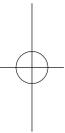
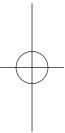




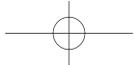
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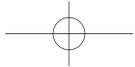
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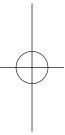


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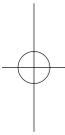
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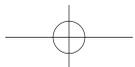
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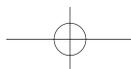
Chapter Thirteen

Crafting Rural Resilience

Joanna Wozniak-Brown

This chapter explores resilience within the rural context, with a special emphasis on the need for local community character to guide resilience planning. Such efforts must consider the unique sense of place, the complex socio-ecological relationships in that setting, and the ultimate goals of the residents of such a community. Inspired by American agrarian philosopher Wendell Berry's emphasis on locally crafted identity, this chapter uses concepts from socio-ecological systems thinking, local governance, place attachment, and local and regional planning to build the case for a rural-specific resilience, responsive to change and responsible to its setting. The concept of "rural character," a term often used in comprehensive plans of conservation and development for local and regional land use planning, teases out the unique vulnerabilities faced by rural communities while tailoring specific strategies to deal with those threats and complicating economic, political and social factors. It is also vital to identify this character if resilience is to be interpreted as a system's ability to "cope with shocks and keep functioning in much the same kind of way" (Walker and Salt 2012, 3). Rural character is not only an accounting of components, but a unique emergence of relationships within the socio-ecological system that can gage the systems' resilience to climate change.

Largely neglected in the climate change and planning literature, rural communities require a unique resilience framework that addresses their place-specific vulnerabilities and provides appropriate support. Crafting a resilient rural community requires an understanding of climate vulnerability in rural communities, the definition of "rural character" and how adaptation and local rural character inform each other, and the changes necessary for scholarship and practice to advance rural resilience.



RURAL-SPECIFIC CLIMATE VULNERABILITIES AND RESILIENCE

Due to several factors, the effects of climate change are amplified in rural communities. They tend to be geographically isolated from major resources such as power generation, emergency centers, and water infrastructure (Hales et al. 2014). They also have less economic diversity and are more dependent on natural resources for tourism, ecosystem services, resource extraction, recreation, and quality of life (Hales et al. 2014). Furthermore, demographic shifts mean that rural residents are increasing older while young families shift to urban areas (Lichter 2017). This leaves rural regions vulnerable to economic uncertainty with limited available workforce except in instances of immigration (Van Hook 2017). Elderly, low income, low English proficiency, and residents with preexisting medical conditions are especially vulnerable to climate change effects like poor air quality, high heat days, and intense storm events (Gamble et al. 2016). This contrasts with urban areas where existing infrastructure replaces ecosystem services and provides adaptation measures, for example storm water management, sewer systems, and even commercial buildings as informal cooling or heating shelters.

Scholarship around rural resilience and the relationship of place attachment to climate change is in its infancy. Even basic rural scholarship in the United States is far behind the rigorous analysis undertaken in Europe and Australia (Bell 2007). Further discussion on rural scholarship is available in Wozniak-Brown (2017); however, numerous scholars admit that the literature around rural resilience is complex and contested (Halfacree 1993; Woods 2004).

From a national perspective, the American political dialogue on rural areas tends to focus on particular regions without regard for a more nuanced understanding of rural that can be present in every state. The US Census Bureau depends on various population formulas to identify rural or “non-metro” areas. The United States Department of Agriculture remains the primary funding provider for projects in rural areas despite significant diverse needs for housing, education, health, etc. Responding to climate change will require technical, monetary, and administrative support from multiple interest areas. While the USDA offers grants beyond agriculture for things like critical facilities and water supply infrastructure, it should not be the only federal agency dedicated to rural areas and a national climate approach must incorporate the skills and knowledge from all departments.

At the moment, climate science cannot offer local-scale predictions for inland climate change impacts. Significant scientific progress has been made with modelling the impacts of sea-level rise on coastal communities; however, anticipated changes to the more complex system of natural resources in a given region are far from being understood. Examples from Connecticut

include general vulnerabilities like increase in invasive species and more variable precipitation (Adaptation Subcommittee 2010). Communities can start implementing appropriate adaptations for these or, at least, become more vigilant for the changes. However, the complex interaction of primary climate impacts on natural resources and secondary impacts on socio-economic indicators has yet to be modeled. For example, prediction for changing precipitation, tree diseases, and leaf phenology at the micro-climate level could be extremely helpful for resilience planning in New England communities. Besides the economic impact to the tourist industry, natural resource changes like maple tree deaths may also affect how individuals in a community experience local rural character.

In rural communities, important infrastructure may be a mix of individual property owners and government investments. Rural areas are more likely to have septic systems, private potable wells, and on-site stormwater management. While the lack of larger infrastructure systems reduces a financial and technical burden on municipal government, it typically places the onus for clean drinking water and functioning sanitation on individuals with varying financial and technical experience. It is also more difficult for the town to enforce sanitation above and beyond building or health codes. Some towns have implemented ordinances for residential areas such as septic walkover programs and low impact development requirements for stormwater management as a way to manage impacts to the greater watershed. Depending on soil types and hydrogeology, climate change may bring about draining of aquifers, limited dispersal or over saturation of septic waste, and waterbody degradation from stormwater contaminants in communities ill-equipped to provide appropriate infrastructure. Responding to these circumstances will require a rural-specific resilience, leveraging the unique characteristics and situations of rural communities.

According to Holling et al., resilience is a system's capacity to undergo a perturbation but remain substantially the same (Holling et al. 1995). At first glance this definition can be appealing as we anticipate that, even after a significant change, life will generally return to some familiar status quo. This is especially appealing for rural towns that wish to remain "just as they are." However, resilience in practice rarely insulates a given system from change entirely. Some changes will be essential, not only because of climate change, but also because of other circumstances that alter local economic, social, demographic, and cultural identities. Therefore, if some change is inevitable, how should communities begin to approach resilience, especially if they wish to "stay the same"? If sense of place is to mean "the characteristics of a location that make it readily recognizable as being unique and different from its surroundings and that provides a feeling of belonging to or being identified with that particular place" (Dolnick and Davidson 1999) and climate change will irrevocably alter a given location, how will that in turn alter the

relationship between a resident and their place? As Berry observed, “the patriotism, say, that grows out of the concern for a particular place in which one expects to live one’s life is a more exacting emotion than that which grows out of concern for a nation” (2012, 57–58). These questions, especially with limited certainty of how those changes will occur at a micro-scale, can be daunting and confusing for local planners, rural scholars, and residents alike.

While situating resilience in relation to “multifunctionality” of rural communities, Geoff Wilson defined rural resilience as both an outcome related to improved adaptive capacity and a process “linked to dynamic changes over time associated with community learning and the willingness of communities to take responsibility and control of their rural development pathways” (Wilson 2010, 366). He further argues that a strong multifunctionality of economic, social, and environmental capitals are the key to resilience. While most of these capitals relate to human consumption rather than pure ecosystem functioning, this multifunctional capital paradigm does include qualitative socio-ecological components such as “close interaction between rural people” and “rural stakeholders in control of development trajectories” (Wilson 2010, 369). It is a significant move forward in understanding rural areas as multifaceted communities and rural resilience as an optimization of rural functioning; however, it still relies heavily on economic development and production as the path to resilience. Approaching resilience should emerge from a local understanding instead of a top-down mandate reliant on external systems.

DEFINING “RURAL”

What constitutes “rural” is a contested concept. Quite often, the identity of a rural area is constructed in terms of what is not urban. The basic comparison may remain true that rural areas have less population density, less infrastructure, and more agricultural land use. These simplistic factors imply a purely quantitative difference where, in reality, the differences are a blend of quantitative and qualitative characteristics. As Wendell Berry explains, “to presume to describe land, work, people, and community by information, by quantities, seems invariably to throw them into competition with one another” (Berry 2011, 73). An “accounting” of quantitative metrics, although partially accurate, does not account for a range along the urban to rural continuum or for an emergent place identity established by residents. While it seems arbitrary to make this distinction, significant decisions are made at a national and state level about funding, land use planning, and infrastructure based on quantitative categories.

From a governance perspective, local and multi-town regional planning may be best suited as a vehicle for establishing long-term practices and



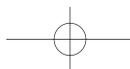
policies to enhance rural resilience. Localities live, experience, and perpetuate nuanced identities that guide their decision making. One of the strongest tools at the local level that will impact economic development, social well-being, natural resource protections, and climate change resilience, is land-use planning.

Local municipalities possess significant control over land use decisions in the United States through the power to enact zoning regulations. Some states do require the enactment of comprehensive plans regardless of zoning regulations. While comprehensive land use plans are not required of all municipalities, some states require the plans before zoning regulations can be created (*The Governance of Land Use in OECD Countries* 2017). Planning practice dictates that these land use plans set forth a strategy or vision that would manifest the community's desires over discrete intervals such as 10, 20, or 30 years.

Distinguishing between urban and rural, or even going further by understanding local character, serves a critical function in climate change adaptation and resilience building. Community character is “a nested interaction of people, place, and processes that cooperate to generate and perpetuate a unique emergent identity with generally identifiable boundaries” (Wozniak-Brown 2017, 26) where place is not only a location but a meaningful interaction or representation of action with a landscape. Adaptation must reflect local character because adaptation measures must be place-based and locally driven. Berry explains that “a culture capable of preserving land and people can be made only within a relatively stable and enduring relationship between a local people and its place . . . and if these cultures are of any value and worthy of any respect, they will not be elective—not determined by mere wishes—but will be formed in response to local nature and local needs” (Berry and Wirzba 2002, 180). Climate vulnerabilities will vary based on the various environmental, economic, and social conditions of a place. Similarly, the capacity of a locality to endure or respond to climate change will also vary along those parameters. Lastly, it is the local residents' socio-cultural traditions and sense of place that will drive and shape the final manifestations of those adaptations. Adaptation measures and local community character communicate in a dialectic relationship, one informing, driving, and shaping the other.

A CASE-STUDY OF “RURAL CHARACTER”

An example of the complexity of rural character can be found in my mixed methods case-study research in northwest Connecticut (Wozniak-Brown 2017) in which I developed a framework for defining and understanding the complexity of rural character that moves beyond the simple quantitative



measurements made at larger scales. The framework consists of three major categories: elements (such as tangible resources and infrastructure), dimensions (such as cultural and personal values), and tensions (such as differences in land use and values), all co-creating rural character. The existence of each component and the interactions among each work to create the overall rural character. The example components of the framework may or may not be transferable to other rural communities but the framework can likely be used by planners, scholars, and rural activists to study the concept of rurality and make recommendations for resilience planning. This framework recognizes both the qualitative and quantitative, as well as positive and negative, components of rurality. The planning discipline generally seeks to minimize the negative and actualize and maintain distinct positive traits. However, the framework doesn't imply that qualities of rural communities are inherently *good* or *bad* as each element, dimension, and tension should be minimized or enhanced at the selection of residents.

Perhaps the most commonly understood, rural elements are tangible and generally quantifiable. This category includes natural resources and geography, built environment and infrastructure, land use activities, geography, people, and representations of the elements. These elements may differ from region to region based on traditional land use practices, geography, and socio-cultural activities. In northwest Connecticut, elements include large mature trees, dark night sky, stonewalls, on-site water wells, etc. (Wozniak-Brown 2017).

While less geography-dependent, the next component, dimensions, can also vary in prevalence by individual preferences or experiences. Dimensions are sociocultural values or practices that are widely recognized in a given community. In northwest Connecticut, these dimensions were "Yankee" self-reliance, volunteerism, neighborliness and community building, cultural experiences, safety, privacy, authenticity, New England government (e.g., town meetings), and time (seasonality, continuity, and permanence) (Wozniak-Brown 2017). Some of the values emerge from socio-ecological interactions that require individual action. For example, my interviewees referred to large damaging storms that took place in the past few years. They explained that emergency response from the state would be going to urban areas first so rural areas had to take care of themselves, demonstrating self-reliance after a natural disaster.

Ever present within communities, tensions also shape character. These tensions can range from innocuous to hostile, depending on the historical context and agency given to each. I encountered multiple tensions during my research in Connecticut, including working vs. bucolic landscape, rural "here but not there," and inside vs. outside community members (weekenders vs. year-round residents, new vs. multi-generational landowners) (Wozniak-Brown 2017). These tensions varied by degree in each community depending



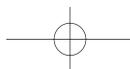
on the prevalence of various social groups and dominant economic activities. Similar tensions, such as “inside” and “outside” members, often exist in communities regardless of their rurality. New members can often be met with general distrust, skepticism, or downright hostility. Other tensions, especially related to rural as a point of pride, can vary even just on either side of a state border.

CRAFTING A RESILIENT RURAL CHARACTER

If resilience implies the maintenance of a system’s significant qualities despite shocks and stress, then rural communities must aspire to a resilient rural character. The exact components will shift among geographies and cultures but overall, communities should look to the elements, dimensions, and tensions that comprise their character and seek to protect these components. Furthermore, they should look for opportunities to leverage each component of the framework as a resilience opportunity, some even unique to rural communities.

As they are more tangible, elements may be easier to locate, measure, and regulate against change. Simple elements like stonewalls, old barns, and historical buildings may be identified and towns can use “command and control” regulations and/or install incentives for protection. For example, towns could disallow major reconstruction in certain zones or they could offer tax credits for historic preservation. Connecticut offers a tax incentive to preserve agricultural, forest, or open space land uses through Public Act 490. If changes are made to the property prior to the agreed upon time, residents are required to pay back the taxes they saved. More systemic-type elements like land use will require more thoughtful planning. Agriculture in a given area might be vulnerable to increased pests, droughts, and intense storm events. These vulnerabilities could be compounded by limited economic opportunity for farmers or increasing equipment costs that are beyond the scope of a municipality. Municipalities will have to sift through the various vulnerabilities to see what aspect can be mitigated by local action such as allowing supplemental income opportunities, encouraging farm stores, and broadening infrastructure permits.

In those instances, elements can also become resilience planning opportunities. Soil-based zoning can direct construction away from prime agricultural soils and wetland soils to preserve food production and water ecosystem services, respectively. Maintaining local place elements like a village green, historical mill buildings, and town centers foster commercial enterprises and opportunities for gathering. If dirt or lake-side roads are predominant features of a community, public works may need to re-evaluate their typical drainage practices to better manage erosion, flooding, and spring thaws.



Some communities may hold dirt roads in high (Wozniak-Brown 2017) or low regard (Ryan 2002). Continued communication with local residents will highlight the places of meaning and, therefore, priorities for protection.

More practice than data point, dimensions can be encouraged or discouraged with both day-to-day municipal actions and long-term physical planning. Some dimensions may require less intensive management in the climate future such as privacy, which happens by virtue of low population density but can be further enhanced with local zoning for fences, hedges, and setbacks. Others, like neighborliness and self-reliance can be realized as resilience strategies. One dimension in particular offers significant resilience leverage. The factor of self-reliance (in Connecticut, commonly called “Yankee” self-reliance) implies an individual’s knowledge, and drive to accomplish certain tasks without waiting for time, external support, or direction. Self-reliance does not necessitate working alone and it may occur among several individuals. During my research, several respondents discussed the use of chainsaws to clear storm debris, neighbors assisting neighbors with debris removal, and an insistence to get the work done without waiting for external aid. These skills, along with the accompanying dimension of neighborliness, can be a community’s largest social asset to ensure resilience (Wozniak-Brown 2017).

Present in all communities, tensions arise among various groups at different times with varying degrees of disruption. Resolution of these tensions may be difficult or impossible depending on the circumstances. Inland communities or less-populated areas may experience an influx of people as climate refugees flee coastal or urban areas. Economic stress compounded by climate stress may force residents to move to neighboring rural communities, increasing commercial or employment competition.

During times of stress or shock, these tensions have the potential to hinder response or recovery efforts. In other instances, it’s possible that dimensions such as neighborliness and volunteerism overcome the tensions to increase the efficiency of response efforts. The exact manifestation of these tensions, especially at times of changes, are uncertain; therefore, managing them becomes even less certain. Some of these tensions can be co-managed with other aspects of rural character. For example, fostering social encounters and sharing regional rural skills among residents may reduce tensions among members of different groups. Communicating at a regional level about increasing rural resilience with a focus on shared connections may reduce inter-municipal tensions between rural communities. Even regional economic development may alleviate some tensions and pre-empt economic imbalances. Regional planning on economic development, emergency sheltering, and refugee influx may reduce unfair distributions of climate change burdens.

Other research has shown that tailored physical designs of community spaces can increase social engagement and residents' happiness (Pfeiffer and Cloutier 2016) and socially engaged residents are more resilient after natural disasters (Seidman 2013). By maneuvering the elements, dimensions, and tensions, planners and local officials can create resilience-optimized physical space design, social participation, and civic opportunities. Rural communities should create multiple physical points for chance encounters (e.g., seasonal farmers' markets, religious/social clubs, grocery store, etc.) to build neighborly sentiment (these social spaces should be evaluated for their use in future climate conditions like high-heat days and improved as necessary). Planners and town officials can encourage social interaction with multiple modes of communication that includes traditional channels (e.g., library and flyers) and evolving digital opportunities (social media, town/region specific websites, text messages). Communication with residents should be rapid and widely distributed to engender inclusion of vulnerable groups and to distribute vital emergency response information if necessary. Communities should also work to encourage a robust network of civic groups (often present already in rural areas) that can respond after natural disasters (Godschalk and Anderson 2012) while increasing social engagement during non-emergency conditions.

LOOKING FORWARD

Climate change and its interaction with local socioeconomic changes presents unique challenges to residents, scholars, and planners. To a certain extent, flexibility will be essential as conditions evolve. In the meantime, what can be done *now* to increase the efficacy, equity, and efficiency of rural resilience?

At a basic level, governmental, non-profit, and academic organizations should fully develop the arsenal of digital GIS data for rural communities as has been done for urban areas. Rural areas may struggle to view, access, or analyze basic digital data sets. The creation and maintenance of such data should be organized, funded, and well-distributed in a format accessible to local decision makers including municipal zoning commissions and regional planners. Data of local, state, and national importance should be included. For example, mapping of parcel data, water utilities, and cultural resources could be critical pieces to a resilient rural region. The region in which my case-study was based is only now undergoing the Federal Emergency Management Agency's (FEMA) multi-year process to update and digitize Flood Insurance Rate Maps (FIRM). The disconnect between planning and climate change data at even the most basic level hobbles decision-making at its (potentially) most effective level.

Critically, rural scholarship must move beyond the accounting of rurality as place of only extraction or production. It must consider how rural residents live, experience, and perpetuate rural life and how that life may be protected, improved, or enhanced in spite of or because of internal weaknesses or external threats since “if the word *community* is to amount to anything, it must refer to a place (in its natural integrity) and its people . . . it must refer to a *placed* people” (Berry and Wirzba 2002, 178). It should be place-dependent and defined by local residents. Scholars should be careful to avoid assumptions that “rural development” and participation in the global capitalist production model will be the main paths to rural resilience. Pursuit of resilience through those paradigms may result in a sterilized caricature of a rural community, a rural exhibition preserved in time or, conversely, a highly agrarian “productive” community, none of which honor the complexity of local determination.

While my case-study focused on a region in the northeastern United States, the elements, dimensions, and tensions framework can be used elsewhere as a way of sorting the complex local socio-ecological identity of rural communities. A bottom-up consideration using hyper-local data may offer a challenge to false assumptions about the meaning of rurality and, consequently, “appropriate” resilience strategies. Scholars, planners, and resilience activists alike carry the burden to responsibly and ethically represent the communities in which they work.

Moving beyond rural communities, the literature of locally determined place will become increasingly important as the complexities of climate change become more visible. The deep emotional distress emerging from loss of place will submerge communities along with the floods. Crafting resilience by rooting it in the experience of rurality maximizes the efficacy of the adaptation methods while simultaneously protecting the local culture or community character (Adger et al. 2012; Wozniak-Brown 2017). Enhanced dialogue between natural resource management, human geography, rural scholarship, and municipal planning disciplines are necessary to create a productive and responsive agenda for resilience.

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William M. Throop is emeritus professor of philosophy and environmental studies, Green Mountain College. He also served as Green Mountain's provost for twelve years, during which he built the national reputation of the college for sustainability education and led the creation of its highly successful graduate programs. He served on the board of directors of the Association for the Advancement of Sustainability in Higher Education (AASHE) for six years, and was elected chair of the board for his last two years. His current book project, *Flourishing in the Age of Climate Change*, explores the character traits we need to develop in order to successfully address our sustainability challenges and the role that higher education can play in cultivating those traits.

Judy D. Whipps is professor of philosophy and liberal studies at Grand Valley State University where she teaches courses in feminist philosophy, leadership studies, and innovation. Her research interests focus on feminism and pragmatism, particularly the work of Jane Addams. Her recent essays include "Ethical Obligations of Thinking in Dark Times: A Deweyan Reading of Hannah Arendt" (*Contemporary Pragmatism* 2019) and "Dewey, Addams and Design Thinking: Pragmatist Feminist Innovation for Democratic Change" (*Oxford Handbook of Dewey* 2019). She has served on the Board of the Society for the Advancement of American Philosophy and is a member of that organization's Jane Collective.

Joanna Wozniak-Brown is a resiliency planner with a PhD in environmental studies from Antioch University New England and an MSc in environmental planning from Johns Hopkins University. Her research and planning interests focus on rural communities, community character, and local identity resilience. She recently created an interactive resilience toolkit for small communities based on her doctoral research and is working with Connecticut municipalities to assess their vulnerability and incorporate adaptation strategies in existing municipal workflows. More information can be found at joannawbrown.com