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UNDERSTANDING RESILIENCE FOR FOOD AND NUTRITION SECURITY

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ABSTRACT

This paper provides a structured overview of the concept of resilience for use in discussions surrounding food security and nutrition. It defines resilience as the capacity that ensures adverse stressors and shocks do not have long-lasting adverse development consequences. It links the discourse on resilience to earlier work on vulnerability, noting both common features and differences, and discusses implications of the conceptualization of resilience for measurement and for policy and practice.

Keywords: resilience, shocks, food security, nutrition, measurement

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1. INTRODUCTION

> *Resilience … poses a challenge as a term in its own right. Instead of bringing clarity to the table as envisaged, it has brought utter confusion … nobody really knows what resilience means, or perhaps more accurately, everybody has a different understanding of it.*
> (Hussain 2013)

Resilience is a relatively new concept in development discourse.[1] But recurrent humanitarian crises in places such as the Sahel and the Horn of Africa, together with accentuated climatic shocks resulting from climate change and increased geopolitical instability, have led bilateral and multilateral donors, along with other development partners, to begin to think differently about development issues. Rather than placing each—humanitarian assistance, governance, food security and nutrition, economic development, and so on—in a separate silo, these agencies are using the concept of resilience to join up their myriad activities. As Constas, Frankenberger, and Hoddinott wrote, "In a world where conventional approaches to dealing with humanitarian aid and development assistance have been questioned, resilience has captured the attention of many audiences because it provides a new perspective on how to effectively plan for and analyze the effects of shocks and stressors that threaten the well-being of vulnerable populations" (2014, 4).

Despite its promise and hype, or perhaps because of it, resilience has already undergone a backlash, as evidenced by the quotation that begins this paper. Does it really add new and useful understanding to development theory and practice, or does it contribute to "utter confusion"? The goal of this paper is to address this concern through a structured overview of what resilience means and how it is conceptualized. We then briefly discuss the implications of our approach for measurement and for policy.

[1] A simple example of the growth of the discourse is provided by the website of the Resilience Alliance, which held 276 papers on application of the principles of resilience in 2006; this number had grown to more than 1,700 by early 2014. See www.resalliance.org.

2. A BRIEF HISTORY OF RESILIENCE AND ITS DEFINITION

The word *resilience* comes from the Latin word *resilire,* which means "to rebound or recoil." Its earliest usage is in 19th-century shipbuilding, specifically as a measure of the capacity of different materials to absorb loads, and sudden changes in those loads, without breaking (Tredgold 1818 and Mallett 1862, cited in McAslan 2010). Its use was subsequently extended to civil and mechanical engineering and to material science. In these fields, there is common usage of the measurement of the "modulus of resilience," the maximum amount of energy that can be absorbed without creating a permanent distortion.[2]

Starting in the 1970s, researchers in ecology and psychology began to explore the notion of resilience. Holling (1973) introduced the term in ecology, describing it as the amount of disturbance a *system* (emphasis mine) can absorb before shifting into an alternative state (Walker et al. 2006). Other writers in ecology followed Pimm's (1984) focus on the speed of return to a preexisting equilibrium following a perturbation or shock (Perrings 2006).[3] Around the same time as Holling, psychologists also began exploring the notion of resilience (Garmezy 1974). Work in this area was spurred by Bleuler's (1978) study of children whose mothers were schizophrenic and his findings that despite starting life at considerable disadvantage, many were able to adapt and live healthy, productive lives. The many psychological studies of resilience since the publication of Bleuler's work have resulted in a series of definitions that have been summarized by Rutter: "Resilience can be defined as reduced vulnerability to environmental risk experiences, the overcoming of a stress or adversity, or a relatively good outcome despite risk experiences.… it is an interactive concept in which the presence of resilience has to be inferred from individual variations in outcome among individuals who have experienced significant major stress or adversity" (2012, 336). The literature notes that resilience in individuals reflects both individual traits and the presence of a supportive, nurturing environment. Attempts have been made to capture these traits through the development and application of psychological scales of resilience such as the Connor-Davidson Resilience Scale, which captures notions such as self-efficacy, attitudes toward change, realistic sense of control, patience, ability to engage the support of others, secure attachments, and optimism (Connor and Davidson 2003). More recently, neuroscientists have used functional magnetic resonance imaging to explore the neurological basis for resilience (Hughes 2012).

Béné and colleagues (2012) and IFPRI (2013) have documented the evolution of discourse on resilience in development. In the United Kingdom, resilience as an organizing framework came out of a high-level review of the UK's humanitarian emergency response programs. At the same time, a number of operational agencies were beginning to use resilience as a way of bringing together their humanitarian and development work. Box 2.1 provides some examples of definitions of resilience that emerged from this work.

While these definitions and the documents they draw from make scant reference to the notion of resilience as found in other disciplines, they clearly share common elements with work in engineering, ecology, and psychology, and with each other. Three elements in particular are worth noting.

First, all emphasize that resilience is an ability to respond to transitory adverse events (shocks) or more persistent adverse trends (stressors). This emphasis on ability, or perhaps more accurately capacity,[4] places resilience firmly within an older tradition in economic development. Sen argued that development is concerned with the achievement of a better life and thus that discussions around specific development issues must ultimately reference "the nature of the life that people succeed in living" (1988, 15). He wrote, "People

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[2] *Wikipedia,* s.v. "resilience," accessed April 4, 2014, http://en.wikipedia.org/wiki/Resilience.

[3] Perrings (2006) provides a useful set of links between ecology and economics.

[4] Ability refers to an actual skill; capacity includes both actual and potential skills. Since resilience relates to responses to events that may occur, enhancing resilience is more precisely defined as a capacity.

BOX 2.1 DEFINITIONS OF RESILIENCE

"Disaster Resilience is the ability of countries, communities and households to manage change, by maintaining or transforming living standards in the face of shocks or stresses—such as earthquakes, drought or violent conflict—without compromising their long-term prospects" (DFID 2011, 6).

"[Resilience is] the ability of individuals, communities, organisations, or countries exposed to disasters and crises and underlying vulnerabilities to anticipate, reduce the impact of, cope with, and recover from the effects of adversity without compromising their long term prospects" (IFRC 2012, 3).

"Resilience is most often defined as the ability of individuals, communities and states and their institutions to absorb and recover from shocks, whilst positively adapting and transforming their structures and means for living in the face of long-term changes and uncertainty" (OECD 2013, 1).

"USAID defines resilience to recurrent crisis as the ability of people, households, communities, countries, and systems to mitigate, adapt to and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth" (USAID 2012, 1).

value their ability to do certain things and to achieve certain types of beings (such as being well nourished, being free from avoidable morbidity … and so on)" (15). He referred to these "'doings' and 'beings'" as "'functionings' of a person" and the ability to choose among alternative sets of functionings as a person's capabilities (15). Sen argued that the expansion of capabilities lies at the core of the concept of development. Seen in this light, resilience represents a means of protecting and enhancing a person's functionings; as such, it is central to development.

Second, the concept of resilience can be applied at different levels of aggregation: individuals (as in the psychological literature), households, communities, organizations, and systems (as in the ecology literature) or states. Third, all have a temporal focus, putting greater emphasis on the potential long-term adverse consequences of shocks. Drawing on these commonalities, Constas, Frankenberger, and Hoddinott defined resilience as follows: "Resilience is the capacity that ensures adverse stressors and shocks do not have long-lasting adverse development consequences" (2014, 6).

3. A CONCEPTUAL FRAMEWORK

Just as there are many definitions of resilience, there is a plethora of conceptual frameworks, most notably those found in Frankenberger and colleagues (2012) and DFID (2011). All share a number of common components. These include highlighting the broader environment in which a household (or locality or individual or whatever the unit of observation happens to be) resides; the resources available to that household; how that household uses those resources; how the economic returns on those uses are affected by shocks that households experience; and how the outcomes of those uses leads to consumption of food and other goods and services, savings, health and nutrition status, and other such outcomes.

The broader environment in which households are situated can be described as a series of settings—physical, social, legal, governance, and economic. The physical setting encompasses climate, geography, and infrastructure. The level and variability of rainfall, soil fertility, distances to markets, access to safe water, and quality of infrastructure are all components of the physical setting. The social setting captures such factors as the existence of trust, reciprocity, social cohesion, and strife. Norms of gender roles, notions of "correct" behaviors, and folk wisdom are also part of the social setting. The legal setting can be thought of as the "rules of the game" under which economic exchange takes place. It affects how households use their resources through the restrictions it imposes on and opportunities it creates for the production and sale of different goods, and through the regulation of labor and capital markets. The legal setting is linked to but distinct from the governance setting. The governance setting captures *how* rules are developed, implemented, and enforced. This includes the political processes that create rules—for example, centralized or decentralized decisionmaking, dictatorial or democratic processes—and the implementation of these rules through bureaucracies, parastatals, and third-party organizations. Finally, the economic setting captures policies that affect the level and variability of returns on assets and thus influence choices regarding productive activities undertaken by individuals, firms, and households.

Households have resources. These can be divided into two broad categories: time (or labor power) and capital. Time refers to the availability of physical labor for work. Capital can be divided into three categories. First are assets such as land; tools for agricultural and nonagricultural production; livestock; social capital; and financial resources that, when combined with labor, produce income. Second is human capital in the form of formal schooling and knowledge.[5] The third and final resource is human capital in the form of health and nutrition status—specifically, the physical capacity to do work. Some household resources, such as health and schooling, are always held by individuals, whereas others, such as land and financial capital, may be individually or collectively owned.

These resources are allocated to different productive activities; the bundle of activities chosen is sometimes referred to as the household's livelihood strategy. These activities include food production, cash crop production, livestock, and nonagricultural income-generating activities (such as wage labor, handicrafts, services, and so on) based on perceptions of the income each generates. Households may also receive transfer income from other households or from the state.

Income determines what resources are available for the consumption of food, for other goods, for savings, and for human capital formation (health, nutrition, schooling). However, income generated by allocating these resources to activities is affected by the likelihood of a shock's occurring, what Heitzmann, Canagarajah, and Siegel (2002) called a "risk realization." These could be shocks that emanate from the setting in which households are situated—a common or covariant shock—or they could be restricted to only this household—

[5] For example, in an agricultural household, knowledge is obtained from both formal schooling and training in agricultural production, informal knowledge obtained via trial and error, indigenous knowledge, past farming experiences, discussions with friends and relatives, observations made about practices on neighbors' farms, and so on.

an idiosyncratic shock. These shocks might be isolated, rapid-onset events such as earthquakes, or they may be manifestations of stressors resulting from longer-term processes such as climate change. Table 3.1 lists common covariate shocks by their duration; Table 3.2 describes how selected shocks affect settings, assets, livelihoods, and outcomes.

Table 3.1 Covariate shocks by their duration

Setting in which the shock takes place	Duration of the shock		
	Rapid onset	**Slow onset**	**Prolonged**
Physical	• Heavy rains; flooding • Landslides • Volcanic eruptions • Earthquakes • Hurricanes • Insect infestations (such as locusts)	• Drought • Epidemic	
Social		• Breakdown in traditional commitments of trust and reciprocity	• Ethnic strife • Civil war
Political	• Rioting • Coup d'état		• Collapse of governance
Legal		• Changes in legal environment, eroding or eliminating tenure security or title to property	
Economic	• Inflation or collapse of stock market or exchange rate leading to loss of value of financial assets	• Loss of export markets • Collapse in prices of internationally traded agricultural commodities	• Changes in fundamental structure of the economy (such as transition from centrally planned to mixed or market economy)

Source: Author, adapted from Hoddinott and Quisumbing (2010).

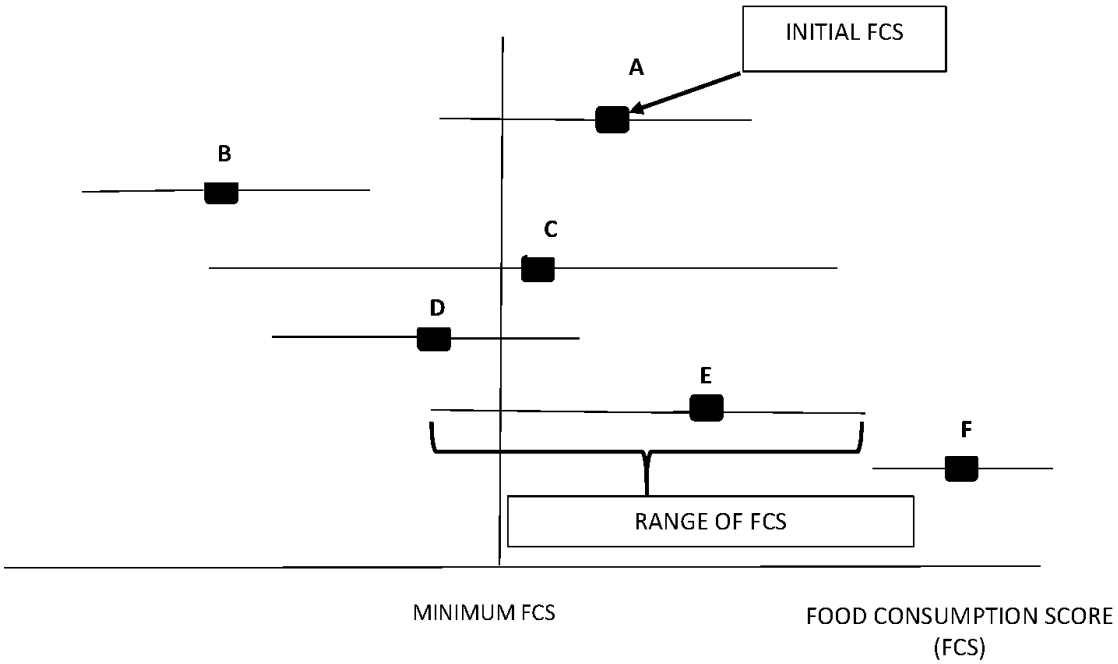
With these ideas in mind, we can now link our definition of resilience to our conceptual framework. We use as a heuristic a measure of food security called the food consumption score (FCS), but we could easily substitute some other measure of food security or a measure of nutritional status or a poverty measure. Figure 3.1 graphs two elements of the FCS for six households, its initial level—shown by the dark rectangles—and its range or variability—shown by the horizontal lines going outward from each rectangle. The initial value reflects the settings and resources available to households as well as their livelihood strategies and shocks that may have occurred. As shown in Figure 3.1, four households (A, C, E, and F) are food secure (that is, their FCSs lie to the right of the minimum-FCS vertical line) and two (B and D) are food insecure (that is, their FCSs lie to the left of the minimum-FCS vertical line). The range gives us an indication as to how, given these settings, resources, and activity choices, shocks of different types and severity will affect the FCS. The length of these horizontal lines tells us by how much different households may be affected by shocks. Compare households C and F. As depicted in Figure 3.1, both are food secure. The range of FCS for household F is relatively small—consistent, for example, with this household's deriving income from reliable salaried employment. In contrast, the range of FCS for household C is much larger—consistent, for example, with this household's having a reasonably large stock of productive assets (which is why it is food secure) but being reliant on, say, rainfed agriculture, which accounts for the wider range of possible FCS outcomes. In Figure 3.1, given the range of possible FCS values that we could observe for these households, five households (A, B, C, D, and E) are vulnerable to becoming food insecure. The minimum possible values for their FCSs all lie to the left of the minimum FCS level.

Table 3.2 Examples of impacts of selected shocks on settings, assets, livelihoods, and outcomes

Shock	Setting in which shock takes place / impacts on that setting	Possible impacts on other settings	Impact on household assets	Impact on livelihoods and outcomes	
				Availability of and returns on income-earning activities	Availability and real costs of transactions
Floods, landslides, earthquakes, hurricanes	**Physical:** Destruction of public physical infrastructure (roads, bridges, clinics, water systems, and so on)	**Economic:** Increased prices of food and other goods **Social:** Breakdown of social cohesion if recovery is not rapid	• Damage to or destruction of productive and other household assets	• General reduction in wage labor and other off-farm opportunities • Reduced access to agricultural inputs; inability to sell agricultural surplus	• Increased real costs of food and other goods consumed by the households • Some goods either unavailable or rationed • Difficulty in accessing publicly provided goods such as schooling and healthcare
Drought	**Physical:** Reduced soil moisture for plant growth; possibly reduced surface or ground water for drinking	**Economic:** Increased prices, reduced availability of food; possible decisions by government to limit food trade	• Damage to tree crops; soil erosion	• Reduction in returns on labor and other inputs in agriculture • Fewer wage labor opportunities in agriculture	• Increased real costs of food; staples may be unavailable
Civil strife	**Social:** Reduced social cohesion, increased violence	**Political:** More authoritarian government **Legal:** More restrictive laws; less personal freedom **Physical:** Destruction of public infrastructure **Economic:** Increased prices	• Temporary or permanent confiscation of physical assets • Loss of labor through abduction, conscription, or imprisonment • Forced relocation	• Reduced access to agricultural inputs; difficulty selling agricultural surplus • Reductions in returns due to insecurity, lower output prices • Reduced hiring of agricultural labor	• Increased real costs of food and other goods consumed by the household • Some goods either unavailable or rationed • Difficulty in accessing publicly provided goods such as schooling and healthcare

Source: Author, adapted from Hoddinott and Quisumbing (2010).

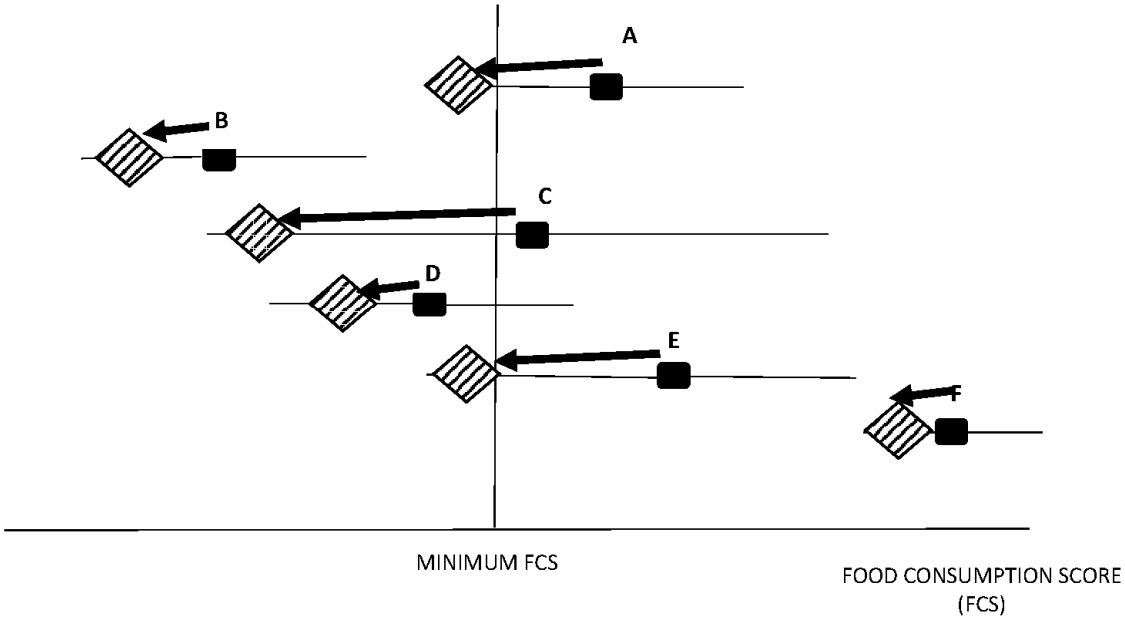
Figure 3.1 Initial food security outcomes for six households



Source: Author.

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

Figure 3.2 Food security outcomes for six households following adverse shock

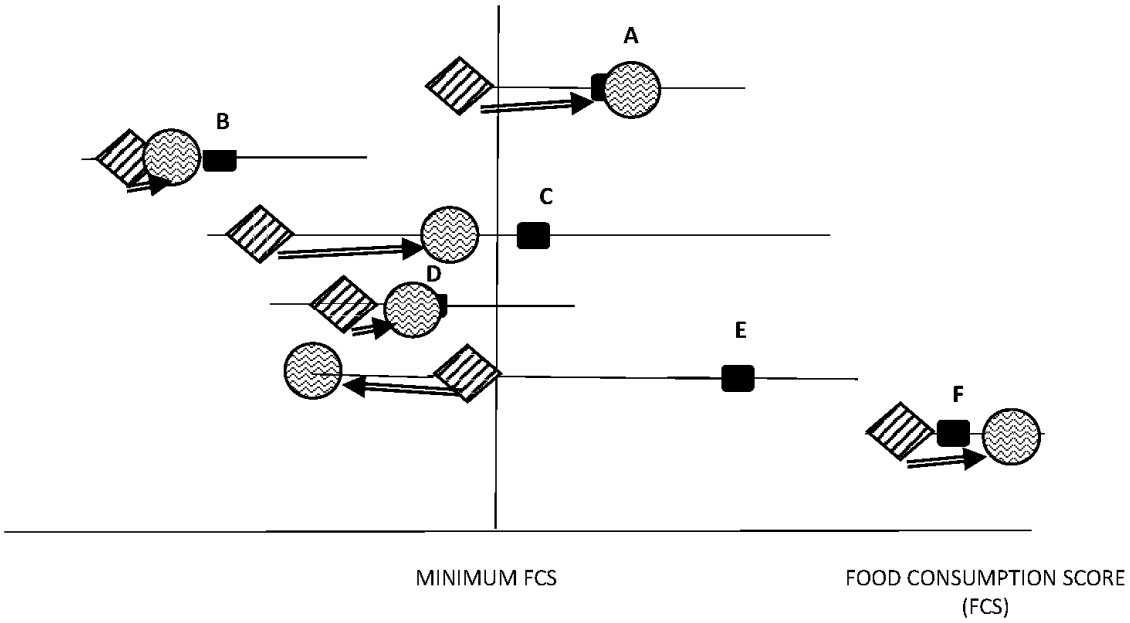


Source: Author.

Now consider Figure 3.3. This figure describes the food security status of each household after the shock has passed. Figure 3.3 shows heterogeneity in recovery from this shock. FCS in this period is denoted by

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

Figure 3.3 Food security outcomes for six households during recovery



Source: Author.

Taking this sequence of figures together with the definition given in Section 2, we can see that households A, D, and F would appear to be resilient—they were able to recover and return to their preshock level of FCS. Households B and C exhibit some resilience inasmuch as their FCS partially recovers. Household E exhibits no resilience.

A useful feature of this framework is that it helps distinguish the study of resilience from earlier work on vulnerability. Vulnerability is the "likelihood that at a given time in the future, an individual will have a level of welfare below some norm or benchmark" (Hoddinott and Quisumbing 2010, 72) and is captured by Figures 3.1 and 3.2. Work on vulnerability and resilience do share common features. They both emphasize that households and individuals do not live and work in isolation but rather are strongly influenced by the settings they find themselves in. They both give prominence to the asset holdings of households, where these assets are broadly defined. Both resilience and vulnerability emphasize that the conjunction of settings and assets determines livelihood strategies, and these strategies are both affected by shocks and stressors and respond to shocks and stressors. However, vulnerability work focuses on the question, "Will shocks push people into poverty?" Work on resilience asks, "Do shocks or stressors have *long-term* adverse consequences?" Box 3.1 provides an example of this difference.

Figure 3.4 illustrates this idea. It graphs the food security status of two households, HH-Q (the solid line) and HH-R (the dashed line), over time. Initially both have the same food security status. In the aftermath of a shock, their food security falls. However, HH-Q sees its food security gradually recover. In contrast, HH-R's food security recovers more slowly and HH-R never fully regains its preshock level of food security. HH-Q is resilient to this shock; HH-R is not.

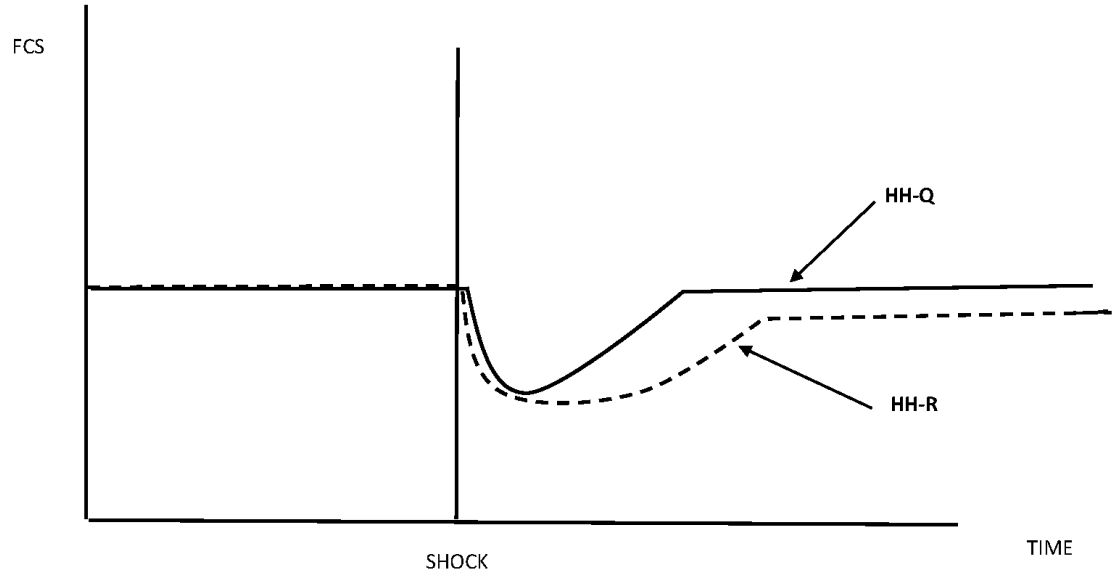
BOX 3.1 DISTINGUISHING BETWEEN VULNERABILITY AND RESILIENCE USING DATA ON CHILD ANTHROPOMETRY: A ZIMBABWEAN CASE STUDY

Hoddinott and Kinsey (2001) examined the impact of a severe drought on the anthropometric status of preschool children in rural Zimbabwe. Their study is useful in showing how the concept of resilience can be extended beyond food security and how resilience can be distinguished from vulnerability.

Hoddinott and Kinsey began by examining the impact of the 1994–1995 drought on the linear (height) growth of children. Children aged 12–24 months in the year following the drought grew 15–20 percent more slowly than comparably aged children who had not been exposed to the drought. As is well known, children aged 0–24 months are at risk of growth faltering because they are at a point in their life cycle at which they should be growing rapidly, and they have high nutrient requirements and limited immunity to disease. Consistent with this set of facts, older children in this sample—those aged 24–36 months, 36–48 months, and 48–60 months—experienced no reduction in growth. So in this sample, children 12–24 months were vulnerable.

Hoddinott and Kinsey followed these vulnerable children for four years after the 1994–1995 drought. When they remeasured these children at ages 60–72 months, they found that they had height-for-age z scores about six-tenths of a standard deviation below that of comparable children not affected by the 1994–1995 drought. However, when they estimated a maternal fixed effects regression that accounted for predrought household wealth, they found that children from wealthier households suffered no long-term adverse effects from this drought. Children from poorer households, in contrast, experienced a growth slowdown that had persisted to age 60–72 months. So while all children 12–24 months were vulnerable to the malign effects of the drought shock, children in wealthier households exhibited resilience; children in poorer households did not.

Figure 3.4 Food security and resilience over time

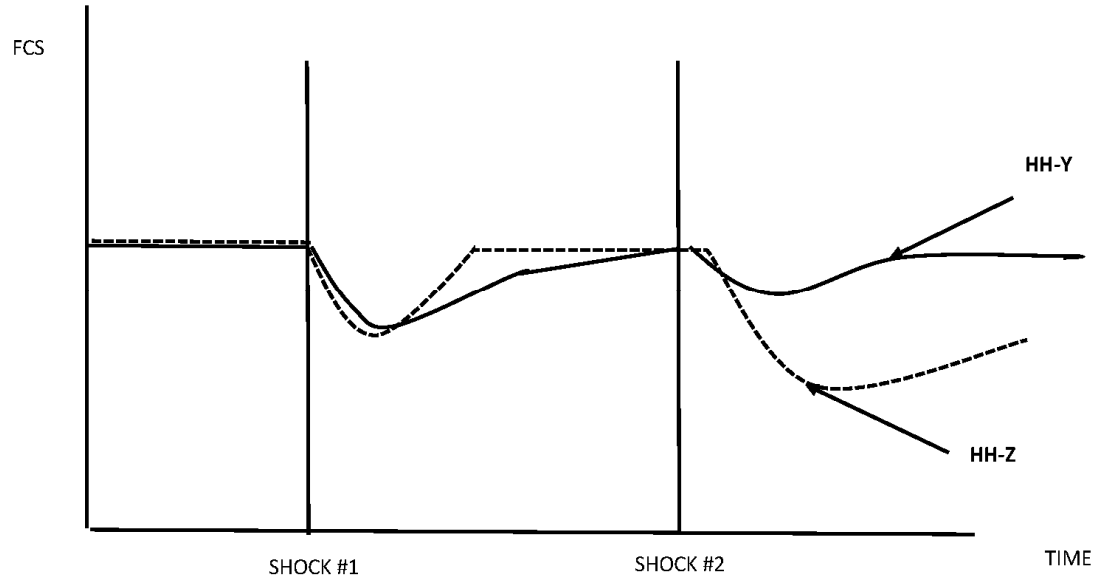


Source: Author.
Notes: FCS = food consumption score; HH-Q = household Q; HH-R = household R.

Finally, consider a variant of the paths shown by Figure 3.4. In Figure 3.5, we have two households that have, at the outset, similar levels of food security. Both experience a shock that causes food security to first fall before recovering. However, a second shock then occurs. Household Y recovers quickly from this second shock, but household Z does not. Instead, its food security falls to a new, lower level. Household Z seemed resilient in the face of one shock but could not manage a second. The reason for this lies in the capacity to respond and how it differs across households. For example, if a household is forced to sell off assets (thereby compromising future FCS) or undertakes a risky income-generating activity that might have undesirable future consequences (for example, a woman's undertaking transactional sex to obtain money to

buy food but, by so doing, increasing her risk of contracting HIV), then while the household might appear resilient, these responses imperil future food security.

Figure 3.5 Food security and resilience with multiple shocks



Source: Author.
Notes: FCS = food consumption score; HH-Y = household Y; HH-Z = household Z.

Hoddinott (2006) provides an example of these processes at work in the context of the 1994–1995 drought in southern Africa. In his survey of resettlement localities in three parts of rural Zimbabwe, households' principal assets were land, livestock, and human capital. These assets were used to generate income derived from agricultural activities; in nondrought years, agricultural activities (principally maize production, cash crops such as tobacco and cotton, and income from livestock) accounted for a little less than 80 percent of total household income. In 1994–1995, rainfall fell by 20 to 40 percent (depending on location), causing agricultural incomes to fall by more than half. Household responses to this shock differed markedly by level of asset ownership. Specifically, both econometric evidence (Owens, Hoddinott, and Kinsey 2003) and conversations with farmers themselves indicated that a span of oxen (two animals) was needed for plowing and that the absence of these severely constrained households' ability to generate income. Households with more than two oxen were three times more likely to sell at least one ox than households with one or two oxen—showing that the threat of irreversibility significantly affected household behavior. However, women in households that did not sell oxen experienced a larger loss of body mass, and preschool children in households with low oxen holdings experienced a reduction in growth velocity that proved to be permanent. In addition to illustrating the nature of these feedback mechanisms, this study illustrates several other issues—the nature of the difficult decisions households face in the aftermath of a significant income shock, the way in which these decisions are affected by the threat of a poverty trap, and the value of disaggregating the conceptual framework further so as to take into account how household responses to shocks are shaped by intrahousehold allocation rules.[6] Also worth noting is the frequently made assumption that in the aftermath of a shock, the households most badly affected are those that sell assets. In this case, the most badly affected households were those *not* selling assets, and indeed it was children within these households who most suffered irreversible consequences of the 1994–1995 drought.

[6] Very loosely, these can be described as "who does what," "who gets what," and "who decides who does what and gets what." See Haddad, Hoddinott, and Alderman (1997) for a lengthier treatment.

4. IMPLICATIONS FOR MEASUREMENT

A growing body of work attempts to provide metrics for resilience. Examples include Alinovi and others (2010); Alinovi, Mane, and Romano (2008); Constas and Barrett (2013); and Collins (2013). Examining this work in detail is beyond the scope of this paper. Instead, we provide some general observations.

We begin by noting that these metrics must distinguish between the ex ante (preshock) capacity of resilience and the ex post time path of the outcome (food security, nutrition, and so on) after the shock has occurred. Provided comparable data are collected over an appropriate time frame (see Barrett and Headey 2014), collection and analysis of the ex post time path can draw heavily on existing metrics. For example, in the case of undernutrition, we could track weight for height and height for age, assessing the timing and severity of their fall and the length of time it takes to recover from the shock.

Most attention has focused on measuring ex ante capacity to be resilient. Much of this work aims to construct a resilience index. This index could take the form of a scale aggregating across a set of diverse assets, livelihood activities, and outcomes. The scale could be based on arbitrarily chosen weights or on a principal components analysis. In addition, or possibly alternatively, the index could be based on responses to questions regarding households' perceptions of their resilience. Measures of resilience capacity are still in their infancy. Work on them must grapple with several difficult problems, including the following.

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

Much of the work done on resilience indexes focuses on levels of assets. These are important, but so too are the returns on assets. As noted in Table 3.2, a single drought does not necessarily destroy land as an asset but it does dramatically diminish the income generated from the land. The Zimbabwe example emphasizes that the relationship between assets and resilience may be nonlinear and that this is difficult to capture in a single index. Earlier literature on the economics of famines offers an additional caveat. Devereux wrote, "Another reason why the focus on incomes [or assets—my annotation] is incomplete is that it fails to consider non-market entitlements—which include not just aid and welfare transfers, but also the complex social relationships that exist between rural households (the 'moral economy' and extended family networks, patron-client bonds, reciprocity and sharing arrangements)" (1993, 75).

There is a difficult question of whether welfare weights should be attached to these indexes. Suppose we wish to assess the success of an intervention designed to increase resilience capacity in the context of a locality with households like those shown in Figure 3.1. Do we ascribe equal weight to increasing the resilience of any household—so that a unit improvement in the resilience of the most well-off household (F) and a unit improvement in the resilience of the poorest household (B) are valued equally? Or do we put more weight on improving the resilience of less-advantaged households? How do we make these decisions gender sensitive? Determining weights and how they are applied is not straightforward. In our example that runs through Figures 3.1–3.3, household E looks relatively well off initially but proves to be less resilient than other households.

Two further points are worth noting. Much of the focus on measurement has been on the resilience capacity of individuals or households. But as the discussion of definitions makes clear, resilience can also be thought of in terms of institutions, governments, informal social protection mechanisms, or put more generally, systems (the focus of resilience work in ecology)—and there has been much less work on measuring

resilience at these levels. Last, any proposed measure should be subject to tests of validity and reliability; in the case of measures of resilience capacity, we are also interested in understanding their predictive power. As yet, there is little work in these areas.

5. IMPLICATIONS FOR POLICY AND PRACTICE

In a number of development agencies, resilience has emerged not so much as a new conceptual construct but rather as an organizing framework that integrates humanitarian and development efforts. As an organizing framework, there is scope for taking it further. Efforts to mitigate and adapt to climate change are one example. While current development discourse treats such efforts as a distinct activity, using resilience as an organizing framework is a means of mainstreaming them in broader development efforts. Work on strengthening informal and formal collective action, including work on governance, also becomes integrated into a broader development effort. A shift from a focus on risk and vulnerability to one on resilience has an added merit of emphasizing the positive over the negative or maladaptive; indeed Rutter (2012) noted that this is one reason underpinning its widespread use in psychology. But if the contribution of resilience to development policy and practice is merely rhetorical, it is not clear that it is worth all the attention it currently receives. There are, however, other implications of looking at food security and nutrition, or indeed broader development objectives, through a resilience lens.

In psychology and ecology, people and species do not live in isolation. Rather, they are part of a broader social or ecological system. Indeed, in the child psychology literature, the ability of children to access a supportive network is often seen as a core element of their resilience. With some exceptions (for example, work on strengthening governance and work on certain types of informal support mechanisms, such as women's savings and credit or income-generating groups), many current development efforts bypass systems and instead focus on individuals. Given how time-consuming, frustrating, and difficult it can be to work within existing systems such as government structures, bypassing these—and in some cases setting up parallel structures—means that when called upon in time of need, such systems themselves are not resilient. Rather than assisting affected households and individuals in bouncing back more quickly, they crumble. So one implication of an approach to development grounded in the notion of resilience is increased attention to systems, especially governance. That said, systems do not and should not work in isolation, either! Rather, increased attention to resilience implies thinking holistically about development interventions. A good example—an appropriate one given the location of this conference—is Ethiopia's Productive Safety Net Programme (PSNP).

For many years, the government of Ethiopia launched near-annual emergency appeals for food aid and other forms of emergency assistance. While these succeeded in averting mass starvation, they did not banish the threat of further famine and they did not prevent asset depletion—in other words, they did not enhance resilience capacity. Starting in 2005, the government of Ethiopia and a consortium of donors implemented a new response to chronic food insecurity in rural Ethiopia. Rather than annual appeals for assistance and ad hoc distributions, the PSNP was established. The objective of the PSNP is "to provide transfers to the food insecure population in chronically food insecure *woredas* [districts] in a way that prevents asset depletion at the household level and creates assets at the community level" (Ethiopia, Ministry of Agriculture and Rural Development 2010, 5). It is a multiyear program so as to provide recipients with predictable and reliable transfers. Most beneficiary households participate in Public Works: criteria for selection into these are that the households are poor (for example, they have low holdings of land, cattle, or both) and food insecure, but they also have able-bodied labor power. A much smaller proportion of beneficiaries receive Direct Support: these households are poorer than those receiving public works employment and lack labor power; this group includes households whose primary income earners are elderly or disabled. A significant fraction of the public works are environmental activities—gully reclamation, flood control, reforestation, and so on. The transfers both improve household food security and protect assets (Berhane et al. 2014), thus contributing to resilience capacity. The environmental activities make local ecological systems both less risk prone and more resilient. Importantly, the PSNP is not a stand-alone, donor-driven initiative. Rather, it is a government of Ethiopia program implemented through government structures in partnership with donors who provide funding and technical assistance. Over time, the PSNP has extended

local government capacity to estimate needs for assistance and to plan and deliver that assistance, thereby building resilience at the state level (Berhane et al. 2013).

Resilience focuses attention on the idea that short-term shocks are malign not just because of their immediate effects but because of their adverse long-term consequences. This is especially important in the context of addressing chronic undernutrition. Among others, Alderman, Hoddinott, and Kinsey (2006) documented that not only do shocks and stressors such as civil war and drought have immediate effects on preschool children's nutritional status but these effects persist into adulthood. Hoddinott and colleagues (2013) showed that undernourished children have less human capital in adulthood, have lower consumption levels, and are significantly more likely to be poor.

In turn, this takes us to a final implication of a resilience lens to development. Nearly 40 years ago, T. W. Schultz, the first economist to win the Nobel Prize for work on economic development, wrote that perhaps the most important value of schooling, or of human capital development more generally, lay in the ability it gave individuals to deal with disequilibria—changes both positive and negative (Schultz 1975). Children in households with greater resilience are likely to be better nourished and better schooled; in turn, as adults, these children will likely be more resilient to the shocks and stressors they face. In this sense, a resilience lens gives especial importance to human capital formation (health, schooling, nutrition) as a means of building sustainable resilience.

6. SUMMARY

New ideas in development and elsewhere are often characterized by a "hype cycle" (Gartner Inc. 2014). As of early 2014, resilience is rapidly moving along this cycle, lying somewhere between the initial trigger that kicks things off and the peak of expectations. Does the trough of disillusion beckon?

While there is much rhetoric around resilience, to say nothing of a multitude of definitions and conceptual frameworks, the similarities across these constructs dwarf their differences. All emphasize that resilience is the capacity to respond to transitory adverse events (shocks) or more persistent adverse trends (stressors). The concept of resilience can be applied at different levels of aggregation. Finally, resilience has an important temporal focus, putting particular emphasis on the potential long-term adverse consequences of shocks. The challenges are twofold: to put resilience into practice and to develop robust measures of resilience capacity.

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