

Journal of Homeland Security and Emergency Management

Volume 6, Issue 1

2009

Article 46

Long Term Recovery from Disasters -- The Neglected Component of Emergency Management

Claire B. Rubin, *Claire B. Rubin & Associates*

Recommended Citation:

Rubin, Claire B. (2009) "Long Term Recovery from Disasters -- The Neglected Component of Emergency Management," *Journal of Homeland Security and Emergency Management*: Vol. 6: Iss. 1, Article 46.

DOI: 10.2202/1547-7355.1616

Long Term Recovery from Disasters -- The Neglected Component of Emergency Management

Claire B. Rubin

Abstract

This paper stems from my presentation on long-term recovery given at the 2009 All-Hazards Higher Education Conference, sponsored by the Department of Homeland Security at its Emergency Management Institute, June 2-4, 2009.

KEYWORDS: disaster recovery, long-term recovery, ESF #14

Author Notes: I would like to thank the friends/colleagues who essentially served as my self-selected peer review committee for critiquing the drafts of this article. They are Prof. Jane Kushma (Jacksonville State University), Ms. Jude Colle (HSI), Prof. Daniel Barbee (University of N.C. at Pembroke), William Cumming (Vacation Lane Group) and Keith Bea (Congressional Research Service). Thanks also to Ms. Dorothy Schepps for copy editing the drafts and Ellen Barnes for help with the graphics. All opinions and errors of fact are mine alone.

After reviewing my disaster-related research efforts during the past 30 years, I decided to share some thoughts on one aspect of emergency management that has intrigued me for a long time—long-term recovery from major disasters at the community level.¹

This article provides a personal retrospective of research on long-term recovery (LTR), based on my own work on this subject for the past 30 years. It is not a comprehensive or objective review of the literature; rather it is a personal account of the topic with some observations and recommendations for improvement. I also will discuss some of my observations and opinions about the current state of research and practice.

My start in LTR research was in the early 1980s when I began some basic research on the long-term recovery process at the local level. The results of those two years of work was the 1985 monograph titled *Community Recovery From Major Disasters*, published by the University of Colorado/Boulder, and some related journal articles. Since then the topic has been of periodic interest, but not of paramount concern, for me in recent decades.

But then, almost two years ago I happened to browse a book titled the *Handbook of Disaster Research*, in particular the chapter by Gavin P. Smith and Dennis Wenger (2006), *Chapter 14: Sustainable Disaster Recovery: Operationalizing an Existing Agenda.* This chapter is the best summary of the topic that I have ever read. It begins with the sentence: “Disaster recovery represents the least understood aspect of emergency management, from the standpoint of both the research communities and the practitioners.” My early recovery research results were cited as one source for that quote. Bear in mind this chapter was published in 2006, 21 years after I published my monograph on community recovery.

My reaction was both surprise and concern: It was nice to see my work referenced, but disappointing and discouraging to see the authors document the lack of research and applications during the past two decades. One of their main findings was “Recovery practice traditionally emphasizes the management of federal assistance programs rather than a systematic identification of community needs and the development of a comprehensive strategy for long-term recovery and reconstruction.” (p. 239).

After reading the Smith and Wenger chapter, and then doing more current research of my own, I have concluded that the research and knowledge base in the realm of long-term recovery is seriously inadequate to the needs we face today. In my opinion, LTR was, and still is, the neglected element of emergency management. I am not clear on the specifics of why that neglect has occurred,

¹ The paper stems from my presentation given at the 2009 All-Hazards Higher Education Conference, sponsored by the Dept. of Homeland Security at its Emergency Management Institute, June 2-4, 2009, on the occasion of receiving the 2009 Dr. B. Wayne Blanchard Award for Academic Excellence in Emergency Management Higher Education.

particularly given the importance of the topic, but I have some thoughts about the matter to share. Presently I am very concerned about the LTR research field because I think that the amount and quality of research is not adequate for our present needs; I think there are very serious deficiencies in basic and applied research on the topic, and that means a weak foundation exists for current and future recovery planning and implementation.

In my view, the progression of research and knowledge about long-term recovery has moved in fits and starts during the past 25 years. This lack of consistent progress in improving the knowledge base contributes directly to the very serious lack of knowledge acquisition, utilization, and institutionalization in professional practice.

What Does LTR Look Like?

Before I go into more specifics, I'd like to take a moment to discuss what we mean by "recovery." Definitions for recovery abound, but you know you are in the recovery phase when fire and police officials (first responders) have gone back to their stations (if not damaged) and their regular work, and you see local public officials dealing with debris, infrastructure, economic development, and housing. Much of it is conventional and boring stuff -- debris removal and rebuilding houses, and getting people back on their feet. As a friend once characterized it, it is flogging paper, not pumping adrenaline. The inclination is to resume "business as usual," with people trying to get back to normal. The tradeoffs then begin between the old methods and new, better ways of building and organizing a community. There are always conflicts over snapback (essentially restoration of the past) vs. redevelopment that address future needs and vision. This sounds conventional, but this conflict is dynamic and often volatile.

The topic of the changing definitions and observational challenges noted in the literature in recent decades remains to be examined at a later date. I like the definition: "the process of restoring, rebuilding, and reshaping the physical, social economic, and natural environment through pre-event planning and post-event actions." [Smith and Wenger (2006), p. 237.]

Researching LTR 30 Years Ago

In the late 1970s, I began my work as a disaster researcher with a talented team at the National Governors Association (NGA). They completed several important research projects, based on extensive field work, that were completed just prior to and leading to the formation of FEMA. Their work was very influential with

Congress, the President's Reorganization Project ², and then later with FEMA staff. One of the products of the NGA study was a report on EM that first articulated the four phases of emergency management and Comprehensive Emergency Management (CEM): preparedness, response, recovery, and mitigation. This is where I first learned of the phases and what each represented, although I was focused on overall emergency management at that time.

The NGA staff had conducted a series of studies, based on direct contacts with governors and extensive field work of recent disasters. They carefully documented what the (informal) system was for obtaining federal attention and assistance in the pre-FEMA days (before April 1, 1979). More important, that capable staff synthesized a great deal of information and made highly significant recommendations for improvement in the federal system of emergency management, including the identification of the four phases as the platform on which to build emergency management. They also participated in some Office of Management and Budget meetings in connection with the formation of FEMA.

LTR was the New Frontier in the 1980s

When I decided to work on long-term recovery in early 1980, I did so because relatively little original research had been done on this aspect of recovery, and virtually none involved collected empirical information, done via field work. The field of emergency management was still relatively unknown as a researchable topic in the social science research community. At that time, there were three principal books on the topic available to academics and practitioners:

- Friesma, H. Paul et al. (1979). *Aftermath; Communities after Natural Disaster*. Sage Publications Ltd.
- Rossi, Peter et al. (1979). *After the Clean-Up: Long-Range Effects of Natural Disasters*. Sage Publications.
- Haas, J. Eugene et al.(1977). *Reconstruction Following Disaster*. MIT Press.

I decided to do field work to determine what recovery planning and implementation at the local level looked like. I assembled a team and we conducted case studies of 14 communities that had experienced a major disaster.

We had NSF funding support for almost two years and did extensive field research; we visited the 14 localities, at least one time for each, to gather the data. We struggled mightily with the analysis of the research results. We had collected huge amounts of information from our field work, but had great difficulties with a

² President Carter's Reorganization No. 3 of 1978, sent to Congress in May 1978, establishing FEMA.

conceptual framework for the analysis. Using the four-phase concept derived from the NGA work in the late 1970s, we attempted to come up with a workable and reliable way of estimating the quality and efficiency of the community recovery process.

One lesson I learned is that it is wise to start a major research project with at least a working set of hypotheses regarding the conceptual framework and methodology to be used. Given that our research project was an exploratory effort, the field work was expected to subsequently be tested and refined.

Our field study results were ultimately published in a few journals and in a monograph. My colleagues and co-authors of the monograph were Dr. Dan Barbee and Dr. Martin Saperstein, both political scientists.

- Claire B. Rubin, Martin D. Saperstein, and Daniel G. Barbee (1985) *Community Recovery from a Major Natural Disaster*. Monograph # 41. Boulder, CO: University of Colorado/NHRAIC.
- Rubin, Claire B. (1985). *The Community Recovery Process in the United States after a Major Natural Disaster*, in *International Journal of Mass Emergencies and Disasters*

The major contribution of our work was to identify those factors that are essential to an efficient and effective recovery. We accomplished this, even though we were never able to settle on a single operational definition of efficient and effective recovery. Even now, an operational definition of efficient and effective recovery is not established in the recovery literature or in the regulatory structures at the national and state levels.

One crucial finding from our case studies is that effective intergovernmental relationships are essential to an efficient recovery. The processes and relationships are important, but the actual outcomes and results produced are the critical aspects. As many of you know, it is common to see major conflicts/feuds between cities, and between cities and counties, and between the local and state governments during normal times. Conflict does not disappear during a disaster response, and it may even intensify.

One major finding of the research was depicted by a conceptual graphic that portrayed the findings regarding the knowledge, skills, and abilities needed at the local level to guide effective recovery. The main product or outcome of the research was a simple chart (see Figure 1) depicting three not-so-simple components of efficient and effective recovery:

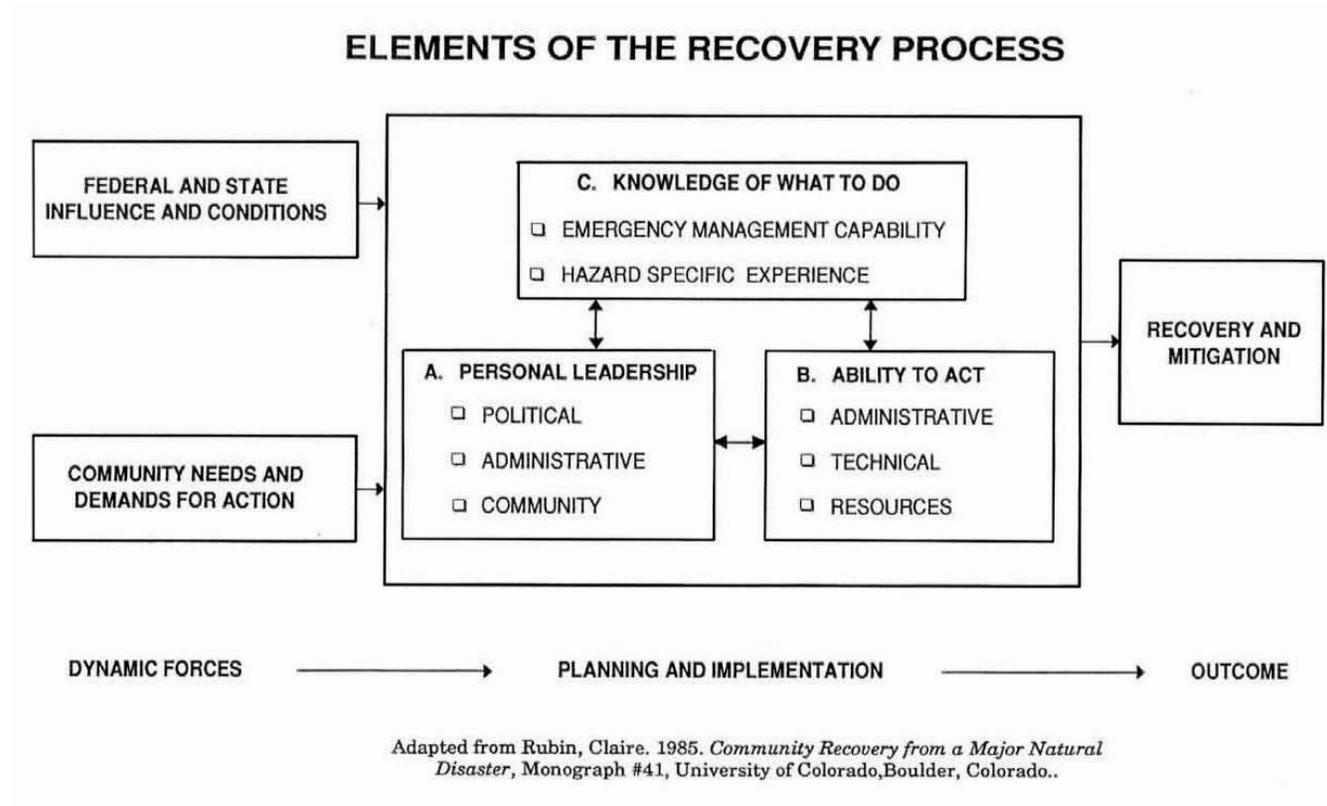


Figure 1: Elements of the Recovery Process

Each of the three components is necessary, but not sufficient by itself for effective recovery at the community level. In short, at least two of the components must be in place to achieve a satisfactory outcome.

Today, I would assert that these three components apply not only to local government, but also to state government efforts regarding LTR. While federal policy may influence or dictate (e.g., certain requirements of the National Flood Insurance Program), the state and local decisions are overwhelmingly powerful.

New Facts and Theories

Although we did not set out to challenge the earlier research, some of our results did in fact find errors and deficiencies in the three earliest books. After doing the field work, we had some reservations about two aspects of the earlier literature. First the famous “wave chart” (done by Haas et al. in 1977) suggested neat and predictable time cycles to the recovery process; but the concept did not hold true in the cases we studied.

Through the years, some academics have worked with this wave sequence and noted that the breaks and linear sequence amongst the waves is in fact not empirically correct, but that in many instances there is very substantial overlap, including in the kinds of activities undertaken at the local level and when they are started.

Second was the notion that no actual long-term economic impacts could be discerned from most major disasters. In 1987, working with Prof. Anthony Yezer, an economist at GWU in an in-depth project supported by the NSF, we documented some deficiencies in early studies, some of which were done with limited field work and also without benefit of an economist on the research team. Prof. Yezer and I reviewed the vexing question of whether or not there are long-term economic effects of disasters. Contrary to findings reported by researchers in the 1970s, our contention was that long-term economic impacts could be identified following significant disasters. (It is important to distinguish between anticipated and unanticipated disasters.) The findings indicated that changes in the frequency of natural disasters can affect local economic activity in ways that are reflected in the land market and property values, and that past experience with disasters influences responses to, and therefore economic impacts of, subsequent events.

- Yezer, Anthony M. and Rubin, Claire B. *The Local Economic Effects of Natural Disasters*. Working Paper #61. NHRAIC. (75 pp.)

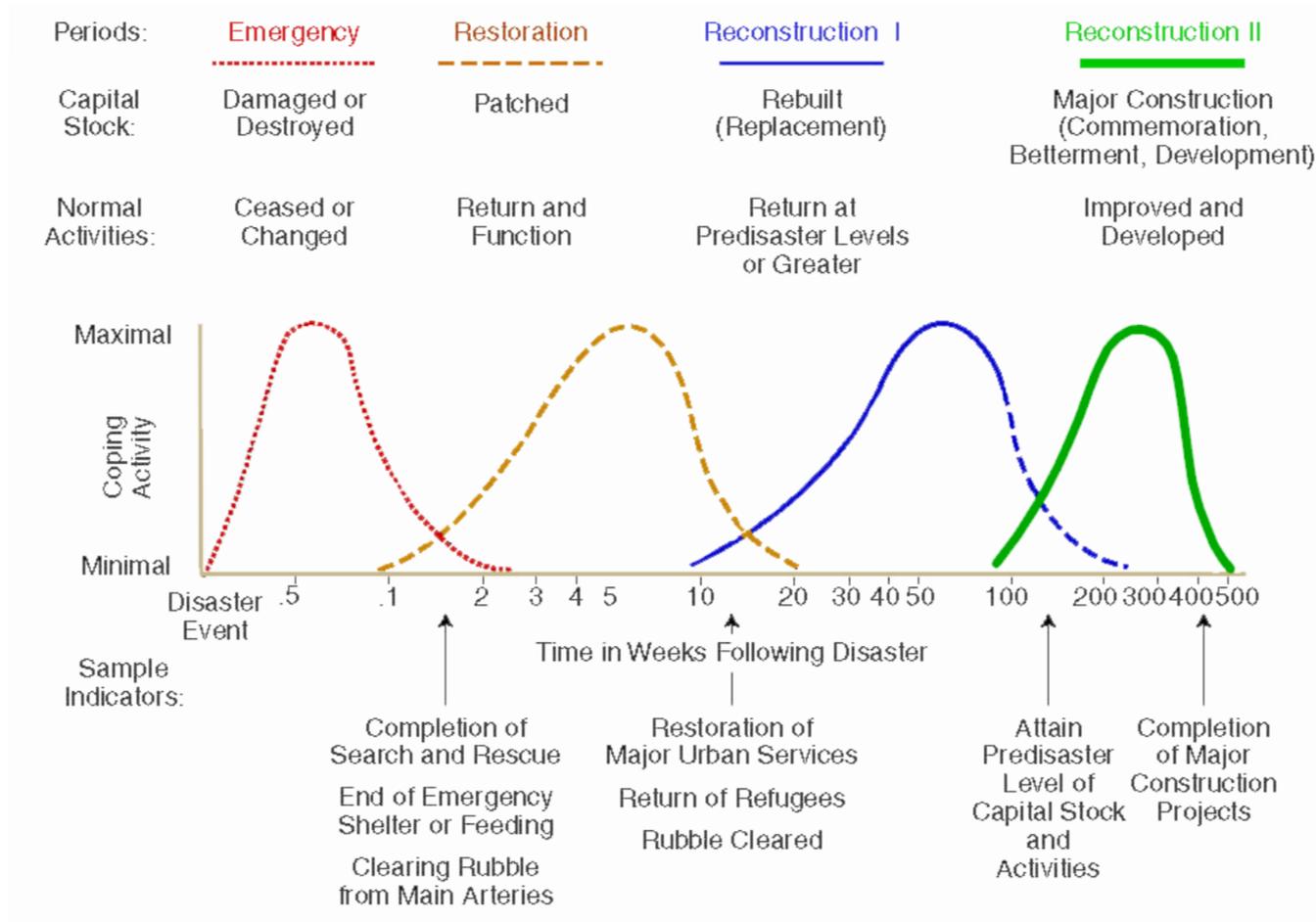


Figure 2

Subsequent Field Studies (1985-2000)

As a researcher with continuing curiosity, from time to time I became intrigued with some disaster recovery experiences that occurred after we completed the 1985 monograph and occasionally did some short field trips to study some additional recovery examples.

1) Hurricane Hugo (1989) – another field trip to examine why the recovery process was so challenged, administratively and politically. Working with Roy Popkin, former Deputy Director of Disaster Services at the American National Red Cross, I went to S.C. to follow up on short quick response trips we each had made post-Hugo. We both had been struck by how poorly the response and recovery processes were going and wanted to know why. Through an NSF quick response grant, our field work revealed two competing systems – essentially one linking political officials and another linking career public officials—that was quite an eye opener. There was a host of related problems due to political and jurisdictional (city of Charleston, county, and state) rivalries. Another problem was the relatively low expenditures made by state and local officials for emergency management prior to Hurricane Hugo, with the predictable lack of personnel and other resources needed for a disaster that impacted about one-half of the state.

- Rubin, Claire B. and Roy Popkin (1991). *Disaster Recovery from Hurricane Hugo in South Carolina*. NHRAIC Univ. of Colorado. Working Paper # 69.

2) Hurricane Andrew (1992) – field work in Homestead, Florida, under the auspices of the International City/County Management Association. There I saw the highest ratio of damage to undamaged structural impacts for all sectors of the community than I had ever seen before. An unusually high proportion of the residential and commercial structures were damaged or destroyed completely. Fortunately, much of the public infrastructure, including city hall, was at least partially functional.

In 1993 I created a Disaster Recovery Matrix, which appeared initially in an ICMA report by Olson and Rubin (1993), titled *Planning for Disaster Recovery*. Fortunately, the graphic was revised, scanned, and posted online by some Minnesota State officials in 1997. The graphic was scanned and posted online; it can be seen at:

http://www.dps.state.mn.us/dhsem/uploadedfile/recovery_handbook/Chapter02/Toolkits/Community_Recovery_Matrix.pdf

3) Scranton, PA Floods - In 1996, I went out into the field once more to witness a recovery operation, following a major flood in Scranton, PA. Again, more than

10 years after we wrote the monograph, I was looking for signs of progress. But, yet again, the recovery process was a relatively ineffective and inefficient situation. The problems stemmed from factors that predictably did not bode well for the recovery process in Scranton or anywhere else, such as failures of FEMA and the state with respect to future flood mitigation, and I said so in the report.

- Rubin, Claire B. (1996) *Disaster Recovery: It's Not Getting any Easier*. Quick Response Report #89
<http://www.colorado.edu/hazards/research/qr/qr89.html> Published by the Natural Hazards Research and Information Center, University of Colorado at Boulder.

Early 2000s

From 1996 to present, like many others in the EM world, I got distracted by homeland security matters. I realized that some researchers were engaged in recovery research, and in one case a compendium of research was done – see the work of Jeannine Petterson.³ Some of the best work on LTR during that time was published by Gavin Smith, Dennis Wenger, and others in several chapters in an expensive book entitled *Disaster Research Handbook*. (Full citation is in the Reference section of this paper.)

Catastrophic Hurricanes of 2005. Hurricane Katrina (2005), compounded by Hurricanes Rita (2005) and Wilma (2005), was a milestone in every sense by which we measure disasters, and certainly in terms of the number of people killed and injured and the number displaced from their homes, plus the high ratio of destroyed and badly damaged homes. The high numbers and long duration of the displacements were unusual, as are the many permanent resettlements. The problems with getting an initial strategic recovery plan in LA persisted for almost four years, which meant that some home and business owners already have taken action to rebuild or relocate, while others are still waiting.

Soon after DHS Secretary Napolitano arrived in early 2009, she was faced with making some decisions to facilitate the LTR process. In Louisiana in particular, the initial strategic planning had dragged on for years, well past the point that is normal and well past the point when it would influence early (or even long-term) recovery decisions. Among the many problems of long duration is the housing element of LTR. As recently as June 13, 2009 the Washington Post published a detailed account of the slow re-housing effort.

³ Jeannine Petterson (1999) *A Review of the Literature and Programs on Local Recovery from Disaster*.
<http://www.colorado.edu/hazards/publications/wp/wp102/wp102.html>

About two years ago, when I decided to get back into the field of long-term recovery, I specifically set out to collect in a systematic way some of the best of the old (hard copy) research products and assemble some documents and sources in one convenient place so they could be shared. If researchers could not find information, then busy practitioners did not stand a chance. I approached PERI for a small grant to start a recovery resources website, that is now available at: <http://www.DisasterRecoveryResources.net>

Since I am now in my second year of working on that site, I know how very difficult it is to locate useful resources, identify potential users, and share the information. (The demand side is lagging as well as the supply side.)

2009

There are some hopeful signs at the present time that LTR is moving up in the list of priority concerns for public officials. Some indicators are:

- Sec. Napolitano has acknowledged some of the recovery problems still pending almost 4 years after Katrina, and is working to correct them. On April 21, the Secretary listed five principal missions for DHS, the fourth of which was response and recovery. Again she mentioned the post-Katrina aftermath needs improvement.
- In April, Acting FEMA Director Nancy Ward said recovery was one concern that kept her up at night.
- Also, staff in FEMA's Office at headquarters that deals with Emergency Support Function #14 (ESF #14) are trying to help states and locals plan better and are making connections with the research community. I recently learned that an LTR course is now offered at the Emergency Management Institute (see <http://training.fema.gov/EMIWeb/IS/IS814.asp>) and a self-help guide has been produced (<http://www.fema.gov/library/viewRecord.do?id=2151>). Nevertheless, ESF #14 is federal guidance and it focuses on the process to apply for using and reporting federal monies. In my view, there's still not enough attention paid to the need for a better repository of information and the pressing need to build capacity at the local level. Also needed are extensive technical assistance and funding for strategic recovery planning at the State and local levels.
- FEMA and the staff charged with ESF #14 have initiated more field visits, technical assistance, and a fledging project to collect "lessons learned" in recent months. For example, after Hurricane Ike in Texas, both FEMA and the State initiated some new recovery planning efforts. It is still too early to tell if

there will be a better outcome in Galveston, TX post Hurricane Ike. (Will local and state officials there be quicker to act and more cohesive in determining needs and desires of the city?) And recently in Lincoln County, NE, FEMA dispatched a planning team to work with local officials on recovery. Good progress, though it occurred about one year after the flood disasters. They have recently initiated a small effort to collect lessons learned.

Much More Remains to Be Done

We do need to collect lessons learned and document best practices. We need far more information about successful and unsuccessful recovery experiences, and also more documents with guidance and source information. *For reasons we cannot determine, researchers do not seem to want to do field work and case studies anymore.* Another reason researchers do not get involved is a lack of funding for research on the LTR process.

Some Personal Observations about some Very Fundamental Problems

- Knowledge Base
- State of the Practice of LTR
- Problems with how we fund (fail to fund) LTR research
- Final thoughts

Knowledge Base

Looking back over almost 30 years, it seems to me that the progression of knowledge about LTR has moved in fits and starts. But the lack of consistent progress in improving the knowledge base is a small problem compared with the serious lack of systematic knowledge development and storage, and also with the utilization and institutionalization in public practice.

Recovery as a practice issue is virtually uninformed by the research that does exist, at the present time. The national response framework we have presently does little to enable local officials to address the challenges associated with the local and intergovernmental politics of disaster recovery.⁴

Not only is the knowledge base inadequate for what we need today, it surely is not adequate for what we are likely to face in the near future. Given the prospect of global warming and sea level rise as drivers, we can expect many major disasters and major population relocations looming ahead. (See recent UN report on Risk and Poverty; full citation is in the References section.)

⁴ As pointed out in an exchange with Dan Barbee, the world of LTR is actually two worlds—one public policy and regulatory matters and the other scholarly takes on local and intergovernment real politik. Smith and Wenger described the gap, but no one seems to know how to fill it in.

Among the adverse consequences of an inadequate knowledge base are:

- (1) Significant limitations on educational content, materials needed for education and training programs regarding LTR, and
- (2) A less than optimal ability of the public sector to engage in and facilitate the practice of long-term recovery. (This does not suggest the private sector is better prepared, but I have not examined the history of their past efforts.)

State of the Practice of Long-term Recovery

I would suggest that the three essential elements of conducting recovery at the local level also apply to the federal level: knowledge of what to do, ability to act, and leadership. Clearly, broad knowledge of what to do is still lacking today; and thus the ability to act properly and effectively also is deficient. Leadership and commitment at the national level also are lacking at the present time, but I am hopeful this situation will change with the new administration.

Regarding Ability to Act:

- Related to the need for some strategic thinking is some enabling legislation that sets out recovery goals, requirements, and an overall framework. See Ken Topping's (January, 2009) opinion piece titled *Towards a National Disaster Recovery Act of 2009* in the *Natural Hazards Observer*.

What is missing?

- No federal enabling legislation, no prescribed actions or budget;
- Congress has not acted; and
- The General Accountability Office (GAO) has shown a limited view in its recent reports, having mostly identified the trees rather than the forest of LTR.
- Also sorely needed is a National Disaster Recovery Strategy document.⁵ It was required by law, and the deadline has past, but it still has not been delivered. If one assumes a strategic plan is a measure of priority, we can see recovery is lagging as an agency priority.)

⁵ Sec. 682 of Stafford Act amendments. (6 U.S.C.771); 2006. Another matter that needs to be investigated is Title V of the 1974 action, which Congress vitiated in the 1988 statute.

What is missing?

FEMA has not provided an overall strategy or guidance re strategic planning for state and local officials.

The main responsibilities for recovery remain with local and state governments. Rethinking policies and practices at every level of government would be an important first step toward redressing the neglect of long-term recovery in recent decades.

Need for Networks and Action

Common goals and the creation of networks of researchers and practitioners to identify and conduct research and studies are needed to further the development of knowledge needed to enhance the process of recovery.

Among the many challenges is the essential step of enlisting more multi-disciplinary research teams to engage in needed studies and encourage more educators to find and share the best information for their courses dealing with long-term recovery.

Recovery will remain problematic for the foreseeable future because it is very messy, difficult to do, and requires long-term attention and resources. In my view there are so many variables at the community level, and so many competing demands and requirements that each community needs to determine its own vision, needs. Once goals and objectives once are articulated and agreed upon, it will be necessary to develop a system accomplish them. Many jurisdictions, especially smaller ones, will need assistance with all aspects of the operation.

Recovery progress takes many years, and often decades. Practitioners need to know that the agencies involved, at all levels of government, need to be ready for that lengthy stay. Researchers need to know that and act accordingly; i.e., longitudinal studies may be needed, not one-time case studies.

One positive note. I can only touch on a very important element of the solution to the problems we now face and cite just a few recent social science research articles on “wicked problems”—and also on the recommended use of networks to deal with them -- that have a bearing on the topic of recovery and emergency management in general. Three recent citations on this matter include:

- Chris Bellavita on “Tame Problems” vs. “Wicked Problems,” essentially a discussion of linear decision makings vs. more complex forms of decision making. [See: <http://www.hlswatch.com/index.php?s=%22wicked+problems%22>

- Edward Weber and Anne Khademian. *Wicked Problems, Knowledge Challenges, and Collaborative Capacity Builders in Network Settings* in PAR, March/April 2008.⁶
- Robert Ward and Gary Wamsley (2007), *Chapter 8: From a Painful Past to an Uncertain Future* in Claire B. Rubin (Ed.) *Emergency Management, the American Experience, 1900-2005*. PERI.

Problems with How we Fund (or Fail to Fund) LTR Research

In reviewing the projects I have been connected with for the past 30 years, I realized that not one of the major research projects was funded by FEMA. As the mission agency with the lead for recovery⁷, seemingly it should scope and request help from the research community to better achieve its mission. Since FEMA has neither conceptualized nor offered a solicitation for research on recovery, it has not received results that it wants or can use. Waiting for results of unsolicited research from non-mission agencies, like the National Science Foundation, is not the most direct way to achieve needed information, feedback, and evaluations of its efforts.

FEMA Has Not Initiated or Funded Recovery Research Directly

We need more in-depth information regarding actual recovery experiences, successful and unsuccessful. Examples; documents and guidance useful to practitioners; best sources of information identified; and much more in the way of education and training. This information is essential as the basis for delivering the much needed technical assistance to local officials.

Final Thoughts

Most of my funding support was from NSF and more recently from the non-profit Public Entity Risk Institute (PERI). [PERI is a small non-profit, but its director has supported many recovery projects due to his sustained personal concern and interest in recovery.]

⁶ “The fundamental challenges posed by wicked problems place critical emphasis on the tasks of knowledge transmission and integration.” (p344, Weber and Khademian).

⁷ The issue of whether or not FEMA should be the lead agency for recovery is one under active scrutiny of late. Recent efforts have placed more responsibility for housing recovery with The Dept. of HUD. It is ironic to note that one of the predecessor agencies that was integrated into FEMA in 1979 was the Federal Disaster Assistance Administration, which resided at HUD.

Publication outlets were mainly the NHRAIC in Colorado and some specialty journals – *International Journal of Mass Emergencies and Disasters*, SPECTRA (EERI) etc. (The *Journal of Homeland Security and Emergency Management* (JHSEM) did not exist in those days.)

Currently, most of the funding for research at DHS is provided via the Science and Technology Directorate, which funds several University Centers of Excellence as the predominant way to get research done for DHS.

I am not a fan of that big institutional system, since it does not allow either individual researchers or individual institutions to work with DHS or to suggest unsolicited research to DHS. Plus, that system is a very expensive way to proceed, given the large number of institutions and their overhead rates. I consider the support of these big centers as a sort of “Research Oligarchy.”

I would like to conclude by saying: *It is not essential to have a large grant to do worthwhile things.* If it were, I would not be here today and I would not be engaged in any of the projects I have been doing for the past several years – such as the time line charts and JHSEM. Yet, very few organizations or agencies will even bother to support a purchase order sized project, even when the benefits might be significant.

My parting thought: think big, but support small projects and maverick project leaders because they may just have a lot to offer.

RECOVERY REFERENCES

Bellavita, Christopher (March 11, 2009). “Clocks, clouds, and homeland security.” Posting to a blog:

<http://www.hlswatch.com/index.php?s=%22wicked+problems%22>

CQ Homeland Security (April 15, 2009) *FEMA’s Housing and Recovery Efforts among Acting Director’s Biggest Worries.* [subscription service, URL not available]

FEMA (May 2009) *Public Assistance Catastrophic Disaster Recovery Concept Plan.* 27 pp URL: N/A

Friesma, H. Paul et al. (1979) *Aftermath; communities after natural disaster.* Sage Publications Ltd.

Haas, J. Eugene et al.(1977) *Reconstruction Following Disaster.* Cambridge, MA: MIT Press.

- Kunreuther, Howard (1973). *Recovery From Natural Disasters; Insurance or Federal Aid?* American Enterprise Institute; Evaluation Studies.
- National Academy of Public Administration. (1993). *Coping With Catastrophe; Building an Emergency Management System to Meet People's Needs in Natural and Manmade Disasters*. Published by NAPA; available online. [http://71.4.192.38/NAPA/NAPAPubs.nsf/17bc036fe939efd685256951004e37f4/78f9632b737c132b85256886007eb4bc/\\$FILE/93-01--Coping+with+Catastrophe.pdf](http://71.4.192.38/NAPA/NAPAPubs.nsf/17bc036fe939efd685256951004e37f4/78f9632b737c132b85256886007eb4bc/$FILE/93-01--Coping+with+Catastrophe.pdf)
- Olsen, Christine Ohlsen and Claire B. Rubin (1993) *Planning for Disaster Recovery*. Management Information Service Report, International City/County Management Association. 28 pages. [Contains the first version of the recovery matrix chart.]
- Petterson, Jeanine Pettersen (1999). *A Review of the Literature and Programs on Local Recovery From Disasters*. Univ. of Colorado/NHRAIC Working Paper #102. <http://www.colorado.edu/hazards/wp/wp102/wp102.html>
- Platt, Rutherford and Claire B. Rubin (1999) Chapter 3: *Stemming the Losses: The Quest for Hazard Mitigation*, in *Disasters and Democracy: The Politics of Extreme Natural Events*, Rutherford Platt, Editor, Washington, DC: Island Press.
- Rossi, Peter et al. (1979) *After the Clean-Up; Long-Range Effects of Natural Disasters*. Sage Publications.
- Rubin, Claire B. Webmaster for Disaster Recovery Resources website. <http://www.disasterrecoveryresources.net> (2008-2009) Supported by the Public Entity Risk Institute.
- Rubin, Claire B. (1995), *Physical Reconstruction: Timescale for Reconstruction, in Wellington After the 'Quake in The Challenge of Rebuilding Cities*. Proceedings of invitational conference, Wellington After the 'Quake, held in Wellington, New Zealand, March 27-29, 1995. Published by the New Zealand Earthquake Commission and University of Canterbury, August 1995.
- Rubin, Claire B. *Disaster Recovery: After Hurricane Hugo in SC (1990)*, NHRAIC Working Paper #69. <http://www.colorado.edu/hazards/publications/wp/wp69.pdf>

- Rubin, Claire B. (1996) *Disaster Recovery: It's Not Getting any Easier* QR Report #89 <http://www.colorado.edu/hazards/research/qr/qr89.html>
- Rubin, Claire B. *Disaster Recovery Matrix*. (1997) Graphic revised by Minnesota State officials. Reprinted from Claire B. Rubin (1997) *Planning for Disaster Recovery*, report issued by the International City County Management Association.
http://www.dps.state.mn.us/dhsem/uploadedfile/recovery_handbook/Chapter02/Toolkits/Community_Recovery_Matrix.pdf
- Rubin, Claire B. et al. (1985) *Community Recovery from a Major Natural Disaster*. Monograph #41. Boulder, CO: University of Colorado/NHRAIC. (295 pp.)
- Rubin, Claire B. and Roy Popkin (1991). *Disaster Recovery from Hurricane Hugo in South Carolina*. NHRAIC Univ. of Colorado. Natural hazard research working paper # 69.
- Rubin, Claire (1985). The Community Recovery Process in the United States after a Major Natural Disaster. *International Journal of Mass Emergencies and Disasters*
<http://www.training.fema.gov/EMIWeb/downloads/IJEMS/ARTICLES/THE%20COMMUNITY%20RECOVERY%20PROCESS%20IN%20THE%20UNITED%20STATES%20AFTR%20A%20M.pdf>
- Smith, Gavin P. and Dennis Wenger (2006), *Chapter 14: Sustainable Disaster Recovery: Operationalizing an Existing Agenda* in Handbook of Disaster Research, edited by H. Rodriguez, E. L. Quarantelli, and R. Dynes. (NY: Springer); pp. 234-274.
- Topping, Ken (Jan 2009) *Towards a National Recovery Act of 2009*, in *Natural Hazards Observer*,
http://www.colorado.edu/hazards/o/archives/2009/jan_observerweb.pdf
- UN (2009) *Risk and Poverty in a Changing Climate*.
http://www.preventionweb.net/files/9414_GARsummary.pdf
- Yezer, Anthony M. and Rubin, Claire B. (1987) *The Local Economic Effects of Natural Disasters*. Working Paper #61. NHRAIC. (75 pp.)