Harvesting Experience for Adapting to Climate Change

In June 2002, at the opening of the 27th annual Natural Hazard Workshop in Boulder, Colorado, several hundred participants were asked to stand up one by one, and, in 10 seconds each, introduce themselves and explain why they were there. Gilbert White, the leading pioneer in natural hazards research, explained that he was looking for answers to a question: ''Why, despite all the research on hazard mitigation over three decades, do losses from hazards continue to go up?''

White's question implies that explaining the problem of increasing losses is not enough. As researchers, we share some portion of responsibility for reducing net losses and vulnerability to extreme weather events and climate change. This is a policy goal and typically the common interest in vulnerable communities. From this standpoint, our research is one means of adapting to climate change, not an end in itself. It is time to reconsider our roles in that light.

Let us begin by recognizing that the continuing problem—increasing losses—is not uniform. Some local communities have made significant progress in reducing their net losses and vulnerability to extreme weather events and climate change, even if they have not taken climate change explicitly into account. They present opportunities for harvesting experience, to move beyond explaining the aggregate problem to finding action alternatives. Some cases are relatively well documented outside the peer-reviewed literature.

After decades of devastating floods in Soldiers Grove, Wisconsin, village leaders rejected a levee proposed by the Army Corps of Engineers and pressed ahead in 1975 to relocate its downtown out of the floodplain. A breakthrough to federal funding in 1978 allowed the village to complete its relocation plans a year later. It began buying out properties and removing buildings from the floodplain, while helping property owners rebuild on higher ground. With completion of relocation in 1983, the floodplain was transformed into a public park (Becker 1983).

After another flood in Tulsa, Oklahoma, in 1974, flood victims organized to pressure the city to reduce flood damage. Gradually, the city improved its technical capabilities, organizational structure, regulations, and financing for floodplain management and began relocating buildings from floodplains—more than 1000 by the mid-1990s. In 1998, a grant from the Federal Emergency Management Agency's (FEMA) Project Impact helped Tulsa Partners, Inc., create public–private partnerships for multihazard mitigation. Tulsa Partners is still becoming a disaster-resistant and sustainable community, its long-term goal (Patton 2009).

After another flood in Napa Valley, California, in 1995, citizens rejected another flood control proposal from the Army Corps, catalyzing a community coalition process. It coalesced many interests around a ''living river'' flood-protection plan to restore the Napa River to its floodplain. In a special election in 1998, a two-thirds majority of voters approved a detailed plan including a sales-tax increase. That quickly stimulated new economic development and led to restoration of wetlands, bridges rebuilt to reduce flooding, and trailer parks relocated out of harm's way, among other benefits (Dickson 2009).

Residents of Soldiers Grove, Tulsa, and the Napa Valley generally consider their communities successful in reducing net losses from floods and, importantly, advancing other community interests at the same time. (Many other communities, typically less well

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documented, also have reduced their losses.) Stepping back from individual cases, what are the implications for research?

- A variety of local communities have succeeded in adapting to extreme weather events and climate change—without climate projections and often before climate change became a legitimate research topic. They reacted to recent and persistent losses experienced directly.
- They succeeded by integrating many resources step by step, through trial and error, toward a long-term goal, according to their own circumstances. Research was not the only resource, nor was research focused on any single factor. It focused on clarifying action alternatives.
- Each case is unique when these many factors are taken into account. This is an empirical finding consistent with the conjunction rule of probability. Thus, there is no ''one best way.'' Nor are there ''best'' practices—only better practices, assessed according to local circumstances.

Practitioners on the ground nevertheless harvest experience from their peers: what works anywhere tends to be diffused and adapted (not replicated) by similar communities elsewhere. They also tend to self-organize to influence and seek support for what works from higher-level officials. For example, leaders in Soldiers Grove early on visited Niobrara, Nebraska, to observe relocation firsthand, and with federal funding Soldiers Grove became a model for other local communities and influenced the design of FEMA's Project Impact.

More recently, community-based initiatives in climate adaptation have been catalyzed by scientific experts in addition to extreme weather events. Among participants in a workshop in Portland, Oregon, in 2012, leading experts working with different local communities had moved beyond downscaling climate projections and planning. Attempting to implement plans made, they confronted many human factors. Proceeding pragmatically they learned to:

- ''Bring the right people to the table. They vary from place to place, but generally are people and groups who can make a difference in moving ahead.''
- ''Engage them 'where they are, not where we are,' as one participant put it. They may be most concerned about taxpayer savings, fiscal conservatism, etc., and indifferent or hostile to climate change.''
- ''Rely on maps, photos, and other means of visualization in communicating vulnerabilities and possibilities. Anecdotes and stories based on case studies also work.''
- ''Encourage collaboration within and across groups in finding common ground sufficient for a community to act on implementation.''
- ''Build personal relationships, credibility, and trust. This human capital is the foundation of effective communication and community action.''

Uncertainties inherent in the human factors compounded uncertainties about local climate impacts. Consequently, progress depended on trial-and-error learning, especially learning the politics of finding common ground. Thus, Brunner and Nordgren (2012, 2; their emphasis) concluded that ''climate adaptation can be characterized as an evolutionary process guided by a shared goal—*reducing the vulnerability of natural and human systems to climate change*.''

In such evolutionary processes, fraught with uncertainties, evaluation is a more critical function than planning: *innovations* tend to arise spontaneously from the diversity of initiatives in response to losses; sound *selection* depends on evaluation of what works for each community; and *adaptation* of what works tends to occur in different and changing circumstances, stimulating further innovations. Without evaluation, the status quo prevails over progress toward long-term goals.

Practitioners need, and often seek, several models to adapt to their own circumstances. The best models are communities similar to their own that have already succeeded

in reducing their losses and vulnerability to climate change. (Communities that have not yet succeeded, or have failed, are less reliable and useful.) Good models provide guidance, encouragement that progress is possible, and anecdotes and stories to promote action.

Comprehensive and detailed case studies help meet these needs. For example, Becker's (1983) case study directs attention to the range of resources and other factors involved in Soldiers Grove's success and their integration step by step. The details reveal specific action alternatives for performing necessary functions, such as finding common ground. In Soldiers Grove, village leaders relied on rapid feedback from neighbors on each key step to build support for relocation. In Tulsa, flood victims organized as an interest group to pressure the city to act and eventually became partners of the city. In Napa, leaders relied on the community coalition process to integrate interests into a ballot measure.

How can researchers contribute to harvesting experience? One role is to serve as third-party evaluators of case studies written by practitioners. Experience elsewhere suggests that sometimes practitioners exaggerate their claims of success and practitioners accept such claims uncritically. Another role, requiring more commitment, is continuing cooperation with practitioners on the ground, to help advance their common interests and contribute case studies based on that experience (e.g., Schroeder et al. 2012; Brunner and Lynch 2010, chapter 3).

A third role is to evaluate networks for diffusing information and insights among practitioners. In the absence of empirical work specific to climate adaptation, theory and comparative cases (e.g., Rogers 2003) provide some guidance. For example, given cognitive constraints, Simon (1996, 144) suggested that ''[t]he task is not to design information-distributing systems but intelligent information-filtering systems.'' Centralized information clearinghouses devolve filtering to the user, providing search tools for that purpose. The assumption that users have a comprehensive and detailed understanding of what they need to know may be invalid, especially in communities just getting started. Perhaps more promising are communities of practice (Wenger and Snyder 2000) that have begun to emerge from the Portland workshop and others like it.

Returning to Professor White's question, one answer is that losses have continued to go up because researchers have generally overlooked working models of successful adaptation to climate change. Most of our attention has been invested in peer-reviewed literature for other researchers and scientific assessments for national policy makers. This favors projections and general explanations that leave practitioners on the ground in the dark. However, we can enlighten practitioners on the ground, where most of the action is, by harvesting experience as comprehensive and detailed case-study evaluations. This would help communities advance their common interests—and help researchers qualify and correct theories of climate adaptation.

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