

# Enhancing Resilience to Food Security Shocks

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## Table of Contents

<b>Introduction.....</b>	<b>1</b>
<b>A Conceptual Framework for Resilience .....</b>	<b>2</b>
<b>Resilience: a new paradigm for development.....</b>	<b>4</b>
Common Characteristics of Resilience Programming .....	4
Principles of Resilience Programming .....	7
Challenges to Resilience Programming .....	11
<b>Measuring Resilience Outcomes and Impact .....</b>	<b>15</b>
<b>Promising Examples of Resilience Programming.....</b>	<b>16</b>
<b>Moving the Resilience Agenda Forward .....</b>	<b>23</b>
<b>References .....</b>	<b>27</b>
<b>Annex 1: Definition of Terms.....</b>	<b>33</b>
<b>Annex 2: Basis of the Conceptual Framework for Resilience .....</b>	<b>34</b>
<b>Annex 3: Analyzing Resilience .....</b>	<b>42</b>

## Introduction

In recent decades communities within the Horn of Africa (HoA), the Sahel, south Asia, and the Caribbean have faced continuous cycles of crisis. These are the result of complex interactions between political, economic, social and environmental factors. In spite of efforts to respond to these interactions, recent climate-related crises coupled with conflict and chronic poverty have directly threatened the lives of millions of people. The collective response to these emergencies and underlying structural contributors to vulnerability have exposed the shortcomings of international aid practices and national/regional policies. A common concern with these responses is that while they have saved lives, they have not increased the capacity of affected populations to withstand future shocks and stresses.<sup>1</sup> These efforts have not done enough to enhance resilience so that households and communities in the region can avert future crises.

The starting point for reversing the downward spiral of chronic vulnerability in these regions lies in understanding that while the frequency and severity of natural disasters are likely to increase as a result of climate-related change, this trend exacerbates other underlying factors such as poverty, degraded ecosystems, inadequate physical infrastructure, conflict and ineffective governance. It goes without saying that the combination of these and other factors results in considerably different contexts in individual regions and countries.<sup>2</sup>

In such settings, a relatively mild stress on chronically vulnerable households – such as delayed or inadequate rains, sharp price increases in food staples – can lead to major shocks due to their lack of ability to respond. Building the resilience of affected people so they can respond positively to these changes requires helping people to cope with current change, adapt their livelihoods, and improve governance systems and ecosystem health so they are better able to avoid problems in the future. This means not only helping people through direct implementation of assistance programs, but also facilitating change through promotion of improved policies and adaptive practices.

The abundance of definitions and variation in use of terms in the literature does little to clarify the relationship between resilience, vulnerability, adaptive capacity, and adaptation.<sup>3</sup> For the purposes of this paper, **vulnerability** is defined as:

*“...the degree to which a population, system, community, household, or individual is susceptible to and unable to cope with hazards and stresses, including the effects of climate change”.*<sup>4</sup>

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<sup>1</sup> USAID. 2011. Enhancing resilience in the Horn of Africa: An evidence-based workshop on strategies for success. USAID Workshop Proceedings. December 13-14, 2011.

<sup>2</sup> FAO. 2008. Food Security in Protracted Crises. What can be done? Food Security Information for Action (FSIA). Policy Brief.

<sup>3</sup> Detailed definitions of terms commonly used in discussions of resilience are provided in Annex 1.

<sup>4</sup> Pasteur, K. 2011. From vulnerability to resilience: A framework for analysis and action to build community resilience. Rugby: Practical Action.

Recently, considerable research has gone into defining the properties, principles, and processes that strengthen resilience at the individual, household, community, institutional and ecosystem levels. As a result of this research, and ongoing programming experience, many definitions of ‘resilience’ have been developed. For this paper, the following definition of **resilience** will be used:

*“...the ability of countries, communities, and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses – such as earthquakes, drought or violent conflict – without compromising their long-term prospects.”<sup>5</sup>*

This paper identifies the key elements and processes involved in resilience building in various contexts but draws extensively from literature and programming experienced based in the Horn of Africa. It attempts to differentiate resilience programming from traditional humanitarian and development programs for the benefit of technical staff and policy makers and goes on to provide a prospective methodology for assessing resilience and measuring the outcomes of programs aimed at enhancing resilience. Finally, the paper describes a potential path forward for resilience programming in light of some of the more common constraints to achieving resilience.

## A Conceptual Framework for Resilience

Adoption of a conceptual framework for resilience programming is important for providing a graphic depiction of the specific elements and processes that should guide resilience programming and clarify the types of information that must be collected in order to adequately measure the outcome of such programs. The conceptual framework for resilience (Figure 1) integrates a livelihoods framework, a disaster risk reduction framework, and elements of a climate change approach to address the underlying causes of vulnerability. It also helps users to understand how long-term trends (e.g., institutional, economic, socio-political or environmental factors) affect livelihoods security and exposure to risk and formulate policies and programs to address critical needs.<sup>6,7</sup>

The overall objective of the resilience framework is to enable policy makers and practitioners to consider processes across different societal levels to holistically strengthen resilience by addressing gaps in key livelihood assets, enhancing the structures and processes of key institutions, and diversifying the livelihood strategies of vulnerable households. The extent to which communities and households are able to do so will result either in increased vulnerability or increased adaptive capacity and resilience over time.

A more detailed description of these conceptual approaches and explanation of the individual components of the conceptual framework for resilience are provided in Annex 2.

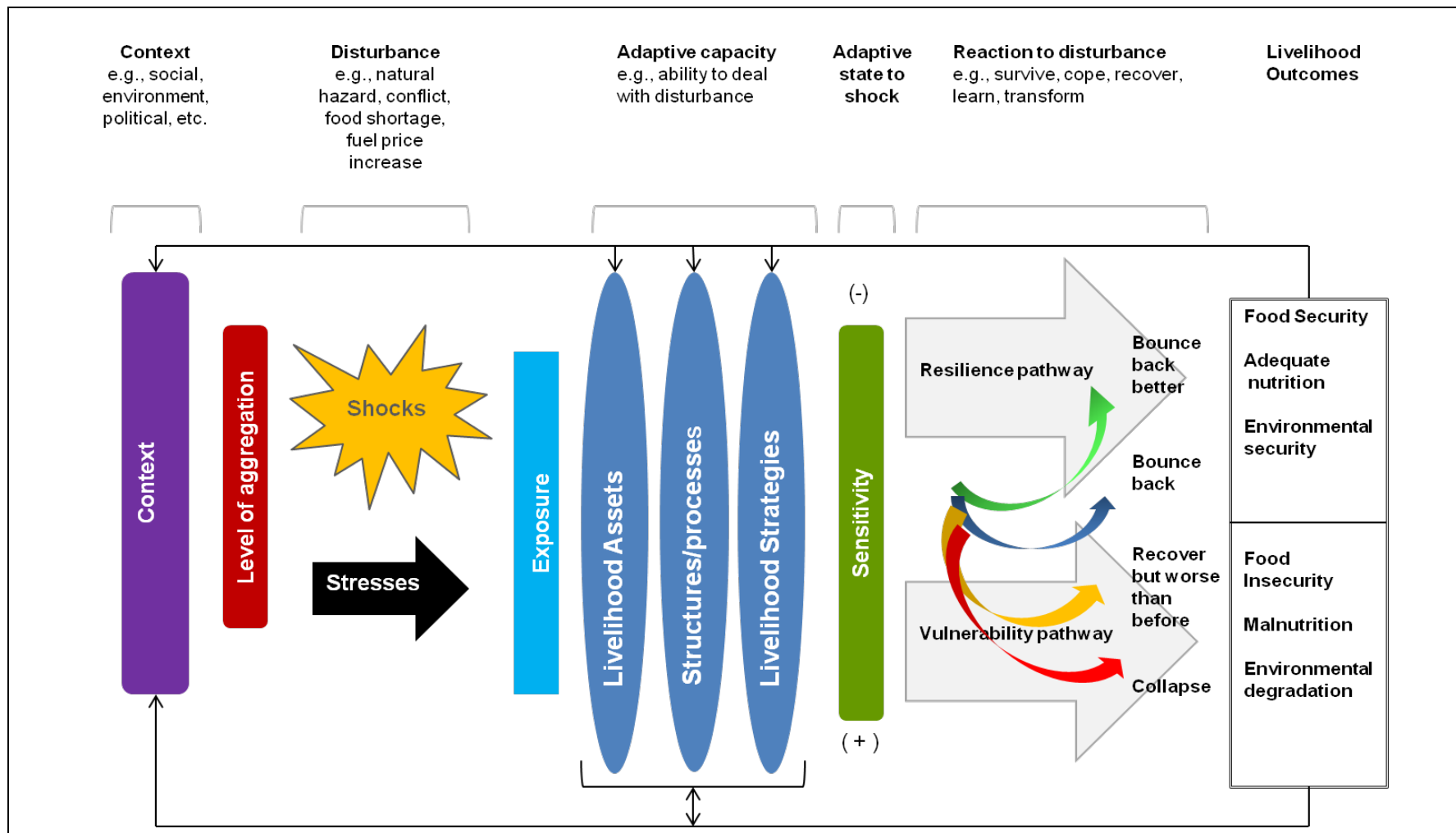
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<sup>5</sup> Department for International Development (DfID). 2011. Defining Disaster Resilience: A DFID Approach Paper. London: DFID.

<sup>6</sup> Frankenberger, T., Sutter, P., Teshome, A., Aberra, A., Tefera, M., Tefera, M., Taffesse, A.S., and T. Bernard. 2007. Ethiopia: The path to self-resiliency. Final Report prepared for CHF-Partners in Rural Development. July 2007.

<sup>7</sup> Department for International Development (DfID). 1999. Sustainable livelihoods guidance sheets. London: DFID.

**Figure 1: Resilience Framework**



TANGO 2012. Adapted from DFID Disaster Resilience Framework (2011), TANGO Livelihoods Framework (2007), DFID Sustainable Livelihoods Framework (1999) and CARE Household Livelihood Security Framework (2002).

## Resilience: a new paradigm for development

While there is growing debate over the specific means of achieving resilience in various contexts, there is a general consensus that in order to have a sustainable impact, approaches to building resilience somehow transcend the pitfalls and false distinctions made among humanitarian assistance efforts, longer-term development initiatives and social protection programs. Each of these approaches to meeting specific needs may succeed each other in a “continuum” or may coexist in a “contiguuum.”<sup>8</sup> In either case, humanitarian food assistance operations, livelihood security development interventions, climate change adaptation, social protection, peace building and governance activities should be designed and implemented in such a way that together they address changing needs and ensure adequate coverage for achieving a significant and lasting impact on the resilience of target populations.

In light of the continually changing social, economic and natural environments in most developing countries, resilience to shock is properly viewed as a process rather than a static state. A critical aspect of resilience programming is that it embraces the notions of dynamic change, risk, uncertainty, and alternative strategies in designing, planning and implementing interventions. However, in order to be locally appropriate, effective and sustainable, interventions must be focused on facilitating resilient processes rather than simply directing change toward intended outcomes. Such an approach encourages communities and institutions to prepare for inevitable change and promotes the flexibility needed to adapt programs to differing risk and vulnerability contexts. Underpinning this capacity is the commitment to engage in regular and comprehensive monitoring and analysis of the food and livelihood status of vulnerable populations, and incorporating lessons learned into revised program strategies.

### Common Characteristics of Resilience Programming

The necessary elements for building resilience may vary greatly depending on the nature of the shock experienced, the population(s) affected, and the extent of their access to important assets and services. Nonetheless, experience and existing literature reveals several **common characteristics** of effective resilience programming in support of resilient socio-ecological systems. They include:

#### ***Integrated and complementary partnerships, networks and strategies***

<sup>8</sup> A “continuum” assumes a natural, predictable, sequential progression from one state to another (e.g. from relief to development). Alternatively, a “contiguuum” acknowledges that various stages of development and disaster response may be operating at the same time, in overlapping juxtaposition.

<sup>9</sup> Interagency Resilience Working Group (IRWG). 2012. The Characteristics of Resilience Building: A discussion paper. 11 October 2012.

Building and maintaining resilience requires the combination of a range of actors with complementary capacities and skills. By forging mutually advantageous partnerships and drawing on diverse networks, communities, civil society, academic research institution, government and the private sector can strengthen the ability of vulnerable populations to improve their wellbeing and adapt to change. In resilient socio-ecological systems this entails: 1) addressing gaps in critical livelihood assets such as cash, skills, leadership, knowledge, health, food; 2) improving access to public assets such as roads, power, water, schools, markets and health facilities; 3) strengthening the operation and capabilities of formal and informal institutions; 4) supporting livelihood diversification; 5) resolving conflicts and building peace; and 6) rehabilitating degraded ecosystems.

### ***Achievement of sustainable impact through adequate scale and duration***

In order to positively impact people's lives, projects must be implemented at sufficient scale and over a long enough time period to have lasting benefits. All too often, promising pilot initiatives targeting small populations have experienced difficulty in scaling up innovative and effective practices to benefit millions of affected households in disaster-prone regions.<sup>10,11</sup> Others have ultimately failed because they have not adequately built sufficient vertical and horizontal linkages across multiple scales. Resilience programming must adopt a holistic approach to strengthening linkages between local, national, regional and international levels, and promote effective collaboration across multiple disciplines (governance, agriculture, markets, financial services, health, education, etc.)<sup>12</sup> In order to avoid recurrent crises, and the huge amounts of financial and human resources directed toward periodic humanitarian assistance, civil society and donors should collaborate on developing strategies for building resilience over longer time frames (7-10 years). It is critical that such long-term investments have built-in response capacity for dealing with periodic shock (e.g., with crisis modifiers) and avoid limit bureaucratic obstacles to transitioning between emergency and longer-term development programming.

### ***Promotion of healthy ecosystems***

In order to address vulnerability and sustainably build resilience among poor, rural populations, governments, donors and implementing agencies must acknowledge the critical nature of healthy ecosystems for the long-term wellbeing of human populations. Currently in many disaster-prone regions, degradation of land, water and biodiversity stems from deforestation, overgrazing, over-exploitation of natural resources, and poor land management practices. Each of these practices contributes to a reduced capacity of the natural environment to provide resources and ecosystem services to rural populations that depend on them. Ecosystem-based planning, including payment for ecosystem services (PES), enables rehabilitation of degraded resources and can help ensure the environmental sustainability of predominant livelihood activities. Previous examples of PES include compensation of communities by external actors for conservation of landscapes, wildlife corridors and

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<sup>10</sup> Agriculture for Impact. 2010. The Montpellier Panel Report: Africa and Europe: Partnerships for Agricultural Development.

<sup>11</sup> TANGO International. 2007. Ethiopia: The Path to Self-Resiliency. Prepared for CHF – Partners in Rural Development. July 2007.

<sup>12</sup> IRWG. 2012.

carbon sequestration.<sup>13,14</sup> Policy makers and civil society can also promote rehabilitation of degraded ecosystems at the local level by supporting farmer managed natural regeneration (FMNR), cultivation of drought-tolerant crops and livestock, integrated pest management, conservation and utilization of local genetic resources, breeding for local adaptation, improved water resource management, and other climate smart agricultural practices.<sup>15,16</sup>

### ***Effective formal and informal governance***

Representative, responsive, transparent and accountable governance is critical for enabling countries, communities and households to exercise their rights, benefit from equitable laws and policies, attain sustainable food and livelihood security and achieve greater resilience in the face of potential shocks.<sup>17</sup> Governance includes a wide range of public, private, formal, and informal organizations, policies and processes that function at local, national and international levels.<sup>18</sup> The governance context is critical for resilience programming in that it determines household and community access to resources, skills, technology, services, markets and information. Programming that strengthens existing local institutions, advocates for decentralized and participatory decision-making (including women), strengthens linkages between various levels of governance, and seeks to address existing imbalances in power relations will enhance the adaptive capacity of communities to respond to and recover from shocks. Resilience programs should enable ownership at the country level by linking with national policies and investment plans consistent with the regional and global policy initiatives (e.g. Comprehensive Africa Agriculture Development Programme, Hyogo Framework for Action, etc.)

### ***Gender equity***

The importance of women in helping to raise families out of poverty is underscored by Millennium Development Goal 3 – promoting gender equality and empowering women. Evidence strongly suggests that providing equal access to assets and opportunities for women results in better food security and health outcomes for all household members.<sup>19, 20</sup> Resilience programming should recognize and respond to the needs and capabilities of populations that are most sensitive to shocks, including women and members of female-headed households. Activities that create opportunities for women (and youths) to access and control resources, and address challenges to existing attitudes and practices that perpetuate gender inequalities help build resilience for women, their families and community. In many

<sup>13</sup> Njoka, J.T. 2012. Enhancing Resilience to Climate Change in the Horn of Africa. Produced in collaboration with USAID, IFPRI, ILRI, and the University of Nairobi.

<sup>14</sup> TANGO International. 2011. Horn of Africa (HOA) Drought and Hunger Crisis Research – Kenya, Ethiopia, Somalia. Prepared for World Vision International. December 2011.

<sup>15</sup> Agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals.

<sup>16</sup> FAO. 2010. "Climate-smart agriculture: Policies, practices and financing for food security, adaptation and mitigation. Rome: Food and Agriculture Organization of the United Nations.

<sup>17</sup> IRWG. 2012.

<sup>18</sup> Pasteur, K. 2011. From vulnerability to resilience: A framework for analysis and action to build community resilience. Rugby: Practical Action.

<sup>19</sup> International Food Policy Research Institute (IFPRI). 2012. Women's empowerment in agriculture index.

<sup>20</sup> TANGO . 2009. SHOUHARDO: A Title II program of USAID Final Evaluation Report. December 2009. Washington, D.C.: USAID.



disaster-prone areas, women are often disproportionately affected by the onset of shocks and their aftermath.<sup>21,22</sup> Resilience programming should focus on diversifying and enhancing livelihood options for women and girls by empowering them through education and skills training, and supporting their efforts to achieve a greater voice in policy formulation as well as problem assessment and development planning at the community level.

### **Social Protection**

Social protection programs are typically targeted at chronically vulnerable populations and often aim to address both immediate and long-term needs through cash or food transfers in exchange for creation of physical, human, and financial assets at the household and community levels. Social protection programs can enhance resilience to shocks by effectively linking humanitarian and longer-term development outcomes and providing guaranteed support that allows households to increase their adaptive capacity (through asset accumulation or livelihoods diversification) during times of non-stress conditions while cushioning households from destitution during times of stress or emergency. The reliability of cash and food transfers provided through social protection schemes not only provides poor households with more flexibility in the use of limited financial and food resources, it can also have a positive effect on local market economies.<sup>23,24</sup> While social protection mechanisms are typically coordinated through national governments, civil society organizations and donors can contribute to greater resilience of vulnerable populations by complementing social protection schemes where they exist, or advocating strongly for their establishment where they do not.

### **Principles of Resilience Programming**

Development specialists involved in resilience work at the international and regional levels have identified a number of related *principles* to guide practitioners, policy makers and communities develop and implement programs that embody these five *characteristics* of resilience.<sup>25,26</sup> In order to be effective resilience programming should:

- **Support a transition, over time, in the balance of effort and resources** from humanitarian assistance toward disaster risk management, climate change adaptation, livelihood diversification, and social protection. To support this transition, all stakeholders must play their part in reducing the artificial divide between humanitarian emergency assistance and longer-term development.
- **Recognize and respond to the different needs, capabilities and aspirations of different people**, especially those of the most vulnerable groups (women, children, orphans, elderly,

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<sup>21</sup> Flintan, F. 2011. The importance of gender in drought and Disaster Risk Reduction. In: de Jode, H., & V. Tilstone (eds.), Disaster risk reduction in the drylands of the Horn of Africa: Good practice examples from the ECHO DCM partners and beyond - Edition 2. Regional Learning & Advocacy Programme (REGLAP) for Vulnerable Dryland Communities. European Commission Humanitarian Aid Department (ECHO).

<sup>22</sup> Pincha, Chaman. 2008. Indian Ocean Tsunami Through The Gender Lens: Insights from Tamil Nadu, India.

<sup>23</sup> Beesley, Jane. 2011. The Hunger Safety Nets Programme, Kenya: A social protection case study. Oxfam GB.

<sup>24</sup> DFID. 2012. Programming for Resilience in Ethiopia – a model. DFID Ethiopia.

<sup>25</sup> DfID. 2011.

<sup>26</sup> Inter-Agency Standing Committee (IASC). 2011. Inter-Agency Plan of Action for the Horn of Africa. 30 September 2011.

displaced, conflict-affected). Approaches to building resilience in one context or for one particular population may be ineffective, or even detrimental when applied in different contexts or among different populations;<sup>27</sup>

- **Support greater investment in human capital** to enable households to maintain health, diversify livelihood options and exercise their individual and collective rights. Resilience programming needs to go beyond treating the symptoms of vulnerability (malnutrition, poor health status, poverty, etc.) and adopt a commitment to facilitating greater resilience to potential shocks. Perhaps the most powerful means of doing this is through long-term investments in access to education, health care, skills training for livelihood diversification.<sup>28</sup> Strategies to empower women (especially female heads of household) – provision of education, skills training in improved nutrition and hygiene practices and enhanced roles in household and community decision-making – not only improve their resilience, but typically have dramatic impacts on the health and wellbeing of their entire households.<sup>29,30</sup>
- **Enable community participation** by identifying and engaging customary institutions and valuable forms of traditional knowledge for coping with climate variability, conflict, and food insecurity. Community solidarity, engagement, ownership of resources, and the capacity to organize are critical for building resilience. When people are empowered to draw on their own capacity, strengths, and values rather than viewing themselves in a situation of hopeless poverty, resilience is strengthened. Empowering communities also entails the exchange of knowledge and information so that they have the ability to make informed decisions that lead to improved adaptive capacity and reduced vulnerability.
- **Advocate for and support improved governance** among government, civil society and informal community institutions by supporting responsive policies, transparent resource allocation and greater accountability. Governance can also be strengthened by identifying and drawing from traditional knowledge and practices regarding natural resource management, conflict mitigation and social protection.
- **Contribute to peace-building and conflict mitigation** – Conflict undermines resilience, particularly where impoverished communities are exposed to violence amid ongoing economic and/or environmental shock. Working on peace building and disaster risk reduction simultaneously has been shown to increase resilience by ensuring access to productive resources needed for

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<sup>27</sup> Interagency Resilience Working Group (IRWG). 2012. The Characteristics of Resilience Building: A discussion paper. 16 April, 2012.

<sup>28</sup> Frankenberger, T., Sutter, P., Teshome, A., Aberra, A., Tefera, M., Tefera, M., Taffesse, A.S., and T. Bernard. 2007. Ethiopia: The path to self-resiliency. Final Report prepared for CHF-Partners in Rural Development. July 2007.

<sup>29</sup> Agriculture for Impact. 2010. The Montpellier Panel Report: Africa and Europe: Partnerships for Agricultural Development.

<sup>30</sup> TANGO International. 2009. SHOUHARDO: A Title II program of USAID Final Evaluation Report. December 2009. Washington, D.C.: USAID.

maintaining livelihood security.<sup>31,32</sup> In regions where chronic, violent conflict is present, activities to promote peace appear to be a pre-requisite for strengthening resilience since livelihoods diversification, market integration, and other forms of risk reduction and adaptation among pastoralists are directly dependent on security and freedom of movement.

- **Facilitate livelihood diversification** through improved access to public and productive infrastructure (roads, markets, water infrastructure, power, etc.), access to financial services and greater participation in markets.<sup>33</sup> Building resilience among a diverse range of livelihood groups dependent on natural resources will also require attention to issues related to collective management of natural resources (land, water, forests, fisheries) and legal rights governing access to them (e.g. land tenure, water allocation, harvest/catch quotas, etc.).<sup>34</sup> Given the pressure placed on rural livelihood by climate change, governments, donors, and implementing agencies should continue to seek means of promoting 'off-farm' income generating opportunities.
  
- **Utilize a broader range of assistance modalities**, including (but not limited to) distribution of cash and/or vouchers. While direct food assistance provided at times of crisis helps save lives, it is increasingly seen as failing to contribute to sustainable food security.<sup>35</sup> Transfers of cash – either in place of or in combination with – food assistance have in many cases proven an effective means of addressing food insecurity while helping beneficiaries enhance livelihood activities and prepare for potential shock in the future. Cash and vouchers have also gained support due to their ability to counteract erosion of traditional/informal safety nets and the stimulating effect they have on local economies.<sup>36-38</sup> Extensive studies of cash transfer programs in sub-Saharan Africa have also demonstrated their potential for positive impacts on household food and non-food consumption as well as children's nutrition and education.<sup>39</sup> Caution should be exercised, however, in deciding whether to utilize cash/vouchers or in-kind food assistance. Previous studies have shown that in-

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<sup>31</sup> Kurtz, J., & G. Scarborough. 2011. From Conflict to Coping: Evidence from Southern Ethiopia on the contributions of peacebuilding to drought resilience among pastoralist groups.

<sup>32</sup> International Institute for Environment and Development (IIED) and SOS Sahel UK. 2010. Modern and mobile: The future of livestock production in Africa's drylands.

<sup>33</sup> Alinovi, L., D'Errico, M., Mane, E., & D. Romano. 2010. Livelihoods strategies and household resilience to food insecurity: an empirical analysis to Kenya. Paper prepared for the Conference on "Promoting Resilience through Social Protection in Sub-Saharan Africa", organised by the European Report of Development in Dakar, Senegal, 28-30 June, 2010.

<sup>34</sup> Frankenberger, T. et al. 2007.

<sup>35</sup> Garcia, M. and C.M.T. Moore. 2012. The cash dividend: the rise of cash transfer programs in Sub-Saharan Africa. Washington, D.C.: World Bank.

<sup>36</sup> WFP. 2009. Strategic Evaluation of the Effectiveness of WFP Livelihood Recovery Interventions. A Report from the Office of Evaluation. World Food Programme, Rome.

<sup>37</sup> Beesley, Jane. 2011. The Hunger Safety Nets Programme, Kenya: A social protection case study. Oxfam GB.

<sup>38</sup> Fitzgibbon, C. 2011. How distributing food aid via vouchers is stimulating local traders in pastoral communities and building the market for meat, milk and fish consumption. In: de Jode, H., & V. Tilstone (eds.), Disaster risk reduction in the drylands of the Horn of Africa: Good practice examples from the ECHO DCM partners and beyond - Edition 2. Regional Learning & Advocacy Programme (REGLAP) for Vulnerable Dryland Communities. European Commission Humanitarian Aid Department (ECHO).

<sup>39</sup> Garcia, M. and C.M.T. Moore. 2012. The cash dividend: the rise of cash transfer programs in Sub-Saharan Africa. Washington, D.C.: World Bank.

kind food assistance can have greater impact on food security and livelihood recovery than cash in certain situations, particularly those characterized by rapid currency devaluation and or food price inflation.<sup>40-42</sup>

- **Strengthen access to and participation in markets** – Access to, and participation in well-functioning markets is critical to building resilience among vulnerable populations. Strengthening linkages with local markets will help ensure that small-holder farmers and pastoralists have consistent access to input and produce markets and income streams. Improving market access requires not only creation of market infrastructure (roads, market facilities) but also access to price information, as well as support for assets and financial services to enable engagement in value chains. Increasingly, technology (e.g. cell phones) has enabled remote pastoralist and agro-pastoralist populations to access price information and more efficiently utilize financial resources. In the Horn of Africa and other regions with highly mobile populations, participation in markets is also dependent on government policies that encourage and regulate (rather than restrict) cross-border trade.<sup>43</sup>
  
- **Look for means of engaging the private sector** in order to complement donor funding and provide market incentives for investment in livelihoods. When properly aligned with community priorities and a country's national strategies, significant benefit can result from strategic partnerships between government, civil society and the private sector. Low public investment has resulted in a critical lack of basic infrastructure in many developing countries. Partnering with private interests may prove an effective avenue for advocating for infrastructure investment in underserved areas in a manner that delivers long-term benefits to communities, governments, and the private industry. Public-private partnerships and clustering of donor, government and private-sector investments – in agricultural markets, household and public assets, social protection, climate change adaptation, and financial services – have the potential to secure livelihoods and enhance resilience.
  
- **Contribute to improved knowledge management** by identifying and addressing key knowledge gaps. Knowledge management also means informing coherent policy formulation and program design that responds to ongoing change in environmental, social and economic conditions by making knowledge available in appropriate timeframes and formats.<sup>44</sup> Evidence-based knowledge regarding the effectiveness of alternative approaches to building resilience and cost-benefit analysis

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<sup>40</sup> TANGO International. 2012b. NGO response to food price crises: Evidence of change in NGO operations since 2008. Input for policy brief. March 2012. DRAFT prepared for International Food Policy Research Institute.

<sup>41</sup> Hobson, Matt. 2009. The Food Price Crisis and its Impact on the Ethiopian Productive Safety Net Programme 2008. Humanitarian Practice Network. No.42. March 2009. London: Overseas Development Institute.

<sup>42</sup> Sabates-Wheeler R, and S Devereux. 2010. Cash Transfers and High Food Prices: Explaining Outcomes on Ethiopia's Productive Safety Net Programme. Working Paper 004. Future Agricultures Consortium, United Kingdom.

<sup>43</sup> Mortimore, M. with contributions from S. Anderson, L. Cotula, J. Davies, K. Facer, C. Hesse, J. Morton, W. Nyangena, J. Skinner, and C. Wolfangel. 2009. Dryland Opportunities: A new paradigm for people, ecosystems and development, IUCN, Gland, Switzerland; IIED, London, UK and UNDP/DDC, Nairobi, Kenya. x + 86p.

<sup>44</sup> DfID. 2011.

of these various alternative are especially high priorities for informing future resilience programming.

## Challenges to Resilience Programming

The growing consensus for ‘resilience building’ stems in part from widespread acknowledgement that previous humanitarian responses and development initiatives have failed to adequately address the needs of chronically vulnerable populations. At the same time, policy makers and other development actors are confronted with a range of significant challenges in their efforts to operationalize the principles of resilience programming.

### *Community Challenges*

- Deforestation, encroachment into fragile ecosystems, overgrazing, and improper land use have resulted in soil erosion, loss of vegetation, and loss of biodiversity and ecosystem services throughout much of the developing world. When rangelands and water sources are made inaccessible – due to conflict, restrictions on cross-border migration – the stress placed on natural resources exacerbates environmental degradation, the loss of biodiversity and the spread of alien or unpalatable species.<sup>45</sup> While pastoralist and agro-pastoralist practices have long been thought to contribute to **environmental degradation** (e.g., deforestation, soil nutrient mining, over-grazing), depletion of natural resources tends to be less evident under systems of traditional management. For example, in open rangelands where mobility is unrestricted, little overgrazing occurs as herders move cattle to take advantage of different types of pasturelands (e.g., wet, dry and drought-time grazing areas). In Niger, mobile herds are 20 percent more productive (i.e., have higher annual reproduction, lower calf mortality and higher milk production) than herds produced through sedentary ranching.<sup>46</sup>
  
- In many areas characterized by pastoral and agro-pastoral livelihood systems, natural resources are owned, managed and used collectively by various entities and are often under different tenure arrangements.<sup>47</sup> **Rights of use and access to land** are largely determined by the type of land tenure arrangement and determine land management options available to users.<sup>48</sup> Common property or community-owned lands are subject to collective communal management, though privatization of communal lands has increased, largely from encroachment by agriculture, urbanization, sedentarization and emergence of human settlements.

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<sup>45</sup> Republic of Kenya. 2011. Vision 2030 Development Strategy for northern Kenya and other arid lands. Final, August 2011.

<sup>46</sup> Mortimore, M. with contributions from S. Anderson, L. Cotula, J. Davies, K. Facer, C. Hesse, J. Morton, W. Nyangena, J. Skinner, and C. Wolfangel. 2009. Dryland Opportunities: A new paradigm for people, ecosystems and development, IUCN, Gland, Switzerland; IIED, London, UK and UNDP/DDC, Nairobi, Kenya. x + 86p.

<sup>47</sup> International Institute for Environment and Development (IIED) and SOS Sahel UK. 2010. Modern and mobile: The future of livestock production in Africa’s drylands.

<sup>48</sup> Njoka, J.T. 2012. Enhancing Resilience to Climate Change in the Horn of Africa. Produced in collaboration with USAID, IFPRI, ILRI, and the University of Nairobi.

- Prevailing social structures and **power relations** that guide dynamic interactions between poor and non-poor households at the community level can create significant challenges for vulnerable households seeking to increase their assets and resilience to shock.<sup>49</sup> Such attempts at upward mobility among poor populations can be viewed as a threat to the status quo and may be resisted by the powerful elite. Poor households seeking to limit their sense of economic and physical sense of insecurity often respond rationally to risk by linking with the non-poor in exploitive relationships.<sup>50</sup> In such relationships, the most vulnerable are often forced to choose a modicum of economic and personal security at the cost of empowerment, asset accumulation and self-reliance. Over time, such processes contribute to low aspirations and aspiration failures among chronically vulnerable populations. Promotion of resilient households and communities requires identification of mechanisms of improving the adaptive capacity of communities without relying on exploitive relationships between poor and non-poor households.
  
- Women play a critical and potentially transformative role in social and economic processes at the community level. However, despite their potential, women continue to face cultural, political and economic obstacles limiting their ability to make decisions about agricultural production, access to and decision-making power over productive resources, control over use of income, leadership opportunities within their communities, and use of their time.<sup>51</sup> A commitment to addressing **gender inequality** at the household and community levels will be critical for all programs seeking to improve long-term resilience of vulnerable populations.

### **Government Challenges**

- **Ineffectual governance** (including inefficient and/or inappropriate policies) poses a clear constraint to achievement of greater household and community resilience in many developing countries. Notable and common outcomes of policy and governance failures in the Horn of Africa include conflict over natural resources, inefficient livestock marketing, insecure land rights, and inadequate provision of services and infrastructure in arid and semi-arid lands (ASALs).<sup>52-54</sup> Weak governance and protracted conflict in Somalia over the last decades have contributed greatly to increased vulnerability of the Somali people.<sup>55</sup> Meanwhile, the ongoing process of decentralization in Kenya, and the tendency for central government control over resource investments in Ethiopia both present challenges to implementation of responsive, contextually appropriate policies in support of

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<sup>49</sup> Frankenberger et al. 2007.

<sup>50</sup> Shephard, A. 2007. Understanding and explaining chronic poverty: An evolving framework for Phase III of CPRC's research. *CPRC Working Paper #80*. London: Overseas Development Institute.

<sup>51</sup> International Food Policy Research Institute (IFPRI). 2012. Women's empowerment in agriculture index.

<sup>52</sup> Helland, J. 2006. Land Tenure in the Pastoral Areas of Ethiopia. International Livestock Research Institute Campus. Addis Ababa, Ethiopia.

<sup>53</sup> Humanitarian Policy Group (HPG). 2006. Saving lives through livelihoods: critical gaps in the response to the drought in the Greater Horn of Africa.

<sup>54</sup> Morton J. 2005. Legislators and Livestock: A comparative Analysis of Pastoralist Parliamentary Groups in Ethiopia, Kenya and Uganda. Final Report for the NRI/PENHA Research Project on Pastoralist Parliamentary Groups.

<sup>55</sup> FAO/WFP/UNICEF. 2012. Building Resilience – rethinking aid strategy for Somalia. A FAO/WFP/UNICEF Joint Strategy on building resilience against shocks for Somalia. DRAFT. 14 March 2012.

resilience.<sup>56</sup> A poignant example is provided by the fact that while 75 percent of Kenya's livestock are held in ASALs, only 10 percent of government livestock officers are based there.<sup>57</sup> While a draft policy on the sustainable development of ASALs was drawn up in Kenya in 2004, it has yet to be approved, mainly due to political maneuvering before and since the passage of the country's new constitution. Meanwhile, Pastoral Policy Groups (PPGs) established within the Ethiopian and Kenyan parliaments have been unable to initiate significant legislation of benefit to their constituencies.<sup>58,59</sup>

- On a related, but separate note, the **lack of political will**, or in some cases interference by local or national governments in humanitarian and development activities, also compromises the ability of efforts to address the root causes of household and community vulnerability to drought.<sup>60</sup> Often pursuing the priorities of economic growth and poverty eradication, governments may be particularly averse to allocating scarce resources toward development initiatives in destitute, drought-prone, and asset-poor regions of their countries, fearing that such investments do not yield short-term economic returns. In Ethiopia and Kenya, the lack of investment in ASALs is also attributed to limited understanding at the policy level of the potential of pastoral livestock value chains for poverty reduction.
  
- Lack of accountability for and transparency in use of development funds at the local, national or regional levels of government undermines programming efforts to build resilience. Wide-spread **corruption** coupled with weak governance lends itself to misappropriation of donor resources.<sup>61</sup> Efforts to minimize the potential for such corruption are highlighted in a recent review of business procedures for Drought Contingency Funds (DCF) disbursements through Kenya's National Drought Management Authority (NDMA).<sup>62</sup> Mechanisms for preventing and addressing corruption are critical for maximizing the potential of scarce resources to promote greater resilience among vulnerable communities.
  
- **Internal and cross-border conflicts** – often spurred by contested access to and management of natural resources – represent a significant constraint to livelihood security and resilience in many disaster-prone regions. Conflict mitigation and peace building must therefore be included in

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<sup>56</sup> TANGO International. 2011. Horn of Africa (HOA) Drought and Hunger Crisis Research – Kenya, Ethiopia, Somalia. Prepared for World Vision International. December 2011.

<sup>57</sup> IRIN. 2011. [website accessed Sept. 23, 2011]. Kenya: Push to put pastoralists on the map. <http://www.irinnews.org/report.aspx?reportid=93786>

<sup>58</sup> Pavanello, S. 2009. Pastoralists' Vulnerability in the Horn of Africa: Exploring political marginalization, donors' policies and cross-border issues – Literature review. Humanitarian Policy Group (HPG).

<sup>59</sup> Markakis J. 2004. Pastoralism on the Margin. Minority Rights Group International.

<sup>60</sup> Njoka, J.T. 2012.

<sup>61</sup> Njoka, J.T. 2012.

<sup>62</sup> Tilstone, V. 2011. An innovative approach to drought management in Kenya: the establishment of the National Drought Management Authority. In: de Jode, H., & V. Tilstone (eds.), *Disaster risk reduction in the drylands of the Horn of Africa: Good practice examples from the ECHO DCM partners and beyond - Edition 2*. Regional Learning & Advocacy Programme (REGLAP) for Vulnerable Dryland Communities. European Commission Humanitarian Aid Department (ECHO).

resilience programming, along with measures to strengthen local governance structures and improve social cohesion and collective resource management among vulnerable populations.<sup>63</sup>

### **Donor Challenges**

- Effective resilience programming requires integration of disaster response, support for sustainable livelihoods and climate change adaptation in order to address underlying causes of vulnerability.<sup>64</sup> Such an approach is dependent upon **long-term, flexible and timely funding mechanisms**. However, the differing programming timelines and procurement processes between humanitarian assistance and development interventions have hampered previous efforts to adopt a ‘development relief’ approach to enhancing livelihood security.<sup>65</sup> Development funding tends to be more structured and less flexible than emergency funding, making it more difficult to shift back to a humanitarian response if needed.
- Experience strongly suggests that flexible funding commitments in the range of 6-10 years will likely be needed to restore livelihoods and address the root causes of vulnerability to livelihood security in disaster-prone regions. Securing flexible and timely funding streams for resilience programming will require closer coordination between donors currently supporting short-term humanitarian assistance and longer-term development initiatives.<sup>66,67</sup>
- Achievement of impact is often compromised by the **lack of geographic overlap** between emergency and development operations. In certain contexts the objectives of humanitarian assistance and development programming may overlap. Indeed it is often possible and desirable to meet people’s basic needs at the same time as help them to recover key livelihood assets. Development interventions should be designed and implemented in such a way that together they ensure an optimal solution to meeting these different needs. However, development agencies tend to work more closely with governments while the priorities of humanitarian agencies do not always coincide with those of the government. This can be problematic because governments determine their support for interventions on factors other than humanitarian need – i.e. economic development, private sector development, market expansion. Finally, humanitarian actors often provide food assistance and support for livelihoods to populations who are difficult to access and not being served by other actors (humanitarian or development). This often makes it extremely difficult to find development partners willing to fund follow-up activities aligned with previous emergency activities.<sup>68</sup>

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<sup>63</sup> Njoka, J.T. 2012.

<sup>64</sup> Pasteur, K. 2011. From vulnerability to resilience: A framework for analysis and action to build community resilience. Rugby: Practical Action.

<sup>65</sup> Haver, K., Frankenberger, T., Greeley, M., & P. Harvey. 2012. Evaluation and Review of DG ECHO financed livelihood interventions in humanitarian crises. Final Report 5 March 2012. European Commission Humanitarian Aid Office (ECHO).

<sup>66</sup> TANGO International. 2012. Secure the Future: Enhancing resilience of drought-affected nations, communities, and households in the Horn of Africa. World Vision Concept note. DRAFT. March 2012.

<sup>67</sup> FAO/WFP/UNICEF. 2012.

<sup>68</sup> Haver, K., Frankenberger, T., Greeley, M., & P. Harvey. 2012.



- **Trade-offs** often complicate building resilience, especially between marginalized groups and commercial interests.<sup>69</sup> A common example is competition between livestock producers, agricultural interests and industrial users for scarce resources such as land and water. Building resilience in one livelihood group may negatively impact resilience in another. The multi-sectoral nature of resilience programming also leaves room for potential tension or conflicts over resource allocation between various stakeholders, particularly if the ability of programmes to deliver depends on funding levels.<sup>70</sup> Coherence and coordination of innovative funding mechanisms can minimize the potential for competition or negative trade-offs between humanitarian and development-focused programming.

## Measuring Resilience Outcomes and Impact

Looking forward, a major milestone in achieving resilience at a significant scale will be the ability to measure the outcomes and impacts of specific resilience-building initiatives. While several ongoing efforts show considerable potential for enhancing the resilience of vulnerable populations, to date few measures have been put in place to provide objective, verifiable information on the progress made. The continuous and dynamic process of building resilience makes it inherently difficult to measure. Nonetheless, such information is critical for assessing the relative effectiveness and value of different approaches to building resilience in the face of recurrent shocks.

When measuring the impact of resilience programs, priority should be given to approaches that involve the affected communities themselves in assessing the success of interventions in ways that are meaningful to them. To be operationally meaningful, monitoring and evaluation of resilience building initiatives must be flexible and/or tailored to particular types or categories of shocks.<sup>71</sup> Several overarching lessons have been learned for monitoring the effectiveness of resilience building efforts at the regional, national, community and household levels:

- **Context-specific**  
Resilience measures must be closely tied to the local context and the nature of the particular shock (e.g., drought, price volatility, conflict).
- **Shock-dependent**  
It is not possible to measure resilience to shock without the implementation of comprehensive baseline assessments and the occurrence of an actual shock.

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<sup>69</sup> Berger, R., & M Chambwera. 2010. Beyond cost-benefit: developing a complete toolkit for adaptation decisions. International Institute for Environment and Development. London: IIED.

<sup>70</sup> Béné, C. 2012. Social protection and resilience to climate and disaster. IDS Programme Briefing. March 2012. Brighton: Institute of Development Studies

<sup>71</sup> One of the shortcomings of much of the existing empirical research on vulnerability is that it is not assessing vulnerability with respect to specific types of shocks or populations, but rather assesses vulnerability of homogenous communities to all types of shocks (both idiosyncratic and covariate).

➤ **Robust indicators**

Measurement of resilience must include a complementary mix of quantitative and qualitative indicators that have the power to explain *why* certain individuals, households and populations have achieved different levels of resilience than others.

➤ **Outcome-oriented**

Measurement of resilience must move beyond the traditional focus on outputs to give priority to measurement of outcomes and impacts. Nutrition outcomes have been identified as particularly relevant indicators of resilience programs.

A more detailed description of the theoretical and technical approach to measuring resilience outcomes and impact is provided in Annex 3.

## Promising Examples of Resilience Programming

Donors, implementing agencies, and national governments are eager to identify and replicate activities that have proven effective (or show promise) in enhancing resilience and in achieving wide-scale and sustainable impact in the Horn of Africa and other chronically vulnerable regions. However, given the relatively recent emergence of the concept of ‘resilience’ within the wider development community, there is an understandable scarcity of robust, verifiable evidence of impact among programs seeking to build resilience within such reasons.<sup>72,73</sup> There is however, a growing body of literature highlighting a range of better practices for enhancing resilience among households and communities affected by climate change.

It should be noted that the following examples have not been selected based on documented evidence of sustainable impact on community and household resilience. Rather, they have been selected based on the extent to which they responded to context-specific constraints to resilience and embody certain *characteristics* of effective resilience programming. They combine shorter-term humanitarian and longer-term development interventions, taking advantage of complementarities between the approaches. To varying degrees, each integrates some combination of multi-disciplinary resilience-focused approaches, such as livelihoods, disaster risk reduction, climate change adaptation, and social protection activities. Building household and community resilience requires full participation at the community level through community decision-making in identification of appropriate interventions and determining what constitutes success at the community level. Some of the programs selected are currently operating as evidenced-based pilots with the intention of scaling-up; others currently operate at scale.

### ***The Sahel Plan***

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<sup>72</sup> DfID. 2011. Defining Disaster Resilience: A DFID Approach Paper. London: DFID.

<sup>73</sup> Headey, Derek, Alemayehu Seyoum Taffesse, and Liangzhi You. 2012. Enhancing Resilience in the Horn of Africa: An Exploration into Alternative Investment Options. IFPRI Discussion Paper 01176. April 2012.

In 2007 the European Commission for Humanitarian Aid department (ECHO) developed a “Sahel strategy” that promotes short and long-term aid to achieve a sustainable reduction in malnutrition rates in the Sahel.<sup>74</sup> The Sahel Plan pursues a broad approach to resilience that is built, in large part, on lessons learned from the 2005 food security crisis in the Sahel; in particular, a lack of understanding of the underlying causes of malnutrition in the Sahel.<sup>75</sup> The Plan covers Niger, Burkina Faso, Chad, Nigeria, Mali, Mauritania, Cameroon and provides funding from the Humanitarian Food Assistance (HFA) budget of ECHO to NGOs and UN agencies for humanitarian food assistance aimed at reducing (through treatment *and* prevention) severe acute malnutrition (SAM). Strategies include support for Disaster Risk Reduction (DRR), and advocacy to prioritize integration of food and nutrition security into public policies.<sup>76</sup>

The Plan takes a regional approach, including cross-border learning and cooperation, and advocates among governments and donors for strengthening linkages between relief and development activities to prevent acute malnutrition by an address its underlying structural causes. To more effectively advocate with government and other partners, the Plan places high priority on using Standardized Monitoring and Assessment of Relief and Transition surveys (SMART) and Emergency Market Mapping and Analysis (EMMA). Since 2005, many NGOs and other implementing partners made significant changes to their “strategies, structure, staffing, policies and funding” to promote DRR and enhance local assets and capacities.<sup>77</sup> ECHO’s 2011 Sahel plan gives priority to ‘operations that give emphasis to disaster risk reduction’, and aim to assist people ‘to strengthen their coping mechanisms and resilience.’

### ***Pastoral Livelihoods Initiative (PLI)***

Jointly designed and funded by the Government of Ethiopia (GOE) and USAID/Ethiopia, the Pastoral Livelihoods Initiative (PLI) is implemented by a range of NGOs, private sector representatives and universities in an effort to strengthen livelihood security among pastoralist populations in Ethiopia through a variety of proven interventions.<sup>78</sup> These include early market purchase of stock prior to the onset of severe drought; restocking with improved breeds of small ruminants (sheep and goats) while improving productivity of existing breeding stock; and engagement in immediate opportunities for long term livestock market development (including policy reform and public/private partnerships for systems improvement). With an initial two-year phase (2005-2007) and a subsequent five-year phase (2008-2013), the PLI is implemented in the Somali, Afar, and Oromia Regions of Ethiopia. A key component of the PLI is an effort to improve Drought Cycle Management (DCM) which acknowledges that cyclical drought is a predictable occurrence in the region with impacts that can be minimized through adequate policy, preparedness and planning.

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<sup>74</sup> Gubbels, P. 2011. Escaping the Hunger Cycle: Pathways to Resilience in the Sahel. Sahel Working Group.

<sup>75</sup> Haver, K., Frankenberger, T., Greeley, M., & P. Harvey. 2012. Evaluation and Review of DG ECHO financed livelihood interventions in humanitarian crises. Final Report 5 March 2012. European Commission Humanitarian Aid Office (ECHO).

<sup>76</sup> Gubbels, P. 2011.

<sup>77</sup> Ibid.

<sup>78</sup> Feinstein International Famine Center. 2006. Pastoralist Livelihood Initiative: Guidelines for Livestock-based Livelihood Relief Interventions in Pastoralist Areas. Tufts University. USAID/Ethiopia.

A particularly innovative and effective component of the PLI in terms of supporting the resilience of pastoralists subject to severe drought was the incorporation of a ‘crisis modifier’ approach to funding. Based on the idea that periodic ‘emergencies’ should not undermine longer-term development activities, the crisis modifier approach enables greater flexibility among implementing partners by allowing them to access Office of Foreign Disaster Assistance (OFDA) funding in the event of severe drought. By linking project activities with early warning ‘trigger’ indicators, the crisis modifier approach enables indicators to inform timely responses including animal destocking, provision of animal health services, and provision of emergency fodder and water support to valuable breeding stock.<sup>79</sup>

### ***Arid and Marginal Lands Recovery Consortium***

The Arid and Marginal Lands Recovery Consortium (ARC) is made up of five NGOs, including Food for the Hungry, CARE, Catholic Relief Service, Action Against Hunger, and World Vision. Combining various funding streams (ECHO, OFDA, FFP), the consortium implemented a three-year “developmental relief” effort to build sustained access to food through enhanced resilience to shocks among practicing pastoralists and marginal small-holder farmers. The project takes advantage of a perceived opportunity by the consortium for positive change in pastoral areas of northern Kenya resulting from growing investment in the region by both the government and the private sector.

Project objectives include increasing agricultural production to protect and diversify household asset bases, and strengthening livelihood options in order to increase household purchasing power. Both short-term and long-term approaches were used to strengthen community assets, including construction of a livestock market, business training, building community awareness around livestock as “wealth” in a formal economy, and understanding of and access to financial instruments (e.g., insurance, credit). Among the most critical elements of the project were both the development of market infrastructure and the skills required for successful livestock production and marketing, as well as an innovative partnership with a private sector bank (i.e., Equity Bank) to introduce the concept of equity and provide credit. Communities have shown growing capacity to deal with shocks; livestock prices are stable, alternative livelihood options are providing additional income, crop production is less affected by drought and farmers are producing more per unit area.

### ***Productive Safety Net Programme – Plus (PSNP Plus) Project***

The overall goal of the three-year PSNP-Plus pilot project was to complement food and cash transfers provided through Ethiopia’s Productive Safety Net Programme (PSNP) with market-oriented support to achieve beneficiary graduation. Designed to directly benefit over 47,000 households in 12 *woredas*, the project included components focused on capacity building for income generation, community-based savings, increased access to financial services, and transfer of productive assets as part of an overall value chain approach to improved food and livelihood security. By demonstrating the potential impact of value chain approaches among chronically vulnerable populations, the PSNP-Plus project also sought to inform government and private-sector policies and strategies for strengthening markets in support of

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<sup>79</sup> Ismail, A. 2011. Strengthening Pastoralists Livelihoods in the Drylands of Ethiopia.

greater household livelihood security. The PSNP-Plus was also instrumental in demonstrating the potential economic gains to be had by private interests (banks, trade associations, input suppliers) through cooperation with chronically vulnerable populations.<sup>80</sup> Final impact assessments of the PSNP Plus project demonstrate significant gains in household food and livelihood security and increased beneficiary participation in financial services and agricultural value chains. Importantly, the study claims that PSNP plus has “helped diversify household income strengthen household livelihoods and improved people’s resiliency to income and production shocks.”<sup>81</sup> While fewer than 20 percent of livestock and cereal value chain participants have actually graduated from the PSNP, this shortcoming is largely attributed to the severe drought in 2009 that negatively affected asset accumulation since the start of the three-year pilot in 2008. Despite this setback, evaluators express confidence that the PSNP Plus model is capable of contributing to greater resilience to livelihood shocks if adequately scaled up and implemented over a longer duration.

Based on the success of PSNP Plus, the consortium of six agencies responsible for implementing the project in various regions of Ethiopia recently won approval of a subsequent five-year phase entitled the Graduation with Resilience to Achieve Sustainable Development (GRAD) Project. Lessons learned through implementation and evaluation of the PSNP-Plus Project have informed the design and implementation of the government-supported Household Asset Building Programme (HABP), which is also aimed at promoting graduation among PSNP beneficiaries.

### ***African Risk Capacity Project (ARC)***

The ARC project is a pan-African disaster risk pool designed to improve drought risk financing in Africa. The overarching objective of the ARC project is to provide governments with fast-disbursing contingency funds to finance drought responses. Led by the African Union Commission (AUC) and funded by DFID, the ARC provides a framework for drought risk financing (e.g., reserves, contingency lines of credit, weather-indexed insurance, catastrophe bonds) that emphasizes crop monitoring and early warning, vulnerability assessment and mapping, emergency response, and financial planning and risk management.

### ***Using Food Aid to Stimulate Local Markets***

In pastoral areas of northern Kenya, decades of food assistance has done little to improve the food security situation, or resulted in diminished malnutrition rates.<sup>82</sup> The objective of the consortium-implemented project “Using Food Aid to Stimulate Local Markets” is to stimulate market function and

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<sup>80</sup> TANGO International. 2011b. Final Evaluation – PSNP Plus Project. December 2011.

<sup>81</sup> Burns, John. 2011. PSNP Plus Longitudinal Impact Study Summary of Findings. Feinstein International Center, Tufts University. November 2011.

<sup>82</sup> Fitzgibbon, C. 2011. How distributing food aid via vouchers is stimulating local traders in pastoral communities and building the market for meat, milk and fish consumption. In: de Jode, H., & V. Tilstone (eds.), Disaster risk reduction in the drylands of the Horn of Africa: Good practice examples from the ECHO DCM partners and beyond - Edition 2. Regional Learning & Advocacy Programme (REGLAP) for Vulnerable Dryland Communities. European Commission Humanitarian Aid Department (ECHO).

food production in pastoral areas, helping local agricultural producers, traders and consumers.<sup>83</sup> A major assumption of the programme is that by making food available through local markets, and sourcing as much as possible locally, significant inroads can be made toward reducing food insecurity. The project design also addresses lack of investment by helping to ensure that money is invested in and supports local livelihood activities (e.g., livestock and related products).

An improved voucher system, which allows beneficiaries to access food allotments from local vendors according to their own time schedule and with multiple visits, has contributed to a greater sense of control and satisfaction among beneficiaries. The project has substituted locally-produced milk, meat and fish for part of the standard WFP-designed food basket (i.e. pulses), resulting in dramatically increased demand for quality fresh meat. This underscores the importance of appropriate market incentives in enabling pastoral systems to cope with extreme and variable weather and build resilience to food insecurity.

### ***Enhancing Resilience to Drought in Southern Africa***

Incorporating principles from the Hyogo Framework for Action (2005-2015), OFDA's Regional Disaster Risk Reduction (DRR) Strategy for Southern Africa Region is based on four major components: conservation agriculture; small-scale water harvesting and irrigation; crop diversification; and holistic land and livestock management (HLLM). The overarching goal of OFDA's DRR strategy is to enable households to withstand at least one year of crop failure or bad rains without needing to resort to food assistance. Results from southern Africa have shown that certain activities (e.g., low/no-till agriculture, mulching, contour stripping, water harvesting, cereal/legume intercropping, crop diversification, HLLM, access to water for irrigation) enhance household resilience to drought by minimizing losses associated with its impact, though there is no "silver bullet." The programme also promotes efforts to enhance resilience through behaviour change and adoption of new ideas by households and communities.

### ***Hunger Safety Net Programme***

Initiated in 2008, Kenya's Hunger Safety Net Programme (HSNP) was designed to provide long-term and predictable support through unconditional cash transfers to the chronically food insecure and those most vulnerable to drought-related risk.<sup>84</sup> Supported by DFID and the Government of Kenya, the HSNP is administered by a consortium (Oxfam GB, Save the Children UK, and CARE) with additional implementing partners (e.g., Equity Bank).

The HSNP consists of two phases, the first of which is a "pilot at scale" and targets 60,000 of the poorest households in the arid and semi-arid lands (ASAL) of north and north-eastern Kenya. Phase 1 focuses on learning how cash transfers can achieve outcome goals (e.g., reducing poverty and hunger) and providing evidence for scaling up at the national level through testing of three targeting approaches (i.e.,

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<sup>83</sup> Beginning in January 2010, Save the Children UK, Oxfam GB, and local NGOs (ALDEF and WASDA) have implemented the program. As an associate partner, WFP provides the majority of food aid commodities. VSF-Suisse will provide training in animal husbandry and hygienic food handling for livestock producers and traders.

<sup>84</sup> Beesley, Jane. 2011. The Hunger Safety Nets Programme, Kenya: A social protection case study. Oxfam GB.

social pension, dependency ratio, community-based targeting). Kenya's Equity Bank provides cash transfers to households through local shopkeepers, which is possibly one of the most cost-effective approaches available. Phase 2 involves scaling-up of the HSNP under a national social protection system for 1.5 million Kenyans with Government of Kenya (GoK) and donor funding. The cost of the national scale-up is estimated at Ksh 7.6 billion (£56.5m), which the GoK is expected to include as part of its budget commitments and which represents less than 2 percent of total GoK expenditure.<sup>85</sup>

Early indications from beneficiaries indicate cash transfers may be an effective mechanism for delivery of social protection addressing chronic hunger. Beneficiaries are better able to cope with drought-related shocks because the cash transfers allow them to purchase food, fodder and water when needed, reduce their sale of household assets (particularly livestock at reduced prices), invest in small businesses, and reduce the frequency of families breaking up to search for greener pastures.

### ***Enabling livestock-based economies in Kenya to adapt to climate change***

Among dryland pastoral areas of Kenya, payment for environmental services (PES) is seen as a potentially more predictable source of income that is less subject to the effects of drought.<sup>86</sup> PES has been championed as an innovative market-based approach based on the idea that those who benefit from environmental services should pay for them and those who provide environmental services should be appropriately compensated.<sup>87</sup> This project, initiated in 2011 by ILRI, the University of Hohenheim (Stuttgart), and the Leibniz-Centre for Agricultural Landscape Research in Germany, explores the possibility of compensating pastoralist communities in Kenya for promoting wildlife conservation to attract tourists and generate income while simultaneously managing rangelands for their livestock.

### ***Cross Border Drought Preparedness Project (ICRD)***

Implemented by Vétérinaires San Frontières (VSF), the ICRD project helps communities to holistically review their resource needs and problems, and to develop conflict-sensitive solutions through a participatory approach to developing reciprocal resource agreements.<sup>88</sup> A traditional DRR strategy utilized by neighbouring pastoralist groups, reciprocal resource agreements are agreed-upon plans for sharing resources, notably water and grazing lands. Community working groups, the use of resource use maps (including areas of conflict), and inter-community meetings and strategic plans are used to promote a participatory process validated by key community members, political leaders and government representatives. Such agreements have dramatically reduced conflict between communities within Ethiopia, between communities in Uganda and Kenya, and between communities

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<sup>85</sup> Mwititi, C. and N. Kukrety. 2009. Delivery of social protection programmes in Kenya.

<sup>86</sup> ILRI. n.d. Enabling livestock based economies in Kenya to adapt to climate change: A review of payment for ecosystem services from wildlife tourism as a climate change adaptation option.

<sup>87</sup> Pagiola, S. 2007. Guidelines for "Pro-Poor" payments for environmental services. Washington: World Bank.

<sup>88</sup> Obala, E. 2011. Reciprocal grazing agreements build peace between communities and reduce the impact of drought. In: de Jode, H., & V. Tilstone (eds.), Disaster risk reduction in the drylands of the Horn of Africa: Good practice examples from the ECHO DCM partners and beyond - Edition 2. Regional Learning & Advocacy Programme (REGLAP) for Vulnerable Dryland Communities. European Commission Humanitarian Aid Department (ECHO).

on the Kenya-Ethiopia border. As a result, dramatically improved security and resource management has demonstrated a positive influence on the resilience of participating communities.

### ***Strengthening Institutions for Peace and Development (SIPED)***

After receiving anecdotal evidence from local leaders that drought-affected pastoralist communities that had participated in Mercy Corps' SIPED programme were better able to cope with recent drought than pastoralist groups that had not participated in the programme, Mercy Corps conducted a study to "generate greater insights and evidence on the extent to which peace-building efforts that rely on skills building and sustained dialogue among conflicting parties can serve as an effective form of disaster risk reduction".<sup>89</sup>

The peace-building process utilized by Mercy Corps in the SIPED project, funded by USAID, included strengthening government and customary institutions, community dialogues (including clan leaders, elders, women and youths), joint livelihood activities, formation of peace committees, and development of peace accords and resource use plans. In particular, the Negelle Peace Accord was considered by local officials and communities to have played a critical role in reducing conflict and promoting peaceful co-existence among clans. Freedom of movement and access to water, grazing lands, and other natural resources facilitated by Mercy Corps' peace-building programme has positively contributed to household drought resilience.

### ***Arid Lands Resource Management Project (ALRMP)***

Supported by the World Bank, the Arids Land Resource Management Project is a community-based drought management project of the Government of Kenya.<sup>90</sup> The project follows on the earlier World Bank-supported Emergency Drought Recovery Project that provided "quick-fixes" to the effects of severe drought. However, the ALRMP is a longer-term development-type project that mainstreams drought management activities within the GoK and aims to enhance food security and reduce livelihood vulnerability in drought-prone and marginalized communities in the ASALs.<sup>91</sup>

Other development partners (including NGOs) support ALRMP activities. The EC provides support to the Drought Management Initiative (DMI) Programme that is implemented within the ALRMP framework and is intended to improve effectiveness and efficiency of Kenya's drought management system. The drought management system includes development and operationalization of relevant policies and strategies, an early warning system, a funded contingency plan and overall drought coordination and

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<sup>89</sup> Kurtz, J., & G. Scarborough. 2011. From Conflict to Coping: Evidence from Southern Ethiopia on the contributions of peacebuilding to drought resilience among pastoralist groups.

<sup>90</sup> <http://www.aridland.go.ke/inside.php?articleid=441>

<sup>91</sup> Zwaagstra, L., Sharif, Z., Wambile, A., de Leeuw, J., Said, M.Y., Johnson, N., Njuki, J., Ericksen, P. & M. Herrero. 2010. An assessment of the response to the 2008-2009 drought in Kenya. A report commissioned by the European Delegation to the Republic of Kenya. Nairobi: International Livestock Research Institute.



response structure.<sup>92</sup> Important institutional changes to the drought management system include development of a Drought Management Authority and a National Drought Contingency Fund.

## Moving the Resilience Agenda Forward

The concept of resilience holds promise for guiding efforts in the Sahel, the Horn of Africa and other regions exposed to diverse and recurrent shocks. In order to have a significant and lasting impact, actors involved in these regions will need to integrate the various elements and enablers of resilience into a coherent strategy that addresses the current and future sources of vulnerability among poor households. They must also continue to monitor and capture lessons from resilience building initiatives in order to inform donor investment portfolios and influence the policies of national governments. Within the context of natural disaster, climate change and underlying structural constraints, resilience must serve as a unifying concept that bridges the traditionally distinct domains of humanitarian assistance and longer-term development programming.

This paper has provided a conceptual framework for the assessment of resilience, the design of resilience programming, and the measurement of resilience outcomes. Looking ahead, achieving greater effectiveness in resilience programming will also require addressing problems at sufficient scale, over a longer duration, and with greater flexibility in strategies, funding streams and procurement mechanisms. In order to ensure greater sustainability, transparency and accountability, development partners must establish partnerships among national governments, regional policy institutions, the private sector and communities that reflect the principles of resilience programming. Towards this end, several important steps for responding to the ongoing challenges of resilience building have been identified.

**Challenge:** *Donors and policy makers have limited understanding of how best to prioritize investment in resilience building in light of scarce resources. There is currently little clarity regarding how resilience principles can best be operationalized and what the added value would be compared to other more mainstream approaches such as poverty reduction.*

The proposed resilience framework should be tested in a number of settings. By carrying out **resilience assessments** in several countries, stakeholders can help determine if the analytical approach outlined in this paper has value for measuring resilience outcomes in diverse contexts. It is expected that information gained from such exercises would highlight key factors contributing to or constraining resilience beyond the more generic indicators of vulnerability (poverty, malnutrition, etc.). Arguments for resilience programming may also be strengthened through **enhanced knowledge management**. This requires identifying and addressing critical knowledge gaps, making program-based knowledge available in a timely fashion and reader-friendly format. Knowledge management also requires that relevant information is linked back into iterative programming.

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<sup>92</sup> <http://www.ilri.org/ilrinews/index.php/archives/tag/kenya-arid-lands-resource-management-project>

The resilience framework and information gained from comprehensive resilience assessments will also provide critical insight into the proper **sequencing and combination** of distinct activities or interventions. Rather than simply addressing issues as part of a perceived ‘continuum’ from emergency relief to long-term development, practitioners of resilience programming will likely need to design projects capable of addressing immediate needs and longer-term projects simultaneously. All too often, progress made through longer-term development initiatives has been immediately undone due to the effects of rapid-onset disaster. By preparing for these scenarios, implementers can continue to address critical needs in the areas of infrastructure, education, health, and social protection without fearing that periodic shocks (drought, flood, conflict) will have a permanently negative impact on the adaptive capacity of target populations.

This will necessarily include close coordination between humanitarian and development actors throughout the entire project cycle, especially through joint needs assessments, and joint programming exercises. In order to attain the flexibility needed to quickly respond to changing conditions, implementing organizations may also consider “built-in” contingency planning mechanisms such as the ‘crisis modifiers’ utilized by ECHO’s DRR program in the HOA. These modifiers enable implementing organizations to shift focus from development programming to humanitarian response when localized early warning systems detect a significant change in conditions. Such crisis modifiers allow both implementing agencies and donors to avoid the critical disruptions that often accompany procurement of emergency funding and retooling of development activities during times of crisis.<sup>93</sup>

**Challenge:** *The institutional framework for implementing resilience oriented programs needs to be clarified in order to develop integrated, multi-sectoral programs that may not be aligned with the current work of sectoral ministries and related policy frameworks.*

Donors and policy makers should seize the current momentum for building resilience by alleviating current obstacles to coordination across sectoral boundaries and temporal scales. One means of doing this is to **seek consensus on a locally appropriate framework for resilience**, identify the principle constraints to resilience within a particular country or region, and solicit firm commitments to common strategic objectives.

One such effort was initiated at the recent ‘*Joint IGAD Ministerial and High-Level Development Partners Meeting on Drought Resilience in the Horn of Africa*’.<sup>94</sup> Jointly organized by the Intergovernmental Authority on Development (IGAD) and the Comprehensive Africa Agriculture Development (CAADP) Program, the meeting resulted in a “Common Framework for Risk, Resilience and Growth in the Drylands.” The framework is intended to result in a collective agenda that can focus the complementary efforts of governments, development agencies, civil society, and the private sector in order to enhance

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<sup>93</sup> European Commission. 2010b. Commission Staff Working Document, accompanying document to the Communication from the Commission to the Council and the European Parliament, Humanitarian Food Assistance, Brussels, 31.3.2010, SEC (2010) 374 final {COM(2010)126}

<sup>94</sup> <http://www.hornofafricadevelopment.org/>

community and household resilience throughout the Horn of Africa. During the meeting, participants reached consensus on six central areas of concern (or pillars) for the Common Framework. They include: 1) Increased economic opportunity; 2) Strengthened institutions, governance and accountability; 3) Improved security conditions and conflict-management capacity; 4) Improved physical infrastructure; 5) Sustainable natural resource management; and 6) Enhanced innovation and knowledge management.<sup>95</sup> Individual countries within the region are currently drafting their own “Country Program Frameworks” that will be reviewed by technical experts in both the humanitarian assistance and development communities to ensure coherence and consistency with the regional Common Framework.

By directly involving counterparts from multiple sectors, levels of government and civil society, this effort has the potential to deliver an appropriate, coherent and sustainable institutional framework capable of effectively promoting resilience in the HOA.

**Challenge:** *Governments and the private sector have difficulty prioritizing investments for improved resilience in ‘low potential’ areas and instead focus national poverty reduction and economic growth initiatives within ‘high potential’ areas.*

A history of failed attempts to address widespread poverty and food insecurity has discouraged governments, donors, and private interests from making new investments in many disaster-prone regions of sub-Saharan Africa. **External private investment has been particularly limited** due to a range of negative stereotypes regarding the investment climate in rural areas. These include: a lack of physical infrastructure capable of strengthening human capital and enabling sector development; poor access to financial services; limited information on and/or right to environmental resources; physical insecurity; and high trade barriers. Nonetheless, previous research has revealed that investments in soil and water conservation in Niger, farmer-managed irrigation in Mali, forest management in Tanzania, and farmer-to-farmer extension in Ethiopia have all resulted in satisfactory economic rates of return (from 12 -40 percent) for investors.<sup>96</sup>

Opportunities for private (commercial) investment in many disaster-prone regions are likely to increase with continual monetization of local economies, growing international trade, rural-urban interactions and the emergence of larger middle-income social groups. These opportunities include commodity bulking in agricultural value chains, service provision (agricultural and health extension, possibly education provision), provision of financial services, communication and transportation networks.<sup>97</sup>

Spurring private investors to build on these opportunities will require creation of both **direct and indirect investment incentives**. Direct incentives for investment are linked to distinct projects where financial gains are made through project participation. Indirect incentives include both market and

<sup>95</sup> USAID. 2012. Meeting Notes: New Country and Region-Led Efforts and Partnerships for Enhancing Resilience and Building Growth in the Horn of Africa. May 10, 2012.

<sup>96</sup> Mortimore, M. with contributions from S. Anderson, L. Cotula, J. Davies, K. Facer, C. Hesse, J. Morton, W. Nyangena, J. Skinner, and C. Wolfangel. 2009. Dryland Opportunities: A new paradigm for people, ecosystems and development, IUCN, Gland, Switzerland; IIED, London, UK and UNDP/DDC, Nairobi, Kenya. x + 86p.

<sup>97</sup> Mortimore, M. et al. 2009.

enabling incentives. In recent years, market incentives for investment in sub-Saharan Africa have increased as the perceived risks of market isolation (e.g. cash and food scarcity, unemployment, limited access to services) have outweighed the perceived risks of market involvement (e.g. dependence on greater food purchases) among many rural households. Governments can do their part to create enabling incentives for greater private investment in disaster-prone areas by adopting more effective and just land tenure policies, supporting establishment of credit institutions, providing decentralized government services, and integrating research and extension systems.<sup>98,99</sup>

To promote greater private investment in resource poor environments characterized by chronically vulnerable populations, several important considerations must be made. First, government and private sector investment should not be made at the expense of adequate social protection mechanisms. Such mechanisms are vital for ensuring the health and survival of the most vulnerable during times of crisis, and enabling them to take the risks necessary to build greater household resilience over the longer-term. In fact, previous studies have suggested that social protection interventions can be complementary to market-based activities by providing a degree of protection from market failures and/or adverse market-based corrections (European University Institute 2010). By **clustering investments** in social protection, disaster risk reduction, livelihoods, and climate change adaptation within specific geographic areas, government can work with the private sector and civil society to create synergistic effects and scale up successful pilot initiatives. Finally, in order to properly account for the social and environmental costs and benefits of new developments, private sector institutions should actively seek partnerships with local governments and other organizations.

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<sup>98</sup> Mortimore, M. et al. 2009.

<sup>99</sup> Private sector banks, such as Kenya's Equity Bank, are important partners in Kenya's resilience programming in that they provide access to credit, savings and loans, and insurance instruments to vulnerable households. Through Kenya's Hunger Safety Nets Programme (HSNP), Equity Bank uses "smart cards" to provide cash transfers to beneficiary households through local shopkeepers (Beesley 2011).

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## Annex 1: Definition of Terms

Vulnerability and resilience are often seen as opposing poles of an individual's or a group's capacity to deal with stresses or shocks. Promoting and building resilience directly contributes to a lessening of vulnerabilities in communities at risk of natural disasters and a range of social and or economic shocks. The concept draws on multiple disciplines across different societal levels and thus draws on a variety of concepts and terms. The most common are defined below.

**Adaptive capacity** refers to the ability of households or communities to cope with and adapt to shocks or stresses i.e., do they have the skills and tools needed to deal with shocks or stresses?

**Adaptation** can be thought of as the learning component of adaptive capacity; adaptation occurs when communities learn from past experiences and make adjustments that reduce their vulnerability to future shocks.

**Coping strategies** are strategies that households and communities use based on available skills and resources to face, manage and recover from adverse conditions, emergencies or disasters in the short-term (Pasteur 2011). These are reactive short-term responses. **Adaptive strategies** involve responding to change proactively and tend to be longer-term anticipatory strategies that moderate harm or exploit beneficial opportunities.

**Shocks or hazards** are sudden onset unexpected high impact events. They are dangerous natural phenomena, human activities or conditions that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption or environmental damage (Pasteur 2011).

**Stresses** are smaller low impact events and seasonal factors, unemployment, price fluctuations, ill health, local conflicts or gradual change in climate conditions that undermine livelihoods (Pasteur 2011).

**Disasters** are commonly defined as a serious disruption in the functioning of a community or society involving widespread human, material, economic or environmental losses and impacts that exceed the ability of the affected community or society to cope with its own resources (Pasteur 2011). Not all shocks and stresses lead to disasters.

## Annex 2: Basis of the Conceptual Framework for Resilience

The livelihoods framework focuses on the adaptive capacity of households and communities and consists of **access to assets** (e.g., physical, political, social, human, natural, financial), transformative **structures and processes** (e.g., governance, laws, policies, institutions), and diverse **livelihood strategies**. In general, households and communities are more capable of dealing with shocks and stresses when they have more than one way of earning a living (i.e., engage in a diversity of livelihood strategies), access to sufficient livelihood assets (e.g., financial markets, good education, social networks, roads, water) and access to formal and informal governance structures that promote resource management and policies, laws, and social/cultural norms that enable households and communities to manifest adaptive capacity (e.g., delivery of basic services, security, access to social safety nets).

The disaster management framework (DRR) focuses on preparedness, prevention, response and recovery (i.e., ex ante and ex post activities). Ex ante responses stress prevention and preparedness in order to reduce the risk of disaster. Communities that are well prepared for a disaster will require fewer relief and recovery resources because either the disaster was diverted through prevention or its impact was reduced through preparedness (Pasteur 2011). In a resilience approach, response and recovery (i.e., ex post) needs to go farther than dealing with immediate infrastructure needs and consider ways of building back better to reduce vulnerability in the future.

The climate change adaptation (CCA) approach essentially focuses on reducing the impacts of climate change through a more integrated approach linked to Disaster Risk Reduction (DRR). DRR and CCA are overlapping but distinct approaches: both involve focusing on managing risks and reducing vulnerability to hazards (Twigg 2009). However, DRR addresses hazards beyond those relating specifically to climate change (FAO 2011); CCA addresses issues beyond the scope of DRR, such as loss of biodiversity and ecosystem changes. By considering Disaster Risk Management in the context of a changing climate, strategies and programming can be developed for managing and adapting to long-term trends and future uncertainty.

The conceptual framework for resilience integrates all three approaches to address the underlying causes (e.g., institutional, structural, socio-economic, environmental) that contribute to vulnerability and seeks to understand and address how long-term trends (e.g., climate change, economic, socio-political or environment factors) affect livelihoods security and exposure to risk, which results either in increased vulnerability or increased adaptive capacity over time. It is comprised of the following elements:

### **Context**

Context refers to the environmental, political, social, economic, historical, demographic and policy conditions that affect households, communities, and governments (i.e., a unit), and determine to some degree the extent to which they are able to cope with risks. The context is dynamic, rather than static,

and changes according to the adaptive capacity of a unit in response to risks and disasters (Alinovi et al. 2010). Thus, while a snapshot of initial contextual conditions sets the stage for developing responses that build resilience, those responses then change at least some contextual factors, which impacts – either positively or negatively – the ability of a unit to cope with future risks and disasters. Incorporation of new contextual factors is critical to a resilience approach and underscores the importance of disaster planning and “future thinking”.

### ***Level of aggregation***

This can be thought of as the unit of analysis for determining resilience to what or of whom (e.g., the individual, household, community, institution, government, ecosystem) (Alinovi et al. 2009). There is no “one size fits all” in resilience programming. What makes a household resilient differs from what makes a community or government resilient. The relationship between these levels is that of a ‘nested hierarchy’, i.e., resilient individuals and households are the foundation for resilient communities. However, resilience at one level does not automatically result in resilience at other levels; resilient households do not necessarily result in resilient communities and vice versa.

Both ex ante and ex post responses must consider both the type of shock being addressed and how a particular type of shock might affect the different individuals that make up households and sub-groups within a community (i.e., men, women, children, the elderly, the disabled) as no single intervention will build resilience in all vulnerable groups.

### ***Disturbance***

Disturbance may come in the form of rapid or slow onset *shocks* (i.e., natural or man-made hazards) such as earthquakes, floods, drought, human disease epidemics, plant pest outbreaks, and conflict, or longer-term *stresses* (e.g., environmental degradation, political instability, conflict, price inflation). By itself, a shock is not a disaster; it can, however, trigger a disaster because of underlying physical, social, economic or environmental vulnerabilities. A disaster occurs when households, communities, institutions or governments are unable to cope with a shock or stress (Pasteur 2011).

In assessing resilience it is important to acknowledge that some disturbances are *idiosyncratic* (i.e., affecting only certain individuals or households) whereas others are *covariate* (i.e., affecting an entire population or geographic area).

While certain broad characteristics (particularly those related to enabling environments) may promote resilience to shocks generally (Alinovi et al. 2009; Twigg 2009), the underlying causes of vulnerability to shock or stress differ and therefore require different analysis and response based on the type of shock/stress (Harris 2011). Resilience to one type of shock (e.g., drought) does not necessarily ensure resilience to others (e.g., food price increases, insect outbreaks).

### ***Exposure***

In the resilience framework, exposure is a function of the magnitude, frequency, and duration of a shock or stress. Some shocks come on quickly, with little or no advance warning and are over with

quickly (e.g., earthquakes, flash floods) while others may be so slow to progress that their duration can be marked in years (e.g., conflict, drought). Duration only refers to the actual shock itself, not the resulting impact, which may be short- or long-term.

Many stresses or shocks are seasonal, including floods, pest outbreaks, and unemployment. The inability to cope with seasonal shocks or stresses can make already vulnerable households even more vulnerable to disaster by increasing their risk of exposure to future hazards (Pasteur 2011). According to Twigg (2009), disaster preparedness and planning can significantly reduce exposure: good risk analysis, including disaggregation by gender, socio-economic, or other groupings; contingency planning; early warning systems and awareness; and improved disaster risk prevention and protection strategies reduce exposure of communities to shocks and therefore reduce their vulnerability to disasters.

### ***Adaptive Capacity***

Adaptive capacity can be understood as the nature and extent of access to and use of resources in order to deal not only with disturbance (e.g., shocks or hazards) but also with stresses and longer-term trends (i.e., changing conditions). It results not only in the ability to ‘bounce back’ from shocks but to successfully adapt to long-term trends or changing conditions in the future. It can be thought of as both the processes and assets that enable a unit or system to adapt rather than the act of adapting, or its outcome (Ludi et al. 2011).

In contrast, adaptation can be thought of as the result of reducing the adverse effects of shocks and stresses on livelihoods and general well-being combined with the ability to take advantage of “new opportunities provided by a changing environment” (TERI 2007). Adaptation requires that adaptive capacity be put into positive action; it is described as the adjustments that occur – in either natural or human systems – in response to actual or expected events (or their impacts), which minimize negative consequences or exploit positive opportunities (IPCC 2011).

Adaptation can be both positive and negative, though building resilience focuses on positive adaptation. Particularly during very slow onset shocks or long-term trends, such as cyclical drought or unemployment, negative adaptation can occur when “crisis” conditions become normalized through a “gradual process of adjusting expectations and habits downward” (Hossain et al. 2010). In other words, hunger becomes “normal” and what might otherwise have been considered a shock or disaster does not differ significantly from various local and idiosyncratic shocks characteristic of poverty itself.

Adaptive capacity is context-specific and multi-dimensional; there is no “one size fits all,” rather adaptive capacity varies by individual, household, community, government, and over time. At the community level, the ability to adapt has been characterized generally by access to certain assets and enabling environments: asset base, institutions and entitlements, knowledge and information, innovation, and flexible, forward-looking decision-making (Ludi et al. 2011). In the resilience framework, adaptive capacity is comprised of three basic, but interrelated elements – livelihood assets; transforming structures and processes; and livelihood strategies.

- **Livelihood Assets** – The tangible and intangible assets that allow individuals and households to meet their basic needs. Livelihood security depends on a sustainable combination of six assets, or capitals: **financial** (e.g., cash, savings, credit, remittances); **physical** (e.g., roads, markets, water systems, electricity); **political** (e.g., formal/informal governance mechanisms, voice in decision-making and advocating for resources or change); **human** (e.g., education, health/nutritional status, skills, ability to work); **social** (e.g., formal/informal networks, family/extended family structures, group membership, labour-sharing systems, social relations, tribe relations, access to wider institutions in society); and **natural** (e.g., land, water, biodiversity, forest resources). Certain assets are prerequisites to others (e.g., education may allow individuals to better manage financial capital) and trade-offs exist between assets (e.g., investment in education may increase human capital but at the expense of household income, or financial capital) (TANGO 2011). Greater diversity of assets reduces vulnerability to shocks, and high adaptive capacity results from the ability of households and communities to access and utilize these key assets in a way that allows them to respond to changing circumstances. For example, high adaptive capacity is possible when the “system has the ability to collect, analyze, and disseminate knowledge and information in support of adaptation activities” (Ludi et al. 2011). This includes use of local or traditional knowledge, where communities may already have developed mechanisms for early warning, prediction, preparedness and coping with stresses and shocks, which have evolved *in situ* over long periods of time (Pasteur 2011). Thus, it is not only critical to have access to livelihoods assets but also to have the skills and knowledge base required to utilize them in ways that improve the capacity of households and communities to deal with future shocks and long-term trends.
  
- **Structures and processes** – These are embodied in the formal and informal institutions that enable or inhibit the resilience of individuals, households and communities. High adaptive capacity results when a “system is able to anticipate, incorporate and respond to changes with regards to its governance structures and future planning” (Ludi et al. 2011).

In any given community, multiple institutions and organizations share responsibility for certain community functions that directly influence the adaptive capacity of local households (TANGO 2011). In the public sector, this typically includes national, regional, and local (formal and informal) governance bodies or structures that manage and implement political, judicial, and legislative processes, including delivery of basic services, security, and access to social safety nets. In civil society, examples of typical structures are non-governmental organizations (NGOs) and community-based organizations (CBOs), religious institutions, and trade associations. There may also be structures within the private or commercial sector, such as financial institutions that offer financial services (e.g., credit, savings, insurance) to poor households.

These structures organize and regulate community behaviour and processes, such as through creating and enforcing policy and legislation, or through setting and maintaining social and cultural norms or power relations. They shape and influence people’s values and behaviour,

affecting what they do and how they do it. High adaptive capacity requires flexible and forward-looking decision-making and governance. Community resilience can be enhanced by creation/strengthening of community governance mechanisms that promote awareness of risks and risk reduction strategies, community DRR and disaster preparedness plans/committees, community-based early warning systems, and training community members in search and rescue, relief distribution, risk assessment, etc.

Important interactions exist between structures and processes within the context of rules and social norms in which they exist. Various structures and patterns of collaboration among institutions, and among individuals or communities, can have positive or negative effects on local livelihood systems (e.g., individuals or communities with many assets may be able to change some of the rules, such as who has access to specific assets). These interactions can enhance or limit adaptive capacity. High adaptive capacity results from “an appropriate and evolving institutional environment that allows fair access and entitlement to key assets and capitals” (Ludi et al. 2011).

- **Livelihood strategies** – This represents the distinct or combined strategies that individuals and households pursue to make a living and cope with shocks. It is critical to note that different livelihood strategies have various risks associated with potential shocks and that certain coping strategies may have negative and permanent consequences with respect to resilience. Positive coping strategies are “the strategies that households and communities use, based on available skills and resources, to face, manage and recover from adverse conditions, emergencies or disasters in the short term” (Pasteur 2011). This may include using stored assets (e.g., savings, extra food, excess livestock), even to their exhaustion, without necessarily diminishing their future ability to cope. In contrast, negative coping strategies (e.g., eating less, eating less nutritious food, delaying medical treatment, taking children out of school, exploiting natural resources) erode productive assets (e.g., educational attainment, health status, ability to work, healthy ecosystems). These strategies are negative in that they undermine future options, making it more difficult to cope with the next shock or stress.

Importantly, people’s **aspirations** – or lack thereof – influence the choices and preferences they make, either individually or in groups (Frankenberger et al. 2007). Aspirations represent “the manner in which people visualize the future and engage in forward-thinking behaviour” (see Rao and Walton 2002; Appadurai 2001). From a resilience perspective, aspirations are a critical component of the livelihood strategies used by households and communities in terms of risk reduction and response to shocks, i.e., whether an individual “chooses” a positive or negative coping strategy. According to Appadurai (2001), lack of “aspiration” (to a better life or future) results in not making the needed investments to better one’s well-being, even when the return on those investments might be positive. Such a response is often seen among poorer people, though it has also been shown that even the poor make choices (Frankenberger et al. 2007). This does not, however, mean that the poor lack aspirations. Rather, their opportunities for



exploring the links between the means (i.e., how to achieve a desired outcome) and the ends (i.e., a desired outcome) are more limited than the non-poor (e.g., through lack of education, limited resources, less exposure to new ideas/technology).

**Livelihood strategies** include various types of activities intended to build-up assets as well as those which aim to reduce risk or cope with shock. Households form livelihood strategies based on the combination of assets they have, the shocks and trends they are exposed to, and the overall context regarding formal and informal structures and social and legal systems. Asset optimizing strategies include production and income-generating activities (e.g., agricultural production, off-farm employment, informal sector employment) and strategic investment (e.g., land, animals, tools, training) or, more often, a diverse and evolving combination of multiple income-generating activities. They also include actions such as advocating for rights and services, getting married, going to school, or diversifying assets. High adaptive capacity involves systems that create “an enabling environment to foster innovation, experimentation and the ability to explore niche solutions in order to take advantage of new opportunities” (Ludi et al. 2011). Importantly, taking advantage of such opportunities may require reducing household aversion to “taking a risk” (e.g., investing in new and unfamiliar livelihood activities). For example, use of insurance mechanisms to spread risk (e.g., weather-indexed crop/livestock insurance) may be limited not only by access to such instruments but also by unfamiliarity with the concept of insurance and how it would be of benefit.

**Risk reduction strategies** are those that help people prepare for and respond to shocks, thereby reducing their vulnerability to the shock, and increasing adaptive capacity. Risk reduction strategies are preventive in nature and are therefore implemented ex ante – before a shock or stress occurs (e.g., crop diversification, use of drought-tolerant crops/livestock, obtaining insurance, protecting health). Vulnerable populations use coping strategies when they are incapable of meeting basic household needs because of the impact a shock has had on their normal livelihood options. Household coping strategies are implemented ex post, in response to a shock or stress. Some coping strategies are unsustainable (e.g., selling productive assets, reducing meals, switching to less nutritious foods) others are beneficial (e.g., social interdependence, solidarity). As the impact of a shock becomes more severe, households’ coping strategies are likely to become more desperate and/or irreversible. Households generally begin with the short-term strategies and transition to longer-term (distress) strategies as the impact of the shock continues and worsens. Distress strategies are more detrimental over the long term to household livelihood systems and tend to reduce household adaptive capacity and resilience.

**Ex-post risk management strategies** also include use of safety nets that provide consumption smoothing and asset protection for vulnerable populations. These can be facilitated by either formal or informal groups or organizations, including religious groups, social clubs, savings, or credit groups, funeral societies, etc. Informal safety nets are often more effective in dealing with

idiosyncratic shocks due to the fact that they incorporate community-specific knowledge and account for cultural, physical and economic differences among affected communities. Formal safety nets implemented by the government or NGOs often take the form of employment programmes or cash/food transfers, and are often more effective at addressing covariate shocks.

Adaptive capacity both affects and is affected by the larger contextual factors that contribute to vulnerability or resilience. Households and communities that are able to learn from past experiences and make changes (i.e., adapt) that lessen the impact of future shocks are more resilient. Those not able to adapt remain or become more vulnerable, depending on the coping strategies they utilized and their ability to rebuild depleted assets.

### ***Sensitivity***

Sensitivity to shocks refers to the degree to which an individual, household or community will be affected by a given shock or stress. Sensitivity, or susceptibility, differs from exposure in that it reflects different underlying causes of vulnerability to shocks. Vulnerability is a function of exposure, adaptive capacity, and sensitivity. Certain individuals or groups of individuals (e.g., women, children, the elderly, displaced persons) are differentially affected by shocks (Ludi et al. 2011). Even within the same household, individuals will be affected differently by the same shock and by different shocks (i.e., some will be more/less impacted than others depending on the shock). For example, the elderly may not be sufficiently mobile to quickly seek higher ground during a flood; women were more sensitive to the 2005 tsunami in Indonesia because of cultural constraints on their mobility within the community; owners of large livestock herds may be more sensitive to drought than owners of smaller herds. Greater sensitivity implies a lower degree of resilience whereas lower sensitivity implies greater resilience.

Men and women are not only differentially affected by shocks, they also differ in their perceptions of the impact of shocks, as do livelihood or wealth groups (Ludi et al. 2011). While there is typically broad agreement on weather-related covariate hazards, each group prioritizes those hazards that most directly affect them. Thus, interventions aimed at building resilience need to not only target improving adaptive capacity generally but specifically need to target reducing sensitivity of vulnerable groups.

### ***Resilience and Vulnerability Pathways***

The term 'pathways' underscores the idea that both vulnerability and resilience are properly viewed as processes rather than static states. Households or communities that are able to use their adaptive capacity to manage the shocks or stresses they are exposed to are less sensitive and are on a ***resilience pathway***. Households that are not able to use their adaptive capacity to manage shocks or stresses are sensitive to shocks and are likely to go down a ***vulnerability pathway***. The vulnerability pathway could result in permanent and negative changes to coping capacity, ultimately leading to a state of chronic vulnerability and destitution; the more vulnerable households and communities are, the less able they will be to cope with shocks and disaster may result.

The resilience pathway is based largely on preparedness, in terms of infrastructure (e.g., flood or earthquake-proofing), early warning systems (including community-based systems and knowledge), contingency/emergency planning, governance structures that are flexible and responsive to community needs, access to information (e.g., market price information) and the ability to utilize that information (e.g., access to markets), strong community mechanisms for managing natural resources and avoiding conflict, government provision of basic services and social safety nets, diverse and ample household assets (e.g., land, skills, education, livestock), diversified livelihood strategies, etc. The resilience pathway is an iterative process, involving innovation and application of lessons learned from past experience that increases adaptive capacity and leads to resilience.

### ***Livelihood Outcomes***

These are the needs and objectives that households are trying to realize – or aspire to. Resilient individuals, communities and households will be able to meet their food security needs, will have access to adequate nutrition, their environment will be protected, they will have income security, health security, and they will be able to participate in the decisions that affect their lives. Vulnerable households experience deficits, or a high risk of deficits in each of these aspects. In the resilience framework, a resilience pathway leads to positive livelihood outcomes, which lead to resilience outcomes; the ability to cope with shocks, to learn from past and prepare for future shocks while remaining food secure, and ultimately, moving beyond poverty and food insecurity.

Aspirations are reflected in household livelihood outcomes, in terms of whether they were met or not. When households are willing to make pro-active investments directed at bettering their lives, they are more likely to be resilient, even in the absence of achieving all of their household objectives or to the desired level.

It is important to note that the resilience framework is not uni-directional, but includes several feedback loops. Improved adaptive capacity affects contextual factors (especially those related to poverty and vulnerability), exposure and sensitivity. Increased resilience (or increased vulnerability) also reshapes contextual factors, exposure and sensitivity. Importantly, improved livelihood outcomes (resilience pathway) increase adaptive capacity and reduce exposure and sensitivity to shocks/stresses. Conversely, worsening livelihood outcomes (vulnerability pathway) negatively impact adaptive capacity and increase exposure and sensitivity. Thus, resilience is not just about dealing with today's shocks and stresses but also planning for and being able to adapt to unpredictable shocks and changing conditions in the future.

## Annex 3: Analyzing Resilience

The resilience conceptual framework provides guidelines for ways to measure the resilience/vulnerability of communities, households, and individuals, and in addition, provides a framework for measuring quantitatively the impacts of different factors, including interventions and policies, on resilience.

For the purposes of assessing the effectiveness of policies and programmes to strengthen resilience, several empirical questions must be addressed:

- a) Who are the vulnerable households? What are their characteristics? Are they located in certain geographic areas?
- b) What are the differences in the risk management strategies (both short- and long-term) adopted by different types of households in response to shocks, and how effective are these different types of strategies for maintaining current household food security and resilience in the face of future shocks?
- c) What are the most effective intervention strategies to enhance resilience or reduce vulnerability?

The first question is important for targeting and overall resource allocation decisions. In order to decide how many resources should be used to increase resilience of vulnerable households it is necessary to know the number of vulnerable households. For planning purposes, it is also necessary to know the characteristics and geographic locations of vulnerable households. Questions b) and c) are important to make assessments about what are appropriate interventions or policies to improve resilience of targeted households to specific types of shocks.

To be operationally meaningful, each of these questions must be addressed in relation to particular types or categories of shocks. One of the shortcomings of much of the existing empirical research on vulnerability is that it is not assessing vulnerability with respect to specific types of shocks, but rather assesses vulnerability to all types of shocks (both idiosyncratic and covariate) that households are exposed to. The results from this research are unsurprising: there are more vulnerable households than those that are currently food insecure (and conversely there are some households that are currently food insecure for transitory reasons but are not vulnerable), and households with more capital (of all types) are more resilient than those with less capital. In addition to being fairly self-evident, these findings do not help to identify appropriate interventions that will strengthen household resilience.

### Quantitative analysis

Much of the recent empirical research focuses on the first question, namely, identifying vulnerable households within a particular context, and in some cases with respect to specific types of risk. The theoretical basis for much of the empirical work on vulnerability has started from the operational definition of vulnerability based on the probability that a household will fall below the poverty level at some point in the future. This general concept is then expressed in an equation of observable variables in the following general form (adapted from Chaudhuri et al. 2002):

$$(1) \quad V_{h,t} = \Pr(c_{h,t+1} < z \mid X_h, B_t, e_{h,t})$$

Where  $V_{h,t}$  is the vulnerability of household  $h$  at time  $t$ ,  $c_{h,t+1}$  is the household's consumption expenditures in time  $t+1$ ,  $z$  is the minimum required consumption expenditure (poverty line),  $X_h$  are the set of household-level characteristics of household  $h$ ,  $B_t$  is the set of external (community, national

economy, etc.) factors in time  $t$ , and  $e_{h,t}$  is the set of shocks that household  $h$  is exposed to in time  $t$ . This formal definition of vulnerability based on observable variables forms the conceptual basis for developing equations of variables that can be empirically estimated. A number of variations of this general formulation have been proposed (Azam and Imai 2012; Dutta et al. 2010; Calvo and Dercon 2005; Christiaensen and Subbarao 2004; Christiaensen and Boisvert 2000; Pritchett, et al. 2000).

Attempts to measure resilience and its determinants have been hindered by the fact that resilience as defined in (1) is a dynamic concept, which implies that empirical estimates should be based on time-series, preferably panel data from the same households over time. Some studies have been able to utilize panel data (Pritchett et al. 2005; Glewwe and Hall 1998; Jalan and Ravallion 1998), but as Christiaensen and Subbarao (2004) point out, such data are usually not available, particularly in developing countries.

Given this relative scarcity of panel data, a number of researchers have developed empirical models estimated on cross-sectional data. One early approach (Chaudhuri et al. 2002) was based on the following model, which estimates consumption expenditure per household member,  $c_h$ , as a function of household characteristics ( $X_h$ ), with an error term ( $e_h$ ) as follows:

$$(2) \quad c_h = X_h \beta + e_h$$

The variance of  $e_h$  ( $\sigma_{e,h}^2$ ) is then modelled to also be a function of household characteristics, in the following form:

$$(3) \quad \sigma_{e,h}^2 = X_h \Theta$$

The parameters in equations (2) and (3),  $\beta$  and  $\Theta$ , are estimated by Chaudhuri et al. (2002) using a three step feasible generalized least squares (FGLS) procedure proposed by Amemiya (1977),<sup>100</sup> in which the estimated residuals from (2) are used to estimate  $\Theta$ . The parameters are then employed to estimate *expected* consumption expenditures and the variance of consumption expenditures for each household, which finally yield an estimate of the probability that a household with characteristics  $X_h$  will be poor, that is, the level of vulnerability as defined in (1) above.

In this formulation, the specific strategies that households adopt to cope with shocks are captured in the unexplained residual variation in observed consumption, and so are the “black box” of the model. This basic model has been extended by others to include both more dimensions of household level (idiosyncratic) factors, such as access to various types of capital and assets and agricultural production technologies used (Karfakis et al. 2011; Capaldo et al. 2010), and community-level (covariate) factors affecting household consumption patterns (Azam and Imai 2012). Later models also incorporated exogenous variables to measure specific shocks: drought and illness (Capaldo et al. 2010) and variations in rainfall and temperature from mean values (Karfakis et al. 2010).

Several studies by FAO have examined vulnerability using the general form of model described above. Capaldo et al. (2010) estimated a model based on a cross-section survey of 1,831 rural households in Nicaragua. This model estimated the probability that a household would consume less than the minimum required level of calories based on household characteristics, whether the household experienced an illness shock, and whether the household experienced a drought shock. The results from

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<sup>100</sup> Other researchers (Capaldo et al. 2010; Karfakis et al. 2011; Azam and Imai 2012) have used somewhat different estimating models from that of Chaudhuri et al., but the underlying logic is similar, namely to estimate both the mean and variance of food security indicators as a function of exogenous household (and community-level) characteristics.

this model provide estimates of the proportion of vulnerable households in the population, and the characteristics of vulnerable households.

A later paper by Karfakis et al. (2011) examined the impacts of global warming, as measured by changes in rainfall and temperature patterns at the household level. By simulating alternative scenarios for future changes in rainfall and temperature, the authors were able to estimate the impacts on the vulnerability levels of households. This paper represents an advancement in the empirical studies of vulnerability to estimate the impacts of a particular type of risk, in this case weather risks associated with global warming, on patterns of vulnerability within a specific population, specifically households in rural Nicaragua.

Research by Alinovi and others (Alinovi et al. 2010; Alinovi et al. 2008) follows a different empirical approach. These studies use structural equation modelling and factor analysis to identify unobserved (latent) variables that are components of household resilience. Then overall resilience is estimated as a higher-level latent variable that is a function of the component latent variables. In this formulation, the resilience variable is an aggregate measure, which is a combination of exogenous factors, endogenous responses of households, and outcome measures of household well-being. In the Kenya study, the overall resilience measure, along with the components, are compared across different household livelihood categories.

While this line of research helps to better understand the differences in resilience across categories of livelihood strategy, it is less helpful in determining why some households are more resilient than others, and identifying appropriate interventions to strengthen resilience.<sup>101</sup> Because the resilience index is a composite of both the determinants and the results of resilience, it does not help to shed light on how households adjust to shocks. In particular, the model does not clarify the factors that determine or limit the types of risk management strategies that households choose. Another limitation of this framework is that, because resilience is measured in relation to all types of shocks in aggregate (in the form of the stability latent variable), the model does not shed light on household resilience to specific categories of shocks.

With the exception of Karfakis et al. (2011), all these FAO studies were designed to identify the proportion of vulnerable households in a particular context, and to identify the characteristics of vulnerable households, particularly their access to different types of physical and financial capital and the characteristics of their livelihood strategies. These studies were not designed to explicitly explore the particular risk management strategies adopted by different kinds of households in response to specific types of shocks, or to understand how the adoption of different risk management strategies affected household outcomes or measure of well-being.

The World Food Programme (WFP) conducts country-level Comprehensive Food Security and Vulnerability Analyses (CFSVA) to “provide an in-depth picture of the food security situation and the vulnerability of households in a given country.” These are baseline surveys, conducted in normal times (not crises), in countries that are subject to vulnerabilities. The CFSVAs are intended to identify food insecure and vulnerable populations within a county, provide insights into why they are food insecure or vulnerable, and identify appropriate assistance to reduce vulnerability and food insecurity.

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<sup>101</sup> This limitation is undoubtedly due to limitations on access to rich datasets with detailed information on households’ adoption of specific risk management studies.

In addition to obtaining basic descriptive information on the scope of food insecurity and vulnerability, the assessments are intended to undertake analyses to identify the root causes of food insecurity, and analyze the risks of all types of shocks and their potential impacts on the most vulnerable.

An external review of CFSVAs was conducted in 2006. This study recommended that vulnerability assessments should “go beyond estimating how many people are currently food insecure, and where they currently live.” The report concluded that CFSVAs should:

*“...seek to analyze multiple dimensions of vulnerability. An essential attribute of the concept of vulnerability is that it is forward-looking. Assessments of current assets or livelihood strategies [should be] made through the temporal lens of risk analysis.”*

In fact, most CFSVAs collect extensive information about the current food security status of households, including anthropometric indicators, income, expenditure, and household assets, and frequencies of different types of livelihood strategies. Information about coping strategies is also often collected, as well as seasonal variations in food security variables (WFP 2011a-c; WFP 2010 a-b). The information presented in the CFSVA reports focuses on current food insecurity status in the populations, but most of the reports do not provide any assessment of households that are vulnerable to food insecurity in the future.

One exception is the Status of Food Security and Vulnerability in Egypt 2009 (WFP 2011d). This report includes an analysis that is similar in spirit to the empirical models summarized above. A model that estimates the likelihood that a household will have caloric deprivation (estimated household calorie consumption below recommended requirements) based on a number of household characteristics, including participation in food subsidy programmes (purchases subsidized bread, holds ration card) was estimated using a logistic regression model. The results of the model show that these food subsidy interventions reduce the probability that households will experience caloric deprivation. Following the logic of the empirical models based on cross-section data described above, these results can arguably be used to conclude that not only do the interventions reduce the likelihood of current caloric deprivation, but also that the likelihood of caloric deprivation in the future (i.e., vulnerability) is reduced as well.

To date, empirical work on vulnerability has focused on identifying the characteristics of vulnerable households, but has not been directed toward understanding 1) the factors that affect households’ choice of risk management strategies to prepare for and respond to particular shocks, and 2) how specific interventions may strengthen households’ adaptive capacities to utilize strategies (either coping or adaptive) that better maintain their resilience to future shocks.<sup>102</sup> Most of the empirical work on vulnerability is based on estimates of reduced form models; the final outcome variables that measure household well-being (e.g., per-capita expenditures) are estimated as functions of household and community-level exogenous variables, in the general form given by equations (2) and (3) above, and in some cases extended to include variables measuring specific types of shock. This form of estimating model does not shed light on the particular strategies used by households to adapt to the shock. The adaptive capacities and coping strategies of households are all hidden in the “black box” of the unexplained variation. These models address question a) above, but not questions b) and c).

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<sup>102</sup> It is likely that the empirical studies reviewed here did not explicitly model household adoption of particular risk management strategies because this information was not available in the data sets they analyzed.

An extension of the empirical modelling approaches reviewed above would be to include household coping and adaptive strategies explicitly in the model. Following on the theoretical framework presented previously in this paper, consider the following hierarchical model:

$$(4) \quad r_{h,k} = F(X_h, B_i, S_m) + \eta_{h,k}$$

where  $r_{h,k}$  is a binary variable that has a value of 1 if risk management strategy  $k$  (indexed over all possible strategies  $K$ ) is adopted by household  $h$ ,  $X_h$  is a vector of characteristics of household  $h$ ,  $B_i$  is a vector of characteristics of the community  $i$  in which household  $h$  resides, and  $S_m$  is a vector of shocks (out of  $M$  possible shocks) to which households might be exposed and

$$(5) \quad c_h = G(r_{h,k}, X_h, B_i, S_m) + \varepsilon_h,$$

where  $c_h$  is a household food security indicator (e.g., per-capita consumption). Then the variance of  $\varepsilon_h$  is assumed to follow the general form

$$(6) \quad \sigma_{\varepsilon,h}^2 = H(r_{h,k}, X_h, B_i, S_m),$$

allowing estimates of the probability that households will be food insecure that take into account both specific shocks and households' risk management strategies adopted to cope with them.

Logically, this is a hierarchical model, with the following sequential steps:

1. In response to particular shocks (or the risk of exposure to shocks), household  $h$  adopts a series of risk management strategies  $r_{h,k}$  based on household characteristics  $X_h$  (e.g., access to different types of capital, livelihood strategies followed by the household), community characteristics  $B_i$  (e.g., local safety networks, access to government services, community physical assets), and its exposure to shocks  $S_m$  out of the set  $M$  of all possible shocks. Equation (4) would be estimated as a binary response model (logistic or probit), since the dependent variable is a binary variable indicating whether or not household  $i$  adopts strategy  $k$ .
2. The level and variance of the food security indicator are both functions of the types of risk management strategies adopted by the household, as well as household and community characteristics, and the shocks experienced by each household.

While the adoption of a risk management strategy is logically prior to achievement of outcome variables, both the adoption of the strategy and the realization of the outcome occur within the recall period of the survey, so that econometrically, the measurement of risk management strategies and outcome variable levels occur simultaneously. Therefore, appropriate estimation techniques, such as inclusion of instrumental variables, should be applied to account for the simultaneity of risk management choices and outcome variables.

This econometric model corresponds directly with the schematic diagram of the resilience framework presented in this paper. In particular, the set of equations (4) – (6) can be restated as:

$$(7) \quad \text{Reaction to shock}_i = F(\text{Context variables, Shock variables, HH adaptive capacity variables})$$

$$(8) \quad \text{Livelihood outcome variables} = G(\text{Reaction to shock, Context variables, Shock variables, HH adaptive capacity variables})$$

*(with separate equations to estimate the level and variance of the outcome variables)*

This structural model provides two key kinds of information. First, the model identifies the factors that influence and constrain the adoption of specific risk management strategies, including the characteristics of households, the social, physical, and economic dimensions of their environments, and the specific types of shocks they face. Second, the model indicates how the choice of specific risk



management strategies affects the livelihood outcomes of households, including the expected variability of those outcomes. Thus, in droughts, the model can capture that households with large herds may sell off livestock in the face of drought, while households without livestock must migrate. Furthermore, the model can detect that impact of livestock sales on livelihood outcomes may be less severe on households with large herds as compared to households with small herds. By incorporating variables that correspond to policy interventions, the model can also assess the effects of these interventions on, first, changes in household risk management strategies, and on the resulting changes in household livelihood outcomes, including the changes in the variability of these outcomes. These results can be used to better understand the risk management behaviours of different types of households, how those behaviours may be affected by alternative interventions, and the impacts of the changed risk management strategies on household current and expected future welfare, that is, on vulnerability.

### **Information needs**

A wide range of quantitative information is needed in order to be able to estimate the empirical model of resilience described above. Quantitative analyses of resilience based on this framework will require datasets that include each of the following general types of information:

**Context.** These are the variables that measure all the exogenous factors at the level of community or region that affect household-level adoption of risk management strategies. In a cross-section survey, the context variables would capture the various community or regional level factors. These should include access to infrastructure and government services (which may vary by community, but normally are the same for households within a community), economic opportunities based on agro-climatic conditions, access to markets, local employment conditions, etc. In time-series data, national-level factors (e.g., macroeconomic conditions) would also have to be included, as these factors change over time.

**Shocks (risks).** Detailed information about the various types of shock that households are exposed to must be collected. Even though the research should focus on analyzing one particular type of shock, information about exposure to all other types of shock should also be collected.

Løvendal and Knowles (2005) offer a typology of risk characteristics:

- Type: political, social, economic, health, natural, environmental, life-cycle related
- Level: individual/household (micro), community/regional (meso), national (macro), and global/regional (supra-macro)
- Frequency: transitory, trend-related, structural
- Timing (frequency): infrequent/random, infrequent/regular pattern, seasonal, concatenated, and compounded
- Severity

Variables that account for all these dimensions should be measured and incorporated into empirical models of vulnerability. For example, dummy variables can be included for each type of shock relevant for a particular context, or categorical variables that measure the level of severity (e.g., low/medium/high) of the incidence of specific shocks. In addition, variables measuring the probability that specific shocks will occur can be included to capture the frequency dimension.

Another modelling strategy could be to incorporate variables that measure the probabilities of certain shocks occurring, rather than ex-post recording of shocks that individual households experienced during the recall period of a survey. These probability variables, such as the probability that annual rainfall will be a specified amount below the mean level for a particular location, would be obtained from secondary

sources, such as meteorological time series information for specific locations. The probabilities of risks occurring should be computed at the smallest geographic unit possible, such as the community-specific probabilities of being exposed to flooding. If secondary data permits computing risks only at the national level, then primary data should be collected to estimate the risks for a smaller geographic unit. Incorporation of risks of shocks occurring rather than ex-post information about past exposure to risks would permit analysis of a priori strategies to reduce or mitigate the impacts of risks on household welfare.

#### **Adaptive capacities of households.**

- *Aspirations and empowerment* – The aspirations of households provide the motivation for households to become more resilient (Bernard et al. 2011; Frankenberger et al. 2007). In particular, households and individuals with greater aspirations will have more incentives to make short-term sacrifices to be able to adopt more effective risk management strategies that protect their future food security levels. A report by TANGO International on Self-Resilience in Ethiopia (Frankenberger et al. 2007) incorporated several sets of questions to get measures of: 1) degree of control people feel they have over their life, 2) aspiration gaps and desire for change, 3) individuals’ “aspirations windows” based on contact with others within and outside their communities, and 4) “aspiration failures” when individuals are unwilling to make pro-active investments to better their lives.

In addition, more empowered households, and in particular households in which women are more empowered, will be able to act on their aspirations by being able to effectively interact with more powerful individuals and groups within their communities and with local governments to access needed resources and services. IFPRI (2012) has developed for Feed the Future an index to measure women’s empowerment, for use in monitoring impact evaluations of projects. The index measures whether women are empowered across five domains of activity (production, resources, income, leadership, time) based on women’s ability to make decisions in each of these domains. A separate index measures the percentage of women who are as empowered as men in their households.

Resilience studies should include information to measure these dimensions of aspirations and empowerment. The analysis may be conducted using the indexes proposed in these studies, or other indexes may be developed that are more relevant for specific contexts being analyzed.

- *Livelihood assets* – Within the model, household access to livelihood assets (capital) conditions the types of reactions that households may adopt in response to particular shocks. Livelihood assets include natural, financial, physical (productive and non-productive), social, political, and human capital. The values of financial and physical assets are relatively easy to assess, based on market prices. Proxy indicators for human capital include years of education of household head, or of all household members. Social capital may be proxied by the number of different community and local organizations that a household or individual is a member of, or by more complex indexes of participation in these groups. The value of natural capital should be based on the potential economic returns (including long-term) of the natural capital combined with the level of the household’s (individual’s) access or use rights to the natural capital.

Note that one challenge with livelihood assets, is that information about household assets prior to as well as after the household was exposed to shocks is extremely important. In particular, it

is important to be able to measure or estimate the magnitudes of changes in the different types of capital after a shock, not just whether or not the availability declined. In cross-section surveys, this information must be obtained through respondents' recall. Households may not be able to provide the magnitudes of these changes very accurately.<sup>103</sup>

**Livelihood strategies.** Many dimensions of livelihood strategies may be measured, including the following examples:

- Number of sources of household income
- Number of household members employed or engaged in income-generating activities
- Number of household members employed in specific types of employment or income-generating activities
- Monthly (or annual) income from specified sources
- Types and quantities of crops grown
- Types and quantities of livestock owned

As with assets, it would be extremely useful to have information about livelihood strategies before and after the shocks, in order to be able to capture changes in livelihood strategies (adaptation) as a response to shocks. With panel data these changes could be measured directly, otherwise recall questions would need to be used in questionnaires.

- Risk management strategies* – Detailed information about how households react and adapt to shocks as well as how they prepare for the risk of future shocks is critical to measuring resilience in a way that can provide policy insights. This information is necessary to get inside the “black box”, to be able to understand how people react to shocks, what the implications are to household welfare of different types of reactions, and what factors permit or restrict households from responding to shocks in ways that will not compromise their resilience to future shocks. Løvendal and Knowles (2005), identify the following types of risk management strategies:
  1. Prevention strategies aimed at reducing the probability of a negative shock occurring
  2. Mitigation strategies to reduce the impact of a negative shock by providing compensation for risk-generated losses
  3. Risk preparedness strategies are ex-ante strategies seeking to ensure effective ex-post responses to shocks
  4. Coping strategies are reactive, only utilized after the shocks actually occur

Resilience surveys should collect information about each of these types of risk management strategy. Note that several national surveys have included sections about coping strategies and shocks (e.g., Kenya Integrated Household Budget Survey 2004/5, Uganda National Panel Survey 2009/10, and Afghanistan National Risk and Vulnerability Assessment 2007/8).

**Livelihood outcomes.** Livelihood outcome variables are measures of the current well-being of households or individuals. They measure the level of consumption of basic necessities, including food (or may focus only on food security). Examples of outcome indicators include:

- Per-capita expenditures

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<sup>103</sup>See Echevin, 2011a for an estimate of recall bias of estimates of physical assets pre- and post-earthquake in Haiti. In this instance the bias is estimated to be small.

- Household diet diversity score
- Health and nutritional status indicators
- Household/individual access to various types of capital

These are measures of the current status of households or individuals. If the observed levels of these outcomes fall below minimum threshold levels, then the households are identified as currently poor, or food insecure. Households who are currently observed as poor – their consumption levels are below the minimum thresholds – may not be considered as vulnerable if their future consumption levels are expected to be above the threshold levels. Conversely, households with current outcome variables above the poverty line may be vulnerable if they have a high risk of falling below the poverty line when faced with future shocks.

### **Qualitative analysis**

Qualitative data collection approaches are complementary to quantitative approaches to analyzing vulnerability and resilience. Because the different factors that affect household resilience are so context-specific, it is not possible to identify all of the key variables that should be included in an analysis. A qualitative analysis of the context for specific types of shocks is necessary to identify the key variables that should be included in the quantitative analysis, as well as indicate how the variables should be appropriately measured.

Qualitative approaches are also important for analyzing some shocks that happen so infrequently that sufficient data are not available, or the timeframes needed to measure resilience are so long as to be unworkable for policy analysis (e.g., resilience to tsunamis or earthquakes), or the shocks may be of varied manifestations across time and space (e.g., civil unrest). In such cases quantitative analysis may not be feasible. For these types of shocks, detailed qualitative analysis of past events may be necessary to understand vulnerability and resilience.

Another way that qualitative techniques are used in analyzing resilience is to have communities identify key characteristics of households and communities that affect how well they are able to cope with shocks and adapt to longer term climatic change. For example, in a study in Ethiopia carried out in 2007 (Frankenberger et al. 2007), communities were asked to identify several households (both male and female headed) that were able to meet their food needs for the whole year and to manage the types of shocks that regularly plague the community. Interviews were then conducted with these households to identify the characteristics that made them more resilient than the rest of the households. What was surprising was that many of these households across locations had many of the same attributes (Frankenberger et al. 2007). Most of these households exhibited pro-active behaviour and an entrepreneurial spirit that enabled them to overcome their vulnerable state. Some the key attributes can be summarized below. These are listed in rank order.

- **Income diversification.** Households across livelihood contexts emphasized the importance of diversifying sources of income to manage climatic shocks more effectively. Limited resources that were available would be used strategically to make such investments.
- **Investing in quality improvements in their farmland to raise production.** These households often invest in soil conservation and water management to improve their yields. They were considered model farmers by others in the community.
- **Propensity to save.** These households saw the value to save income earned for future investments rather than spend it on non-productive items like alcohol, chat or new clothes.

Some of these individuals felt pressure from the rest of the community to use these resources in less productive ways.

- **Good work ethic.** All of these households saw the value of hard work in achieving their objectives despite community pressure not to work so hard.
- **Access to food year round.** Most of the resilient households emphasized the need to have access to food on a year round basis.
- **Joint decision making with spouse.** The majority of these households had positive relationships with their spouses and regularly consulted them on all investment decisions. This common household vision seems to be very important to successful income diversification strategies.
- **Openness to change and early adopters of extension packages.** These households were often the first adopters of new extension technologies and used credit effectively in investments.
- **Contingency funds.** Households living in areas prone to erratic rainfall saw the value of investing in contingency funds to manage risk (lowland mixed livelihood systems). This was especially true in resilient female-headed households. In some locations, this involved storing grain for 2 years. In other locations it involved cash savings.
- **Placing value on education.** Although many of these household heads did not have much education, they recognized the value of education for income diversification. If possible, they made sure that all of their children were educated.
- **Do not drink or chew chat.** These households see conspicuous consumption of alcohol and chat as negative attributes.
- **Sharing with others.** Several resilient households saw the value of sharing food and resources with other members of the community to build social capital. Community cohesion was important to maintain through these informal safety nets.
- **Engaging the community as change agents.** Many resilient households sought opportunities to share their ideas and even resources to enable other households to follow their example.

The study also looked at characteristics of resilient communities. These are outlined below.

- **Attitudes toward change.** Resilient communities exhibit a sense of pride and openness to new ideas and alternatives, see the value of education, and understand the economic impact of social issues.
- **Organizational capacity.** There is a collaborative spirit in the community to respond to shocks and adversity. Resilient communities also have sufficient organizational capacity to respond in a collective manner. They use both traditional social capital mechanisms and strategically selected, externally-derived organizational structures to achieve their objectives.
- **Management of internal and external resources.** These communities can manage communal resources effectively and seek out external resources strategically to meet objectives.
- **Decision making processes.** These communities have decision making processes that enable planning, equitable participation and implementation of shared goals and objectives.

In another study (Hughes 2011) carried out in Ethiopia by Oxfam GB that focused on key characteristics of resilient households and communities, the following key characteristics were identified.

- **Livelihood viability**-having less climate-sensitive livelihood activities to fall back on. The key indicators that are being tracked are the ability to meet household needs, livelihood diversification, livestock herd diversity, crop portfolio, access to veterinary services, access to agricultural extension.
- **Livelihood innovation potential**-ability to modify livelihood strategies in response to shocks and climate change. Indicators would include level of interest and willingness to experiment with

new livelihood practices, access to seasonal forecasting information, access to disaster preparedness information.

- **Contingency resources and external support**-indicators are access to savings, food and seed reserves, access to social protection, kin and non-kin support networks, access to emergency programmes and access to assets that can be converted to cash.
- **Natural resource access**-access to healthy ecosystems. Indicators would include access to pastureland during drought, access to livestock feed, access to productive agricultural land, and access to water for productive use.
- **Social response capability**-community leadership that is capable of mobilizing collective action. Indicators would include the existence of DRR/CCA committees, conflict prevention and resolution mechanisms, linkages and coordination with local government.

What is interesting about these two studies is that they found very similar characteristics that support household and community resilience.

### **Monitoring and evaluation of resilience interventions**

As stated earlier, resilience is the *capacity* of communities, households, or individuals to deal effectively with shocks and stresses, not an observed measurement of well-being at a particular point in time. It is the capacity to be able to maintain “acceptable” well-being outcomes after experiencing some kind of shock. Thus, a particular challenge for monitoring and evaluation of projects designed to enhance resilience is to come up with appropriate indicators to measure this capacity. It is made more challenging that households may never have to actually utilize this capacity (e.g., improved response to severe drought conditions) within the timeframe of the project. Thus, if the particular shock for which the intervention is targeted is not experienced within the timeframe of the project, then direct measurement of improved capacity in terms of a reduction in post-shock disruptions of household well-being cannot be measured directly. In this situation, indirect measures of capacities will need to be measured. For example, there may be a low chance that a particular project intervention area will experience a severe flood during the life of a project, so it will be impossible to measure whether the project reduced the negative impacts of flooding on household well-being. In this case, the highest level of “impact” that can be measured is whether all the flood control and mitigation infrastructures and systems are in place and operational.

Two general categories of indicators to measure the impacts of interventions to enhance resilience are:

1. **Increased stability of indicators of household livelihood outcomes**, such as food security. For example, after construction of retaining walls, households’ food consumption is more stable from year to year because they are less likely to experience crop loss from flooding. Relative improvement (smaller disruptions) in such outcome indicators in response to shocks as a result of the interventions may be measured directly for recurring or structural stresses, or for shocks that occur with high frequency. For these types of shocks, comparison of the impact on outcome variables before and after the interventions have been implemented will directly measure the benefits of the resilience-enhancing interventions on the target populations.
2. **Indicators of improved capacities of communities, households, and individuals to respond to shocks**. These are outcome-level indicators to demonstrate that necessary physical infrastructures, service delivery infrastructures, local organizations, early warning systems, etc. are put into place. They are assumed to be necessary and sufficient conditions to protect households from the negative impacts of particular types of shocks. These assumptions are either based on logical connections

made between improved capacities and actual behaviours in response to shocks, or on findings from previous empirical studies.

The second category of indicators does not measure the final impacts on target beneficiaries in terms of livelihood outcomes. In many cases, direct measurement of such outcome indicators may not be feasible because the incidence of the risks (cyclones, floods, earthquakes, tsunamis, etc) may be too infrequent to ensure that direct measurement is feasible within a reasonable timeframe.

Measurement of the benefits from interventions to improve resilience may utilize the following standard evaluation techniques:

1. **Simple pre-post comparisons of outcome indicators.** For example, before a resilience-enhancing intervention is implemented, food security indicators fall by 10 percent after a drought, and then after interventions, the same indicators fall by only 3 percent after a later drought. For analyzing outcome indicators, this is the least preferred technique because it is very difficult to attribute the observed changes in the outcome indicators to interventions. An additional difficulty in applying pre-post comparisons to measuring resilience is that the severity of the shock (drought) may also be different between the two rounds of observations. The fact that food security indicators fell less in the second round may be because the second drought was less severe than the first, not because of the interventions. For indicators of capacity (e.g., early warning systems in place), pre-post comparisons are sufficient, if the improved capacities can be clearly attributed to project interventions.
2. **Experimental design (randomized control trials)**, in which households are randomly assigned to receive or not receive resilience-enhancing interventions. This is the “gold standard” for impact evaluations, because the differences between the treatment and control groups can be more clearly attributed to the treatment compared with the other techniques, and selection bias of treatment group is minimized. However, this technique will be very difficult to apply in measuring resilience, because shocks cannot be “administered” in a controlled way, they are not “manipulable causes” (Shadish et al. 2002).
3. **Quasi-experimental design**, in which household adoption of risk management strategies, are estimated in statistical models that control for the effects of household characteristics and other exogenous factors on choice of risk management strategies. This technique is normally not considered as robust as randomized control trials, since selection bias cannot be accounted for as completely. However, in most cases, this is the best evaluation technique available to measure the impacts of interventions to enhance resilience. The empirical model described above provides an analytical framework to develop statistical models that can be used for evaluation of the impacts of interventions on household resilience using quasi-experimental design. In particular, models of the form described will identify the exogenous factors that are associated with different types of households adopting specific risk management strategies, and how the adoption of those strategies affects the vulnerability of the households to future shocks. By including exogenous variables that are associated with particular interventions, such as whether the household is in a community with an early-warning system, the impacts of these interventions on outcome variables can be estimated and simulated from the model results.

In cases where measurement of livelihood outcome variables before and after shocks is not feasible, because the shocks are too infrequent or unpredictable, the best option for measuring impact is on the basis of outcome-level variables of improved capacities of households to respond to future shocks. For measurement of capacity indicators that can be directly attributed to interventions, a basic pre-post intervention comparison of capacities is the best available evaluation strategy. In these instances, the

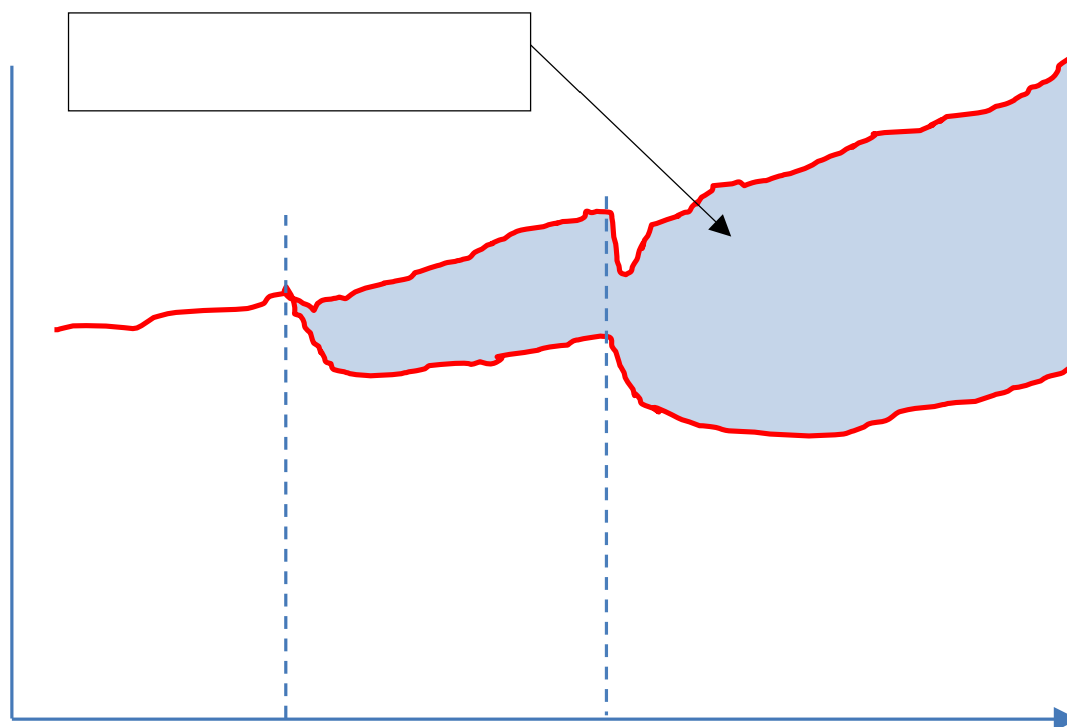
Shock #1

Shock #2

underlying assumptions that link these capacity indicators to improved (more stable) livelihood outcomes should be supported by other empirical studies and by extensive qualitative research to understand the factors that determine and constrain adoption of alternative risk management strategies by different types of households.

In cases where it is possible to measure or estimate livelihood outcome variables before and after shocks, the measurement of the impacts must be made over a period of time, not at a single point in time. This is because resilience is a dynamic concept, and improved resilience can only be measured over time. Consider the alternative scenarios shown in Figure 2. After being exposed to a shock, non-beneficiary households experience large declines in their livelihood outcome indicators (e.g., per-capita consumption), and they recover relatively slowly over time. As shown in the diagram, they may not be able to fully recover from one shock and a subsequent shock will move them to a lower trajectory. Households who benefit from a resilience-improving intervention will follow a different trajectory: they will experience a smaller decline in their livelihood outcome variables after a shock, and will be able to recover more quickly. As shown in the diagram, they are able to maintain a general upward trend in livelihood outcomes, even when exposed to future shocks. The total measure of benefits that the beneficiary household accrues from the resilience-improving intervention is the difference between the two trajectories measured over time, represented by the shaded area in the graph.<sup>104</sup>

**Figure 2. Projected benefits from resilience-enhancing intervention**



<sup>104</sup> One way to collapse the time dimension of outcomes is to use the statistical measurement of the standard deviation of the indicator over time. That is, rather than projecting that a livelihood outcome indicator will be at a particular level at a particular time in the future, estimate the likelihood that the indicator will fall below a specified threshold at some point in the future. This is the logic of the empirical models described above.



Shock #2

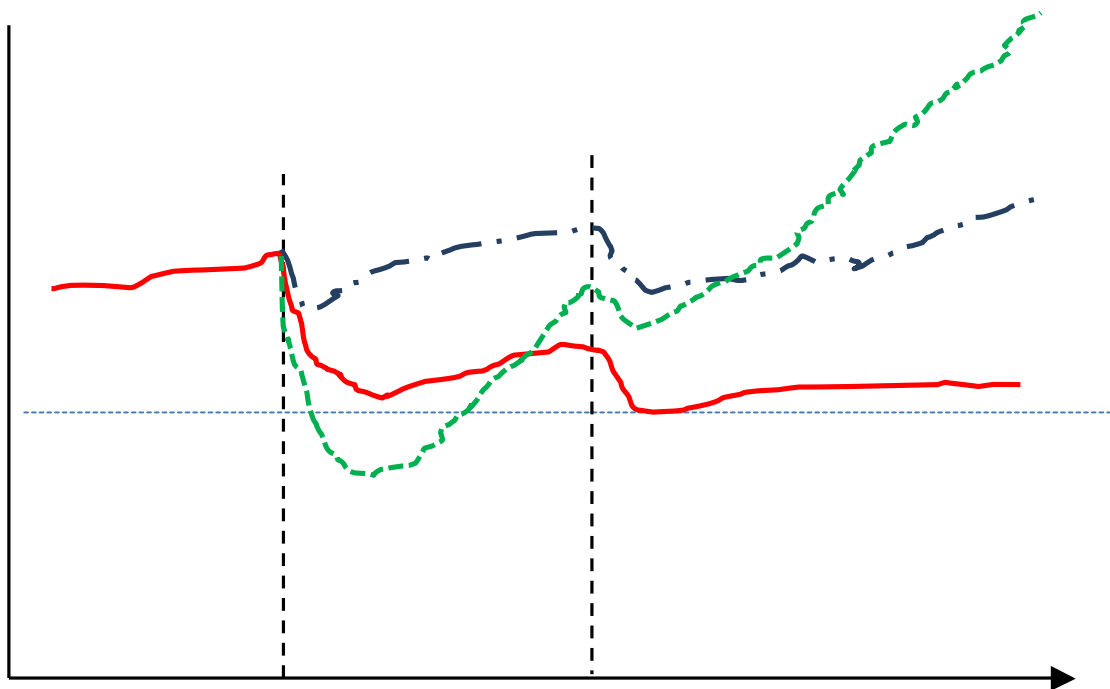
Shock #1

Intervention A  
(Coping)

This time-bound measure of the benefits of improved resilience introduces an additional set of assumptions that must be made in order to estimate the total benefits. In addition to the assumption of the counter-factual – what would be the livelihood outcome of beneficiary households if they did not receive the intervention – it is also necessary to make assumptions about the future trajectories of both the beneficiary and non-beneficiary households. In other words, how will the non-beneficiary households respond to future shocks, and how will the beneficiary households respond to future shocks. The empirical model described above can be used to estimate how beneficiary and non-beneficiary households will respond to shocks and then used to simulate future outcomes.

This process of comparing future trends in livelihood outcomes for non-beneficiaries can be extended to measure and compare the benefits of alternative strategies.<sup>105</sup> Figure 3 shows a non-beneficiary household that suffers from large declines in livelihood outcomes after being exposed to shocks, and is unable to recover, eventually falling to the basic survival level where livelihoods are just enough to meet current basic necessities. Intervention A is an intervention that provides short-term protection to the household (such as food aid distribution), so livelihood outcomes are stabilized after shocks, but the overall trend of livelihood outcomes remains unchanged. Intervention B allows the household to undertake an adaptive strategy, such as adopting irrigation agriculture or destocking livestock, which has the potential to reduce the negative impacts of shocks, and also put the household on a higher livelihood outcome path.

**Figure 3. Projected benefits from alternative resilience-enhancing interventions**



As drawn in this diagram, the household is not able to adopt this particular strategy because the initial investments required would initially drop the household below the survival level. By measuring the

<sup>105</sup> See Owens and Hoddinott (1999) for an example of an estimate of benefits from alternative policies over time.

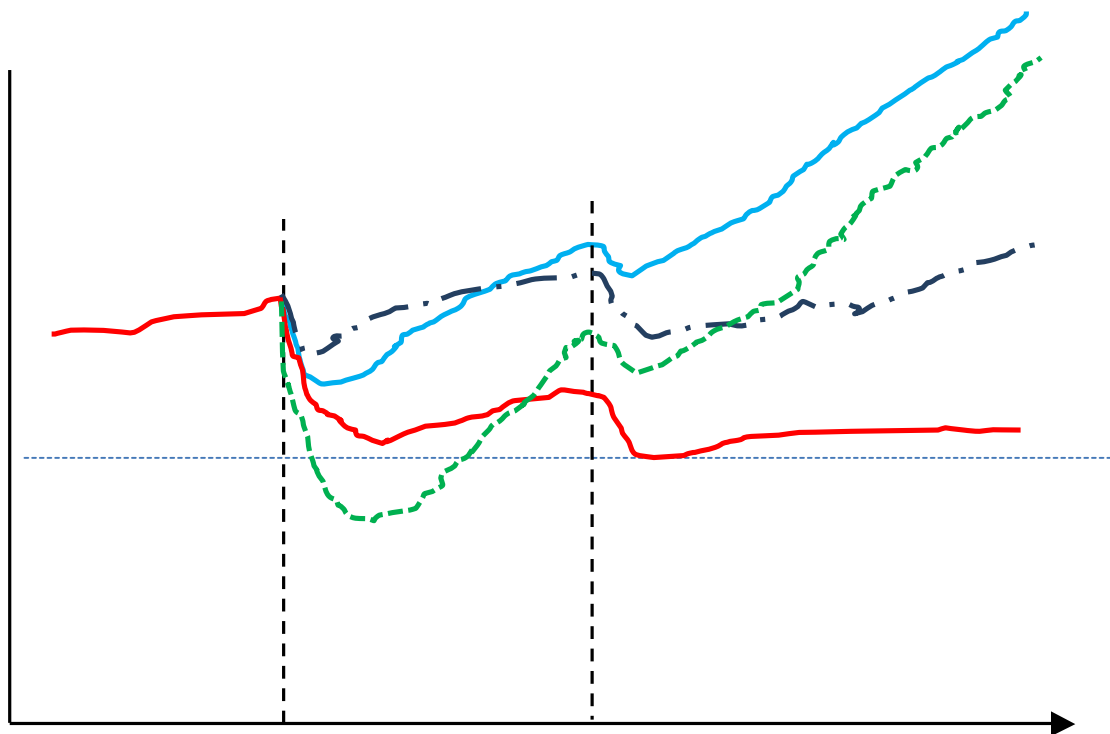
(Per-capita consumption)

Shock #1 Shock #2 Intervention B

difference between the trend lines of the alternative interventions and the no intervention, the relative benefits of the two interventions can be compared. The long-term benefits associated with Intervention B may be much larger than Intervention A, even though some households may not be able to adopt Intervention B because of the high initial investment requirements. In this situation, there are potential benefits to a combined strategy, which protects households from the large initial investment costs associated with Intervention B, as shown by a combination of Interventions A and B in Figure 4. By comparing the costs of these interventions with their projected benefits, it is possible to determine which option provides the greatest overall net benefits, and the time horizon of the benefits.

These examples demonstrating the benefits of interventions to improve resilience must be measured over time. Projected future benefits depend on many assumptions about future conditions. For example, in particular contexts it may be necessary to incorporate assumptions about the future impacts of climate change or changing economic conditions on the different scenarios. For example, a rainfed livelihood strategy (the non-intervention counterfactual) may be exposed to increased likelihood of drought in the future, whereas investment in irrigation (an intervention option) may be expected to face increasingly variable market prices for the crops produced. While conceptually the idea of comparing alternative scenarios is quite clear, the estimation of future benefits of increased resilience depends on a large number of assumptions about future conditions.

**Figure 4. Projected benefits from alternative resilience-enhancing interventions**



**Outcome Monitoring**

The important time dimension of resilience places particular importance on monitoring of both changes in conditions and households' responses to those changes over time. **Monitoring of project outcome-**

**level indicators**, namely changes in risk management behaviours, in response to shocks should be monitored over short (3-4 month) intervals. In these shorter intervals, the following categories of information should be tracked in outcome monitoring:

1. All shocks that households have been exposed to since the time of the last round, including measures of severity of exposure, if possible.
2. Outcome level indicators – indication of all risk management strategies adopted by households in response to shocks, including:
  - Coping strategies adopted
  - Adaptive strategies
  - Adoption of behaviours or practices that are promoted by project interventions to enhance resilience
3. A limited set of impact indicators that can be easily measured and are sensitive. Examples of appropriate impact indicators, which meet these criteria are:
  - Household diet diversity score (HDDS)
  - Household Food Insecurity Access score (HFIAS)

The reasons for tracking these indicators in short intervals are to be able to track shocks and their impacts on household food security status in “real time”, and to provide a richer set of information about how different types of households react to different types of shocks in different environments. This information can be used to identify which interventions, or combinations of interventions, are most effective and robust in enhancing resilience of households to particular types of shocks.