

Planning for a More Resilient Future

A Guide to Regional Approaches



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Planning for Resilience: SUMMARY

Since the NADO Research Foundation published *Regional Resilience: Research and Policy Brief* (Dabson et al., 2012), much has happened in the areas of research, public policy, and community practice related to disaster resilience. This publication builds upon the themes discussed in that brief and is intended for regional development organizations (RDOs)¹ as well as local governments, community foundations, voluntary organizations, and others who step forward as planners, conveners, organizers, fundraisers, mediators, coordinators, and advocates on behalf of communities impacted by, or at risk of being impacted by, disasters, natural and human-induced.

This report summarizes the rapidly-growing body of research on resilience, describing the main ideas that are driving policy and practice across the country, and examining current thinking on regional and economic resilience. It is accompanied by an online guide to resources on the practice of resilience, available at www.nado.org. The guide includes examples of ways to approach planning for resilience, a primer on the expansive federal policy framework which determines the priorities for funding resilience initiatives, and describes the current state of philanthropic engagement in resilience efforts.

Key Takeaways:

- **On resilience and regional development organizations.** The financial, social, and environmental costs of disasters continue to rise. Regional development organizations are in a unique position to guide and support communities and regions towards greater resilience.
- **On understanding resilience.** It is vital that regional development organizations understand what resilience means for the communities they serve. Resilience (or lack thereof) is a complex and dynamic feature of communities and regions. It is both a process and an outcome. It requires communities to anticipate threats, reduce their vulnerabilities, mobilize their resources and assets, and plan for a better future.
- **On the regional dimensions of resilience.** Disasters do not respect jurisdictional boundaries. Resilience at the community level has to be matched by resilience at the regional level. Regional development organizations are well-positioned

as bridges between local needs and regional and national resources. For rural communities they have a pivotal role as conveners, planners, coordinators, and connectors, especially where formal government capacity is weak.

- **On economic resilience.** Regional development organizations can play a key role in enhancing economic resilience at two levels. First, they can work with businesses to help increase their ability to rapidly return to normal functioning after a disaster, and second, they can pursue a broad range of economic development strategies and initiatives to improve long-term regional competitiveness.
- **On measuring resilience.** Measuring resilience presents communities and regions with the opportunity to think about their future options and create meaningful, actionable resilience plans. Community support for resilience-building initiatives will almost certainly result if residents, businesses, and communities have the data to correctly prioritize how they improve the quality of their preparedness; if they can demonstrate their successes; and if they can measure the benefits of increasing resilience.
- **On planning for improved resilience.** Most regional development organizations are already engaged in a number of planning processes for their communities. Incorporating resilience into these efforts should be the goal. New practices are becoming available and merit consideration.
- **On the national policy framework.** An extensive federal policy framework has been created to substantially improve preparedness and resilience at all levels in the face of hazards and disasters of all types. Regional development organizations should be familiar with this framework as it determines the priorities, funding, and activities of the Department of Homeland Security and FEMA as well as other federal departments and agencies such as HUD, EPA, and EDA.
- **On philanthropic engagement.** There is increasing interest by philanthropic foundations to provide resources to communities and individuals impacted by disasters and to help them build resilience to future disruptions. These foundations are increasingly becoming important partners for regional development organizations.

¹ The term “regional development organization” or RDO refers to the multi-jurisdictional regional planning and development organizations that exist throughout the country and are known by various names in different states, including: councils of government, regional councils, economic development districts, local development districts, and planning and development commissions. These public-based entities play an invaluable role in fostering intergovernmental collaboration among federal, state, and local officials; deliver and manage federal and state programs; and work to solve area-wide issues and to address the fundamental building blocks required for competitive and sustainable communities and economies.



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in which regional development organizations can improve regional resilience:

- 1** As regional leaders that cross governmental and functional boundaries
 - 2** As experienced practitioners with strong networks and deep knowledge of federal funding opportunities
 - 3** As coordinators and managers of external funding streams
 - 4** As planners
 - 5** As sources of technical expertise
 - 6** As communicators
 - 7** As networkers
 - 8** As conveners
 - 9** As a means of reaching out to vulnerable populations
 - 10** As additional staff capacity
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1 Resilience and Regional Development Organizations

The financial, social, and environmental costs of disasters continue to rise. Regional development organizations are in a unique position to guide and support communities and regions towards greater resilience.

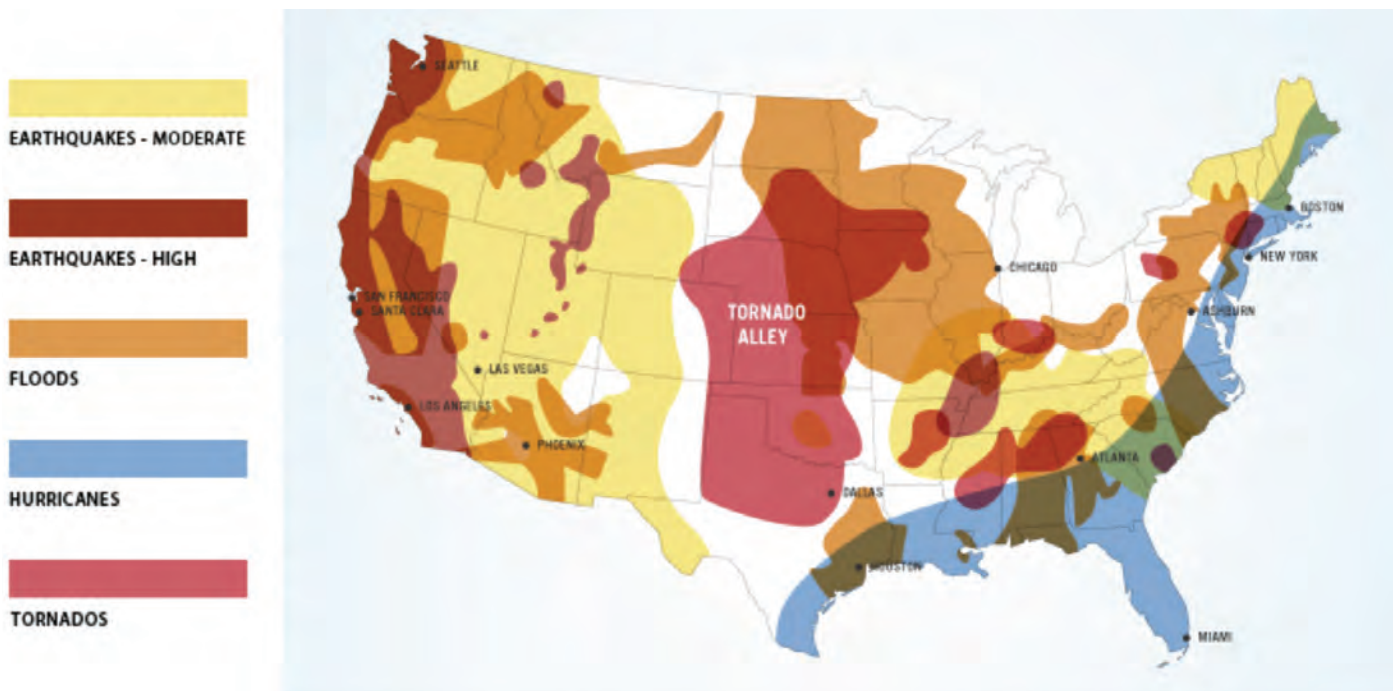
Every year, people and communities across the United States experience disasters and major disruptions. These can be the result of damaging weather events, such as hurricanes, tornadoes, or floods, or of the decline of a significant industry or closure of a major employer. They can also be caused by the outbreak of infectious diseases, acts of terrorism, technological mishaps, or financial meltdowns. The financial, social, and environmental costs of these disasters continue to rise, and represent substantial drains on governments, businesses, communities, and the nation as a whole.

Resilience is the capacity to prepare for such disruptions, recover from shocks and stresses, and adapt and grow from a disruptive experience (Rodin, 2014). As we shall see in the next chapter, there are many variations on this definition, but

one of the most direct comes from the Economic Development Administration (EDA): resilience is “the ability to recover quickly from a shock, the ability to withstand a shock, and the ability to avoid the shock altogether” (EDA, 2015, p. 16). The inclusion of “economic resilience” in the content guidelines for EDA’s Comprehensive Economic Development Strategy (CEDS) is one indicator of the growing importance attached by the federal government and others to building resilience in communities and regions.

Judith Rodin, president of the Rockefeller Foundation, describes why resilience is something to which we need to be paying increasing attention:

“There is no question that building resilience must become a priority for us all... we need a keener awareness of the threats we face, greater ability to withstand and survive the disruptions we can’t avoid, and a deeper commitment and broader capacity to resume functioning so we don’t suffer debilitating loss or even collapse. We can no longer accept our vulnerabilities or ignore the threats we live with. Nor can we devote such great amounts of resources to recovering from disasters that could have been prevented or responded



Source: CrisisHQ.com (2012)

to more effectively. Nor can we continue to delude ourselves that things will get back to normal one of these days. They won't" (Rodin, 2014, p. 6).

The following data on natural disasters gives a sense of the scale of human and economic implications:

- EM-DAT, an international disaster database, estimates since the year 2000 natural disasters in the United States have led to 3,128 deaths and over \$314 billion in economic damages (CRED, 2009).
- The National Oceanic and Atmospheric Administration's National Climatic Data Center estimates that there have been 178 weather and climate disasters in the U.S. since 1980 where overall damages and costs of each event reached or exceeded \$1 billion (including CPI adjustment to 2015). The total cost of these 178 events exceeded \$1 trillion (NOAA, 2015).
- One analysis shows that severe local storms including tornadoes, straight-line winds, and hail accounted for one-third of these events, and tropical cyclones, including hurricanes and sea surges, almost one-quarter. However, tropical cyclones caused nearly half of all damages and drought and heat waves almost one-quarter (Smith & Katz, 2013).

Map 1 provides a clear sense of the distribution of the main natural disaster events across the United States.

Local communities have become increasingly accustomed to Presidential Disaster Declarations as these events wreak havoc and destruction across the country. So far this century (up to mid-June 2015) 1,611 major disasters have been declared with a peak in 2011 when 99 major disasters were declared affecting 44 states, Washington DC, and Puerto Rico (FEMA, 2015).

A report by the National Academy of Sciences (2012) argues for greater attention and investment to make the nation and its communities more resilient in the face of continuing hazards and threats. It emphasizes not only threats we face but also points to factors which are adding to the nation's overall vulnerability such as shifting demographics, population migration to areas susceptible to droughts and hurricanes, aging public infrastructure, and environmental degradation.

The Role of Regional Development Organizations

Some regional development organizations (RDOs) have already demonstrated that they have the capabilities to be key players in promoting and enhancing community and regional resilience. Case studies prepared by the NADO Research Foundation show how RDOs from Virginia to Florida, Iowa to Louisiana, and Texas to North Carolina have assumed important roles in anticipating, mitigating, responding to,



East Central Iowa

In response to devastating floods in 2008, the East Central Iowa Council of Governments received an EDA grant to hire two disaster recovery coordinators. One focused on helping homeowners find funds for rehabilitation, mortgages, and new construction; the other on local businesses to secure funding for rent, lost inventory, equipment, and supplies (NADO Research Foundation, 2015).

and recovering from a range of major natural and economic disasters (NADO Research Foundation, 2014 & 2015).

But, no part of the country is immune to disasters, and RDOs everywhere have the potential, if not the responsibility, to step up and be the agents of resilience in their communities and regions. Here are ten ways in which they can, and do, make a difference.

1 As regional leaders that cross governmental and functional boundaries

By definition, RDOs are multi-jurisdictional entities representing the interests of counties and cities across a variety of urban, suburban, and rural settings. Their strength is their ability to bring a broader, regional perspective on a range of issues that cross county and city lines and which can best be addressed when all the affected local governments are at the table together. Most RDOs have a range of functions for which they are responsible, such as comprehensive economic development planning, transportation planning, business development finance services, public infrastructure improvements, aging services, affordable housing, and emergency preparedness, among others. This breadth of focus areas places RDOs in a strong position to provide regional leadership, an asset particularly important before, during, and after disasters.

2 As experienced practitioners with strong networks and deep knowledge of federal funding opportunities

Most RDOs have long-established relationships with federal agencies, particularly with the Economic Development Administration (EDA), but also with the Federal Emergency Management Agency, the Department of Housing & Urban Development, the Department of Transportation, the Small Business Administration, the



South Florida

The South Florida Regional Planning Council anticipated the requirements of the CEDS guidelines by demonstrating that disaster resilience is a critical component of economic competitiveness. Goals included a greater number of workers and businesses prepared for hurricanes, property insurance costs reduced, and land use responses to rising sea levels (*NADO Research Foundation, 2015*).

Environmental Protection Agency, and the Department of Agriculture (Rural Development). This means that they have strong personal networks with government officials both in Washington, DC and regional offices, as well as the knowledge to help local governments, businesses, and others navigate access to federal funding opportunities, before and after disasters.

3 As coordinators and managers of external funding streams

Because of their funding experience, RDOs can be called upon to guide homeowners and local businesses through the processes of applying for federal and state assistance, help prioritize the allocation of funds within a region, and track and report on the use of external funds. Some RDOs have established revolving loan funds to provide loans to businesses impacted by disasters in order to speed their recovery.

4 As planners

A major function of RDOs that are also EDA-designated economic development districts is to prepare and regularly update the Comprehensive Economic Development Strategy (CEDS). With economic resilience officially regarded as a vital component of regional economic development strategies, there is the opportunity for integration with other planning processes that contribute to the enhancement of resilience. For instance, hazard mitigation planning, which brings regional planners together with emergency managers and utility companies, helps to integrate short-term response planning with longer-term strategic planning.²



Southwest Arkansas

Following a series of hurricanes and tornadoes in 2008, the Southwest Arkansas Planning & Development District, with EDA funding, developed a comprehensive database on businesses (location, employees, and contact information) and infrastructure (critical facilities and transportation). It was intended to better support small businesses in preparing for and recovering from disasters, given their importance to the rural economy (*NADO Research Foundation, 2014*).

5 As sources of technical expertise

RDOs, because of their planning responsibilities, act as centers of demographic, economic, and hazard vulnerability data, with expertise in geographic information systems and statistical analysis. This enables them to conduct initial disaster impact assessments, longer-term economic and environmental impact analyses, and asset mapping, and to develop indicators for measuring resilience and vulnerability.

6 As communicators

The flow of information across governments, businesses, and communities represents a major challenge particularly during a disaster, but also in the days and months afterwards. A RDO's relationships with all sectors of its region and constituent communities, its networks with federal agencies, and its data and analytical functions place it in a position to be a communications hub. To do this effectively, it will need to be proficient in all forms of media, and particularly social media, to reach households and businesses within its region.

7 As networkers

Close connections with the business community – employers large and small – and with the philanthropic, nonprofit and volunteer communities need to be cultivated, not just after a disaster but at all times, so that lines of communication and high levels of trust are well-established. The strength of social capital will be as important as any other aspect of resilience in the face of disaster. In addition, a RDO's networks with neighboring

² For example, see: *The NADO Research Foundation & University of Louisville Center for Hazards Research & Policy Development (2015). Building Economic Resilience in the Kerr-Tar Region: Recommendations for Linking Comprehensive Economic Development Strategies and Hazard Mitigation Plans (available at www.nado.org).*



East Central Vermont

Two Rivers-Ottawaquechee Regional Commission (TRORC) played a critical role in recovery efforts after a damaging tropical storm (formerly Hurricane Irene) struck Vermont in August 2011. This was possible because “[w]e had good relationships with our communities before Irene, and that was evident from the number of calls we received,” said Peter Gregory, TRORC’s executive director. “We knew we were being looked at as someone who could help them because we had a strong track record of doing just that” (NADO Research Foundation, 2015).

regions, through both state associations and the National Association of Development Organizations (NADO), are important for sharing resources, experiences, and expertise.

8 As conveners

Decisions on the allocation of scarce public resources in anticipation of a disaster and on strategies for recovery and rebuilding after a disaster are almost always contentious. Forging a vision for a more resilient community often requires trade-offs that may adversely affect some neighborhoods and groups. But, resilience requires all stakeholders to be brought into the process to improve the chances of finding win-win outcomes. RDOs can provide a safe space for difficult conversations, and act as neutral conveners.

9 As a means of reaching out to vulnerable populations

In any community, there are populations who typically are not engaged with the processes of governance and whose interests are often overlooked. These may be minority populations, low-income residents, the elderly, and people in institutions. Regional planners can use their networks of partners to ensure that vulnerable populations are engaged and supported by the appropriate people and organizations.

10 As additional staff capacity

The reality of many rural regions is that there is very limited capacity in local government to carry out the functions required to build resilience. Even engaging volunteers requires institutional capacity and many



Southwestern Massachusetts

A major tornado hit the town of Monson, MA in June 2011 causing irreparable damage to many historic buildings including the town hall. One of the challenges of recovery was that the existing zoning ordinances would prevent rebuilding the town center in ways that would retain its historic character. With a small staff and a volunteer planning board the town turned to the Pioneer Valley Planning Commission for help in updating the master plan and designing new zoning ordinances with the engagement of the local community. The result is new development that reflects the community’s desire to preserve their architectural heritage (NADO Research Foundation, 2015).

funding sources are contingent on local matches beyond the reach of some rural communities. RDOs may be in a position to provide technical and organizational staff support to fill gaps at the local level, and can and do supplement emergency management capacity in times of disaster.

Purpose and Structure of the Report

This report is intended for regional development organizations as well as local governments, community foundations, voluntary organizations, and others who step forward as planners, conveners, organizers, fundraisers, mediators, coordinators, and advocates on behalf of communities impacted by, or at risk of being impacted by, disasters, natural and human-induced.

It is a summary of the rapidly-growing body of research on resilience, describing the main ideas that are driving policy and practice across the country, examining current thinking on regional and economic resilience, and presents the latest developments in attempts to measure resilience. To accompany the report, an online guide to resources on the practice of resilience is available at www.nado.org. It includes examples of ways to approach planning for resilience, a primer on the expansive federal policy framework which determines the priorities for funding resilience initiatives, and describes the current state of philanthropic engagement in resilience efforts.

2

Understanding Resilience

It is vital that regional development organizations understand what resilience means for the communities they serve. Resilience, or lack thereof, is a complex and dynamic feature of communities and regions. It is both a process and an outcome. It requires communities to anticipate threats, reduce their vulnerabilities, mobilize their resources and assets, and plan for a better future.

Concepts and Definitions

The word ‘resilience’ has its roots in ecology, geography, engineering, economics, psychology, and sociology, which explains why there are many ways in which resilience is described. Three main strands of resilience are in common use (Martin & Sunley, 2015). These are not mutually exclusive ideas and in fact all can be in play at the same time:

- **Resilience as “bouncing back.”** This is referred to as “engineering resilience” where after a shock, a system (a community or region) will return to its pre-shock condition or continue on its pre-shock path. Thus after a storm, buildings, infrastructure, and services can be quickly restored to normal functioning. The focus of this idea is on efficiency, constancy, and predictability of structures, equipment, and systems. Economists describe this form of resilience as self-restoring equilibrium.

- **Resilience as the “ability to absorb shocks.”** Also known as “ecological resilience,” this describes systems that continue to function after a shock even though their structure and organization may change. Here the system shifts to another equilibrium, having been pushed beyond some threshold or limit. Buildings, infrastructure, and services will be modified or replaced to enable acceptable levels of functioning in the hope that the new circumstances will be at least as good as pre-shock conditions.

- **Resilience as “positive adaptability.”** This describes systems that are in states of constant adaptation in anticipation of and in response to shocks. “Evolutionary resilience” emphasizes pre-emptive action, learning from experience, embracing change and “bouncing forward.” Buildings, infrastructure, and services can be protected from the worst effects of shocks through adaptation, and shocks are regarded as opportunities for change and improvement.

As might be expected, there are numerous definitions in use, some of which seek to weave together these strands. For example, the Community & Regional Resilience Institute (CARRI) recommends the following:

Community resilience is the capability to anticipate risk, limit impact and recover rapidly through survival, adaptability, evolution and growth in the face of turbulent change (White et al., 2015, pp. 200-201).

Echoing the previously mentioned definitions offered by Rodin and the Economic Development Administration (EDA), this assumes that resilience is an inherent and dynamic attribute of a community and includes, at its core, the ability to adapt to achieve positive outcomes or trajectories.

Resilience & Sustainability

Sometimes the terms resilience and sustainability are used interchangeably, but there are important differences. Sustainability is concerned with economic, environmental, and social outcomes, with a focus on future options and on developing strategies to attain those options – using values and anticipatory thinking to imagine a future where the economy, the environment, and society are in harmony. “In contrast... resilience... develops adaptive capacity into the system so that the system can gracefully weather the inevitable, but unspecified, system shocks and stressors. Resilience... does not require predicting outcomes. Instead, it builds social and natural capital and enhances adaptive capacity to cope with unknown futures. Simply put, sustainability prioritizes outcomes; resilience prioritizes process” (Redman, 2014).

A Resilience Framework

The power of a resilience framework is that it broadens attention from emergency response – how to deal with the immediate impact of a disruptive event – to planning and organizing in advance and rebuilding afterwards within a coherent framework. One particularly useful framework, derived from the work of Fran Norris and others (Norris et al., 2008) brings together five components – the source of the shock (the disruptive event or stress), the community’s capacity to withstand and cope with this shock, the immediate impact, the community’s subsequent trajectory, and the eventual outcome (Dabson et al., 2012).

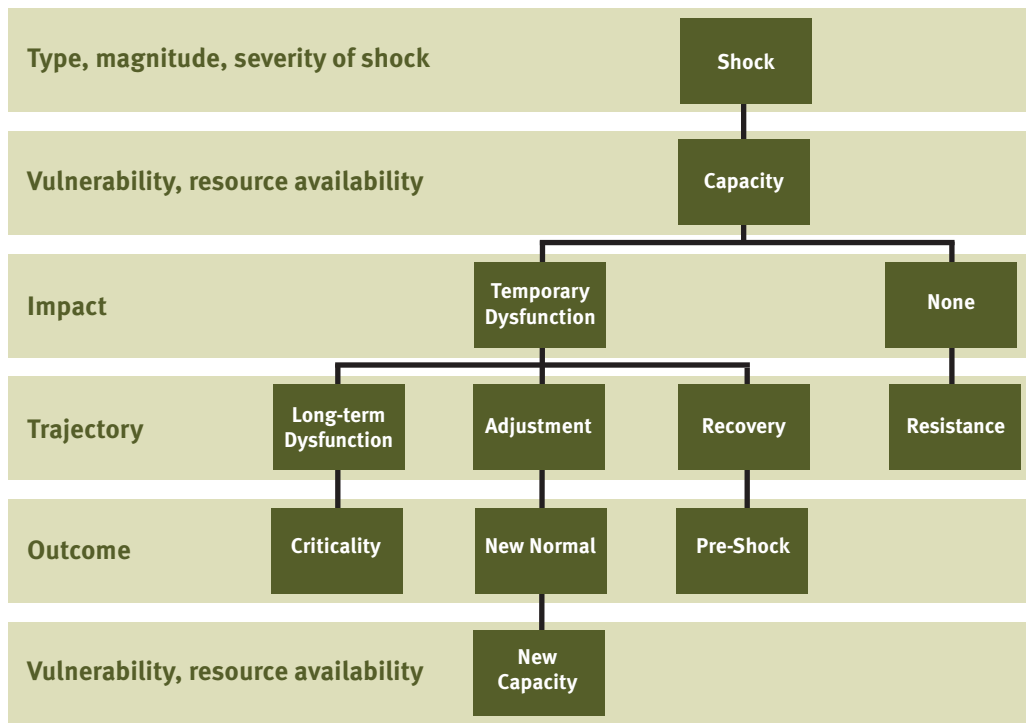


Figure 1: The Resilience Framework

Source: Derived from Norris et al. (2008)

In this framework,

- **Shock** includes the range of probable events and the magnitude and severity of the actual event(s).
- **Capacity** encompasses both the inherent vulnerability of the community to shocks and the adaptive resources available to the community.
- **Impact** refers to whether or not capacity matches the magnitude and severity of the shock, and thus whether or not there is any resultant community dysfunction.
- **Trajectory** refers to one of four paths the community follows after the shock – resistance, recovery, adjustment, or persistent dysfunction.
- **Outcomes** may be of three types: return to pre-event functioning, a “new normal,” or some level of persistent dysfunction. The eventual outcome then determines the capacity of the community to withstand the next shock, underscoring the dynamic and recurring nature of the process.

At its simplest, if a community is able to withstand an event without any real loss of function, then it has demonstrated **resistance** to that particular type, scale, and intensity of shock. For example, if a river bursts its banks, but no development has been allowed in the floodplain, there is little or no effect on the lives of the community’s residents. Similarly, if local companies have generators available, then there is no loss of business if there is a power failure.

However, if the impact of the shock overcomes the community’s ability to resist, then there will be an inevitable state of **temporary dysfunction** as the community responds to the emergency. What happens next depends on the strength and depth of the community’s resources. For many residents and businesses, the desired pathway is that of **recovery**, where the community is able to overcome the dysfunction and return to pre-event functioning without the need for substantial change or adaptation. This means that debris is cleared away, utilities are reconnected, buildings are repaired, businesses have reopened quickly, and life returns

to the way it was before. The potential downside is that the community has not increased its resilience and will be just as vulnerable to the next event.

Another trajectory or pathway for communities is **adjustment**, where they move to a “**new normal**” in the face of a shock at the level of ‘disaster’ or ‘catastrophe’ (see Table 1). A resilient community will be one which, through planning and preparation, adapts to increase resources and reduce vulnerability. Here the “new normal” is a significant improvement on how the community functioned before the shock. However, towns and cities less well prepared may find the “new normal” to be less attractive than before. Businesses may close or move locations, historic buildings may be destroyed, and residents’ sense of community may be undermined. The worst case scenario is when the temporary dysfunction becomes persistent or **long-term dysfunction** and the community is unable to return to an acceptable level of functioning.

The Framework’s Components

Three terms used in the framework – shock, capacity, and impact – require further explanation.

Shock

Shocks can include natural events, often but not always weather-related; human-made events, such as terrorism or nuclear or chemical accidents; medical events, such as

pandemic diseases; and economic events, such as the collapse of an industrial sector or the cessation of a vital economic activity. These events may, and often do, occur in some combination, thus multiplying the impacts on a community or region.

Some commentators and researchers refer to “slow-burn” disasters, such as long-term economic decline or climate change, but these are not in themselves shocks. Instead, they should be considered as part of the inherent vulnerability of a community or region (Martin & Sunley, 2015). However, when these impending disasters spawn specific events such as a plant closing or a multi-year drought, then these can be regarded as shocks.

A community’s resilience has to be measured against the magnitude and severity of the shock. Table 1 provides a comparison across different degrees of severity.

Tierney (2009) makes a useful distinction between emergencies, disasters, and catastrophes. **Emergencies** are serious events which can be managed locally without recourse to external resources. **Disasters** are events which have widespread and severe effects that are beyond the coping ability of local agencies and which require complex governmental responses involving state and federal agencies.

Catastrophes represent the most extreme challenges of overwhelming and cascading events. The hurricane, storm surges, levee collapses, failure of social support systems, and widespread destruction associated with Hurricane Katrina in 2005 represent one such catastrophic shock. The massive earthquake followed by a tsunami and a meltdown in a nuclear

power plant in Japan in 2011 is another example. Four years later, 230,000 people who lost their homes are still living in temporary housing, and the economic effects have been felt throughout the world (Japanese Reconstruction Agency, 2015).

Capacity

The capacity of a community to withstand major threats is in large part a function of two factors: its inherent vulnerability to such threats, and the availability of resources for coping with and adapting to the impacts of these threats.

Vulnerability

Cutter et al. (2008) define vulnerability as “the pre-event, inherent characteristics or qualities of systems that create the potential for harm or differential ability to recover following the event” (p. 2). There are three main dimensions of vulnerability (Cutter et al., 2008; Colten, Kates & Laska, 2008; Alasia et al., 2008):

- **Physical vulnerability** – Communities that are close to hazard-prone areas such as coasts, floodplains, seismic zones, and potential contamination sites are more or less vulnerable depending upon the magnitude, duration, frequency, impact, and rapidity of the onset of an event. The condition of the built environment is another aspect of physical vulnerability. Where buildings are poorly constructed or maintained, or where critical pieces of infrastructure are susceptible to damage such as bridges, roads, and water and sewer pipes, then the community is particularly vulnerable and may be faced with the prospects of slow recovery.
- **Economic vulnerability** – Communities that are dependent upon a single economic sector for their livelihoods tend to be more vulnerable to a threat than those with diversified economies. Economies that were already struggling before an

	Emergencies	Disasters	Catastrophes
Impacts	Localized	Widespread, severe	Extreme, physical, and social
Response	Mainly local	Multiple-jurisdictional, intergovernmental but bottom-up	Federal initiative and proactive mobilization
Procedures	Standard operating procedures	Disaster plans into effect, but likely changes	Massive challenges beyond pre-existing plans
Resources	Within response resources	Extensive damage to emergency services	Emergency response system paralyzed
Recovery	No significant challenges	Major recovery challenges	Cascading long-term effects, massive recovery challenges

Table 1: Typology of Emergencies, Disasters, and Catastrophes

Source: Derived from Tierney (2009)

event are likely to continue on a downward path afterwards, even though in some cases there may be a short term boost from reconstruction funds.

• **Social vulnerability** – This “occurs when unequal exposure to risk is coupled with unequal access to resources” (Morrow, 2008, p. 4). Morrow identified a number of factors that relate to differential exposure and impact as well as to slow or inadequate recovery. These include poverty, minority status, gender, age and disabilities, low educational and technical skill levels, and weak social capital. Cutter et al. (2008) noted “the social vulnerability of communities is borne from inequalities, which affect access to resources and information, the ability to absorb the impacts of hazards and disasters without governmental interventions, housing choice and location, and the political marginalization of impoverished residents” (pp. 3-4).

Resource Availability

According to Longstaff et al. (2010), a community’s resilience is a function of adaptive capacity and resource robustness. Those with a high degree of adaptive capacity and a highly robust pool of resources, they argue, will be the most resilient, but in reality most will tend to be stronger in one of these dimensions than the other. Thus, a community with high adaptive capacity may be able to overcome its relatively low level of resources.

A community’s adaptive capacity derives from its institutional memory, its facility for innovative learning, and its ability to connect with people, institutions, and resources inside and outside the community. Accumulated shared experiences and local knowledge used to adapt creatively to environmental changes or to avoid past mistakes, and then shared widely to enable and encourage collective action, would represent a high level of adaptive capacity.

Resources – “objects, conditions, characteristics and energies that people value” (Norris et al., 2008) – are critical to a community’s sustained functioning and provision of public services. They can be evaluated as to their performance (their general level of capacity and quality), their diversity (availability of multiple options to provide a given function), and their redundancy (availability of back-up resources to allow continued functioning). The combination of performance, diversity, and redundancy determines overall robustness in the face of a variety of favorable and unfavorable conditions (Longstaff et al., 2010).

One approach to understanding the strength of such resources is to think in terms of the community’s wealth across a number of types of capitals or assets. The Community Capitals Framework (Emery & Flora, 2006) uses seven components of community capital – natural, cultural, human, social, political, financial, and built – to assess how investments can



Forms of Wealth

Built capital is the stock of fully functioning constructed infrastructure

Financial capital is the stock of unencumbered monetary assets invested in other forms of capital or financial instruments

Individual capital is the stock of skills and physical and mental healthiness of people in a region

Intellectual capital is the stock of knowledge, innovation, and creativity or imagination in a region

Natural capital is the stock of unimpaired environmental assets (e.g. air, water, land, flora, fauna, etc.) in a region

Political capital is the stock of power and goodwill held by individuals, groups, and/or organizations that can be held, spent, or shared to achieve desired ends

Social capital is the stock of trust, relationships, and networks that support civil society

Cultural capital is the stock of practices that reflect values and identity rooted in place, class, and/or ethnicity

(www.wealthworks.org)

lead to a mutually-reinforcing upward spiral of community development, or to understand why a community may be spiraling downwards as key community assets are undermined or weakened.

A similar framework has been applied to understanding the processes of wealth creation and depletion in rural America (Pender, Marre, & Reeder, 2012) using the same capitals plus one additional capital relating to knowledge and innovation. To be able to benchmark a community’s assets and to measure changes over time can be a powerful means of focusing effort and investment in activities that do not enhance just one asset while undermining others. For instance, building levees to protect low-lying farmland from flooding while increasing the flood risk for riverside towns; or pursuing zoning that puts poor people in harm’s way; or providing tax incentives to a new business, while reducing spending on local infrastructure. An assets- or wealth-based approach encourages communities to focus on their strengths, to invite in a wide range of community members and partners to participate in development efforts, and to look for positive impacts on the assets that mean most to them (Ratner & Markley, 2014).

WealthWorks is the practical application of the wealth creation approach that systematically connects a community’s assets to market demand in ways that build long-lasting livelihoods. It is intended to complement or incorporate traditional economic development methods with a focus on building self-reliant local economies, bringing community assets,

such as people, place, property, and know-how, into fuller participation and production, and creating wealth that is locally-owned, controlled, and reinvested. *WealthWorks* is an inclusive process that emphasizes the importance of identifying market opportunities and constructing value chains that connect people, businesses, organizations, and agencies in an effort to realize those opportunities (WealthWorks, 2015).

Impact

Impact refers to what happens immediately after a shock, when it becomes apparent whether or not the community’s capacity has been adequate, and along which trajectory the community is heading. Figure 2 shows the **Resilience Loss Recovery Curve** used by the Community & Regional Resilience Institute and others to describe changes in community functioning over time.

A more resilient community – one that has anticipated threats and mitigated some of them, developed a vision for the future, organized itself around key resilience priorities, and planned for recovery – can restart its community services more quickly and chart a path to a “new normal.”

Such a community will incur some losses (blue area) but will not experience the additional losses (pink area) like less resilient communities because it has been able to speed up the recovery and decrease its inherent vulnerability to the shock. Some communities will be able to return to pre-shock levels of functionality (Line B); others will fall short (Line C). Those that are able to seize new opportunities to transform themselves may reach a higher level of post-shock functionality (Line A).

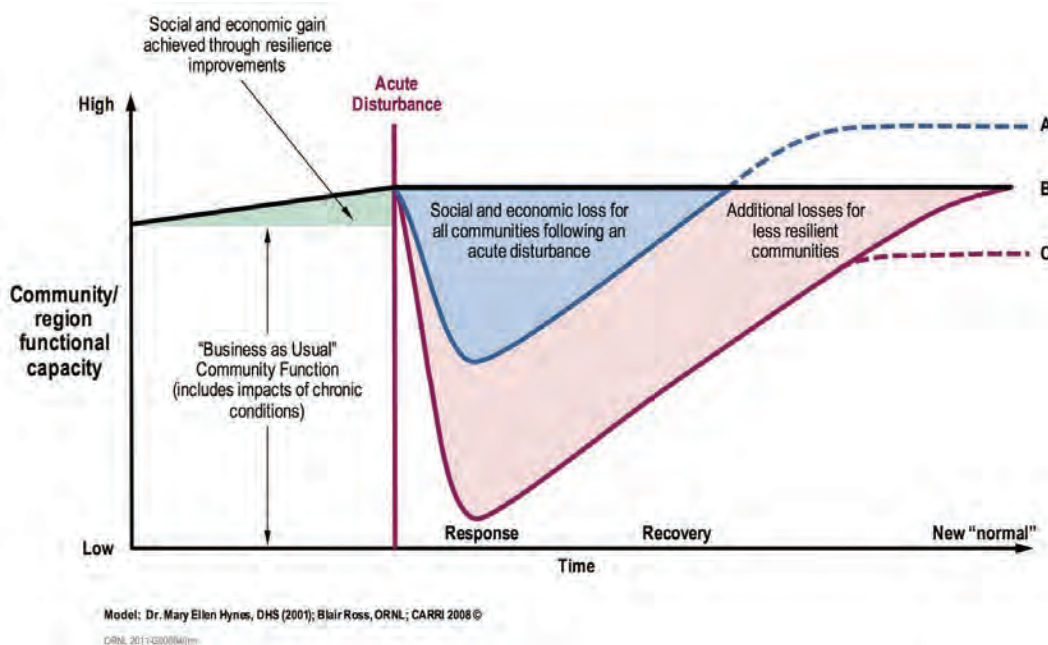


Figure 2: Resilience Loss Recovery Curve

Source: White et al. (2015), p. 203

Adapted from model developed by M.E Hynes, B. Ross, and CARRI (2008), presented at the DHS University Summit, Washington, DC

3

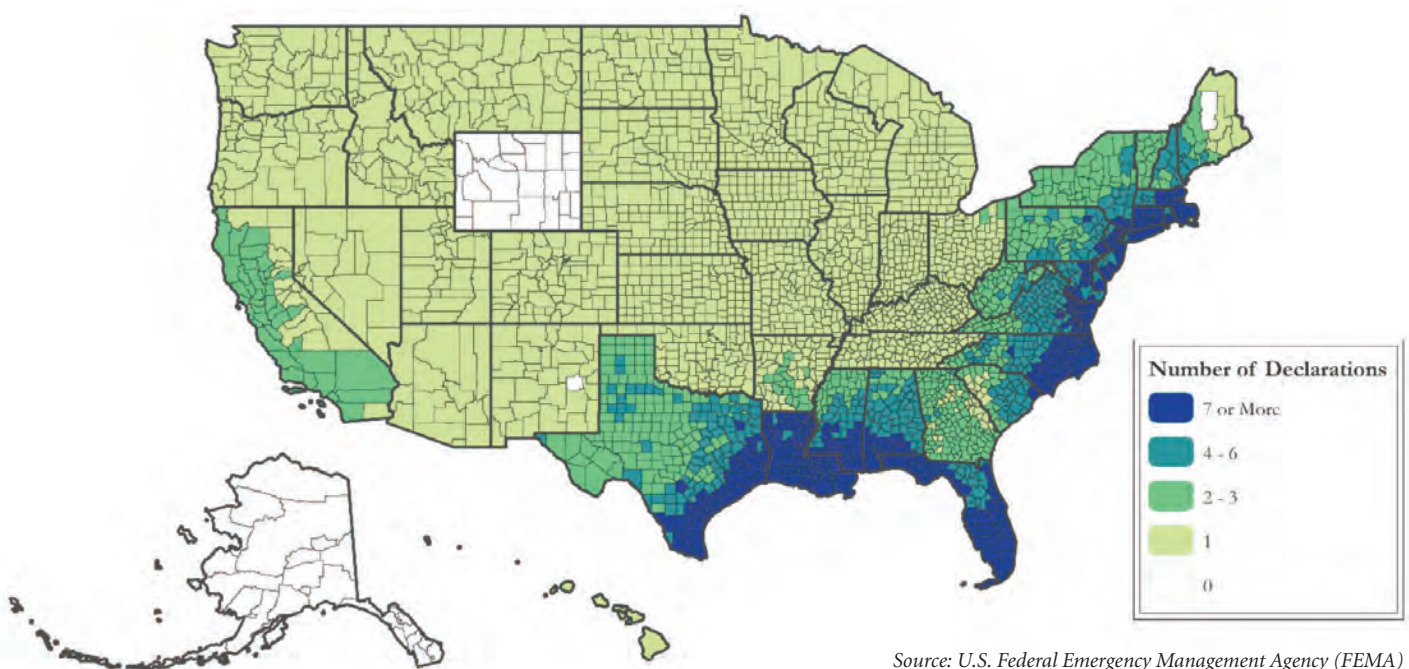
Regional Dimensions of Resilience

Disasters do not respect jurisdictional boundaries. Resilience at the community level has to be matched by resilience at the regional level. Regional development organizations are well-positioned as bridges between local needs and regional and national resources. For rural communities they have a pivotal role as conveners, planners, coordinators, and connectors, especially where formal government capacity is weak.

An analysis of Presidential Disaster Declarations since 2011 shows that, as of mid-2015, there have been 259 such declarations for a range of weather-related events at least one in every state and the District of Columbia, and an average of

five per state (FEMA, 2015). Some states (Idaho, Nevada, New Mexico, and South Carolina) have only had one declaration, while others have had 10 or more (Iowa, Oklahoma, and Vermont). There are three regions of the United States which have been more susceptible to disasters in the past five years, specifically the Mississippi and Missouri River states from North Dakota and Minnesota to Mississippi, parts of southern and central Appalachia from Tennessee to West Virginia, and New England. Some disaster declarations extended over multiple states, for example, Hurricane Sandy in 2012 which impacted 10 states and the District of Columbia.

Maps 2 and 3 present the distribution of disaster declarations by county for the period 1965-2012. Map 2 of coastal storms and hurricanes shows not only the extent from the Gulf of Mexico to New England, but also the inland penetration of these storms. Map 3 of tornadoes clearly shows the concentration in the Midwest, but it also shows the spread



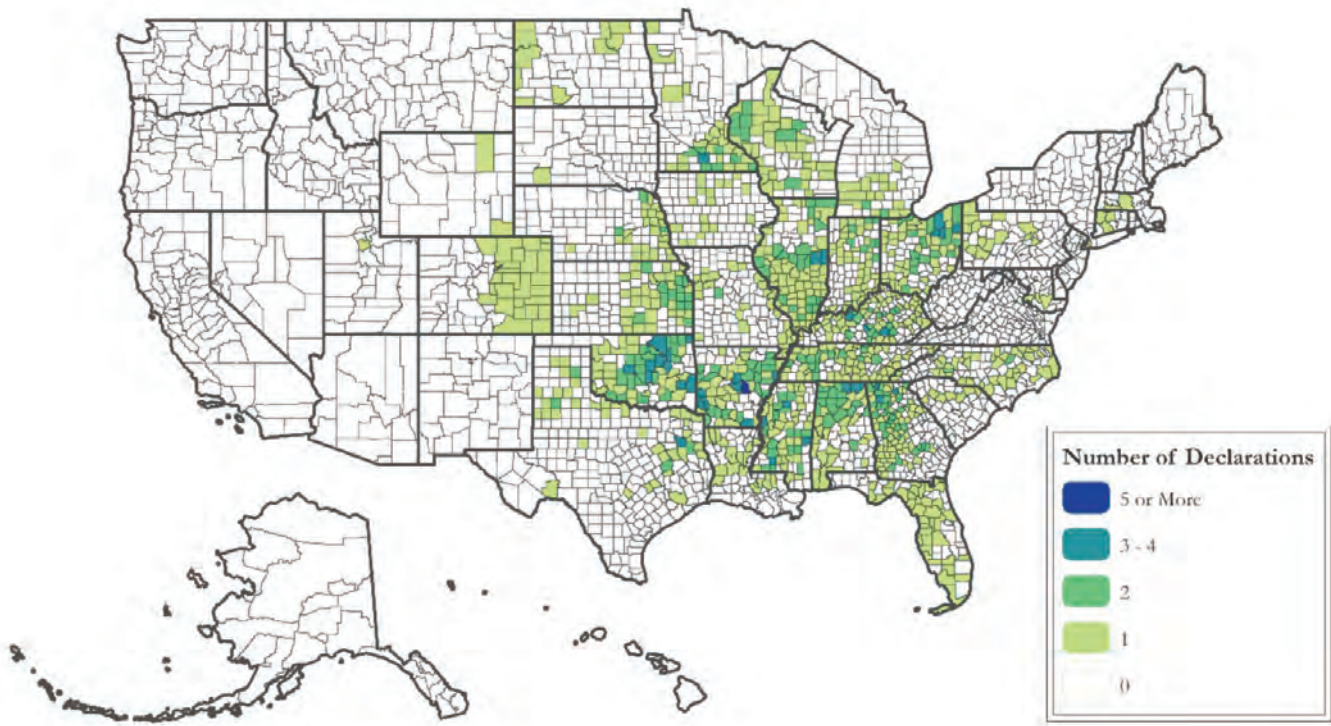
Source: U.S. Federal Emergency Management Agency (FEMA) Disaster Declarations Summary, 1965-2012

Note: Alaska and Hawaii not shown to scale

Map prepared by CARES July 9, 2015

Map 2: Federal Disaster Declarations: Coastal Storms and Hurricanes, 1965-2012

Source: FEMA and Center for Applied Research & Environmental Systems



Source: U.S. Federal Emergency Management Agency (FEMA)
Disaster Declarations Summary, 1965-2012

Note: Alaska and Hawaii not shown to scale

Map prepared by CARES July 9, 2015

Map 3: Federal Disaster Declarations: Tornadoes, 1965-2012

Source: FEMA and Center for Applied Research & Environmental Systems

beyond the middle of the country towards Alabama and areas northeastward to Kentucky and Ohio, and northwards to Minnesota.

These findings underscore the important point that while a focus on community resilience is clearly necessary, it has to be complemented by an understanding of regional resilience given that the effects of disasters rarely stay within the boundaries of local or even state jurisdictions. An extreme example was the mass exodus of population from New Orleans after Katrina, which was felt in every state in the nation, with some areas, both urban and rural, having to cope with significant shelter and quality of life challenges.

Moreover, resilience may differ across levels of geography, so it is possible for a highly resilient community to be located within a region of low resilience, and for there to be a community with limited resilience to be part of a highly resilient region (Wilbanks, 2009). Resilience requires there to be integration of processes, actions, and decisions across geographies. When damaging events threaten to overwhelm a community's resources, there need to be appropriate responses

from neighboring communities and also from the state and federal agencies. Being able to rely on outside sources of support is an essential part of a community's resilience.

But the respective roles and contributions of different geographies vary in their impact on resilience. There is a definite tension between the need to act quickly and decisively in times of emergency based on clear chains of command and responsibilities, while maximizing opportunities for local citizen control over their destiny and allocation of resources. To assure resilience, there have to be co-management structures in place that can bridge levels of geography, create trust, and strengthen communication. This need is frequently reinforced by the fact that governmental and other functional boundaries are often a poor fit particularly in situations where resources have to be mobilized quickly in adverse conditions. Issues over turf and jurisdiction can arise even in the middle of a disaster. This is where regional development organizations and other intermediaries can play an important role in facilitating and managing cross-scale relationships. Table 2 provides a summary of some of these relationships according to the four stages of resilience.

Resilience Dimension	From Small to Large Scale	From Large to Small Scale
Anticipation	Information needs as priorities for larger-scale monitoring and data-gathering systems	Information about possible threats and historical experiences with those threats
Reduction/Mitigation	Information about needs for regional-scale stockpiles of emergency supplies	Information about what can be expected from the region in responding to possible emergency needs
Response	Evacuation of displaced population	Provision of emergency supplies
Recovery	Contributions to regional economic growth	Access to financial resources for investment in new infrastructures

Table 2: Cross-Scale Relationships

Source: Wilbanks (2009)

Rural Resilience

Disasters impact communities of all sizes, but because of the number of people affected and the costs of the damage incurred, most public attention and resources tend to be directed to larger centers of population. However, there are some factors which constrain the capacity of rural communities and regions both to cope with the immediate aftermath of a disaster and to adapt long-term to reduce future vulnerability.

Findings from a study of disaster management and resilience in eight central Florida counties (Kapucu, Hawkins, & Rivera, 2013) will resonate for many communities across rural America. They found that in comparison with urban areas, rural communities have fewer resources to support disaster mitigation practices or rebuilding efforts, and that low population density and inadequate communications networks pose particular challenges. This was reinforced by the fact that rural communities hit by disasters tend to receive limited media attention and are often on the periphery of large emergency response efforts.

Dispersed communities are often faced with delays in receiving response and relief partly as a result of a need to reach the largest number of people as quickly as possible and partly because of the logistical challenges of moving equipment and supplies to remote locations. This highlights the importance of reinforcing networks and collaborative activities across individuals, governments, businesses, and nonprofit organizations before disasters occur, so that rural

regions are better able to help themselves while awaiting external resources. Regional development organizations and community foundations can play a pivotal role as conveners, planners, coordinators, and connectors across rural landscapes especially where formal government capacity is weak.

Greatest rural resilience can be found where there is well-developed economic, environmental, and social capital, whereas rural vulnerability is associated with weakly-developed capital. “Rural community resilience can, therefore, be seen as the balance between economic, environmental, and social needs of rural communities” (Wilson, 2010, p. 368) so that rural communities have the capacity to withstand and recover from a range of internal and external threats.

Maintaining such a balance is challenging, because strengthening one capital can lead to weakening in the others. For instance, as Wilson (2010) suggests, integrating a rural economy into the global economy may be a route to increased economic resilience and access to new and diverse markets, or it may lead to increased vulnerability as the rural economy is increasingly tied to external forces beyond its control leading to new dependencies, loss of local and regional networks, and extended supply chains. High productivity landscapes, tending to monoculture, may be strong economically, but lead to diminished bio-diversity and a less healthy rural environment. Strong social resilience may be associated with tight-knit communities and strong communications, but few job opportunities will lead to out-migration, and eventually weakened local leadership and governance capacity.

4

Economic Dimensions of Resilience

Regional development organizations can play a key role in enhancing economic resilience at two levels. First, they can work with businesses to help increase their ability to rapidly return to normal functioning after a disaster, and second, they can pursue a broad range of economic development strategies and initiatives to improve long-term regional competitiveness.

Economic resilience is important from two perspectives. On the one hand, it is about a community's individual businesses and short-term, practical actions to sustain their operations after a disaster. On the other hand, economic resilience is concerned with the broader regional economic development and long-range adaptability to a changing, and often turbulent, economic environment.

Business Resilience

Business resilience is primarily focused on business operations and business behavior in the days and months following a disaster. This is because economic recovery is very much determined by short-term actions and responses (Rose & Krausmann, 2013). Although it is not unusual for recovery agencies to focus on business property and the extent to which it is damaged, it is more important to prioritize the maintenance of markets and customers and the generation of income, without which businesses cannot continue (Rose, 2009).

Thus, supply chains and logistics feature prominently in business resilience, as interruptions in supplies, distribution of finished products and services, access to customers, or availability of the workforce can jeopardize the continuing operation of the business. As supply chains have become more global and complex, the risks from a variety of natural and

human-made shocks rise exponentially (Lynch, 2011). A shock impacting any part of a supply chain can cause significant short-term and sometimes long-term damage to economic activity in several geographic locations. The 2011 earthquake in Japan created major supply problems for assemblers and retailers of Japanese cars in the United States and across the world. It is worth noting that the adoption of just-in-time practices, where inventories are kept to a minimum and dependency upon reliable suppliers and efficient logistics, can increase business vulnerability.

There are therefore tensions between operational efficiency and business resilience, with the former focusing on short-term cost-reductions and profitability based on current understandings of the business environment, and the latter on pre-emptive investments to reduce vulnerabilities and increase adaptability in the face of longer-term uncertainties. Such investments might include advance planning and preparation for increasing essential inventory, building excess capacity, alternative locations for temporary operations, and contractual arrangements for accessing alternative supplies. However, if disaster strikes, the spotlight shines on human resources and their ingenuity under stress – doing whatever it takes to survive and recover, from ways of conserving resources and energy to adapting work practice and processes (Rose & Krausmann, 2013).

A series of surveys of 5,000 businesses in four states (Webb, Tierney & Dahlhamer, 2000) found that apart from direct damage to premises, the largest impact of a disaster was the disruption of lifelines – water, electricity, sewer, and waste water treatment. Other factors included disruption in logistics flows, reduced employee productivity through transportation difficulties and the effects of the disaster on their homes, and reduced customer traffic. Disconcertingly, the surveys also found that businesses placed limited emphasis on disaster preparedness, favoring generic lower cost measures rather than developing emergency and recovery plans or buying business interruption insurance. Small businesses generally were less

prepared than larger ones, presumably a factor of resources. According to the Insurance Institute for Business and Home Safety, an estimated 25 percent of businesses do not reopen following a major disaster (IBHS, 2007).

However, the majority of businesses surveyed (Webb, Tierney & Dahlhamer, 2000) did return to pre-disaster levels of operation, and some even reported being better off. Important determinants of business recovery were broader economic trends, although smaller firms generally fared less well, and those in poor financial condition before the event were less likely to survive. The main takeaways from the surveys were that greater emphasis has to be given to the needs of smaller businesses to increase survival rates, and that businesses, having a strong vested interest in ensuring the preparedness of utility companies, emergency services, and public services, need to be much more active in community preparedness and recovery planning.

Economic Development

The ability of local and regional economies to adapt to changing conditions, including disasters, is the focus of regional economic resilience. Although it is common to talk about economies bouncing back after a shock, current thinking tends to focus on how economies respond to and generate constant change. Economies comprise many moving parts – the structure and type of industries, the engagement of the banking and financial system, labor market conditions and workforce skills, and the interactions between business and government. These in turn are subject to a broad range of local, regional, national, and international influences. It is this complexity that determines why regions differ in their vulnerability to shocks and how future growth and development are differently shaped in their aftermath (Martin & Sunley, 2015).

A region's economic resilience will change over time as it passes through stages of development. Resilience increases as a region's firms respond to, and exploit new markets and technologies, but as the economy enters into a phase of stability, the economy "locks-in" to a particular trajectory of development. At this point, the indicators of a highly competitive economy, such as clustering, increasing specialization, and tighter networks may also be early warning signs of decreasing resilience to potential disasters. This is not necessarily an argument against economic development strategies that encourage regional competitiveness such as industrial and occupational clusters, but an acknowledgement that these are not static and do evolve and may decline over time (Audretsch & Feldman, 1996; Sölvell, 2008).

As a regional economy becomes less competitive, much will depend upon the extent the economy has locked in to a path

characterized by lack of innovation, comfort with the status quo, failure to discern broader economic trends, and resistance to change (Hassink, 2010). A disaster may push an economy further down the path of decline or it may shift it onto a new path of emergence and openness and new opportunity, and increasing resilience.

Economic diversity is often seen as an indicator of economic resilience. "...[T]he greater the variety of industries in a region, and the more dispersed the regional employment among these industries, the less likely a region is to suffer severe economic decline" (Dissart, 2013, p. 424). Some researchers point to the negative consequences for regions that specialize in extraction industries (Melizia & Ke, 1993; Thompson, 2004) and to the "staple trap" where the profitability of resource extraction effectively delays development, reduces job creation, and inhibits regional competitiveness (Watkins, 1977; Auty, 2000, 2001).

Feser et al. (2014) argue that "pursuing diversity as a goal helps economic development practitioners and community stakeholders better detect and understand economic opportunities and threats" (p. v). They suggest that "a competitive regional economy, and one that is also diverse in comparison to other regional economies of similar levels of development and scale, is likely to be comprised of multiple competitive specializations" (p.vi).

In its content guidelines for the Comprehensive Economic Development Strategy (CEDS), the Economic Development Administration (EDA) provides some practical guidance to regional development organizations on how to improve business resilience and regional economic resilience through what are called responsive and steady-state initiatives (EDA, 2015):

- **Responsive** initiatives include pre-disaster recovery planning to define key stakeholders, roles, responsibilities, and actions; establishing a process for regular communication, monitoring, and updating of business community needs and issues; and building a capability to connect with public officials at local, regional, state, and federal levels to rapidly communicate business sector needs and to coordinate impact assessments. These are intended to develop a capacity to address the immediate post-disaster needs to maximize the prospects for continuity of businesses in a community.
- **Steady-state** initiatives refer to longer-term efforts to bolster a region's ability to withstand or avoid a shock, and in doing so, improve its adaptability. These include comprehensive planning efforts to engage the community in a collective vision for resilience, economic diversification initiatives building on local and regional assets, business retention and expansion programs, workforce development strategies, and many other examples of good economic development practice.

5

Measuring Resilience

Measuring resilience presents regional development organizations with the opportunity to think forward and create meaningful, actionable resilience plans. If groups have the data to correctly prioritize how communities or regions improve the quality of their preparedness; if they can demonstrate their successes; and if they can measure the cost benefits of increasing resilience, chances that community and partner buy-in will occur in greater measure are significantly enhanced, and better resilience will result.

A Challenge, But Good News on the Way

The measurement of resilience has posed significant challenges to community leaders, nonprofits, and state and federal agencies over the past several years. While many regional development organizations have the analytical and GIS capabilities for assessing resilience, achieving consistent and comprehensive resilience measurement systems can remain elusive.

The multi-dimensional nature of resilience has confounded many efforts to develop methods for measuring it. And a lack of consensus on how to define resilience has so far prevented any generally-agreed-upon metrics. As the National Academy of Sciences (2012) have noted, it is impossible to identify priority needs for improvement, to measure progress, or to compare the benefits of increasing resilience with the associated costs, without such metrics. The challenge is to develop a measurement system that is comprehensive across physical, economic, and social dimensions, incorporates rigorous procedures for data collection, analysis, weighting, and combination, and is open and transparent. Fortunately, several efforts are underway to solidify the definition of resilience and to develop tools and methods that regional development organizations can utilize with the communities and regions they serve:

National Resilience Scorecard: The National Academy of Sciences has called for the development of a National

Resilience Scorecard that would strike a balance between a community self-assessment tool and a national coordinated mechanism. The scorecard would encompass indicators of the ability of infrastructure and buildings to withstand and recover from shocks, as well as factors that affect the ability of communities to recover and capture the needs of vulnerable populations.

Community Resilience Center of Excellence: In 2015, the National Institute of Standards and Technology (NIST) awarded major funding to Colorado State University to establish a Community Resilience Center of Excellence (NIST, 2015). The main purpose of the center will be to develop tools so that communities can measure their resilience, evaluate the effectiveness of alternative measures, and develop a business case for resilience investments. This will be part of NIST's continuing efforts to create a disaster resilience framework for protecting and strengthening buildings, power, communications, water, and transportation systems, as well as maintaining social services, institutions, and economic functions important to community well-being.

Resilience Scores for Corporations and Government

Agencies: In the private sector, the Resilient Corporation (2015) has assembled what it claims to be the largest repository of resilience data and has created a proprietary analytical platform to generate resilience scores for corporations and government agencies. Using big data and open source intelligence, the corporation is able to provide analysis of the resilience of 18 industry sectors worldwide. Ten dimensions inform the scoring process, most of them related to the internal operations of a given company or sector, such as disaster management, financial stability, human capital, and information security.

County-Level Resilience-Vulnerability Index: Another initiative now in development focuses on using resilience metrics to create financial incentives that encourage communities to take appropriate steps that will improve their resilience. The Community & Regional Resilience Institute (CARRI) and the University of Missouri are working to develop a county-level resilience-vulnerability index (Miller & Dabson, 2015) that will generate a score equivalent to a credit score. The intention is that communities will be given tools to enable them to improve their scores before these are used by financial institutions to determine insurance premiums and loan terms (for example, see FEMA's Community Rating System).

The combination of comprehensive metrics for social, environmental, infrastructure, and environmental factors, both top-down quantitative analyses and bottom-up qualitative local input, and clear incentives for action will represent a significant step forward.

The following table lists existing examples of efforts to create resilience measurement systems, although some are somewhat narrow in their focus, geographically limited, or hard to replicate. They are listed chronologically, most recent first.

What	How	Tools	Website
Resilience Capacity Index (Foster, 2011) - Developed by the University of Buffalo Regional Institute	Enables a comparison across all metropolitan regions	Based on a composite measure of regional economic, socio-demographic, and community connectivity factors that influence a region's ability to bounce back after a shock	http://brr.berkeley.edu/rci/data/ranking
Community Assessment of Resilience Tool (CART) (Pfefferbaum et al., 2011) - National Consortium for the Study of Terrorism and Responses to Terrorism	Helps communities assess and build resilience	Includes: survey instrument, focus group guidelines, method for creating a community profile	www.start.umd.edu/research-projects/community-assessment-resilience-tool-cart
Community Disaster Resilience Index (Peacock, 2010)	Develops a composite index of resilience for Gulf of Mexico coastal counties	Combines the four phases of the disaster management cycle (preparedness, response, recovery, and mitigation) with community capital assets (social, economic, physical, human, and natural) to compute scores and a composite index of resilience	http://hrrc.arch.tamu.edu/publications
Baseline Resilience Indicator for Communities (BRIC) (Cutter et al., 2010)	Seeks to measure community resilience across five dimensions. One application has been the the spatial distribution of resilience over 736 counties within FEMA Region IV.	Studies social, economic, institutional, infrastructural, and community factors, combining them into a single composite score	http://artsandsciences.sc.edu/geog/hvri
SPUR Performance Goals (SPUR, 2008) Developed by the San Francisco Planning and Urban Research Association	Measures the prospects for recovery from earthquakes in the Bay Area	Uses specific time-to-recovery objectives for critical response facilities, utilities, transportation, housing, businesses, and neighborhood services	www.spur.org
Coastal Resilience Index (Emmer et al., 2008)	Determines the likely impact of storms	Community self-assessment tool that examines transportation systems and critical infrastructure and facilities, as well as measures of community participation, ongoing mitigation efforts, business continuity, and social networks. The measures are converted into a rating system for both individual components and the community as a whole.	http://masgc.org/coastal-storms-program/resilience-index
Social Vulnerability Index (Cutter et al., 2003)	Enables the comparison of capacity of preparedness, response, and recovery across county and sub-county levels	Uses statistically-derived measures combined into a single index - socio-economic status, race and ethnicity, gender, age, and housing tenure are important indicators of inherent vulnerability prior to a shock.	http://artsandsciences.sc.edu/geog/hvri
Community Rating System (FEMA, 1990)	Recognizes and encourages community flood plain management activities over and above the requirements of the National Flood Insurance program (NFIP).	The system is used to determine flood insurance premiums for residents, and points are awarded for a range of activities related to public information, mapping and regulations, flood damage reduction, and warning and response. The more points accrued, the greater the discounts for residents.	www.fema.gov/national-flood-insurance-program-community-rating-system

Conclusion

Resilient communities and regions are those that are able to anticipate their vulnerability to natural, economic, and other potential threats. They take action to limit their exposure to these threats, and they have plans, processes, and resources in place to help them recover quickly should disaster strike. At the core of resilience is the willingness and ability to adapt to change to ensure positive outcomes for all residents and businesses.

The resilience framework described in this brief shows how the type, magnitude, and severity of a disaster (shock) interacts with the inherent vulnerabilities and resources of a community or region. This relationship will determine the path taken after the disaster – resistance, recovery, or adjustment – and the extent a community or region can convert the inevitable challenges into positive opportunities for the future.

The fact that disasters rarely remain within jurisdictional boundaries underscores the importance of well-developed relationships between local, regional, state, and national agencies and organizations to ensure resources and expertise are readily available when needed. But pursuing resilience is not a function or responsibility of just the government, but rather every part of the community – businesses, residents, non-profits, educational institutions, and others. Economic

resilience relies both on the ability of businesses to keep on functioning after a disaster and about building long-term regional competitiveness that does not depend upon a narrow range of industries or sectors. Ensuring that all parts of the community are taken care of before, during, and after a disaster requires intentional and coordinated efforts by public, private, nonprofit, and voluntary actors.

Regional development organizations have the opportunity and responsibility to shape effective resilience efforts in their communities. They serve as regional leaders with wide-ranging expertise that crosses different levels of government and are also experienced practitioners with strong networks and a deep knowledge of public funding opportunities. RDOs serve in a variety of roles to support regional resilience, including as conveners, coordinators, and planners. They are also able to reach out to the most vulnerable residents and communities and provide staff capacity to overstretched local governments. Planning for resilience is a team effort, involving first responders and emergency managers, elected officials, businesses, residents, educational institutions, non-profits and others. Given their expertise, experience, and networks of partners, RDOs are well-positioned to guide regional planning initiatives to forge a more resilient and prosperous future.



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