Post-Disaster Recovery and Vulnerability

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Abstract:

After a disaster event impacts a community, many governments, institutions and aid organizations become involved with the recovery process, often with the stated goal of returning the community to its pre-disaster form. In recent years, this goal has evolved into an approach, termed 'build back better', which builds on vulnerability research and the theory that the post-disaster context offers a window of opportunity for disaster risk reduction and improved re-development. In this sense, the recovery period is seen as a tool for implementing policies and programs designed to remedy the weaknesses in developmental policies, infrastructure and institutional arrangements. The following chapter provides an overview of the disaster recovery literature, beginning with early approaches that provide descriptions of human behavior and the phases of recovery. This leads into the theory of disaster recovery, and a discussion of the issues associated with defining 'better'. It is found that although many governmental and aid organizations have adopted the term 'building back better' to define their reconstruction and recovery activities, defining what building back better encompasses has been difficult and poorly researched. This chapter argues for an approach to disaster recovery that uses vulnerability research to guide recovery efforts. Using this approach, six guidelines are presented to provide a framework for disaster recovery efforts with the goal of reducing the impact of future hazardous events.

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Introduction

The disaster management cycle contains four phases, including preparedness, response, recovery and mitigation. Of these four phases, recovery is the most poorly understood and has been the least well researched (Barton, 1969; Rubin et al., 1985; Schwab, 1998; Lloyd-Jones, 2006). Recovery can be defined as the longer term activities undertaken to recover from a disaster event in an attempt to return the community to pre-disaster norms (Joakim, 2008; Mileti, 1999). On the other hand, Alesch (2004) argues that communities rarely return to pre-disaster form as "they struggle to achieve viability in the newly-emerging environment within which they exist" (p. 3). More recent definitions explore how recovery entails the "decisions and actions taken after a disaster with a view to resorting or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk" (UNDP, p. 3).

This chapter reviews the disaster recovery literature, including descriptions of the processes that occur during the recovery phase, as well as focusing on theoretical approaches to recovery. The review incorporates literature from both developing and developed country perspectives: although there are some differences within these contexts (for example, developing countries tend to experience higher human losses whereas developed countries tend to experience higher economic losses), many similar issues exist in terms of the processes that affect who is most severely impacted and experiences the greatest difficulty during the recovery phase. Through this review, the role of conflict, social

networks and community characteristics that increase the effectiveness of the post-disaster recovery period is explored. This is followed by an overview of recent disaster mitigation paradigms that impact recovery efforts, including Mileti's (1999) sustainable hazards mitigation approach as well as McEntire's (1999) invulnerable development approach. This leads into a discussion of one of the most recent understandings of disaster recovery, termed 'building back better'. The concept of 'better' is explored from a vulnerability perspective, arguing that in order for disaster recovery to be effective, it must reduce vulnerability to future events. To conclude, six guidelines are provided for approaching disaster recovery from a vulnerability reduction perspective.

Historical Disaster Recovery Research

The earliest studies of disaster recovery focus on describing the processes that occur during the recovery period, as well as describing behavioral reactions both during and after disaster events. Barton (1969) summarized the existing disaster recovery literature up to 1970 with his work on the nature of social response to chronic and rapid-onset disaster events. His work found patterns of organizational behavior: he explores how individuals and communities respond during recovery periods, including:

1) The replacement of local government institutions that are often unable to effectively cope and respond with improvised emergency government agencies (such as a citizens committee or in conjunction with provincial/state or national agencies);

2) The responsibility of relief and reconstruction activities tend to be given to voluntary, humanitarian organizations who often compete for funds and recognition, possibly leading to breakdown in coordination;

3) Public response to organizations is driven both by rational assessment of achievements, as well as by symbolic actions; bureaucratic and emotionally neutral responses tend to create misunderstanding and even hostility;

4) Antagonism and group conflicts may resurface during the recovery and reconstruction period overcoming the collaboration and solidarity experienced during the post-disaster period.

5) As large-scale events overwhelm local capacity, major national programs are required to aid local responses and increase efficiency (Barton, 1969, p. 284).

One of the earliest studies to systematically analyze the recovery process was that of Haas, Kates & Bowden (1977) who argued that "disaster recovery is

ordered, knowable and predictable" (p. xxvi). After exploring the reconstruction and recovery efforts of four major disasters (three in the United States, one in Nicaragua), they developed a disaster recovery model that divided the recovery process into four distinct, but overlapping periods:

1) Emergency Period: the initial period following the disaster, lasting a few hours or days, where the community begins to cope with losses of life, property and injury as well as initiating the beginning of cleanup. The normal functioning of the community is disrupted during this period.

2) Restoration Period: covers the time where major services, transportation and communications are restored. Depending on the community and resources available, this period may take several weeks or months.

3) Replacement Reconstruction Period: the city's capital stock is rebuilt to pre-disaster levels, and social and economic activities return to pre-disaster levels or higher.

4) Commemorative, Betterment and Developmental Reconstruction Period: involves three interrelated functions, including memorials and commemorations of the disaster events, major reconstruction activities to improve the city and to begin future growth and development (Haas, Kates & Bowden, 1977, p. xxvii).

According to this model, the length of time required to complete each period is based on a logarithmic relationship, in that each period lasts approximately ten times longer than the previous period, although recovery and reconstruction times are also "a function of predisaster trends, the damages suffered, the resources available for recovery, and, to a lesser degree, leadership, planning and organizations" (Haas, Kates & Bowden, 1977, p. 1). While Haas, Kates & Bowden's (1977) model offered one of the first theories of disaster recovery, others have criticized the model for its linear, value-added approach, as well as its lack of explicit recognition of the politics involved in disaster recovery (Berke, Kartez & Wenger, 1993; Schwab, 1998).

Geipel (1982) examined the role of historical heritage, culture and politics on the perception of hazards and the recovery process through the study of reconstruction after the 1976 Friuli earthquake in Italy. He discovered that the disaster event heightened pre-existing inequalities and that the "original hierarchy of functions, persons, and power relationships asserts itself rather more sharply than ever, and it is very hard even for relief policies to change" (Geipel, 1982, p. 180). While the elderly and financially weak were disadvantaged as a result of the 1976 Friuli earthquake, merchants and tradesman gained from the post-disaster recovery operations.

Like Haas, Kartez and Bowden (1977) Geipel (1982) notes that the time required for reconstruction is a function of the damages suffered, pre-existing

economic trends and the presence of local resources for recovery. Geipel's work also focuses on the conflicts experienced during the recovery period as planners and developers establish grandiose rebuilding plans that compete with local citizens' ideas for reconstruction – which are usually to see the area rebuilt to pre-disaster norms. Other recovery research has also found that local citizens exert tremendous pressure on local government to rebuild the community to its pre-disaster form and that other forms of conflict arise from the distribution of relief and recovery aid (Schwab, 1998; Mileti, 1999; Mustafa, 2003). This finding is depicted in the conflict model of recovery in Figure 1.

Figure 1: Conflict Model of Recovery (Geipel, 1982, p. 172)
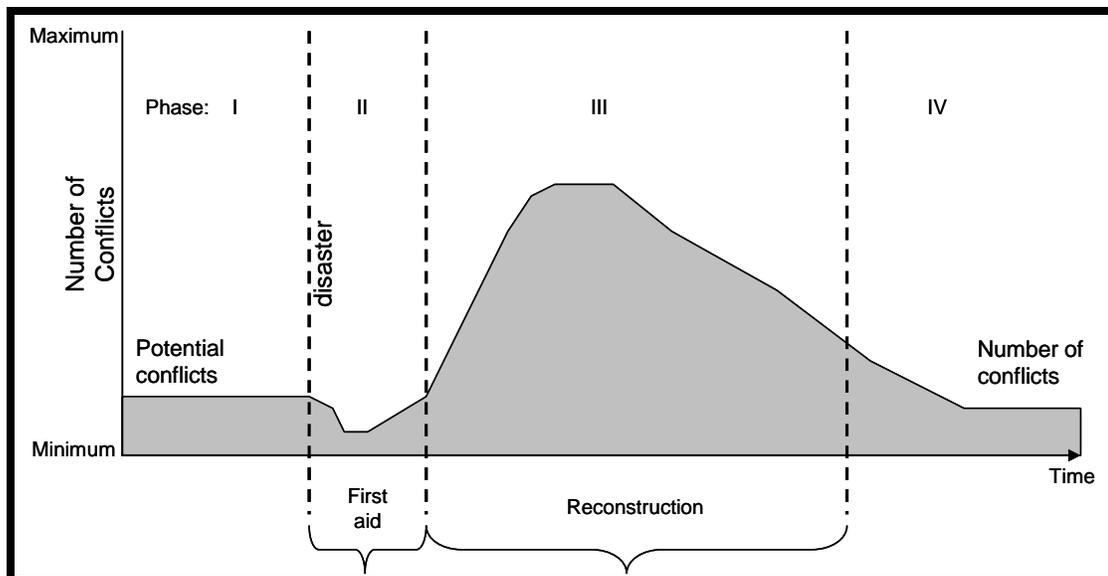
In this model, there are a number of pre-existing potential conflicts (phase I), although the disaster event itself acts as a catalyst for solidarity, sacrifice and mutual helping (phase II). As external interventions begin and relief aid is distributed, conflicts begin to arise and during the reconstruction planning phase, conflicts reach a maximum (phase III). Issues of class, culture, and in the case of Friuli, historical heritage, create differing perceptions on needs, rebuilding plans and the role of government and external intervention in the recovery process. As reconstruction comes to an end, the number of conflicts decreases as individuals' and family's become accustomed to the new circumstances and living arrangements (Geipel, 1982).

Rubin et al. (1985) explored the difficulties in measuring recovery as an outcome. After examining how previous research had attempted to use recovery

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as a dependent variable, they made the decision to conceptualize recovery as a process: "recovery is an ongoing process and, therefore, difficult to measure once and have that suffice" (Rubin et al., 1985, p. 14). Conceptualizing recovery in this way has a definitive impact on how one goes about assessing recovery efforts and this view has been increasingly adopted in recovery research (Mileti, 1999; Brown et al., 2008). Mileti (1999) focuses on recovery as a process incorporating "not just a physical outcome but a social process that encompasses decision-making about restoration and reconstruction activities…[and] also stresses the nature, components, and activities of related and interacting groups in a systematic process and the fact that different people experience recovery differently" (p. 229 – 230).

Rubin et al. (1985) critique previous recovery literature, including the recovery framework developed by Haas, Kartez & Bowden (1977), where it was found that the recovery process did not always imitate the sequential phases set out by their model and that "issues frequently crop up in simultaneous or illogical sequences" (p. 6). Rubin et al. (1985) also found that local governments have increased their capacity to respond to disasters, limiting the need to supplant them with emergency government agencies, as suggested by Barton (1969). For example, Lewis (1999) observed that supplanting indigenous administrative units may result in reduced "local capacity to identify, assess and to adjust those structural weaknesses that exacerbate vulnerability" (p. 159). On the other hand, this finding is contradicted by research on more recent disaster events, particularly in developing countries, which found that the establishment of coordinating reconstruction and recovery agencies has helped facilitate the recovery process and increased communication and coordination among the many actors involved in reconstruction after large-scale disasters (for example: see Rehabilitation and Reconstruction Agency (BRR) in Aceh, Indonesia after the 2004 Indian Ocean tsunami) (Fengler, Ishan & Kaiser, 2008). These contradictory findings indicate a need for further research on the characteristics of successful post-disaster recovery and reconstruction agencies.

Rubin et al. (1985) developed a framework for examining important elements of the recovery process (see Figure 2). Unlike Haas, Kartez & Bowden (1977) and Geipel (1982), Rubin et al. (1985) focus on the roles of leadership and organizational knowledge in reducing the length and increasing the efficiency of disaster recovery.

While Rubin et al. (1985) focus almost exclusively on political leadership, Alesch (2004) acknowledges that although local governments can influence community recovery, overall "whether a community system survives and becomes viable in the post-event setting depends in part on the individual choices of a critical mass of people and institutions (automata) in the community" (p. 7).

Berke, Kartez & Wenger (1993) focus on inter- and intra-community relationships to explore the success of disaster reconstruction and recovery processes. Horizontal relationships refers to the level of formal and informal integration of people and organizations in a equalitarian manner whereas vertical integration refers to the level of relations between various social units and organizations in the community to external social, economic and political institutions (Berke, Kartez & Wenger, 1993). The level of both vertical and horizontal relationships can impact disaster recovery as they inevitably reflect the capacity to influence and organize effective recovery programs that meet the needs of the community and impacted households. As shown in Table 1, the horizontal and vertical integration model of recovery suggests that Community type I is in an ideal position to effectively recovery from a disaster event, whereas Community type IV may face significant difficulties during recovery due to lack of social cohesion and access to and influence over external resources (Berke, Kartez & Wenger, 1993).

**Figure 2 – Elements of the Recovery Process
(Rubin et al., 1985, p. 18)**

Table 1 – Horizontal and Vertical Integration Model of Recovery

Vertical / Horizontal	Strong	Weak
Strong	Community Type I	Community Type II
Weak	Community Type III	Community Type IV

The horizontal and vertical integration model offers important insight into community characteristics that can influence the success of disaster recovery; they reflect access to power and links to important social networks. This model also indicates the types of social capital that increase community coping capacity and provides direction for community improvement. Unfortunately, there is little focus on the processes that create 'strong' and 'weak' communities, as well as how this can be achieved through the recovery process itself. Box 1 provides an example of how social capital and vertical relationships can impact the overall recovery process.

Box 1: Community Characteristics and Disaster Recovery 1997 Red River Flood, Manitoba, Canada

In 1997, the Red River overflowed its banks, resulting in flooded areas in Southern Manitoba as well as areas south of the US Border. Causing more than $500 million in damages to property and infrastructure in Canada, the 1997 event was coined the 'flood of the century'. Buckland & Rahman (1999) explored the impacts of development, culture and ethnicity on the disaster management capabilities of three communities that were heavily impacted by the 1997 flood event. These communities include the Roseau River Anishinabe First Nation which is predominantly Objiway; Rosenort, which is predominantly Mennonite (mainly of German origin); and St Jean Baptiste, a predominantly Francophone community. Of these communities, Rosenort appeared to have the highest levels of community development, as evidenced by higher incomes and home prices, as well as increased levels of social capital. While Rosenort and St Jean Baptiste had similar levels of community development, the social, economic and political marginalization of the Roseau River First Nations community was evident through low incomes, high crime and unemployment rates and low levels of social capital. These three communities represent places with different cultural values, world views and levels of community development that had an impact on the response and recovery efforts after the 1997 flood event (Buckland & Rahman, 1999).

As the Canadian government has become increasingly involved in disaster preparedness and flood plain management over the past 50 – 60 years, the relationship between each community and the government can be characterized as a partnership for the European-origin communities of Rosenort and St Jean Baptiste, compared to dependency for the native community of Roseau River. In the particular case of the First Nations Roseau River community, ambiguity between the role of the Federal and Provincial governments lead to increased difficulties in receiving funding for the recovery process as well as decreased access to external aid organizations, including the Red Cross. Interestingly, after the provincial government

declared a mandatory evacuation order, the residents of St Jean Baptiste and Rosenort were able to make their own hotel arrangements and offered reimbursement from the government, whereas the Roseau River community was evacuated as a group to a local arena acting as a shelter.

In terms of disaster recovery, Roseau River represents a community that had been socially, economically and politically marginalized, resulting in weak vertical and horizontal linkages. Dependent relationships between the community and federal government resulted in decreased political power, and decreased capacity to influence and organize effective recovery programs that met the needs of the community and impacted households. Interestingly, while this particular study found that the community of Rosenort had the highest levels of social capital, this also played a role in creating higher levels of conflict in decision-making processes due to the flatter social structure (Buckland & Rahman, 1999).

As the disaster recovery literature has matured throughout the 1980's and 1990's, research has moved away from descriptions of the recovery process towards a paradigm for disaster management that incorporates a mitigation component designed to reduce vulnerability and susceptibility to future disaster events. Mileti (1999) argues that a shift in thinking in disaster management is required to adopt a global systems perspective; accept responsibility for hazards and disasters; anticipate ambiguity, constant change, and surprise; reject short-term thinking; take a broader, more general view of social forces and their role in hazards and disasters; and embrace the principles of sustainable development (p. 26 – 29). Embracing the sustainable development movement as a core component of this proposed shift in thinking, Mileti (1999) advances the *sustainable hazards mitigation* paradigm to consolidate ideas originally formulated decades ago by Gilbert White and colleagues, as well as integrating ideas from more recent research. The sustainable hazards mitigation approach has six central components, including:

1) Maintaining and enhancing environmental quality: as a fundamental element of the sustainable development concept, hazard mitigation efforts should be linked to efforts to reduce environmental degradation.
2) Maintaining and enhancing people's quality of life: exploration of the impacts of structure and agency in increasing individual, household and community access to various resources to increase their quality of life.

3) Foster local resiliency to and responsibility for disasters: particularly during the recovery period where political pressure to increase safety and build community coping capacity is high.
4) Recognize that sustainable, vital local economies are essential.
5) Identify and ensure inter- and intra-generational equality: leading to fair and equal distribution of resources and hazards across the population, including different regions, genders, ethnic groups and cultures.
6) Adopt a consensus-building approach, beginning at the local scale through the process of local participation (Mileti, 1999, pp. 31 – 34).

The sustainable hazards mitigation approach acknowledges that hazards and disasters are not experienced in isolation – they are linked to broader systems and processes (Mileti, 1999). Through this perspective, the similarity between the goals of vulnerability reduction and sustainability are acknowledged (Lewis, 1999). This approach connects disasters to everyday activities that have a bearing on disasters as well as viewing disaster reduction and recovery as a process. This approach also relates disasters to development activities and explores the complex relationship between the two (McEntire et al., 2002). Through the actions taken during the post-disaster recovery period "every action taken on account of one disaster must be designed and managed also to reduce vulnerability of the future. In this way, vulnerability reduction itself would be socially and environmentally sustainable development (Lewis, 1999, p. 143).

The sustainable hazards mitigation approach has been adopted by other researchers and organizations, including the United Nations Development Programme (UNDP), through their sustainable recovery framework. This framework offers ten guiding principles for implementing "disaster risk reduction and the promotion of development that is participatory and equitable", including mainstreaming disaster risk reduction in the recovery and development process; improving and maintaining coordination among disaster response and recovery organizations; promoting participatory and decentralized approaches; enhancing safety standards and integrating risk reduction into reconstruction, recovery and development; improving the living conditions of affected communities and sectors; building local and national capacities for increased resilience, risk management and sustainable development; taking advantage of previous or ongoing initiatives; incorporating a gender sensitive approach; demonstrative effects; and continued monitoring, evaluation and learning (UNDP, p. 3 - 8).

An alternative disaster paradigm presented by McEntire (1998; 1999; 2000; 2001) critiques the sustainable hazards mitigation (sustainable recovery) approach, arguing that sustainable development is an unclear concept, does not directly contend with the root causes of disaster (namely vulnerability) (see also Wisner et al., 2004) and is not particularly well suited to non-natural hazardous

events, such as industrial/transportation accidents . Building upon the strengths of Mileti's work, David McEntire's concept of *invulnerable development* is defined as "development pursued in such a manner as to address vulnerabilities, and thereby decrease the probability that social, political and economic progress will be set back by disaster" (McEntire, 1998, p. 216). This approach is specifically designed to reduce risk and susceptibility, as well as increasing resistance and resilience to disasters. Invulnerable development asks the question: 'how can vulnerability be minimized in order to reduce occurrence of disaster and safeguard the progress of development?' whereas sustainability asks 'what should be done to promote the continuation of development?' (McEntire, 2000, p. 59). The four tenets of the invulnerable development approach include:

1) Development that initiates a variety of well-thought-out activities and programs designed to reduce existing vulnerabilities and avert the creation of additional vulnerabilities;

2) Development that acts as a form of progress that attempts to avoid promoting or contributing to the probability of disaster;

3) Development that seeks to promote social, political and economic advances while at the same time, minimizing the likelihood of those advances being reversed by a disaster event;

4) Through the promotion of safe and continued progress, invulnerable development recognizes that the response of both the community and external agents after a disaster event can work to either perpetuate and further entrench vulnerability or to break out of the vulnerability cycle (McEntire, 2001, 193 – 194).

Although the concept of invulnerable development does not specifically relate to processes of recovery and reconstruction, the concepts of invulnerable development can be applied through all phases of a disaster. Through an explicit focus on vulnerability, the role of physical, social, cultural, political, economic, technological and developmental factors that contribute to disasters is recognized and offers an approach that focuses on the conditions that people have control over. Thus, if this paradigm was adopted during the disaster recovery process, there would be an attempt to:

- Link development activities to vulnerability reduction;
- Foment a culture of safety, prevention and preparedness among all individuals, families, groups, businesses, organizations, communities, and nations around the world; and

- Increase the capacities, cooperation, coordination and effectiveness of all public, private and non-profit organizations and agencies involved in or related to disaster management and vulnerability reduction (McEntire, 2001, p. 193).

In this particular paradigm, the post-disaster context is viewed as period where efforts can be directed at increasing the resilience of individuals and communities in the face of future hazard threats. This leads into a discussion of 'building back better' after major disaster events.

Build Back Better

The 2004 Indian Ocean Tsunami devastated several countries, particularly Indonesia, Thailand, Sri Lanka and India. The astounding international response to this disaster event led to increased interest in recovery operations. Through response and recovery efforts, a new approach to disaster recovery was popularized, particularly by government institutions and non-government organizations (NGOs), through the concept of 'build back better' (Lloyd-Jones, 2007; Kennedy et al., 2008). This approach builds on vulnerability research and the theory that a 'window of opportunity' for disaster risk reduction and improved re-development is created during the post-disaster recovery period. During this period, local citizens may have increased awareness of disasters risks and place pressure on government and organizations to use reconstruction funds to remedy the weaknesses in developmental policies, infrastructure and institutional arrangements (Christopolos, 2006; Clinton, 2006; UNISDR, 2005).

Although many organizations and institutions have adopted the term 'building back better' to define their reconstruction and recovery activities, defining what building back better encompasses has been difficult. Alexander (2006) argues that in order for the concept of 'build back better' to be effective, it must be operationalized under a holistic framework that offers a comprehensive vision of the future. While this comprehensive framework in the recovery literature is lacking, Clinton (2006) outlines ten key propositions for building back better including:

Proposition 1: Governments, donors, and aid agencies must recognize that families and communities drive their own recovery.

Proposition 2: Recovery must promote fairness and equity.

Proposition 3: Governments must enhance preparedness for future disasters.

Proposition 4: Local governments must be empowered to manage recovery efforts, and donors must devote greater resources to strengthening government recovery institutions, especially at the local level.

Proposition 5: Good recovery planning and effective coordination depend on good information.

Proposition 6: The United Nations, World Bank, and other multilateral agencies must clarify their roles and relationships, especially in addressing the early stage of a recovery process.

Proposition 7: The expanding role of non-governmental organizations (NGOs) and the Red Cross/Red Crescent Movement carries greater responsibilities for quality in recovery efforts.

Proposition 8: From the start of recovery operations, governments and aid agencies must create the conditions for entrepreneurs to flourish.

Proposition 9: Beneficiaries deserve the kind of agency partnerships that move beyond rivalry and unhealthy competition.

Proposition 10: Good recovery must leave communities safer by reducing risks and building resilience (Clinton, 2006, p. 3).

These propositions incorporate many of the ideas from the post-disaster recovery literature, including addressing some of the underlying vulnerabilities and inequalities as well as linking recovery efforts to longer-term development and sustainable initiatives. On the other hand, propositions may create controversy through differing ideologies on development and the strategies used to achieve these goals. For example, Proposition 8 focuses on promoting entrepreneurship through a variety of means, including tourism, which may be in conflict with local desires (see Box 2 – Disaster Capitalism).

In terms of measuring and analyzing the concept of 'build back better', Kennedy et al. (2008) explore the difficulties in interpreting the meaning of 'better'. A variety of factors influence the perceptions local people and aid organizations have of 'better' and trade-off's exist between the many potential forms of betterment. Within the tsunami recovery effort, the practical constraints of funding mandates, timelines and organizational focus on the product as opposed to the process, led to diminished opportunities to 'build back better'. In

trying to balance the variety of perceptions, needs and risks in the community, the interpretation in some sectors was to 'build back faster' as opposed to 'build back better' (Kennedy et al., 2008, p. 28). During the recovery effort after Hurricane Katrina, funding originally intended for low-income residents impacted by the hurricane was re-directed towards large-scale economic development projects, such as expansion of port facilities, indicating a focus on economic activities as opposed to vulnerable populations (Steps Coalition, 2009, Klein, 2007). Based on these findings, it is clear that although governments and aid organizations may claim to be building back better, there is a lack of clarity of what 'better' entails and lack of a conceptual framework to drive recovery efforts (Regnier et al., 2008).

Box 2 – Disaster Capitalism

Arising almost simultaneously with the 'build back better' paradigm, the concept of disaster capitalism and the relief-and-reconstruction complex has argued that Western governments, the World Bank and the International Monetary Fund have conspired to use disaster events, particularly in post-conflict contexts, for their own gains in perpetuating a neo-liberal agenda (Klein, 2007; Bello, 2006). This approach specifically links the localized post-disaster reconstruction and recovery process with global social, economic and political processes (Mustafa, 2003). Followers of this paradigm provide support for their beliefs through the multiple examples of land-title disputes between villagers and developers after the Indian Ocean tsunami in both Sri Lanka and Thailand, and funding emphasis on commercial enterprises such as tourism and larger-scale aqua-farms (Bello, 2006; Shiva, 2005; Kaplan, 2005). In particular, the push towards privatization and disempowerment of government agencies in Central America after Hurricane Mitch, as well as in Iraq and Afghanistan have provided multiple examples of post-disaster and post-conflict recovery operations that have appeared to benefit certain actors at the expense of the most vulnerable (Bello, 2006; Klein, 2007).

This links to concepts of 'building back better' as these examples indicate a need to understand what it means to achieve successful and effective disaster recovery. Particularly in the context of vulnerability, the concept of disaster capitalism explores the linkages between the structural processes established by powerful nations and the institutions designed to help the most vulnerable. In this case, the argument is made that it is the very processes established to reduce vulnerability that have led to the continued perpetuation of vulnerability.
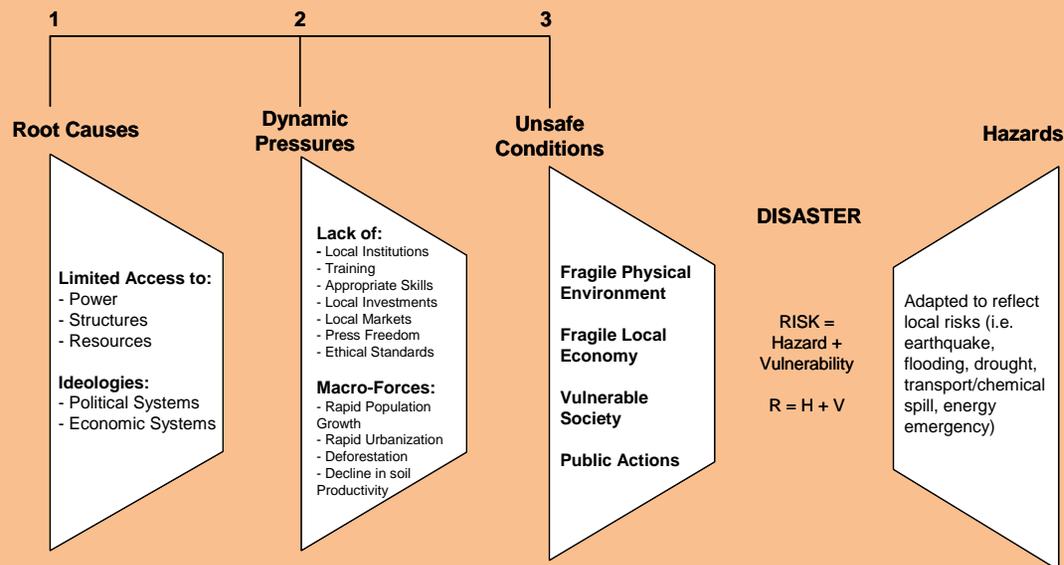
Disaster Recovery and Vulnerability Reduction

While the concept of vulnerability has been discussed throughout the recovery literature, (see Mileti, 1999; McEntire, 1999; McEntire, 2000; Wisner et al., 2004) this paper argues that vulnerability reduction should comprise the overarching framework driving disaster recovery efforts. Historically, hazardous events were viewed as 'acts of God' where affected populations were seen as passive victims, although this view has been largely discredited. More recent approaches to disaster management and mitigation have focused on the socio-economic and political processes that differentially distribute levels of vulnerability and impact the ability of individuals, groups and communities to resist, respond and recover from disaster events (Blaikie et al., 1994; Cutter, 1996; Hewitt, 1997; Anderson & Woodrow, 1998, Lewis, 1999; Wisner et al., 2004). This approach recognizes that it is the interaction of both the hazard and vulnerabilities shaped by society that create disaster events (Cannon, 2000). Through this focus on the socially constructed nature of vulnerability, the larger-scale processes that are a reflection of the power relations in a given society are emphasized (Cannon, Twigg & Rowell, 2003). From this view, vulnerability is the key process affecting the level of impact of hazardous events, and as such, should be addressed as a main component of recovery efforts.

Vulnerability can be defined as "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recovery from the impact of a natural hazards" (Wisner et al., 2004, p. 11). This understanding sees vulnerability as existing before, during and after a disaster event and incorporates coping capacity and resilience as an inherent part of overall vulnerability. According to Watts & Bohle (1993) vulnerability is a "multi-layered and multi-dimensional social space defined by the political, economic, and institutional capabilities of people in specific places and times" (p. 46). Key processes impacting levels of vulnerability include access to assets (Chambers, 1989; Watts & Bohle, 1993; Blaikie et al., 1994; Lewis, 1999), access to power (Hewitt, 1997; Lewis, 1999) and access to information and knowledge (Alexander, 2000). Several models exist to conceptualize vulnerability, including the Pressure and Release model highlighted in Box 3.

Box 3 – Pressure and Release Model of Vulnerability

Blaikie *et al*. (1994) recognize the significance of examining vulnerability within the context of its underlying causes and origins. The Pressure and Release Model of Vulnerability (PAR), developed by Blaikie *et al*. (1994) and updated by Wisner et al. (2004), is a schematic expression of the complex interactions between the underlying social processes that create vulnerability and the hazard itself. The model is built upon the juxtaposition between these two opposing forces. In this model, 'pressure' builds through increased vulnerability and exposure to hazards, while the 'release' conceptualizes the mitigation activities taken to reduce the impact of the disaster – the reduction of vulnerability. The progression of vulnerability from root causes through to their manifestations as unsafe conditions is depicted below.

1 **2** **3**

Root Causes

Dynamic Pressures

Unsafe Conditions

Hazards

DISASTER

Limited Access to:
- Power
- Structures
- Resources

Ideologies:
- Political Systems
- Economic Systems

Lack of:
- Local Institutions
- Training
- Appropriate Skills
- Local Investments
- Local Markets
- Press Freedom
- Ethical Standards

Macro-Forces:
- Rapid Population Growth
- Rapid Urbanization
- Deforestation
- Decline in soil Productivity

Fragile Physical Environment

Fragile Local Economy

Vulnerable Society

Public Actions

RISK =
Hazard +
Vulnerability

R = H + V

Adapted to reflect local risks (i.e. earthquake, flooding, drought, transport/chemical spill, energy emergency)

The progression of vulnerability starts with the *Root Causes*, including limited access to power, structures and resources, as well as vulnerabilities created through specific political and economic ideologies. These root causes are widespread processes that impact the distribution of resources and are a reflection of the distribution of power in a society. Individuals and groups who are marginalized and lacking in power, either economically, politically and/or socially, are exposed to a double source of vulnerability. These groups are less likely to have secure access to quality livelihoods and resources and they have a tendency towards lower priority for government action and intervention. The *Dynamic Pressures* "channel the root causes into particular forms of insecurity" and are visibly manifested as *unsafe conditions* (Blaikie et al., 1994, p. 24). These processes range from economic investments in human capital to macro demographic trends and environmental sustainability. The unsafe conditions in the PAR model present the visible manifestations of the root causes and are the actual populations that experience vulnerability during a disaster event. Unsafe conditions are the "specific forms in which the vulnerability of a population is expressed in time and space in conjunction with a hazard" (Blaikie *et al.*, 1994 p. 25). Therefore, each manifestation of vulnerability can be traced back to larger, widespread social, economic and political processes that work to generate vulnerable populations (see Blaikie et al., 1994; Wisner et al., 2004).

As the role of vulnerability in contributing to disasters has been increasingly recognized, conceptualizations of vulnerability provide effective strategies to 'build back better'. Vulnerability frameworks and models, including the Pressure and Release model, outline the various factors and processes that impact the ability of individuals, groups and communities to respond and cope with disaster events. This provides an indication of the weaknesses in individual and community capacity to mitigate, cope, respond and recover from disaster events. Through an assessment of the key processes impacting levels of vulnerability, strategies and policies can be developed for reducing vulnerability and increasing resiliency in the face of future hazards.

The importance of explicitly acknowledging the role of vulnerability during the recovery process is highlighted by Wisner et al. (2004), who define recovery based on the reduction of vulnerability. They argue that in order for recovery to take place, individuals, households and communities must have decreased their vulnerability and increased their resilience to future disaster

events – indicating that vulnerability reduction should be the most important component of disaster recovery:

> We would suggest that in order to have 'recovered', a household should have not only re-established its livelihoods, physical assets and patterns of access, but should be *more* resilient to the next extreme event. Thus, without the profound changes in social relations and structures of domination suggested by [the Pressure and Release] model, it could be argued that recovery never takes place and never can take place (p. 359).

In order to operationalize a vulnerability reduction framework during the post-disaster period, the following six guidelines provide an approach to recovery that seeks to address the underlying issues that created the disaster in the first place. These guidelines build on concepts from the recovery and vulnerability literature (particularly the Pressure and Release model) to provide guidance for recovery and reconstruction projects.

Guideline 1: Explore root causes of vulnerability

In this conception of "building back better", the "identification and assessment of 'most vulnerable' areas, groups and infrastructures are essential…to ensure that sustainable recovery takes place, rather than just the rebuilding of structures that proved highly vulnerable" (Birkmann & Fernando, 2008, p. 83). This indicates that an exploration of *why* the community was vulnerable to a disaster in the first place, along with an assessment of the risk of other hazards and stresses, is required to guide policy development during recovery efforts. While a vulnerability-reduction approach is implicit in the disaster mitigation paradigms discussed above, an explicit focus on vulnerability-reduction will ensure that the recovery effort does not unintentionally perpetuate, worsen or create new vulnerabilities in impacted communities.

Guideline 2: Recognize the role of resilience

As more recent conceptualizations of vulnerability have incorporated concepts of coping capacity and resilience (see Birkmann & Fernando, 2008; Joakim, 2008, Cutter et al., 2008), acknowledgement of the role of resilience may counteract the tendency to view individuals impacted by a disaster event as 'helpless victims' who require the assistance of 'skilled' outsiders, particularly when the disaster impacts impoverished regions. Through the incorporation of a resilience approach, individuals and communities are recognized as having capacities on

which programs and resources can be built upon (IFRC, 1996). This approach recognizes that all individuals have some form of resilience and capacity to cope and respond to both current and future events and seeks to build upon the strengths that already exist within the community.

Guideline 3: Focus on long-term outcomes

Many scholars, governments and NGOs have recognized the need for longer-term programs to recover from and mitigate against future disaster events (Rubin et al., 1985; McEntire, 1998; Anderson & Woodrow, 1998; Mileti, 1999; Cannon, Twigg & Rowell, 2003; Wisner et al., 2004). Unfortunately, in the face of trying to fulfill immediate basic needs under a critical timeline in a post-disaster context, many actors are forced to abandon their development goals and the systematic planning and analysis phases found in many development programs are ignored (Anderson & Woodrow, 1998). Through the recognition that the most successful recovery interventions require long-term commitments and the strategic planning characteristics of development programs, disaster recovery initiatives should incorporate strategies that are mid-to-long term in nature and "promote disaster-resilient societies by reducing vulnerability" (Birkmann & Fernando, 2008, p. 82). A focus on the long-term outcomes of relief and recovery efforts will provide some measure to ensure aid is not undermining the long-term social, economic and political recovery of affected populations.

Guideline 4: Acknowledge human-environment relationship

Similar to the sustainability approach advocated by Mileti (1999), recovery initiatives should recognize the interconnections between human society and the natural world. Researchers have increasingly identified how the impacts of human activities on the natural environment may have led to increased susceptibility to, and devastation after, a disaster event (Doberstein, 2006; Abramovitz, 2001). Examples of these impacts include increased risk of landslide events through deforestation and development on hill slopes; lack of natural buffers to storm surge and hurricanes due to destruction of mangrove forests in coastal areas; and the increasing role of human-induced climate change on the frequency and severity of meteorological hazards. Through the recognition of the inter-connections between nature and society, recovery initiatives should explore options that promote sustainable human-environment interactions, inhibit further environmental degradation and enhance environmental quality.

Guideline 5: Local Participation

Involving the local population in the recovery process will help to ensure that recovery efforts reflect the needs and wants of the local population. The use of community participation encourages bottom-up approaches that recognize the inherent knowledge and capacities of affected populations (see guideline 2) (URD, 2003). As community members examine their own strengths and weaknesses, participatory approaches may help to empower and motivate them to take appropriate actions (ActionAid, 2004). Participatory approaches also help to provide an understanding of community perceptions of vulnerabilities and resiliencies, leading to more appropriate recovery and preparedness activities that address the specific needs of the community (de Dios, 2002; Geipel, 1982). In terms of vulnerability reduction, an understanding of the local context is required to ensure that recovery efforts are addressing the root causes of vulnerability within the community as well as engaging in effective strategies for recovery that have long-term sustainability.

Guideline 6: Continued monitoring and evaluation

 Continued monitoring and evaluation of recovery efforts is required to ensure that vulnerabilities are not intensified or perpetuated throughout the rehabilitation process. Although large amounts of money have been spent to rebuild after disaster events, "there is rarely any systematic consideration of whether such lengthy projects actually achieve the goals for which they were implemented" (Labadie, 2008: 576). In order to achieve the outcome of 'building back better' through vulnerability reduction, long-term monitoring and evaluation methods are required to scrutinize recovery interventions and initiatives, provide direction to improve the success of recovery programs, as well as provide a platform for learning and disseminating information regarding disaster recovery strategies for future events.

Conclusion

The above chapter has explored the disaster recovery literature, demonstrating how the literature has expanded from descriptions of behaviors and phases of recovery, towards theoretical approaches that provide strategies for reducing vulnerability to future disaster events. From the understanding of vulnerability presented in this chapter, the hazard is viewed as the triggering event, but the disaster is created when pre-existing vulnerabilities interact with the hazard. Based on this perspective, vulnerability reduction and increasing the capacity to

cope with future events should form a central component of effective and sustainable recovery (Brown et al., 2008; Wisner et al., 2004). In this sense, any recovery and reconstruction efforts that attempt to "build back better" need to focus on long-term, sustainable efforts to reduce pre-existing vulnerabilities and increasing capacities to cope with future hazardous events. To achieve this goal, recovery efforts should incorporate local participation to explore and focus on adjusting the underlying causes contributing to vulnerability, build on existing resilience and capacities in the community, focus on long-term outcomes that acknowledge the inherent relationship between people and their environment, as well as use ongoing monitoring and evaluation techniques. Through the use of this framework, it is hoped that the impact of future hazardous events can be reduced, ensuring the ongoing social, economic and political sustainability of communities.

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