Chapter 6. Implications/Lessons Learned

The purpose of this project was to conduct a series of case studies using the community capitals framework (Flora, Flora, & Gasteyer, 2016) of communities that were successfully recovering from various natural disasters. Methods and materials were developed to examine flood recovery in Breckenridge, MN, tornado recovery in Pilger, NE, and drought recovery in McCook, NE. This chapter describes implications and lessons learned from these three case studies.

The Community Capitals Framework and Disaster Recovery

The community capitals framework (CCF) can be a useful, viable approach to develop case studies of communities recovering from natural disasters. The CCF provides an approach to inventory community assets extant prior to the disaster, those affected by the disaster, assets used during disaster response, and those that were leveraged in the recovery. Additionally, the CCF provides a means to compare recovery efforts in different types of communities (e.g., based on population, industry, location, etc.) and for different types of natural disasters (e.g., floods, tornados, droughts, etc.).

Different types of disasters adversely initially impact different sets of capitals. For example, droughts adversely affect water supplies and vegetation (natural capital). Tornados can be particularly destructive to buildings (built capital) and can result in injury and death to residents (human capital). Floods initially affect buildings and property (built capital). Response and recovery efforts will vary according to those capitals initially affected.

The CCF can be a useful tool for elected officials and community leaders to assess the assets available for their disaster recovery efforts. Elected city and county officials, emergency managers, first responders, city planners, and community developers could coordinate efforts to collect and maintain an inventory of community assets using the CCF as a model. Although every community may not have the same constellation of assets that other communities have, every community has some assets. Thus, the CCF incorporates an inclusive range of asset categories assuring that important assets are not overlooked.

Leaders' and officials' use of the CCF to inventory their community's assets can highlight areas of capacity, vulnerability, and resilience. This information is essential for all four phases of emergency management – preparedness, mitigation, response, and recovery. Conducting a CCF inventory prior to a natural disaster would be essential. The case studies in this report highlighted multiple methods by which officials and their staff can collect, catalog, and update inventories of community assets. For example, observations, interviews, and documents can be used by these individuals with relatively little specialized training. The universities' Extension Services, their specialists, and publications will be particularly helpful in the leaders' and staffs' CCF efforts.

Tools such as asset mapping and ripple mapping may be employed to note the systemic connections among the various capitals. Officials and leaders can use these tools to visualize the short- and long-term impacts of their recovery efforts. Mapping can help them anticipate what capitals may be leveraged and how to anticipate the effects of recovery actions. Communities

and their conditions vary. So, too, do the recovery processes these communities employ. The recovery processes leaders use will vary depending on the mix of a community's assets.

The case studies illustrated the systemic roles played by the various capitals in the recovery stage. Recovery starts with people (human, cultural, and social capital) (Stofferahn, 2012). These individuals and groups use their networks and connections (political capital) to obtain resources. They leverage their connections to obtain funds (financial capital) in order to repair buildings, homes, and infrastructure (built capital) in the short-term and construct mitigation infrastructure (built capital) in the long term. An observation that emerged from the case studies was that different capitals recover at different rates. That is, whereas a "spiraling up" process (Emery & Flora, 2006) may be evident among all of the capitals during the recovery phase, some capitals, such as built capital (e.g., flood mitigation projects), may take an extensive amount of time to be funded and constructed. Additionally, the capitals are themselves constructions comprised of multiple indicators, each of which may be affected differently during the four emergency management phases. How each of the capitals are differentially comprised is an issues to be addressed as the CCF continues to evolve.

Resilience Theory and Community Recovery

Natural hazards occur at divergent temporal scales. A tornado happens on the scale of minutes and hours; a flood can occur in hours and days; a drought can stretch out over weeks, months, and years. These differences in time periods offer ways to categorize hazard events. Similarly, the length and rate of the recovery period can be used as a metric to examine the overall resilience of a community. Measurement of the recovery period can reveal differences that are situated within communities and the capitals themselves. An understanding of these differences in recovery rate times necessitates a consideration of the lag time between the hazard and the recovery as well as an agreed-upon notion of resilience.

Resilience can take on various dimensions and meanings. At a basic level, it refers to the ability of a system to absorb shocks and maintain functionality (Holling, 1973). In the more recent literature, it takes on a wholly more ambitious and forward-looking character (Berkes & Seixas, 2005). In this sense, resilience requires adaptation and positive transformation that allows communities to function better than they did in their prior states (Berkes et al., 2003; Folke, 2006; Lebel et al., 2006). During periods of crisis, highly adaptive forms of social organization reorganize in more collaborative ways; in this process of reorganizing, conflict is reduced and social cohesion grows stronger (Folke, Hahn, & Olsson, 2005). In sum, a natural disaster is a crisis that cannot be prevented, but its damages can be limited through preparation and planning. Furthermore, resilience thinking suggests that a community can be stronger after a disaster.

When we apply this notion of resilience to the capitals in the recovery process, we consider a "triple bottom line" and ask how the financial, social, and ecological dimensions of the community respond to the recovery efforts. That is to say, as the components of the capitals bounce back to their pre-event states, recovery can be detected in these three areas. When damaged infrastructure is rebuilt, a community comes back to life. Therefore, a baseline measure of recovery should include a consideration of the amount of time that it takes for a community to return to its prior state. Sometimes the community response to the secondary and tertiary impacts of a natural hazard event can leave the community better positioned to deal with future events, as

well as more socially connected. In this sense, particularly with regard to the emergence of new programs and projects designed to enhance the well-being of residents, a natural hazard may have the overall net effect of community improvement. The timing of the hazard, when coupled with the timing of "bounce back" as well as new program emergence may provide an additional measure of resilience that can be incorporated into a community capitals approach in future research.

Community Capitals Framework and Data Collection Methods

These three case studies demonstrate how multiple methodologies can be used to assess community capitals. Although there is no "one-size fits all" research design for the CCF, a mixed methods approach is preferable (Creswell & Plano-Clark, 2010). Our case studies used various combinations of secondary data sources, interviews, focus groups, observation, documents, and photographic material. Given funding limitations, more expensive data collection methods such as surveys of community residents were not used. These types of data would have made the results more robust, but would probably not have changed the core findings.

Entry into the case study communities was facilitated by contacts with various community leaders. Although not formalized in each case, an "advisory board" comprised of formal and informal community leaders emerged as we conducted our research. Future studies might benefit from a more formalized advisory board that can provide insights on pre-event conditions, power dynamics, and other social processes. The advisory committee should play a substantial role in establishing pre-event benchmarks from which to evaluate impacts of natural hazard events on community capitals.

Limitations of These Case Studies and Recommendations for Future Studies

The community capitals framework works well for drought planning processes as the impacts of drought can be generally applied and correlated to the various capital areas. This gives context for stakeholders that can help them understand which capitals are needed to build on as they write or update their drought plans. Future work includes visiting new communities that have recently experienced drought, like those in California. Different types of natural and financial capital could be explored, like how impacts to row crops may be different than to those to specialty crops like nuts or orchard fruits. Also, following up on the types of built capital needed to transfer water various agricultural communities could also be highlighted, along with the impact on drought to human capital, especially those who work outside in various agricultural labor positions.

References

Berkes, F. J., Colding, J., & Folke, C. (2003). *Navigating Social-ecological Systems: Building Resilience for Complexity and Change*. Cambridge, UK: Cambridge University Press.

Berkes, F., & Seixas, C. (2005). Building Resilience in Lagoon Social-Ecological Systems: A Local-level Perspective. *Ecosystems*, *8*, 967–974.

Creswell, John W. and Vicki L. Plano-Clark. 2010. *Designing and Conducting Mixed Methods Research*, 2nd ed. Thousand Oaks, CA: SAGE Publications, Inc.

Emery, M., & Flora, C. B. (2006). Spiraling-up: Mapping community transformation with community capitals framework. *Community Development*, 37, 19-35.

Flora, C. B., Flora, J. L., & Gasteyer, S. P. (2016). *Rural communities: Legacy and change*, (5th ed.). Boulder, CO: Westview Press.

Folke, C. (2006). Resilience: the emergence of a perspective for social-ecological systems analyses. *Global Environmental Change*, *16*, 253–267.

Folke, C., Hahn, T., & Olsson, P. (2005). Adaptive Governance of Social-Ecological Systems. *Annual Review of Environment and Resources*, *30*, 441–473.

Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, *4*, 1–23.

Lebel, L., Anderies, J. M., Campbell, B., Folke, C., Hatfield-Dodds, S., Hughes, T. P., & Wilson, J. (2006). Governance and the Capacity to Manage Reslience in Regional Social-Ecological Systems. *Marine Sciences Faculty Scholarship*, *52*.

Stofferahn, W. C. (2012). Community capitals and disaster recovery: Norhwood ND recovers from an EF 4 tornado. *Community Development*, *43*, 1-18.