COMMUNITY RESILIENCE AND WEALTH:

The Challenges and Opportunities for Rural Communities in a Rapidly Changing World

Appendix C

A Review of the Historical Evolution and Meaning of the Concept of Resilience

APPENDIX C: A REVIEW OF THE HISTORICAL EVOLUTION AND MEANING OF THE CONCEPT OF RESILIENCE

Overview: Origin and Evolution of the Concept of Resilience

The concept of resilience does not have an origin in only one discipline. In ecology, it emerged as a central research theme and working concept in the early 1970s, though far earlier mentions exist (e.g., Errington 1953). Since the 1970s, however, resilience has been an important research topic in natural science, ecology, natural resource and environmental management, and has evolved and changed in meaning over time. Researchers in other disciplines and related fields have adopted and adapted it for their purposes (for recent reviews, see Brand and Jax 2007; Folke 2006; Gallopin 2006; Gunderson 2009).

In risk, hazards, and disaster studies, the origin of resilience is more difficult to track, though the concept has been absolutely central to the concerns of hazards management, hazard mitigation, and recovery since the inception of the field in the 1930s. Closely related notions of vulnerability, coping with extreme events, and a system's or community's capacity to recover and adapt have been central research topics for hazards experts since the early 1970s. Since the early 1990s, resilience is pervasive both as a topic of research and as a description of either means or goal of a system that is able to anticipate, prepare for, respond effectively to, and recover without major losses and interruption from hazardous events (Cutter et al. 2008; Cannon 2008).

Related branches developed in engineering, economics, sociology and psychology adopted the concept of resilience as an important research focus. Engineering became interested in designing infrastructure and technological systems which can withstand extreme conditions and disruptions (e.g., http://ciasce.asce.org/; Hollnagel, Woods, and Leveson 2006; ICE 2008); economists focused on understanding how businesses and industry can be structured and sustained through periods of disruption (not just from natural disasters but other economic shocks and down-turns as well); some of this thinking has entered more recently into development studies (e.g., Rose 2004; Rose and Liao 2005; Arrow et al. 1995; Farber 1995; Briguglio et al. 2005); in psychology, hazard-related studies emerged of mental health and individuals', families' and communities' psychological capabilities "to keep going" after traumatic events (e.g., Norris et al. 2008; Luthar, Cicchetti, and Becker 2003; Fredrickson et al. 2003; Bonnano 2004); others focus more on organizational and institutional set-up to be most responsive and robust during crisis times (e.g., Berkes and Turner 2006; Adger 2003a; Lebel et al. 2006; Vogel et al. 2007).

The now pervasive presence of the term "resilience" that emerged over the last decade or so has led to countless novel investigations in various fields, a burgeoning and hard-to-follow literature, but also considerable confusion in terminology because different fields and disciplines use the concept slightly differently. Moreover, in recent years, resilience in common parlance has come to be used almost synonymously with "sustainability," or better maybe as "the new sustainability" – persistence in the face of disturbances and change, as some of the definitions offered by interviewees reveal (see the discussion in the main body of the report). While a welcome development in some respects, the core meaning of the term is increasingly diluted or forgotten, thus potentially producing conceptual confusion rather than analytical clarity and practical strength.

Several helpful reviews of this diverse literature have been published in the last few years (though none is complete), tracing not only the evolution of resilience, but also that of related concepts such as adaptation, adaptive capacity, robustness, transformability, vulnerability, and the latter concept's commonly discussed components of exposure, sensitivity (or resistance), and coping capacity (e.g., Klein, Nicholls, and Thomalla 2003; Adger 2006; Folke 2006; Gallopin 2006; Smit and Wandel 2006; Manyena 2006; Brand and Jax 2007; O'Brien et al. 2007; Cutter et al. 2008; Morrow 2008; Moser 2008; Gunderson 2009). We point the reader to these for deeper explorations of these fields. Below, we focus on just some to emphasize key components of the current understanding of resilience.

Selected Definitions of Resilience

Ecology, Resource Management and the Study of Social-Ecological Systems

As described above in the brief history of interest in resilience, ecology has studied resilience for at least three decades and likely for significantly longer. Holling's groundbreaking work in the 1970s is the foundation for much of today's ecological research on resilience. Holling and colleagues within the Resilience Alliance (see Appendix B) define the concept as reflecting (1) the level of disturbance that an ecosystem can absorb without crossing

a threshold to a different ecosystem structure or state (i.e., retain the same controls on function and structure), (2) the capacity to self-organize into an initial configuration and into a new configuration after disturbance. This *ecological resilience* emphasizes qualities such as persistence, variability, sustainability, regime shifts, and unpredictability) (Holling 1996; Walker et al. 2006a, p.14; Folke, et al. 2002, p.13).

Most simply put, ecological resilience is a characteristic of ecosystems to maintain themselves in the face of disturbance (Adger 2000). One critical implication of this definition is that resilience does not only help to maintain systems in a desirable state, but potentially also in an undesirable one – a situation commonly referred to as a "trap" (e.g., Allison and Hobbs 2004). Over time, ecological researchers made two important adaptations in their understanding of resilience. One was the recognition of a changing environment, the other the recognition – for virtually all natural and managed ecosystems – of the tight interaction of ecological and social processes that determine the system's ability to function. Thus, later definitions recognize resilience as the capacity of a system to absorb disturbance and *reorganize while undergoing change* so as to still retain essentially the same function, structure, identity, and feedbacks (Walker et al. 2004). The human role is reflected in the imperative of "good ecosystem stewardship," to keep ecosystems stable and productive (WRI 2008).

With the growing recognition of the human role in the management of natural resources and ecosystems, researchers now emphasize the human dimensions more than in earlier studies. For example, Gunderson and Folke (2005) emphasize the role of people in the ability to stay the same and – if necessary – to renew and adapt: Resilience is the "return or recovery time of a social-ecological system, determined by (1) that system's capacity for renewal in a dynamic environment and (2) people's ability to learn and change (which, in turn, is partially determined by the institutional context for knowledge sharing, learning, and management, and partially by the social capital among people)."

Disaster, Hazards, Risk and Emergency Management Field

In a recent review of the relevant hazards literature, (Cutter et al. 2008, p.1) acknowledged that, "While there is considerable research and federal activity in the area of disaster resilience, there is no common definition of resilience." In one widely referenced definition, resilience is defined as "the capacity of a system, community, or society potentially exposed to hazards to adapt, by resisting or changing, in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures" (SDR 2005, p.17).

Older definitions emphasized more the return 'back to normal' – a form of *engineering* resilience, where resilience is the capacity to return over a short period of time after disturbance to a prior (relatively stable) state. This conceptualization emphasizes qualities such as efficiency, control, constancy, stability, and predictability.

Other hazards researchers emphasize to varying degrees different aspects, including:

- The ability to anticipate and prepare for hazardous events;
- Include hazard mitigation (i.e., preventive or minimizing measures) in planning;
- Contain the impacts if and when a disaster occurs,
- Absorb shocks and remain essentially the same in terms of community character, cohesion and capacity;
- Minimize social and economic disruption during and after a hazardous event;
- Avoid permanent impairment of public safety, health, and security;
- Quickly recover and be fully functional again;
- Learn from the event and adapt; and
- Include hazard mitigation measures in the course of rebuilding and recovery so as to reduce future risks (e.g., Timmerman 1981; Paton, Smith, and Violanti 2000; Bruneau et al. 2003; Klein, Nicholls, and Thomalla 2003; Manyena 2006).

Interestingly, researchers disagree whether resilience encompasses all of these dimensions or is separate from some. For example, Wildavsky (1988) viewed the ability to anticipate risks not as a characteristic of resilience. He confines resilience to the capability to respond, rather than to prepare for a hazardous event

Hazards researchers, frequently motivated by the desire to minimize harm to individuals and communities, focus strongly on the human component of social-ecological systems, including the psychological ability to cope with trauma, the social cohesion of communities, economic stability and functioning, the stability and functioning of the human-built environment, and facilitative organizational, institutional and governance aspects. At the same time, they recognize that functional ecosystems and environments and well built infrastructure, homes, and protective structures are essential components of community resilience. Historically, the natural and built aspects of social-ecological systems were maybe even more central to hazards studies, while in the last few decades substantial attention has been paid to the human dynamics that do or don't make a system resilient.

The Community and Regional Resilience Institute (CARRI) adopted such a hybrid approach and definition, by defining a resilient community as one that (1) anticipates shocks and hazards, (2) reduces vulnerability as much as possible, (3) responds effectively, efficiently and equitably, and (4) recovers rapidly and fairly in a way that makes the community safer all around (http://www.resilientus.org/).

Economic Resilience in Disaster and Development Studies

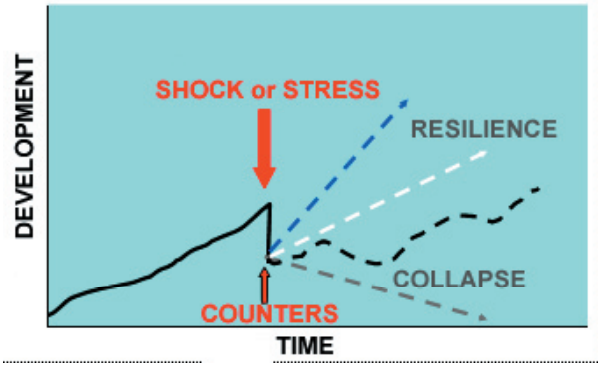
Interestingly, while ecologists and disaster researchers increasingly recognize the importance of the human dimension and social resilience, economists and engineers increasingly emphasize the maintenance of ecosystem functioning, natural capital, and ecosystem goods and services as the basis for social systems' functioning in the long run (Ott and Döring 2004; Millennium Ecosystem Assessment 2005). This coming together of ideas is much welcome and needed to advance the understanding of resilience. The specific contribution from economists is particularly interesting in the context of this report as economic viability, renewal, entrepreneurship, and long-term sustainability of forest-based communities are of particular interest to the Endowment.

Maybe somewhat surprising, and yet entirely consistent with the focus of this report, are the valuable contributions and insights from development studies. This body of literature exists rather separate from rural development in developed nations, yet the situation of many rural communities in the US shares some important commonalities in challenges and disadvantages as the even more marginalized rural communities in developing nations. In its annual report (focused entirely on developing nations), WRI (2008, p.28) defined economic resilience as "the ability to recover from adverse economic conditions or economic shocks" (see also Briguglio et al. 2005, pp.6–7). WRI continued, "It encompasses having a variety of economic options available if a particular economic activity fails or being able to create more options if necessary. It benefits from being able to call on a wide variety of skill sets and contacts." The importance of social skills and networks to be economically resilient is particularly noteworthy.

Other researchers offer similar or related definitions. Perrings (2006), for example, defines economic resilience as "the ability of the system to withstand either market or environmental shocks without losing the capacity to allocate resources efficiently," implying that efficient resource allocation translates directly into social welfare. Somewhat less focused on disruptions or shocks to the economic system, the (Centre for Community Enterprise 2000) focuses more on forward-looking self-determination. Thus, members of a resilient community are able to take "intentional action to enhance the personal and collective capacity of its citizens and institutions to respond to, and influence the course of social and economic change." Adapting the "engineering" resilience discussed above, (Liu et al. 2007) refer to resilience as "the capability to retain similar structures and functioning after disturbances for continuous development."

These definitions raise an important question, namely what trajectory communities, sectors, or economies take after a disruptive event (see Figure 1 below). For example, what is meant by the notion "return to normal" – the same level of development, the same kind of development, a return to the same rate of economic growth, a return to basic economic functioning and exchange, or a return to the same level of economic wealth. By contrast, the CARRI notion of resilience assumes that a resilient community recovers after a disruptive event "better, safer, and faster," i.e., remedies to some extent past maladapatations and unsustainable development practices. Clearly, in a rapidly changing economic environment, it seems unwise to want to return entirely back to the pre-disruptive state, and instead build into the recovery a component of adaptation to whatever the new context is while reviewing whether the past economic structure and activity served the community.

Figure 1 - Concept of resilience



Source: http://www.dfid.gov.uk

WRI (2008) therefore suggests that economically resilient, community-based enterprises depend heavily on a variety of skills that enable adaptability over time (much like in other disciplines, moving toward far more dynamic definitions of resilience). For example, learning skills and actual learning from past errors and experiments are found to be central to resilience and adaptability over time, as are expanding commercial networks, diversifying the local economy, building entrepreneurial skills, and inclusive local organizations with the organizational skills and business experience to succeed in a variety of social enterprises (WRI, 2008, p.71). "Indeed, social resilience is not about avoiding change but about gaining the tools to survive and reorganize when change is inevitable" (WRI 2008, p.28-29).

Other Studies of Community Social Resilience

Across a number of disciplines and fields of study (e.g., global change research, rural sociology, governance and institutions), researchers have paid specific attention to the human aspects and capacities that can enhance resilience (e.g., Smit and Pilifosova 2003; Adger et al. 2004; Adger et al. 2007; Brooks, Neil Adger, and Kelly 2005; Brooks and Adger 2005; Pelling et al. 2007; Smit and Wandel 2006; Folke, Carpenter, Elmqvist, Gunderson, Holling, and Walker 2002; Gallopín 2006; Smith, Klein, and Huq 2003).

In these studies, social resilience is sometimes equated with, and other times a critical ingredient of the wider concept of, community resilience. For example, Adger (2000) equates the two: "Social resilience is the ability of groups or communities to cope with external stresses and disturbances as a result of social, political, and environmental change (p. 347) [...] the ability of communities to withstand external shocks to their social infrastructure" (Adger 2000, p. 361). In later publications (e.g., Adger 2003a; Adger 2003b; Adger et al. 2005), he essentially adopts the definition offered by members of the Resilience Alliance (see Ecology section above), but emphasizes the role of institutions and social capital in persisting in the face of stress and in building capacity to learn and adapt to changing conditions.

Relevant work here (e.g., Abel and Langston 2001; Turner et al. 2003; Robards and Alessa 2004; Anderies, Janssen, and Ostrom 2004; Allenby and Fink 2005) refers to resilience as involving several components, including:

- An ability to recover from a stress (a present or past dimension related to currently available capacities, structures and processes).
- An ability to buffer against and persist through future stresses (an explicit future orientation).
- An ability to anticipate ahead of time, recognize current, and adapt to future stresses (both gradual and rapid changes and perturbations) (an explicit focus on anticipation, observation, learning, and making changes in advance of future stresses).
- An ability to deal effectively with both internal and external stressors.

Some researchers point to the proactive ability of communities to improve upon current social conditions, defining resilience explicitly as "the ability to respond to crises in ways that strengthen community bonds, resources, and the community's capacity to cope" (Chenoweth and Stehlik 2001). Others recognize that community are not always able to improve upon a situation, but can deal with whatever the dynamic environment may bring them (Robards and Alessa 2004). This is also recognized by Kofinas (2003), who found that there are two types of social resilience: (1) a social system's capacity to facilitate human efforts to deduce the trends of change, reduce vulnerabilities, and facilitate adaptation... often related to the effectiveness of social institutions to serve society in adapting and innovating in the face of novel conditions; and (2) the capacity of a [social-ecological system] to sustain preferred modes of economic activity."

WRI (2008, p.28) distinguishes social resilience from community resilience, stating that it is one essential component (ecological and economic resilience being the other two components). It defines social resilience specifically as "the ability to face internal or external crises and effectively resolve them. In the best cases it may allow groups to not simply resolve crises but also learn from and be strengthened by them," to work together for mutual benefit (see also Brenson-Lazan 2003, p.1). "It implies an ability to cohere as a community and to solve problems together in spite of differences within the community. Social capital and a shared sense of identity and common purpose support this aspect of resilience" (WRI 2008, p.28). As a result, resilience cushions the impacts of stresses such as economic recession, climate change or social disruption, and helps provide needed social stability (WRI 2008, p.vii), keeps communities rooted (WRI 2008, p.189), and helps them emerge out of poverty and thrive (WRI 2008, p.ix). In short, while the ability to build functional and inclusive institutions, social cohesion, a common vision, collaborative skills, accountability, adaptability, dense social networks, economic opportunities, financial options, the courage to innovate, and business skills can foster social resilience, the loss of traditional livelihoods, political (or other forms of) marginalization, and break-down of traditional institutions can diminish it (WRI 2008; Walker and Salt 2006; Walker et al. 2006b).

Summary

By way of summarizing what researchers and practitioners have found to be "ingredients" of community resilience, we offer the following summary table. The items listed in each of the categories are not organized by importance; these are simply the factors and elements that scientists and practitioners (including those in our interviews) have found to be important.

Community Dimension	**Traits of, and Ways to Enhance, Community Resilience** Adaptive capacity to change + Coping capacity in the face of shocks + Capacity for self-determination	
Economic	• Diversification • Decentralization • Flexible resources • Local control of capital • Moderate but steady funding • Asset-based development • Resourcefulness • Relevant resources and skills available locally (type, accessibility, availability, cost of use, and location all matter)	• Some access to outside resources • Grants to do economic development plans • Identify niches to improve economic health • Marketing skills • Middle class jobs • Public financing • Investments • Infusion of private capital • Insurance

Community Dimension	Traits of, and Ways to Enhance, Community Resilience Adaptive capacity to change + Coping capacity in the face of shocks + Capacity for self-determination	
Ecological	• Maintenance of functionality • Ecosystem goods and services • Inherent right and benefit of species existence	• Redundancy • Biodiversity (genetic to habitat diversity) • Connectivity (among habitats) through corridors
Institutional	• Strong local institutions • Collaboration among institutions, and partnerships between agencies, community groups and commercial enterprises • Redundancy • Transparency	• Collaboration with academic institutions for the benefit of the community • Ability to access outside resources • Having a gathering space • Policy changes to support local capacity building • Improvisational flexibility
Social	• Stable (or growing) population • Ability to convene people • Informal and formal opportunities to exchange and bonding • Access and exchange with outside • Engaged citizenry, collaboration among communities, across region • Inclusiveness and broad participation • Trust • Reaching across cultural barriers • Forming coalitions and increasing network connectivity (within and between communities)	• Communities of interest (members share a common area of interest, expertise or skills; communities bound together by faith, religion, culture, business or commercial interests, or common sporting and recreational interests) • In-migration of new community members • Shared community values, aspirations and goals • Shared and positive sense of the future • Commitment to community as a whole • Agreement on community goals • Shared culture
Human	• Innovative leadership • Women and younger individuals in leadership roles • Willingness to experiment with new ideas, curiosity • A forward-looking culture • Proactive leadership, willing to step up • Openness to new ideas • Self-empowerment • Confidence • Political savvyness • Creativity • Endurance	• Skill-building (communication, leadership, conflict resolution, organizing, grant writing, business management, visioning, inspiring others, implementation, ability to see and act on an opportunity, strategic thinking, planning, collaboration, etc.) • Knowledge about external, internal forces that shape environment, future • Thinking in systems • Hope • Strong K-12 education
Physical/Infrastructure	• Intact infrastructure • Good maintenance of infrastructure • Keeping the community “attractive”	• Long-term investment of infrastructure made with changes in need and changes in environment in mind