

ASSESSING STATE POLICY LINKING DISASTER RECOVERY, SMART GROWTH, AND RESILIENCE IN VERMONT FOLLOWING TROPICAL STORM IRENE

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INTRODUCTION

This article describes the process used to assess state programs in Vermont and identify policy options to further the connection between disaster recovery, smart growth, and flood resilience. First, we introduce the preconditions that existed in the state prior to Tropical Storm Irene, followed by the methods used to conduct the assessment. Then we discuss the disaster recovery, smart growth, and resilience literature, including its relevance to Vermont. The review of the literature is followed by a series of proposed policy options that are supplemented by best practices identified in other states that provide insights and lessons for Vermont agency officials. The paper concludes with a set of recommendations that emphasize the need to modify existing national policy frameworks to better support state needs and capabilities.

Flood Hazard Vulnerability in Vermont: The Past as Prelude

Ten months following the devastating floods that struck Vermont in 1927, U.S. President Calvin Coolidge toured his home state to assess the progress of recovery and delivered these words in Bennington on September 21, 1928:

My fellow Vermonters:

It is gratifying to note the splendid recovery from the great catastrophe which overtook the state nearly a year ago. Transportation has been restored. The railroads are in a better condition than before. The highways are open to traffic for those who wish to travel by automobile. . .

I love Vermont because of her hills and valleys, her scenery and invigorating climate, but most of all because of her indomitable people. They are a race of pioneers who have almost beggared themselves to serve others. If the spirit of liberty should vanish in other parts of the Union, and support of our institutions should

languish, it could all be replenished from the generous store held by the people of the brave little state of Vermont.¹

On August 28, 2011, the rivers rose again. Tropical Storm Irene dumped four to eight inches of rain across the Green Mountain State, resulting in record-breaking flood totals in four of Vermont's rivers.² More than 500 miles of roads and dozens of bridges were damaged or destroyed, including many of the iconic structures that dot the landscape.³ The storm cut off a number of communities for several days and resulted in losses approximating one billion dollars.⁴ In the aftermath of Irene, the degree to which President Coolidge's words ring true can be reframed as a question: Is a more resilient Vermont possible, recognizing long-standing conditions and potential post-event actions?

Vermont's Legacy of Environmental Stewardship, Public Participation, and Limited Government

Disasters shine a spotlight on a range of pre-event conditions including inequitable decision-making processes, power imbalances, pre-event vulnerability, unsustainable development practices, and institutional fragmentation.⁵ Disasters also highlight strong inter-organizational

1. Calvin Coolidge, U.S. President, Speech to citizens in Bennington, Vermont: Brave Little State of Vermont (Sept. 21, 1928).

2. Preliminary Hurricane/Tropical Storm Irene Weather Summary for the North Country, NAT'L WEATHER SERVICE FORECAST OFFICE, BURLINGTON, VT, <http://www.erh.noaa.gov/btv/events/Irene2011/> (last visited Nov. 8, 2013).

3. The Associated Press, *Hurricane Irene Facts: A Region-by-Region Look at the Storm's Toll*, HUFFINGTON POST (Aug. 27, 2012), http://www.huffingtonpost.com/2012/08/27/hurricane-irene-damage-statistics-2011_n_1832342.html.

4. See Associated Press, *Hurricane Irene One Year Later: Storm cost \$15.8 in Damage from Florida to New York to the Caribbean*, DAILY NEWS (Aug. 27, 2012), <http://www.nydailynews.com/new-york/hurricane-irene-year-storm-cost-15-8-damage-florida-new-york-caribbean-article-1.1145302> (discussing the total cost of damages in Vermont from Hurricane Irene one year after the storm).

5. See N. Emel Ganapati & Sukumar Ganapati, *Enabling Participatory Planning After Disasters: A Case Study of the World Bank's Housing Reconstruction in Turkey*, 75 J. AM. PLAN. ASS'N 41 (2009) (discussing the inequitable outcomes of the World Bank's disaster relief efforts in Turkey). See also HURRICANE ANDREW: ETHNICITY, GENDER, AND THE SOCIOLOGY OF DISASTERS (Walter Gillis Peacock, Betty Hearn Morrow & Hugh Gladwin eds., 1997) (examining the conditions in Miami prior to Hurricane Andrew and their effect on subsequent recovery efforts); Timothy Beatley, *The Vision of Sustainable Communities*, in COOPERATING WITH NATURE: CONFRONTING NATURAL HAZARDS WITH LAND-USE PLANNING FOR SUSTAINABLE COMMUNITIES 233, 237 (Raymond J. Burby, ed. 1998) (exploring extensive damages following natural disasters as an indicator of unsustainable development); Philip R. Berke, Jack Kartez & Dennis Wenger, *Recovery after Disaster: Achieving Sustainable Development, Mitigation and Equity*, 17 DISASTERS 93, 95 (1993) (describing impediments to disaster recovery caused by institutional fragmentation of relief efforts); Eve Passerini, *Sustainability and*

relationships and social capital, a strong pre-event or emergent planning culture, and high levels of self-reliance.⁶

In Vermont, important institutional preconditions include a history of public participation, a legacy of environmental stewardship, a commitment to farmland preservation, and a belief in limited state and local government. The flood exposed varied levels of capacity among state agencies, local governments, non-profits, and quasi-governmental organizations acting independently, and it tested the strength of bonds that span what amounts to a loosely-coupled network. Physical characteristics that have exacerbated flood hazard risk over time and represent challenges to achieving greater disaster resilience include development along highly dynamic river systems and increased growth in hillside areas.

The State of Vermont has a unique and longstanding history of growth management, environmental protection, and participatory decision-making. This history is exemplified by the Land Use and Development Act (Act 250), passed in 1970 to preserve the environmental, social, and aesthetic character of the state in the face of development pressure.⁷ In addition to environmental protections, a commitment to farmland preservation has helped maintain the agricultural sector while shielding the compact urban form of many Vermont communities from suburban and exurban sprawl. Transcending legal and policy safeguards, a land ethic persists within the state that guides many local and individual decisions to be more consistent with community and environmental values. Vermont's rich history of public participation further contributes to a thoughtful and inclusive dialogue surrounding public policy.

Yet, despite the "indomitable people"⁸ dedicated to healthy communities and environmental protection, Tropical Storm Irene exposed significant vulnerabilities and heightened the state's awareness of a number of preconditions affecting flood-hazard vulnerability. The degree to which these vulnerabilities trigger a desire to become more resilient in the face of

Sociology, 29 AM. SOCIOLOGIST 59 (1998) (discussing the concept of sustainability in the field of sociology).

6. Daniel P. Aldrich, *The Crucial Role of Civil Society in Disaster Recovery and Japan's Preparedness for Emergencies*, 3 JAPAN AKTUELL, 81, 85–87 (2008). See also ROBERT GEIPEL, *DISASTER AND RECONSTRUCTION: THE FRIULI (ITALY) EARTHQUAKE OF 1976* (P. Wagner trans., 1982) (describing the behavior of regional societies following catastrophes); Anthony Oliver-Smith, *Post-Disaster Housing Reconstruction and Social Inequality: A Challenge to Policy and Practice*, 14 DISASTERS 7, 11–12 (1990) (discussing coordination and self-reliance of local people and institutions in the aftermath of an earthquake/avalanche in Peru); GAVIN SMITH, *PLANNING FOR POST-DISASTER RECOVERY: A REVIEW OF THE UNITED STATES DISASTER ASSISTANCE FRAMEWORK* (Public Entity Risk Institute 2011) (discussing the role of planning in recovery).

7. Land Use and Development Act, VT. STAT. ANN. tit. 10, §§ 6001–6093 (2011).

8. Coolidge, *supra* note 1.

future extreme events—including those driven by a changing climate—remains uncertain. Long-standing settlement patterns along the state's rivers and the cumulative effect of small-scale hillside development on the edges of many communities has exacerbated stormwater runoff while increasing the exposure of structures to natural processes like riverine erosion and flash flooding. The armoring of streams and rivers and the constriction of floodplains—done in part to reduce the loss of productive farmland and protect infrastructure investments like roads and bridges—has increased the volume and velocity of floodwaters, which wreaked havoc on historic villages. Building codes, flood ordinances, and hazard mitigation plans and programs drafted to meet minimum Federal Emergency Management Administration (FEMA) requirements left many structures and communities exposed to severe flood-hazard risk.⁹

Additional institutional limitations were shown to hinder recovery, including inadequate state capabilities to manage the influx of federal assistance;¹⁰ challenges associated with coordinating across agencies and non-profit, quasi-governmental, and private sector organizations;¹¹ and difficulties with implementing post-disaster policies and programs at the local level due to limited staff and largely volunteer government officials.¹² At the same time, the recovery effort has uncovered opportunities to strengthen the commitment to more flood resilient practices and achieve complimentary smart growth goals. To this end, the U.S. Environmental Protection Agency (EPA) and FEMA have partnered with the State of Vermont through the Smart Growth Implementation Assistance program to help achieve these aims.¹³

I. METHODS: DATA COLLECTION, ANALYSIS, AND PROCESS

The acquisition and analysis of varied sources of data informed the development of policy options. Data was obtained through: 1) the review of

9. Gavin Smith, Dylan Sandler & Mikey Goralnik, Vermont State Agency Policy Memo Smart Growth Implementation Assistance Program: Disaster Recovery and Long-Term Resilience Planning in Vermont 12 (2013), available at <http://coastalhazardscenter.org/news/chc-in-the-news> [hereinafter Policy Memo].

10. *Id.* at 16.

11. *Id.* at 17.

12. *Id.* at 18.

13. In 2009, the EPA, in partnership with the State of Iowa and a number of communities, developed policy options focused on the integration of smart growth and disaster recovery following a number of floods and tornadoes. See *Smart Growth Technical Assistance in Iowa*, EPA, http://www.epa.gov/smartgrowth/iowa_techasst.htm (last updated Oct. 30, 2012) (discussing creation of smart growth policies developed by the Environmental Protection Agency and State of Iowa following a series of destructive floods).

state documents; 2) interviews with state officials; 3) the observation of public meetings held in Irene-affected towns; 4) a review of a local policy memo;¹⁴ 5) written feedback on the drafts of the state policy memo from state agency officials, Mad River Valley Planning District officials,¹⁵ EPA and FEMA staff, and members of the National Hazard Mitigation Association;¹⁶ and 6) a national review of best practices.¹⁷

The research team reviewed a number of state documents including the Irene Recovery Report, the Vermont Long Range Transportation Business Plan, State Hazard Mitigation Plan, Act 250 and its technical guidance, and the 2015 Agency Strategic Plan. This information was used to gain an understanding of state policies, particularly those that address disaster recovery and smart growth. The review of the local-level policy memo allowed the research team to understand how well state policies addressed local needs, an important but often underemphasized aspect of disaster recovery.¹⁸ The varied sources of data were used to help understand the larger state and local policy milieu, gain a greater understanding of state and local capacity, and identify common themes targeting shortfalls. The analysis of the data helped uncover potentially conflicting policies that could help or hinder the state's ability to link smart growth, disaster recovery, and resilience. The process also informed the development of interview questions that followed the document review process.

Understanding existing regulatory and legal frameworks, interagency dynamics, and the impacts of Tropical Storm Irene proved critical in the next phase of the data collection process, which involved conducting interviews with state officials. The semi-structured interview process involved key informants across six state agencies, divisions, and offices in

14. The State of Vermont, EPA, and FEMA commissioned a firm to develop a local policy memo, which describes a series of potential policies that local governments may want to consider that advance the nexus between disaster resilience and smart growth.

15. The local policy memo focused on communities located in the Mad River Valley Planning District.

16. The Natural Hazard Mitigation Association is a non-profit organization that provides a professional forum to share ideas and disseminate information, improve natural hazards awareness, conduct education and training initiatives, establish hazard mitigation as a recognized profession, and serve as a unified voice advocating for improved hazard mitigation programs and policies. *See generally* NAT'L HAZARD MITIGATION ASS'N, <http://nhma.info> (last visited Nov. 8, 2013) (providing information on the National Hazard Mitigation Association).

17. *See Policy Memo, supra* note 9 (listing of all state best practices). *See generally*, EPA, DISASTER RECOVERY AND LONG-TERM RESILIENCE PLANNING IN VERMONT: US EPA SMART GROWTH IMPLEMENTATION ASSISTANCE PROJECT GUIDANCE DOCUMENT FOR THE STATE OF VERMONT (Aug. 2013), *available at* <http://accd.vermont.gov/sites/accd/files/Documents/strongcommunities/cpr/Vermont%20SGIA%20Guidance%20Document%20FINAL.pdf> (suggesting strategies to enhance flood resilient communities in Vermont).

18. SMITH, *supra* note 6, at 45.

Vermont, including agency Secretaries and mid-level staff. Interviews were conducted with officials from the Vermont Agency of Natural Resources (ANR), Agency of Agriculture, Food and Markets (AAFM), Agency of Commerce and Community Development (ACCD), Agency of Transportation (VTrans), Division of Emergency Management and Homeland Security (DEMHS), and the Irene Recovery Office (IRO). Interview questions addressed the following themes: state agency involvement in flood resilience-related activities, including post-disaster disaster recovery programs; the nature of interagency coordination; the types of capacity-building initiatives present; and the manner in which state agencies collect, use, and convey information. The interviews allowed the research team to capture information across pre-identified topical areas, as well as probe issues uncovered during the discussion. Examples of information uncovered using this approach included previously unknown policies and programs and the level of coordination between state agencies and others involved in recovery, such as FEMA, non-profits, and quasi-governmental organizations.

Public meetings—facilitated by officials at the Mad River Valley Planning District—were attended in order to understand the perspectives of local officials and citizens, and to observe and document the responses of state agency officials to questions posed in these meetings. Capturing this dialogue further solidified the research team’s understanding of the degree to which existing state policies and programs addressed local needs identified during the public meetings. The transcribed proceedings were used to refine interview questions, check against the inventory of state policies and programs already identified, and develop preliminary policy options.

The review of state documents combined with the comments made by state and local officials helped shape the nature of interagency and agency-specific policy options. In order to provide an improved contextual understanding and demonstrate how similar recommendations were implemented elsewhere, analogous best practices drawn from across the country supplemented each policy option. Websites describing each of the best practices provided additional information, including background material and the means by which the policies were implemented.

II. DEFINING DISASTER RECOVERY, SMART GROWTH, AND RESILIENCE

Smith and Wenger describe disaster recovery as “the differential process of restoring, rebuilding, and reshaping the physical, social,

economic, and natural environment through pre-event planning and post-event actions.”¹⁹ This definition highlights the reality that disaster recovery involves more than the physical reconstruction of the built environment, as earlier research suggests. Nor is recovery a simple, linear process that is unilaterally applied across members of a community, as described by Haas, Kates, and Bowden.²⁰ Rather, recovery is shaped by key social, economic, and environmental dimensions, which influence the differentially distributed, temporal nature of this process among communities, institutions, households, and individuals.²¹ Drawing from the tenets of sustainable development, a number of researchers and practitioners have described aspirational recovery outcomes including interconnected social, environmental, and economic components.²² The concept of smart growth, which aims to confront the negative effects of urban sprawl, also includes a number of interrelated elements such as compact urban form leading to more walkable and less auto-dependent communities, energy-efficient design features, the protection of environmentally sensitive areas, the promotion of green infrastructure, and the placement of development along existing multi-modal transportation systems. Yet, there remains limited discussion among smart growth proponents about the nexus between smart growth and disaster resilience, although this is changing.

19. Gavin Smith & Dennis Wenger, *Sustainable Disaster Recovery: Operationalizing an Existing Agenda*, in HANDBOOK OF DISASTER RESEARCH 234, 237 (Havidan Rodriguez, Enrico L. Quarantelli & Russell R. Dynes eds. 2006).

20. MASS. INST. OF TECH., RECONSTRUCTION FOLLOWING DISASTER 261–63 (J. Eugene Haas et al. eds. 1977).

21. Robert Bolin & Lois Stanford, *Shelter, Housing and Recovery: A Comparison of U.S. Disasters*, 15 DISASTERS 24, 24–25 (1991) (discussing the factors affecting post-disaster housing). See also SMITH, *supra* note 6 (discussing key dimensions that affect the efficacy of disaster recovery efforts). See generally Peacock, Morrow & Gladwin, *supra* note 5 (discussing disaster recovery in the context of human ecology); PIERS BLAIKIE ET AL., AT RISK: NATURAL HAZARDS, PEOPLE’S VULNERABILITY, AND DISASTERS (1994) (describing social, political, and economic vulnerability); WILLIAM R. FREUDENBURG ET AL., CATASTROPHE IN THE MAKING: THE ENGINEERING OF KATRINA AND THE DISASTERS OF TOMORROW (2009) (arguing that specific historical development patterns and economic factors set the stage for the Katrina disaster).

22. See WILLIAM S. BECKER & ROBERTA F. STAUFFER, REBUILDING FOR THE FUTURE: A GUIDE TO SUSTAINABLE REDEVELOPMENT FOR DISASTER-AFFECTED COMMUNITIES (1994) (discussing sustainable disaster recovery). See also Berke, Kartez & Wenger, *supra* note 5, at 93 (discussing the possibility of disaster recovery to help facilitate local economic and social policy objectives); CHARLES EADIE ET AL., HOLISTIC DISASTER RECOVERY: IDEAS FOR BUILDING LOCAL SUSTAINABILITY AFTER A NATURAL DISASTER (Univ. of Colo. Natural Hazards Research and Applications Info. Ctr., 2001) (outlining key components for building community sustainability following a natural disaster); GAVIN SMITH, HOLISTIC DISASTER RECOVERY: CREATING A MORE SUSTAINABLE FUTURE, 6–7 (Sept. 2004), available at <http://www.training.fema.gov/emiweb/edu/sdr.asp> (incorporating social, economic, and environmental components of sustainable development into the disaster recovery process); Smith & Wenger, *supra* note 19, at 240 (discussing the implementation of a proposed policy framework that can help achieve a sustainable recovery).

While the tenets of sustainability, disaster resilience, and smart growth share important complementary aims, the failure to plan for their integration before and after disasters can have unintended negative consequences. Several studies have shown that smart growth plans and policies can hinder the ability of communities to become more disaster resilient. For instance, the adoption of smart growth principles into disaster recovery design plans in Mississippi may have actually encouraged the reconstruction of communities in a manner that increases hazard risk.²³ Moreover, Berke, Song, and Stevens found that New Urbanist plans did not incorporate hazard mitigation measures into their design features.²⁴ In a study conducted by Chapin, Deyle, and Higgins, researchers found that varied growth scenarios, including one advancing smart growth principles (land use strategies that increase densities in existing urban core areas) actually increased hazard exposure when compared to a “resiliency scenario,”²⁵ which sought to establish new core urban areas that allow for growth outside of locations prone to flooding.²⁶

In its most simple terms, the failure to connect the practice of smart growth and disaster resilience could be referred to as “smart growth in dumb locations.” The emerging concept of safe growth posits that taking action to develop land in a thoughtful way in advance of an extreme event can limit future losses while improving public safety. An integrative theme that bridges sustainable development, smart growth, and safe growth is the concept of hazard mitigation. Hazard mitigation can be defined as those actions, policies, and plans that strive to reduce the loss of life and damages to the built environment due to natural hazards and disasters.²⁷ Sustainable communities, including those that embrace smart growth practices, should include actions that reduce their vulnerability to natural disasters. Such actions stand to make human settlements more enduring in the long run as disasters can disrupt the normal functioning of communities, and in extreme cases, result in permanent damage to interconnected physical, social, economic, and environmental systems.

23. SMITH, *supra* note 6, at 87–90.

24. Philip R. Berke, et al., *Integrating Hazard Mitigation into New Urban and Conventional Developments*, 28 J. PLAN. EDUC. & RESEARCH 441, 450 (2009).

25. Tim Chapin, et al., *Integrating Hazard Mitigation and Sea Level Rise Adaptation into Long-Range Transportation Planning*, Paper Presentation at the ACSP Annual Conference in Minneapolis, Minnesota (Oct. 7, 2010).

26. *Id.*

27. DAVID R. GODSCHALK ET AL., *NATURAL HAZARD MITIGATION: RECASTING DISASTER POLICY AND PLANNING* 5 (1999).

Disaster resilience has gained increasing support among practitioners and hazards scholars.²⁸ Nested within the larger sustainability paradigm, disaster resilience implies developing a system-wide adaptive capacity to rebound from a shock and return to a desirable post-event condition in an expeditious manner. This expands upon the definition of hazard mitigation as not only taking action to reduce physical vulnerability, but also as building an enhanced institutional capacity to adapt to current and future conditions, while learning from the past.²⁹ Narrow definitions of resilience imply quickly returning to a sense of normalcy. Local officials, residents, and business owners are often consumed by the speed at which this occurs, rather than exploring options to return to a “new normal” that may include improving upon pre-event conditions that span the dimensions originally posited under the sustainability framework. For instance, improving social resilience may involve addressing pre-event conditions tied to equity and social justice, as those most vulnerable to the effects of disasters are often the poor, elderly, or those that speak English as a second language. Quickly returning to a precondition characterized as highly inequitable or vulnerable to future events is not indicative of resilience.

Social resilience implies the development of strong institutions and networks that work together collaboratively and coordinate the distribution of the resources they possess, thereby improving the speed and quality of recovery outcomes.³⁰ Economic resilience implies the ability to rebound from economic disturbances, including shocks that affect small businesses that are often dependent on local consumers and are among the most vulnerable to the disruptive effects of disasters.³¹ It also implies developing

28. David R. Godschalk, *Urban Hazard Mitigation: Creating Resilient Cities*, 4 NAT. HAZARDS REV. 136, 137 (2003). See also THE NAT'L ACAD. OF SCI., *DISASTER RESILIENCE: A NATIONAL IMPERATIVE R8* (2012) (describing the interdisciplinary support enjoyed by disaster resiliency scholarship). See generally DOUGLAS PATTON & DAVID JOHNSTON, *DISASTER RESILIENCE: AN INTEGRATED APPROACH* (2006) (defining and discussing resilience); TIMOTHY BEATLEY, *PLANNING FOR COASTAL RESILIENCE: BEST PRACTICES FOR CALAMITOUS TIMES* (2009) (describing coastal resilience and planning for natural disasters); BRIAN WALKER & DAVID SALT, *RESILIENCE THINKING: SUSTAINING ECOSYSTEMS AND PEOPLE IN A CHANGING WORLD* (2006) (defining and discussing resilience); Philip R. Berke & Thomas J. Campanella, *Planning for Postdisaster Resiliency*, 604 ANNALS AM. ACAD. POL. & SOC. SCI. 192 (2006) (describing planning for disaster resilience).

29. BEATLEY, *supra* note 28, at 6–7.

30. See generally SMITH, *supra* note 6 (discussing the coordination of disaster relief institutions and networks in the United States).

31. DANIEL J. ALESCH ET AL., *ORGANIZATIONS AT RISK: WHAT HAPPENS WHEN SMALL BUSINESSES AND NOT-FOR-PROFITS ENCOUNTER NATURAL DISASTERS* 16–18 (2001). Kathleen J. Tierney, *Business and Disasters: Vulnerability, Impacts, and Recovery*, in *HANDBOOK OF DISASTER RESEARCH* 275, 281 (Havidan Rodriguez, et al. eds. 2006). See also Frederick L. Bates & Walter G. Peacock, *Disaster and Social Change*, in *SOCIOLOGY OF DISASTERS: CONTRIBUTION OF SOCIOLOGY TO DISASTER RESEARCH* 291, 326–27 (Russell R. Dynes, et al. eds. 1987) (contrasting the disaster recovery policies of various countries).

a more diversified economy that is able to weather volatile markets and the long-term effects of disasters. Environmental resilience means allowing natural systems, like floodplains, to express their inherent dynamism to the greatest extent possible; this implies recognizing that human settlements and associated physical alterations can impede natural systems' abilities to absorb natural fluctuations in water flow, while still allowing them to benefit from regular change.³²

A. Disaster Recovery Assistance Framework

An important part of understanding sustainability and resilience is linked to the inter-organizational and institutional nature of how groups and organizations operate.³³ Understood relative to disaster recovery, Smith describes the "Disaster Recovery Assistance Framework" and its three defining dimensions: 1) resource rules and understanding of local needs, 2) the timing of assistance, and 3) horizontal and vertical integration.³⁴

i. Resource Rules and Understanding of Local Needs

The disaster recovery assistance network shown in Figure 1 assumes that stakeholder groups or "nodes" provide or influence the distribution of three types of resources, including funding, policy, and technical assistance.³⁵ Each of these stakeholder nodes represents a simplified version of reality. For instance, "federal governments" include not only FEMA, but also Housing and Urban Development, the U.S. Army Corps of Engineers, the EPA, and many others. The graphic shows how the rules associated with the distribution of the resources stakeholders control or influence vary in terms of their prescriptiveness and the degree to which they meet local needs. The power of engaging the larger disaster recovery assistance network in purposeful planning, collaborative decision-making, and

32. The roots of resilience stem from the work of ecologist C.S. Hollings who described resilience as the "capacity of a system to absorb and utilize or even benefit from perturbations and changes that attain it, and so persist without a qualitative change in the system's structure." C.S. Holling, *Resilience and Stability of Ecological Systems*, 4 ANNUAL REV. OF ECOLOGY AND SYSTEMATICS 1, 9 (1973).

33. See Gavin Smith and Thomas Birkland, *Building a Theory of Recovery: Institutional Dimensions*, 30 INT'L J. MASS EMERGENCIES & DISASTERS 147, 148 (2012) (discussing the nature of the network of organizations that take part in disaster recovery efforts).

34. SMITH, *supra* note 6, at 13–26.

35. The assistance network shown in Figure 1, *infra*, is a hypothetical representation of reality. Varied network composition and node placement along the diagonal line may be found in differing geographic locations. SMITH, *supra* note 6, at 14.

resource distribution, undergirds many of the policy options described in this article and the State of Vermont Policy Memo.³⁶

Collaborative planning has been shown to improve the understanding of local conditions and needs.³⁷ Depicting this condition involves shifting the diagonal line to a vertical position whereby stakeholders possess a greater understanding of local needs but maintain the rules governing their resource distribution strategies. Continued dialogue and negotiated agreements can lead to changes in resource rules in which distribution strategies are coordinated and prescriptive rules are modified or relaxed to reflect a more flexible array of programmatic policies, referred to as the “collaborative optimization process.”³⁸ This condition can be graphically displayed as the clustering of nodes downward along the vertical axis and to the right along the horizontal axis. Such change is difficult to achieve across all members of the assistance network in practice, due to a variety of conditions, including varied organizational cultures, entrenched bureaucracies, and poor pre-event planning.³⁹

36. *Policy Memo*, *supra* note 9.

37. See Judith E. Innes & David E. Booher, *Consensus Building and Complex Adaptive Systems*, 65 J. AM. PLAN. ASS'N 412, 413 (1999) (discussing the use of collaborative planning and consensus building to create feasible strategies). See also Judith E. Innes & David E. Booher, *Collaborative policymaking: governance through dialogue*, in *DELIBERATIVE POLICY ANALYSIS: UNDERSTANDING GOVERNANCE IN THE NETWORK SOCIETY* 33, 34 (Maarten A. Hajer & Hendrik Wagenaar eds., 2003) (discussing how multi-discursive approaches to policymaking produce different results than traditional approaches).

38. SMITH, *supra* note 6, at 27.

39. See *id.* at 26–30, 265–320 (describing how planning can lead to a transformation of the disaster recovery assistance framework).

Figure 1. Disaster Recovery Assistance Network. This figure is drawn from *Planning for Post-Disaster Recovery: A Review of the United States Disaster Assistance Framework*.⁴⁰

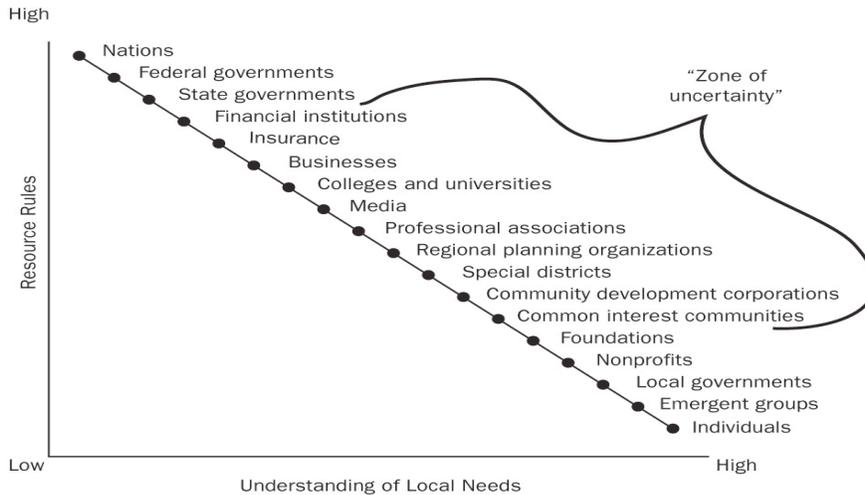


Figure 1 includes a “zone of uncertainty” among stakeholder groups, of which we know less about their roles in recovery, as limited research has been conducted on their actions. In many ways they have been less involved, or even excluded, from participating in recovery-related policymaking and planning undertaken by federal, state, and local governments. As a result, government officials do not necessarily know how to incorporate these stakeholders and the resources they possess into formal plans, policies, and programs. The limited degree to which these groups work collaboratively with other members of the assistance network to coordinate the distribution of the three resource types (funding, policy, and technical assistance) represents an ongoing problem that merits more focused attention.

Much of the literature on disaster recovery focuses on the importance of gaining access to post-disaster funding.⁴¹ A review of practice also shows that state and local governments tend to focus their efforts on the

40. *Id.* at 14.

41. ROBERT B. OLSHANSKY & LAURIE A. JOHNSON, CLEAR AS MUD: PLANNING FOR THE REBUILDING OF NEW ORLEANS 227 (2010). *See generally* H. PAUL FRIESEMA ET AL., AFTERMATH: COMMUNITIES AFTER NATURAL DISASTERS (1979) (discussing patterns of recovery in various communities following natural disasters); RUTHERFORD H. PLATT, DISASTERS AND DEMOCRACY: THE POLITICS OF EXTREME NATURAL EVENTS (1999) (describing the politics of disaster relief and governmental funding).

acquisition of financial aid in the aftermath of an extreme event, rather than investing in pre-event capacity-building initiatives, such as collaborative planning and problem-solving.⁴² Not only does this reactive approach to recovery overwhelm local governments when a major disaster strikes, it underemphasizes the important and complimentary resources that can shape recovery outcomes, including the development of more thoughtful policies that address identified needs and inform technical assistance strategies intended to build the collective capacity of the network.

ii. Timing of Assistance

The rapidity with which recovery occurs is a driving force for action, albeit one that can supersede the importance of post-disaster reflection and meaningful pre-event planning.⁴³ In most cases, state and local officials are placed under tremendous pressure to act, often in order to speed the return to a sense of normalcy, even though pre-event conditions may include high levels of vulnerability to natural hazards, inequitable decision making processes, a weak economy, and poor environmental stewardship.⁴⁴ The framework's temporal dimension also refers to the degree to which members of the assistance network engage in pre-event activities in preparation for a disaster. These activities include the formation of disaster recovery committees that explore ways to better coordinate the distribution of resources and create pre-disaster recovery plans. The framework assumes that each member of the assistance network provides resources at some point in time across a larger disaster recovery continuum (e.g., before an event strikes, in the immediate aftermath, and as part of long-term recovery activities). The timing of that assistance, including the degree to which it is coordinated with others delivering their own set of resources over time, can significantly affect recovery options and outcomes. Furthermore, when the temporal distribution of resources is aggregated across the network of stakeholders, the complexity of the recovery process becomes evident.

iii. Horizontal and Vertical Integration

The concepts of horizontal and vertical integration provide useful ways to understand multi-jurisdictional decision-making, including decisions

42. See generally SMITH, *supra* note 6 (discussing general patterns of post disaster recovery efforts, including the obtainment of financial aid in the United States).

43. Robert B. Olshansky, *Planning After Hurricane Katrina*, 72 J. AM. PLAN. ASS'N. 147, 148-49 (2008).

44. See generally SMITH, *supra* note 6 (describing patterns of post disaster recovery in the United States).

involving disaster recovery.⁴⁵ Horizontal integration refers to the strength of relationships across organizations in a given area.⁴⁶ Vertical integration typically describes the strength of relationships between local, state, and federal stakeholders.⁴⁷ Understood relative to disaster recovery, horizontal and vertical integration also highlight relationships with external aid providers such as federal agencies, corporations, and national lending institutions. The true power of horizontal and vertical integration is achieved when both dimensions are strong and act in tandem. For instance, a small rural community may possess strong horizontal linkages between local faith-based organizations, citizens, and a local government guided by sound participatory decision-making processes. This same community may be characterized by poor vertical connectivity with state and federal government agencies and the programs and policies they employ post-disaster.⁴⁸ Thus, the community may have a good understanding of local conditions and post-disaster needs but be unable to effectively navigate the multitude of recovery programs that are delivered by external stakeholder groups. Conversely, a community that possesses both strong horizontal and vertical integration tends to share information within its borders and has established relationships with state and federal stakeholders that facilitate the acquisition of resources that meet local needs. Research has shown that organizations can influence the strength of horizontal and vertical integration through capacity-building efforts including training, education, and outreach initiatives. Examples of organizations that have undertaken

45. Berke, Kartez & Wenger, *supra* note 5, at 100.

46. See Dylan Sandler & Gavin Smith, *Assessing the Quality of State Disaster Recovery Plans: Implications for Policy and Practice*, J. HOMELAND SEC. & EMERGENCY MGMT. (forthcoming 2013) (discussing that while the horizontal integration concept is typically applied at the local or community level, it has been applied across state agencies).

47. Smith expands the concept of vertical integration to include individuals and international aid organizations and nations at either ends of the spectrum. See SMITH, *supra* note 6 (expanding the concept of vertical integration).

48. Strong horizontal and weak vertical integration characterize many of Vermont's small jurisdictions. For instance, several state officials described the lack of county government as a real hindrance to vertical integration, as evidenced by the difficulty of implementing federal policies at the local level, including the distribution of grants to individuals. One official noted that this lack of connectivity had the effect of limiting community resilience. State officials also noted gaps in their ability to manage federal assistance programs, build local capacity, and effectively implement post-disaster policies when federal and state rules conflict. Recognizing the gaps in horizontal and vertical integration can be used to help create new or modified state policies that are capable of addressing this void. Interviews conducted with state agency officials in Montpelier, VT (October 23–24th, 2012). Interviews conducted with state agency officials granted on the condition that all identities remain confidential.

such efforts include quasi-governmental, non-profit, and private sector groups as well as state agencies.⁴⁹

B. *State Roles in Disaster Recovery, Resilience, and Smart Growth*

While states provide an important linkage between federal and local governments, they have received less attention by researchers and policy makers in terms of the roles they play in recovery.⁵⁰ States formulate policy, coordinate the delivery of federal assistance, and engage in a range of pre- and post-disaster capacity-building initiatives that target local governments.⁵¹

At the state level, the lack of pre-event planning for post-disaster recovery remains a problem. A review of state recovery plans produced the following findings: 1) states are often ill-prepared to address the challenges associated with disaster recovery; 2) states tend to focus on the administration of federally funded post-disaster grant programs with less emphasis placed on emerging local needs and capacity-building efforts like pre-event planning for post-disaster recovery; 3) few states have developed sound recovery plans designed to foster greater horizontal and vertical integration; and 4) state plans do not include the breadth of stakeholders found in typical disaster recovery assistance networks.⁵² In the State of Vermont, many of the same conditions were evident following Tropical

49. See generally SMITH, *supra* note 6 (describing the various institutions and organizations involved in disaster recovery).

50. See William L. Waugh, Jr. & Richard T. Sylvés, *The Intergovernmental Relations of Emergency Management*, in *DISASTER MGMT. IN THE U.S. AND CANADA: THE POLITICS, POLICYMAKING, ADMINISTRATION AND ANALYSIS OF EMERGENCY MGMT.* 46 (Richard T. Sylvés & William L. Waugh, Jr. eds., 1996). See also Smith & Wenger, *supra* note 19, at 240 (suggesting the need for more research into federal-state and local-state coordination in recovery planning); SMITH, *supra* note 6 (describing the roles of different levels of government in disaster relief); Sandler & Smith, *supra* note 46, at 2 (describing the role of state governments in disaster recovery).

51. SMITH, *supra* note 6, at 45.

52. See GAVIN SMITH & VICTOR FLATT, *ASSESSING THE DISASTER RECOVERY PLANNING CAPACITY OF THE STATE OF NORTH CAROLINA* 1–2 (2011) (discussing inconsistency and ineffectiveness in existing state recovery plans). See generally Sandler & Smith, *supra* note 46 (analyzing state recovery plans). The review process found that none of the states had in place a document that could be characterized as a plan based on the plan quality literature. See Sandler & Smith, *supra* note 46, at 5–8 (analyzing state recovery plans). See also Philip Berke & David Godschalk, *Searching for the Good Plan: A Meta-Analysis of Plan Quality Studies*, 23 *J. OF PLAN. LITERATURE* 227 (2009) (analyzing the findings of several studies on local plan quality). Instead, states tended to maintain a collection of documents rather than an integrated decision making tool that adhered to plan quality principles. Plan quality principles include: 1) a vision and direction-setting collection of goals; 2) policies; 3) a fact base; 4) an implementation strategy; 5) a monitoring and evaluation process; 6) a means to foster inter-organizational coordination; 7) compliance with existing mandates and voluntary agreements; and 8) a method to ensure organizational clarity. See SMITH, *supra* note 6, at 275–92 (discussing plan quality principles as they apply to disaster recovery plans).

Storm Irene. The remainder of this paper describes a number of policy options intended to address identified weaknesses while building on enduring strengths.

III. THE STATE OF VERMONT'S PROPOSED POLICY OPTIONS

The policy options described next were developed as part of a year-long project in cooperation with state agencies, EPA, FEMA, and the Mad River Valley Planning District. Each of the policy options are framed across five themes:

- 1) Take a Watershed-Based Approach to Address Development Patterns and Flood Hazard Vulnerability;
- 2) Create a Clear Plan of Action to Guide Pre- and Post-Disaster Decisions;
- 3) Tackle Capacity Limits and Maximize Partnerships;
- 4) Develop Coordinative Guidance for the use of Assistance Before and After Disasters that Advance Resilience and Smart Growth Goals; and
- 5) Align River Science, State Goals, and Programs that Recognize Existing and Future Settlement Patterns.

A. Take a Watershed-Based Approach to Address Development Patterns and Flood Hazard Vulnerability

Planning at the watershed scale represents an important—albeit difficult—way to address the cumulative effects of development and associated flood hazard vulnerability. Historic settlement patterns in Vermont are characterized by relatively compact urban form adjacent to highly dynamic river systems. Gateway farms often bound these long-standing towns on either end of linear development patterns shaped by the adjacent river and steep-sloped terrain. More recent growth patterns include sprawling hillside development. The preservation of farmland, a nationally recognized practice in Vermont, can provide a tangible alternative to more intensive land uses in the floodplain that exacerbate downstream flooding.⁵³ Yet the armoring of riverine shorelines in order to protect vulnerable

53. One of the problems uncovered in interviews with state and local officials involved the storage of hay bales in the floodplain. The floodwaters associated with Tropical Storm Irene washed the bales downstream where they exacerbated damages to covered bridges and obstructed the flow of water. One policy option noted in both the local and state policy memos encouraged the storage of hay bales and other potential obstructions outside of the floodplain, if practicable. Interviews with state agency officials in Montpelier, VT (Oct. 23–24th, 2012).

agricultural infrastructure and limit the loss of farmland can hinder natural processes along riparian corridors. As noted by one respondent:

Farmers have been waging skirmishes with river systems . . . [using] rip-rap, armoring, expanding meadows/cropland. . . municipalities have been doing the same . . . making these investments without taking into account risks . . . [They] have loaded the gun and cocked it with regard to risks.⁵⁴

Recommendations suggested in the state policy memo include: the adoption of a state-wide “No Adverse Impact” program; the creation of a more comprehensive fluvial erosion mapping program; and the incorporation of flood resilience measures into Act 250.⁵⁵ The Association of State Floodplain Managers (ASFPM) created the “No Adverse Impact” program to address the unintended consequences of the National Flood Insurance Program (NFIP), which does not account for the cumulative effects of upstream development patterns on downstream flood hazard vulnerability. More specifically, ASFPM defines “No Adverse Impact” as actions taken at the community and individual level when:

the actions of one property owner are not allowed to adversely affect the rights of other property owners. The adverse effects or impacts can be measured in terms of increased flood peaks, increased flood stages, higher flood velocities, increased erosion and sedimentation, or other impacts the community considers important. The No Adverse Impact philosophy can shape the default management criteria: a community develops and adopts a comprehensive plan to manage development that identifies acceptable levels of impact, specifies appropriate measures to mitigate those adverse impacts, and establishes a plan for implementation. No Adverse Impact criteria can be extended to entire watersheds as a means to promote the use of regional retention/detention or other stormwater techniques to mitigate damage from increased runoff from urban areas.⁵⁶

54. Interviews with officials from Agency of Agriculture, Food and Markets officials in Montpelier, VT (Oct. 23–24th, 2012).

55. *Policy Memo*, *supra* note 9, at 18.

56. ASS’N OF STATE FLOODPLAIN MANAGERS, NAI: NO ADVERSE IMPACT FLOODPLAIN MANAGEMENT 2 (2008), *available at* <http://www.floods.org/index.asp?menuID=349&firstlevelmenuID=187&siteID=1>. The State of Ohio has incorporated “No Adverse Impact” criteria into its model floodplain management ordinance, the legal vehicle through which local governments regulate floodplain management and comply with the

The state policy memo suggests that the best way to implement a “No Adverse Impact” program is to “establish state minimum ‘No Adverse Impact’ standards that municipalities would be required to incorporate into local bylaws limiting development in flood-prone areas.”⁵⁷ Reflecting recommendations stated at the end of this paper, this approach couples state-led capacity building initiatives with increased accountability among local governments through a gradual increase in flood resilience-related standards.

Due to the unique river systems in the state, Vermont has developed a fluvial, geomorphic-based River Corridor Planning Program.⁵⁸ The ability to maintain and expand the state mapping of fluvial erosion provides a critical fact base upon which to assess flood risk. It also helps establish appropriate policies, plans, and programs that reflect the state’s natural hazard conditions and land development patterns, both of which are subject to change over time. In order to accomplish this objective, the state faces two principal, interrelated challenges—namely, identifying the funding needed to maintain the program, and FEMA’s unwillingness to use these maps for regulatory purposes as part of the NFIP. As noted by one state official, “[t]he classic inundation model of the national flood program is inaccurate and the methodology that goes into FEMA maps [only] works well on low gradient streams.”⁵⁹ Because FEMA does not recognize the fluvial erosion maps as a legal basis for managing the NFIP, it does not use the maps for determining compliance of local governments or individual property owners.⁶⁰

requirements established under the National Flood Insurance Program. According to Vermont Agency of Natural Resources officials, seventy percent of municipalities in the state follow FEMA’s minimum flood ordinance standards while seventeen percent have adopted bylaws that use “No Adverse Impact” standards for Special Flood Hazard Areas and/or river corridors. *Policy Memo*, *supra* note 9, at 14.

57. *Policy Memo*, *supra* note 9, at 19.

58. *See River Corridor Planning, Protection, and Restoration*, VT. DEP’T OF ENVTL. CONSERVATION, WATERSHED MGMT. DIV., http://www.vtwaterquality.org/rivers/htm/rv_restoration.htm (last updated July 2007) (providing information on Vermont’s River Management Program and river corridor planning).

59. Interviews with officials from Agency of Natural Resources in Montpelier, VT (October 23-24th, 2012).

60. Fluvial erosion mapping has been funded under the Hazard Mitigation Grant Program (HMGP), a FEMA grant that is triggered by a federal disaster declaration. *Policy Memo*, *supra* note 9, at 26. The amount of HMGP funds a state receives is predicated on fifteen percent of total federal disaster costs. FED. EMERGENCY MGMT. AGENCY, *HOLISTIC DISASTER RECOVERY: CREATING A MORE SUSTAINABLE FUTURE*, (2004) 14, *available at*, <http://training.fema.gov/EMIWeb/downloads/hdr/EMIDRTSessionXIV%20Final%209.17.04.pdf>. A policy option encourages FEMA to support the funding of fluvial erosion maps in Vermont as part of their growing Risk Mapping and Assessment Program (RISKMAP) initiative, an effort intended to improve the assessment and mapping of other hazards. *Policy Memo*, *supra* note 9, at 27. However, a

Act 250 provides an important and well-established vehicle to address watershed-level planning as it relates to increased flood hazard resilience. Among the most significant limitations, however, have been the restrictions placed on the Act through perceived violations of Criterion 1(D), which requires that qualifying subdivisions do not “result in undue water or air pollution” from sources “including stormwater...floodways, streams, [and] shorelines.”⁶¹ In most cases, application of this provision depends on a proposed development’s location in the floodplain, as delineated by Flood Insurance Rate Maps. However, in cases such as the *Woodford Packers, Inc.* appeal, the Agency of Natural Resources (“ANR”) has relied upon fluvial geomorphology to determine the flood hazard vulnerability of proposed developments.⁶² The more routine use of this approach could help foster flood resilient development while recognizing the legal limits of Act 250.⁶³ This approach falls in line with emerging state policy initiatives such as Act 138, which gives ANR discretionary authority to adopt rules that exceed NFIP standards. The ability to more closely integrate state policies can be achieved through sound pre-event planning.

B. Create a Clear Plan of Action to Guide Post-Disaster Decisions

A number of state agency officials commented on how the lack of pre-event planning left them unprepared to integrate disaster resilience into post-Irene recovery and develop proactive, collaboratively derived strategies. According to one state official, “somebody needs to organize this tangled mess of resilience conversation so I have a clue what’s the order of things, what’s the map, what’s the timeline, because I am totally unprepared for the next event. And it’s not because I haven’t spent time thinking about it.”⁶⁴ Officials from the Agency of Commerce and Community Development highlighted the benefits of a coordinative effort linking hazard mitigation plans and grant selection processes that evolved between their agency and the Division of Emergency Management and Homeland

state official lamented that FEMA has cut funding of the RISKMAP program in Vermont by forty percent. Interviews with officials from Agency of Natural Resources officials in Montpelier, VT (Oct. 23–24th, 2012).

61. VT. STAT. ANN., tit. 10, § 6086(a)(1) (2013) (amended by An Act Relating to Reducing Energy Costs and Greenhouse Gas Emissions, 2013 Vermont Laws No. 89 (H. 520)).

62. *In re Woodford Packers, Inc.*, 830 A.2d 100, 104 (Vt. 2003).

63. *Policy Memo*, *supra* note 9, at 28.

64. Interviews with officials from Agency of Agriculture, Food and Markets in Montpelier, VT (October 23–24th, 2012).

Security after Tropical Storm Irene. However, they lamented that “none of this coordination was in place before [the event].”⁶⁵

The lack of pre-event planning also hindered the state’s ability to identify unmet needs and craft a state-level recovery strategy. Similar conditions are common across the United States as post-disaster recovery is largely an ad-hoc process.⁶⁶ As noted earlier in this paper, one of the few studies of state-level recovery plans found that many states did not effectively plan for recovery as reflected in the quality of pre-disaster recovery plans.⁶⁷ Most states possessed a series of documents best characterized as “a descriptive collection of existing recovery programs rather than plans that lay out a vision, goals and a set of corresponding steps that should be carried out to achieve those goals.”⁶⁸ Nor did state plans discuss policies designed to foster inter-organizational collaboration or balance competing interests.⁶⁹

In an effort to address these concerns, a set of policy options center on recovery planning. More specifically, recommendations include: 1) move forward with the implementation of an Irene-specific recovery strategy (guided by the state’s Inter-Agency Long-Term Flood Resiliency Goals and policy options described in the state policy memo); 2) build on the process (including lessons learned following Tropical Storm Irene) to develop a comprehensive pre-event recovery plan in advance of the next disaster;⁷⁰ 3) exercise the recovery plan over time;⁷¹ and 4) advocate for changes in federal policy that support the aims of Vermont to achieve the flood resiliency goals and policies described in the state policy memo and other documents.⁷²

The state policy memo suggested that the development of a pre-disaster recovery plan should coincide with FEMA’s nascent National Disaster

65. Interviews with officials from the Agency of Commerce and Community Development in Montpelier, VT (Oct. 23–24th, 2012).

66. James W. Fosset, *Let’s Stop Improvising Disaster Recovery*, THE NELSON A. ROCKEFELLER INST. OF GOV’T: OBSERVATIONS (July 2013) http://www.rockinst.org/observations/fossettj/2013-07-09-Improvising_Disaster_Recovery.aspx.

67. See Smith, *supra* note 6 (discussing the lack of state pre-disaster planning). See generally Sandler & Smith, *supra* note 46 (describing inadequate quality of state recovery plans).

68. Sandler & Smith, *supra* note 46, at 5.

69. The study evaluated state recovery documents in Florida, Mississippi, California, and North Carolina.

70. The State of Florida requires local governments to update their disaster recovery plans following disasters. See STATE OF FLA. DIV. OF EMERGENCY MGMT., RECOVERY PLAN, *available at* <http://floridadisaster.org/documents/Recovery%20Plan%2011-2008.pdf> (last modified Aug. 2008) (describing the State of Florida’s Post-Disaster Redevelopment Planning Initiative).

71. See generally ILL. EMERGENCY MGMT. AGENCY, STATE OF ILLINOIS DISASTER RECOVERY PLAN (2012), *available at* http://www.state.il.us/iema/disaster/pdf/IDRP/IDRP_Forward.pdf (discussing Illinois state policy of revising state disaster plan biannually).

72. *Policy Memo*, *supra* note 9, at 14–15.

Recovery Framework.⁷³ The recent hiring of a FEMA Region 1 Federal Recovery Coordinator provides an opportunity for the state to draw from the lessons of Irene and work with FEMA and members of the larger disaster assistance network to develop a comprehensive state plan. This plan would help to influence the final makeup of federal recovery planning requirements that reflect the state's unique conditions and needs and identify ways to build the capacity of communities to develop local recovery plans.⁷⁴ Exercising these plans in advance of future disasters allows for the larger disaster recovery assistance network to assess the plans' operational functionality and to make necessary changes based on post-exercise review.⁷⁵

As the federal recovery planning requirements are being developed, the state should advocate for changes in federal policies that advance and facilitate Vermont's flood resiliency goals.⁷⁶ Specifically, the state should support federal policies that address issues associated with "No Adverse Impact," incorporate risk reduction measures into infrastructure repair, and make use of fluvial erosion maps in regulating floodplain development. Specific measures may include: 1) a stronger emphasis on pre-event capacity building programs, including the development of robust pre-disaster recovery plans; 2) a greater emphasis on injecting risk reduction measures into existing federal recovery policies and programs; and 3) expanding the involvement of underutilized members of the disaster assistance network.

73. *Policy Memo, supra* note 9 at 15. The National Disaster Recovery Framework (NDRF) is a new federal initiative required by the Post-Katrina Emergency Management Reform Act (PKEMRA). Prior to Hurricane Katrina, the federal government did not have a clear national disaster recovery strategy in place that emphasized the value of disaster recovery planning. PKEMRA represents an effort to remedy this problem. The NDRF places greater emphasis on building the capacity of federal, state, and local governments to address the issues associated with disaster recovery by encouraging states and local governments to develop pre-disaster recovery plans. FEMA is in the process of completing state and local disaster recovery guidance. Some of the still-emerging federal guidance for state-level recovery planning, which has been used by FEMA in lieu of their own materials, was created by the writers of this journal article. See GAVIN SMITH & DYLAN SANDLER, U.S. DEP'T. OF HOMELAND SEC., COASTAL HAZARDS CTR. OF EXCELLENCE, UNIV. OF N.C., STATE DISASTER RECOVERY PLANNING GUIDE 6 (2012), available at http://coastalhazardscenter.org/dev/wp-content/uploads/2012/05/State-Disaster-Recovery-Planning-Guide_2012.pdf (describing state-level guidance).

74. FEMA Region 1 includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

75. While the State of Vermont held a disaster recovery exercise in 2010, it should repeat the exercise once the new NDRF-compliant state recovery plan is developed.

76. *Policy Memo, supra* note 9 at 15.

C. Tackle Capacity Limits and Maximize Partnerships

Interviews with agency officials and a review of post-disaster program requirements demonstrated the need to bolster the capacity of state agencies involved in recovery. In order to achieve a more fine-grained assessment of capabilities, the research team suggested that the state conduct an audit of existing programs, including the degree to which they help or hinder the ability of the state to achieve its Inter-Agency Long-Term Flood Resiliency Goals and the policy options cited in the state policy memo.⁷⁷ The results of this assessment should be used to help frame a policy dialogue across state agencies and the larger assistance network with the ultimate aim of better understanding identified shortfalls, duplication, and policies that contradict flood resiliency goals. Based on this assessment, existing policies should be modified or eliminated and new policies developed as needed.

For instance, a number of pre-existing programs such as disaster assistance cadres, mutual aid agreements, professional emergency management accreditation programs, and collective non-profit assistance operations such as National Voluntary Organizations Active in Disaster (VOAD) tend to focus on response-oriented activities and less on disaster recovery.⁷⁸ Other examples include comprehensive hazard mitigation plans that should be better linked to disaster recovery planning efforts. This comprehensive approach stands in contrast to disaster recovery practice in the United States, which has historically placed less emphasis on the development of integrated disaster recovery policies guided by an underlying set of goals or principles.⁷⁹ Nor do most states or local governments effectively integrate hazard mitigation and disaster recovery

77. Often referred to as a capability assessment, the process involves a review of existing and proposed policy options, programs, and plans, including their technical, fiscal, administrative, and political feasibility. For instance, feasibility determinations may include a review of analytical tools (technical), internal and external funding sources (fiscal), the number and qualifications of staff (administrative), and the political will necessary to adopt and implement proposed policy measures. *Policy Memo*, *supra* note 9, at 16–17.

78. The emergency management community is dominated by a response orientation, placing less emphasis on hazard mitigation and disaster recovery. For an in-depth discussion of response-oriented “collaborative operations in hazards management” that merit change in order to better address disaster recovery needs, see SMITH, *supra* note 6, at 345–66.

79. Prior to the post-Katrina development of the National Disaster Recovery Framework, FEMA relied on the National Response Framework (NRF), which as the name implies, is focused on disaster response activities. Recovery-related activities were located in an appendix of the NRF. See *generally id.* (discussing FEMA’s reliance on the National Response Framework to guide federal recovery efforts prior to the development of the National Disaster Recovery Framework).

elements into state and local comprehensive planning policies, programs, and plans.⁸⁰

In the case of Vermont and its limited state-level staffing, the capacity of agencies was severely stretched following Tropical Storm Irene.⁸¹ Not only did representatives from smaller agencies—such as Agency of Commerce and Community Development and Agency of Agriculture, Food and Markets—indicate that it was difficult to fulfill their recovery responsibilities, the Vermont Agency of Transportation, the state’s largest agency, had to employ independent contractors to complete a great deal of work, which was a process so fraught and challenging that VTrans officials referred to it as “[their] second flood.”⁸²

Following federally declared disasters, funds are available to hire additional state staff to assist with the administration of disaster recovery grant programs. Given the general reluctance of the State of Vermont to hire temporary staff following Tropical Storm Irene, the state policy memo suggests a “hybrid approach to increase capacity by selectively hiring additional state staff and maximizing the coordination of stakeholders across the larger Vermont Disaster Recovery Assistance Network.”⁸³ In order to accomplish this aim the memo suggests that the state “develop a pre-disaster personnel plan that identifies agency needs as well as those resources that can be provided by the larger assistance network, including federal and local officials, non-profits, quasi-governmental organizations, consulting firms, and those groups that emerge following disasters.”⁸⁴ The personnel plan should also include the development of “pre-disaster contracting templates and scopes of work in advance of the next disaster, expanding on the needs and issues identified following Tropical Storm Irene.”⁸⁵ These pre-event contracts should purposely target areas that

80. *Id.* at 349–55. The State of California’s planning law requires that local comprehensive plans include a seismic safety element. California Earthquake Hazards Mitigation Legislation, WESTERN STATES SEISMIC POL. COUNCIL, <http://www.wsspc.org/policy/California.shtml> (last visited Nov. 8, 2013).

81. Low levels of state agency capacity is a widespread problem across the United States. See Smith, *supra* note 6 (discussing variability in state pre-disaster planning). Problems associated with variable levels of state capacity were also found in an evaluation of state hazard mitigation plans and programs. Gavin Smith, Ward Lyles, and Philip Berke, *The Role of the State in Building Local Capacity and Commitment for Hazard Mitigation Planning*, 31 INT’L J. MASS EMERGENCIES & DISASTERS 2, 178–203 (2013) (discussing the role of the state in enhancing local capacity and commitment to hazard mitigation planning).

82. *Policy Memo*, *supra* note 9, at 34.

83. *Id.* at 17.

84. *Id.*

85. *Id.* at 18. See also *North Carolina Emergency Management*, U.N.C. SCHOOL OF GOV’T, <http://www.sog.unc.edu/ncem> (last visited Nov. 8, 2013) (providing examples of contracting documents).

existing state agencies are not equipped to address and should be codified and included in standard operating procedures. In many cases, these contracted services are eligible for reimbursement by FEMA following a federally declared disaster, and the use of pre-existing agreements can help speed the implementation of post-disaster activities. Pre-disaster contracts adopted in other states include those used to assist with debris management, infrastructure repair, grant management, and legal services.

An additional way to develop and maintain a surge capacity is to create a state-level disaster reservist cadre that is experienced in disaster recovery operations.⁸⁶ These on-call individuals—who can be paid using federal or state post-disaster funds—are not a drain on day-to-day state resources, but rather are paid only when activated. Disaster reservist cadres may include current and retired professionals drawn from fields such as engineering, public works, land use planning, floodplain management, financial management, social services, and agricultural extension.⁸⁷ In the aftermath of a disaster these groups can supplement local staff, assisting with grant management, permitting, building inspections, damage assessments, and repair cost estimations. Ideally, members of the disaster assistance cadre understand the important contextual issues surrounding post-disaster recovery operations including complex and bureaucratic program rules, an ability to operate in a high-paced environment, and decision-making with incomplete and rapidly changing information. Disaster assistance cadres benefit from an understanding of the overarching state goals and principles that guide recovery operations, including those that advance the integration of disaster resilience and smart growth.

D. Develop Coordinative Guidance for the use of Assistance Before and After Disasters that Advance Resilience and Smart Growth Goals

The state of Vermont created the Irene Recovery Office in order to help coordinate state agency activities and identify additional sources of funding to aid recovery. An assessment of the Irene Recovery Office showed that it

86. *Disaster Reservist Program*, N.C. DEP'T. OF PUB. SAFETY, <https://www.ncdps.gov/Index2.cfm?a=000003,000010,001623,002151> (last modified Aug. 9, 2012). See STATE OF FLA., DIV. OF EMERGENCY MGMT.: FLORIDA DISASTER RESERVIST FIELD OPERATIONS MANUAL, *available at* <http://www.floridadisaster.org/Recovery/documents/disasterreservistfieldoperationsmanual.pdf> (last modified Sept. 2010) (discussing Florida's Disaster Reservist Program); *NJ Disaster Reservist Program (NJDRP)*, N.J. OFFICE OF EMERGENCY MGMT., <http://www.state.nj.us/njoem/programs/njdrp.html> (last visited Nov. 8, 2013); MILITARY DEP'T., WASH. STATE, PUBLIC ASSISTANCE DISASTER RESERVIST PROGRAM, *available at* <http://mil.wa.gov/jobs/documents/PublicAssistanceReservist.pdf> (last visited Nov. 8, 2013).

87. *Policy Memo*, *supra* note 9, at 18.

was understaffed and too focused on the review of federal programs traditionally administered by the state's emergency management agency.⁸⁸ Specific policy options suggested in the state policy memo include: "the long-term staffing of a Flood Recovery Office, expanding its duties to include the development of a State Disaster Recovery Plan, and the coordination of higher-level interagency policies."⁸⁹ While the development of state recovery offices is common following major disasters, their long-standing existence is less prevalent. The potential creation of a permanent office will need to be further explored, as Vermont has not had a series of major storms in close succession like other states in which recovery offices have endured over longer periods of time.⁹⁰ In addition, the state will need to determine the location in which the disaster recovery office resides as well as its organizational structure. As noted by one state official:

There are people who see [the post-Irene condition] as an opportunity to embrace resilience. Some think the Recovery Office could become the organization responsible to lead that effort. But maybe the structure shouldn't be solely public. Maybe [the organization should be] more of a partnership that is made up of public, private, and nonprofit organizations. The capacity has to be contained within organizations that go beyond the public sector and that can be stood up quickly.⁹¹

88. *Policy Memo*, *supra* note 9 at 19.

89. *Id.* at 19. If the State of Vermont decides to establish a recovery office, it will need to determine where it is housed and how its activities mesh with other state agencies, including the Division of Emergency Management and Homeland Security (DEMHS). Following Tropical Storm Irene, the DEMHS created a new section focused on disaster recovery and assumed additional responsibilities tied to the management of federal grants used to repair damaged state and local infrastructure. Options include the Governor's Office, the DEMHS, or some form of quasi-governmental agency. For example, the Louisiana Recovery Authority is a 33-member organization responsible for the identification of post-disaster recovery resources as well as the coordination of long-term recovery activities. *See* LA. RECOVERY AUTH., LOUISIANA RECOVERY AUTHORITY STRATEGIC PLAN FY 2008/2009, available at <http://lra.louisiana.gov/assets/docs/searchable/StrategicPlan0809.pdf> (last visited Nov. 8, 2013) (describing the role of the Louisiana Recovery Authority).

90. *See* Andrew Nemethy, *UPDATED: FEMA balks at price tag for Irene damage to state property*, VTDIGGER.ORG (July 20, 2012), <http://vtdigger.org/2012/07/20/fema-balks-at-price-tag-for-irene-damage-to-state-property/>. The states of North Carolina and Mississippi have maintained recovery offices over long periods of time. In the case of North Carolina, which experienced the state's two worst disasters in close succession (e.g., Hurricanes Fran (1996) and Floyd (1999)) and Mississippi, which experienced Hurricane Katrina (2005) and the BP Oil Spill (2011), both offices were still open at the time this article was published. Following Hurricane Floyd, the State of North Carolina created a three tiered disaster declaration process that codifies the conditions that trigger a number of state recovery programs, many of which are administered by the North Carolina Disaster Recovery Center. *See* N.C. GEN. STAT. §§ 166A-19.20–166A-19.22 (2012), available at <http://www.ncga.state.nc.us/gascripts/Statutes/StatutesTOC.pl?Chapter=0166A> (establishing North Carolina's tiered disaster declaration process).

91. Interviews with officials from the Irene Recovery Office in Montpelier, VT (October 23-24th, 2012).

The non-profit sector may supplement state agency efforts, as it tends to be more flexible and target needs that are not met by government organizations.⁹² The state policy memo suggests that the Vermont Community Foundation “could take the lead in working with other non-profits (including the Vermont Disaster Relief Fund), state agencies, and local officials to develop guidance focused on assisting those in need while simultaneously advancing disaster resilience goals.”⁹³ The memo also recommends that “the state could work with Vermont Voluntary Organizations Active in Disaster (VOAD) to expand their coordinative role among non-profits and foundations to explore how they can play a greater role in achieving more flood resilient communities.”⁹⁴

Non-profits do not always coordinate their efforts with the public sector. This can lead to the unintended perpetuation of social vulnerability because non-profits often deliver assistance to low-income populations with greater speed than state and federal agencies. In some cases this can lead to the rebuilding of housing to its pre-event condition rather than in conformance with new codes and standards adopted by states and local governments during disaster recovery.⁹⁵ On the other hand, non-profits can serve an important boundary spanning function by helping the most vulnerable groups rebuild their homes, assisting with immediate needs like temporary housing and food, advocating for needed policy change, or explaining complex federal grant programs.⁹⁶ Recognizing the importance of the coordinated delivery of resources highlights the value of robust pre-event planning for post-disaster recovery. This is reflected in the following policy option: “[r]ecognizing that the likelihood of hiring additional staff in this economic climate is small, we suggest revisiting the specific tasks undertaken by various stakeholders following Irene, assessing gaps in the needs that remain . . . unmet, and developing a pre-disaster recovery plan

92. SMITH, *supra* note 6, at 127.

93. *Policy Memo*, *supra* note 9, at 19–20. Following Hurricane Katrina, the Greater New Orleans Foundation stipulated in their eligibility criteria that grant proposals must describe how an applicant’s project advances resilience. See generally GREATER NEW ORLEANS FOUND., http://www.gnof.org/nonprofits/apply_for_a_grant/ (last visited Nov. 8, 2013) (noting that post-Katrina grant applications require applicants to describe how projects promote resilience).

94. *Policy Memo*, *supra* note 9, at 19–20. National Voluntary Organizations Active in Disasters (NVOAD) was created after Hurricane Camille struck the Mississippi Gulf Coast in 1969 in order to improve the coordinated distribution of non-profit aid. In 2004, NVOAD created a Long-Term Recovery Manual, which describes the recovery tasks undertaken by participating members, including case management, donations management, and other reconstruction-related activities. See NAT’L VOLUNTARY ORGS. ACTIVE IN DISASTER, LONG-TERM RECOVERY MANUAL (2004) available at http://www.nationalservicerresources.org/filemanager/download/ProgramMgmt/NVOAD_Manual.pdf.

95. SMITH, *supra* note 6, at 18.

96. *Id.* at 127–28.

for future events that clarifies roles, reduces duplication of effort, and maximizes available resources.”⁹⁷ For instance, “the Agency of Commerce and Community Development (ACCD), working with its partners, could strengthen, expand, and codify the roles of the economic development network in Vermont to include disaster resilience as part of all smart growth initiatives.”⁹⁸ This approach, undertaken by agencies and other members of the assistance network, improves the alignment of state-level programs to achieve higher order goals and may represent the first step towards creating a more flood resilient Vermont. The next section discusses the Agency of Natural Resources, a key player at the state level whose programs have the potential to shape flood resilience.

E. Align River Science, State Goals, and Programs that Recognize Existing and Future Settlement Patterns

The State of Vermont is widely recognized as a leader in floodplain management and has been able to accomplish a number of progressive initiatives in the face of limited state staffing and low levels of local government capacity. This has led to the development of state initiatives that reflect unique local conditions. The Agency of Natural Resources (“ANR”) plays a key role in linking the use of river science-based information to state-level policies and programs. Given the importance of strengthening vertical integration in recovery, strong state policy may be necessary but insufficient to address post-disaster recovery needs. As noted in the policy section titled “Create a Clear Plan of Action to Guide Pre- and Post-Disaster Decisions,” a number of state policies do not necessarily adhere to a more narrowly defined set of federal rules, including those tied to post-disaster eligibility criteria. As a result, the state policy memo recommends the following: “Incorporate ANR river standards into federal, state, and local plans and policies through coordinated policy dialogue, training, and educational initiatives.”⁹⁹ ANR standards should be integrated into state and local hazard mitigation plans, emerging local disaster recovery plans, and local comprehensive plans. One way to accomplish this

97. *Policy Memo*, *supra* note 9, at 20-21.

98. *Id.* at 20. Following the 2009 Iowa floods, the state created the Smart Planning Act that linked post-disaster recovery and smart growth principles through the creation of a comprehensive planning requirement that includes a natural hazards element. *See generally Smart Growth Technical Assistance in Iowa*, ENVTL. PROT. AGENCY, http://www.epa.gov/smartgrowth/iowa_techasst.htm (last updated Oct. 30, 2012) (discussing the creation of smart growth policies developed by the Environmental Protection Agency and the State of Iowa following a series of destructive floods).

99. *Id.* at 21.

aim is to “[d]evelop [a] flood resilient communities program.”¹⁰⁰ This program should include a scorecard to assess the progress of communities relative to established goals, “thereby providing a tangible way to achieve monitoring and implementation procedures as required under FEMA guidance.”¹⁰¹ One of the lessons learned from Irene is the importance of improving horizontal connectivity across state programs that utilize the data and knowledge maintained by ANR. For example, ANR standards need to be better incorporated into emergency rulemaking with respect to emergency roadway repair and stream restoration granted to ANR by the state legislature. Improving horizontal connectivity also means engaging in a thoughtful policy dialogue with FEMA to explore ways to meet federal program goals—including post-disaster grant eligibility—that reflect the physical and institutional conditions found in Vermont. Achieving this aim may require negotiating an agreement with FEMA regarding the interpretation of rules that govern how damaged infrastructure is repaired relative to NFIP or fluvial erosion standards, the latter of which is a state program.¹⁰²

The disaster recovery literature emphasizes the importance of involving those with a sound understanding of local needs and conditions in the policymaking process.¹⁰³ The policy memo emphasizes the need to “[e]nsure that the process used to create and adopt River Corridor Maps, including fluvial erosion hazard areas, is state supported and actively engages local partners that have a deep, locally-grounded understanding of flood hazard risk.”¹⁰⁴ The involvement of farmers, property owners, foundations, and regional planning organizations in the development and use of this information can lead to greater buy-in among those the maps affect. This would increase the likelihood of their use in hazard mitigation

100. Act 138, which was signed into law in 2012, created the Flood Resilient Communities Program, thereby enabling the state to provide funding and technical assistance to communities if they adopt higher river corridor and NFIP standards. *Id.* at 22.

101. *Policy Memo*, *supra* note 9, at 23.

102. See generally SMITH, *supra* note 6, at 296–307, 328–32 (suggesting that disaster recovery is an inherently contentious process and could benefit from the use of Alternative Dispute Resolution techniques to address resource allocation conflicts).

103. See Oliver-Smith, *supra* note 6, at 17 (explaining that knowledge of local social and economic conditions is crucial to avoiding inequitable outcomes in disaster recovery efforts); Andrew Maskrey, *Disaster Mitigation as a Crisis of Paradigms: Reconstructing After the Alto Mayo Earthquake, Peru*, in DISASTERS, DEVELOPMENT, AND ENVIRONMENT 109, 122 (Ann Varley, ed. 1994) (discussing the importance of engaging local people in the post-earthquake recovery decision making process). See also Berke, Kartez and Wenger, *supra* note 5, at 106 (discussing the importance of strong vertical connectivity between local, state, and federal officials and strong horizontal connectivity among stakeholders at the local level). SMITH, *supra* note 6 (emphasizing the role of local governments and organizations in the disaster recovery process).

104. *Policy Memo*, *supra* note 9, at 24.

plans, agricultural best practices, local flood damage prevention ordinances, and the acquisition of flood-prone properties.¹⁰⁵

Trusted members of the network should be identified and used to assist in the delivery of science-based information across broad audiences. As noted by one state official:

One of the most critical things we need to do [is] to help folks understand what are the right kinds of land use decisions they need to be making in the context of safe and smart growth and how to do that when we're topographically challenged. The more people understand the science, the better we're going to be. Our biggest challenge to rebuilding strong and safe is understanding and living by this science.¹⁰⁶

Organizations that can deliver this type of information include the Vermont Extension Service, neighborhood organizations, business leaders,¹⁰⁷ university officials, school teachers,¹⁰⁸ regional planning

105. *Id.* Following Tropical Storm Irene, the state attempted to use river corridor maps to delineate areas eligible for acquisition and relocation of flood-prone houses as part of an HMGP application. FEMA denied the project, citing the need to use existing Flood Insurance Rate Maps, which, according to state officials, underestimate the actual flood risk.

106. *Id.* at 25. Interviews with officials from the Agency of Commerce and Community Development in Montpelier, VT (Oct. 23–24th, 2012).

107. An important case study in which the power of negotiation, policy dialogue, and the role of the private sector as a partner in achieving more flood resilient communities can be found in the City of Charlotte and Mecklenburg County, North Carolina. Following extensive and sometimes heated debate with floodplain administrators, environmentalists, citizens, and others, developers began to recognize the cumulative effects of continued development in the floodplain, including increased flooding in many of the areas in which they had built homes and neighborhoods. Over time it became clear that developers did not want to garner the reputation as those who built flood-prone housing. As a result, it was the developers who advocated for the creation of a “future conditions” flood mapping program. This locally-funded program led to the creation of maps that depict the future breadth and depth of the floodplain assuming the watershed was built out. Based on these maps, the county began regulating development to these higher standards, which in some cases, changed the flood elevations by as much as eight feet. *See SMITH, supra* note 6, at 269–71 (discussing the cooperation between municipal governments and private developers to stop the construction of flood-prone housing and regulate development in flood plains). The case highlights the need to employ proven dispute resolution techniques to help address the types of issues that arise during pre- and post-disaster recovery decision-making process. *See Mel Rubin, Disaster Mediation: Lessons in Conflict Coordination and Collaboration*, 9 *CARDOZO J. CONFLICT RESOL.* 351 (2007–2008) (discussing the role of dispute resolution professionals in disaster management and recovery). *See also Linda Baron, Disaster Basics: The Life Cycle of a Disaster and the Role of Conflict Resolution Professionals*, 9 *CARDOZO J. CONFLICT RESOL.* 301 (2007–2008) (discussing the role of mediators in disaster recovery efforts). The state policy memo raises a similar point. *Policy Memo, supra* note 9, at 26 (discussing the importance of involving stakeholders in policy discussions surrounding river science and seeking to develop agreed upon solutions). It is suggested that the state could utilize mediators drawn from or trained by the Vermont Law School or private practice to help stakeholders engage in a productive dialogue surrounding river science, planning, and resilience. *See generally* Connie P. Ozawa & Lawrence Susskind, *Mediating*

organizations, religious leaders, and professional associations like the Vermont Floodplain Administrators and the Vermont chapter of the American Planning Association. Institutionalizing the results of protracted debate requires the incorporation of this information into policies with legal standing in Vermont that are also recognized by the larger network, such as FEMA. Specific recommendations to address this aim include:

- (1) Create incentives for Vermont communities to regulate land use within floodplains and mitigate hazards through a combination of:
 - (a) Setbacks,
 - (b) Fluvial erosion hazard overlays,
 - (c) River corridor protection plans,
 - (d) Best management practices, land use and hazard mitigation plans,
 - (e) Infrastructure management initiatives, and
 - (f) Stormwater management plans;
- (2) Use the Hazard Mitigation Grant Program (HMGP) to expand funding for communities to develop river corridor plans and develop strategies that recognize the natural dynamism of Vermont's rivers;
- (3) ANR, the Vermont Environmental Board, and the District Environmental Commissions could encourage communities to use geomorphological, River Corridor (fluvial erosion) Maps in addition to Flood Insurance Rate Maps to review developments under Act 250; and
- (4) Consider the expansion of the River Corridor Easement Program through the development of a land banking or transfer of development rights (TDR) program.¹⁰⁹

CONCLUSIONS AND RECOMMENDATIONS

The State of Vermont faces a number of challenges if it is to integrate smart growth, disaster recovery, and resilience policies. These challenges

Science-Intensive Policy Disputes, 5 J. POL. ANALYSIS & MGMT. 23 (1985) (discussing the value of using ADR in resolving science-related debates).

108. The policy memo suggests: "Incorporate river science into elementary, middle school, high school and college curricula." *Policy Memo*, *supra* note 9, at 26. Project WET (Water Education for Teachers) includes a series of workshops for teachers covering river science and management topics such as fluvial erosion and flood safety. What Is Project WET?, PROJECT WET WORLDWIDE WATER EDUCATION, <http://projectwet.org> (last visited Nov. 9, 2013).

109. *Policy Memo*, *supra* note 9, at 27–28.

include a public opinion that favors limited government; a highly dynamic flood hazard; historic towns and associated infrastructure located adjacent to flood-prone areas; increased hillside development; and a growing threat of hazards induced or exacerbated by climate change. The state is also characterized by a number of long-standing characteristics that can be used to confront these challenges, including a strong sense of self-reliance, a history of public participation and environmental stewardship, and a robust floodplain management program.

This article has shown that the state has an important role to play in addressing identified weaknesses and capitalizing on existing strengths by facilitating more effective involvement of a larger network of stakeholders. We suggest that the state should play a leadership role by creating the preconditions that allow collaboration to thrive across heretofore uncoordinated networks.¹¹⁰ The approach proposed in this article stands in contrast to the current federal disaster recovery policy milieu that fosters a sense of state and local dependency. In order to avoid this outcome, the state should institute a number of changes. Such changes include a sustained commitment to increasing state and local capacity; integrating hazard mitigation, disaster recovery, and comprehensive plans; a gradual shift towards greater state and local accountability; and operationalizing mature and emerging federal policy frameworks.

*Build the Collective Capacity and Self-Reliance of State-Led Networks
through Capability Assessments and the Modification of Policies*

It is incumbent on states, working with federal agency partners, to invest more resources in pre-event capacity building initiatives while gradually holding local governments more accountable for increased standards over time. State-federal collaboration should be guided by disaster resilience and smart growth goals. A central part of this pre-event initiative should be to build the collective capacity and self-reliance of local networks, including the identification of ways that stakeholders can better coordinate resources. Specific capacity-building initiatives include the routine sharing of knowledge and skills required to improve the timely use of resources in a manner that addresses local needs while actively engaging in pre-event planning for post-disaster recovery. First, the state should conduct an assessment of existing capabilities and resources across the network. Based on this assessment, policies and plans should be modified if

110. SMITH, *supra* note 6, at 332–33 (describing the fostering of enhanced collaborative networks in disaster recovery).

they hinder pre-identified goals. For instance, the current one-dimensional approach to disaster assistance emphasizes the release of post-disaster funding to communities that are ill-prepared to accept and effectively manage it. Narrowly defined policies disproportionately drive the trajectory of local recovery, focusing on the physical repair of communities, often to their pre-event condition, rather than shaping outcomes that are focused on higher order goals like sustainability, resilience, and smart growth. Harnessing and coordinating the varied resources held by members of the disaster assistance network—many of whom would not initially consider themselves part of this collective body—can address many of the challenges identified in Vermont.

Further, goals advancing the nexus between disaster resilience and smart growth should be incorporated into state mandates¹¹¹ and ongoing discussions concerning the expansion of Act 250 to better address floodplain management such as those promulgated under Act 138. Planning mandates tied to local hazard mitigation plans and the development of comprehensive plans should also serve as a venue to achieve this objective.

Integrate Local Hazard Mitigation and Disaster Recovery Plans into Pre-Existing Comprehensive Plans

It is important that increased standards and capacity-building efforts work together because local governments in Vermont are characterized by small staffs and volunteer town select boards. One way to do this is by integrating hazard mitigation plans and disaster recovery plans into existing town plans. The recent passage of Act 16—which requires the incorporation of resilience into local comprehensive plans—is representative of this type of action. However, we propose the explicit incorporation of hazard mitigation and disaster recovery planning elements into the comprehensive plan in order to achieve the aims of Act 16. The development of local recovery plans as encouraged under the National Disaster Recovery Framework should also be incorporated into local comprehensive plans. This type of plan integration will necessitate working across departments that administer hazard mitigation and disaster recovery programs within FEMA. Plan integration will also require working within and across state agencies responsible for the oversight of local hazard mitigation, disaster recovery, and comprehensive plans. In both instances,

111. See No. 16. An act relating to municipal and regional planning and flood resilience, H.401 (Vt. 2013), <http://www.leg.state.vt.us/DOCS/2014/ACTS/ACT016.PDF> (amending VT. STAT. ANN., tit. 24, § 4302 (2013) and incorporating smart growth and resilience principles into forthcoming state planning legislation).

the state should play a leadership role, ensuring that local comprehensive plans meet all federal requirements as stipulated in existing hazard mitigation and emerging disaster recovery planning rules and guidance materials. It is also crucial that the state works to ensure that these plans meet state goals linking recovery, resilience, and smart growth principles.

The fact remains that local governments are struggling to develop sound hazard mitigation plans in Vermont and across the country. A national study of local and state hazard mitigation plans found that local plans are generally weak and most do not address key elements of good planning practice.¹¹² One way to help improve the quality of these local plans is through a greater commitment among states to help local governments build their capacity through improved education, outreach, and training efforts.¹¹³ In most states, local hazard mitigation plans tend to be developed in coordination with state emergency management agencies and their local counterparts. This has led to plans that meet minimum federal requirements but often fail to include land use planning tools and techniques.¹¹⁴

In Vermont, regional planning districts have played an important role in the development of hazard mitigation and comprehensive plans by bringing to the table a greater understanding of the role land use plays in achieving higher levels of disaster resilience. In practice, local governments often strive to meet minimum federal mitigation planning standards, which do not require the application of land use tools and techniques as part of a comprehensive risk reduction strategy. In interviews with state agency officials, regional planning districts were routinely described as playing a valuable role in Irene recovery efforts and are representative of one organization among many that can help local governments develop better plans.¹¹⁵ Asking the regional planning districts to assist with the integration of local plans will, however, necessitate providing additional resources.

Hold Local Governments More Accountable Over Time

The provision of more pre-event resources should be accompanied by requirements that hold stakeholders more accountable for their actions. As

112. Philip Berke, Gavin Smith & Ward Lyles, *Planning for Resiliency: Evaluation of State Hazard Mitigation Plans Under the Disaster Mitigation Act*, 13 NATURAL HAZARDS REV. 139, 143–45 (2012).

113. Smith et al., *supra* note 81.

114. Ward Lyles, Philip Berke & Gavin Smith, *Do Planners Matter? Examining Factors Driving Incorporation of Land Use Approaches into Hazard Mitigation Plans*, J. OF ENVTL. PLANNING AND MGMT., DOI: 10.1080/09640568.2013.768973.

115. Interviews with state agency officials in Montpelier, VT (Oct. 23–24th, 2012).

the level of collective capacity is raised, state and local government accountability should rise as well. The adoption of higher codes and standards; the development of higher quality hazard mitigation, disaster recovery, and comprehensive plans; and a reduced emphasis on the expenditure of federal funds before and after disasters would demonstrate this greater accountability. The current system, in contrast, provides large sums of post-disaster federal assistance but does not sufficiently hold state and local governments responsible for decisions that place people and property at risk. Nor is sufficient pre-event investments made in capacity building initiatives. Combined, these actions are a recipe for disaster. Rectifying this problem requires investing federal funds well in advance of a disaster. Federal funding could be drawn from the national disaster relief fund or linked to a proposed Disaster Recovery Act that would provide funds to pay for the costs associated with this more proactive approach.¹¹⁶

Operationalize Mature and Emerging Federal Policy Frameworks

The power of the disaster assistance network can be further solidified through the more effective use of national policy frameworks that currently remain underutilized. The National Disaster Recovery Framework (NDRF), the Disaster Mitigation Act (DMA), and the Whole of Community concept provide three examples of federal programs that have the potential to address the issues raised here. Emerging policies tied to the NDRF should reflect a greater commitment to working with states and communities before a disaster strikes. States and communities should more effectively coordinate the collective capacity of the larger disaster recovery assistance network to improve planning capacity and recovery efforts. More specifically, this means shifting the emphasis from post-disaster recovery planning as currently practiced by FEMA, states, and many local governments, to investing the time needed to engage in pre-event training, education, and outreach programs; develop and implement plans that target identified problems; and build inclusive disaster recovery committees that coordinate the use of pre- and post-disaster resources.

The DMA requires states and communities to develop pre-disaster hazard mitigation plans in order to remain eligible for federal pre- and post-

116. The national disaster relief fund is used to pay for the costs associated with federally declared disasters, and as such, changes in this policy would require amending the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The creation of a Disaster Recovery Act was proposed by Smith and later suggested by Senator Landrieu from the State of Louisiana. The Act has not been brought to the floor for discussion in part because of the reluctance to introduce the bill during the United States economic crisis. See SMITH, *supra* note 6, at 321–76 (advocating for the adoption of a Disaster Recovery Act).

disaster assistance. The DMA also provides pre-event hazard mitigation funds that can be used to pay for the development of plans and the implementation of risk reduction policies and projects identified in plans. In recent years, support for the pre-disaster mitigation program has been under attack by some members of Congress who propose to reduce or eliminate the program even though the Congressionally-created Multi-Hazard Mitigation Council found a 4 to 1 return on investment on hazard mitigation projects funded by FEMA.¹¹⁷ The DMA could be strengthened by improving the quality of state and local plans. Specific areas in need of improvement include incorporation of land use strategies into local plans, integration of applicable state policies into state hazard mitigation plans, and development of improved state-level technical assistance strategies.¹¹⁸

In an effort to encourage the greater involvement of private and non-profit sector stakeholders, FEMA has initiated the Whole of Community concept.¹¹⁹ This concept should be fully operationalized through tangible policies, such as those tied to the Disaster Mitigation Act and the National Disaster Recovery Framework.¹²⁰ The Whole of Community concept starts to address the power of governance and should be further clarified and linked to specific pre- and post-disaster programs and policies within new and existing policy frameworks, including those that link disasters with climate change. The ability to achieve this aim must overcome existing impediments. For instance, a number of federal policies continue to run counter to the Whole of Community concept, such as those that foster a sense of state and local dependence and policies that do not reflect local needs and conditions.

Empirical evidence shows a clear link between a changing climate and an increase in the number and severity of natural hazard events.¹²¹ Climate change is likely to result in rising sea levels, more intense coastal storms, extreme rainfall events, an increased prevalence of drought, and extreme heat. Specific changes predicted in the New England area include more

117. MULTIHAZARD MITIGATION COUNCIL, NAT'L INST. OF BLDG. SCIS., *NATURAL HAZARD MITIGATION SAVES: AN INDEPENDENT STUDY TO ASSESS THE FUTURE SAVINGS FROM MITIGATION ACTIVITIES* 5–7 (2005).

118. Smith et al., *supra* note 81; Berke, Smith, & Lyles, *supra* note 112 (describing state mitigation plan quality). Lyles, Berke and Smith, *supra* note 114 (describing local hazard mitigation planning).

119. FED. EMERGENCY MGMT. AGENCY, FDOC-104-008-1, *A WHOLE COMMUNITY APPROACH TO EMERGENCY MANAGEMENT: PRINCIPLES, THEMES, AND PATHWAYS FOR ACTION* (2011).

120. Presidential Policy Directive 8 provides a high level narrative describing how preparedness mission areas, including the National Protection Framework, National Prevention Framework, National Mitigation Framework, National Response Framework, and National Disaster Recovery Framework, all rely on the Whole of Community concept.

121. NAT'L RESEARCH COUNCIL, *ADAPTING TO THE IMPACTS OF CLIMATE CHANGE* 1–2 (2010).

extreme rainfall events, increased average temperatures, and an increased likelihood of Irene-like storms. Growing research findings and practice-based results points to the importance of better coordinating the climate change adaptation and natural hazards risk management communities.¹²²

State-level approaches linking natural hazards risk reduction, disaster recovery, and adaptation through resilience-based initiatives have emerged in spite of no clear national policy addressing climate change adaptation. States like California and Maryland are taking the lead in adaptation efforts, while states like Florida have initiated a disaster recovery effort well in advance of National Disaster Recovery Framework guidance.

Following Tropical Storm Irene, Vermont's state agencies have realized that climate change will exacerbate future natural hazards and disasters, and as a result, requires the maximization of existing state capabilities to address these threats as well as the formulation of new policy options that advance the power of collaborative governance. The ability of Vermont to clearly operationalize the policies described here represents the next step toward building an expanded network capable of addressing disaster recovery, resilience, smart growth, and the threats associated with a changing climate.

122. See John Handmer, *Adaptive Capacity: What Does it Mean in the Context of Natural Hazards?*, in THE EARTHSCAN READER ON ADAPTION TO CLIMATE CHANGE 213 (E. Lisa F. Schipper & Ian Burton eds., 2009) (arguing for integration of natural hazards research into climate change adaptation). INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, MANAGING THE RISKS OF EXTREME EVENTS AND DISASTERS TO ADVANCE CLIMATE CHANGE ADAPTATION 321 *passim* (Christopher B. Field et al. eds., 2012). INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, MANAGING THE RISKS OF EXTREME EVENTS AND DISASTERS TO ADVANCE CLIMATE CHANGE ADAPTATION: SUMMARY FOR POLICYMAKERS 14 (C.B. Field, et al. eds., 2012). BRUCE GLAVOVIC & GAVIN SMITH, ADAPTING TO CLIMATE CHANGE: LESSONS FROM NATURAL HAZARDS PLANNING (forthcoming 2014).