

**“Overview of the Role of Communities in Conceptual Models of Disaster and Their
Application in Katrina Related Research”**

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Abstract:

We focus on the role that community plays in the continuum of disaster preparedness, response and recovery by first focusing on conceptual frameworks which include communities as well as highlighting several research projects which illustrate the conceptual models' applications to disaster research. Each model illustrates some aspect of the spectrum of disaster preparedness and recovery, beginning with the constructs of risk perception and vulnerability, then proceeding to notions of resiliency and capacity building as a vehicle for recovery. We conclude with a discussion of the strengths and weaknesses of incorporating the notion of communities in disaster response and research as well as a look to the future of this growing body of research.

Keywords: community, disaster, risk perception, recovery, vulnerability

Introduction

People make decisions every day, but decision-making in a natural disaster is unique and has great implications for individuals, communities and society at large. Hurricane Katrina clearly demonstrated the need for sound planning, swift execution and efficient accountability; but ultimately the negative consequences people experienced in this (as in any) disaster were conditioned by their perceptions of risk and their vulnerability, and how these factors influenced their ability to make and carry out decisions. (Anderson-Berry, 2003)

Aldunate and colleagues postulate that the quality of decision-making improves if the right people interact about the right tasks at the right time and with the right information. (Aldunate, 2005) While this proposition forms a good starting point for understanding how people make choices in the face of risk, chances are good that each of these conditions will likely not be met in any one given situation.

Most decisions are the products of complex interactions between individuals, their communities, their surroundings and the natural environment itself. For example, in a random sample of evacuees surveyed immediately after Hurricane Katrina, the majority of evacuees stated that although they had previously experienced a significant hurricane before, they still felt that they lacked the appropriate information to make a decision to evacuate when a mandatory evacuation order was issued by local officials (Patel K, Submitted and under review). This finding reveals that their perception of risk might have

been correlated with the information conveyed as well as trust in authorities (e.g. less trust in order leads to a different decision). Dow and Cutter investigated the same phenomenon in communities affected by hurricanes in South Carolina and labeled it the “Crying Wolf syndrome”, referring to an evacuation order for a storm that misses, which revealed a considerable degree of consistency in evacuation behavior despite a dramatic difference in the severity of storms. (Dow, 1998)

So what explains this behavior? Why do some people, despite being presented with the same facts and compelling forces of nature, respond differently? In order to answer these questions and their implications, we must take a closer look at the factors that influence a decision. In particular, *perceived risk* by an individual or community has been thought to be a major component of decision-making.

Perceived risk is generally defined as consisting of two components: one’s assessment of a natural hazard and one’s vulnerability. The assessment of a natural hazard generally has to do with physical attributes such as the individual’s shelter, distance from projected point of impact, structural integrity of safety mechanisms such as levees, etc.

Vulnerability is largely defined as the “capacity to anticipate, cope with, resist and recover from the impact of a natural hazard” (Blaikie, 1994). Influences on risk perception can be thought of as protective or inhibitory. Protective factors include a supportive social network, increased resources (financial, intellectual) and household preparedness. (Anderson-Berry, 2003; Cutter, 2006; Johnston, 2005; Peacock, Brody, & Highfield, 2005) Taken together, these dimensions have a large effect on vulnerability,

since vulnerability exists in equilibrium with these largely protective and inhibitory factors.

So if the goal of disaster preparedness is to maximize beneficial decision-making under sub-optimal conditions, then whatever influences risk perception will have great impact. One of the emerging lessons in the immediate and long-term aftermath of Hurricane Katrina has been the role that community organizations and community-based networks played in all stages of disaster preparedness and recovery. The many community and faith-based organizations have consistently been on the ground early and remained in the forefront of the recovery effort, along with larger volunteer organizations like the American Red Cross. Observers have frequently pointed out that local faith-based, volunteer, nongovernmental organizations have been much more flexible and adaptive in the work of recovery (Appleseed, 2006).

Analysts who approach disaster preparedness and recovery from a “top-down” managerial, policy, or planning perspective generally acknowledge that intangible social phenomena like “resilience” play a major role, but they often find them hard to explain. Yet concepts like social resilience have a long history in social theory. Much current work on “social capital” stresses the importance of social networks, reciprocity, and interpersonal trust, which allow individuals and groups to accomplish greater things than they could by their isolated efforts (Coleman, 1990; Lin, 2001; R. D. Putnam, 2000; R. D. Putnam, Feldstein, L.M. , 2003; Sampson, 2005). Earlier, related, work on democracy and political participation stress the importance of community, religion, family, social

organizations – namely, civil society – in promoting the self-restraint that makes democratic government and a free-market economy possible (Lipset, 1981; Skocpol, 2000; Verba, 1995; F. D. Weil, 1994). These ideas come together most fully in the first empirical and theoretical accounts of modern democratic society by Alexis de Tocqueville (Tocqueville, 2000, 2001).

In Tocqueville's view, free citizens who act together in community – using institutions of civil society like churches, voluntary associations, the press, and so on – are able to take immediate action to address issues that face them. They do not wait for a higher authority to solve problems for them, but rather, join together in addressing them themselves. They do not neglect self-interest; rather, they are moderated by a regard for the common good. Tocqueville also distinguishes between two contrasting notions of community. On one hand, community is sometimes treated simply as an aggregation of individual persons, that is, as a population. While the population may be discussed as neighborhoods or by income or race/ethnicity, they remain essentially aggregations of individuals. And as individuals, they are subject to administrative decisions that authorities impose on them.

On the other hand, Tocqueville posits a second notion treats community as an autonomous actor, with its own interests, preferences, resources, and capabilities. Of course, communities are themselves composed of individual persons – but this is a truism of only limited utility in this context and Tocqueville argues that community organizations are more effective than agents of central government – more flexible,

adaptive, rapid, thorough, and consistent – not only because they have local knowledge, but also because they have an interest in a common good. This definition of community has also been embraced by community-based participatory researchers and has been thought to offer an approach that is more active and advocacy-oriented (<http://www.niehs.nih.gov/translat/cbpr/cbpr.htm>). This definition is also important for developing strategies for recovery and preparedness because it illuminates the relationship between organizations, individuals and government.

In this paper, we focus on the role that community – or civil society – plays in the continuum of disaster preparedness, response and recovery, and we explore where community fits in conceptual frameworks around natural disasters. By highlighting several key conceptual models that currently exist in the literature, we hope that scientists, policymakers and other stakeholders can acknowledge the important role of communities in the process of preparedness and recovery.

We selected particular models which are well suited to illustrate the importance of the inclusion of communities in the decision making framework for disaster preparedness and response. Each model illustrates some aspect of the spectrum of disaster preparedness, response and recovery, beginning with risk perception and vulnerability assessments, and proceeding to notions of resiliency and capacity building.

Next, we offer findings from disaster researchers who have been working in communities affected by Katrina in order to illustrate the applicability of these models in

disaster/recovery situations. We close with some recommendations for future directions in disaster related research and the inclusion of communities in the research framework.

Overview of Models:

Models of Risk Perception and Vulnerability

The first model we highlight is from Smit and Wandel and is noteworthy for its explicit incorporation of the community in identifying risk and vulnerability in current as well as future situations. (Smit, 2006) [FIGURE 1] Stakeholder and community engagement is highlighted in the model as a point of emphasis and as a means of improving “adaptive capacity.” Adaptive capacity refers to the collective adaptability, coping capacity and resilience of a population. Smit refers to this framework as a “bottom-up” approach, involving key community stakeholders in a process to implement changes that are relevant to the community.(Smit, 2006)

“Figure 1 about here”

In addition, the framework calls for identifying current exposures, sensitivities and future adaptive capacity to understand issues a particular community might be confronted with and then employing various ethnographic methods to operationalize the constructs in the model. Such data collection has the advantage of qualitatively illustrating the complex interaction between communities and risk perception and decision-making.

Finally Smit's model suggests that the implementation of any strategy for enhancing adaptive capacity should involve key stakeholders, decision makers and community members, as the adoption of increased adaptive capacity is determined by the cultural appropriateness and relevancy to the community members of these changes. In the context of disasters, this aspect of Smit's model offers a framework for government and other aid agencies.

The model for integrating community-based disaster management (ICBDM) developed by Chen and colleagues (see Figure 2) offers an additional model of a community's role in (Chen, 2006) risk perception and disaster preparedness.

“Figure 2 about here”

The ICBDM model incorporates a variety of phased steps including the establishment of a community-based disaster management organization, highlighting the importance of community participants in the definition of goals and strategies for disaster mitigation. Chen draws from research in a region of Taiwan that has been affected by multiple natural disasters; in the first phase “initiation,” the community develops their own assessment through their previous experiences of natural disasters. Previous experiences can serve as a formative basis for a range of responses. If there is a “crying wolf” effect, the participant tends to downplay future warnings, whereas if there is a significant event where there is damage to life or property, these individuals will likely have higher risk preparation and risk perception.

In the remaining stages of the model, community participants identify problems and develop solutions, as well as identify responsibilities for managing disasters (e.g. which groups, household, community, or government, are responsible for which tasks). Chen's work is exceptional, as most community integrating models seek to employ the resources of the community for the response or aftermath of a disaster, but not for the initial planning phases. The IBCDM model postulates that if a community can strengthen its cohesion than it can play a key role in preparedness and thus the reduction of vulnerability to disasters.

Both Smit and Wandel and Chen offer frameworks which can inform the study of evacuation behavior as well as explore the notion of evacuation as a community action. From this point, we explore a model of disaster recovery.

Models of Disaster Recovery

The dimension of recovery after a disaster is probably the one that has been the most studied over the last several decades and offers a number of conceptual models related to the roles of stakeholders at all levels. A number of these models are especially germane to the experiences of communities after Katrina, but we have chosen to highlight one that emphasizes the notion of communities as an integral piece of psychosocial recovery. LeMyre and colleagues drew from the fields of psychology, sociology and public health

to develop a model which can ultimately be used to conceptualize the factors involved in developing intervention programs for psychosocial risk after disasters. (Lemyre et al., 2005). In the Psychosocial Risk Assessment and Management Framework (PRAM model), LeMyre et al emphasize the notion of a community as a resource, similar in fashion to the adaptive capacity described by Smit and Wandel (figure three). (Cutter, 2006; Norris, Baker, Murphy, & Kaniasty, 2005)

The PRAM model specifically emphasizes the “dynamic interaction between features of the *individual, community, and society*, and characteristics of the disaster *event* itself as mediators of psychosocial stress responses to a crisis event.”(Lemyre et al., 2005): p. 321. Through the identification of factors which are both protective and risk related, the PRAM model highlights the notion of resilience at the individual, family and community levels. Thus, resilience serves to mitigate the impacts of adversity and strengthen community capacity to deal with existing and future events.

Applications of Conceptual Models in the Context of Katrina

The applications of these models are best exemplified by looking at some recent examples of research conducted before, during and after Hurricane Katrina. In the following section, we highlight several research projects funded primarily by the National Science Foundation’s SGER (Small Grants for Exploratory Research), a funding mechanism which allows for rapid execution of rigorous research in disaster settings.

These projects can also greatly inform theories and practice of disaster preparedness and risk perception planning, and help us see better how communities' strengths and capabilities can be integrated into these processes.

Risk Perception and Vulnerability

In a study of over six hundred Katrina evacuees immediately after the hurricane, a little over half of the evacuees who evacuated after the storm made landfall stated that they had previously evacuated from a hurricane or other natural disaster (Patel K, Submitted and under review). These respondents cited their previous experiences (and lack of any serious consequences in those instances) as a principal reason for delayed evacuation. As illustrated in Smit and Wandel's conceptual framework of risk perception, the influence of exposures, sensitivities and adaptations of previous experiences likely played a significant role in their ultimate decision making and evacuation behaviors. Another important finding was that a large proportion of those who evacuated early cited their neighbor's actions as a key predictor of their own evacuation behavior, which Smit and Wandel aptly point out as community engagement in their model and its subsequent influence on evacuations.

Evacuation and Action

In another NSF funded research effort, an interdisciplinary team of investigators

conducted a study of African American and Vietnamese communities to understand how the communities negotiated evacuation and access to relief services, relocation assistance and rebuilding funds. (Airriess, 2006) Through mixed methodology of focus groups and surveys, they discovered that when compared with members of Vietnamese communities, African Americans were more likely to obtain information about the hurricane from the media and seek help from their families after the hurricane. Vietnamese respondents tended to display more trust in the government and church and cited both as their principal resources after the hurricane. Further exploration revealed that there are significant reasons behind these differences some of which are largely cultural and socioeconomic. Through GIS mapping, Airriess and colleagues were also able to look at pre and post disaster neighborhood density by ethnicity and found that Vietnamese community members had returned to their original homes in greater numbers than African American community members and the presence of a prominent and active Vietnamese church in the neighborhood was thought to be a large factor in this return. Airriess' findings emphasize the need for thoughtful consideration of populations.

Recovery

In Baton Rouge, the closest large place of refuge, fully half or more of the residents had spontaneously housed evacuees and volunteered for relief work (Editorial, 2005; Kern, 2005; F. Weil, Shihadeh, E., Lee, M.R., 2006). A large, informal, loosely structured, interdenominational group of faith leaders was immediately called into being and began meeting weekly, continuing to present day. Community, faith-based, and nonprofit organizations have been so centrally involved in long and short-term recovery efforts, illustrating the importance of communities in the conceptualization of the entire spectrum of disaster planning and management.

In a similar fashion, community cohesion aided recovery in Greater New Orleans. In a series of self-administered surveys completed by a convenience sample of three hundred eight-seven (n=387) residents of Orleans and St. Bernard Parishes during August to December 2006, Weil found that respondents' residences recovered more fully among people with higher levels of social trust. (FIGURE THREE) Social trust is a scale composed of trust of neighbors, colleagues at work, fellow congregants, people who work in local stores, and the local police; and the principal outcome measured was the degree of recovery from storm damage. Respondents with high levels of social capital (measured as social trust) reported that their residences were more fully repaired, despite the degree of damage they had sustained. Social capital also helped protect people from stress. Those who attended church or synagogue more frequently reported lower levels of disturbance of sleep, appetite, or concentration, again despite the level of storm damage they had sustained.

INSERT FIGURE 3 HERE

Discussion

Hurricane Katrina has caused our entire nation to pause and re-examine our own capacity to deal with a disaster. The models we have highlighted each offer a different perspective on the conceptual framework that underlies the capacity to prepare for, act during and recover after a disaster. Each model also has some aspect of a community involved in the process; with Chen's model (FIGURE Two) offering what we feel is the most comprehensive incorporation of community by illustrating the benefit of bringing community members into each aspect of disaster management. In particular, the Integrated Community-Based Disaster Management (ICBDM) model is closely aligned with our experience after Katrina with regard to the roles of community-based organizations in general.

But not every community is equal and not all communities are beneficial. The strengths and weaknesses of community must be taken into account. On the positive side, well-functioning community organizations have the trust of their members that government agencies might lack especially in disaster situations. They also have strong abilities to assess needs and distribute goods and services efficiently and equitably. Thus, observers often stress the importance of including communities in disaster response and creating meaningful partnerships between communities and government agencies.

However, communities have weaknesses, too. For instance, partnerships with government may neutralize community's potential benefits. Government funding or pre-certification could undermine the independence and autonomy of community organizations – and along with that, the loyalty of their members (Pipa, 2006). Cain and Barthelemy note that every church in their Baton Rouge study (N=157) but one declined government reimbursement for the expenses they incurred in their relief work. (D. S. Cain & Barthelemy, Under review; D. S. Cain, Barthelemy, J.)

Communities may also play a role that is detrimental to their members or to society at large. For example community cohesion in disaster response may encourage members to remain in vulnerable locations because they have a false sense of security or desire to maintain community solidarity. Certain shared practices, beliefs, etc, may lead communities & their members to act in ways that make them more vulnerable.

Communities may also act in an exclusionary fashion with respect to non-community members. They may attempt to monopolize resources, information, access, etc, for their own members & exclude others. In the context of Katrina, these limitations were likely outweighed by their benefits.

Finally, there are methodological challenges in operationalizing community variables in empirical research. Inequality is generally easier to measure than is social capital or group solidarity. For instance, in discussing the “architecture of entitlements” that determine the resilience and vulnerability of a community, Kelly notes that “...there is a

danger that those factors that can be easily incorporated in a composite index [of vulnerability], such as poverty, will be over-emphasized as factors such as institutional adaptation that, although no less important, cannot be as readily quantified are neglected.”(Kelly, 2000): 331.

In conclusion, we highlight models which incorporate communities in the spectrum of dealing with disasters because throughout history, communities and their organizations have played very significant roles. Each of the models we highlight also serves as a foundation for further empirical research. Some important questions that should be addressed include: what is the applicability of the model to different disasters and populations? Who is the community and how is it defined? Nevertheless, the experiences of Hurricane Katrina bring researchers, policymakers and other relevant stakeholders to pause and consider a broader model that incorporates true partnerships with communities.

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Index of Figures:

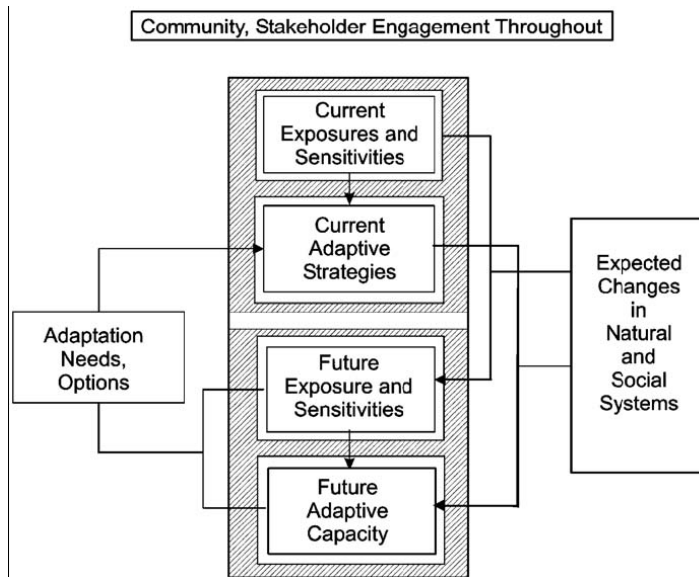


Figure 1. Conceptual framework for vulnerability assessment and mainstreaming. (Smit & Wandel, 2006:288) from:
 Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change - Human and Policy Dimensions*, 16(3), 282-292.

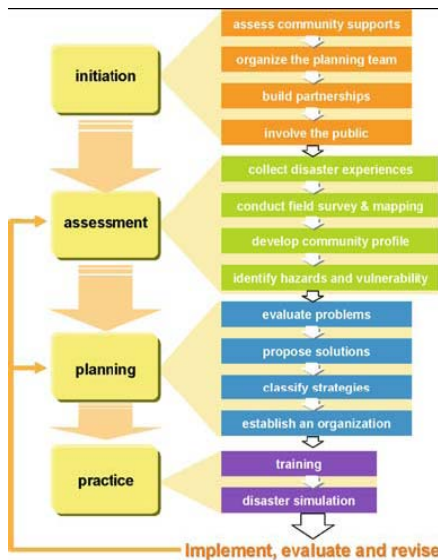


Figure 2. Phased approach of ICBDM project. (Chen, 2006: 220) from:
 Chen, L. C., Liu, Y.C., Chan, K.C. (2006). Integrated community-based disaster management program in Taiwan: A case study of Shang-An Village. *Natural Hazards*, 37(1-2), 209-223.

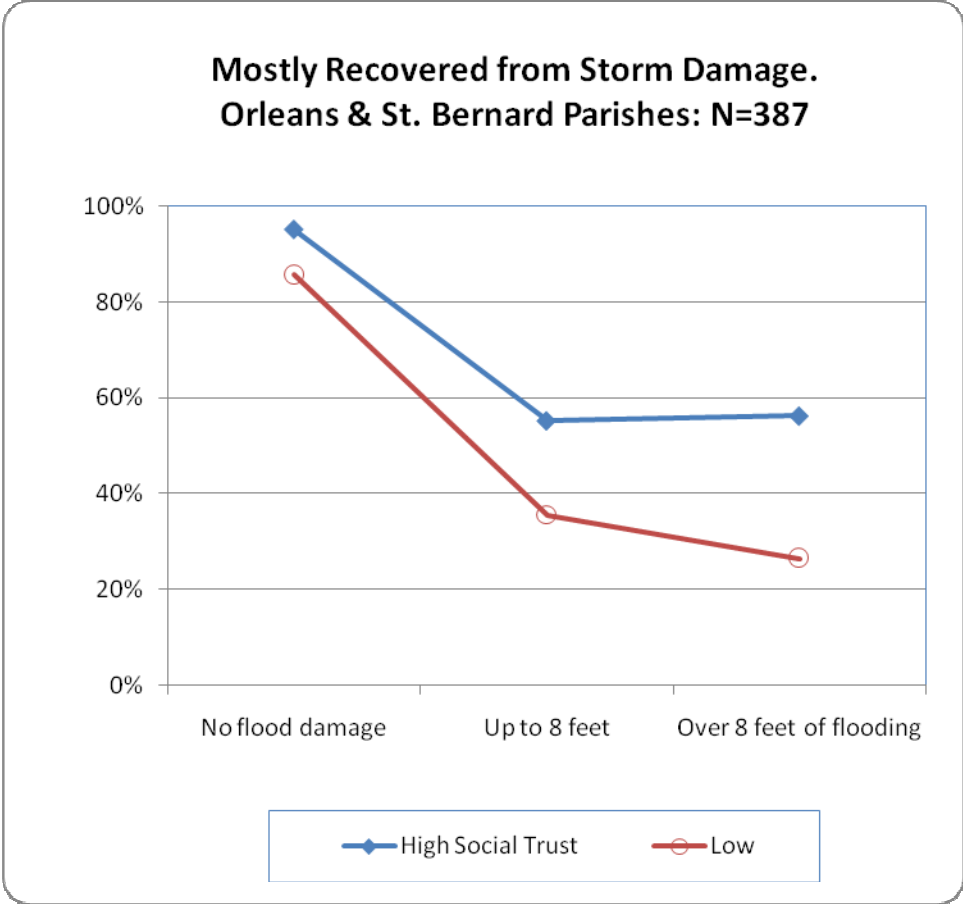


Figure 3: Preliminary findings from Weil et al. Study of the impact of social capital on storm recovery, at different levels of damage.