ANALYSIS OF RESILIENCE MEASUREMENT FRAMEWORKS AND APPROACHES

The Resilience Measurement, Evidence and Learning Community of Practice (CoP)

PREPARED BY OVERSEAS DEVELOPMENT INSTITUTE (ODI), AND MEMBERS OF THE RESILIENCE MEASUREMENT, EVIDENCE AND LEARNING COP

October 2016
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About the Windward Fund

The Windward Fund advances public awareness about conservation, climate, and environmental issues, sustainable food systems, and the protection of land, wildlife, and other natural resources. It hosts public awareness campaigns and grant-making projects that address conservation from a range of angles. Windward Fund commissioned this report as the host of the Resilience Measurement, Evidence and Learning Community of Practice (CoP).

About The Rockefeller Foundation

For more than 100 years, The Rockefeller Foundation’s mission has been to promote the well-being of humanity throughout the world. Today, The Rockefeller Foundation pursues this mission through dual goals: advancing inclusive economies that expand opportunities for more broadly shared prosperity, and building resilience by helping people, communities, and institutions prepare for, withstand, and emerge stronger from acute shocks and chronic stresses. Over the past decade, The Foundation has increasingly supported multi-year resilience initiatives including the 100 Resilient Cities (100RC), Asian Cities Climate Change Resilience Network (ACCCRN), Global Resilience Partnership (GRP), Rebuild by Design (RBD), the National Disaster Resilience Competition (NDRC), and resilience measurement projects such as the City Resilience Framework/Index and the Resilience Value Realization (RVR) process.

About the Resilience Measurement, Evidence and Learning Community of Practice

Launched in late 2016, the Resilience Measurement, Evidence and Learning Community of Practice (CoP) responds to a growing recognition that while investments in the concept and aspiration of resilient individuals, communities, and systems continue to grow, evidence of the effectiveness and impact of these investments lags behind. The COP enables resilience measurement experts, and monitoring, evaluation, and learning practitioners across sectors, disciplines, and geographies to work together in analyzing the current state of resilience measurement, improving approaches to measurement, and learning what works, all aimed at building the knowledge, experience, and evidence needed to further advance this promising field.

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## Acronyms

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<th>Description</th>
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<tr>
<td>ARCAB</td>
<td>Action Research for Community Action in Bangladesh</td>
</tr>
<tr>
<td>BRACED</td>
<td>Build Resilience and Adaptation to Climate Extremes and Disasters</td>
</tr>
<tr>
<td>CCA</td>
<td>Climate change adaptation</td>
</tr>
<tr>
<td>CoBRA</td>
<td>Community-Based Resilience Analysis (UNDP)</td>
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<td>CoP</td>
<td>Community of practice</td>
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<td>CRFI</td>
<td>City Resilience Framework and Index (Arup)</td>
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<td>DROP</td>
<td>Disaster Resilience of Place</td>
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<td>DRR</td>
<td>Disaster risk reduction</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the UN</td>
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<tr>
<td>FSIN</td>
<td>Food Security Information Network</td>
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<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<tr>
<td>IFRC</td>
<td>International Federation of the Red Cross and Red Crescent Societies</td>
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<tr>
<td>IIASA</td>
<td>International Institute for Applied System Analysis</td>
</tr>
<tr>
<td>IISD</td>
<td>International Institute for Sustainable Development</td>
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<tr>
<td>ISET</td>
<td>Institute for Social and Environmental Transition</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
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<tr>
<td>MEL</td>
<td>Measurement, evidence and learning</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental organization</td>
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<tr>
<td>NRM</td>
<td>Natural resource management</td>
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<td>ODI</td>
<td>Overseas Development Institute</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<tr>
<td>RAPTA</td>
<td>Resilience Adaptation Pathways Transformation Assessment Framework</td>
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<td>RIMA</td>
<td>Resilience Index Measurement and Analysis (FAO)</td>
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<tr>
<td>SHARP</td>
<td>Self-evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (FAO)</td>
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<td>SLA</td>
<td>Sustainable Livelihoods Approach</td>
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<td>STRESS</td>
<td>Strategic Resilience Assessment (Mercy Corps)</td>
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<tr>
<td>TAMD</td>
<td>Tracking Adaptation and Measuring Development</td>
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<td>TANGO</td>
<td>Technical Assistance to NGOs</td>
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<td>ToC</td>
<td>Theory of change</td>
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<td>TWG</td>
<td>Technical Working Group (FSIN)</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNISDR</td>
<td>United Nations Office for Disaster Risk</td>
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<td>URF</td>
<td>Urban Resilience Framework (ISET)</td>
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<td>USAID</td>
<td>U.S. Agency for International Development</td>
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<td>WFP</td>
<td>World Food Programme (UN)</td>
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Acknowledgements

The Community of Practice is grateful to authors Aditya Bahadur and Florence Pichon and their team members from ODI who undertook, at relatively short notice, a first inventory and analysis of what eventually totaled 45 resilience measurement frameworks. This enabled the first and second convenings of the CoP to get an overarching sense of the range of approaches, commonalities, issues, and challenges across many sectors in the resilience field.

This analysis was deepened with further input from Sachin Bhoite (Arup), Colin McQuistan (Practical Action), Luca Russo (Food and Agriculture Organization of the UN – FAO), and Sebastian Thomas (Oxfam).

Finally, a peer review panel comprised of Laura Mattioli (Global Resilience Partnership – GRP), Marcus Moench (Institute for Social and Environmental Transition – ISET), Christopher Béné (Consultative Group on International Agricultural Research – CGIAR), Mark Constas (Cornell), Tim Frankenberger (Technical Assistance to NGOs – TANGO), and Carol Tan and Nancy MacPherson (The Rockefeller Foundation) reviewed the expanded overview report and provided additional sources, comments, and advice. Maliha Khan provided indispensable support in facilitating and coordinating this process to produce the final briefing paper.

We are grateful to the ODI team for getting the ball rolling, and for its willingness to engage in constructive peer review, debate, and collaboration with the members of the CoP to enrich the report. Our special thanks to those resilience measurement specialists who helped to expand and deepen the analysis by illustrating how resilience is conceptualized, measured, and evaluated in key resilience interventions in their organizations and networks.

CoP Members and Secretariat
Introduction

The resilience concept is on a journey from scientific niche towards widespread operational application. A wide range of frameworks and approaches, emerging from a diverse set of sectors and organizations, exists to guide, diagnose, measure, and evaluate resilience.

This briefing report aims to stimulate early thinking around the landscape of resilience measurement and monitoring and evaluation (M&E). The document is not a technical discussion of measurement principles but rather an overview of commonly used approaches in the field. It was elaborated in collaboration with members of the Resilience Measurement, Evidence and Learning Community of Practice (CoP) who have provided invaluable contributions and feedback that reflect their knowledge of resilience measurement.

A first draft of the paper was presented and circulated at the CoP’s first core group meeting in May 2016 with a sample of 20 frameworks. After the convening, members of the CoP provided advice on the structure of the final report and suggestions for expanding the sample and analysis to an additional 25 frameworks and resilience treatises.

Further, this report was designed to inform the second meeting of the CoP, determine areas of commonality across major resilience approaches, and identify areas where the CoP can advance the field of resilience measurement.

The inventory and analysis of frameworks asked the following questions.

- **Definition.** Do the frameworks subscribe to a particular conceptualization/definition of resilience?
- **Scale, system, and temporal issues.** At what scale do the frameworks measure resilience? For which systems and sectors are the frameworks designed? How do the frameworks consider temporal dimensions?
- **Building blocks.** What are the principal components of the frameworks that help build resilience?
- **Function.** Are frameworks oriented towards measuring changes in resilience resulting from particular interventions, or concerned with helping to plan for resilience by diagnosing the elements of a system that make them more or less resilient?
- **Capacity.** How do the frameworks conceptualize resilience in terms of capacities?
- **Sector.** How do fields beyond international development, humanitarian interventions, disaster risk reduction, and urban planning frame and measure resilience?
The following sections explore these questions by illustrating key points with examples from resilience measurement frameworks. Despite the numerous differences among approaches that have been debated to date, there are also a surprising number of similarities among them. The emerging field of resilience measurement could build on these, in order to develop an evidence base for resilience interventions.

Methodology

The frameworks sampled were selected from a literature review drawing on systematic review methodologies (Gasteen, 2010). The literature review involved three steps. First, key search terms on resilience measurement frameworks based on title and abstract were used to scan academic journal databases, including Google Scholar, IngentaConnect, ScienceDirect, Taylor & Francis Online, and Wiley Online Library. Search words included combining “resilience” with the words measurement, indicators, assessment, metrics, thresholds, evaluation, monitoring, impact, score, and estimate. Then, a more purposive search, including discussions with key informants, covered the gray literature produced by organizations actively involved in research on resilience. Once this initial set of material was collected, an exponential discriminative snowball sampling technique was employed, starting with a small, core set of data sources to uncover new sources while rejecting those that were not centrally aligned to the research design (Denzin and Lincoln, 2005). An exclusion criterion was developed, and papers were retained that had an explicit focus on approaches for conceptualizing, measuring, and evaluating resilience from areas of practice within the broad paradigm of international development. This exclusion favored frameworks that considered resilience in relation to socio-environmental shocks and stresses, rather than, for example, psychological trauma or disruptions in information technology systems. The scan yielded more conceptual than analytical frameworks, so the subsequent analysis focused on the theoretical and conceptual issues related to resilience measurement.

1 The frameworks use a range of terms to describe their purpose, including tools, principles, guidelines and frameworks. For clarity and coherence throughout this document, the authors use the term “frameworks” to describe a document that presents a method of measuring or conceptualizing the components of resilience.
SECTION 1

Defining resilience

Key points

- While definitions of resilience vary, in general, they state that resilience should enable systems to function and flourish in the face of shocks and stresses.
- Limiting damage from disturbances and recovering from shocks features prominently across definitions.
- Managing change is core to most definitions, though some frameworks extend this to include transformative shifts.

The definitions of resilience across the frameworks are not uniform. However, they demonstrate interesting similarities around key elements, thus offering potential foundations for building a coherent evidence base over time.

System/unit. Almost all the frameworks highlight one particular entity or unit that needs to be made resilient. Some leave the definition open-ended by calling it a “system.” Others identify the types of systems/units they are referring to, such as household, community, city, ecosystem, or country.

Disturbances. Almost all frameworks agree that resilience is critical in enabling systems to function or flourish in the face of shocks and stresses. Some are tailored for measuring resilience to specific disturbances; others do not specify the disturbance.

For instance, Action Research for Community Action in Bangladesh (ARCAB) defines resilience as “a process of building the securities of the climate-vulnerable poor in ways that enable them to respond positively to climate-related shocks and stresses” (ARCAB, 2012). As such, it is clear that the framework operates in the context of climate shocks. On the other hand, Mercy Corps underlines that resilience is deployed to deal with disturbances but does not identify these disturbances. According to this approach, resilience is “the capacity to ensure that adverse shocks and stressors do not
have long lasting adverse development consequences” (Constas et al., 2014; Mercy Corps, 2015). This point is also highlighted by Béné and Frankenberger (2015) who explicitly frame resilience as a means rather than an end.

Underlining resilience as inherently about ensuring continued wellbeing despite shocks and stresses, they also stress the vital importance of monitoring shocks and stresses through the development of indicators at different levels in any approach to measure resilience. Others have also stressed the vital importance of collecting data on shocks in any approach to resilience measurement, emphasizing the lack of standardization in this type of data (Carletto et al., 2015). Choularton et al. (2015) also highlight the importance of measuring shocks. The six principles they proposed for doing this effectively are presented in Box 1.

**BOX 1**

**Six principles for shock measurement**

These should be considered in any resilience-building initiative.

1. Conduct a comprehensive analysis of the larger risk landscape including potential risks over time
2. Measure shocks and stressors at multiple scales and over different time periods
3. Measure the connections and interrelationships between shocks and stressors
4. Measure both the objective and subjective aspects of shocks
5. Measure the occurrence of large-scale and small-scale shocks
6. Include indicators of political instability and conflict in shock and stressor management

Source: Choularton et al., 2015

**Pre-event action.** Many definitions of resilience reference actions that need to be taken in preparation for shocks and stresses. Here, language around the importance of anticipation and risk management and reduction actions dominates. For example, the International Federation of the Red Cross and Red Crescent Societies (IFRC) defines resilience as the ability to “anticipate, prepare for, reduce the impact of, cope with and recover from the effects of shocks and stresses without compromising their long-term prospects” (IFRC, 2014). Similarly, the U.S. Agency for International Development (USAID) defines resilience as the ability to “mitigate, adapt to and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth” (Frankenberger et al., 2013).

**Damage limitation.** Another key component of most definitions references resilience as limiting damage from disturbances, including recovery, “bouncing back,” or absorbing shocks. For example, Béné (2013) defines resilience as the ability “to anticipate, absorb, accommodate, or recover from the impacts

<table>
<thead>
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<th>TABLE 1: Frequency of concepts within definitions</th>
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<tr>
<td><strong>PRE-EVENT ACTION</strong></td>
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<tr>
<td>Anticipate, plan, prepare (4)</td>
</tr>
<tr>
<td>Reduce or manage risk (4)</td>
</tr>
<tr>
<td>Avoid (1)</td>
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of a particular adverse event, (shock, stress, or (un) expected changes).” Similarly, the UN Development Programme (UNDP) Community-Based Resilience Analysis (CoBRA) defines resilience as a pathway that allows communities to bounce back or bounce back better after a shock or stress (UNDP, 2014).

Managing change. Most definitions highlight that resilience is about initiating or managing processes of change to deal with changing circumstances. Most frameworks frame the depth and breadth of this change in terms of learning, reorganization, adaptation, and evolution, with embedded assumptions of incremental shifts. Some, but not all, conceptualize it to include transformation or transformative shifts. For example, Cabell and Oelofse (2012) highlight that resilience is the ability to retain function through disturbance but also refer to “the degree to which the system is capable of self-organization; and the ability to build and increase the capacity for learning and adaptation.” This is in contrast with the definition of resilience included as part of the FAO’s Resilience Index Measurement and Analysis (RIMA) approach – an approach that spans absorption and adaptation but also includes “the transformative capacity of an enabling institutional environment” (FAO, 2014).
SECTION 2

Level, scale, system, and temporal dimensions

Key points

- The majority of resilience measurement frameworks focus analysis at the local level, with some indicators related to higher governance systems.
- Few frameworks consider the resilience of individuals, though emerging research on subjective and psychological resilience is generating evidence of cognitive factors that influence resilience outcomes.
- Generally, urban frameworks focus primarily on systems, institutions, and policies that deliver resilience, rather than on the agency of people and the resources available to them.
- There is room for greater exploration of the interaction between scales and the potential trade-offs in resilience-building efforts across scales.

Resilience is a cross-scalar phenomenon, and understanding the question, “resilience for whom?” requires a closer look at the scales at which frameworks aim to measure. These scales are inherently interlinked – the resilience of an individual is influenced by the resilience of the wider community, which, in turn, is influenced by national government – although resilience qualities manifest differently at each level. Mock et al. (2015:12) underline that processes of resilience, vulnerability, and wellbeing must be analyzed from a “multi-level and multi-scale perspective” for a number of reasons, including feedback loops and complex interactions among system components.

This aside, in a subsequent paper, Béné and Frankenberger (2015) add that a multi-scalar, multi-level approach is also needed for measuring the “responses” to disturbances. This makes attempting to measure the resilience of the entire landscape at multiple scales an extremely complex task (Choularton et al., 2015). The majority of the resilience measurement frameworks reviewed focus analysis on the local level, which covers individuals, households, and communities. This allows practitioners and policymakers to understand and operationalize a framework more easily, and is more comfortable from a traditional development paradigm perspective that directs interventions at the household level. Local frameworks focus on people’s agency, capacity and abilities, whereas higher-level frameworks describe how larger systems can deliver resilience for people within them.

The frameworks analyzed focus disproportionately on the local scale (see Figure 2). This scale is often referred
to as “community resilience” and is measured largely by looking at capital assets and, in some cases, qualities of resilience. This is both a strength, because it draws on a history and set of tools, and a weakness, because of the potentially poor linkage between established capital assets and the qualities of those assets that either contribute to resilience or create fragility. The comparatively smaller number of frameworks that aim at measuring resilience at higher scales focus on systems, institutions, and policies that deliver resilience.

**Resilience at the local level**

Of the 35 frameworks analyzed, 28 focus on the community or local level. These local level frameworks are generally linked to particular interventions or designed to help inform programming. For example, UNDP’s CoBRA uses participatory tools to identify “building blocks” of community resilience, and to ask people to gauge which development interventions were the most impactful in building resilience against shocks. Factors that influence resilience at the household level are derived from this analysis (UNDP, 2014). The frameworks have been developed for use in primarily rural development contexts. The limited number of other frameworks suggests a potentially weak engagement with other arenas of action that are relevant in relation to large-scale stresses, such as those emerging as a consequence of climate change, including, for example, economic system resilience, critical infrastructure, water resources, and urban systems.

Unpacking the components of community resilience yields three levels: individual, household and community. The notion of the community itself is loosely or not defined. The Cabell and Oelofse (2012) agriculture-focused framework defines the community level as “concerned with a scale greater than the individual and his or her farm, but a scale small enough that an individual’s voice can still be heard.” Community-level indicators include quality of environment and natural resource management institutions, access to communal resources, quality of protective infrastructure, levels of peace and security, availability of contingency resources or social safety nets, and social participation in the community. Frameworks that measure resilience at the household level primarily use assets, services and endowments that a particular household can access. This is true of FAO’s Resilience Index Measurement Program.

![FIGURE 2: Measurement at scales](image-url)
and Analysis (RIMA), which includes a number of dimensions of resilience, such as income, food, access to basic services, assets, and social safety nets (FAO, 2014). This is also true for the measurement framework proposed by the Food Security Information Network (FSIN) Technical Working Group (Constas et al., 2014).

Assessing resilience at the individual level is crucial to understanding intra-household dynamics and psychosocial well-being. There can be large differences even within the same household in how shocks or stresses affect individuals. For example, in places where migration is a coping or adaptation strategy, measuring resilience at the individual level is vital to understanding how the absence of a breadwinner impacts spouses and children (Brooks et al., 2014). Recent research on psychological resilience following traumatic events such as major disasters suggests positive parent-child and mutually supportive social networks are key, while a lack of these key relationships may erode mental health (Graber et al., 2015). In some cases, long-term displacement after a humanitarian disaster may also impact psychological health. Tulane University’s Haiti Humanitarian Assistance Evaluation is one of the few frameworks that attempt to measure individual resilience in a meaningful way.

The evaluation measures psychological health using three instruments: focus group discussions, the General Health Questionnaire–12, and the Personal Wellbeing Index IIWG, 2013). Material factors, such as livelihood capitals and assets, are clearly not the only drivers of resilience in the aftermath of a shock or stress (Tulane University, 2012). Additionally, research on subjective resilience brings attention to psychosocial factors that impact resilience at the individual and community levels. Béné et al.’s (2016) technical report provides compelling evidence that aspirations, self-efficacy, and perceptions of risk influence the ability to absorb and recover from shocks and stresses at both the individual and collective levels. The paper suggests that key social variables linked to subjective and cognitive elements are as important as material factors in people’s ability to buffer shocks. These early forays into including psychological factors in resilience measurement demonstrate the value that these metrics can bring to the understanding of resilience at individual and community scales.

**Resilience at higher scales – city, national, and systems levels**

The remaining frameworks are divided between those measuring the resilience of cities or national systems, or of other types of systems, such as ecosystems or socio-ecological systems. These frameworks are qualitatively distinct from those that measure resilience at the household level. They tend to focus primarily on systems, institutions, and policies that deliver resilience, rather than on the agency of people and the resources available to them. For example, Tracking Adaptation and Measuring Development (TAMD) measures climate risk management processes across scales, at global, national, subnational, and local levels (Brooks et al., 2011). At the national level, indicators are focused on the national government’s capacity to respond to climate change risks. Suggested indicators include institutional knowledge of climate change, budgeting for adaptation activities, and integration of climate change into planning and institutional coordination. The framework builds on traditional mainstreaming tools to measure whether the government provides an enabling environment for resilience building. Tracking resilience at the subnational scale follows the same protocol.

**Multiple scale focus.** One novel approach that assesses resilience at multiple scales – the Resilience Adaptation Pathways Transformation Assessment Framework (RAPTA) – focuses on assessing resilience of socio-ecological systems to aid the planning of interventions. The tool guides practitioners to conduct “systems assessments” to determine risks and key controlling influences for dealing with future shocks and identify benefits of maintaining, adapting, or

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2 Note, however, that reliance on strong local social networks can also undermine resilience in the face of communicable forms of stress. For example, this was the case with Ebola, where reliance on strong community networks accompanied by weak trust in governmental systems contributed to rapid transmission. A similar dynamic could also apply to panic and social unrest.
transforming the system. Key stakeholders feed into the systems analysis, which can be conducted at the scale of a community, nation, or food system. A RAPTA ‘systems assessment’ application, for example, may show that demographic growth has outstripped milk supply, and that the livestock losses from drought prevent intensification of pastoralism. In this case, the system assessment may suggest an intervention that helps shift the system towards agro-pastoralism to help diversify the food production system (O’Connell et al., 2016). The framework focuses on broad social, economic, and ecological trends in order to improve resilience practitioners’ understanding of their interactions, and emphasizes that effective social networks that are open to change are needed to effect transformation at system levels.

**City focus.** Though there is slight variation among city-focused tools, city-level resilience measurement focuses on the qualities of resilient systems. City-level frameworks aim to measure how an urban system allows for safe failure, learning from disturbances and organization in the face of disruption. Arup’s City Resilience Framework and Index (CRFI) defines these qualities as reflective, robust, redundant, resourceful, inclusive, and integrated (Arup, 2015). The Institute for Social and Environmental Transition’s (ISET’s) Urban Resilience Framework (URF) focuses on flexibility and diversity, redundancy, and modularity, and failing safely (Tyler et al., 2010; Moench, 2014).

**Urban focus.** When describing the same concept, urban-focused frameworks use different indicators than locally focused, community-based resilience frameworks. The URF was derived primarily from work undertaken by the large community involved in research on Social-Ecological Systems through the Resilience Alliance and, while adding a significant emphasis on governance and social processes to that body of work, reflects many of its basic findings in relation to large scale systems. In an urban context, for example, it recognizes the dependence during acute crises of most urban systems (from water or sanitation to markets and social networks) on the reliability of power, communications, transport, and the larger governance structures essential for maintaining and operating such systems (Moench, 2014). As a result, in comparison to more community focused frameworks, it pays much greater attention to the larger formal governance environment and the design qualities of physical and ecological infrastructure systems. These are seen as the essential foundation for social networks, urban markets, and the diverse livelihoods they enable. Similarly, in urban areas, maintaining employment or income is key to surviving shocks and stresses. The CRFI recommends measuring inclusive labor policies, supportive financial mechanisms, and local business development to capture this phenomenon (Arup, 2015).

**Community focus.** A framework measuring at the community level such as Mercy Corps’ "Our resilience approach" (2015) uses total number of income sources and independence of economic activities to capture livelihood diversity. Both the CRFI and URF consider how a city supports diverse livelihood opportunities, whereas a locally focused framework considers people’s agency and their capacity to maintain or adopt diverse livelihoods themselves.

Three factors can explain the high number of frameworks aimed at measuring resilience at the scale of the community or lower.

First, the proliferation of resilience programs for nongovernmental organizations (NGOs) and governments has brought an imperative to measure, monitor, and analyze the resilience of beneficiaries. Figure 3 shows that there was a proliferation of measurement frameworks between 2012 and 2015, which was also the time that several large operational initiatives were initiated and getting underway.

Second, by focusing on the household, where it is easier to track program inputs and outputs, NGOs can produce a more straightforward analysis that maps onto existing project M&E practices. For example, Oxfam’s Framework assesses the direct contribution of Oxfam’s intervention to building the adaptive, absorptive, and transformative capacities of beneficiaries. Oxfam collects resilience-related indicators to capture final outcomes such as food security and wealth indicators, as well as characteris-
tics of future resilience, such as livelihood diversification and attitudes towards changing practices. Oxfam then conducts a separate analysis of the impact programs have in building resilience capacities (Jeans et al., 2015).

Third, measuring resilience at higher scales, or at multiple scales simultaneously, involves struggles with complexity. Although considering higher systems allows for a more sophisticated understanding of what drives resilience, it often extends beyond the scope of a single resilience intervention and beyond the in-house expertise of the organizations involved. They also require such a large number of data points that a meaningful analysis is difficult and expensive.

Causal pathways of resilience-building are much clearer at the local level. That said, a number of frameworks and treatises on resilience measurement reviewed have highlighted the manner in which resilience measurement approaches need to acknowledge the inherent interaction between scales (Constas and Barret, 2013; Constas et al., 2014; Choularton et al., 2015). This interaction between scales would benefit from engagement with insights from

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**BOX 2**

**Operationalizing resilience with Oxfam**

Sebastian Thomas, Oxfam

In response to requests from staff for clarity on tangible approaches to operationalizing the concept of resilience, Oxfam developed The Framework and Guidance for Resilient Development. The framework attempts to:

1. lay out exactly what building resilience to diverse shocks and stresses entails
2. bring Oxfam staff up to speed with latest debates on resilience and offer a framework for the convergence of work on disaster risk reduction (DRR), climate change adaptation (CCA), livelihoods and natural resource management (NRM)
3. provide a systemic theory of change on resilience. (See Section 4: Planning function – for more discussion on theories of change in resilience frameworks).

Overall, the framework provides Oxfam staff with an approach for designing projects and programs that contribute to resilient development outcomes. It links resilience to the three main challenges that Oxfam is tackling through its work: the humanitarian challenge (understanding and addressing the causes of humanitarian crises at local, national, and global levels); the adaptive challenge (understanding the nature of uncertainty and volatility, and developing the capacity to adapt); and the justice challenge (understanding and addressing how power is being used to increase poor people’s vulnerability and exposure to risk).

The framework outlines how resilience outcomes are understood as a set of three capacities: the capacity to absorb shocks, the capacity to adapt to change and uncertainties, and the capacity to transform the context and underlying causes of vulnerability.

The framework further assumes that, in order to build the three resilience capacities, six social change processes need to be enhanced, sequenced in time, and layered across levels, using different building blocks, including area of practice as DRR, CCA, NRM, and livelihood. These processes are: gender justice and empowerment, learning and innovation, informing, flexible and forward-looking planning, securing and enhancing livelihoods, and accountable governing.

This framework marks a transition from Oxfam’s existing approach to conceptualizing resilience that hinged on five dimensions of resilience: livelihood viability, innovation potential, access to contingency resources and support, integrity of the natural and built environment, and social and institutional capability. This shift has ensured that Oxfam’s approach to resilience reflects emerging global best practice, and builds on a consensus in resilience thinking that conceptualizes resilience as a capacity to deal with shocks and stresses.

Source: Oxfam, 2016
other disciplines that have a strong evidence base of how other "scales" of resilience can be characterized, and work in practice. Looking at resilience at different scales can also help understand the trade-offs in resilience dynamics. For example, a highly resilient economy may have replaceable workers, which results in a high social equity cost and lack of resilience at the household level. Resilience in complex systems must acknowledge the dynamics between scales; assessing resilience at one level in isolation may lose important details on factors that may have a large bearing on resilience but that unfold at another scale.

Resilience over time

In looking at temporal aspects of resilience measurement, three key issues emerge:

i) frameworks advocate for measuring at regular intervals over time to ensure sufficient time for the manifestation of results,

ii) relevant time scales to measure resilience depend on the shock or stress, and may overlap, and

iii) some resilience-building activities may be beneficial in the short-term but detrimental in the long-term,
Resilience Index Measurement and Analysis II
Luca Russo, FAO

The FAO Resilience Index Measurement and Analysis II (RIMA-II) methodology is a quantitative approach that identifies the main factors that contribute to household resilience with respect to food insecurity. Through consultation with the Food Security Information Network (FSIN) and after application of RIMA-I in multiple countries, FAO produced RIMA-II to measure resilience both directly and indirectly. Direct measures of resilience provide descriptive information on a household’s resilience capacity, allowing decision-makers and organizations to target and rank households from most to least resilient. In Uganda, for example, the least resilient households were female headed or located in rural areas. RIMA-II’s indirect measure of resilience provides evidence on the main determinants of households’ resilience capacity and food security dynamics. In the case of Uganda, application of RIMA found that ownership of agricultural assets and short distance to markets were the primary determinants of household resilience.

The model identifies four multi-dimensional "pillars" that contribute to resilience: access to basic services, assets, social safety nets, and adaptive capacity. The pillars are measured through variables that are not observable, as well as through related observable variables. Using these data, RIMA-II first estimates the capacity of households to cope with shocks and stresses overall, and then estimates how much each pillar contributes in determining the resilience capacity. In different contexts, the pillars will play relatively larger or small roles, such as in Sudan, where access to basic services was a key driver of resilience, and adaptive capacity was less relevant. The analysis relies on data gathered from surveys undertaken by FAO’s Resilience Analysis and Policies team, or pre-existing data sets undertaken periodically by the National Bureau of Statistics or other international organizations.

In addition to isolating the variables that contribute to resilience, RIMA-II is designed for pure impact evaluation. Impact evaluation is an analysis based on a data set measures the impact of a program on household resilience capacity, attributing how the intervention impacted resilience-related indicators. Three rounds of surveys – baseline, mid-term and final – are carried out over the course of three years, or the duration of a program. The tool is flexible, meaning it can be used often to capture seasonality, or less often, with lighter M&E surveys and fewer rounds of surveying. Through this rigorous methodology, RIMA-II is contributing to building a robust evidence base of what interventions and policies can best support resilience to poverty and climate change impacts (FAO 2016a; 2016b).

**Finalized analysis**
Burkina Faso, Kenya, Malawi, Mali, Niger, Nigeria, Senegal, Somalia (Dolow, Somaliland and Puntland), South Sudan (Upper Nile and Jonglei), Sudan (Kordofan), Tanzania, Uganda, West Bank, and Gaza Strip.

**Ongoing analysis**
Chad, Ethiopia, Lesotho, Mauritania, Senegal, West Bank, and Gaza Strip.
or vice versa, so there is a need to track unintended consequences.

A small subset of the treatise on resilience measurement highlights the critical importance of the “temporal dimension” of resilience measurement. Frankenberger and Nelson’s 2013 “Background Paper for the Expert Consultation on Resilience Measurement for Food Security” highlights the vital importance of measurements of resilience being based on time-series, preferably panel data collected from the same households over time. FAO’s RIMA-II also hinges on the assessment of resilience at regular intervals over time, against a baseline (FAO, 2014). The Resilience Measurement Principles consolidated by the FSIN also underline the importance of “temporal sensitivity,” recognizing resilience as the interaction of dynamic factors over time and stressing that the “points at which data on resilience capacity, and shocks and stressors are collected should be informed by knowledge of expected rates of change/growth associated with a particular unit or scale of measurement for resilience capacity” (Constas et al., 2015). Similar points are raised in other key examinations of resilience measurement emanating from the FSIN (Constas, 2015; Mock et al., 2015). A very different take on time is seen within the PEOPLES Resilience Framework,3 where time is fundamental to the very idea of resilience to earthquakes. Here, resilience is defined as “a function indicating the capability to sustain a level of functionality or performance for a given building, bridge, lifeline network, or community, over a period defined as the control time” (Renschler et al., 2010).

Efforts to measure resilience at various timescales are important for capturing data over longer time periods, but also for understanding resilience to different types of hazards. The Cutter et al. (2008) Disaster Resilience of Place model (DROP) touches upon this, arguing for a careful consideration of the timescales of disturbances to which resilience is being built. Essentially, a society may be deemed as resilient to “hazards at one-time scale (e.g. short-term phenomena such as severe weather) due to mitigation measures that have been adopted but not another (e.g. long-term such as climate change),” (Cutter et al., 2008). The exact same point is underlined by Carpenter et al. (2001), who also underline the vital importance of temporal dimensions in resilience measurement: “resilience can be achieved in one time period at the expense of resilience in a succeeding period.” Constas et al. (2015) illustrate this issue by explaining that although sale of assets or risky income-generating activity may help households absorb shocks successfully, they also may compromise household ability to deal with shocks in the future. This is partly why they argue that measurements need to take place multiple times and at high frequency, a point also highlighted by Mock et al. (2015). Such an approach is currently being used by a USAID-funded impact evaluation in Ethiopia (Frankenberger and Smith, 2015). Therefore, while a few frameworks underline the importance of considering time, there is a scope for a much greater appreciation of temporal issues in resilience measurement.

3 The PEOPLES Resilience Framework is an acronym for seven dimensions of community resilience: Population and demographics, Environmental and ecosystem services, Organized governmental services, Physical infrastructure, Lifestyle and community competence, Economic development, and Social-cultural capital.
SECTION 3:

Building blocks of resilience

Key points

- Half of the frameworks use livelihood capitals to explain factors that contribute to resilience.
- Combination of qualities and capitals can capture system dynamics to provide a more accurate picture of resilience.
- Livelihood capitals need to be considered alongside a range of intangible processes that include decision-making, fostering innovation, and institutions and entitlements.
- More examination of structural issues that can have a pivotal role in determining the resilience of systems is required.

Another key parameter for analyzing the existing array of resilience measurement frameworks entails scrutinizing their proposals on the factors, components, or elements of resilience. Overall, half of the frameworks have broad agreement on the use of capital assets. According to the sustainable livelihoods approach (SLA), resilience results from the deployment of human, financial, social, natural, physical, and sometimes political capital, as in the Practical Action framework.

Frameworks that do not employ capital assets tend to focus on resilience qualities such as flexibility and redundancy, on procedures or processes such as emergency planning, or on functions such as continuity of critical services. Some frameworks, such as the Zurich framework (see Box 5), combine one or more of these building blocks.

There is a division between those that make explicit use of capitals in laying out their approach and those that refer to only some of the “five capitals” (see Figure 3). Some approaches make no direct reference to capital assets but they are implicit in the building blocks that they propose.

The Zurich Flood Resilience Alliance approach to measuring flood resilience is based on a systems approach to understanding the factors that enable communities to withstand flood-related shocks and stresses (Keating et al., 2014). In identifying opportunities to enhance community resilience to floods, the framework explicitly highlights the importance of human capital such as skills and health; social capital such as strong relationships and cooperation; natural capital such as land productivity and water; physical capital such as infrastructure and equipment; and financial capital such as the level and diversity of income. FAO’s Self-evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (SHARP) approach makes reference to capitals but
is not entirely based on this approach (FAO, 2015). So, while it stresses the importance of social capital (self-organization, collective action) and natural capital (soil health, land quality), it also proposes a range of other factors that are not included in the SLA. These include factors more familiar in resilience thinking, including the nature of learning through, for example, participation in farmer field schools; legacy by, for example, ensuring community elders participate in decision-making; and heterogeneity, which refers to intercropping and the types of trees on the farm.

**Capitals and characteristics**

There are a number of reasons for the use of capitals and the SLA. First, teams designing operational approaches for enhancing resilience can draw on an existing history of development projects on livelihoods, rural development and agricultural development. Second, measuring changes in capital assets is perhaps easier than gauging resilience characteristics or qualities such as flexibility, modularity, and redundancy. This is because many elements of the capital assets are tangible, and because there is a much longer history of measuring changes in assets with an accompanying abundance of tools and methods.

Some frameworks combine qualities and characteristics with capital assets. For example, the Zurich Flood Resilience Alliance framework combines an assessment of capital assets, referred to as the 5Cs – human, social, physical, natural and financial – with resilience properties of those assets, referred to as the 4Rs – robustness, redundancy, resourcefulness and rapidity (Keating et al., 2014). ISET’s Urban Climate Resilience framework argues that, for urban areas to be resilient, systems, agents, and institutions need to be endowed with qualities that include flexibility, diversity, redundancy, modularity, safe failure, resourcefulness, responsiveness, learning, rights, and entitlements (Tyler et al., 2010).

Arup’s CRFI conceptualizes a city as a “system of systems,” providing a vast range of resilience indicators, some of which overlap with capitals. However, it also argues that the resilience of cities needs to be conceptualized in terms of a set of functions, including continuity of critical services and integrated development planning (Arup, 2015). Other frameworks do not measure capitals directly. For example, USAID’s Coastal Community Resilience to Tsunamis approach highlights the importance of early warning, evacuation plans, risk knowledge, and risk governance (US Indian Ocean Tsunami Warning System Program, 2007). Similarly, the International Institute for Sustainable Development (IISD) Climate Resilience and Food Security framework that is aimed at supporting analysis of community-level food security and the resilience of food systems does not explicitly draw on the SLA (Tyler et al., 2013). Instead, it focuses on aspects of resilience in the context of food security that include food utilization, food access, food availability, supporting organizations and policies, and supporting resources and services (Tyler et al., 2013).

Analyzing the building blocks of resilience proposed by these frameworks reveals a few broad trends. Frameworks attempting to gauge resilience at the
There are four key factors to consider in measuring resilience:

1. Identify the wellbeing outcomes to be achieved, and measure resilience in relation to these outcomes.
2. Identify the shocks and stressors that individuals, households, communities, and larger systems are exposed to, and the severity and duration of these shocks and stressors.
3. Measure the absorptive, adaptive, and transformative capacities in relation to these shocks and stressors at different levels.
4. Identify the responses of individuals, households, communities, and larger systems to these shocks and stressors, and the trajectories of wellbeing outcomes.

The following categories of indicators need to be measured:

- Ex ante component: resilience capacity, initial wellbeing outcomes, and initial vulnerability.
- Disturbance component: natural disasters, pest and disease outbreaks, political conflicts, and economic shocks/stressors.
- Ex post component: resilience capacity, wellbeing outcomes, and vulnerability.

All three components must be understood in relation to contextual factors. The categories of contextual indicators include political, agro-ecological, and cultural factors.

**Refining building blocks of resilience**

This analysis points to future directions that need to be pursued in order to further improve practice.

First, resilience measurement and M&E approaches need to engage with critiques of the SLA, including attention to the role of processes and functions (politics, institutions, policy processes, and learning) in...
Resilience defined as an instrumental capacity that affects well-being in the face of shocks and stresses

Operational and analytical goal of resilience measurement
Collect and analyze data to model recovery and wellbeing trajectories over time as a function of initial states and shocks/stressors, mediated by resilience capacity

Supporting adaptive capacity (Jones et al., 2010). The five capitals need to be considered alongside a range of intangible processes that include decision-making and governance, the fostering of innovation, experimentation, and opportunity exploitation, and the structure of institutions and entitlements. Some frameworks are making strides in this regard, including the FSIN’s Background Paper for the Expert Consultation on Resilience Measurement for Food Security. This paper emphasizes the importance of considering livelihood factors alongside the formal and informal institutions that enable the resilience of individuals, households, and communities (Frankenberger and Nelson, 2013). These structures and processes have a critical bearing on the ability of a system to function and flourish through shocks and stresses (Frankenberger and Nelson, 2013).

Second, combining capital assets with resilience qualities and characteristics, and tracking both these aspects may provide a more accurate picture of resilience. For example, income from a livelihood activity is important for building household adaptive capacity.
In 2013 the Z Zurich Foundation initiated a global program to enhance flood resilience. This alliance has taken an innovative approach – linking academic insights, humanitarian and development sector capabilities, as well as Zurich’s skills and knowledge – to enhance community resilience to flooding. The alliance includes the Zurich Insurance Company, the Z Zurich Foundation, IFRC, Practical Action, the International Institute for Applied Systems Analysis (IIASA) and the Wharton Risk Management and Decision Processes Center.

We have developed a measurement framework and corresponding tools in an attempt to measure flood resilience.

The tool involves measuring the degree to which communities are endowed with the five capitals, described in the Sustainable Livelihoods Framework (SLF). These five capitals characterize community assets and are complementary resources that sustain and improve communities’ wellbeing. Theoretically, by tracking the capitals pre- and post-event, it is possible to observe how development, disasters, and risk management activities within the community are eroding or supporting wellbeing. Having baseline information means the five capitals could be measured after a hazard event to assess how they were impacted or utilized to cope and recover. A grounded set of metrics could help to guide the exploration of potential sources of resilience and test their effect on outcomes in order to contribute further evidence to our understanding of resilience.

The complexity of measuring resilience leads to a huge diversity of elements which can be measured, and raises a number of questions about process and outputs: At what stage is measurement appropriate? Do we measure resilience \textit{ex ante} during a state of normality which means a focus on ability to manage risk, or only \textit{ex post}, which means a focus on ability to cope and recover? Can we give an absolute value to a state of resilience or only one that is relative to a baseline or benchmark?

In light of the inherent complexity, we are looking for ways to explore the interdependencies among the capitals themselves, and between the capitals and other elements of the framework. It will be important to measure the capitals but also to understand the relationships among them, such as how social assets, or the wider governance context, frame access to particular resources which may appear plentiful in the wider community but are inaccessible for a large portion of the population due to social barriers. We are aware that the mere existence of an asset does not necessarily imply that it is being used effectively to manage risk or enhance wellbeing. Conversely, the lack of an asset may be indicative of vulnerability, which raises further questions around the weighting of the measurements.

By adopting a standardized approach, we are hoping to learn more about resilience, understand how the capitals interact and, most importantly, how they can be applied in practice to enhance resilient wellbeing.

We are currently testing the tool in a number of communities in different countries that have varying livelihoods and asset bases and face different flood typographies. This will help to test and refine the tool, and provide learning on the methods and processes. We also continually look for opportunities to share and disseminate the experiences and results being produced. Representation of the results of the measurement tool for two different communities, one with strengths in the social and natural capitals (red) while the other (green) in the human and physical capitals, is captured below. Although they score differently, which community will be more resilient to a flood event?

![Diagram showing resilience measurement for two communities](source: Practical Action)
But gauging the ability of vulnerable communities to switch to an alternative source of income – should the first one be disrupted on account of a disturbance – provides a far more evolved perspective on resilience.

A few frameworks engage with broad, structural issues that can have a pivotal role in determining the resilience of systems. These include issues such as pressures exerted by rapidly expanding populations, changes in economic regimes, and transitions to new modes of production and socio-technical regimes such as low-carbon development. The TAMD framework highlights the importance of considering shifts in agricultural and economic systems within any approach to measure adaptation, but most frameworks focus more sharply on tracking resilience building blocks in terms of more proximate factors (Brooks et al., 2011). This point is also partly accommodated within the FSIN's emphasis on analyzing contextual factors and background variables, including geographical, social, cultural, political, and historical factors (see Box 4).

Choularton et al. (2015) also touch on this when they advocate for a comprehensive analysis of the larger risk landscape that includes long-term pressures such as degradation of natural resources, urbanization, political instability or diminishing social capital. The Mercy Corps Strategic Resilience Assessment (STRESS) also lays out a process for conducting this kind of analysis.
SECTION 4
Function

Key points

- A number of frameworks deliberately attempt to diagnose the resilience of an entire system to better plan for resilience-building interventions, while others are geared more towards evaluating the degree to which resilience-building projects can achieve impact.

- Frameworks that explicitly lend themselves to both diagnostic and evaluative functions seem to do a better job of diagnosing the resilience of a system and the factors that need attention to enhance the resilience of a system, as opposed to proposing a fine-tuned approach to measuring the impact of resilience programs.

- Frameworks rarely define analytical functions or methodologies for assessing the relationship between resilience-related variables.

Though many of the frameworks reviewed could be applied to any resilience measurement purpose, some have been developed to perform a specific function or are more readily used in a particular way. The functions identified in this assessment are not pure binaries; functions could be nested or applied in sequence. Most frameworks fall somewhere on a spectrum between diagnostic and evaluative, or conceptual and applied. Planning frameworks often have elements of diagnostic functions in order to increase understanding of the drivers and characteristics of resilience in the context of a specific intervention. A framework that has a diagnostic function could also serve to evaluate the impact a particular program has had on resilience more broadly, or a framework with an evaluative function could measure a baseline that serves as a wider diagnostic of resilience issues. Conceptual frameworks can be tested, while applied frameworks have conceptual or theoretical underpinnings. This section intends to illustrate some of these functions and draw attention to possibilities for integration of frameworks and functions to create an accurate picture of resilience.

The landscape of resilience approaches or frameworks can also be understood through the ways they can be applied. Broadly, this refers to using frameworks for diagnostic, evaluative and planning purposes.

- **Diagnostic purposes** – gauging the degree to which a system, such as a household, community or city, is resilient to diverse shocks and stresses calls for measuring and quantifying resilience.

- **Evaluative purposes** – gauging the degree to which resilience initiatives, projects, and programs are successful in achieving their objectives calls for assessing impact.

- **Planning purposes** – articulating the intended outcomes of the resilience approach calls for...
understanding how the proposed design fits into the context of the intervention.

Most frameworks reviewed are based in theoretical and conceptual ideas of resilience, and are not applied analytically with a clear methodology to estimate the relationships between resilience-related variables. As a result, these frameworks’ functions are categorized as diagnostic or evaluative, but their ability to assess the attribution of any particular resilience-building intervention is not explored. RIMA is a notable exception among the frameworks analyzed, as it has a clear analytical component alongside its conceptual presentation of resilience. The FSIN TWG measurement framework also combines a conceptual presentation with a clear analytical component (Constas et al., 2014).

Diagnostic function

The diagnostic framework proposed by Speranza et al. (2014) argues that the resilience of livelihood systems needs to be understood by gauging buffer capacity (livelihood capital assets, endowments, and entitlements), self-organization (institutions, participation, and trust), and capacity for learning (knowledge sharing, planning, and experimentation).

Similarly, the UN Office for Disaster Risk (UNISDR) Disaster Resilience Score Card is primarily aimed at diagnosing the resilience of a city using UNISDR's "ten essentials" as the starting point to assess urban resilience to natural hazards (UNISDR, 2014). This provides checklists that city governments can use to score their current level of resilience by, for instance, reviewing the degree to which disaster resilience is mainstreamed into plans and policies or whether contingency funds are available for post-disaster recovery. A number of frameworks seem to use a similar score card approach for assessing resilience, including one developed by Torrens Resilience Institute which contains 22 questions across the four categories of connectedness, risk/vulnerability, procedures, and resources (Arbon 2012). The answer to each sub-question is rated on a scale ranging from one to five and the total score for each main question is then provided and falls into three categories represented by different zones: red zone (not resilient), caution zone (fairly resilient), and going well zone (very resilient).

Mercy Corps STRESS approach is another example of a framework that is primarily diagnostic, calling for applying a resilience lens to a context analysis to inform strategy development or long-term program design. This is sharply focused on an assessment and analysis of socio-ecological contexts that then permits the design and development of long-term, measurable resilience strategies. While all these frameworks help gauge the resilience of a system, the Speranza et al. (2014) framework is more conceptual. It provides illustrative indicators that can guide the development of a similar framework and is shock agnostic, whereas UNISDR's score card and Mercy Corps’ STRESS approach are designed for use almost straight out of the box.

Evaluative function

Other frameworks are specifically designed to evaluate the degree to which initiatives to build resilience have been successful in delivering the outcomes they set out. This approach, developed by TANGO International (see Smith et al., 2014) and adopted by Mercy Corps (2015), relies on tracking the following main elements:

- **changes in resilience capacity** – including livelihood opportunities, access to and use of essential services, "or other abilities presumed to be linked with more successful coping strategies or adaptations to risk" (Mercy Corps, 2015: 5)
- **development outcomes** – such as food security, improved health and reduced poverty
- **magnitude and levels** – of exposure to disturbances.

The approach argues that if there are improved resilience capacities due to specific interventions, and consequential improvements in development outcomes despite increasing shocks and stresses, then
a particular resilience intervention has been successful. In some circumstances, the resilience of a system may also increase, despite a dip in development outcomes, if the frequency or intensity of shocks and stresses has also increased in relation to a baseline. As such, the approach provides a robust conceptual foundation for evaluating the impacts of resilience programs on diverse shocks and stresses. USAID has adopted the TANGO approach for resilience impact evaluations in Ethiopia, Somalia, and West Africa.

The Tulane University framework, developed to measure the impact of humanitarian assistance in the aftermath of the Haitian earthquake of 2010, offers another example of a framework that was explicitly evaluative in nature but is more applied and specific to shocks (Tulane University, 2012). This resilience framework was based on seven dimensions of resilience – wealth, debt and credit, coping behaviors, human capital, community networks, protection and security, and psychosocial – applied to compare households living in displacement camps with those not in directly and non-directly affected areas. This approach stands out in the current set of frameworks/approaches analyzed, as it is a fully fleshed out evaluation approach, unlike most other frameworks aimed at guiding or informing evaluations. More specifically, it not only presents the conceptual approach to resilience that was adopted, it also provides an overview of sampling methods, data collection approaches, and statistical methodologies for ascertaining attribution and contribution.

Some frameworks combine evaluative and diagnostic elements. UNDP's CoBRA is a sum of four broad steps (UNDP, 2012).

1. Identify priority characteristics of disaster resilience for a target community.
2. Assess the degree to which a community achieves these characteristics – in the normal period, as well as in a period of crisis.
3. Examine the characteristics and strategies of disaster-resilient households.
4. Identify the most highly rated interventions or services in building local disaster resilience.

CoBRA analyses community and household characteristics of resilience – those factors that have an impact on the ability of a household to withstand shocks and stresses. These can then be used to develop indicators for impact assessment and to identify the underlying factors with the greatest impact on building resilience through participatory qualitative approaches. As a qualitative method, this approach lends itself to insights regarding community perceptions about the local drivers of resilience. It is not a substitute for more rigorous resilience impact assessments that have more representative samples.

The Organisation for Economic Co-operation and Development (OECD) Guidelines for Resilience Systems Analysis is a how-to guide, not a measurement framework. It has been included because of its utility in permitting people in the field to analyze what is needed to boost the resilience of specific groups, specific systems, and specific programs to the risks people face every day. This approach uses five key steps that facilitate a collaborative understanding of risks, the development of a roadmap to boost resilience, and the measurement of resilience. The OECD framework identifies system resilience indicators that can map wellbeing across the five capitals; negative resilience indicators that track negative coping capacities; process indicators that track the degree to which the resilience roadmap developed from the resilient systems analysis has been translated into policy and programming; output indicators that track resilience-building activities; and proxy impact indicators that follow the proportion of the target population that slips back into poverty.

The results of this concept-mapping analysis are then used to design new programs to boost resilience, or to modify ongoing plans and actions (OECD, 2014:3). This tool builds on traditional risk management approaches to enable not only a better understanding of the disturbances for which a system must prepare but also “a shared vision of what needs to be done to boost resilience in the system, and how to integrate these aspects into policies, strategies and development efforts at every layer of society” (OECD, 2014:8). Overall, this lends itself to the design of theories of change and the consolidation of logical frameworks on which resilience-building initiatives are based.
Planning function

Lastly, a small number of frameworks explicitly intend to plan for a resilience intervention by assessing the context in order to help shape the best approach for improving resilience. These approaches give practical guidelines on how to embed resilience goals into projects addressing climate change adaptation, food security, and protecting ecosystem functions. One component of this might be to develop a theory of change (ToC), defining the problem, root causes, and barriers to address through the project.

RAPTA includes the development of a ToC as part of its resilience planning and assessment tool. The ToC is developed after a scoping exercise to define the elements of the context that should be considered for optimum project design, including stakeholders, governance structure, project goals, and history of work in the project area. The ToC builds on this, developing hypotheses about how the project goal will be achieved and then mapping impact pathways that link the activities, outputs, outcomes, and, ultimately, the desired impact.

As Constas et al. (2016) noted, these ToCs in resilience programs support development of testable propositions that enable projects to evaluate the effects of a program later (evaluative functions).

Because the individuals who develop theories of change are often not the same people who analyze the impacts of a program, ensuring the coherence between project planning and project evaluation using a theory of change can be particularly challenging. The authors identified the following conditions, which limit the use of theories of change for an empirical study:

- the set of causal assumptions on which the ToCs are based remain implicit
- high level ToCs for governments and donors are overly elaborate, with only a general level of associated descriptions that lack the detail needed to apply an empirical study
- empirical work of analysts is not well aligned with a given ToC (Constas et al., 2016:4).

The authors propose an “Empirically Testable Theory of Change” approach to explicitly integrate knowledge of the empirical demands of evaluation with the specific theoretical perspective that a theory of change advances. This process is an opportunity to bring together individuals designing development projects, policy makers, and monitoring, evaluation and learning experts working on resilience measurement (ibid: 17).

Integration of functions

The functions of any given framework can be malleable. Frameworks that identify their purpose as primarily diagnostic lend themselves to evaluative exercises. This is mainly because they can be used initially to develop a baseline assessment of levels of resilience. Most can then be used periodically to measure changes in these levels in the context of a resilience-building intervention, provided robust data evaluation protocols are used to explain the attribution of the intervention to achieving the changes being tracked. On the other hand, frameworks that are explicitly evaluative in nature focus, to some degree, on measuring the state or capacity of a system, regardless of the intervention – even if it is limited to conducting a baseline.

It is vital to think about the purpose of a framework in its early stages of development, as frameworks are usually better suited for one purpose or another. For example, it is possible to use UNISDR’s Score Card to conduct a baseline assessment and then use it periodically while implementing an intervention to build city resilience (UNISDR, 2014). However, doing so would provide only a very general idea of the effectiveness of an intervention, as mechanisms to develop causal linkages and evidence of the intervention’s contribution to the changes would need to be established.

Frameworks that explicitly lend themselves to both diagnostic and evaluative functions seem to do a better job of diagnosing the resilience of a system and the factors that need attention to enhance the
Apart from considering the value of sequencing diagnostic and evaluative approaches, there is also a need for the Community of Practice to consider the degree to which the current array of frameworks strike the right balance between conceptual rigor and operational detail. Many frameworks that are evaluative and applied (e.g. by providing sets of well-defined indicators) also address issues such as sampling, attribution, and contribution. All measurement frameworks should explicitly lay out the analytical functions and articulate the methodologies needed to estimate the relationships between resilience-related variables (see Smith et al., 2014).

resilience of a system, as opposed to proposing a fine-tuned approach to measuring the impact of resilience programs. Both types of frameworks propose step-by-step approaches to understanding the system and its ability to withstand disturbances. Yet, they also provide only general broad guidelines on how to evaluate the effectiveness of interventions. This points to a clear need to consider the manner in which diagnostic and evaluative approaches can be used in conjunction, and sequenced in order to understand the resilience of a system and then measure the impact of interventions to enhance resilience.
SECTION 5

Capacities

Key points

- Two-thirds of frameworks fully or partially use adaptive, absorptive, and transformative capacities to track changes in people's resilience.
- Some frameworks track resilience capacities while normalizing for shocks and stresses, to better understand whether or how strengthening resilience capacities may enable communities to endure disturbances and maintain their development trajectories.
- Transformative capacity is linked to shifting power relations, governance mechanisms, and social change processes, though there is less agreement on methods to measure transformative capacity.
- There is limited application of resilience capacities at scales beyond the household or local levels.
- At the individual level, using resilience capacities may enable practitioners to explore cognitive and psychosocial factors that have a bearing on resilience outcomes.

Another key parameter on which a majority of the frameworks come together is the use of capacities to measure changes in people's resilience. Two-thirds of the frameworks reviewed either fully or partially attempt to track changes in adaptive, absorptive, anticipatory, and transformative capacities. This seems to indicate that the wide variety of definitions of resilience is underpinned by a set of similar assumptions on what accounts for resilience, particularly at the household and local community levels. Woodson et al. (2016) define resilience capacities as a “set of conditions, attributes, and skills that are thought to enable households to achieve resilience in the face of shocks,” and further subdivides these capacities into adaptive, absorptive, and transformative capacities. A number of seminal treatises on resilience measurement also highlight the salience of capacities. For instance, Béné and Frankenberger (2015:9) argue that resilience “is the ability or the capacity of individuals, groups of people, organizations, institutions, or systems to deal effectively with shocks/stressors.” They also argue that strengthening capacities is not the end goal of resilience building, and that capacities need to be accommodated as intermediate outcomes in any ToC aimed at resilience measurement as “they are necessary results along the pathway to achieving the project’s overall goal or impact (i.e. improved wellbeing)” (2015:16).

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4 This is very different in the urban frameworks. With the partial exception of the informal sector, in urban areas much more depends on the functioning of large-scale organizations (businesses and government departments), the institutional rules they follow (laws and norms), and the physical systems through which they access resources. As a result, locational-bounded communities tend to be weaker elements of the urban landscape, and capacities at the individual and household level, while relevant, are not the dominant factors determining urban resilience.
Adaptive, absorptive, and transformative capacities

The Community Resilience Framework put forth by USAID’s Feed the Future Initiative explicitly states that “building resilience requires an integrated approach and a long-term commitment to improving three critical capacities: absorptive capacity, adaptive capacity, and transformative capacity” (Frankenberger et al., 2013:17). The combination of these three capacities was first suggested by Béné et al. (2012), drawing on a diverse range of literature. The Feed the Future framework goes on to define these three capacities and argues that absorptive capacity is the ability to minimize exposure to shocks and stresses (ex ante) where possible and to recover quickly when exposed (ex post).

Adaptive capacity involves making proactive and informed choices about alternative livelihood strategies based on changing conditions. Transformative capacity relates to governance mechanisms, policies and regulations, infrastructure, community networks, and formal social protection mechanisms that are part of the wider system in which communities are embedded. The framework says these capacities are a function of capital assets and of social dimensions such as learning, diversity, and inclusion. These, in turn, permit a community to participate in a number of areas of collective action, including DRR, social protection, and natural resource management, and to engage with or react to diverse disturbances. Woodson et al. (2016) reiterate USAID’s assertion that capacities are a function of capital assets, but focus specifically on social capital. The authors describe social capital as a key capacity to deal with shocks and stresses at the household level, and their empirical analysis confirms that social capital helped households recover from shocks and had a positive effect on food security across the projects examined. Similarly, Smith et al.’s (2015) index that measures adaptive capacity includes human, social, and economic capitals. This link between capitals and capacities, with capacities being a function of people’s livelihood capitals, is prominent across the FSIN’s Technical Series No. 2 working papers (Bower et al., 2016; Woodson et al., 2016).
much more emphasis on the skills and resources of large-scale organizations along with the laws and norms under which they function. Beyond this, it is debatable how some of the basic tenets of resilience from the rural context would apply in other contexts. It is, for example, uncertain how much the resilience of economic systems depends on inclusion or collective action – labor mobility and trade, for example, are fundamental to the flexibility and adaptability of economic systems but can imply the treatment of workers as “replaceable cogs.”

Some frameworks, such as UNDP’s CoBRA and DFID’s Disaster Resilience approach, do not include all the three commonly occurring capacities, choosing to emphasize particular capacities (DFID, 2011; UNDP, 2014). Within this subset of frameworks is the Disaster Resilience of Place model (DROP) (Cutter et al., 2008). Operating specifically within the domain of natural disasters, this model conceives of resilience as the capacity of a system to absorb disturbance and reorganize into a fully functioning system. It emphasizes and focuses sharply on absorptive capacity. The BRACED program, which includes 15 individual projects unfolding across 12 countries, is firmly focused on measuring changes in resilience in terms of capacities. In line with many of the frameworks discussed, it focuses on absorptive, adaptive, and transformative capacity. This said, the BRACED framework separates out those elements of absorptive capacity that explicitly have to do with disaster preparedness into a separate “anticipatory capacity” (Bahadur et al., 2015). Unlike many other resilience frameworks, the CoBRA framework explicitly includes “adaptive capacity” while also highlighting the importance of tracking negative adaptive capacities, including coping with change based on unsustainable or unethical practices.

The framework’s third pillar, self-organization, aims to gauge the robustness of institutions and the degree of participation/trust and, therefore, bears some resemblance to what other frameworks call transformative capacity. Yet another angle on capacities is evident in USAID’s Coastal Community Resilience to Tsunamis framework. This framework identifies eight elements of resilience, such as governance, risk knowledge, and emergency response. However, it argues that each of these needs to demonstrate four capacities, namely policy and planning capacity, physical and natural capacity, social and cultural capacity, and technical and financial capacity.

In their work on resilience measurement, Conistas et al. (2014; 2015) argue that capacities “must encompass a range of indicators including economic (assets, markets, supply chains), social (social capital, social networks), technological (agricultural practices), environmental (resources, natural resource management practices), infrastructure-related (roads), safety (conflict mitigation practices,) and institutional (government) resources and capabilities.” They go on to argue qualitative measures to understand, e.g. conflict dynamics, local resilience mechanisms and aspects of social capital; quantitative measures to understand, e.g. characteristics of environmental or socio-environmental systems; subjective measures to understand, e.g. coping behaviors, risk exposure and social capital; and objective measures to understand, e.g. environmental data sourced from satellites, observable assets, can all help estimate resilience capacities. Maxwell et al. (2015) build on this to make an especially strong argument for the use of subjective and qualitative data for accurately gauging capacities.
The existence of capacities does not always mean that a system, community, or household will be able to manage a shock. This is why a number of frameworks, most notably the TAMD approach (Brooks et al., 2011) as well as the Mercy Corps resilience measurement framework (Mercy Corps, 2015) and the framework employed by TANGO International (Frankenberger and Smith 2015) track capacities but also their impact on development outcomes (i.e. wellbeing) while normalizing for shocks and stresses. The focus on wellbeing is also seen in the conceptualization of resilience for international development applications put forth by Barrett and Constas (2014). This permits an assessment of how/if resilience capacities are supporting communities to endure disturbances and maintaining their development trajectories. Constas et al. (2014:12) also touch on this point and argue that “resilience can be measured to produce a set of \textit{ex ante} indicators that are hypothesized as representing characteristics that predict the future wellbeing of a reference group,” but that “\textit{ex post} indicators are also needed to examine how one or more sets of wellbeing indicators change over time for a target group.”

Capacities at individual and local scales

Capacities are mediated by psychosocial factors. Individuals’ attitudes about their own abilities, the risks they face, and their motivations have a large bearing on how they respond to shocks and stresses. Béné et al. (2016) investigate these issues in their paper, “The Influence of Subjective and Psycho-social factors on People’s Resilience,” developing a framework in which psychosocial factors, household and community characteristics, the effects of shocks and stressors, and resilience capacities all determine one’s subjective resilience. In testing this theory using data sets from a few studies, they found that the higher a household’s level of subjective resilience, the less likely it is to engage in negative coping strategies. The analysis also found that people’s perceptions that they have control over their lives (a self-efficacy score) positively influence their ability to recover from a shock or stress.
BOX 6

**Food Security Information Network Principles**

Humanitarian and development programs in food insecure areas are increasingly investing into resilience-building, each with its own approach to predicting and tracking resilience. In an effort to harmonize these diverse evaluation frameworks, FSIN – an initiative sponsored by FAO, World Food Programme (WFP), and International Food Policy Research Institute (IFPRI) focused on improving food security-related information systems to support evidence-based decision-making – hosted a meeting in 2013 for practitioners and policymakers monitoring resilience. This meeting resulted in the creation of the Technical Working Group (TWG), a group of experts tasked with developing a common analytical framework and core principles for robust resilience measurement in the context of food security.

The first step among the newly formed TWG was agreeing upon a common understanding of resilience focused on the relationship between wellbeing outcomes, shocks, and stressors, and the capacity to improve wellbeing. The final definition calls resilience “a capacity that ensures stressors and shocks do not have long-lasting adverse development consequences.” Following this, the group deliberated over what needed to be included in estimation models to measure resilience, and how often the data needed to be collected. The results of these deliberations are two seminal papers that define the following 10 principles for resilience measurement.

1. Resilience is a capacity that should be indexed to a given development outcome (e.g. food security, poverty, health).

2. Subjective data, such as perceptions of shocks, perceived utility of actions taken, and general expectations of future states, should be included as key components of resilience measurement.

3. Measuring resilience should recognize that the development outcome (e.g. food security) is a result of a series of interactions among the conditions, attributes and processes, and disturbances that affect wellbeing – systems thinking and an understanding of complex causality is essential.

4. Resilience measurement should be designed to take into account the full range of specific shocks and stresses that households experience in a given context.

5. Resilience measurement should contain indicators that help identify instances when the return to a prior state is and when it is not desirable.

6. Conditions before and after a shock may be characterized by chaos, and research methods need to be adapted to situations of prolonged and inherent instability.

7. Resilience is a capacity that can be observed at different levels and scales, and identifying how resilience functions within and between levels is important for understanding the mechanisms that have positive effects on wellbeing outcomes.

8. Resilience outcomes are likely to change at different timescales, and data collection should be informed by understandings of these expected rates of change.

9. Resilience analysis should build on knowledge gained from vulnerability assessments and studies.

10. Measuring resilience should assess the way resilience capacities mediate the impacts of shocks, taking into account heterogeneity of outcomes. This should facilitate efforts to explain how people with similar vulnerability profiles can exhibit different levels of resilience.

The principles have already been used to refine resilience measurement approaches by development organizations, including RIMA-II. The principles provided a starting point for the TWG to develop additional practical guidance for development organizations on specific areas of resilience measurement, including sources of household data for resilience measurement, qualitative data and subjective indicators, measuring shocks and stresses, and applying systems analysis in the context of resilience.

Key to the TWG’s success in elaborating the principles has been a common outcome of interest: food security. Working in the same sector, and sometimes in the same countries, has allowed the group to collaborate strategically to improve assessment tools and share data sets. The demand for useful, practical measures has driven the work of the TWG forward, and the outputs lay testament to the value of collaboration to develop minimum guidance and support the use of high quality evaluation methods.
The authors make a step towards better understanding the role of resilience capacities by incorporating psychosocial factors into their analysis.

Using capacities to measure resilience calls for recognizing that they seem to work best only when measuring resilience at the local level. A substantially higher number of frameworks that operate at the local level use capacities, compared with those that operate at higher scales. Claiming changes in higher order systems, such as cities, is difficult, as different parts of the systems will all demonstrate differing levels of the same capacity. For example, different neighborhoods will be able to deal with shocks with varying degrees of success. Even in lower order systems, such as communities, there will always be varying levels of capacity, but it is easy to assume this variance will be lower. Very few frameworks that operate across scales, or at higher city, national, regional, or system scales, use capacities. In the ones that do, capacities are interpreted differently than with frameworks that operate at the lower scales. For example, at the household level, use of climate information in livelihood decision-making may be an important component of adaptive capacity (Jones et al., 2010); at the national level, adaptive capacity may be enhanced by use of climate information through climate models in sectoral development plans, such as national agriculture strategies (Brooks et al., 2011).

**Conceptualizing transformative capacity**

It is important to be cognizant that, while there is a degree of clarity and agreement on the factors that enable adaptive and absorptive capacities, there is substantially less agreement on methods to enhance or measure transformative capacity. For example, the Feed the Future initiative’s Community Resilience Measurement framework finds that the capacity for transformative change results from governance mechanisms, policies and regulations, infrastructure, community networks, and formal social protection mechanisms (Frankenberger et al., 2013). Similarly, Practical Action’s From Vulnerability to Resilience framework highlights the importance of advocacy and lobbying for effecting big policy shifts and tackling underlying systemic issues that enhance risk and vulnerability (Pasteur, 2011). In comparison, the TAMD approach conceptualizes transformative change as “structural shifts” that could include the restructuring of local, regional, or national economies, the large-scale restructuring of agricultural systems, or relocation of settlements and economic activities away from areas of extreme climate risk (Brooks et al., 2011).

Notably, the Stockholm Resilience Center’s RAPTA framework places a system’s capacity to transform at the center of its approach. RAPTA is a planning tool that aims to help identify options to adapt and transform a system in the face of climate risks, tailored for application in agroecosystems. According to RAPTA, most transformations are the unintended consequences of shocks, but some transformation can be intentional and can increase human wellbeing (O’Connell et al., 2016:23). The authors concede that deliberate transformation is uncommon, but identify 10 potential indicators for a system’s capacity to transform:

1. willingness to change values and seek agreement on the need for change among a sufficiently high proportion of influential individuals and groups
2. feasibility and attractiveness of alternative resource uses
3. effective social networks open to change and linking across scales and stakeholder groups
4. distributed governance that is able to empower local scale groups to initiate and implement change
5. social processes for negotiating agreements over equitable distribution of the benefits and costs of change
6. potential for leaders at several levels of governance to promote radical change
7. processes that link new local, scientific, and inter disciplinary knowledge and learning
Furthermore, a few frameworks such as Christian Aid’s (2016) approach to resilience clearly identify “shifting power relations” as an important lever for building resilience. Certain treatises on resilience measurement also focus on the critical importance of measuring any trade-offs, meaning that, for example, protecting one part of the city from floods may mean flooding others. These are important in terms of power dynamics and political willingness (or lack thereof) to ensure equitable responses to shocks and stressors (Béné and Frankenberger, 2015). Similarly, Maxwell et al. (2015) underline the importance of understanding power, trade-offs, and conflict dynamics while measuring resilience and, therefore, strongly advocate for the use of qualitative and subjective indicators to capture these factors. Yet despite the aforementioned noteworthy exceptions, these issues are currently underrepresented in the frameworks reviewed.

8. opportunities for developing and resourcing unconventional ideas
9. capacity to change rules, especially those governing resource use, to enable innovative uses
10. capacity to divest from the status quo and invest in change (O’Connell et al., 2016).

RAPTA’s indicators of transformability emphasize social change processes and governance that empowers local groups, a theme echoed in other frameworks. Insights on transformation and transformative capacity highlight that these depend on altering existing power relations, which involves recognizing the social and political processes that both undermine and constrain resilience, such as through the inequitable transfer of risks to the marginalized (Bahadur and Tanner, 2014).
Opportunities for learning across resilience disciplines

The concept of resilience has been applied across numerous disciplines, with no “one size fits all” method of monitoring changes in resilience. Ecological, financial, and psychological resilience are all articulated in various fashions throughout the frameworks reviewed. While each framework generally remains within the expertise and body of knowledge derived from its own sector, be it humanitarian, development, urban planning, or DRR, some differences do emerge between sectors. For example, urban, DRR, food security, and humanitarian-focused approaches give slightly different direction on the set of variables that contribute to resilience. By analyzing against the parameters applied across all the frameworks, a few key differences emerge in the uptake of capacities, the ways the approaches conceptualize building blocks, and the scales at which frameworks from different sectors measure resilience.

Resilience capacities

People's ability to deal with shocks and stresses is not only influenced by their assets, but also by their choices and actions. Across the frameworks reviewed, this aspect of resilience related to people’s responses to disturbances is often conceptualized as a “capacity.” As frameworks have proliferated, use of capacities has been fairly consistent, with some distinction between usage across sectors. Urban and humanitarian frameworks do not use resilience capacities, while DRR, CCA, food security, and livelihood frameworks are much more likely to describe resilience in these terms.

Food security and livelihood frameworks in particular tend to explicitly use adaptive, absorptive, and transformative capacities. DRR- and CCA-oriented frameworks have a looser conceptualization of capacities, describing buffer capacity, anticipatory capacity, coping capacity, and ability to adapt to climactic changes.

Scale

Different sectors consider resilience at different scales. Measuring across scales makes a difference in the choice of indicators and, ultimately, the outcomes measured. Urban frameworks look at higher scales than households, and feature urban functions such as municipal planning processes, communication systems, business environment, and structural and infrastructure-related factors. As Arup’s framework
exhibits, cities are considered “systems of systems,” making these higher level indicators most appropriate to capture the specific dynamics of urban resilience. Rather than focusing exclusively on household wellbeing, these frameworks deal with the service delivery and regulatory functions of urban spaces.

Frameworks dealing with food security and livelihoods focus on both the household and community levels, though the majority of indicators of resilience emanate from the household level. The Climate Resilience and Food Security framework specifies that the “household is at the centre of our framework, because it is at the household level that food insecurity manifests in hunger, malnutrition, and declining human welfare.” Similarly, DRR frameworks include many household level indicators, but tend to have a stronger focus at the community level. Indicators at this level include engagement in community-level participatory planning, use of early warning and risk knowledge, effective land use, and the existence of emergency response mechanisms. In DRR, food security, and CCA frameworks, the outcome measured is geared towards household wellbeing, though DRR frameworks use preparedness and hazard mitigation as a mechanism for achieving and protecting wellbeing outcomes.

These distinctions should not imply that frameworks do not consider other scales – national policies, wider ecosystems, and community institutions all have a place nested within the choice of indicators included in DRR, CCA, food security, livelihoods, and humanitarian-focused resilience measurement. However, some scales are more central than others, and these scales reflect broad trends between the sectors. Furthermore, frameworks that do consider other scales rarely address the feedback loops and trade-offs between scales.

**Building blocks**

As with scales and capacities, there is some divergence in the building blocks used to measure resilience between different sectors. Analysis in other sections of this report (see Section 3) focus on the common usage
BOX 7
The impetus for developing the City Resilience Index
Sachin Bhoite, Arup

Urban populations around the world face numerous challenges, from infrastructure deficits to unforeseen crises, from climate change to pandemics. Resilience is now recognized as a critical urban agenda that addresses both future uncertainty and inherent complexity, requiring cities to take proactive action to threats both sudden and evolving.

The challenge is to make resilience tangible and practical for cities to evaluate their performance and prioritize investments. Pioneering approaches and new competencies are required in order to adopt resilience as a positive urban development agenda.

Over the past three years, with the support of The Rockefeller Foundation, Arup has developed the City Resilience Index – a new way to understand and champion resilience in cities. It represents three years of research and analysis into what constitutes resilience, based on evidence from 28 diverse cities spread across the world. Our research shows that the factors that contribute to city resilience are the same worldwide, although their relative importance in each city may vary. This forms the basis of the City Resilience Index.

The Index
The CRI enables cities to assess and measure their present-day performance and also assess their trajectory towards a more resilient future. This is achieved through assessment and measurement of both qualitative and quantitative information.

Each city’s resilience profile is generated by assessing its current state or level of resilience against 12 goals and 52 indicators. This provides a holistic overview of a city’s resilience across the four key dimensions of people, organization, place, and knowledge.

1. **People** – the health and well-being of everyone living and working in the city.
2. **Organization** – the systems within the economy and society that enable urban populations to live peacefully and act collectively.
3. **Place** – the quality of physical infrastructure and natural environment that protect, provide, and connect us.
4. **Knowledge** – appropriate leadership and strategy, enabling the city to learn from the past and take timely action.

The City Resilience Index has already been tested in five diverse cities. These tests produced a wealth of information and data which were used to improve the index and the assessment process. A key learning was the need for cities to take ownership of the assessment process, which should be flexible to adapt to cities of different sizes, government structures, and capacities.
of livelihood capitals in the frameworks sampled, with over 50 percent of the frameworks partially or fully employing livelihood capitals as building blocks of resilience. Yet no urban frameworks employ livelihood capitals to approximate resilience; they use descriptive qualities to capture the nature of city functions instead. These characteristics are varied, including robustness, flexibility, inclusiveness, integration, reflectiveness, redundancy, and resourcefulness. ISET's urban framework takes resilience characteristics one step further, breaking them down into characteristics of systems, agents, and institutions.

Among the DRR-, CCA-, and food security-related frameworks, over half include livelihood capitals as key building blocks of resilience. Those that do not adopt the sustainable livelihood framework have a stronger focus on the risk knowledge and information flows, emergency response, enabling environment for DRR, land use planning, and social capital to allow people to anticipate and cope with climate stresses. Two-thirds of the CCA-oriented frameworks use the sustainable livelihood frameworks, but they focus on institutional and governance capacity to deal with climate risks. In the Local Adaptive Capacity Framework, this is represented as "flexible and forward looking decision-making and governance." In ARCAB's Monitoring and Evaluation Framework, this property of resilience is called "institutional capacity to manage climate risks and deliver adaptation benefits." Food security-related frameworks cover similar factors that contribute to resilience, but ask explicitly about the equitable access to these institutions and decision-making processes. For example, Christian Aid's resilience framework provides a few examples of inclusive institutions to build the resilience of the chronically food insecure, including inclusive market development and participatory peace-building processes.

FIGURE 6: Use of livelihood capitals
Resilience in additional disciplines

Because they are all derived from an international development perspective, the differences among frameworks sampled are fairly marginal. Disciplinary perspectives from ecology, psychology, and finance give very different directions on what to measure and what relationships matter in order to model resilience. Ecosystem-based approaches focus on the “amplitude” and “elasticity” of an ecosystem state (Westman, 1986), psychological resilience can be measured as a set of personal characteristics or protective mechanisms that facilitate positive adaptation (Graber et al., 2015), and analytical criterion for financial resilience is encapsulated in “stress tests” which examine banks’ leverage ratios and liquidity, among other factors (Borio and Drehmann, 2009).

Yet within the sample of frameworks, there are elements of measuring aspects of resilience borrowed from these other disciplines. Haiti’s Humanitarian Aid Evaluation included two instruments aimed to measure psychosocial health to capture the psychological status of recipients of humanitarian assistance (Tulane University, 2012). The Agro-Ecosystem Approaches to Resilience framework includes behavior-based indicators of ecological self-regulation, combining human activity with ecosystem characteristics (Cabell and Oelofse, 2012). Lastly, Arup’s City Resilience Framework includes some variables related to financial resilience of the business sector, such as specific financial mechanisms that enable business to adapt to changing circumstances and business continuity planning.
SECTION 7
Additional areas of work

The inventory and analysis of frameworks suggests a number of specific areas where additional dialogue, both with new groups and among those currently engaged with the frameworks reviewed here, as well as research and action would contribute substantially to resilience field building.

Recognizing this, there are additional areas of work that can be addressed. These include:

- determining how to develop and promote a common conceptualization of resilience that works across diverse contexts or, conversely, how to ensure that the diverse conceptualizations that may be appropriate at different levels, in different contexts, and across different disciplines are effectively linked;

- undertaking substantive work to improve theoretical, conceptual and applied measurement frameworks to better accommodate issues of power, politics, equity, and marginalization;

- translating conceptual and theoretical frameworks and emerging empirical evidence into tools and metrics that can be used for analytical purposes and implementation support;

- investigating further how the resilience field can learn from disciplines that offer a body of scientific evidence on how to understand and measure resilience (such as ecology, psychology, finance, engineering);

- supporting substantial work on issues related to scale including steps to:
  - improve understanding of how to link resilience dynamics between scales and articulate the trade-offs across institutional, geographical and temporal scales;
  - determine how and when approaches for measuring resilience at scales higher and lower than the community/household level are appropriate or essential;
  - explore whether current understandings of resilience capacities are effective in measuring changes in resilience at different scales;

- understanding ways of balancing the measurement of proximate enablers of resilience, such as assets and processes, with structural issues that underpin risk and vulnerability, such as demographic shifts;

- reviewing the value of using capital assets (from the SLA) as the building blocks of resilience at the household and higher levels;

- developing better approaches to capture information on subjective and psychosocial factors when using resilience capacities.

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5 This should draw on the considerable contributions to the field from the FSIN, which has developed a common analytical model for resilience measurement. See Constas, et al., 2014.
• improving understanding of how and when to sequence, integrate, and choose resilience measurement tools based on the appropriate context.

Addressing questions such as the above as part of an ongoing process of resilience field building is essential for supporting the development of implementation and measurement strategies that can deliver real results in response to major global challenges. Forms of engagement, research, and learning that cross disciplines and generate or refine the scientific and applied foundations of resilience frameworks will enable policymakers, researchers, programmers, and practitioners to develop a robust evidence base on “what works” in enhancing resilience. This will ensure the concept continues to be applied by a variety of actors, ensuring that individuals, households, communities, cities, and nations not only function but also flourish in the face of growing shocks and stresses. These questions and issues will be considered by the CoP in its work planning efforts.
Conclusion

It is clear that the field of resilience measurement is exciting and highly dynamic. A considerable amount of progress has been made on measuring a concept that is widely recognized to be powerful, yet somewhat nebulous. This snapshot has revealed that there are areas of considerable commonality, such as on resilience building blocks, the function and purpose of measurement frameworks, and the employment of capacities for measuring resilience.

At the same time, the review highlights the extent to which most resilience frameworks currently in use have been developed based on prior work on food systems, development, and disaster in rural contexts. Reflecting this common context, they emphasize capacities at the household and community levels along with the social and natural capitals that rural households depend on for livelihoods and wellbeing. This emphasis is quite different from the limited number of frameworks that have been developed in urban areas. In contrast to the rural frameworks, the urban frameworks place much greater emphasis on large-scale organizations, infrastructure systems, and institutional/legal structures. In addition, the urban frameworks place greater emphasis on qualities such as the flexibility and safe-failure characteristics of systems as opposed to simply the presence or absence of different social, physical, and other forms of capital. Furthermore, few of the frameworks developed for either urban or rural areas engage comprehensively with the large bodies of work undertaken through entities such as the Resilience Alliance on the dynamics of social-ecological systems or with parallel resilience-related work in fields such as economics, critical infrastructure, and water resources.

Overall, as a result, the review suggests that current frameworks reflect a partial and relatively fragmented field. Strengthening the field would require much greater substantive engagement with researchers and organizations in other disciplines.

This is important because current frameworks are likely to prove insufficient for building resilience in relation to the likely stresses emerging as a consequence of climate change, conflict, and other global processes. In many cases, the nature of the stress to which local communities are exposed is likely to exceed the level of resilience that can be created based on locally available capacities and capitals. In addition, with over 50 percent of the world's population residing in urban areas, resilience of these areas and the large-scale environmental, infrastructure, governance, and economic systems on which they depend will be of fundamental importance to future wellbeing. Effective
strategies for achieving major global development objectives and responding to issues such as climate change depend, as a result, on cross-fertilization among the array of resilience frameworks reviewed here and the wide body of relevant knowledge in other disciplines.

In sum, the review of resilience frameworks undertaken here suggests the critical importance of next steps that involve substantive:

- **engagement with groups working on resilience** across a range of disciplines such as ecology, psychology, finance, engineering, and others beyond those involved in the frameworks reviewed here

- **work to develop frameworks** (or to link frameworks) that more effectively address issues across scales and levels of disruption

- **actions that strengthen the capacity of organizations** to engage effectively in urban and large-scale contexts as well as at the household and community levels.
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Resilience Measurement – MEL Approaches in Practice – Interim Report

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## Annex 1

### Inventory of Frameworks

<table>
<thead>
<tr>
<th>ORGANISATION/AUTHOR</th>
<th>FRAMEWORK</th>
<th>OVERVIEW</th>
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</thead>
<tbody>
<tr>
<td>1. Action Research for Community Action in Bangladesh</td>
<td>ARCAB Monitoring and Evaluation Framework Paper</td>
<td>It presents key indicators to track changes in climate change vulnerability and adaptive capacity at the community level. It identifies indicators that track changes in adaptive capacity (e.g., improvements in assets, livelihoods and awareness); to track changes in institutional capacity (e.g., number of local level institutions with the capacity to develop and deliver adaptation services to the climate-vulnerable poor; access to regular and updated sources of weather and climate information). The framework also aims to garner evidence that people are adapting by tracking the use of climate information and behaviour change. As such, it aims to measure the effectiveness of resilience programs.</td>
</tr>
<tr>
<td>2. Arup</td>
<td>City Resilience Index</td>
<td>The City Resilience Framework provides a holistic approach to diagnosing the resilience of a city, structured around four dimensions (leadership and strategy, health and wellbeing, economy and society, infrastructure and environment) and 12 goals (e.g., diverse livelihoods, social stability and continuity of critical services) that the framework argues are critical for the resilience of cities. This has informed the structure of the City Resilience Index that includes a set of 52 indicators that stack up against the 12 goals (e.g., indicators ‘for diverse livelihoods’ include ‘the degree of relevant skills and training’). This is a highly operational approach that lends itself to measuring the resilience of cities to diverse shocks and stresses.</td>
</tr>
<tr>
<td>3. Barret, C., Constas, M.A</td>
<td>Toward a Theory of Resilience for International Development Applications</td>
<td>This framework advances a theory of resilience as it applies to the challenges of international development. The conceptualization it advances for development resilience focuses on the stochastic dynamics of individual and collective human well-being, especially on the avoidance of and escape from chronic poverty over time in the face of myriad stressors and shocks. It outlines various interventions that can support individuals or households to move above a resilience threshold in spite of their risk exposure. Some of these includes: material support (cash transfers, education, health care), risk reduction (disease resistant seeds, insurance programmes, improved police protection), and transformative change (changes in cultural, economic, and sociopolitical institutions that mediate risks).</td>
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<tr>
<td>4. Béné, C.</td>
<td>Towards a Quantifiable Measure of Resilience</td>
<td>The argument put forward by this framework is that the ‘costs of resilience’ (that is, the different ex ante and ex post investments, losses, sacrifices, and costs that people have to undertake at individual and collective levels to ‘get through’ a shock or an adverse event) provide an appropriate and independent metric to measure resilience across scales and dimensions. The framework shows how the independent nature of this metric offers an explanatory power that can be used to infer, in a testable and rigorous manner potential, causalities between the metric and household and/or community characteristics.</td>
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<tr>
<td>ORGANISATION/AUTHOR</td>
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<tr>
<td>5. Béné, C., Frankenberger, T., and Nelson, S.</td>
<td>Design, Monitoring, and Evaluation of Resilience Interventions: Conceptual and Empirical Considerations</td>
<td>This working paper intends to support the development of robust monitoring and evaluation frameworks for resilience. The paper proposes a logical framework that incorporates unique, resilience-specific components of M&amp;E into a conventional logframe. This includes intermediate outcome indicators (which are conceptualized as absorptive, adaptive, and transformative capacities), outcome indicators (which include household coping strategies or the use of early warning systems), and impact indicators (which can be chosen from a variety of wellbeing indicators). The last additional component to monitor is the incidence of shocks and stresses, which should be measured at national levels, at the local level, and at the household level.</td>
</tr>
<tr>
<td>6. Bizikova, L., Tyler, S., Moench, M., Keller, M., Echeverria, D.</td>
<td>Climate Resilience and Food Security in Central America: A Practical Framework</td>
<td>This article introduces and tests a method of assessing the resilience of a food system which investigates the food system at various scales. At the household level, the framework considers the resilience of household utilization and access to food. At higher scales, the framework tracks the resilience of broader food system dimensions, such as livelihood resources and supporting services for food production. Finally, the framework includes capacities and institutional factors that enable supporting institutions and policies to operate effectively.</td>
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<tr>
<td>7. Cabell, J. and Oelofse, M.</td>
<td>An Indicator Framework for Assessing Agroecosystem Resilience</td>
<td>This framework delineates behavior-based indicators of resilience within agroecosystems. Based on a review of relevant literature, it presents and discusses an index of 13 such indicators (e.g. socially self organised, ecologically self regulated, response diversity, optimally redundant) which, when identified in an agroecosystem, suggest that it is resilient and endowed with the capacity for adaptation and transformation. Absence of these indicators identifies points of intervention for managers and stakeholders to build resilience where there is vulnerability.</td>
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<tr>
<td>8. Christian Aid</td>
<td>Resilience Framework: Christian Aid’s Approach</td>
<td>Christian Aid’s framework aims to improve integration of different program areas to create longer-term impact. The framework orients Christian Aid’s approach towards strengthening resilience capacities across seven areas: i) shifting power relations; ii) climate resilient agriculture and natural resource management; iii) inclusive markets development; iv) community health; v) disaster risk reduction; vi) humanitarian response; vii) peace-building. The approach advocates for macro-context analysis of power, vulnerabilities, and conflicts. At the community level, the framework advocates for a power analysis focuses on risks, vulnerabilities, and capacities. The framework helps plan interventions and integrate ongoing work.</td>
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<td>9. Cutter, S., Barnes, L., Berry, M., Burton, C. Evans, E., Tate, E., Webb, J.</td>
<td>A Place-based model for understanding community resilience to natural disasters</td>
<td>This framework proposes a Disaster Resilience of Place (DROP) model to improve comparative assessments of disaster resilience at the local or community level. Drawing from an overview of resilience and vulnerability frameworks and integrating the literatures, the framework proposes various dimensions of community resilience, from ecological, to social, economic, institutional, infrastructure, and ‘community competence’, which includes psychosocial and cognitive indicators such as risk perception, occurrence of psychopathologies, and satisfaction with quality of life.</td>
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<td>10. DFID</td>
<td>Defining Disaster Resilience</td>
<td>This framework is intended to inform DFID’s work on resilience and stems from the domain of disaster risk reduction. As such it is aimed at informing resilience initiatives as opposed to only diagnosing the levels of resilience in a system. This framework is comprised of four parts: context (e.g., region/institution), disturbance (e.g., natural hazard, conflict), capacity to deal with disturbance (exposure, sensitivity and adaptive capacity) and reaction to disturbance (survive, cope, recover, learn, transform).</td>
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<td>11. Food and Agricultural Organization</td>
<td>Resilience Index Measurement and Analysis Model (RIMA)</td>
<td>This framework presents the FAO’s latest thinking on resilience measurement and adheres to the idea of resilience comprising of absorptive, adaptive and transformative capacity. It argues that resilience is a function of physical dimensions (income and food access; access to basic services; agricultural assets; non-agricultural assets; agricultural practice and technology; social safety nets; climate change; enabling institutional environment;) and capacity dimensions (sensitivity; adaptive capacity). This framework lends itself to evaluating resilience initiatives and diagnosing the level of resilience in a system.</td>
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<tr>
<td>12. Food and Agricultural Organization</td>
<td>Self-evaluation and Holistic Assessment of Climate Resilience of Farmers and Pastoralists (SHARP)</td>
<td>The Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists (SHARP) comprises a base assessment of the current farmer/pastoralist situation through self-assessment with farming communities; a gap analysis of climate change resilience weaknesses based on output of Phase 1 and available data on Climate Change in the relevant region; and proposes specific strategies for each situation. At the core of this approach is a set of 13 indicators for assessing the resilience of agro-ecosystems that cover the degree of social self-organisation, ecological self-regulation, connectedness etc. As such, this is a highly applied approach for diagnosing the resilience of a system.</td>
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<td>13. Food Security Information Network</td>
<td>Resilience Measurement Principles</td>
<td>This seminal paper on resilience measurement defines resilience and identifies ten principles for designing resilience measurement approaches. Although the principles were elaborated in regards to food security interventions, the principles and technical guidelines are widely applicable to other resilience measurement approaches. The principles cover the following topics: resilience as a capacity that should be indexed to a development outcome; the role of subjective states and qualitative indicators; systems and complex causality; shock and stressor specificity; desirable and undesirable equilibria; detecting volatility; measuring multiple scale and multi-level interactions; the timing of data collection and measurement; connections between resilience and vulnerability; and the ability to explain heterogeneous effects.</td>
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<tr>
<td>14. Food Security Information Network</td>
<td>A Common Analytical Model for Resilience Measurement</td>
<td>This paper builds on FSIN’s Resilience Measurement Principles by proposing a common analytical model for resilience measurement. The key analytical elements components include assumptions about resilience capacities, the causal framework, what resilience specific indicators are needed, the expected rate of change, the types of data collection tools, and the estimation procedures involved in resilience measurement. The paper describes estimation models that could be used to assess the impact of resilience, highlights the importance of quantitative and qualitative methods and indicators, and proposes a construction of resilience capacity measures using categories of indicators.</td>
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<td>15. Frankenberger, T. &amp; Nelson, S.</td>
<td>Background Paper for the Expert Consultation on Resilience Measurement for Food Security</td>
<td>This paper presents a resilience conceptual framework that integrates a livelihoods approach, disaster risk reduction, and climate change adaptation approach to address underlying causes of vulnerability. The framework establishes contextual factors that affect adaptive capacity, defines a unit of analysis (resilience of what or whom), examines adaptive capacity (which is defined as the resources that people have to deal with disturbances, including livelihood assets, institutions, and strategies), and tracks resilience and vulnerability pathways which lead to positive or negative livelihood outcomes. Importantly, the framework includes specific disturbances and mentions the exposure and sensitivity to the population to these shocks or stresses. The assessment is designed to identify leverage points for a theory of change and help develop an appropriate resilience intervention.</td>
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<td>16. Global Environmental Facility</td>
<td>Resilience, Adaptation Pathways, and Transformation Assessment Framework (RAPTA): from theory to application</td>
<td>RAPTA is a tool developed to support effective planning by embedding the concepts of resilience, adaptation, and transformation at the heart of any intervention. Though it is oriented towards agro-ecosystem resilience, the framework is flexible and provides step-by-step guidelines to characterize a system, identify important variables, analyze the current and the desired future state of that system. The tool brings together key stakeholders to assess the system and integrates a theory of change for improving resilience to help inform decisions and interventions. The framework also explicitly intends to be used in conjunction with existing frameworks.</td>
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<td>17. ICF</td>
<td>Assessing the Impact of ICF Programmes on Household and Community Resilience to Climate Variability and Climate Change</td>
<td>This framework is aimed at enabling projects to report against Key Performance Indicator 14 (numbers of people with improved resilience as a result of project support) of the International Climate Fund. The methodology is based on the identification of context-specific indicators by individual projects, informed but not prescribed by a consideration of a number of dimensions of resilience where this is appropriate and helpful. These dimensions are (i) assets, (ii) access to services, (iii) adaptive capacity, (iv) income and food access, (v) safety nets, (vi) livelihood viability, (vii) institutional and governance contexts, (viii) natural and built infrastructure, and (ix) personal attributes.</td>
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<td>18. IFRC</td>
<td>IFRC Framework for Community Resilience</td>
<td>The framework for community resilience provides a systematic approach to measuring resilience at the community level. The framework suggests that at the community level building resilience entails improving the knowledge and health of communities; strengthening the social cohesion of communities; developing well-maintained and accessible infrastructure and services in communities; providing economic opportunities; managing natural assets and strengthening the connectedness of communities.</td>
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<td>19. IIED</td>
<td>Tracking Adaptation and Measuring Development (TAMD)</td>
<td>TAMD is an approach to the evaluation of adaptation ‘success’ that combines assessment of how well climate risks to development are managed by institutions (‘upstream’ indicators), with assessment of how successful adaptation interventions are in reducing vulnerability and keeping development ‘on track’ in the face of changing climate risks (‘downstream’ indicators). Examples of upstream indicators include tracking ‘how well national systems conduct climate risk management functions’ and the degree to which climate and monitoring and evaluation information is employed in policy and programme design. The aim here is to provide a framework that defines indicators’ categories or ‘domains’ that can be tailored to specific contexts, rather than a ‘toolkit’ for monitoring and evaluation that prescribes particular indicators.</td>
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<td>20. International Institute for Sustainable Development</td>
<td>Climate Resilience and Food Security: A Framework for Planning and Monitoring</td>
<td>This framework presents approaches to understanding and monitoring food system resilience to climate change. Based on an overview of existing approaches to understanding food systems as well as climate resilience, the paper describes a new framework designed to support the analysis of community-level food security in the context of climate shocks and stresses, as well as of resilience of food systems at larger scales. By analyzing food access, utilization, and availability at the household level in conjunction with considering important variables related to ecosystem health, infrastructure, services, and institutions at the system level, this framework aims to provide a cross-scalar picture of resilience and food security.</td>
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<td><strong>21.</strong> ISET Planning for Urban Climate Resilience: Framework and Examples from the Asian Cities Climate Change Resilience Network</td>
<td>This is a conceptual framework that emphasizes the role of systems and social agents (both internal and external) for building resilience in cities to shocks and stresses induced by climate change. Strengthening resilience, as described in the framework, includes building the capacity of agents to visualize and act, organize and reorganize, and learn; and the performance of systems with enhanced flexibility and diversity, redundancy and modularity; so that they fail safely rather than catastrophically; the third pillar of the framework is focussed on institutions that include rights/entitlements, decision-making, information and the application of new knowledge. The framework underlines that to strengthen urban resilience, iterative processes of diagnosing vulnerability, planning, and implementation are required.</td>
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<td><strong>22.</strong> Longstaff, P. Armstrong, N. Perrin, K. May, W. Matthew P and Hidek, A Building Resilient Communities: A Preliminary Framework for Assessment</td>
<td>This is a preliminary conceptual framework for assessing community resilience. The framework is not specific to particular shocks and identifies core attributes of resilience systems that include resource performance, resource diversity, resource redundancy, institutional memory, innovative learning and connectedness. It identifies adaptive capacity as key element of resilience and is useful for gauging the degree to which a system is resilient. Five key community subsystems (ecological, economic, physical infrastructure, civil society, and governance) that need to be considered during the assessment process are also identified.</td>
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<td><strong>23.</strong> Lutheran World Relief Resilience Assessment Benchmarking and Impact Toolkit (RABIT)</td>
<td>This toolkit offers a methodology for understanding community resilience, drawing on resilience attributes of rapidity, scale, redundancy, learning, self-organization, robustness, equality, diversity and flexibility to understand the relative strengths and weaknesses of resilience in a particular community. The tool intends to identify priorities for action, and was trialed in Uganda to evaluate the contribution of ICT to resilience.</td>
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<td><strong>24.</strong> Mayunga, J. Understanding and Applying the Concept of Community Disaster Resilience: A Capital-based Approach</td>
<td>This framework proposes the use of the capital based approach as a framework to assess community disaster resilience. By building on the foundation laid out by others, this framework includes the five major forms of capital – social, economic, physical, human and natural capital. The framework provides indicators of resilience across the five capitals and explains the relationship between the indicators and the capacity of individuals to cope with disasters. The framework also provides an approach to weight indicators and derive a Community Disaster Resilience Index. This framework is not specific to particular shocks and aims to diagnose the levels of resilience at the community level.</td>
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<td><strong>25.</strong> Mercy Corps Our Resilience Approach</td>
<td>The resilience approach adopted by Mercy Corps focuses on tracking three main elements: 1) changes in resilience capacity, including livelihood opportunities, access to and use of essential services ‘or other abilities presumed to be linked with more successful coping strategies or adaptations to risk; 2) development outcomes such as food security, improved health and reduced poverty; 3) the magnitude and levels of exposure to disturbances. The approach argues that improvements in resilience capacities (as a result of specific interventions) with consequential improvements in development outcomes despite increasing shocks and stresses mean a particular resilience intervention has been successful. In some circumstances, the resilience of a system may also increase, despite a dip in development outcomes, if the frequency or intensity of shocks and stresses has also increased with reference to a baseline. In this way, the approach provides a robust conceptual foundation for evaluating the impacts of resilience programmes to diverse shocks and stresses.</td>
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<td>26. Mercy Corps</td>
<td>Strategic Resilience Assessment (STRESS)</td>
<td>STRESS is a methodology for integrating a resilience thinking into program design by developing a measurable Theory of Change that articulates how programs build resilience. The specific objectives of STRESS are to i) identify and analyze drivers and root causes of shocks and stresses across local, regional, and national scales, that undermine development outcomes; ii) define the impacts of shocks and stresses on different sub-groups or geographies and the factors that worsen them; iii) understand the capacity of people, communities, and systems to absorb, adapt, and transform in the face of shocks/stresses, and iv) develop the program team's capacity to understand complexity and build resilience.</td>
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<td>27. National Institute of Standards and Technology</td>
<td>A Framework for Defining and Measuring Resilience at the Community Scale: The PEOPLES Resilience Framework</td>
<td>This framework anchors its understanding of resilience between technological units and social systems. It highlights physical, environmental, political, and socio-economic functions of a system through seven dimensions: i) Population and demographics, ii) environmental and ecosystem, iii) organised governmental services, iv) physical infrastructure; v) lifestyle and community competence, vi) economic development; and vii) social-cultural capital as the key community resilience indices. Importantly, the framework is intended for geo-spatial mapping of resilience functions to better define resilience at the community level.</td>
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<td>28. OECD</td>
<td>Guidelines for Resilience Systems Analysis</td>
<td>This framework lays out a process of undertaking resilience systems analysis to gauge the levels of resilience in a system. Very broadly, this focuses on identifying assets (using the Sustainable Livelihoods Framework) within a system, identifying the risks that might affect these assets, and then identifying actions to strengthen resilience across the absorptive, adaptive and transformative capacities of the system. The framework identifies system resilience indicators (well-being-type indicators that can map across the five capitals); negative resilience indicators (that track negative coping capacities); process indicators (that track the degree to which the resilience roadmap developed from the resilient systems analysis has been translated into policy and programming); output indicators (that track resilience-building activities); and proxy impact indicators (the proportion of the target population that slips back into poverty).</td>
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<td>29. Overseas Development Institute</td>
<td>Towards a Characterisation of Adaptive Capacity: A Framework for Analysing Adaptive Capacity at the Local Level</td>
<td>This framework aims to understand and assess adaptive capacity at the local level. It is primarily focussed on shocks and stresses from climate change and serves as an approach to monitor progress, identify needs and allocate development resources to enhance a system's ability to adapt to change. At the heart of this framework are five characteristics of resilience, each with a set of 'features': This includes 1) Asset base – availability of key assets that allow the system to respond to evolving circumstances; 2) Flexible and forward-thinking decision-making and governance – the system is able to anticipate, incorporate, and respond to changes in governance structures and future planning; 3) Institutions and entitlements – appropriate institutional environment that allows for fair access to key assets; 4) Innovation – system creates an enabling environment to foster innovation, experimentation, and the ability to take advantage of new opportunities; 5) Knowledge and Information – system has ability to collect, analyse and disseminate knowledge and information in support of adaptation activities.</td>
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<td>30. Overseas Development Institute</td>
<td>The 3As: tracking resilience across BRACED</td>
<td>This approach is an explanatory framework for analyzing resilience outcomes that cut across a diversity of different resilience projects in the BRACED program. The framework applies a set of interrelated resilience capacities – the capacity to adapt to, anticipate, and absorb shocks and stresses – to understand these outcomes. Transformation is treated as separate from resilience capacities, but the approach does stress the importance of analyzing potentially transformative impacts of resilience interventions, including policy shifts, empowerment processes, and technological innovations.</td>
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<td>31. Oxfam</td>
<td>Oxfam Framework and Guidance for Resilient Development</td>
<td>This framework presents Oxfam's latest thinking on the ways in which the organisation can and should enhance resilience. It highlights six social change processes that can develop absorptive, adaptive, and transformative capacity. The framework highlights Oxfam's role in enhancing these processes across its programmes to create 'pathways to resilience outcomes.' The social change processes included in the framework are, 1) empowerment (promote gender justice, enhance voice, empowerment, and participation, including conflict resolution); 2) securing and enhancing livelihoods (securing and building human, social, natural, physical, and financial capital and household assets, based on sustainable livelihoods framework); 3) informing (developing information and knowledge to support decision-making and action); 4) flexible and forward-looking planning (enabling and enhancing collective, forward-looking, and flexible decision making); 5) accountable governing (securing accountability and enabling institutions); 6) learning (enable people to learn together, support experimentation, and increase potential for social and technological innovation).</td>
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<td>32. Practical Action</td>
<td>From Vulnerability to Resilience (V2R)</td>
<td>Setting out key factors that contribute to people's vulnerability (namely hazards and stresses, fragile livelihoods, future uncertainty, and weak governance), this approach provides explanations for the linkages between these factors and sets out ideas for action to strengthen resilience. The framework's defines resilience not only as an ability to manage risks, adapt to change, and ensure food supply, but also brings a strong focus on a household's ability to move out of poverty.</td>
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<td>33. Speranza, C., Wiesmann, U. and Rist, S.</td>
<td>An Indicator Framework for Assessing Livelihood Resilience in the Context of Social–ecological Dynamics</td>
<td>This framework presents a set of indicators to measure the resilience of social-economic systems in terms of livelihood strategies pursued by communities. The proposed indicators are clustered around three main focus areas: (i) buffer capacity (the extent to which the social-economic system can absorb change and still maintain the same identity and functions); (ii) self-organization (the extent to which individuals' activities cohere within a social system); and (iii) capacity for learning (the extent to which the system itself can take previous experiences into account, e.g., institutions adapting in response to a shock in order to be better prepared for future shocks).</td>
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<td>34. Torrens Resilience Institute</td>
<td>Developing a Model and Tool to Measure Community Disaster Resilience: An Australian Government Initiative</td>
<td>This toolkit provides a method of diagnosing the disaster-readiness of a community. Originating in Australia, the framework assesses community disaster resilience by asking four basic questions: 1) How connected are members of the community? 2) What is the level of risk and vulnerability in the community? 3) What procedures support community disaster planning, response, and recovery? 4) What emergency planning, response, and recovery resources are available in the community? Using these questions, the framework provides guidelines for using a scorecard to help communities measure their disaster readiness and support planning to strengthen disaster readiness.</td>
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<td>35. Tulane University</td>
<td>Haiti Humanitarian Assistance Evaluation: From a Resilience Perspective</td>
<td>This framework was used to evaluate the impact of humanitarian assistance in the wake of the 2010 Haiti earthquake. It is a detailed, operational and evaluative approach for measuring changes in resilience after the earthquake. At the heart of this framework lies the measurement of changes across seven dimensions of resilience – wealth, debt and credit, coping behaviours, human capital, community networks, protection and security; and psychosocial aspects.</td>
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<td>36. UNDP</td>
<td>Community-based Resilience Analysis (CoBRA) Conceptual Framework and Methodology</td>
<td>This framework has four broad steps that include identifying priority characteristics of disaster resilience for a target community; assessing the degree to which a community achieves these characteristics (in the normal period, as well as in a period of crisis); examining the characteristics and strategies of disaster-resilient households and identifying the most highly rated interventions or services in building local disaster resilience. ‘Community resilience characteristics’ that lie at the heart of this framework map across the capital assets- physical, human, financial, natural and social.</td>
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<td>37. UNISDR</td>
<td>Disaster Resilience Scorecard for Cities</td>
<td>This framework provides a checklist for cities to gauge the degree to which they are resilient to the impacts of natural disasters. It is a list of 85 metrics (each with a suggested 5-point scoring system) relating to UNISDR’s ‘ten essentials’ (e.g. organisation and coordination, financial planning and budget, data on hazards). Overall, the framework aims to track resilience across the following aspects – research (including evidence-based compilation and communication of threats and needed responses); organization (including policy, planning, coordination and financing); infrastructure (including critical and social infrastructure and systems and appropriate development); response capability (including information provision and enhancing capacity); environment (including maintaining and enhancing ecosystem services); recovery (including triage, support services and scenario planning).</td>
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<td>38. USAID</td>
<td>Community Resilience: Conceptual Framework and Measurement. Feed the Future Learning Agenda.</td>
<td>This framework stems from the domain of food security but can be applied to multiple sectors. The framework includes the context (social, ecosystems, political and religious); the disturbance (natural hazard, conflict etc.); community capacities for collective action (assets, social dimensions and areas of collective action); the reaction to disturbance (survive, cope, recover, learn, transform) and livelihood outcomes (economic security, adequate nutrition etc.). Overall, the framework argues that community capacities for collective action mediate the impact of various disturbances on a community allowing it to either proceed on a resilience pathway or tip over into vulnerability.</td>
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<td>39. Zurich Flood Resilience Alliance</td>
<td>Operationalizing Resilience Against Natural Disaster Risk: Opportunities, Barriers and a Way Forward</td>
<td>The Zurich Flood Resilience Alliance approach to measuring flood resilience is based on a ‘systems approach’ to understanding the factors that enable communities to withstand flood-related shocks and stresses. The framework explicitly highlights the importance of human capital (e.g. skills and health); social capital (e.g. strong relationships and cooperation); natural capital (e.g. land productivity and water); physical capital (e.g. infrastructure and equipment); and financial capital (e.g. level and diversity of income) for enhancing the resilience of communities to floods. The framework combines an assessment of capital assets (the 5 Cs) in combination with resilience properties of those assets (the 4 Rs), which include robustness, redundancy, resourcefulness and rapidity.</td>
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Additional sources

The following notable papers and reports were included and referenced in the review, but were not considered stand-alone resilience frameworks or approaches.


If you are actively working in the field of resilience and would like to learn more about the CoP, please contact:

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