National Center for Disaster Preparedness

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Columbia University

Planning for Long-Term Recovery *Before* Disaster Strikes: Case Studies of 4 US Cities

A Final Project Report

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"The part that takes the most time and effort and money is on the back end [of a disaster], not on the front end. There were several years that the state focused on recovery, but it's usually right after a big event that you think about those things. It's not right now when we haven't had one in 15 years."

- County emergency manager in Eastern seaboard "hurricane" city

"If you look at the research, the faster that you do recovery the more likely recovery is to be successful… You want to speed recovery by getting things set up in advance… everything here is with that thought in mind – we're trying to set up interim housing mechanisms in advance, [and in] terms of the capitalization of economic recovery, [we're] developing a way of pumping that money in, having devices [like] venture capital funds onboard with prewritten contracts. And we have a Disaster Survivor's Advocacy Team."

- *Disaster Recovery Coordinator in Pacific Northwest "tsunami" city*

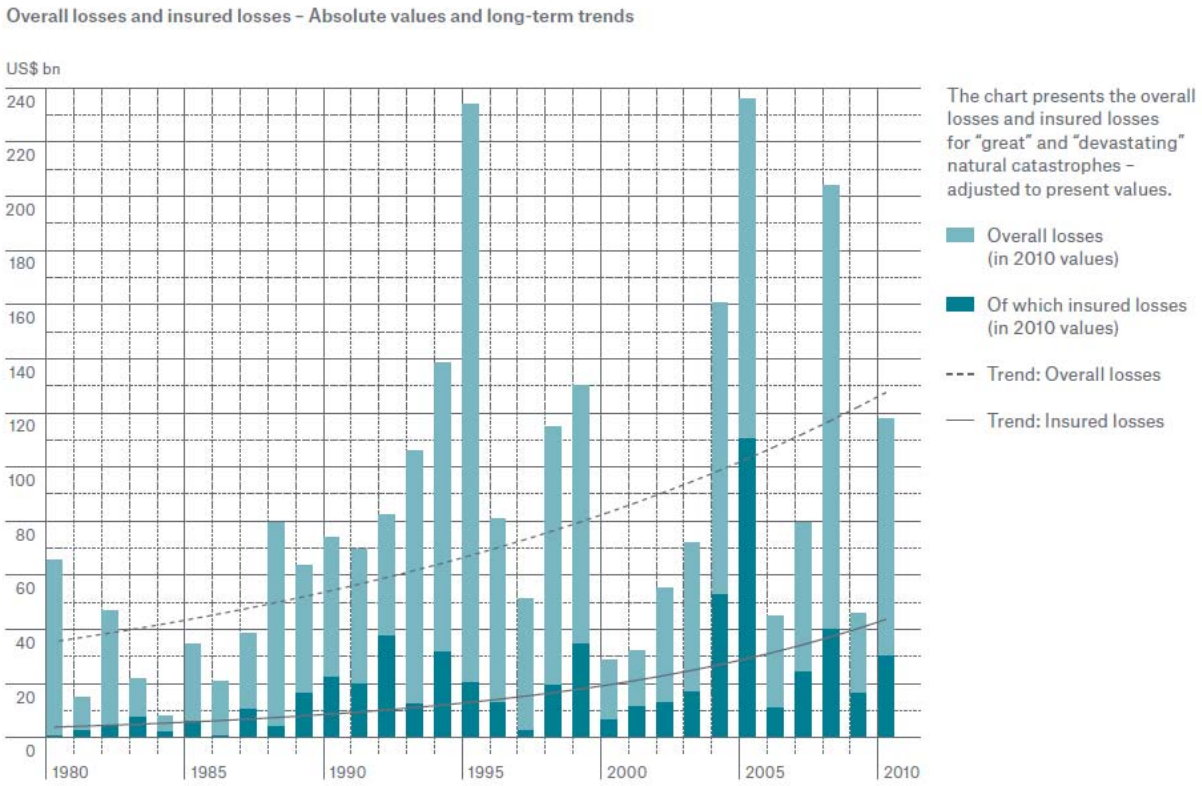
INTRODUCTION

Among the four phases along the hazard continuum – preparedness, response, recovery, and mitigation – the sub-field of long-term recovery has long been an outlier, an "orphan" when it comes to concerted policy attention and pre-disaster planning. It's not that community residents or municipal and state government officials are unaware of the potential long-term residual consequences of natural disasters. Since the attacks of September 11, 2001 and the subsequent creation of the Department of Homeland Security, the U.S. government has spent billions of dollars to upgrade and enhance the country's ability to detect and respond to major catastrophic events, whether man-made or natural in origin. The country experienced catastrophic wildfires in 2003, 2007-2008, and 2011, a regional electrical blackout affecting 9 states and part of Canada in 2003, major Midwest flooding in 2008 and again this year, Category 3 or greater hurricanes in 2004, 2005, and 2008, and significant tornado clusters in 2011 that claimed 529 lives and caused over $17 billion in damages. These hazards have struck virtually every region of the country, and the consequences are readily evident to emergency managers and local city and county planners

Figure 1, below, illustrates the worldwide trend of rising disaster costs over a 30-year period, and the corollary rise in the amount of uncovered financial losses. Although the ratio of uncovered to covered losses has declined over this three-decade timeframe, from approximately 8:1 to 4:1, absolute dollar losses have escalated tremendously. This may represent gains in mitigation efforts to insure against losses in high-risk areas, but the size and growth of uncovered losses suggest a growing recovery challenge. This difference between covered and uncovered losses reflects the absolute minimum investment required for affected areas to return to pre-event conditions, much less build back to a better or higher standard. Furthermore, what this trend line cannot capture are those disaster consequences not so easily monetized – diminished physical and mental health among an affected citizenry, loss of a sense of community and attachment to place, or large-scale social disruptions or population displacements.

Given the magnitude of the social investment needed to pursue long-term recovery after a disaster, and the attention that other phases in the hazard continuum have experienced, why is recovery still a policy orphan, and what are the local implications for pre-disaster planning for long-term recovery?

Figure 1. Covered and Uncovered Losses (Topics Geo: Natural Castastrophes 2010, MunichRe)



Local municipalities are responsive to policy guidance and instruments from federal and state partners, but both are generally silent regarding long-term recovery. FEMA's proposed National Disaster Recovery Framework, mandated under the Post-Katrina Emergency Management Reform Act of 2006 and intended to provide a federal structure for common post-disaster recovery efforts and pre-disaster planning initiatives has languished in draft form for nearly two years. Only one state, Florida, requires counties to develop pre-disaster long-term recovery plans.[1] In the absence of clear federal or state policy structure or mandates, cities and counties engage in – or ignore – pre-disaster long-term recovery planning at their own discretion. Given such potential variability in community planning for long-term recovery, this project focused upon case studies of four mid-sized US cities to reflect upon the following questions and themes:

1. **THE STATUS OF LONG-TERM RECOVERY PLANNING**: Particularly in areas that are vulnerable to catastrophic natural disasters, what is the state of pre-disaster long-term recovery planning? An important premise of this project is that communities in which a catastrophic threat is more salient

[1] See 2005 American Planning Association guide to long-term recovery planning: chart 3-1 lists state-level efforts regarding long-term recovery plans

might be more likely to have considered the requirements, challenges and complexities of long-term recovery, and could serve as natural laboratories for the study of recovery planning.

2. **ORGANIZATIONAL STRUCTURE THAT FACILITATES RECOVERY PLANNING**: Given the absence of federal or state mandates, what are the political, social, and organizational factors most conducive to local pre-disaster long-term recovery planning?
3. **A RECOVERY PLANNING MODEL**: Is it possible to identify the elements of a comprehensive model of pre-disaster long-term recovery planning, particularly one that could inform a broader theoretical framework? Are there ways of thinking about long-term recovery planning that would stimulate US communities to engage in such planning? Are there policy models that should be considered? Is it possible to explicitly link specific governance structures with recovery processes, and then furthermore, with recovery outcomes?

In the course of conducting this research, our project team was struck by the inherent challenge of even discussing the prospects for and implications of long-term recovery planning with key informants in each community. Our respondents were readily able to describe and discuss preparedness, response, and mitigation efforts, but often struggled to articulate their vision or plans for long-term recovery. The consequences of a major disaster were clear to all of our informants, as was the inevitability of an extended period of long-term recovery following a catastrophic event. Still, the absence of administrative rules, programmatic incentives, or political endorsement of long-term recovery planning appeared to limit many of our informants' ability to conceptualize and discuss long-term recovery. The discourse around long-term recovery—including a standard, fairly universal vocabulary--has not evolved as it has for the other phases in the hazard continuum. Nor has the policy environment.

Disaster response clearly captures the most public and policy attention. The response phase offers the most dramatic narrative for media, policymakers, and the public: grim pictures or accounts of broad swaths of destruction, mass fatalities, resolute search and rescue teams, and waves of formal and informal responders swarming to offer aid to people and to devastated areas. Such attention has helped shape the policy and planning landscape for institutional preparedness and response. Domestically, the Stafford Act provides clear enabling legislation governing the federal response. Sentinel federal policy documents such as the National Response Framework, the National Health Security Strategy, and FEMA's Target Capabilities List attempt to harmonize the vocabulary and efforts of the federal, state, and local officials engaged in preparing and responding to disasters.

Although not as much a focus of media or public attention, the mitigation phase is nonetheless driven by market forces and a policy environment that encourages public planners to reduce their risks. Firms and governments have clear incentives to reduce or prevent the costs and damages incurred in a disaster, and are likely to adopt such pre-disaster mitigation strategies as acquiring or requiring insurance against loss, creating protective mechanisms for valued resources and property (e.g., building levees and elevating buildings in flood zones), or imposing land use and other regulatory controls to keep valuable assets out of potential hazards' path. Complementing market-based mitigation incentives, the federal government has begun funding pre-

disaster mitigation planning as a result of the Disaster Mitigation Act of 2000, and also provides access to the National Flood Insurance Program with discounts on insurance premiums for communities adopting key mitigation strategies. A 2007 article by Rose and colleagues validated the cost-effectiveness of mitigation strategies, noting that on average, for every $1 spent in a FEMA mitigation grant, $4 is saved by averting losses (10).

Planners often speak of a "20/80 split" when it comes to the balance between the effort and expense attributable to response and recovery, and an approximate accounting of funds spent on Hurricanes Katrina, Rita and Wilma support such an estimate. Of approximately $170 billion in response to those hurricanes ($10 billion of Small Business Administration loans, $40 billion in covered insurance losses, and $120 billion in total federal outlays), the breakdown was as follows:

> Response: $30 billion (17.6%), encompassing initial Stafford Act funding of FEMA (including debris removal and clean-up, Individual Assistance grants), Department of Defense, and immediate restoration of federal facilities;
>
> Mitigation: $5 billion (2.9%), encompassing levee repair and restoration, coastal restoration, and FEMA, DOT and Army Corps of Engineering funding to restore Gulf Coast infrastructure;
>
> Recovery: $135 billion (79.4%), encompassing repair and reconstruction of commercial, residential, and governmental infrastructure through Public Assistance, National Flood Insurance program funds, Community Development Block Grant funds, and private insurance compensation.

In his recent book, Planning for Post-Disaster Recovery, Gavin Smith considers ways of re-balancing planners' attention so that they might more quickly and equitably access post-disaster resources by engaging in pre-disaster planning. But he is not sanguine about such efforts. While he notes that "Evidence shows that pre-event planning can create the impetus to effect policy change and maximize various forms of financial assistance that lead to positive outcomes after a disaster" [p. 12], he concludes that, "Unfortunately, the current disaster recovery assistance framework discourages such an approach" [p. 13]. Although our field project in four mid-sized American cities was carried out before Smith's book was published, it is clearly trying to understand the dynamics of his despair, and furthermore to consider frameworks that might facilitate real long-term recovery rather than inhibit it.

THE STUDY

Study Objectives

In NCDP's proposal, we described the project as a formative study, signifying that it was not a research project in the sense of collecting and analyzing data in order to test clearly-specified hypotheses about how long-term recovery does work, should work or might work. The project was exploratory by intention and design. We presented the project's key questions to our informants as follows:

"This is a study about what is necessary for a community to recover over the long term from a catastrophic event such as Hurricane Katrina. When we talk about long term recovery in this study, we use that term to mean numerous things, including:

- rebuilding and repairing roads, water & sewer facilities, schools and other infrastructure
- restoring and improving damaged housing stock
- protecting against future disasters
- reviving the local economy
- attending to needs of particularly vulnerable groups of people
- providing for the mental health needs of citizens traumatized by evacuations, temporary or permanent loss of their homes, or injury or death of loved ones
- restoring a semblance of routine, normalcy, security and "community" for the population.

We want to emphasize that the focus of the study is NOT your community's readiness to deal with the period during and immediately after an emergency, when everyone would be focused on saving lives, restoring power, water, sewer, law enforcement, safety and other basic services. Instead, the focus is on your community's preparation ***for the months or years that would follow a crisis***—what arrangements are already in place and what are various people and organizations currently trying to put in place. We want to find out if local government, community and private sector leaders are trying to anticipate and prepare for the kinds of long-term recovery issues they'll need to deal with if and when the area has its "Big One.

In the broadest terms, the study aims to improve our understanding of the local factors and conditions that, if they exist before a disaster strikes, may help a city gear up quickly for all these aspects of recovery after a catastrophe has happened, and then sustain an intense level of effort during a prolonged period when both the citizens and the local government are under severe stress."

The Project Team

The NCDP project team was led by David M. Abramson, PhD, Director of Research at Columbia University's Mailman School of Public Health. In addition to conceptualizing, managing and providing the intellectual guidance for the project as a whole, Dr. Abramson led the interviews in two of the four fieldwork sites, as discussed below. Dr. Abramson has been the principal investigator on NCDP's longitudinal study of households severely impacted by Hurricane Katrina. He has participated in recent recovery and resilience-related panels convened by the UPMC Center for Biosecurity, the National Science Foundation, the Institute of Medicine and the National Research Council's Disasters Roundtable, and he has published and spoken widely on the topic of long-term recovery from disasters. In 2010, Dr. Abramson was the lead author on an article published in the American Medical Association journal *Disaster Medicine and Public Health Preparedness*, discussing a model he developed at NCDP to measure individual long-term disaster recovery (1). Other NCDP project staff included several masters' degree-level research associates and research assistants who had been

involved in preparing the original funding proposal. One of these individuals ensured consistency of approach by conducting interviews in all four of the sites.

NCDP also retained as a project consultant Laurie Johnson, PhD, AICP, who spent several days with the team at NCPD's offices, conducted interviews at two of the four sites, and brought to the project nearly 20 years of experience in catastrophe-related consulting, management and research. Dr. Johnson has investigated on site most of the last two decades' major earthquakes and tsunamis as well as Hurricane Katrina and the 2001 World Trade Center collapse. She has written extensively about the economics of catastrophes, land use and risk, and disaster recovery and reconstruction, most recently co-authoring Clear as Mud: Planning for the Rebuilding of New Orleans (2).

Methodology

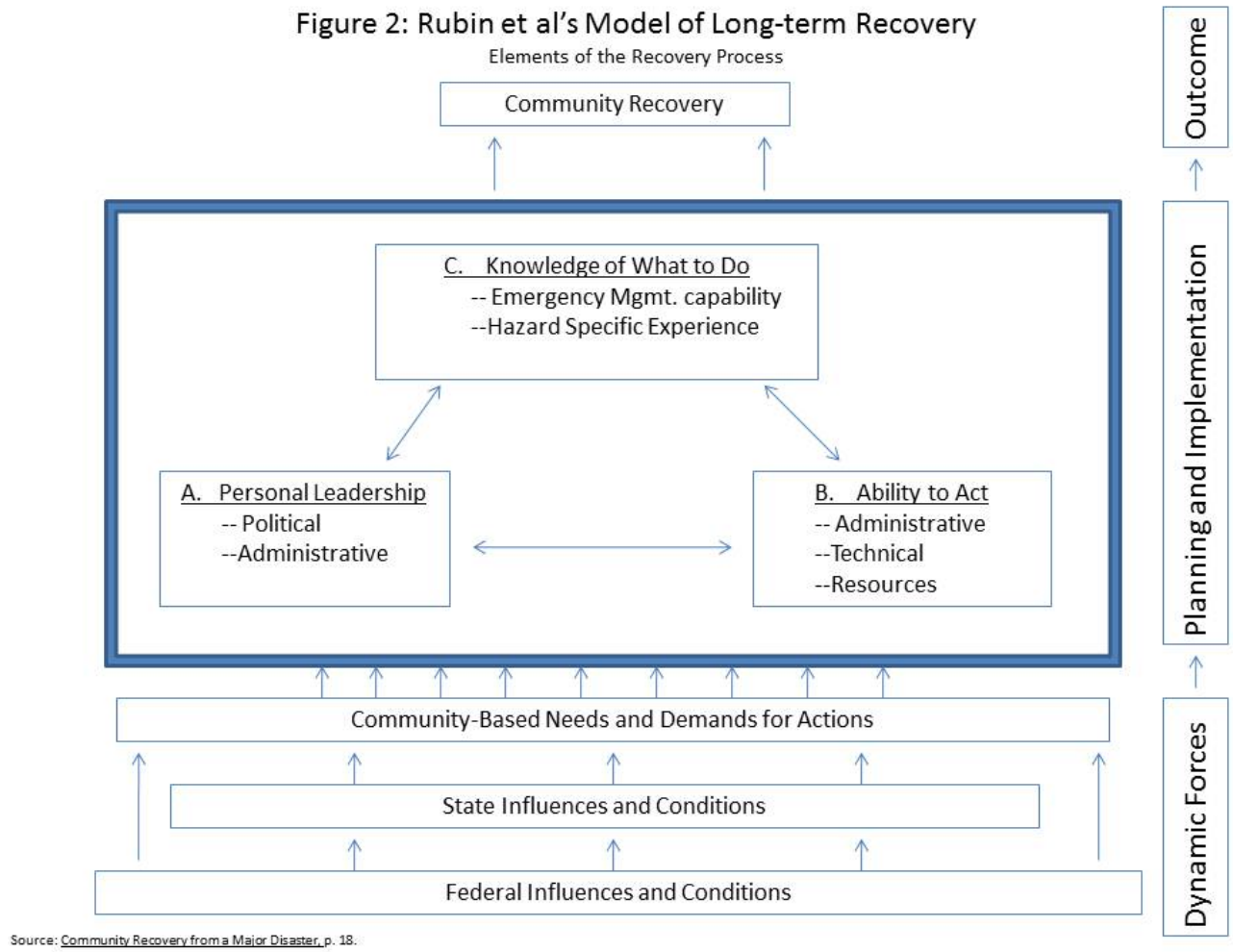
As a formative study, the project expressly sought to glean information and insights that could lead to (a) the formulation of hypotheses about the kinds of pre-disaster preparation that can facilitate long term recovery, and (b) more formal and highly structured data analysis in subsequent research projects. The project team therefore employed some of the same approaches that NCDP would apply in a highly structured research project.

1. Pre-Fieldwork Literature Review

The project team's initial activity was to review several major studies of disaster recovery going back to the early 1980s, that focused on how long-term recovery had played out, how locales had managed their long-term recovery and, most important, what locales had or had not done to prime the pump for their long-term recovery before being hit by a disaster. In moving from our proposal to a formal project plan, we paid particular attention to the following core group of papers and studies:

Community Recovery from a Major Natural Disaster (3), the report of a four year study (1980-84) of fourteen cities that recently had experienced presidentially-declared disasters, including floods, mudslides, tornadoes, coastal storms, a hurricane, an earthquake and a dam failure. The goals of that study, led by Claire Rubin, were "to contribute to the base of knowledge about long-term recovery and to produce an analytical framework for future studies of the recovery process." That framework (reproduced as Figure 2), which the authors called "elements of the recovery process," was our jumping off point.

Managing for Long-Term Community Recovery in the Aftermath of Disaster (4), an attempt by Daniel Alesch and colleagues to synthesize and generalize about what had been learned concerning long-term recovery in the 25 years since Rubin's 1985 report, based primarily upon empirical studies of more recent disasters. This title helped the project team conceptualize five critical "long term recovery actions and processes," such as providing for the continuity of the public sector and mobilizing external resources, as means ("instrumental outcomes") to achieving a broad based recovery of households, individuals and businesses.



Disastrous Uncertainty: How Government Disaster Policy Undermines Community Rebound (5) is one of a series of studies of post-Katrina New Orleans by George Mason University's Mercatus Center. It raises compelling issues about government's appropriate post-disaster roles in supporting and facilitating organic community, individual and small business recovery activities, or at least not unduly impeding such efforts.

Acting in Time Against Disasters: A Comprehensive Risk-Management Framework (6) is a chapter in a recent Wharton book entitled Learning from Catastrophes (7). This article argues that much like response planning that occurs before a disaster, pre-disaster recovery planning can make post-disaster recovery "faster, more reliable [and] more effective." It also reinforced conceptual distinctions between mitigation activities and pre-disaster recovery efforts that were important in designing and implementing our fieldwork.

2. Model Refinement

Informed by our literature review and discussions, the project team elaborated upon the model of long-term community recovery shown above. As we did not (and still do not) believe that the knowledge base about long-term recovery is well-enough developed to justify specifying detailed relationships and causal pathways

among the numerous elements in Rubin's model, we chose instead to design our data gathering and interviews around a broadly descriptive model of how the long-term recovery process may function (see Figure 1). This entailed both rearranging certain elements of Rubin's model into the two bottom layers of our model (baseline administrative capacity and contextual factors) and adding new features. Our primary additions were:

1. Elements of local capacity that we have called "recovery process infrastructure," which localities can create above and beyond their ongoing structures and processes. Such capacity, some of which may remain latent until activated in anticipation of or following a disaster, includes things such as legal authorities provide direct financial assistance, or to suspend or selectively apply certain land use, environmental and administrative regulations; committees, task forces and other formal mechanisms to establish relationships among diverse political actors; recovery plans and guidance documents; mutual aid agreements and other MOU's; and recovery-specific expertise.

2. "Instrumental objectives," i.e., goals that would seem, on the surface, to be essential accomplishments for any jurisdiction that wishes ultimately to get its citizens re-housed, its economy clicking, its physical infrastructure repaired and rebuilt, and for its citizens to feel safe, at home, and positive about life again. These instrumental objectives include:

   a. Ensuring the continuity of essential public sector operations and services over a long period of time during a period of extreme fiscal stress and workforce burnout

   b. Obtaining external resources-primarily financial, but also labor and expertise—to supplement local assets for supporting recovery.

   c. Engaging a broad swath of community interest groups and individuals in making decisions about how the locale should redevelop and recover, how resources should be allocated among competing interests and goals, and how the interests of the most vulnerable and disadvantaged should be protected.

   d. Engaging the private sector, and local and higher levels of government, in such decision processes.

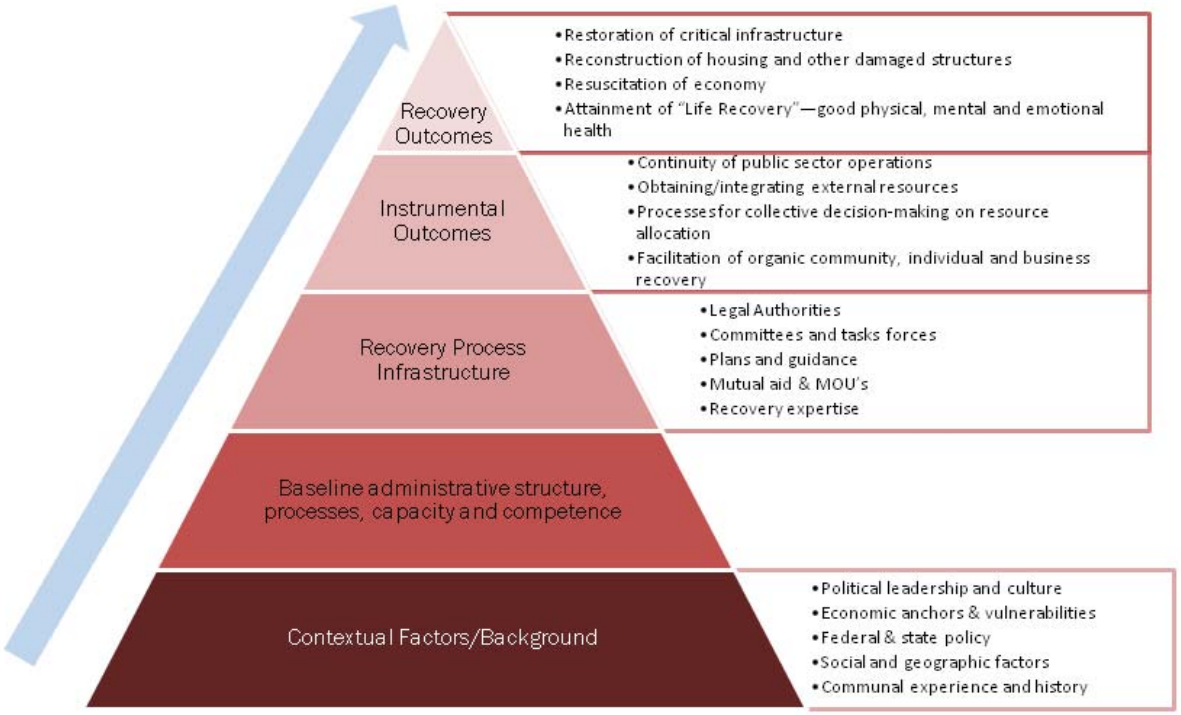
   e. Facilitating organic community recovery processes (iconic examples are community efforts, with minimal governmental involvement or support, (i) to reopen schools, day care centers, houses of worship and (ii) to provide social services, management and help with the paperwork and bureaucracy of seeking government recovery support funding.)

   f. Minimizing the burdens faced by households and businesses in rebuilding, reopening and rehiring.

3. A conception of long-term recovery that expressly includes the entire spectrum of outcomes shown at the pinnacle of Figure 3.

In our revised model, the attainment of the "ultimate recovery outcomes" in which planners, policy-makers and citizens are interested depends upon a set of "instrumental outcomes" that are necessary, but not of intrinsic value. A community's ability to achieve those instrumental outcomes depends upon it having both robust and highly competent administrative structure and processes in its daily operations, and specialized recovery process infrastructure. The entire edifice rests upon a complex stew of contextual factors.

Figure 3. Long-term Recovery Planning Framework



3. Questionnaire Development, Site Selection and Informant Recruitment

Concurrent with refining the Rubin model, the project team developed a structured interview guide (appendix 2), for which we obtained approval of the Columbia University Medical Center Institutional Review Board. We also established criteria for selecting cities and counties in which to conduct fieldwork. The locations had to be vulnerable to a natural hazard that potentially could be damaging enough to be "the big one" for them and their region, i.e. to have Katrina-scale relative impacts. They could not have experienced a catastrophic event for several decades (although all had experienced a significant hazard event or close call within recent memory). The other primary selection criterion was that each locale has a large enough population and government so as to be largely responsible for its own emergency response and long-term recovery, rather than dependent upon a higher level unit of government for those functions.

In order to maximize the range of approaches to long-term recovery preparation and planning that we would encounter, we deliberately selected sites that are geographically distributed across the United States, that are

in both home rule and Dillon's rule states and are highly vulnerable to diverse hazards, including potentially catastrophic earthquakes, tsunamis, floods and hurricanes. Although we did not expressly represent to the participants that we would not disclose the four locations in our written report, we subsequently decided to keep the sites anonymous as extra assurance that we do not inadvertently violate our promise of confidentiality to the informants (see below).

Table 1 shows the mean population and area of the locations—both the urban core and the surrounding counties--where we conducted interviews. Subjective and impressionistic thumbnail portraits of the four sites follow this table.

Table 1. Fieldwork Sites

	2010 Population (mean)	Area (Mean Sq. Miles)
Cities	124,708	47
Counties	392,891	1900

Site 1 – California coastal "earthquake" city: The urban core of this architecturally distinctive West Coast location faces a combination of catastrophic earthquake and tsunami risk, and is physically situated such that an earthquake of sufficient magnitude could pose extreme, long-lived challenges of access for responders and relief providers. The area also periodically has experienced other localized natural hazard crises that have threatened, but not materialized into megadisasters. With an economy highly dependent upon tourism, higher education and the military, it is home to both an extremely affluent permanent and second home population, and to a large population of lower-income renters and transients, and it has a large commuter work force. A number of critical components of its transportation and water infrastructure are particularly vulnerable to the hazards it faces. The much larger surrounding county is largely rural and agricultural.

Site 2 – Pacific Northwest "tsunami" city: Also on the West Coast, this region also faces the combination of catastrophic earthquake and tsunami risk, which has the potential to devastate the critical maritime component of its economy. The area also has a well-established localized natural hazard that has not threatened in living memory. The hilly central city is an important industrial and shipping center whose economy also is closely linked to nearby military facilities and state government. However, it often is eclipsed by a larger regional city with a more diversified economy and greater cultural amenities. The larger county is a mix of small cities and towns, agricultural communities, state and national forests and even a national park.

Site 3 – Midwest "flood" city: This northern Plains region faces a catastrophic flood hazard that is compounded by the area's incredibly flat topography and its rapid expansion. Several times in recent memory, through heroic communal efforts of which it is extremely proud, it has contained events that could have deteriorated into major disasters. The metropolitan area straddles two cities and two states, and is surrounded by an overwhelmingly agricultural hinterland. One of the center cities is the largest in its state--a fast growing, highly desirable residential and commercial location that has attracted divisions of major national

corporations and a young, highly skilled work force. Civic and religious organizations that pride themselves on self-sufficiency, initiative and a communal perspective abound.

Site 4 – Eastern seaboard "hurricane" city: This Hurricane Coast community and its surrounding county have memories of several 1990s Category 3 storms and knowledge of a 1950s Category 4 hurricane. Consequently they dread the impact of a "Cat 5." The central city has an architecturally noteworthy historical district that complements the nearby barrier island beaches as major tourist draws. A mixture of old southern families, snowbirds, low income and super-rich families and an extremely pro-growth real estate industry continue to put pressure on land development.

Across all four sites the project team recruited informants by phone and email, focusing on civic, political, business and community leaders whom we would have expected to be knowledgeable about local recovery planning activities. With only a handful of exceptions, none of the respondents was previously known to anyone on the project team. We represented to all potential informants that we would not quote them or cite them in any way that would permit identification without their prior written permission.

4. Field Operations

During the period August through October 2010, teams of 2-4 individuals conducted 3-4 day site visits to each locality. Dr. Abramson and Dr. Johnson each participated in two of these four visits (but only overlapped on one site). We typically interviewed informants at their offices or other locations of their choosing, following the structured interview guide. In all cases, we were able to obtain a good quality audio recording and subsequently, a full professional transcript. Interviews ranged from 60-120 minutes. In total, we interviewed 66 individuals in 38 distinct meetings. Table 2 shows key attributes of our pool of informants:

Table 2. Informant Characteristics

	Public	**Business**	**University**	**Foundation**	**Civic Organization**	**Medical**
Sector	50	6	2	2	5	1
	Local	**County**	**State**			
Level of Government	22	29	1			
	Emergency Management/ Services	**Public Health**	**Planning**	**Schools**	**Chief Executive**	**Elected Official**
Type of Public Entity*	12	9	6	4	4	2

*categories with 0 or 1 informant not separately reported

5. Data Analysis

Upon receiving a complete set of interview transcripts, the project team reviewed the recently released article Building a Theory of Recovery: Institutional Dimensions (8), which is an introduction to several of the themes in Gavin Smith's recently released book, Planning for Post-Disaster Recovery: A Review of the United States Disaster Assistance Framework (9). This paper focuses in particular on "the actions of a fragmented network of different stakeholder groups who provide disaster recovery assistance," and lays out a series of hypotheses about why and how this network generally fails to marshal the full array of resources that could be available to support disaster recovery. Smith's analysis emphasizes the disconnects between the rules of various assistance programs and actual local recovery needs; multiple independent assistance timeframes and cycles that conflict, impede coordination and waste resources and opportunities; and the lack of horizontal and vertical coordination and integration among members of assistance networks. These three hypothesized general impediments to long term recovery helped inform the project team's design of a codebook for analysis of the interview transcripts.

We then analyzed the transcripts using a combination of grounded theory and content analysis. Initially, the project team members who participated in the development of the structured interview guide developed a structured codebook in conjunction with the individuals who actually conducted the interviews. The codebook, attached as Appendix 1, contains broad thematic categories related to the interview guide and to NCDP's extension of the Claire Rubin conceptual framework for long term recovery (Figure 3). Once the codebook was complete, groups of four team members jointly coded five selected transcripts in order to foster a common understanding and application of the codes. This prompted several revisions and enhancements. Thereafter, at least two team members (although not necessarily one who had participated in the related interview) critically read and individually coded each transcript based on the codebook. These pairs of coders then met to reconcile their codes, and finally applied their agreed upon codes to digital versions of the transcripts using the qualitative data analysis software, nVivo.

FINDINGS

In the four communities visited by the project, informants expressed a clear understanding of the potential implications of "the big one" for their local economy, for irreversible population decline, for their tax base, for their ability to staff government operations and finance government operations, and for the burdens of complying with federal record keeping, paperwork, procedural requirements, etc. Some have done elaborate analyses, some have tried admittedly crude exercises such as that conducted by the Eastern hurricane city, which estimated what part of their beach communities' tax base would be wiped out by a Category 5 hurricane. In the Midwest flood city, there was a palpable concern that a disaster would fundamentally reverse long-term growth trends and derail the fiscal largesse that growth had permitted, and that this would transform the locality's external perception from attraction to aversion.

Notwithstanding this awareness of the consequences, many of the project's informants questioned the reasonableness of planning for long-term recovery in advance. There was a commonly-held view that the possibility of long-term calamities is limited and therefore too abstract and too remote to focus on, especially with limited resources. Another commonly-held view was that the long-term issues can't be easily predicted in advance (i.e. the long-term challenges will be event-specific and unique)[2] and are therefore not appropriate for pre-planning.

That said, each of the cities visited offered a perspective on recovery planning that shaped a broader understanding of how planners, emergency managers, and community officials and stakeholders approach this issue. The Pacific Northwest tsunami city has taken the most progressive stance, in that the county hired a permanent disaster recovery planner in its Planning Department and has actively engaged its business community in planning for post-disaster financing, housing, critical infrastructure, workforce, and mental health services. The Eastern seaboard hurricane city exhibited strong city and county governance with significant expertise in recovery and redevelopment, and also expressed a very strong awareness of the role of "citizen expectations." "Citizens still have a high expectation for what we are able to provide," one local Eastern city official noted, adding that, "in many cases, that is an unrealistic expectation. I think we would really be struggling with that." The Midwest flood city articulated the tension between "flood fights" and long-term recovery planning. Engaging in such planning, local officials reported, was tantamount to acknowledging a failure (or potential failure) to win the flood fight. Political fortunes are often made or lost on officials' ability to successfully navigate flood fights, so recovery planning was viewed as a political failure. This sentiment was echoed – in very different ways – by a local elected official in the West Coast earthquake city. This official nearly lost her post when she engaged her citizenry in a discussion of local redevelopment in the face of climate change-related sea-level rise. Engaging her citizens around land-use issues was a very highly-charged topic, particularly in advance of an event of uncertain probability.

Several themes emerged across these four mid-sized American cities:

[2] This second problem was faced/tackled in 1980's/1990's by Spangle Associates and others. Pre-event Planning for Post-Event Recovery (PEPPER) was a National Science Foundation study to develop damage scenarios from a major earthquake in Los Angeles and anticipate the recovery challenges, and translating them into a mitigation strategy. This was followed by two more NSF studies to transfer long-term recovery planning lessons to U.S. planners from international planners who had rebuilt after large earthquakes, and subsequently to develop a training exercise for local government on rebuilding after earthquakes. After doing a literature review of risk psychology and other topics, and conducting user surveys, Spangle proposed that local officials understood the hazards/risks/challenges of their communities and could (even without a specific scenario) work through a series of recovery tasks (i.e. damage assessment, debris removal, expedited permitting, geologic hazard abatement, housing and business recovery, infrastructure and public facilities repair, and planning for rebuilding). Spangle tested this premise (and the exercise) in cities across the U.S. and found that 'yes' – local officials could engage in the exercise without a specific event scenario.

1. **Context matters** – history, demography, threats, vulnerabilities, and assets may be unique to a given community, and influence their thinking about recovery in specific ways. The West Coast hurricane city, for example, had experienced a significant earthquake early in the 20th century, and the redevelopment decisions that took place in its aftermath fundamentally altered its social and economic landscape. At the time, local elected officials and community leaders dramatically re-shaped the look of the community (mainly through new zoning ordinances), and nearly one hundred years later local planners are still sensitive to the entrenched monied interests who hold sway over such large-scale development projects. In the Eastern hurricane city, a downtown historic district is regarded as part of the community's critical infrastructure since it plays such an important role in the community's identity (although it is highly vulnerable to catastrophic flooding). Within these specific illustrations. Though, are generalizable factors – such as the influence of social and political elites, the interest in preserving distinct community identities, and the political will to engage in long-term planning that may conflict with specific economic interests.
2. **Governance matters**—it is perhaps self-evident that those municipalities with sound governance structures are more likely to survive a significant insult and continue to be functional. The elements of good governance include strong administrative management which is supported by political leaders, and sheltered from political interests, experienced managers and community leaders who have weathered past crises; administrative structures and processes that are robust and flexible (more on this in the next section); and fiscally-stable governments with substantial contingency funding. Although recovery involves many individuals and institutions within a community, local government (city and county) is the cornerstone for the acquisition and exchange of key resources.
3. **Framework matters** – In Donabedian's classic study that spawned a healthcare quality movement (1966), he offered the simple proposition that in order to evaluate the quality of health care, one has to understand the ***structure*** of professional and organizational resources that constitute a health care practice, consider the ***process*** by which tasks are done to or for a patient, and relate them to ***outcomes*** that reflect a desired state that resulted from such health care. One can analogize this approach to long-term recovery: the disaster (disease) may affect a community (patient), such that the local government (the health care system) must resolve or repair damage (treat) in order to achieve recovery (recovery). As illustrated in Figure 3, this framework begins with a set of recovery endpoints. Communities have to have a clear vision of their desired recovery outcomes – critical infrastructure, housing, economic environment, and a population's "life recovery." How those outcomes are expressed – what types of housing, what economic engines, what should be included in critical infrastructure – depend upon various deliberative processes, which should include community engagement efforts. The recovery actions and processes which will lead to such recovery outcomes include: (1) continuity of public sector operations, (2) the acquisition and equitable exchange of external resources, (3) deliberative processes for resource allocation, and (4) organic community and civic actions. And in order for these processes to be enacted, the community needs the appropriate political and administrative structure to achieve them. This could include specific legal authorities,

strategic planning documents, command structures, and memoranda of agreement. Altogether, these structures, processes and outcomes define a long-term recovery framework.

4. **Resources matter** -- Lastly, a broad understanding of what constitute "resources" is necessary. Scholars, planners, and theorists generally adopt an econometric view of resources, in which they are regarded as funds and supplies. The recent literature on community resiliency suggests other resources which should be considered, including those that contribute to collective self-efficacy, social capital, and communication and information sharing. For the purposes of long-term recovery planning, should consider resources to include the following:
    a. External resources, such as federal financing and insurance payouts;
    b. Community decision-making
    c. Inherent urge of businesses to recover (a market model)
    d. Inherent urge of households to rebuild and communities to reconstitute themselves, in order to resume (or commence) socially and economically productive (or sufficient) lives
    e. Internal resources, such as community institutions, markets, civic leaders, expertise, old money, etc.)

BEST PRACTICES, LESSONS LEARNED, and PEARLS OF WISDOM

The key informants in these four mid-sized cities offered several specific suggestions to enhance the prospects for, and success of long-term recovery planning:

- Revisit FEMA's Project Impact, a community-oriented mitigation planning initiative from the 1990s. Several of the sites had participated in Project Impact, and they were convinced that the process-oriented community consensus piece contributed greatly to their current preparedness and planning efforts;
- A number of informants recommended concretizing Disaster Recovery Task Forces in law, legislation, and with specific guidance. Informants suggested using Comprehensive Emergency Management Plans or Comprehensive Land-Use Plans to accomplish such task forces;
- Link long-term recovery planning to business community and economic interests – facilitating continuity of operations, identifying needed resources and supplies ahead of time;
- Tie long-term recovery planning to the National Flood Insurance Program community rating system, in order to develop financial incentives for long-term recovery planning;
- Consider citizen expectations;
- Engage all sectors in community (enfranchised and disenfranchised) in discussion about long-term recovery planning – can serve as a means of addressing current concerns about inequity and power imbalance, and also serve as a mechanism to enhance community preparedness. Could potentially serve to reduce surge on system from vulnerable communities if better prepared… and more oriented to long-term recovery and citizen participation;
- Factors most likely to stimulate recovery planning are federal or state mandates (as Florida has done), and the creation of common vocabulary and expectation of recovery roles as formulated in draft

National Recovery Framework (with Recovery Support Functions analogous to Emergency Support Functions). In the absence of such mandates or structure, intermediate approaches include:

- Extending scope of emergency management and planning departments to encompass elements of recovery planning in their planning processes (land use plans, hazard mitigation plan, comprehensive emergency management plans);
- Identifying and cultivating political support and endorsement for recovery planning;
- Creating latent or manifest recovery structure enabled by legislation;
- Using strategic planning and comprehensive planning efforts as platforms for introducing recovery planning
- And creating or enhancing citizen engagement mechanisms that allow for ongoing dialogue about preparedness, response, recovery, and resiliency.

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APPENDIX 1: Long-term Recovery coding framework

We are trying to relate these 13 broad topics to what the community is doing or considering (or NOT doing or NOT considering) regarding planning, anticipating and preparing for long-term recovery.

1. leadership (good or bad)
2. political factors + political culture
3. administrative structure, capacity, and processes
4. recovery expertise
5. instrumental factors (authorities, committees, plans, guidance, legal authority, mutual aid, MOU's)
6. communal experience / history (that has a palpable connection to what they are doing or thinking about today)
7. inter-governmental relations (actual interactions/give-and-take across different levels of government)
8. contextual / social / geographic factors and vulnerabilities / economic vulnerabilities
9. Population Movement and Relocation
10. recovery actions and processes that locality **is planning for** (simply acknowledging the existence of the issue isn't enough):
    a. continuity of operations
    b. obtaining / integrating external resources
    c. long-term decision-making processes, such as resource allocation, development, prioritization
        (1) community engagement processes
        (2) other than community engagement processes
    d. facilitation (or non-impedance) of organic community process
    e. government facilitation (or non-impedance) of individual recovery / business recovery
11. economic environment / public-private relationships / business culture / anchors (such as a university, major employer, major health care facility, etc.)
12. policy (including rules, regulations, programs, procedures imposed by a higher level of government
    a. fed
    b. state
13. recovery outcomes
    a. critical infrastructure / environment (includes lifelines, schools, transportation, others)
    b. housing / brick + mortar (houses and other buildings)
    c. economic
    d. life recovery

APPENDIX 2: KEY INFORMANT INTERVIEW GUIDE

We wanted to speak with people in your community because it appears to be vulnerable to **[name of hazard(s)]** damage of a magnitude comparable to what **[paired community**] sustained from **[event in year____]**. During and for some period of time immediately after such an event, your community would be focused on restoring power, water, sewer, law enforcement and other basic services. Residents who had evacuated would return to assess the damage to their homes and neighborhoods. The following questions focus on what various members of your community are doing today, or might do today, to prepare for the period of months or years that would follow the crisis and the immediate response, a period that we're going to call "long term recovery."

1. What would a catastrophic—not just a severe but a catastrophic--[wildfire/earthquake/tsunami/flood/hurricane] look like in your community. If your worst case, nightmare event occurred—a Katrina-magnitude event scaled down to [Santa Barbara/Tacoma/Fargo/Wilminton]--what kinds of physical damages would the city and metropolitan area sustain and what kinds of long-term recovery problems would it face? (let person offer ideas; probe for items below if not volunteered):

- A temporary or permanent loss or disruption of a large portion of your economic base
- A major loss in local tax revenues coupled with a big increase in demand for emergency and social services
- Other manifestations of a severe local fiscal crisis (such as layoffs)
- A sustained loss of population and of affordable housing, coupled with increasing rents and homelessness
- A potentially crushing level of additional federal and state bureaucratic requirements in order to receive disaster assistance
- Chronic stress on the municipal workforce
- An upsurge in public health problems—related to both physical and mental health
- Increase in crime
- Others volunteered by respondent

2. Are there particular reasons why you would think about these particular long-term problems and not others?

- Historical experience of your own community
- Applicability or inapplicability to your community of certain problems commonly found in post-disaster situations
- reasons related to the legal authority of local actors to take responsibility
- reasons related to historical precedent or tradition (e.g., other units of government typically have taken responsibility for particular recovery activities)
- Certain recovery decisions and activities are under the control of federal or state or county government, not municipal
- reasons related to perceptions of difficulty, intractability or futility
- political considerations
- Other reasons

3a. To your knowledge, are local government agencies and officials taking any of the following kinds of actions (if YES, clarify WHO):

- designating any key personnel to begin identifying and addressing the kinds of issues your community might face after a disaster
- designating key personnel who would be the primary interface with federal and state interlocutors following a disaster
- establishing a formal planning process to address post disaster LT recovery
- performing or commissioning research about what has been happening in the local economy and population, and holding related discussions about not recovering back into already negative trends
- If there is any long term recovery planning, trying to integrate integrate/coordinate it with any other local planning activities
- Investigating mitigation measures and how to fund them
- Building relationships and protocols with state emergency management teams
- Developing relationships with other state and local government agencies, with local organizations and local businesses that might play an important role in post-disaster recovery activities. If yes, how are these relationships developed—committees, meetings, training, networks, other?
- Reaching out to involve as many interested citizens as possible, or to bring many different community and interest groups into a discussion of long term recovery issues, both today and after a disaster
- Informing citizens about long-term recovery planning activities and decision-making processes, even if they are not invited to participate directly
- Establishing financial reserves to deal with extraordinary post-disaster expenses
- Developing in-house expertise in federal programs and recovery resources (including the accounting and reporting provisions associated with receiving such resources) OR contracting with outside consultants to acquire that expertise as needed on a standby basis? Or some other mechanism to have that expertise available if you were to need it?
- Discussing issues related to reserve staffing, so that local government may be able to function for a long time under extreme stress without total employee burnout
- Discussing issues related to surge staffing, so that after a disaster, local government can quickly respond to a huge demand for emergency inspections, building permits, Certificates of occupancy and other local regulatory approvals that individual households and businesses would require under normal circumstances to move back home, rebuild, invest, etc.
- Talking with colleagues within the local government about what, if anything, can be done today, to help expedite routine decisions following a disaster?
- Talking with state government agencies whose regulations affect local businesses, schools, etc., about what, if anything, can be done today, to help get decisions on an expedited basis after a disaster.

3b. To your knowledge, are major local employers and health care providers and community-based organizations taking any of the following kinds of actions (if YES, clarify WHO):

- designating any key personnel to begin identifying and addressing the kinds of issues your community might face after a disaster
- performing or commissioning research about what has been happening in the local economy and population, and holding related discussions about not recovering back into already negative trends
- Building relationships and protocols with state emergency management teams
- Developing relationships with other state and local government agencies, with local organizations and local businesses that might play an important role in post-disaster recovery activities? If yes, how are these relationships developed—committees, meetings, training, networks, other?
- Talking with local government about what, if anything can be done today, to help expedite routine decisions following a disaster?
- Talking with state government agencies whose regulations affect local businesses, schools, etc., about what, if anything, can be done today, to help get decisions on an expedited basis after a disaster.

3c. Are you aware of any formal memoranda of understanding among different municipalities, counties or agencies, organizations and businesses, for purposes of (a) mutual aid (b) identifying roles and responsibilities following a disaster (c) establishing a decision process to be followed after a disaster (d) streamlining certain governmental processes following a disaster?

3d. Are you aware of any **other** activities (besides M.O.U) going on today that try to get different actors to focus on how they would interact AFTER a disaster?

4. Answer this question just in terms of yourself and the organization for which you work. What level of priority is given to planning for long-term recovery from a disaster that may not occur for a long time, or ever? (Probe for: respondent acknowledging locality's actual hazard exposure and taking a variety of proactive steps, or operating under the assumption that federal and state government will come to the rescue, or pursuing a middle path).

4a. WHY is this the case? **What factors account for the indicated priority level**?

- Perception of the likelihood of event occurring or the magnitude of its impact if it does occur?
- The level of resources available--tools, legal authority, technical assistance, intergovernmental assistance, and staff?
- Characteristics of the political environment?
- Perceptions of personal or organizational efficacy?
- The characteristics and attributes of leadership in your organization?
- Degree of interest by state government?
- Institutional memory of other catastrophes?
- Nature of intergovernmental involvement in disaster preparedness at local level?
- Intergovernmental financial and technical resources to prepare?
- Philosophy—is it or is it not a proper role of government to guide long term recovery
- Other

5. Now answer the same question--as best you can--in terms of other local government, business, health care and community leaders and organizations you know. What level of priority is given to planning for long-term recovery from a disaster that may not occur for a long time, or ever? (Probe for: is individual or organization mentioned by respondent acknowledging locality's actual hazard exposure and taking a variety of proactive steps, or operating under the assumption that federal and state government will come to the rescue, or pursuing a middle path).

5a. WHY is this the case? What factors account for the indicated priority level?

- Perception of low likelihood or impact?
- Limited tools/legal authority/financial and staff resources?
- Contentious political environment?
- Futility/pointlessness?
- Weak leadership?
- Lack of interest by state government?
- Strong awareness/memories of other catastrophes?
- Strong leadership from particular people?
- Intergovernmental pressures to prepare?
- Intergovernmental financial and technical resources to prepare?

- Philosophy—is it or is it not a proper role of government to guide long term recovery
- Other

6. Has **[paired community's]** experience recovering from [**hazard event name**] had any discernable impact on how your community is addressing the possibility that it could sustain a comparable level of destruction?

If yes, please describe the nature of the impact and whether you consider it a positive, negative or neutral impact.

If No, are there significant differences between your community and the **[paired community]**, or between your community's hazard exposure and [**paired community's**] hazard exposure that account for the lack of discernible impact?

7. Finally, I'd like to talk to you about two federal government initiatives that relate to the concept of long term recovery. Hand out summary of ESF #14 and the National Disaster Recovery Framework (version circulated for public comments in February 2010).

- Have you heard about either of these? (if NO, end this question, if YES, probe for whether informant has read it, skimmed it, read articles about it, or just heard about it)
- based upon whatever knowledge you have of this federal initiative, do you have any thoughts or impressions about whether the kinds of federal support for long-term recovery reflected in the documents would be useful or not useful in your local context?
- Do you have any thoughts about the strengths or weaknesses of these initiatives, or any ideas about how they could be made more helpful in your particular situation?