturbances (but often retrospectively), but few collect information on all the capacities that contribute to

resilience. The dominant scale of measurement is the household or community level, rarely the higher systems level.

Challenges

A number of contextual challenges influence and shape NGO strategies for enhancing resilience capacity at the operational level. NGOs will not be able to transcend a number of these challenges without change on the part of donors, governments, and other high-level stakeholders.

- **Limited ability to facilitate transformational change:** The ability of most NGOs to improve transformative capacity, particularly at a national level, is often limited by external factors beyond their control. Interventions designed to influence transformative capacities often require alteration of systems that are maintained and protected by influential stakeholders (Béné et al. 2012). NGO efforts to build transformative capacity at national and regional levels may be greatly enhanced through participation in higher-level task forces that include government, UN actors, and donors (such as the Regional Inter-agency Standing Committee [RIASCO] and the Global Alliance for Resilience Initiative [AGIR]).
- **Funding mechanisms:** Many NGO efforts focus on short-term, stand-alone projects rather than on longer-term programs—those that comprise multiple, integrated, complementary, and often sequential projects, all working toward a cohesive goal. Much of this short-term project focus can be traced to funding mechanisms, which are still geared toward demonstrating impact in the short term. Short funding cycles, such as those that typify humanitarian responses and initiatives focused on disaster risk reduction, often do not allow the time required to effectively promote and improve adaptive and transformative capacities, particularly those that address longer-term enabling conditions necessary to remove structural causes of vulnerability. Resilience programming is best funded through a combination of short-, medium-, and long-term funding streams that allow programs the flexibility to adapt to an evolving risk landscape.
- **Competition among NGOs:** Limited financial resources can result in competition between NGOs and other actors, a situation only made worse by existing difficulties linking humanitarian and development funding mechanisms and activities (Frankenberger et al. 2012). Thus, joint donor action in program analysis, planning, and implementation will be required

in order to push forward a “resilience agenda that promotes a holistic vision of risk management implemented by actions linked across sectors working in partnership” (Mitchell 2013). By using resilience as a “competitive edge” against each other, NGOs and other stakeholders undermine the need for truly integrated and synergistic programs whose effects are felt across sectors.

- **Top-down processes:** NGO efforts to enhance resilience capacity are, at times, constrained by inflexible donor templates that mandate various elements of project design and prescribe a menu of key development leverage points that are assumed to be appropriate in all contexts. Effective resilience programming, however, requires in-depth, cross-sectoral assessments that consider all contextual factors affecting resilience for a target population. These comprehensive assessments inform a theory of change that is adaptive, iterative, and nonlinear in its hypothesis of what is needed for resilience goals to be achieved. When donors box in acceptable responses and predetermine the types of initiatives they will fund, it undermines the utility of using a resilience framework to assess current vulnerability and map out an integrated approach to improved resilience.

- **Donor-government relationships:** NGO programs for enhancing resilience capacity are often shaped by donor-government relationships. Donor support is often geographically determined by government priorities, which can limit programming efforts by NGOs. The separation of humanitarian and development efforts into nonoverlapping geographic regions means recurrent humanitarian crises are more likely to occur in highly vulnerable areas, which in turn makes needed private-sector investment less likely to occur. Governments may be hesitant to acknowledge crises (and thereby admit the need to invest in infrastructure, policies, and systems to prevent them). The capacity of governments to develop, implement, coordinate, and monitor resilience programming often needs strengthening and differs at different levels of government. Lower levels of government (local, district) often do not have the capacity or resources to implement national-level strategies for enhancing resilience or reducing risk.

Opportunities

A number of opportunities have the potential to positively influence and shape NGO approaches to enhancing resilience capacity.

- Many donors are committed to new and more flexible funding mechanisms that link humanitarian and development activities to support building resilience (for example, the UK Department for International

Development [DFID], the European Commission, the US Agency for International Development [USAID], the International Fund for Agricultural Development [IFAD], and The Rockefeller Foundation).

- Collaborations and partnerships between donors and governments help promote the integration of humanitarian and development strategies—for example, AGIR; RIASCO; and the Intergovernmental Authority for Development’s 2012 conference “Resilience and Growth in the Horn: Enhanced Partnership for Change.”
- Partnering with private interests may prove effective in advocating for infrastructure investment in marginalized or underserved areas that are not being served by government initiatives. The private sector may help reduce competition, particularly between NGOs, for limited donor resources and help facilitate a move toward longer-term programming.
- Learning and knowledge management consortia help NGOs identify and replicate activities that have proven effective in enhancing resilience capacity—for example, the Regional Learning and Advocacy Programme for Vulnerable Dryland Communities (REGLAP); the NGO consortium Africa Climate Change Resilience Alliance; the Resilience Learning Consortium; and the Regional CM-DRR Learning Alliance.

Recommendations

Examination of initiatives implemented by NGOs to enhance the resilience capacity of the chronically vulnerable provides lessons that can improve implementation and effectiveness of future programming. Recommendations for future NGO resilience capacity-building initiatives include the following:

- **Risk-informed program design:** Effective interventions for addressing resilience require well-designed programs based on a theory of change that identifies appropriate leverage points needed to effect desired outcomes. Good program design for building resilience capacity requires a comprehensive multihazard, multisector assessment of all the contextual factors that affect the system(s) under study.
- **Investment in monitoring and evaluation (M&E) capacity for measuring resilience:** Comprehensive risk analyses are costly, and NGOs often do not have the capacity to conduct such detailed analyses or to design appropriate M&E systems. Pay scales are often inadequate for recruiting and retaining highly qualified staff. Many NGOs also rely heavily on qualitative data

and potentially miss important quantitative information found in secondary and other sources. More innovative donor funding mechanisms (such as DFID's Building Resilience and Adaptation to Climate Extremes and Disasters initiative) are needed in order to support NGO capacity to conduct comprehensive risk analysis, develop theories of change, design interventions to address underlying causes of vulnerability and risk, and design effective M&E systems to monitor progress and impact.

- **Implementation of long-term, integrated approaches to resilience programming:** A cross-sectoral approach with a long-term commitment is required in order to improve the absorptive, adaptive, and transformative capacities of vulnerable populations to shocks and stresses. Programs with an integrated approach for improving cross-sectoral outcomes ensure that partners and sectors work together to address key leverage points and adopt complementary, synergistic strategies to promote resilience. Cross-sectoral programming needs to support and protect core programming that contributes to strengthened resilience. NGOs need to shift from implementing short-term, stand-alone projects to focusing on longer-term programs that involve multiple, integrated, complementary, and often sequential projects all working toward a single, overarching goal.
- **Strategic collaboration to enhance transformative capacity:** NGOs are often limited in their ability to improve transformative capacity at the national level, though they can be effective at the local level. Collaborative efforts, alliances, or high-level task forces that involve donors, UN agencies, governments, and NGOs can more effectively improve transformative capacity at the national or regional levels, greatly enhancing NGO initiatives to improve the resilience capacity of individuals, households, and communities.
- **Development of regional resilience strategies:** The effectiveness and efficiency of NGOs' resilience programming may be enhanced through use of a regional strategy, which would allow NGOs to align resources, build staff capacity, and address cross-country themes that require systems thinking and approaches. A regional strategy allows for contextualization of a broader geographic area that contributes to problem analysis and programming at the country level. For example, such a strategy could help NGOs better determine how regional issues (such as cross-border conflicts, large-scale natural disasters, and transboundary migration) might affect individual country initiatives.

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A PROPOSAL FOR MEASURING RESILIENCE IN A RISKY WORLD

Christopher B. Barrett and Derek Headey

Much of the world's chronically poor and malnourished population lives in an increasingly volatile world. The dangerous nexus of climate change, rapid population growth, conflict, and economic stagnation has already pushed several poor regions into states of permanent crisis, even as the rest of the world has enjoyed unprecedented progress against poverty. This disturbing state of affairs, along with our expanded knowledge of the intimate interactions between short-term shocks and long-run development, has catalyzed widespread interest in resilience building and in what a resilience framework implies for our understanding of the causes and consequences of acute vulnerability to natural and man-made disasters. We propose that the development community invest in a new multicountry system of sentinel sites to undertake long-term, high-frequency measurement and analysis of individual, household, and community resilience in the world's most vulnerable regions.

What Is Resilience?

The development resilience framework offers three key conceptual strengths.

First, resilience incorporates important *dynamic* concepts of human well-being measured against normative standards—the dynamics of moving in and out of poverty, hunger, and malnutrition—that few other frameworks can.

Second, resilience relates to the capacity to maintain well-being in the face of *risk* manifested in a range of anticipated or unanticipated shocks and stressors, be they biophysical, economic, or sociopolitical in origin.

Third, the framework focuses our attention on the way in which social, economic, and ecological *systems* interact with one another.

The resilience framework therefore necessitates a focus on complex human welfare dynamics that is especially appropriate for contexts in which

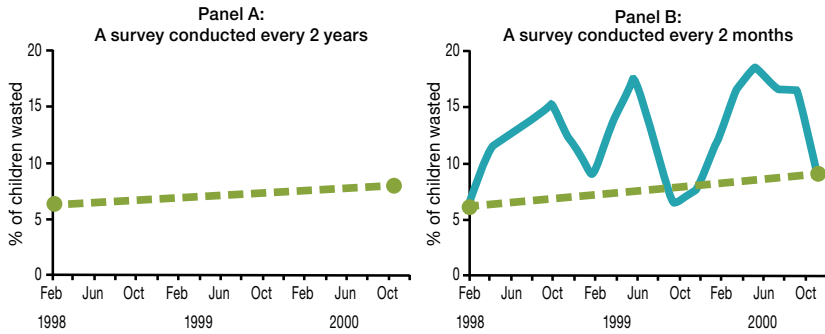
chronically poor and vulnerable populations confront varied and prominent economic, social, and ecological stressors as well as frequent and intense exposure to shocks.

What Does this Concept Imply for Measurement and Analysis?

Good measurement of resilience must be the foundation for early and accurate diagnosis of problems; for mobilizing and targeting short-term resources; and for designing, implementing, and evaluating appropriate long-term resilience-building strategies. But what does good measurement mean in the context of the conceptual foundations of resilience: risk; vulnerability; chronic and transient poverty and food insecurity; and complex interactions between shocks and stressors at various scales and between households and their social, economic, and biophysical environments?

First, resilience measurement *must* involve measurements that are conducted at a *higher frequency* than the current norm of surveys only every 3–5 years. This is because resilience relates to the likelihood of avoiding poverty, hunger, or malnutrition *over time*. Figure 20.1 demonstrates this point with a rare example of high-frequency measurement at scale from Helen Keller International’s (HKI) Nutrition Surveillance Program (NSP) in Bangladesh, the original version of which ran from 1990 to 2003 (Bloem, Moench-Pfanner, and Panagides. 2003). Panel A reports observations of child wasting (low weight-for-height measures) from two surveys, one conducted in February 1998 and the other in October 2000. Child wasting was essentially unchanged over this period and relatively low: 8 percent in the 1998 round and 9 percent in the 2000 round. Panel B supplements with bimonthly data from the same NSP survey instrument. These higher-frequency data tell a different story: from troughs of 6–8 percent in the December to February period, child wasting *doubled* every monsoon (June to August) to levels of 15–18 percent. The magnitude of this severe seasonal variation is not discernible via infrequent snapshots. Similarly dynamic changes would occur with many other welfare indicators and many other shocks. Indeed, the frequency and severity of these events in Bangladesh were the main reason HKI originally elected to engage in higher-frequency surveillance. Of course, what “high-frequency” means will likely be context specific. In extremely volatile environments it could mean measurements conducted several times a year; in other environments it may mean only twice a year. Cost considerations

FIGURE 20.1 The difference between low- and high-frequency measurement: child wasting in Bangladesh, 1998–2000



Source: Authors' construction using data from Bloem, Moench-Pfanner, and Panagides (2003).

must be weighed against the added vulnerability that comes from less frequent measurement.

Second, resilience demands *repeated measures* over the *long term*. Resilience is a dynamic concept and is not just concerned with shocks and their immediate impacts, but more fundamentally requires understanding the longer-term stressors that create vulnerabilities to shocks and the ability to withstand or bounce back from them. But shocks are unpredictable. Resilience-building interventions need evaluation over longer time scales in order to reliably establish whether interventions have the intended effects and whether these effects are sustained beyond the period of intervention. Third, resilience measurement requires *sufficiently sensitive indicators* of stressors, shocks, coping strategies, and human welfare, collected using a variety of qualitative and quantitative methods. Fourth, resilience needs to be measured at multiple levels: for individuals (particularly nutritional status), households, and communities, but also for local economies and ecologies. There remain unnecessary disconnects in the analysis of these different units. The systems origins of the resilience framework demand greater integration across scales of analysis.

Fifth, while measurement needs to follow best practices wherever possible, understanding resilience in diverse environments will require *context-specific measurement* and the right mixture of quantitative and qualitative approaches, with the latter particularly important for understanding the social and political dimensions of resilience.

A Proposal for a Multicountry System of Sentinel Sites

This conceptualization of resilience measurement—combined with the sheer scale of the resilience-building challenge—leads us to propose a new multicountry system of sentinel sites in the world’s most vulnerable regions. Although new, such a system would be built on some established measurement platforms and based on lessons from past experiments with surveillance systems. Economic surveys designed to measure poverty, or health surveys designed to track nutrition, are too infrequent to either measure or help us understand resilience dynamics. Conversely, the often higher-frequency surveys used to conduct randomized controlled trials are inadequate because they typically lack the scale required for genuine program evaluation and because they typically do not extend beyond the short-term project evaluation cycle. Early warning systems fall short as well, since they usually do not collect individual and household-level indicators and have only narrow policy objectives rather than aim at diagnosis of the causal drivers of household and community-level resilience, let alone long-term policy, program, or project evaluation objectives. And while the sentinel system we envisage would bear some affinity to, for example, the nutrition surveillance systems of HKI in Bangladesh, what is now required is a much more systematic multicountry and multidisciplinary effort built up with pilot projects in each of the relevant countries or subnational regions, first to improve the survey instruments and data collection processes, and then to be scaled up as methods become refined with practice.

The costs and challenges associated with developing and maintaining such a system will be substantial. Yet, if implemented well, the benefits would be immense, multidimensional, and multisectoral. Such a system would offer a rigorous means of monitoring vulnerability and resilience in the world’s most volatile regions. It would bolster existing early warning systems by complementing them with household-level indicators, including subjective assessments of risks faced and available coping mechanisms, as well as longer-term data analysis. It could improve the mobilization and targeting of emergency resources by helping to overcome political and bureaucratic constraints. It would be instrumental for diagnosing the underlying sources of vulnerability, for identifying key thresholds of resilience, and for designing appropriate resilience-building strategies. This system would provide a foundation for large-scale experimental and nonexperimental evaluations of resilience-building activities, thereby fueling the learning process critical to long-term development.

Where Should We Measure Resilience?

To contain costs, it will be important for a multicountry system to focus on the most vulnerable countries and subnational regions. As a first stab at identifying these countries, we examined data for five different national-level indicators of vulnerability: exposure to disasters; past emergency assistance levels from the international community; and child stunting, child wasting, and infant mortality rates. These five indicators capture different dimensions of vulnerability. The disaster and emergency aid variables capture both exposure and vulnerability to disasters; child wasting and mortality are good indicators of exposure to severe shocks, including seasonal problems; and stunting is a good catch-all indicator of the myriad problems that create chronic malnutrition.

In order to prioritize country vulnerabilities, we ranked all countries according to each indicator, isolated the 30 most vulnerable countries according to each indicator, and identified the frequency with which each country appeared in these five different rankings (Table 20.1). We classified the 11 countries that appeared four times as “extremely vulnerable” and the 16 countries that appeared three times as “highly vulnerable.” Our list of 11 “extremely vulnerable” countries consists solely of countries in the Sahel, Horn, and central Great Lakes regions of Africa. The group of 16 “highly vulnerable”

TABLE 20.1 The most vulnerable countries according to five indicators

Extremely vulnerable (<i>n</i> = 11)	Highly vulnerable (<i>n</i> = 16)	
Niger	Angola	Bangladesh
Chad	Central African Republic	Sri Lanka
Sudan	Kenya	Cambodia
Eritrea	Liberia	Haiti
Malawi	Madagascar	Yemen
Burundi	Mali	
Democratic Republic of Congo	Mozambique	
Ethiopia	Nigeria	
Somalia	Sierra Leone	
Djibouti	Uganda	
Mauritania	Zambia	

Source: Authors.

Notes: See the full background paper for details (Barrett and Headey 2014). Classifications are based on country rankings among five indicators: child stunting, child wasting, infant mortality, exposure to natural disasters, and dependence on emergency assistance. Extremely vulnerable countries are vulnerable in at least four indicators, and highly vulnerable countries are vulnerable in at least three indicators.

countries is more diverse but contains another 11 African countries, plus Bangladesh, Cambodia, Haiti, Sri Lanka, and Yemen.

This identification of vulnerable countries involves important nuances. First, many of these countries are fragile states, with implications for how surveys should be implemented and who should implement them. At first glance, political fragility and lack of domestic capacity appear to be insurmountable obstacles to monitoring vulnerability and resilience in fragile states. But many international institutions, such as the World Food Programme, already have a permanent presence in fragile environments. Unfortunately, such institutions are typically not well enough funded to implement and analyze higher-frequency surveys. While lack of domestic capacity may prove to be a near-term constraint in some countries, the long-term focus of this system would demand that implementing agencies build up local capacity in both the government and nongovernment sectors, and throughout the “value chain” spanning measurement design, data collection, analysis, evaluation, and policy advice.

Second, this identification exercise is preliminary only. Decisions on where to implement these kinds of programs require more detailed subnational data analysis. Countries that may not appear vulnerable in aggregate often have regions that are highly exposed to shocks. Importantly, we emphasize that sentinel sites do not always need to be nationally representative; they can be targeted toward more vulnerable subnational regions.

Third, the choice of specific sentinel sites should be motivated not only by current or recent vulnerability but also by the need to strategically sample different agroecologies and economic environments in order to generate analyses with adequate external validity. Both researchers and practitioners must be able to make reasonable inferences for populations beyond the sentinel sites based on comparisons with similar agroecologies and socioeconomic conditions.

What Should these Surveys Look Like?

Some Issues of Measurement Design

Long-term, high-frequency, multidisciplinary surveys integrated with biophysical observations and structured qualitative assessments pose significant financial, logistical, and technical challenges. These surveys must be efficiently designed to meet the system’s main objectives under constrained budgets. Should they be repeated cross-sections or panel surveys? How frequently should data be collected? And what sorts of technologies will increase the speed of the collection, cleaning, and analysis of data?

We favor a hybrid approach to survey design that can keep costs down while generating widespread benefits. Similar measurement efforts have typically collected repeated cross-sections on the grounds that nutrition entails targeted sampling of only the youngest children because young children quickly age out of the 1,000-day nutrition window in a standard panel survey. But a more interdisciplinary system for resilience measurement would benefit substantially from collecting individual and household-level panel data, particularly for understanding well-being dynamics and for conducting rigorous program evaluation. In the full background paper (Barrett and Headey 2014) we outline a hybrid sampling strategy that is partly panel (a core group of households that are tracked consistently over time) and partly a repeated cross-section that entails an oversampling of households with young children or pregnant women.

Second, we propose a mixture of “thick” and “thin” rounds of data collection to increase the breadth of variables collected while keeping costs manageable. Thick rounds would consist of the full range of relevant indicators, while thin rounds would more narrowly focus on the subset of indicators that are likely to vary more over time, such as food and nutrition security indicators, coping strategies, and so on.

Third, the use of the latest information and communication technologies is essential. Electronic data collection is fast becoming the norm in large-scale surveys, and these technologies offer tremendous potential for near-real-time collection and analysis of household data. Among other benefits, this means of collection would bolster existing early warning systems, which currently mainly focus on more aggregate indicators. Furthermore, the proliferation of mobile phones—even in some of the harshest and most remote areas—also offers substantial scope for higher-frequency collection of basic self-reported indicators, though further trialing of these approaches is still needed.

Who Should Be Funding and Implementing a Multicountry System of Sentinel Sites?

Finally, we consider who should lead and contribute to this ambitious but important effort. Since this system would benefit a wide range of institutions, and since the costs of a long-term commitment to a multicountry system of sentinel surveys would be prohibitively large for any single agency, we propose a broad consortium of bilateral donors and foundations, multilateral organizations, national and subnational governments, major international and local non-governmental organizations, and leading international academic institutions.

This consortium must first identify which countries and regions most need sentinel sites. It should then focus on establishing partnerships with national governments and make solid financial commitments to *long-term* resilience monitoring, analysis, and domestic capacity building. This consortium must then identify and contract with implementing partners with a permanent presence on the ground, as well as international organizations with the requisite technical expertise, for the purposes of a coordinated survey design and biophysical monitoring. Over the longer term, this system should institutionalize and finance not only data collection but also analysis and research using these data and the dissemination of findings based on the data, since lack of analysis and timely dissemination has arguably been the Achilles' heel of many past efforts.

Ultimately, this kind of cooperative commitment to high-frequency, long-term monitoring and evaluation can provide a crucial scientific evidence base for diagnosing and resolving the most troubling problems of hunger, poverty, and malnutrition and of building sustainable resilience. The status quo is simply not enough.

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THE WAY FORWARD FOR BUILDING RESILIENCE

**Shenggen Fan, Rajul Pandya-Lorch, Sivan Yosef,
Heidi Fritschel, and Laura Zselezcky**

In the coming years and decades, the world will continue to be hit by shocks. Among the shocks that we can anticipate are climate change, conflict and displacement, natural disasters, food price shocks, and health shocks. But the range of possible shocks that pose threats to food and nutrition security is not static. Some shocks are evolving and becoming more frequent or intense, such as extreme weather events. At the same time, new shocks may emerge, such as novel threats to human, plant, and animal health, and others that are still unknown.

Resilience means the capacity not only to bounce back from shocks, but also to get ahead of them. Given that normal conditions for the poor are often dire, people need the capacity to transform and improve after a shock rather than merely returning to a dismal original state. When resilience goes beyond recovery to include a capacity for transformation, it may involve changes in economic, social, and ecological structures that allow for greater long-term well-being. This capacity for transformation is especially important in terms of food and nutrition security, given that more than 800 million people still suffer from chronic hunger and 165 million children younger than five years of age are stunted (Black et al. 2013).

The contributors to this book have shed light on the role of resilience as an organizing framework that the international community could use to effectively tackle these challenges. Indeed, many development agencies are beginning to see the value of resilience as a framework that can link humanitarian efforts with longer-term development. Resilience may offer opportunities for mainstreaming various shock adaptation and mitigation strategies into broader development initiatives. In other words, it allows us to look at development more holistically (Chapter 3, Hoddinott).

Some sections of this chapter draw on the 2020 Conference Brochure (<http://www.ifpri.org/publication/building-resilience-food-and-nutrition-security>) and the 2020 Conference Synopsis (<http://www.ifpri.org/publication/building-resilience-food-and-nutrition-security-highlights-2020-conference>).

Knowledge Gaps

As the resilience agenda in food and nutrition security is still relatively new, there is still much to learn about how individuals, households, communities, countries, systems and institutions—both formal and informal—become and remain resilient to shocks. The chapters in this book highlight a number of knowledge and research gaps that deserve increased attention and investment in the coming years:

- **Better assess and predict the impact of shocks.** A higher-quality body of evidence on the historical trends and projected impact of various shocks in different regions, especially climate change, can inform policy decisions to help vulnerable populations better prepare for future shocks (Chapter 2, Zselezky and Yosef). Research is needed to monitor and track shocks, improve detection, and measure the impact of various shocks on poor communities, so that shocks can be better predicted and policy options can be better discerned. Information on the impact of repatriation, integration, and resettlement of refugees on food security, for example, could help policymakers weigh the value of such options as implementing cash or food transfers, or building up infrastructure (Chapter 6, Mabiso et al.). More long long-term, high-frequency measurement and analysis on the impact of shocks in the world's most vulnerable regions may help discern the resiliency of various populations (Chapter 20, Barrett and Headey). At the same time, predicting shocks is not enough. Since the food price crisis of 2007/08, for example, the international community has slowly improved its ability to predict food price spikes, but the capacity of institutions to respond to this information is still lacking (Chapter 4, Fan and Brzeska). Building up the capacity to take action upon receiving data is critical.
- **Invest in more case studies and identify success stories.** Location-specific case studies could offer insights into how resilience can be built up in different environments, and the challenges and opportunities associated with different demographic, political, economic, and environmental variables. More studies, for example, are needed to shed light on the differential impact of refugees in such countries as Iraq, Jordan, Lebanon, Pakistan, and Turkey (Chapter 6, Mabiso et al.). Case studies could help identify success stories, which could then be replicated and scaled up at the program level. Cross-regional lessons are also key: local areas and communities often have existing ways of dealing with shocks, and these may provide opportunities for South-South learning.

- **Sharpen the concept of resilience, collect the data, and develop the tools.**

Resilience within a food and nutrition security context is still a nascent concept; as such, there is not yet much high-quality evidence on the effectiveness of various tools and approaches that could potentially build up resilience.

More data need to be collected on the impact of various safety net programs, which can include food transfers, supplementary feeding, food-for-work programs, food price subsidies, and cash transfers, on people's resilience. Other strategies and approaches such as asset building, insurance programs, credit, nutrition interventions, trade policies, market information systems, sustainable agricultural practices, investments in infrastructure, just to name a few, all need to be analyzed using a resilience lens. The insights from this type of research can yield a collection of good resilience practices, and shared as part of local, national, and regional lessons.

- **Better understand the role of communities.** Researchers should integrate local community knowledge into all stages of the research process.

Existing adaptation and mitigation strategies and approaches, including the use of social networks and social capital, can shed light on how resilience can be better strengthened in the future. More knowledge on how social institutions respond to external interventions, such as government programs or projects undertaken by nongovernmental organizations (NGOs), especially in the context of shocks, is key. A critical gap in this area is the extent to which excluded groups, including women, the poor, and the discriminated-against, are served or excluded by resilience-oriented activities (Chapter 18, Bernier and Meinzen-Dick).

- **Identify better approaches to building capacity.** The international community needs to assess the cost-effectiveness of different capacity-building strategies at the individual, organizational, and system levels, in order to determine the optimal level of investment in resilience capacity building. This effort includes paying attention to the governance capacity needed to address shocks that affect multiple sectors, including the capacity needed for decentralized decisionmaking (Chapter 14, Babu and Blom). Psychology also plays an important role: research is needed on how people's aspirations interact with development goals such as the take-up of productive investment opportunities that can improve the resilience of the poor. Such knowledge could help make development programs and social protection policies more effective (Chapter 11, Kosec et al.).

Filling our gaps in knowledge will require us to develop a culture of learning about resilience and approaches to it, by conducting new research, and also by looking at what is already working as well as at what does not work. A resilience framework offers an opportunity for researchers to learn from practitioners, who work day-to-day at the frontlines of both development and humanitarian efforts. Practitioners, in turn, can apply this research to improve their programs' design and implementation, as well as monitoring and evaluation of resilience, on the ground.

Policy and Program Actions

This volume has offered insights and evidence, preliminary in some places, about the kinds of approaches that have the potential to help build resilience at a number of levels. Many of these approaches have the ultimate aim of creating a more resilient food and agriculture system that works for small-holder producers, consumers, the urban and rural poor, and the environment. Various chapters call for the international community and national governments to take concrete policy and program actions to address specific shocks:

Climate Change. Promoting resilience to climate change through sustainable land management and climate-smart agriculture will require the following:

- Expanding R&D and extension services to increase tolerance to stresses like heat waves, droughts, floods, salinity, pests, and diseases (Chapter 4, Fan and Brzeska; Chapter 15, Davis, Babu, and Blom);
- Supporting innovative risk management mechanisms such as weather insurance (Chapter 10, Ceballos and Robles);
- Promoting social capital (Chapter 18, Bernier and Meinzen-Dick); and
- Facilitating a diversity of livelihoods and crop choices (Chapter 5, Breisinger et al.).

Conflict and Displacement. Improving resilience in the context of violence and large-scale movements of refugees can involve the following:

- Adopting a multisectoral and participatory approach to resilience building in humanitarian situations, bringing together local communities, governments, researchers, development practitioners, and humanitarian workers (Chapter 7, Ecker; Chapter 6 Mabiso et al.);

- Improving market access and livelihood alternatives for refugees and vulnerable populations such as pastoralists (Chapter 9, Little and McPeak; Chapter 5 Breisinger et al.; Chapter 6, Mabiso et al.);
- Investing in research and development to learn more about community-level coping mechanisms and to inform policy options that incorporate risk management (Chapter 6, Mabiso et al.; Chapter 9, Little and McPeak).

Food Price Spikes. Among the global, regional, and national strategies that can help prevent and cope with food price volatility are the following:

- Adopting policies that mitigate and hedge against risk, such as well-regulated futures and exchange markets for commodities and stock management strategies to ensure adequate stocks at regional levels (Chapter 4, Fan and Brzeska);
- Adjusting biofuel mandates to reduce competition between food and fuel uses (Chapter 4, Fan and Brzeska);
- Promoting mutually beneficial trade that does not rely on distortionary and destabilizing policies, especially during times of high food prices (Chapter 4, Fan and Brzeska; Chapter 2, Zselezky and Yosef).

Natural Disasters. Options for increasing resilience in the context of droughts, floods, hurricanes/cyclones, and earthquakes include the following:

- Investing in new tools and methods to improve detection and ensure frequent transmission of information about natural disasters (Chapter 2, Zselezky and Yosef; Chapter 20, Barrett and Headey);
- Supporting social protection, which can not only improve the welfare of affected communities but also raise their aspirations for the future (Chapter 11, Kosec et al.);
- Mitigating the impacts of natural disasters on especially vulnerable groups such as women and children, whose welfare losses may have intergenerational effects (Chapter 12, Alderman and Walker; Chapter 3, Hoddinott; Chapter 17, Kumar and Quisumbing);
- Rebuilding the local economy, particularly agricultural and food production, immediately after a disaster has struck.

Health Shocks. Options for dealing with health shocks and stresses such as malnutrition, illness, epidemics, and pandemics, include the following:

- Building human capacity at the individual and group levels, including strengthening basic health systems and increasing access to health care (Chapter 14, Babu and Blom);
- Focusing on enabling health delivery systems rather than specific interventions or actions (Chapter 15, Davis, Babu, and Blom; Chapter 13, Dufour, Kauffmann, and Marsland);
- Designing food and agriculture programs that are nutrition-sensitive and linking these with social protection measures, health, water and sanitation, and education (Chapter 13, Dufour Kauffmann, and Marsland; Chapter 12, Alderman and Walker).

Taking these types of actions may certainly be beneficial in addressing individual shocks. At the same time, responding to shocks on a piecemeal basis may not be enough. The world's food system has become increasingly integrated. Poor and vulnerable individuals and communities are often beset by multiple shocks that are linked to each other. Climate-induced natural disasters, for example, can contribute to financial crises. These crises, in turn, can affect the welfare and health of poor households around the world. During the past few years, we have also seen the ways in which climate-related losses in agricultural crops and poor economic policies have affected food prices. This price volatility can often lead to social unrest and conflict. The linkages among different shocks are complex and varied. It is thus essential to also take concerted action that goes beyond any one shock, sector, or level. The collection of chapters in this book recommends a number of overarching policy and program actions that can be taken to build up resilience to predict, prevent, and mitigate shocks *to the entire food system* and all its nodes:

- **Undertake more integrative programming and policy.** Since resilience is a system approach of thinking about food and nutrition security, implementing it will require cross-sectoral research, programming, and policy. Integrative research can include crossing disciplines as well as using both qualitative and quantitative methods (Chapter 6, Mabiso et al.). On-the-ground programs that rely on cross-sectoral outcomes can force coordination among partners and sectors, and help implementing partners transition from short-term, stand-alone projects

to longer-term programs that involve multiple and complementary projects all working toward a single, overarching goal (Chapter 19, Frankenberger et al.). Integrative policies, which take into account that legal, economic, social, and cultural factors all play a role in the vulnerability of poor and excluded groups and communities, can go a long way in building their resilience to shocks (Chapter 16, von Braun and Thorat).

It is particularly important to use resilience as a tool to redesign food and agricultural systems, since it is an apt framework for thinking through the complexities of entire food systems (Chapter 3, Hoddinott). Resilient communities need flexible and diverse sources of accessible and affordable nutritious foods. Resilient smallholder farmers need access to modern seeds, extension, financing and credit, and markets for inputs and outputs (Chapter 15, Davis, Babu, and Blom). A resilient food system includes mechanisms for preventing agriculture-related health hazards and improving food safety, and relies on a sustainable natural resource base. A resilience framework offers the opportunity to design investments in agricultural research and extension, infrastructure, and climate-smart technologies in an integrated way.

- **Improve program design.** On-the-ground resilience interventions should be based on comprehensive risk-informed, multisector assessments of all the contextual factors that affect the system under study (Chapter 19, Frankenberger et al.). Program design should account for the role of women, who are more susceptible to being trapped in long-term poverty, and prone to using consumption adjustment strategies that have negative long-term impacts, such as distress sale of assets or sacrificing their own and their families' health and nutritional status (Chapter 17, Kumar and Quisumbing). Nutrition must be made an explicit objective in the program design phase: implementers can integrate nutrition indicators and data for identifying vulnerable groups, targeting children during the first 1,000 days of life, and measuring the nutritional impact of resilience-building programs. Linking agricultural interventions to the social protection, health, water and sanitation, and education sectors within program design could also be beneficial. Aligning the delivery mechanisms of various projects that address different vulnerabilities to ensure that households are reached with a complementary set of interventions is yet another way of using program design to enhance resilience (Chapter 13, Dufour, Kauffmann, and Marsland; Chapter 12, Alderman and Walker).

- **Invest in measuring resilience.** Questions of what to measure, whom to measure, how often to measure, what methods to use, and at what scale need to be addressed. Measures of resilience must distinguish between the ex ante (preshock) extent of resilience and the ex post time path of the outcome (for example, food security or nutrition) after the shock has occurred (Chapter 3, Hoddinott), as well as identify the extent to which people or communities are able to bounce back from a particular shock (Little and McPeak chapter). As researchers identify metrics and methods, NGOs and agencies need to use compatible methods to test major assumptions. Innovative donor funding mechanisms can support NGOs and governments in undertaking risk analysis, designing interventions to address underlying causes of vulnerability and risk, and implementing monitoring and evaluation (M&E) systems to track progress and impact (Chapter 19, Frankenberger et al.). Proposals for measuring resilience, such as frequent surveying of sentinel sites in global hotspots that are highly vulnerable to shocks, may be able to capture the effects of locally relevant shocks and the coping mechanisms people adopt in response (Chapter 20, Barrett and Headey). There is also still a great need for solid financial commitments to *long-term* resilience monitoring, analysis, and building human, institutional, and system capacity for monitoring and evaluation.
- **Use multiple entry points to achieve resilience.** There is no single way to achieve resilience, and multiple pathways much be explored simultaneously. For example, alternative income sources and diversification are key, particularly in vulnerable pastoralist areas (Chapter 5, Breisinger et al.). Efforts to address the market failures often present in these areas, such as uncompetitive markets, imperfect information, and incomplete insurance markets, could help improve livelihoods and lead to economic growth (Chapter 8, Calderone, Headey, and Maystadt). Price information systems, and credit and insurance markets can help people better cope with shocks. At the same time, income and markets are not enough. Social protection is critical during actual emergencies: cash and/or food transfers, or relief programs, undoubtedly help protect the most vulnerable people in these contexts (Chapter 4, Fan and Brzeska; Chapter 13, Dufour, Kauffmann, and Marsland; Chapter 11, Kosec et al.; Chapter 12, Alderman and Walker). The need for duality rings true for excluded groups as well. Policies that help make markets and information work for groups that face exclusion and discrimination are essential, but these must be coupled with affirmative action policies to address poverty and marginalization (Chapter 16, von Braun and Thorat).

- **Draw upon local knowledge and resources.** Many communities that are hard-hit by shocks already have some resources and knowledge in place to deal with these shocks. Pastoralists for example have a number of strategies they rely upon in the face of high risk and uncertainty, including mobility and intensification of livestock production (Chapter 9, Little and McPeak). Practitioners and policymakers should draw upon local people's knowledge when designing and implementing policies and interventions. Existing social capital and social networks can also be harnessed into improving local interventions and supplemented with additional resources and support to strengthen the adaptive and transformative capacities of communities and individuals. Furthermore, projects and policies that improve interactions between individuals, communities, and outsiders, such as knowledge exchange forums or technology transfers, can also help strengthen social networks (Chapter 18, Bernier and Meinzen-Dick).
- **Support innovation.** Once proven viable, resilience-oriented innovations have the potential to protect vulnerable populations against shocks. Several pilot programs on weather index insurance, for example, suggest that this type of insurance could directly contribute to the resilience of the rural poor in developing countries by protecting them against weather extremes (Chapter 10, Ceballos and Robles). If there is market demand, the private sector could play a role in developing agricultural insurance products, including those tailored to men's and women's different needs, assess their efficacy, and sustainably expand access to them in developing countries (Chapter 17, Kumar and Quisumbing). Though not a silver bullet, information and communication technologies (ICTs) can also be a quick and affordable way to share information with smallholders—donors and policymakers can support agricultural extensionists in linking smallholders to such options (Chapter 15, Davis, Babu, and Blom). Investments in these emerging products could bring about a wave of innovation in the area of resilience.
- **Foster strategic collaboration among different, multi-level actors.** Alliances, collaborations, or high-level task forces that involve donors, UN agencies, researchers, governments, and NGOs have the power to build up capacity for resilience. Regional collaborations especially could enhance the effectiveness of resilience programming, allowing implementing organizations to align resources, build staff capacity, share knowledge and address cross-border issues, such as border conflicts, natural disasters, and migration that require systems thinking and approaches (Chapter 19, Frankenberger et al.). New and more flexible funding mechanisms, and

partnerships between donors and governments that link humanitarian and development activities to support building resilience, should be continued. The involvement of multiple government ministries is also key to the multifaceted problems associated with resilience for food and nutrition security. The private sector could also play a key role by making critical investments in such areas as infrastructure and funding longer-term programming. To make these types of strategic collaborations possible, the incentives of policymakers, practitioners, and researchers need to be better aligned. Greater cooperation and long-term commitment among researchers and practitioners can help produce evidence-based research within a timeframe that is useful for addressing more pressing resilience needs (Chapter 6, Mabiso et al.).

- **Pay attention to excluded groups.** Groups that are discriminated against, whether based on gender, race, ethnicity, socioeconomic group, or other factors, face especially big challenges in accessing resources, being included in resilience-oriented initiatives, and making their voices heard. Policies and measures that address these issues could include anti-discrimination laws in education, health institutions, and government programs, especially those implemented during natural disaster and economic crises, policies for empowerment in asset ownership and human resource development, fair representation in political governance through affirmative action policies, and targeting regions with concentrations of ethnic minorities for development (Chapter 16, von Braun and Thorat). Promoting self-organization is also helpful to improve access to resources. Vulnerable and excluded people are not passive actors in development; instead, their active participation in planning and implementing interventions and policies is critical.
- **Build capacity at all levels.** Much of resilience is about developing capabilities at all levels—individual, household, community, national, and regional—to deal with all kinds of shocks. There is a critical need for assessing capacity requirements from the individual to the organizational to the system level, in order to develop a comprehensive strategy for capacity-development investments (Chapter 15, Davis, Babu, and Blom).

In many developing countries, institutions are weak or missing. Functioning, accountable, and transparent institutions are essential to building resilience (Chapter 5, Breisinger et al.). An important step in strengthening institutions for resilience, therefore, is building their capacity in ways that allow them to help people anticipate, deal with, and recover from shocks. Indeed, institutional reforms may be the most effective way to

put historically-marginalized people, such as pastoralists in the Horn of Africa, on a long-term development path (Chapter 8, Calderone, Headey, and Maystadt). Institutions such as national and local governments, as well as regional multilateral organizations and development banks, have a unique role to play in devising holistic policy frameworks that integrate complementary services, investments, and safety nets. They can also help overcome political inertia and show long-term commitment to such services as extension (Chapter 15, Davis, Babu, and Blom). Building institutional capacity also requires investing in resources and incentives to train and retain qualified employees and participants. Given the complexity of resilience, partnerships among many actors may require extensive management capacity.

The capacity to operationalize the resilience concept at the field level must also be strengthened (Chapter 13, Dufour, Kauffmann and Marsland). Nongovernmental organizations have long been at the forefront of the effort to build resilience because they operate at the intersection of humanitarian relief and long-term development, but other kinds of institutions and organizations such as local government ministries and more informal community groups and arrangements are becoming increasingly relevant.

Closing Remarks

This book has framed resilience as a systems approach, with all of the complexity that implies. Its chapters have underlined that resilience is about ensuring a healthy, sustainable global food system that can provide nutritious food for all without damaging the planet. A “resilience lens” is a way of looking at issues across the food system—including smallholder production, food processing, markets and trade, food reserves/stocks, agriculture-related diseases, food safety, social safety nets, and nutrition interventions—with an eye toward their role in resilience-building. It denotes a more holistic approach to development interventions. Yet it is important to remember that people are at the foundation of any system, and building the capacity of a system means building the capacity of the individuals within it.

As the development community considers how to frame the post-2015 development agenda in the wake of the Millennium Development Goals, resilience may fit into this agenda in several ways. Resilience could be a natural overarching theme of post-2015 goals, encompassing poverty eradication, food security, and nutrition security. It could also be seen as a way of connecting people-centered development goals with planet-centered sustainability goals. A resilience agenda could serve as the impetus to a commitment in the development community to eliminate emergencies that arise from recurrent shocks such as drought.

Clearly, improving resilience for food and nutrition security will require better data and information on risks and responses, better approaches to monitoring and measuring resilience, a commitment to including the most vulnerable people in decisionmaking, and extensive work across disciplinary and sectoral boundaries. There are roles for a wide range of actors:

- Governments need to create an enabling environment for resilience that includes, among other things, disaster preparedness and relief, strategic food reserves, safety nets, education and healthcare, infrastructure, agricultural investment and well-functioning, efficient, and fair trade and market systems.
- Communities need to demand the tools for greater resilience.
- Nongovernmental organizations need to do more to link humanitarian and development actions and measure resilience to strengthen monitoring and evaluation.
- The private sector should explore whether goods and services that build resilience can be profitable, especially those that contribute to innovative value chains, financing, and insurance instruments.
- Researchers need to improve their understanding of resilience and how to measure it by, among other things, settling on the concept, theory, and implications of resilience; looking at new methods and tools for modeling risks and modeling resilience throughout whole systems; identifying resilience success stories; and improving the evidence base on resilience in ways that are useful for development practitioners.

Looking ahead to a future of continuing and even increasing shocks, we will need to get better at finding ways to cope—and to thrive—in the presence of shocks. Achieving food and nutrition security for all will not be possible if each shock pushes people into poverty, hunger, or malnutrition. The post-2015 agenda must incorporate the aim of eliminating both sudden and chronic food crises, even as shocks strike. Indeed, achieving the goal of ending hunger and undernutrition by 2025 demands no less.

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Contributors

Mohamed Abdelgadir (m.abdelgadir@ifad.org) is a country program manager of the Near East, North Africa and Europe Division of the International Fund for Agricultural Development (IFAD), Italy.

Perrihan Al-Riffai (p.al-riffai@cgiar.org) is a senior research analyst in the Development Strategy and Governance Division of the International Food Policy Research Institute, Washington, DC, USA.

Harold Alderman (h.alderman@cgiar.org) is a senior research fellow in the Poverty, Health, and Nutrition Division of the International Food Policy Research Institute.

Suresh Chandra Babu (s.babu@cgiar.org) is a senior research fellow in the Partnerships, Impact, and Capacity Strengthening Unit of the International Food Policy Research Institute.

Christopher B. Barrett (cbb2@cornell.edu) is the David J. Nolan Director and Stephen B. and Janice G. Ashley Professor in the Charles H. Dyson School of Applied Economics and Management, as well as a professor in the Department of Economics at Cornell University, USA.

Quinn Bernier (q.bernier@cgiar.org) is a research analyst in the Environment and Production Technology Division of the International Food Policy Research Institute.

Sylvia Blom (s.blom@cgiar.org) is a senior research assistant in the Partnerships, Impact, and Capacity Strengthening Unit of the International Food Policy Research Institute.

Khalida Bouzar (k.bouzar@ifad.org) is the director of the Near East, North Africa and Europe Division of the International Fund for Agricultural Development.

Clemens Breisinger (c.breisinger@cgiar.org) is a senior research fellow in the Development Strategy and Governance Division of the International Food Policy Research Institute.

Joanna Brzeska (j.brzeska@cgiar.org) is a consultant at the International Food Policy Research Institute based in Luxembourg.

Margherita Calderone (mcalderone1@worldbank.org) is an applied economist in the Education Global Practice of the World Bank Group, USA.

Francisco Ceballos (f.cebillos@cgiar.org) is a research analyst in the Markets, Trade and Institutions Division of the International Food Policy Research Institute.

Mark A. Conostas (mark.constas@cornell.edu) is a professor in the Charles H. Dyson School of Applied Economics at Cornell University, USA.

Kristin Davis (k.davis@cgiar.org) is a research fellow in the Development Strategy and Governance Division of the International Food Policy Research Institute.

Charlotte Dufour (charlotte.dufour@fao.org) is a nutrition policy and programme officer in the Nutrition Division of the Food and Agriculture Organization of the United Nations (FAO), Italy.

Olivier Ecker (o.ecker@cgiar.org) is a research fellow in the Development Strategy and Governance Division of the International Food Policy Research Institute.

Shenggen Fan (s.fan@cgiar.org) is the director general of the International Food Policy Research Institute.

Timothy R. Frankenberger (tim@tangointernational.com) is the president of TANGO International, USA.

Heidi Fritschel (h.fritschel@cgiar.org) is a senior editor in the Communications and Knowledge Management Division of the International Food Policy Research Institute.

Derek Headey (d.headey@cgiar.org) is a senior research fellow in the Poverty, Health, and Nutrition Division of the International Food Policy Research Institute.

Kalle Hirvonen (k.hirvonen@cgiar.org) is an associate research fellow in the Development Strategy and Governance Division of the International Food Policy Research Institute, Ethiopia.

John Hoddinott (j.hoddinott@cgiar.org) is a senior research fellow and deputy director in the Poverty, Health, and Nutrition Division of the International Food Policy Research Institute.

Domitille Kauffmann (domitille.kauffmann@fao.org) is a nutrition and resilience consultant in the Nutrition Division of the Food and Agriculture Organization of the United Nations, Italy.

Huma Khan (h.khan@cgiar.org) is a senior research assistant in the Development Strategy and Governance Division of the International Food Policy Research Institute.

Katrina Kosec (k.kosec@cgiar.org) is a research fellow in the Development Strategy and Governance Division of the International Food Policy Research Institute.

Neha Kumar (n.kumar@cgiar.org) is a research fellow in the Poverty, Health, and Nutrition Division of the International Food Policy Research Institute.

Peter D. Little (pdlittl@emory.edu) is a professor and chair of Anthropology, and director of the Emory Program for Development Studies at Emory University, USA.

Arthur Mabiso (a.mabiso@cgiar.org) is a senior program manager in the Development Strategy and Governance Division of the International Food Policy Research Institute, Malawi.

Neil Marsland (neil.marsland@fao.org) is a senior technical officer in the resilience programming team in the Emergency Division of FAO.

Jean-François Maystadt (j.maystadt@lancaster.ac.uk) is a senior lecturer in the Department of Economics at the Lancaster University Management School, Lancaster, UK. He was previously an associate research fellow in the Development Strategy and Governance Division of IFPRI, and in the Centre for Institutions and Economic Performance (LICOS) of KU Leuven.

John G. McPeak (jomcpeak@maxwell.syr.edu) is an associate professor and vice-chair in the Department of Public Administration and International Affairs, Maxwell School of Citizenship and Public Affairs at Syracuse University, Syracuse, NY, USA.

Ruth Meinzen-Dick (r.meinzen-dick@cgiar.org) is a senior research fellow in the Environment and Production Technology Division of the International Food Policy Research Institute.

Suzanne Nelson (suzanne@tangointernational.com) is a senior research scientist at TANGO International.

Rajul Pandya-Lorch (r.pandya-lorch@cgiar.org) is the chief of staff and head of the 2020 Vision Initiative in the Director General's Office of the International Food Policy Research Institute.

Agnes Quisumbing (a.quisumbing@cgiar.org) is a senior research fellow in the Poverty, Health, and Nutrition Division of the International Food Policy Research Institute.

Miguel Robles (m.robles@cgiar.org) is a research fellow in the Markets, Trade and Institutions Division of the International Food Policy Research Institute.

Alemayehu Seyoum Taffesse (a.seyoumtaffesse@cgiar.org) is a senior research fellow in the Development Strategy and Governance Division of the International Food Policy Research Institute, Ethiopia.

Abdelkarim Sma (a.sma@ifad.org) is a regional economist in the Near East, North Africa and Europe Division of the International Fund for Agricultural Development.

Laurie Starr (laurie@tangointernational.com) is a senior technical advisor at TANGO International.

Fanaye Tadesse (fanaye.t@gmail.com) is a research officer in the Ethiopia Strategy Support Program II of the International Food Policy Research Institute, Ethiopia.

Sukhadeo Thorat (thoratsukhadeo@yahoo.co.in) is a professor of economics, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, and chairman of the Indian Council of Social Science Research, India.

Jean-François Trinh Tan (j.f.trinhthan@cgiar.org) is a research analyst in the Development Strategy and Governance Division of the International Food Policy Research Institute.

Joachim Vandecasteele (joachim.vandecasteele@kuleuven.be) is a PhD student in the Centre for Institutions and Economic Performance of KU Leuven, Belgium.

Joachim von Braun (jvonbraun@uni-bonn.de) is a professor in the Department of Economic and Technological Change and director of the Center for Development Research at the University of Bonn, Germany.

Susan Walker (susan.walker@uwimona.edu.jm) is a professor of nutrition in the Tropical Medicine Research Institute of the University of the West Indies, Jamaica.

Sivan Yosef (s.yosef@cgiar.org) is a senior program manager in the Director General's Office of the International Food Policy Research Institute.

Laura Zselezky (L.zselezky@cgiar.org) is a research analyst in the Director General's Office of the International Food Policy Research Institute.

In recent years, many people and parts of the world have been hit by major shocks ranging from conflicts, erratic weather patterns, earthquakes, droughts, and floods to food price spikes. At the same time, poor people and communities remain vulnerable to shocks that may be smaller in scope—such as emerging diseases and contaminated foods—but just as devastating for affected households. We confront a world of shocks, both familiar and unfamiliar.

We know that building resilience means helping individuals, households, communities, and countries prepare for, cope with, and recover from these shocks and become even better off. We have far less understanding, however, of how to build resilient agricultural and food systems, health systems, social systems, and governance structures that can preempt and better manage different types of shocks.

The 2020 conference, “Building Resilience for Food and Nutrition Security” held in May 2014 assessed emerging shocks that threaten food and nutrition security, discussed approaches and tools for building resilience, and identified knowledge and actions gaps. *Resilience for Food and Nutrition Security* brings together a series of informative briefs from the conference that ask and answer many questions including—are shocks becoming more frequent? Why are some communities more resilient than others? What kinds of interventions are needed to move households from vulnerable to resilient? How can people’s food and nutrition security be assured in the face of different shocks? What works to build resilience?

Shenggen Fan (s.fan@cgiar.org) is the director general of the International Food Policy Research Institute (IFPRI), Washington, DC.

Rajul Pandya-Lorch (r.pandya-lorch@cgiar.org) is the chief of staff and head of the 2020 Vision Initiative in the Director General’s Office at IFPRI.

Sivan Yosef (s.yosef@cgiar.org) is a senior program manager in the Director General’s Office at IFPRI.



IFPRI

2033 K Street, NW, Washington, DC 20006-1002 USA
Tel.: +1.202.862.5600 • Skype: ifprihomeoffice
Fax: +1.202.467.4439 • Email: ifpri@cgiar.org

www.ifpri.org

Cover design: Julia Vivalo

ISBN 978-0-89629-678-7

