Managing Urban Disaster:

A Reissued Text & Reader with Cases

Re-issued in 2019 by Principal Editor

Professor Edward J Blakely

Managing Urban Disaster Recovery: Policy, Planning, Concepts and Cases

Editors:
Edward J. Blakely
Eugénie L. Birch
Roland V. Anglin
Haruo Hayashi

With
Laura Crommelin

Associate editors
Yasushi Aoyama
Peter Fisher
Jed Horne
Joe Leitmann
Norio Maki
Michael Neuman
Kazayuki Sasaki
Richard Voith

Crisis Response Publications
CRISIS | RESPONSE
www.crisis-response.com

A Crisis Response Publications Book

Published by Crisis Response Publications 2011

ISBN: 978-0-9570710-0-1

Crisis Response Publications
A division of FireNet International Ltd
Registered Office:
12 Shepherds Way, Crowthorne,
Berkshire RG45 6AJ, UK

www.crisis-response.com
info@crisis-response.com

typeset & design by E Hough

Cover image courtesy of New Zealand Fire Service

This book is dedicated to disaster recovery workers around the world

Contents

Background to this book

The idea for this book came to me as I reflected on my journey through a number of disaster recoveries, particularly my experience as the head of the New Orleans recovery after Hurricane Katrina. As I worked in New Orleans, I became aware that there was no book that I felt entirely comfortable using to assist me in the recovery. That is not to say there were not many books. But, for the most part, the books I found only recounted the background to various recoveries, without offering much advice on how one might proceed as the recovery moved ahead.

I was fortunate in New Orleans to have many mentors and peers who coached me through periods of uncertainty, but I was conscious that other future recovery managers may not be so lucky. As a result, I made a pledge to myself that I would try to develop a compendium of some kind to fill this gap. So, when I was packing up to leave New Orleans, I called several of the people who helped me through this experience, and floated the idea of creating a book or guide specifically designed for recovery managers. They all agreed this was something that was needed and, much to my delight, many also agreed to be involved as co-editors. This book would not have happened without their hard work and enthusiasm.

The next step in the journey was for us to meet as a group and decide what we could or should do to fill the void. I began by visiting Eugénie Birch at the University of Pennsylvania, who helped shape my rough outline into something more coherent, as well as providing a small start-up fund. Soon after, another colleague, Roland Anglin at Rutgers University, came on board to provide the finances and venue to host the first meeting of co-editors.

We met in New Jersey in late 2009 to flesh out the scope of the book and the key issues to be covered, as well as to make an educational visit to the 9-11 site and museum in Manhattan. During this meeting we decided that the group's personal experiences with managing disaster recovery should be the main focus of the book, thus prompting the decision to base it predominantly on disasters around the Pacific Rim (expanded slightly to include the Gulf of Mexico). We also decided to reach out to other scholars and practitioners we knew, to provide complementary case studies and materials that would enhance the quality and scope of the work.

We were also fortunate at this stage to secure the support of the Japan Society and the Japan Foundation's Center for Global Partnership, which allowed the group to undertake two further meetings – one in Japan and one in Australia. At each of these subsequent meetings, we spent time both reviewing our work and seeing local recovery projects in operation.

In Japan we undertook a field trip to Kobe and spent considerable time reviewing the city's earthquake preparation efforts – an exercise which has given us even more appreciation of how extreme and horrific this year's tragedy in Sendai was, given the country's impressive preparation and mitigation strategies.

In Australia we met in Sydney and took a field trip to Melbourne, this time

generously assisted by the United States Studies Centre at the University of Sydney, RMIT University, and the Victorian Bushfire Recovery and Reconstruction Authority (as it then was). In Melbourne we examined the recovery process following 2009's Black Saturday bushfire tragedy, as well as discussing Australia's flood, sea rise and fire risks with leading experts.

In its final form, the book is a combination of compendium, guide and primer on disaster recovery. It is designed as a starting point for identifying some of the key issues most recovery managers will encounter. Of course, we do not – and cannot – hope to cover all the complexities of recovery that are likely to be relevant to any given place, or any particular kind of disaster. Other books have done or will do that, on a case-by-case basis. But someone has to piece all of these case-based lessons together into a broader framework, and our goal was to begin this process. We expect, and hope, that many more books will soon follow in its footsteps.

We are grateful to our publication partners *Crisis Response Journal/IAFPA Bulletin*, which are publishing this book. This is the right publisher for our work because its primary audience are the practitioners we want to reach. The Crisis Response Journal will also provide strong website support, so that new issues can be posted as they arise.

This will ensure the book remains as current as possible for a work of this kind. We hope the website will also become a forum for discussion among practitioners, who are part of what we see as an emerging specialized professional field in public administration. We hope this work will be one small contribution to the establishment of this important new field of disaster recovery research and practice.

Edward J. Blakely
Lead Editor

Introduction

Edward J. Blakely, Eugénie L. Birch, and Roland V. Anglin

Disasters happen

Disasters happen. Defined as: "Situations or events which overwhelm local capacity, necessitating requests to a national or international level for external assistance; unforeseen and often sudden events that cause great damage, destruction and human suffering," disasters may be natural, man-made or some combination (such as lightning-caused brushfires that engulf poorly-located urban neighborhoods) (*Vos et al. 2010, 5*).[1]

Over the past 15 years, the number of disasters and their victims has varied significantly, from 227 in 1996 with over 200 million victims, to 422 in 2002 (660 million victims) and 434 in 2005 (more than 100 million victims) (*Vos et al. 2010, 2*). In 2005, disasters caused an estimated US$159 billion in damages. That year started with the clean-up from the December 26, 2004, Asian tsunami that killed about 200,000 people and continued with catastrophe after catastrophe: in March an 8.7 (Richter scale) earthquake hit the island of Nias, Indonesia, killing 2,000; in July, monsoon rains led to historically high floods in Mumbai, killing 1,000; in August, Hurricane Katrina battered the US Gulf Coast, leaving 1,836 fatalities in its wake; and October brought an earthquake (7.6 Richter scale, about the same as the 1906 San Francisco earthquake) to the Kashmir region, with 73,000 fatalities in Pakistan and 1,300 in India. Yet natural disasters are not the only problem; In 2010, for example, 11,500 acts of terrorism claimed 13,200 lives (*Ferran 2011*).

As surely as these disasters have occurred in the past, they will continue to occur in the future. Indeed, they are likely to be worse, as global warming leading to climate change will enhance their frequency, duration and severity. It will lead to a rise in coastal and fluvial water levels, hotter, dryer summers and warmer, wetter winters, all of which will contribute to drought, overheating, flooding and more turbulent climatological events (*Mayor of London 2010, x*). The events of the first half of 2011 seem to provide further proof of these changes; as of July, it was already the costliest year on record, with one insurer calculating disaster-related property losses at $265 billion (*Llanos 2011*).

Modeling exercises also produce serious warnings. In one scenario, the melting of the Greenland ice sheet causes sea levels to rise between three and six feet in New York City, a figure that debilitates critical infrastructure (subways, airports, water supplies and sanitation systems) and threatens sizeable populations. Large areas of Sydney and many cities of India and Asia face similar prospects from rising sea levels (*Gregory et al. 2004*).

1 The Center for Research on the Epidemiology of Disasters (CRED) tracks disasters defined as: Geophysical (earthquake, mass movement [dry]), meteorological (storm), hydrological (flood, mass movement [wet]), climatological (extreme temperature, drought, wildfire), biological (epidemic, insect infestation, animal stampede). It records them if they fulfill one of the following criteria: Ten or more fatalities, 100 or more people reported affected, declaration of a state of emergency or call for international assistance (Vos et al. 2010, 5). It does not measure such other disasters as terrorism or war. The figures quoted by Vos are based on CRED data.

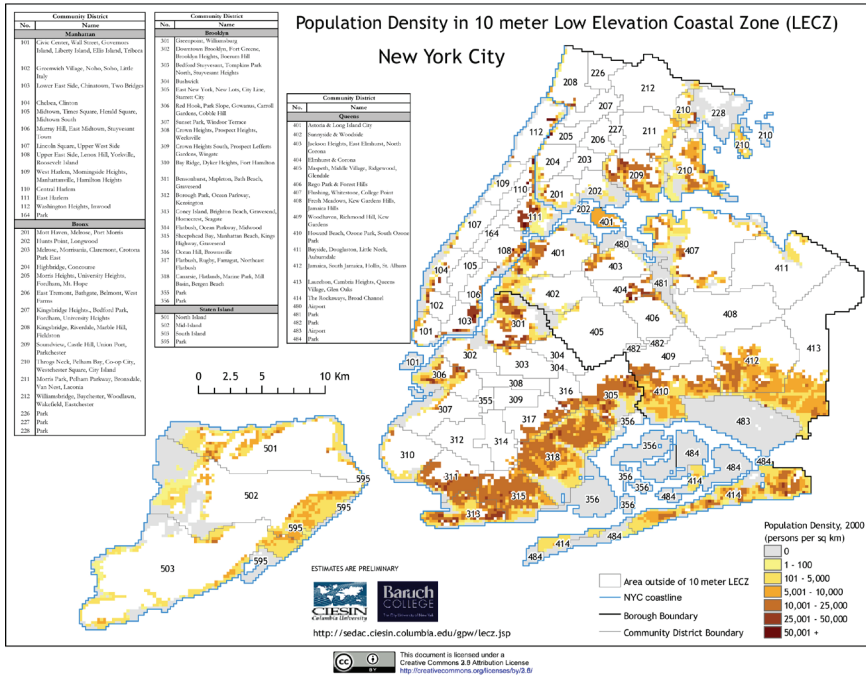

Figure 1: *Low-lying populations in New York City. Source: CIESIN*

The urbanization of disasters

This kind of modeling is concerning, given that disasters in urban areas are exponentially more harmful owing to the high population densities and economic importance of cities. Urban disasters yield enormous mortality and injury rates, tear apart the layered fabric of densely-settled neighborhoods, destroy complex economies and interdependent social systems, and wreak havoc with costly infrastructure. Further, today's sprawling urbanization creates a new confluence of problems (*Angel et al. 2005*). As urban places grow, governments extend infrastructure that tends to follow, rather than lead, development and which forms thin, fragile systems

Figure 2: *Urban population 1975 – 2050*

Place	1975 (billion)	2010 (billion)	2025 (billion)	2050 (billion)	1975 share %	2010 share %	2025 share %	2050 share %
World	1.5	3.4	4.5	6.3	100%	100%	100%	100%
Developed	0.7	0.9	1	1	47%	27%	22%	16%
Developing	0.8	2.5	3.5	5.3	54%	74%	78%	84%
Asia	0.6	1.7	2.4	3.4	38%	50%	53%	54%
Africa	0.1	0.4	0.7	1.2	7%	12%	15%	19%
LA/Caribbean	0.2	0.5	0.6	0.6	13%	14%	12%	10%
Europe/NA	0.6	0.8	0.9	1.0	41%	24%	20%	16%

Figure 3A: Share of urban population by region and size of city, 2010	Number	Asia	Africa	LA/ Caribbean	Europe/ NA
Megacity 10 million	324,000,000	66%	7%	20%	13%
Large City 5-10 million	245,000,000	56%	6%	12%	23%
Medium City 1-5 million	77,000,000	54%	13%	14%	23%
Smaller City 500,000-1 million	350,000,000	48%	12%	12%	23%
Smallest Cities under 500,000	1,777,500,000	49%	13%	13%	26%

Figure 3B: Share of cities by region and size of city, 2010	World (no.)	Asia	Africa	LA/ Caribbean	Europe /NA
Mega City 10 million	21	55%	10%	20%	15%
Large City 5-10 million	33	58%	6%	12%	24%
Medium City 1-5 million	388	53%	12%	13%	22%
Smaller City 500,000-1 million	518	50%	13%	12%	25%
Smallest Cities under 500,000	n/a	n/a	n/a	n/a	n/a

Source for Figures 2, 3A and 3B: UN Department of Economic and Social Affairs World Urbanization Prospects 2007 and 2009 Revisions (UN 2008, UN 2010).

that become brittle and increasingly unreliable over time. The developed world has backlogs of maintenance and repair, while in the developing world infrastructure is non-existent, inadequate or jerry-rigged.

This is a huge concern, given that more than 50 percent of the world's 6.9 billion population is already living in cities, and this number is growing rapidly. If disaster-risk is already high in these urban places, it will be even higher by mid-century, when nearly 70 percent of the world's estimated nine billion people will be urbanites. A glance at the global urban profile shown in Figures Two and Three A/B above reveals that half of all urbanites now live in one of 958 cities of half a million inhabitants or more, including nine percent who live in the two percent of those considered 'megacities' (with populations of at least 10 million people) (*UN 2010, UN 2008*). In addition, 70 percent of the world's gross domestic product originates in metropolitan areas (*World Bank 2010, 5*), with 25 percent of this GDP coming from only 100 cities.

Even more important are regional variations. Three quarters (2.5 billion) of all city dwellers live in the developing world, and in the past generation, Asia surpassed Europe and North America as being the most urbanized continent. Asia now holds 50 percent of the world's urban population (about 1.9 billion), and is home to 55 percent of all megacities and 66 percent of all megacity inhabitants. Notably, while Europe and North America have many more small to medium cities, they contain only 15 percent of all megacities and 13 percent of megacity population.[2] Clearly, urbanization is proceeding in very different ways in different world regions, meaning our current understandings of urbanization and the effects of urban disasters will need to adjust in coming years.

This will be a challenge, given that our current understanding of the potential of

2 Drawn from UN data, this analysis also appears in Birch, EL 2011, 'Design of Healthy Cities for Women' in AI Meleis, EL Birch, and SM Wachter (eds), Women's Health and the World's Cities, *University of Pennsylvania Press, Philadelphia, PA*

hazard-induced threats to cities comes largely from specific, localized experience. In 2003, when Europe sweltered in a heat wave that left 70,000 dead, Paris had a death rate three times greater than the rest of France and London had the highest number of deaths of any region in the United Kingdom (*Robine et al. 2008, 171*; *The World 2009*). These cities were vulnerable because they house large numbers of elderly, have poor air quality and contain heat islands (*The World 2009*). In 2009, cities in southeastern Australia suffered the hottest temperatures in 70 years as northwesterly winds swept in heat from the desert. While not resulting in the same level of heat-related fatalities as Europe, the northwest wind fanned brush fires that killed 173 people, displaced thousands and threatened city environs (*Callinan 2009).*

These different development patterns suggest we are likely to see increasingly significant variations in urban disaster impacts in coming years. To prepare for these changes, we need more interdisciplinary and international collaborative work on how to predict, prepare for, and respond to disasters in different urban settings. This includes work to tailor preparedness, rescue, recovery and rebuilding plans and programs, to develop solid professional implementation strategies, and to strengthen existing conceptual approaches for establishing public policies, urban design guidelines, implementation measures, and recovery scenarios. This work is essential to overcome a lack of appreciation and/or political conviction about the seriousness of threats of urban disaster, which has so far resulted in few cities adopting adaptation or mitigation efforts in their comprehensive plans and associated development regulations.

Notably, one global city, London, is acting on climate change, pledging to reduce CO_2 to 60 percent of 1990 levels by 2025 (*Mayor of London 2010a*). To achieve this, it has a comprehensive plan, now being updated, calling for eventual mandating of zero-carbon new construction, funding green infrastructure and accommodating reduced fossil-fuel transport. Others are beginning to engage in similar efforts. Canberra, Australia, for example, is moving to an electric car environment.

But even all of these measures will not reduce the forces of nature already unleashed. There will be more disasters in the coming years, affecting urban areas

Figure 4: *New Orleans after Katrina.*
Source: illinoisphotos.com

increasingly. As always, these urban disasters will play across the human stage, magnified in the public imagination by timely, dramatic, and heartrending global news reports (images of New Orleans after Hurricane Katrina are emblematic of this).

Disaster recovery

When urban disasters happen, some communities (like hurricane-torn Galveston, Texas in 1910) take decades to return to their former strength. Others have followed the lead of earthquake-stricken, flood-prone Tokyo and risen rapidly to new heights. Although broad national and economic trends condition the pace of rebuilding, the key indicator of why cities rise or fall is their ability to manage the complexities inherent in the wake of a disaster. This simple observation leads to some key questions. What can we learn from the experiences of cities that were forced to respond to disasters? What are the key management lessons that lead to better, more effective rebuilding? How do some cities rebuild better than before the disaster, in the hope of forestalling future cataclysm?

This book is the result of a two-year collaboration of 12 editors – international scholars and practitioners from the United States, Australia, and Japan – whose common experiences in disaster recovery management have prompted us to consider these very questions. Meeting in the three host countries, the editors exchanged ideas and compared past experiences, with the aim of developing an overview of issues likely to be confronted during an urban disaster recovery. The collaboration grew out of a shared sense that while the general principles to inform rebuilding exist, the study and practice of disaster recovery has not yet matured enough to allow comprehensive, timely and effective responses to all disasters. As Amaratunga and Haigh (*2010*) write:

> *"A great deal of work is being done worldwide to advance the agenda to mainstream disaster risk reduction into sustainable development planning. Advancements include the development and implementation of hazard-resistant building codes and standards, training programs on risk reduction and mitigation for communities and civil servants, and operational guidelines and policies for international finance institutions. Analytical research on hazard mapping and analysis has been developed and is being introduced into the development planning processes of vulnerable countries. While these studies offer insight, what is lacking is a specific disaster management theory in the maturity process of the discipline. Most of the current theories remain overlapping with, consumed by, or peripheral to, other theories, borrowed from other disciplines. The role of the built environment within the disaster management context, as a concept, is evolving but remains under-researched."*

The point is well-received; there is little guidance on how to recover and rebuild post-disaster, despite the hundreds of community-destroying events which occur every year.

This book is intended for practitioners, students, and scholars in the emerging area of post-disaster management. Like Amaratunga and Haigh, we distinguish post-disaster management from those activities that occur immediately during and after the crisis, where the emphasis is on rescuing people and stabilizing infrastructure. As many volumes covering these important topics already exist, our only discussion here is to provide some brief but inseparable discussion of resilience and mitigation in the context of the cases. The post-disaster period demands management expertise to reposition and reorganize – as well as to deploy – assets that will be used in the rebuilding of the place.

What we provide here is an overview of issues confronted and lessons learned as scholar/practitioners involved in recent recovery management in the United States, Australia, and Japan. This overview has then been augmented with cases, primarily from our home countries, where we have developed deep practical knowledge to reinforce our reflections. Where useful, we have also drawn in voices from outside our circle to augment the analysis and provide case studies from other parts of the world. It is not our intention to cover every nation or every disaster or all possible ways to manage recovery; this would be a massive undertaking that would lose all analytical texture and relevance. It is more our intention to give the reader the benefit of our experiences and shared knowledge in the hope that this volume helps to build the wider field of disaster recovery management.

While our collective experience is the key driver in determining the nations that have become the focus here, there are also some synergies between the chosen nations that are worth noting. Japan, Australia, and the United States have similar economic platforms and a shared history of recurring disasters. These nations are all shaped by an earthquake ring that creates the risk of devastating tsunamis. Similarly, all three nations are prone to hurricanes, cyclones, floods, drought, and fires. So, this book best fits the particular area we have described and circumscribed, although no doubt many of the lessons and experiences discussed will also be useful for practitioners elsewhere in the world.

The life cycle of disaster management

Post-disaster management and rebuilding has a life cycle that starts with first responses and moves to recovery, then to rebuilding, and ends when the residents or

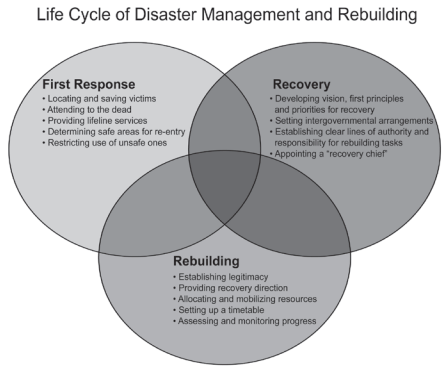

***Figure 5**: The lifecycle of disaster management. Source: Haruo Hayashi*

users of an afflicted area resume their normal lives (albeit adapted to new conditions). Each stage demands specific management skills, an understanding of the scope of the work required and the context in which it will occur.

First response calls for professional emergency workers to undertake rescue and relief efforts, including locating and saving victims, attending to the dead, providing lifeline services (shelter, food, sanitation, and health care), determining safe areas for re-entry, and restricting the use of unsafe ones. As these activities occur they begin to parallel but not replace those of the next stage: recovery.

Recovery demands a different type of management. Political, professional, and civic/community leaders take over, creating the space for developing a broad consensus to guide the rebuilding process.

Good recovery managers know how to deal with these groups effectively and recognize that successful recovery designs result from political processes that are transparent, inclusive, and cognizant of cultural contexts. They have the power to move things along while developing the vision, first principles, and priorities for recovery. They settle intergovernmental (national, state/province/city) relationship issues and establish clear lines of authority and responsibility for rebuilding tasks. These rebuilding tasks fall into five major categories:

- Establishing legitimacy (ie. a clear structure for all organizations involved in rebuilding);
- Providing recovery direction (i.e. a frame for what can be done and how, with safety and future risk reductions in mind);
- Allocating and mobilizing resources (i.e. efficient use of assets);
- Setting up a timetable (i.e. schedule(s) to assist public officials in meeting and ordering public demands); and
- Assessing and monitoring progress, including amending recovery plans.

To achieve these outcomes often requires the appointment of a 'recovery chief' – a professional charged with assessing current conditions, who provides ongoing assessments of progress and supervising the flow of work. This is a hugely demanding and sensitive role.

How is this book organized?

The book is organized into three sections, which move from conceptual issues through to more technical considerations.

Section One deals with the immediate questions that emerge when the rescue phase morphs into the recovery phase: what is the recovery trying to achieve, and how should it be run in order to achieve these goals? The answers to these questions fall into four broad categories:

Strategy: What are we hoping to achieve with the recovery process? As Blakely argues in Chapter One, every recovery needs a vision, and this vision needs to be clearly and concisely expressed through a guiding strategy document. This overarching strategy will inform all of the more detailed decision-making to follow.

Planning: Once the strategy has emerged, it must be translated into specific planning documents that include guidelines for implementing and financing the plan. In Chapter Two, Hayashi uses three case studies to explore different approaches to the planning and implementation process, highlighting key lessons for the planners charged with this challenging process.

Resources: In Chapter Three, Leitmann discusses how people and partnerships are the key resource in any recovery process. Once the plans are made, the challenge becomes that of harnessing the human and financial resources available to turn plans into practice.

Management: Of course, the quality of the management will depend on the quality of the manager. In Chapter Four, Anglin identifies some of the key personal and practical skills any successful recovery manager must have.

Section Two considers the social, cultural and economic aspects of disaster recovery. While effective management of the recovery process is essential, no recovery will be successful if it fails to engage the public in equitable and meaningful ways. The challenge for recovery managers is how to achieve this goal, while still maintaining the momentum and efficiency of the recovery process. All three chapters in this section engage with this question, approaching it in the following ways:

Cultural and social recovery: In Chapter Five, Aoyama and Sasaki identify community engagement as the bedrock of the recovery process. While the substantive goals of community restoration will be highly place-specific, the key procedural principles identified – maintaining community ties among long-term evacuees, identifying and reestablishing the community's chosen way of life, and engaging civic groups and volunteers – can be applied universally.

Recovery communications: Universal lessons also emerge throughout Chapter Six on informing recovery, which draws on journalist Jed Horne's experience during Hurricane Katrina to examine the damaging effects of miscommunication. Covering questions from how to manage the media through to understanding the importance of symbolic messages, this chapter considers the broad scope of communications in disaster recovery.

Economic aspects of recovery: How do different funding sources shape the final recovery outcome? Should the existing economy simply be reinstated, or does the disaster provide an opportunity to pursue new economic development? What role should insurance and moral hazard play in the economic recovery process?

While the answers to these questions must be determined on a case-by-case basis, Voith, in Chapter Seven, considers how to make these decisions in ways that ensure the universal economic goals of efficiency and equity are achieved.

Section Three considers the physical elements of recovery. This is the final section of the book, because if the social, organizational, and institutional arrangements – the 'soft structure' of recovery – are not done well, then the 'hard structures' will be difficult or impossible to achieve. The section focuses on:

Housing: Housing is the primary resource for families. In Chapter Eight, Maki explores the various stages of housing recovery, from temporary through to permanent. This discussion highlights difficult issues of changing settlement patterns post-disaster, as well as rebuilding housing that is equitable and more sustainable.

Infrastructure: In Chapter Nine, Fisher and Neuman examine the complex issues of deciding what hard physical infrastructure is to be rebuilt post-disaster, and to what scale. Disasters change the size and shape of places, so there is a need to rethink what is required, where it is put, how it is built, and how it is interconnected. In this way, the recovery process will be able to both serve current needs, as well as take the right steps toward a resilient future.

In each of the three sections we set out the conceptual base(s) for the recovery process, along with illustrations and tools that can be translated into practice. As a supplement to this core text, we also provide a 'Cases and Resources' section containing case studies that illustrate how the concepts are put in place (see the 'Further Reading' section at the end of each chapter).

The studies that form the Cases and Resources section are also good teaching materials that instructors can use for illustrating the core material.[3] We believe this approach is the best way to provide a book that can be used both as a reference text in the rapid-fire context of disaster recovery and as a catalyst for more conceptual analyses and discussions in the teaching/learning environment.

Three major natural disasters in focus

As noted above, the majority of our examples and cases refer to the disasters with which our authors have the most experience. To minimize repetition, we provide a brief overview of the three main disasters discussed here.

Kobe earthquake

The Great Hanshin-Awaji Earthquake, a 7.3 on the Richter scale, struck the southern part of Hyogo Prefecture, Japan at 5:46 am on January 17, 1995. This vertical-thrust earthquake was responsible for the loss of more than 6,400 lives, and severely damaged utility lines such as electricity, gas and water supply, in addition to houses and urban infrastructure, including expressways, railroads, and harbors. The total damage was estimated at approximately 10 trillion yen (US$ 100 billion). It was one of the largest urban earthquake disasters in a developed country until the Sendai tsunami of 2011, and both events highlight the vulnerability of modern globally connected urban areas.

Indian Ocean tsunami

An earthquake of 8.9 on the Richter scale occurred below the Indian Ocean, northwest of Sumatra Island on December 26, 2004. The resulting tsunami wave ravaged most of Sumatra in Indonesia and parts of Thailand, Sri Lanka, the Maldives, Bangladesh, Myanmar, and even Somalia. In Indonesia, the earthquake and tsunami

3 We also offer separate teaching questions and guides to assist instructors. We are placing a teaching guide as well as offering new cases and other materials on the website to keep the material in the book useful to practitioners. We will ask practitioners, instructors and other writers to contribute to the site: www.blakelycitytalk.com.

wave damaged most of Aceh's coastal areas, claiming heavy casualties and destroying infrastructure, settlements, schools, health centers, and government buildings. In the Province of Nanggroe Aceh Darussalam (NAD), it was estimated that 126,602 people were killed and interred, with 93,638 people missing, while another 130 were killed and 24 missing in the Province of North Sumatra. In addition, 514,150 refugees were scattered across the Province of NAD. Total damage and losses over the two regions was estimated at Rp.41.4 trillion (US $4.5 billion); most of the damage affected non-public assets.

Hurricane Katrina

Hurricane Katrina made landfall in Louisiana in the early morning of August 29, 2005, causing substantial wind and storm surge damage. While wind-related damages were extensive, it was the storm surge and subsequent flooding which caused New Orleans' catastrophic level of loss. In all, roughly 80 percent of the city was inundated. In the days prior to landfall, the city and state implemented an evacuation of residents with automobiles, with estimates showing that over 80 percent of the city's population evacuated successfully.

Many of those who remained had to be rescued in the days that followed, while others perished as floodwaters rose too quickly for them to escape. More than 1,800 people were killed or missing; over 1.4 million people were affected; about 200,000 people became homeless; over 70,000 businesses were impacted and 300,000 jobs were lost; and the total damage was estimated to be more than US $81 billion – the costliest hurricane in US history.

Section One: Managing Recovery

The recovery process is by its nature a fast-moving and fluid enterprise. Multiple actors and events often emerge, at times playing a useful role or, at the other extreme, totally stalling the process. How to manage this shifting process is often the key distinction between an orderly recovery and one fraught with uncertainty and tension.

This section begins with Blakely noting that recovery needs clarity, vision, and strategy to succeed. In the second chapter, Hayashi reinforces Blakely on the need for planning, and concludes that the basic premises for a disaster plan and strategy include creating the vision, using the vision and goals for plan development, and establishing guidelines for implementation and financing of the plan.

Leitmann's chapter expands on the need to focus on financing, but extends the need for strategy and planning by emphasizing the importance of key partners in the implementation process.

Finally, Anglin's chapter reminds us that the implementation of strategy and plans is a function of managers with specific leadership and organizational skills. These skills include the ability to frame the recovery process as a time delimited project, which then argues for political skills in managing sponsors, agencies, and the general public.

Dr. Blakely with US. Congress Representative Maxine Waters (D. California)
Courtesy City of New Orleans, 2007

Chapter 1: Recovery Strategy

Edward J. Blakely

The first strategic action in a disaster is to halt or mitigate the damage that ensues from the disaster itself. Initial steps always seek to provide security for property and human life. Few policymakers or residents can envision doing anything other than resuming their normal lives in the same places, in the same ways – they want to restore their livelihood and renew their community and family ties. Meanwhile, political leaders want to provide immediate assurance to the public, so they promise to fulfil residents' wishes and restore the community as soon as possible.

No matter how much discussion there is of potential dangers, communities often find it hard to believe another equally catastrophic event could occur within their lifetime. This is a perfectly normal human reaction, as the alternative – living in a constant state of fear – is abnormal and stressful. Local officials are not immune either and customarily are keen to reduce the public's psychological stress by downplaying the danger. This response is also partly attributable to our disaster science lexicon. For example, a major flood may often be described as a "Once in one hundred-year episode", giving the public the impression that the next flood will not occur until one hundred years after the last flood. Of course, the real risk is that there is a 1 in 100 chance of a large-scale flood event occurring at any time. Fires and earthquakes are often described using similar long term language, suggesting to the public that large scale events are rare. Meanwhile, we have grown accustomed to many man-made tragedies, ranging from aircraft accidents to train derailments that regularly kill and maim hundreds of people around the world. The net result is that in many respects we have grown to underestimate the possibilities of disaster – even when disasters have already occurred. As a result, those at risk are often not prepared to give up on the place or even parts of the place where disasters occur, despite the obvious risks.

In fact, disasters occur frequently, caused by both man-made and natural events. Nonetheless, there are seldom post-disaster plans or strategies in place explaining what to do, or how to do it. In rare instances where a threat is imminent, community plans have been formulated for long-term action. Every city and region should prepare for the dangers it faces. Plans need to be made either to mitigate these large-scale threats or to re-deploy the region's assets.

Post-disaster strategic mistakes

In the immediate period after a disaster, people want clarity and certainty. When public leaders do not provide clear direction, the political penalties can be harsh. For example, in 2009, Premier Liu Chao-shiuan of Taiwan was forced to resign over the government's slow response in the aftermath of one of the island's worst typhoons. The political costs of failing to act quickly and decisively are very high.

In many parts of New Orleans it was 57 days before residents could come back to the city post-Katrina, and even longer in some cases (like the Lower 9th Ward). But as citizens waited, plans were being made. A small group of business and community

leaders formed an organization, established by the Mayor, called Bring New Orleans Back (BNOB). One of the proposals which came from this organization was the notion of the possible return to wetlands of certain portions of the city deemed too dangerous to re-inhabit. These areas were depicted on BNOB maps with green dots. These green dots became the focal point of community anxiety, since the maps were not accompanied by a clear plan explaining how and where citizens in the identified areas should be resettled. As a result, BNOB's plan was soundly renounced because it came to be viewed as an attempt to take "blacks' land rights." This outcome was unfortunate as BNOB's proposal had many good elements, including concrete approaches to diversifying the local economy and improving health and education for all residents, as well as a proposal for compensation for people who wanted to return to the city.

BNOB is certainly not the only example of political and business leaders crafting a plan to rebuild post-disaster without sufficient consultation or sensitivity to local needs. Many scholars suggest the primary challenge in post-disaster planning is the absence of consensus on the direction for the recovery. It took a full year after the BNOB proposal's defeat before a new strategic approach was finally implemented in New Orleans. The subsequent strategy built on much of the BNOB content, but used a very different approach to communications and resident involvement.

Crafting a strategy

Put simply, strategy is a statement of intent to proceed in a direction. A good strategy shows a clear understanding of the problems or issues it is meant to solve. Strategy should not be confused with tactics or the means of achieving the desired outcome. We will discuss tactics in the next chapter, in what we describe as the Disaster Plan. Strategy is a higher-level analysis that encapsulates a philosophy or way of proceeding. Strategies frequently are summed up in a word or phrase such as "build on higher ground, stronger and smarter". Post-disaster strategies may be long documents, informed by data from scientists and policymakers, but to be truly effective the key meaning has to be conveyed in tightly developed language and form. This brevity and simplicity will enable the strategy to be understood and adopted by the people affected.

While a strategy might reflect a public consensus, it is not merely the repackaging of popular ideas. At its core a strategy has to perform post-disaster in several key ways:

A. Listening

Good strategy needs to show that its developers were listening to the people affected and understand the situation. 'Listening' is not shorthand for repeating every fact or simply accepting all views as though they have equal importance. Listening requires marshalling all of the relevant information and displaying it so the affected population can understand the scale of the issues they confront. This marshalling process needs to proceed in as unbiased and careful a way as possible. It is not an easy task. People affected by disaster are suspicious of those in authority who have not confronted the same risks or undergone the same traumatic journey that they have. In addition, scientific information can be daunting, and transmitting it in a clear manner can be

difficult, particularly when scientists disagree about the same data (as they frequently do). Yet for the most part residents want to know all of the relevant information. In some cases this is simply so they can voice their concern over government failures to warn or to act quickly enough, and this emotional response clouds people's ability to hear and see reasonable evidence to the contrary. But is it still better to put all the pertinent information on the table, with the agreements and disagreements noted, than to risk being accused of covering up or ignoring relevant details.

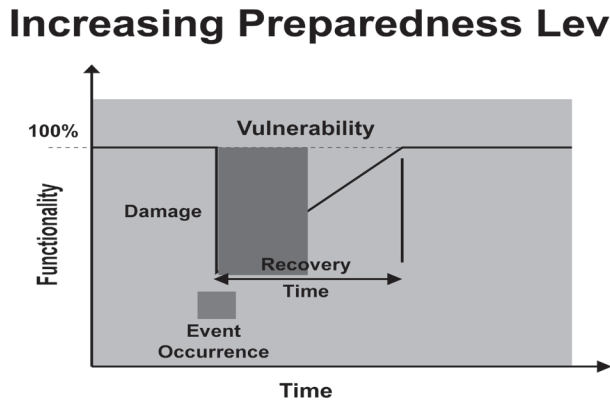

***Figure 1**: Increasing Preparedness Levels.*
Source: Research Center for Disaster Reduction Systems, 2009

The diagram above shows how the recovery strategy acts as a relief valve during the long period of doubt that surrounds the disaster, thereby responding to people's need to know where things are going. The first useful practical step is to produce short informational post-disaster pamphlets, giving the public the following information:

- The time and duration of the disaster;
- The estimated size and scale of destruction, including mapped locations;
- Human losses and dislocation;
- Economic losses and dislocation; and
- Areas of continued danger and estimated timelines of clearance.

B. Recovery processes

The means by which priorities will be set, and by whom, needs to be articulated clearly. An office or organization should be designated with recovery responsibility, and roles in that organization should be clearly defined.

C. Recovery generics

Strategy is about providing assurances. While many priorities will emerge from the consultation process (particularly decisions about how and where to build), other priorities are fundamental. These include:

- Ensuring equitable and speedy redevelopment;
- Restoring utilities and public safety;
- Re-establishing efficient and effective government;
- Ensuring integrity and transparency in government;
- Building stronger neighborhoods; and
- Providing full and fair compensation for property owners who cannot rebuild on their land.

D. Recovery vision

This is the articulation of the basic options and opportunities the rebuilding process presents. Sometimes an existing vision document can be used; in other cases, new directions dealing with social, economic, cultural, and human settlement requirements must be formulated. The 1997 floods in Grand Forks, North Dakota, presented some very difficult questions regarding the future of the city. The process required envisioning different location options for many residents and businesses. In Aceh, Indonesia, painful rethinking and reexamination was required to shape a more resilient future settlement pattern. Similarly, the destruction of the World Trade Center required New York City to rethink the future of its Financial District – a zone already in need of re-conceptualizing as many financial firms had moved to Midtown and the future of the New York Stock Exchange in Lower Manhattan was uncertain. The resulting Post 9-11 Regional Plan Association Civic Alliance Vision Statement offers one of the best summaries available of this re-envisioning process.

E. Strategic priorities

Beyond the fundamental priorities discussed earlier are strategic priorities. These priorities depend on the setting, nature, and extent of the disaster. The short-term strategic actions that must be undertaken are usually clear, and they need to be well articulated. These include:

- Addressing unresolved preexisting problems made more urgent or severe by the disaster;
- Identifying and addressing new vulnerabilities, problems and issues;
- Reworking and adapting preexisting plans, ordinances, and procedures;
- Identifying new opportunities for improvement; and
- Applying new planning concepts.

F. Strategy as the framework for action

The strategy should also set out the course of action that will be taken by those in charge to rebuild the damaged place. In this sense, a strategy is a 'map' of proposed activities on which the community can depend. It lays out what actions will be taken, by whom, when, and in what way. It is not a set of tactics – such as the kind of building material to be used for new buildings – but it does suggest where buildings will be built and the criteria that are to be the focus of the rebuilding process. These criteria usually include:

- Houses and population issues;
- Businesses;
- Industries;
- Historic and cultural features;
- Medical facilities;
- Government facilities such as schools, parks and health centers;
- Streets and transportation;
- Levees and other flood protection; and
- Environmental resources.

G. Strategy as measuring device

Progress in a recovery has to be monitored against a set of benchmarks, and those measures and indicators can be built into the strategy. For instance, if the strategy is to rebuild villages in safer locales, then the monitoring process might focus on tracking the following measures:

- Neighborhood organization and input;
- Regaining/maintaining public financial capability;
- Property buyouts;
- Economic revitalization;
- Facility upgrading; and
- Environmental restoration.

The strategic recovery organization

As the following New Orleans strategy demonstrates, strategy is incomplete without an organization to guide it. In many instances the organization that comes into being after a disaster is the continuation of the rescue organization. There is ample evidence, however, that the people and processes equipped to provide immediate relief are ill-suited to the long-term task of rebuilding. There are many reasons for crafting a new organization for this role.

The first reason is that recovery requires different skills than rescue. First responders are generally well prepared to evacuate, to rescue, and to secure, but have neither the skills nor the preparation for organizing and governing. Second, the rebuilding or recovery effort is aimed at repositioning the community socially, spiritually, economically and physically. This is not a task that is resolved quickly. So, a long-term organization is needed to see the recovery through.

This organization has to be placed alongside the existing government bureaucracies, but not within them. Embedding the recovery organization within an existing organization leads to many frustrations because it is hard to carry out the day-to-day work of running the city, village or province and rebuild at the same time. Public needs for the normal day-to-day services such as fire, police and public works services do not cease with a disaster, but intensify. Furthermore, re-thinking the organization and design of services post-disaster is very different from running the daily operations of these services.

A STRATEGY FOR REBUILDING NEW ORLEANS

An Office of Recovery Management—Making a Strategy for New Orleans

The Office of Recovery Management was formed in January 2007, some 19 months after the crisis. Dr. Edward J. Blakely was named by Mayor Nagin as head of the new office. Dr. Blakely came with the background of involvement with part of recovery efforts in Oakland, San Francisco, Los Angeles, and in New York post-September 11. He immediately assembled a team to craft the recovery.

As the UNOP plan was being ratified and renamed by City government as the Citywide Strategic Recovery and Redevelopment Plan (CSRRP), Blakely and the team crafted five principles (a diagnostic framework) for guiding the City to implement the ideas articulated in their various planning documents. The new framework was open enough for all, but structured to form understandable and logical boundaries for action formulation, the core principle of a good strategy. The new strategic framework was designed both to speak for the people of New Orleans, and to guide them in the recovery process.

Strategic Framework

Continue the healing: Recognizes that some of the trauma experienced during Katrina had its roots in the City's long-standing and deep divisions across race and class. Healing the chasms across the community is an ongoing exercise that the Recovery Office had to play a central role in designing and carrying out. This process includes ongoing meetings of all city employees and community groups as part of the recovery efforts.

Public safety and security for all neighborhoods: The fear of crime in the lowest income communities was impeding the return of residents to these areas. But crime is a citywide contagion affecting all areas of the city, so incorporating both crime prevention and crime intervention became a critical element of the recovery. Programs included citywide crime cameras, along with more community and neighborhood policing strategies to engage young people in positive social and recreational pursuits. But good schools near home are an equally important security issue for every parent. Schools are now the core community facilities, with libraries to act as anchors and encourage a more engaged and engaging community. Finally, good hospital and clinics are required to manage both mental and physical health issues. Therefore, a core element of the strategy was to provide every community with access to better health facilities than pre-Katrina.

Infrastructure for the 21st and 22nd Centuries: New Orleans, like many American cities, has underinvested in the city's primary infrastructure such as sewers and water. This infrastructure is the bedrock for any new industries and a good infrastructure plan balances the needs of all communities across income groups and meets the needs of emerging enterprises for better, cheaper and greener technologies.

Diversify the economy: New Orleans' economy is based in tourism, energy and retail services. The largest job producers are in low wage service sectors. To combat crime and generate a healthy social economy, new job bases related to the city's future had to be developed in areas such as bio-medicine, advanced transportation and media.

Sustainable settlement pattern: This is the foundation of any good city. Cities with good neighborhoods attract people and jobs. While some quarrel with aspects of Richard Florida's (2004) concepts of attracting artists the basic message is correct. So, New Orleans bore a special burden in crafting a re-settlement program that avoids the hazards of the past and builds new, less financially-segregated communities that are environmentally and socially sustainable.

These five principles acted as a framework for analyzing all of the issues and data and articulating them in a clear action path that is both compelling and accurate. The re-building program emerged from a process of constructive engagement.

So, the organization that crafts the strategy and delivers it has to be a unique institution with a clear mandate to coordinate all of the recovery operations as the builder and re-builder. Figure 2 shows how the recovery organization is built into the total institutional framework, with its own leadership and close coordination and liaison with the key elements of the existing administration.

Once the services are planned, financed, and underway, the recovery organization needs to work with the existing bureaucracy to manage the new services and infrastructure. This hand-off period is critical; the bureaucracy cannot manage something with which it is not familiar, so parallel processing is required.

While the recovery organization will need to help the existing bureaucracy to manage the post-disaster services, it can take many other functions off the existing bureaucracy's plate. These include coordination with higher levels of government and finding new funds to secure the rebuilding effort over many years. The New Orleans organization mission statement is an example (see next page).

Organizational issues and tensions

No matter how well-crafted the recovery organization, it is an addition to the ongoing bureaucracy and fits uneasily in the legislative governance system. Local mayors usually appoint the recovery director and provide this director with broad powers which, to some extent, overlap with the existing bureaucracy.

There is no easy way to deal with this. Moreover, the recovery director needs authority over portions of the bureaucracy that report to existing line officers for temporary high-priority projects. Sometimes the recovery director will want or need to re-shape portions of the current bureaucracy to meet recovery needs.

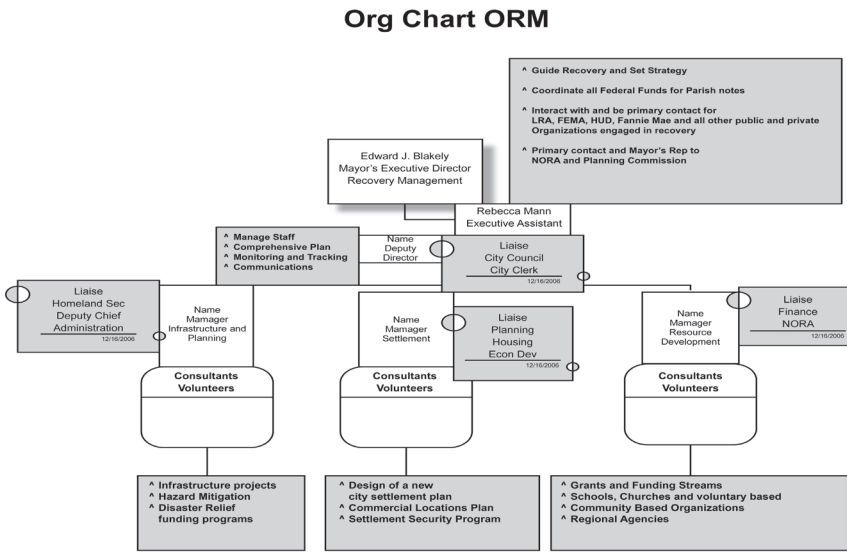

***Figure 2**: Linking the Recovery Organization with Internal City Structures*
Source: Edward J. Blakely

For example, the existing procurement system, which is adequate in normal times, is too slow and cumbersome in recovery mode. This may lead to internal conflicts because the bureaucracy wants to keep its control over these processes and seldom wants to change them. In addition, national government authorities may want some form of control over the recovery, so they may bypass the local bureaucratic chain of command and deal with the recovery office as their point of contact.

Finally, the legislators who are accustomed to the mayor and senior bureaucrats reporting to them for the formulation of procedures, may feel uncomfortable with a recovery director and recovery office that do not report to them. This is made worse by the fact that often the need to act quickly means the recovery office may not even consult with them. Preparing a clear statement of duties, responsibilities and authority, such as the below example from New Orleans, may help to minimise some of these tensions.

CITY OF NEW ORLEANS MAYOR'S OFFICE OF RECOVERY MANAGEMENT: STATEMENT OF DUTIES, RESPONSIBILITIES AND AUTHORITIES

The Mayor's Office of Recovery Management (hereafter ORM) is responsible directly to the Mayor for all aspects of planning, coordination and project management related to recovery efforts in the City and Parish of New Orleans. As such the ORM will be the central resource for all recovery and revitalization efforts. It will be the clearing house for all direct relationships with external agencies to the City with respect to recovery matters including land use planning, hazard mitigation, emergency management, infrastructure provision and the use of strategic economic and physical assets of the city in economic development activities associated with the City's recovery plans and implementation arrangements.

- As directed by the Mayor the ORM will develop and coordinate a detailed plan for the recovery of the City in consultation with all relevant stakeholders, for presentation to the Mayor and Council. All plans, projects and programs associated with the recovery efforts, both public and private, will be coordinated by the Office
- The ORM will be the primarily liaison to all Federal, State and Regional Agencies including FEMA, LRA, the Greater New Orleans Foundation and other resources associated with recovery
- The ORM will act as the communications arm for the City with regard to all communications on recovery matters, and will provide guidance to all agencies on the progress of the recovery for use by external organizations and agencies (including the press)
- The ORM will be responsible for the coordination and implementation of the City Hazard Mitigation and Emergency Management and Evacuation Programs
- The ORM will be the central repository and communication channel for all documents and information transmitted to federal and state agencies, as well as other organizations the Mayor may designate
- The ORM will coordinate and designate the disposition of all assets of the City to any organizations internally (such as NORA) or externally to other groups and organizations associated with recovery plans, projects or programs
- In case of the Declaration of a Parish Emergency the ORM will be the primary contact point for the Mayor

Lessons for recovery strategy

1. The recovery office mandate should be developed in consultation with the mayor and senior levels of government before a crisis. In addition, local legislators' roles and rules of behavior need to be established legally before any crisis arises. This should form part of the Civil Crisis Policy that is part of the local government Charter or Code of Practice.
2. All cities need to develop recovery codes, as well as emergency codes, to deal with processes such as procurement. Of course, these planning codes may require modification post-disaster.
3. Local legislators should be part of an annual disaster and recovery workshop. Attendance to this should be mandatory.
4. Local governments should conduct a recovery planning exercise annually as part of their emergency preparedness exercises.
5. The role and responsibilities of recovery directors should be codified, as well as the size of the office and the command structure.

Further reading

The cases and resources section for this chapter includes:

- *The New York Civic Alliance Vision Statement*, as referred to above in the section on Recovery Vision;
- A note by Hanna on the strategy implemented after the Victorian bushfires; and
- A discussion by Leitmann on creating a recovery management agency to guide the Indonesia recovery.

Cases and Resources for Chapter 1

The new york civic alliance vision for rebuilding lower manhattan: the first 21st century metropolitan city

[*Excerpted from the civic alliance (www.rpa.org/civicalliance)*]

About

The Civic Alliance to Rebuild Downtown New York is a broad-based coalition formed after 9/11 to provide an 'umbrella' for civic planning and advocacy efforts in support of the rebuilding of Lower Manhattan. The Civic Alliance promotes ongoing participation by the public and the civic community in the rebuilding process, and advocates public accountability and sustainable and equitable development. The Alliance sponsored the pivotal 'Listening to the City' town hall meetings in the summer of 2002, where 4,500 people came together and demanded from their public officials more imaginative and ambitious plans for the World Trade Center site.

Vision

Lower Manhattan can become the world's first 21st century city, incorporating the best practices in urban design, green buildings and technology, transportation, and economic development. It is altogether fitting that Lower Manhattan show the way to a new urban future, in much the same way that a century ago it became the first great 20th-century high-rise city built around a modern metropolitan transportation system. We have a vision of a new downtown that builds on New York City's historic past, but takes it into a new era that will be the best of its almost four centuries of existence.

We envision a new Downtown that is alive 24 hours a day, a place where people stroll along the narrow historic streets that anchor America's leadership of the global finance system, while simultaneously serving as a home to diverse and economically integrated residential communities, to shops and restaurants, schools, universities and to new industries.

This is a place that contains moving memorials to tragedy and history, and that offers welcome respite and amenities to millions of visitors each year. This is a regional and global center of culture, and a place with a remarkable number of high quality public parks and spaces for both residents and visitors. It is a place that draws on the latest innovations in sustainable city design practices from all over the world to craft a beautiful and prosperous place to live and work.

Above all, it is a place that honors those who died in a terrible act of war on September 11, 2001, by affirming and building upon our democratic principles, while moving forward into a more prosperous, enlightened, efficient, inclusive and vital era.

DISCUSSION QUESTIONS

- The goals set for a recovery are very important, but decisions about who sets these goals and how can be even more important. What were the advantages and disadvantages of the different approaches taken to goal setting in New Orleans and in New York? Which process did a better job of involving the people?
- Give one or more examples from the readings or your experience where poor choices of goals or poor processes made it difficult to achieve a common purpose in recovery.

Victorian bushfire reconstruction and recovery authority

Prepared by John Hanna and Christine Nixon of the victorian bushfire recovery and reconstruction authority (VBRRA)

By the time the devastating Victorian bushfires of February 2009 had subsided, they had left an unprecedented toll on the people and landscape of this small but relatively populous Australian state. A total of 173 people lost their lives, while 2,133 homes, businesses and community facilities and 1,365 other structures were destroyed. The bushfires had raged across forests, farmland and more than 100 communities, from tiny, isolated clusters of homes to rural towns and metropolitan suburbs.

In the aftermath of such a disaster, it was soon evident that the existing recovery arrangements would be unable to deal with such significant damage and dislocation. In response, the Victorian and Commonwealth governments moved quickly to establish a new authority to advise them on recovery and rebuilding in the affected communities and to coordinate actions across national, state and municipal governments and the many non-government organizations involved in the recovery effort. That authority, the Victorian Bushfire Reconstruction and Recovery Authority (VBRRA), was formally established as an Administrative Office of the Department of Premier and Cabinet on February 11, 2009, just four days after the worst of the fires on what is now remembered as 'Black Saturday'. The diagram opposite shows the strategic framework established by VBRRA to guide the recovery process.

The guiding principles identified in this diagram were then translated into practice by linking them with specific desired outcomes as outlined in the table opposite.

On an operational level, the new authority would primarily coordinate planning for recovery, making sure that government departments and other organizations were contributing in a timely and effective manner. However, where capacity constraints became apparent and where there was no obviously accountable agency for a particular function, VBRRA took on a more operational role. This was the case when it came to the need to clear the huge volume of potentially hazardous debris from properties that had been wholly or partially destroyed in the bushfires (see case study in the Cases and Resources section of Chapter 9 for more details).

The success of this strategic approach is evidenced by the fact that VBRRA ceased to operate at the end of June 2011, only a few months after the end of the two-year period for which it was initially established.

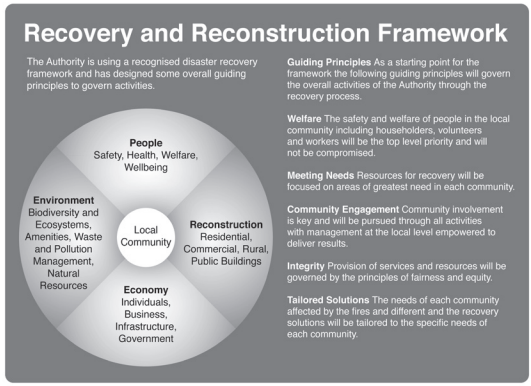

***Figure 1**: Recovery and Reconstruction Framework, VBRRA*

VBRRA Strategic Outcomes Framework	
Planning Components	***Desired Outcomes***
Reconstruction	Properties and infrastructure in damaged communities are rebuilt quickly and efficiently. New structures are of higher quality, safer and affordable. Communities are better equipped to deal with fire threats. New public facilities better meet community needs. Infrastructure is environmentally sustainable.
People and Communities	People are supported to recover and plan for the future. Community members experience good health. Communities experience high levels of civic participation. People regard their communities as strong and resilient. Education and early childhood provision meets child and community needs.
Economic Development	Public and business confidence in the economic viability of damaged areas is restored. More diverse economic bases are developed.
Environment	Environmental regeneration meets the needs of communities and natural habitats. Recovery and reconstruction actions enhance the environment and local amenity. Planning and management decisions minimize fire risk to communities and natural resources. Parks are integrated into the community fabric.

Capacity building: creating a recovery management agency to guide the Indonesia recovery

Joe Leitmann

Early during the process of recovery planning after the 2004 tsunami, the Government of Indonesia realized that it would need to create a specialized recovery agency in order to manage the massive challenge of reconstruction (12,500 projects, 55 donor countries and 900 NGOs). This realization was based on the need to coordinate across many government agencies at the local, provincial and central levels, manage billions of dollars of reconstruction finance from the government, NGOs and donors, and work in two different tsunami-affected locations (the provinces of Aceh and North Sumatra).

A little more than four months after the disaster, the Indonesian President issued a regulation in lieu of law that established the Agency for the Rehabilitation and Reconstruction of Aceh and Nias (known as the BRR), to coordinate and jointly implement a community-driven recovery program. The BRR's mandate was to design policies, strategies and action plans, within an atmosphere of transparency and accountability, and to implement them through effective leadership and coordination of the combined domestic and international reconstruction effort.

The agency grew from a handful of individuals in the early days to over 1,500 staff in decentralized offices, as well as a mandate that expanded from coordination to implementation. Some of the BRR's key features included:

- Leadership by a dynamic, respected and 'clean' civil servant who was given Cabinet-level status and access to the President;
- Staffing by top-notch staff from central and local government, in partnership with international experts;
- A limited lifespan of four years (which was respected when the BRR handed over its assets and responsibilities to local government in April 2009);
- A phased approach to reconstruction that focused on housing, followed by infrastructure, followed by economic development;
- Significant investment in building the capacity of devastated local government institutions so that they could take over the process of moving from reconstruction to development; and
- A commitment to good governance.

Prior to the tsunami, the province of Aceh had a reputation for being poor, conflict-ridden and corrupt – this in a country named by Transparency International as the sixth most corrupt country of 133 nations surveyed. With billions of dollars of aid flowing in and a local government weakened not only by the disaster, but also by decades of civil strife, the flames of corruption were ready to be fanned. To promote a clean recovery, the BRR championed a number of critical initiatives including:

- Higher wages and benefits for all BRR staff, to both attract the best and to

lower the risk of corruption;

- An Integrity Pact that had to be signed by all of its staff and projects;
- Becoming the first Indonesian government agency to field an independent anti-corruption unit;
- Financial disclosure of assets for all key staff;
- Direct supervision by local offices of the national Corruption Eradication Commission and the Treasury (a first-ever);
- Being the first government agency to conduct a full audit of all of its expenditures;
- Development of transparent systems (recovery database, asset management, e-procurement, complaint handling); and
- Oversight by two formal bodies as well as many national and foreign NGOs.

These measures helped the BRR gain the trust of the international community and minimized waste, making for a more effective recovery (*BRR 2009b*).

The BRR was a product of partnership from the very beginning. Initially, the McKinsey & Company consulting firm provided thousands of hours of pro bono support to help develop the BRR's structure, systems and standard operating procedures. Many international donors provided technical staff to help strengthen the BRR's capacity. The Multi Donor Fund provided a $14 million grant to finance critical outsourced services, equipment and consulting skills for the BRR. Hundreds of development partners cooperated with the BRR by registering and seeking endorsement of their projects, submitting progress reports, adhering to reconstruction guidelines, and jointly implementing projects. Finally, in closing down its operations, the BRR engaged in a close partnership with local government agencies to transfer assets and responsibilities.

Chapter 2: Recovery Plans and Planning

Haruo Hayashi

Post-disaster plans should provide the means to rebuild the past as well as a way to design a new social, economic and settlement future for the affected community. The challenge is to balance these two sometimes contradictory goals. To illustrate some ways of doing this we examine three plans, drawing out similarities and differences. Our overview can act as a template for a community that has already suffered a large scale natural disaster or as a checklist for developing a post-disaster plan.

We look at three recovery plans developed after the Kobe, Indian Ocean and New Orleans disasters:

- The Kobe City Restoration Plan;
- The Master Plan for Rehabilitation and Reconstruction in the Province of NAD and Nias Island in the province of North Sumatra; and
- The Unified New Orleans Plan.

The focus is on six key aspects of these plans: Who, why, where, when, what and how.

Basic structure of a recovery plan

Generally, recovery plans have three parts, as is the case for the plans considered here. The first section of the recovery plan is usually concerned with explaining the plan's basic framework. In this section, three points need to be spelled out. First, the vision and the mission of recovery plans will be presented. Second, a set of goals to be achieved through recovery efforts will be articulated. Third, the target areas on which recovery efforts will focus, as well as the overall timeframe of recovery efforts, are identified.

The second section of a recovery plan describes the concrete programs and projects that support the goals of the recovery. These programs and projects can be classified into four groups: Programs and projects that promote future disaster mitigation; programs for the recovery of different social sectors; spatial programs and projects for recovery of various areas of the community; and specially featured projects, which symbolize the progress of the recovery and demonstrate its success.

The last section of the recovery plan explains how to implement the plan. The most important element for successful implementation of a recovery plan is often securing funding. Ensuring the participation of various social sectors in the recovery efforts is also very important for a successful recovery. Establishing good institutions and ensuring good governance for the management of the recovery are additional key elements to consider. In this chapter, the focus is on reviewing the more conceptual aspects of the planning process – i.e. those issues described above as being the feature of the first two sections of all three recovery plans considered here.

Issues relevant to implementation are addressed elsewhere in this book: Institutional issues were addressed in Chapter 1; managing partnerships is covered in Chapter 3; the social and community involvement aspects of recovery are discussed in Chapter 5; and economics/funding are the focus of Chapter 7.

Visions and goals of recovery plans

The plans examined here were all responding to a natural disaster that caused an unprecedented level of damage and loss for the local community, as well as for the national government. In each case, the people in the impacted areas chose to revision, repair, rehabilitate, and rebuild their communities, to make them rise again. To achieve these goals, in all three cases the recovery efforts were focused around forming a recovery plan with a holistic and comprehensive approach.

Kobe city restoration plan

The following three focal points of recovery were identified as the basic principles of the Kobe City Restoration Plan:

- Urban conveniences well-balanced with safety precautions;
- Awareness of both the benefits and the hazards of nature; and
- Enhanced human-to-human contacts and collaborations.

The plan is designed not only to restore Kobe city to its former condition, but also to develop it into a safer, more comfortable, more energetic, and more attractive place by making the best of what people in the impacted area had experienced and learned from the disaster.

In this way, disaster reconstruction contributed to the development of the 'Urban Resort City Development Project', which is the goal of the Kobe comprehensive plan in operation at the time of disaster. This existing plan set out four goals:

- Create a community where people can live, work, relax and get together with a sense of security;
- Create a community full of creativity and vitality;
- Create a community with its own unique features and appeal; and
- Create a community by working together.

Aceh and nias master plan

In Aceh and Nias, the Master Plan for rehabilitation and reconstruction was prepared based on four values: Universalism; Indonesian values; Acehnese values; and Islamic values. It also took into account the 2004-2009 National Medium-Term Development Plan (RPJM) and the regional RPJM, which covered the affected area. As the guidelines for mid-term rehabilitation and reconstruction, the plan set six objectives to be achieved:

1. Build understanding and commitment by: The central government; the provincial, regency (kabupaten), and city (kota) governments; the business community; the communities affected; universities and academicians; NGOs; donor agencies; and the international community for the future reconstruction of Aceh and Nias.

2. Prepare a post-earthquake and tsunami action plan for the rehabilitation and reconstruction of Aceh and Nias Islands that can be immediately implemented by related parties.
3. Coordinate, synchronize and integrate the plans of various sectors, the business community and the community (stakeholders) for formulating the Action Plan for the rehabilitation and reconstruction of Aceh and Nias Islands, based on timeframes, locations, funding sources and the parties in charge.
4. Disseminate and distribute data to local, national and international communities with respect to the disaster, disaster aftermath, damage and loss assessment and needs assessment, as well as an early warning system in anticipation of any exposure to disaster.
5. Promote solidarity, participation, and involvement of the civil society in the plans and efforts for the rehabilitation and reconstruction of Aceh and Nias Islands through dialogue and public consultations.
6. Design a system and mechanism for the mobilization of funds originating from the State Budget (APBN), Regional Budgets (APBD), the communities concerned and the international community in an efficient, effective, transparent, participatory and accountable manner based on good governance principles.

The unified new orleans plan (unop)

After many faltering attempts to develop a coherent approach to rebuilding New Orleans, including efforts by local citizens and the City Council to craft recovery plans, the Rockefeller Foundation offered to help the citizens of New Orleans to create a unified recovery plan based on all the previous planning efforts. UNOP became the focal point for the community consultation process. It was housed in a local New Orleans community foundation (Greater New Orleans Foundation) because this was a neutral party in the recovery politics of the city. The tale of how this organization came into being, its mission and its processes is best described in detail in Robert Olshansky and Laurie Johnson's book *Clear as Mud* (2010).

As the strategic recovery framework, UNOP stressed that: "The Citywide Strategic Recovery and Rebuilding Plan must address the city's recovery as a comprehensive whole."

This required bringing together all the inputs from various stakeholders and elements of all three recovery scenarios – Repair, Rebuild and Revision – into a comprehensive vision, goals, and strategic policy framework to guide the city's recovery and rebuilding. UNOP also set the recovery vision as follows:

> *"All citizens, regardless of current residence, have the right to return to New Orleans. In addition, all citizens, businesses and investors in our Great City have not only a right to return but also a right to return to a Safer, Stronger, Smarter City that enables a substantially higher quality of life, greater economic opportunity, and greater security against hurricanes than New Orleans had prior to Katrina."*

With this vision, UNOP developed seven major planning priorities as recovery goals to help frame the necessary breadth and depth of the city's recovery and rebuilding focus:

1. Promote the integration of multi-level flood protection systems into rebuilding plans.
2. Renew the city's roads, utilities, public transit, and infrastructure in a sustainable and strategic fashion.
3. Ensure an adequate supply of affordable rental and public housing in an equitable manner.
4. Foster remedies to address blighted neighborhood conditions throughout the city.
5. Promote the strengthening and diversification of the economy by retaining key facilities, making strategic investments in workforce development and new infrastructure, and improving the overall quality of life.
6. Make significant, strategic investments in community facilities that will result in substantially enhanced community infrastructure and improved service delivery.
7. Preserve New Orleans' culture, historic architecture and overall aesthetic character to the maximum extent possible while facilitating new development.

Target areas

Target areas for recovery efforts may be quite different in size and population. The largest target area was in the Aceh & Nias recovery plan, which covers about 62,000km^2 with a population of 4.6 million people. The target area for the Kobe earthquake recovery was 1,700 km^2 with a population of 3.6 million people. The target area of the New Orleans recovery was 900 km^2 with a population of 465,000 people.

Recovery timeline

In the Kobe City Restoration Plan, recovery efforts were planned over a period of ten years, split into two five year periods. In addition, the Priority Three-Year Reconstruction Plan was implemented to bring forward the urgently-needed reconstruction of housing for the victims and the restoration of key industries and infrastructure, such as roads, harbors, and railways.

In Aceh and Nias, the timeframe for rehabilitation and reconstruction was set as follows (page i):

> *"Rehabilitation aims to restore the functions of public service, a process that needs one or two years, and is expected to be completed by the end of December 2006. Reconstruction aims to rebuild the public system, economic system, infrastructure, and governance functions, which is predicted to take two to five years until the end of 2009."*

Figure 1 (below) shows how these five years were split into three stages: urgent, short term, and medium term.

EMERGENCY RECOVERY		
EMERGENCY (DAY 0 – MONTH 3)	***REHABILITATION (MONTH 4 – YEAR 2)***	***RECONSTRUCTION (YEAR 2 – YEAR 5)***
Target: Humanitarian rescue and aid	***Target: Enhance public service in a sufficient time***	***Target: Redevelop the community and area***
Rescue and emergency response	General infrastructure and facilities	Economic (production, trade, banking sectors)
Burial of bodies	Economic facilities	Transportation system
Supply of foods and medicines	Banking and finance	Telecommunication system
Improvement of infrastructure and basic facilities	Recovery of rights to land	Social and cultural
	Law enforcement	

Figure 1*: Earthquake and Tsunami Disaster Mitigation Efforts Stages and Plan for Rehabilitation and Reconstruction of NAD and Nias (edited)*
Source: Republic of Indonesia

UNOP estimated the timeframe for recovery at ten years, or more, based on the professional judgment and experience with other disasters. UNOP explained that:

> *"The extent of the damage to the citizenry, the physical environment and the image of the City was unprecedented. Just as the City was not built in a day, it cannot be repaired in a day. Ten years is set as a goal to achieve Recovery, meaning that after that amount of time, the physical damage of the storm has been removed, repaired or rebuilt; the major physical infrastructure serving the residents of the City (water, sewerage, drainage, streets, and electricity) has been renovated to modern standards; the essential social infrastructure (schools, healthcare and public safety) is of high quality and commensurate with the population it serves; the economy is stable and growing; and the quality of life in New Orleans is back to – or better than – what it was before Katrina. (p.10)"*

UNOP also specifies the timelines for project implementation as part of the sector strategies. All are summarized in Figure 2 as an integrated implementation timeline across three phases of project execution for the next 10 years. The three phases are:

1. Short-term, which shows the percentage of required investment during the initial period;
2. Mid-term, which shows the percentage of required investment during the 3-5 year period; and
3. Long-term, which shows the percentage of required investment in the 6-10 year period.

	Short term % (0-2 years)	Mid-term % (3-5 years)	Long-term % (6-10 years)
Flood Protection	23	58	19
Neighborhood Protection	20	40	40
Housing	42	58	0
Economic Development	57	34	9
Infrastructure and Utilities	47	39	14
Transportation	7	16	77
Healthcare	72	28	0
Education	51	47	2
Community Services: Public Safety	52	45	3
Community Services: Environmental Services	34	58	8
Community Services: Recreation and Libraries	22	46	32
Other Municipal and Cultural Resources	20	30	50
Historic Preservation/ Urban Design	19	31	50
Implementation – Staffing and Regulatory Amendments	31	39	30

***Figure 2**: Citywide implementation timeline*
Source: New Orleans Community Support Foundation (used under creative commons license).

Programs/Projects

In each of the three recovery plans reviewed in this chapter, four groups of programs and projects appear:

- Programs and projects that promote future disaster mitigation;
- Programs for recovery of different social sectors;
- Spatial programs and projects for the recovery of various areas of the community; and
- Specially featured projects which symbolize the progress of the recovery and demonstrate the success of the recovery.

Disaster mitigation projects

In both Kobe and New Orleans, disaster mitigation was one of the main features of the recovery efforts. There was also explicit attention paid to how to reduce future disasters in the Aceh and Nias recovery plan.

In Kobe, 'reverence for nature' was the key concept which informed efforts by the people in the impacted area to make their community safer and more sustainable in the process of recovery. In the Kobe City Restoration Plan, an entire chapter was devoted to "Creating a Disaster-safe City". It consists of three elements: Disaster-Preventive Living Zones; Disaster-Preventive City Infrastructure; and Disaster-Preventive Management.

In order to stabilize the community, the Disaster-Preventive Living Zones are trifold: The Neighborhood Zone; the Everyday Life Zone; and the Ward Zone. In the Neighborhood Zone, people are responsible for taking initiatives to make their lives safe and self-sufficient. In the Everyday Life Zone, self-sufficiency will be maintained at the community level by using primary schools as the base for community activities. In the Ward (or Municipal District) Zone, the city government will provide the necessary support to the people through nine Ward Offices and their branches. Kobe City also placed a high priority on upgrading city infrastructure in its restoration process, to make city safer than before the disaster. The city also emphasized the importance of better disaster management to improve resilience.

In UNOP, special attention was paid to enhancing flood protection. This focus is quite natural, given that the return period for a Category 5 Hurricane is much shorter than for a near-field earthquake, and the levee, pumps, and drainage system in New Orleans need to be upgraded structurally. Different plans for flood protection were formulated for each of five drainage basins in the city.

Sectoral programs/projects

The most indispensable elements for recovery, as indicated in all three recovery plans, are:

- Restoration of infrastructure and utilities;
- Economic development;
- Provision of community services such as healthcare and education; and
- Restoration of housing for disaster victims.

These are generally the minimum requirements for recovery. In urban disasters such as Kobe and New Orleans, two other elements are also prioritized: disaster mitigation measures and transportation for the restoration of infrastructure.

There are also some unique sectors identified in each plan, which reflects the unique antecedents and prerequisites for disaster recoveries in Kobe, Aceh and Nias, and New Orleans. In Kobe, the disaster occurred at the dawn of the information and communication technology revolution, meaning information networks were regarded as a new and important social infrastructure to be developed. In Aceh, where civil strife was ongoing with the Indonesian government, there was an emphasis during the recovery on re-establishing social institutions that would help the stabilization of the community. These included religion, socio-cultural elements, science and technology, law, the institution of religion and tradition in the community's social activities, and the restoration of provincial and the kabupaten/kota governments. In New Orleans, there was an emphasis on creating new attractions for the city, which might help attract more tourism when the city had recovered.

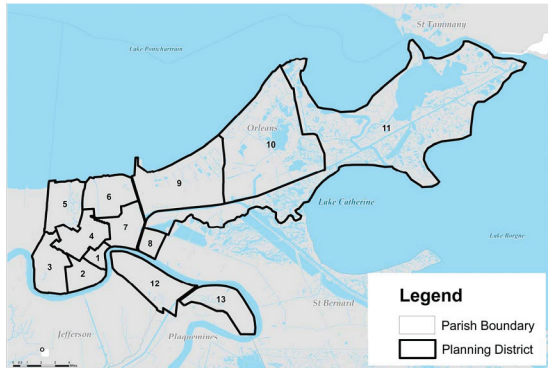

Figure 3: *New Orleans' 13 Planning Districts*
Source: New Orleans Community Support Foundation (used under creative commons license)

Spatial programs/projects

Spatial subdivisions within the plan can allow for specific programs to be targeted to the parts of the recovery region that need them most, while avoiding the confusion and complication that comes from having multiple, coexisting plans. For example, the Kobe City Restoration Plan divided the city into three areas: Eastern, Central, and West, and formed different sets of plans reflecting the specific characteristics of these zones. In the UNOP, different spatial divisions were used depending on the goals to be achieved. Most were based on the notion of 13 planning districts, which were long established (see Figure 3 above), while for flood protection purposes, five different plans were formulated around drainage basins.

Specially featured projects

In all three recovery plans, special projects are identified. These are the symbols of the recovery efforts, by which the people in the impacted area measure the progress of recovery, and which represent the success of the recovery to the rest of the world.

In the Kobe City Restoration Plan, 17 symbolic projects were selected based on the following three criteria: Those that are important and urgent for the lives of the citizens, and for the restoration and reconstruction of city infrastructure; those that will be key projects in leading the restoration of Kobe, and which have far-reaching effects; and those that symbolize the restoration of a new Kobe for the 21st century. Those 17 symbolic projects are:

- The reconstruction plan for citizen housing;
- Creation of a safe and comfortable city area;
- Creation of communities with welfare services for the 21st century;
- Building security networks;
- A plan for the new city center in eastern Kobe;

- Development of a Kobe Business Start-up Zone;
- The China/Asia exchange zone;
- Creation of the Mother Port of Asia for the 21st century;
- Promotion of an international and modern culture of Kobe;
- Creation of multiple transportation networks;
- Development of a base for next generation telecommunication research (Promoting the KIMEC plan);
- Development of a local disaster prevention base;
- Creation of a city with water and greenery;
- Development of a city center symbolic zone connected to the sea;
- Development of lifeline utility systems that stand strong against disasters;
- Inheritance of the experience of disaster; and
- Promotion of the construction of Museum of Disaster Science and a Complex of 20th Century Museums.

In the Aceh and Nias plan, the following four issues were specially identified as the cross-cutting issues for recovery: Recovery of non-public productive assets; right of land ownership; children and women; and security issues.

In the UNOP Plan, there is no specific section for specially featured projects. However, as shown in Figure 4, all programs and projects were given a priority in terms of the risk for future flooding, in combination with population returning home or in some cases moving away forever.

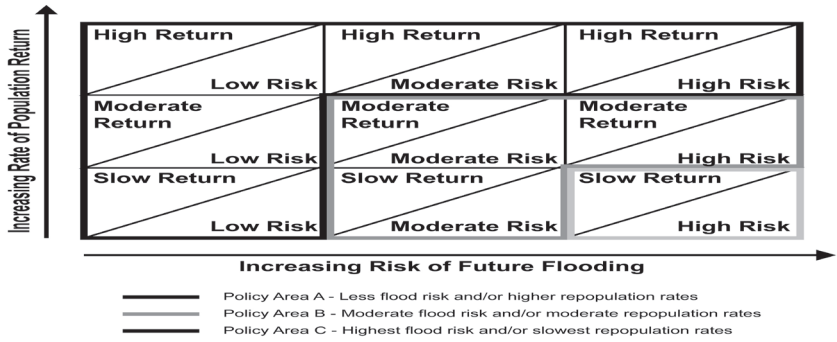

Figure 4: *Potential Combinations of Flood Risk and Repopulation Rates*
Source: New Orleans Community Support Foundation (used under creative commons license)

Organizations responsible for recovery planning

Recovery plans may be written by many different authorities, including the national government, local governments, and non-government organizations. In the case of Kobe, many recovery plans were formulated by prefecture governments and municipal governments in the impacted area. Kobe city's own plan was complemented by the plans of the other municipalities in the affected area (nine cities and ten towns), as well as the overarching recovery plan of the Hyogo Prefecture Government (the Hyogo Phoenix Plan). These plans are interrelated, as shown in Figure 5. The Hyogo

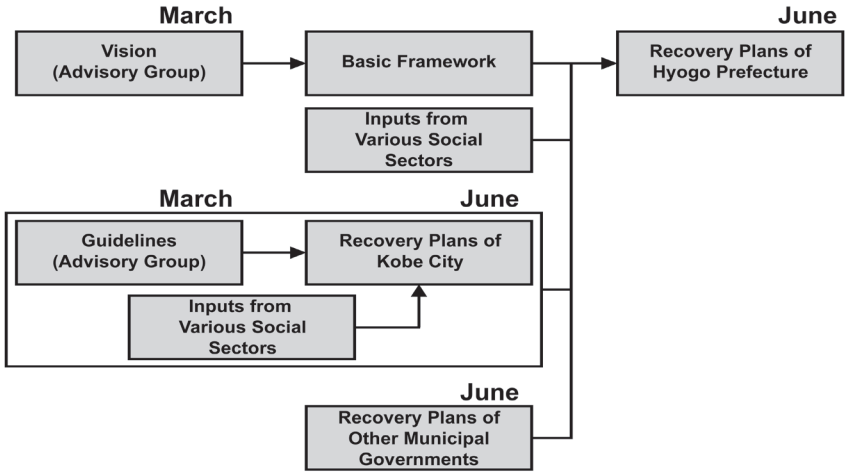

Figure 5: *Interrelationships among various recovery plans for the Kobe earthquake*
Source: Haruo Hayashi

Prefecture recovery plan was an integration of inputs from various stakeholders including impacted municipalities. The Kobe City recovery plan can be regarded as a regional plan of the Hyogo Prefecture. The chart provides a good template for how various parts of the bureaucracy can and do work together.

In the Aceh and Nias recovery plan, the plan was prepared mainly by the national government in collaboration with many organizations. It reads as follows:

> *"The Master Plan has been prepared by the Ministry of National development Planning/BAPPENAS in collaboration with various parties, such as ministries/institutions at the central level, as well as with Regional Governments of the Province of Nanggroe Aceh Darussalam and all kabupaten/kota throughout Aceh and Kabupaten Nias, the Province of North Sumatra, and by involving various universities coordinated by Universitas Syiah Kuala, international donor communities, NGOs, and other related parties."*

UNOP was funded by the Rockefeller Foundation, the Clinton-Bush Katrina Fund and the Greater New Orleans Foundation (GNOF). It was a five month planning process established by the Mayor of New Orleans, the City Council, and the City Planning Commission. The plan was put together by a team of mostly local urban planning practitioners and university professors, called the Citywide Team. This team worked with a number of nationally recognized architectural firms (referred to as the 'District Planners') who were responsible for the development of neighborhood and planning district plans.

Measuring implementation

Finally, while implementation is not being addressed in detail in this chapter, it is important to recognize that the process of planning is neither static nor finite. Monitoring of the recovery plan's implementation is an ongoing requirement, and the plan may require updating and adjusting as the recovery progresses. The following summary by Leitmann shows how this ongoing benchmarking process has been managed in Haiti:

> *"Haiti's reconstruction is guided by an Action Plan for the National Recovery and Development of Haiti that was prepared in the two months following the earthquake and adopted in March 2010. The rebuilding itself is coordinated by an international body known as the Interim Haiti Recovery Commission (IHRC) with an initial lifespan of 18 months (from April 2010 to October 2011).*
>
> *Eleven months after the earthquake, the IHRC recognized the need to accelerate delivery by prioritizing sectors directly affected by the earthquake in order to reduce vulnerability through a 'build back better' approach, and achieving significant, measurable progress within the mandate of the Commission. To do so, seven priority outcome areas were identified with targets established for each area. These were adopted by the Commission in December 2010 along with an eighth cross-cutting area that encompasses capacity building of Haitian institutions.*
>
> *Each priority area is characterized in more detail as to the rationale for its selection, required programs to achieve targets, funding requirements, supporting policy decisions and institutional enablers, and interdependence with other priority areas. Achievement of these interim targets is estimated to require $990 million in financing. Technical specialists working with the Commission, known as sector leads, are responsible for tracking activities and achievements in each area to determine progress towards achieving the relevant targets."*

Lessons for post disaster planning

It is interesting that the three plans which form the base for this chapter share so many things in common, when they represent such very different locations, governmental and institutional leadership and cultural backgrounds. All share common features:

- The recovery plans intend not only to restore the affected area to its original condition, but also make the area safer, stronger, smarter, and better than before the disaster;
- They make use of existing comprehensive plans as the template for the completed recovery;
- They treat the participation of diverse stakeholders as indispensable for the success of the recovery;

- They specify target areas or districts as the building blocks for the projects in the plan;
- They set time frames and resource allocations over time to manage current recovery and future mitigation and resilience; and
- The recovery plans specify a comprehensive approach to guide the community's physical, social and economic destiny post disaster.

The overview below from Bingler puts some of these general lessons into context, using the Katrina recovery as an example.

Further reading

The cases and resources section for this chapter includes:

- A case study by Hu of the planning process after the Chinese earthquake of 2008;
- A discussion of the Victorian bushfire disaster by Mercer and Buxton, which considers how the planning process failed to address the need for the kinds of disaster mitigation efforts discussed in this chapter;
- More details on the disaster mitigation aspects of the Aceh and Nias plan, in the Indonesia case study by Leitmann; and
- More background to the UNOP plan, and the events which gave rise to the lessons Bingler describes.

LESSONS LEARNED FROM NEW ORLEANS' RECOVERY PLANNING

Steven Bingler

These are some of the lessons learned from the UNOP planning process:

Recovery Planning is not Master Planning: The tools and timeframes used in recovery planning are more sharply focused than those used for more comprehensive master planning and zoning. The UNOP plan was delivered for approval in a five-month timeframe.

In an emergency, look at all planning options: The New Orleans city planning department was overwhelmed by Katrina. The UNOP planning process provided some additional private resources and planning talent needed to expedite the recovery planning process.

Issues like race and equity must be addressed openly: At the center of the planning process was a 200-year history of racial distrust fueled by post-Katrina conspiracy theories. Early errors in planning strategies that largely ignored these factors led to delays and finally stalemate. The scale of community engagement in the UNOP plan was a critical ingredient for building enough community trust to restart the recovery planning process.

Be prepared to think outside the box: Disaster events provide opportunities to rethink some core structural issues. In New Orleans, the storm provided impetus for nationally acclaimed revisions to the governance and operations of the public school system. Citizens also elected to reduce seven levee boards to two, and multiple city assessors to one. The number and quality of community organizations have significantly expanded. New post-Katrina citizen umbrella institutions (such as the Neighborhood Partnerships Network) now provide technical support and back up to many fledgling neighborhood groups and organizations.

Trust and support the community to make it work: It was the collective voice of thousands of New Orleans citizens that ultimately created the UNOP plan for New Orleans's recovery. From the November 2005 Louisiana Speaks conference, dozens of Bring New Orleans Back Committee meetings and hundreds of UNOP neighborhood, district and community congress gatherings, community participation in the recovery planning process was omnipresent.

Cases and Resources for Chapter 2

Planning large scale post-disaster recovery after the Wenchuan earthquake in China

Richard Hu

The Wenchuan Earthquake on May 12, 2008, was the most destructive earthquake to have occurred in China since the Tangshan Earthquake in 1976. It was also one of the most deadly anywhere in the world in recent years. Statistics from the Chinese government indicate that more than 80,000 people were killed and an area of 28,000 square kilometers (mostly rural) was affected. However, the Chinese Government's performance in the post-disaster relief and recovery planning has been impressive, compared to other disasters in both developed and developing countries. As evidenced by the post-disaster recovery progress, China's centralized control over post-disaster planning and the government's capacity to mobilize the whole nation's resources allowed an efficient and effective response to what China's media called a 'super large' disaster. This case study examines the recovery planning actions taken by the Chinese Government.

Orchestrating the post-disaster relief and recovery

On the night of the earthquake, the Chinese Politburo held an emergency meeting. A General Headquarters of Earthquake Relief was immediately established within the State Council and was chaired by Premier Wen Jiabao to coordinate the overall rescue and relief efforts. Eleven days later, a sub-unit of the Post-Disaster Recovery Planning Group was established within the General Headquarters to be in charge of preparing the post-disaster recovery plan. Meanwhile, only four days after the earthquake, the Ministry of Housing and Urban-Rural Development called on voluntary planners to devise re-building plans as part of a national voluntary movement. Planners went to work in the disaster areas in groups allocated by their home institutions (mostly government planning agencies), which were coordinated at a higher level. These voluntary planners spent two months investigating the sites, proposing desirable sites for temporary shelters and permanent residences, and preparing for the short-term re-building plan and long-term development plan.

Post-disaster plan and implementation becomes enforceable law

Within one month of the earthquake, the State Council announced the Regulation on Post-Wenchuan Earthquake Rehabilitation and Reconstruction. This is China's first legal regulation on post-earthquake recovery. Its main contents include recovery guidelines and principles, accountable actors, and tasks and responsibilities of government agencies at different levels. It also includes a monitoring mechanism and punishment for breaching the regulation. Five days later, on June 13, 2008, the State Council announced another legal document: The Work Scheme for Post-Wenchuan Earthquake Reconstruction Planning. These two documents were the legal basis for making the overall recovery plan.

Follow-up administrative measures and policies

The State Council released the Master Plan of Post-Wenchuan Earthquake Rehabilitation and Reconstruction on September 19, 2008, a little more than four months after the earthquake. Under the guidelines and principles of this master plan, various government agencies issued ten special plans respectively on urban-rural housing, urban-town systems, rural construction, public service, infrastructure construction, production layout and industrial restructuring, market service systems, disaster prevention and mitigation, ecological rehabilitation, and land use. In order to better facilitate the implementation of these plans, the State Council issued a series of policies to coordinate, support and reinforce the recovery efforts, such as the Opinion on Supporting Policies on Post-Wenchuan Earthquake Rehabilitation and Reconstruction and the Directive Opinion on Better Work of Post-Wenchuan Earthquake Rehabilitation and Reconstruction. These administrative measures were meant to ensure that the central government's requirements for the recovery goals, implementation process, and related supporting measures were fulfilled through all bureaucratic procedures.

Comprehensiveness of the post-disaster recovery plan

The Regulation on Post-Wenchuan Earthquake Rehabilitation and Reconstruction and the Master Plan of Post-Wenchuan Earthquake Rehabilitation and Reconstruction are the cornerstone documents guiding the post-Wenchuan Earthquake recovery efforts. Both were announced by the central government. As stated above, one important feature of these documents was the promptness with which they were prepared, while the other was the comprehensiveness of their content. The Regulation on Post-Wenchuan Earthquake Rehabilitation and Reconstruction is a law and provides guidelines to ensure legal accountability for the whole relief and recovery effort. Major issues include overall principles, temporary shelter and relief, surveying and assessment, rehabilitation and reconstruction planning, rehabilitation and reconstruction implementation, fundraising and policy support, monitoring and control, and legal liability. The Master Plan of Post-Wenchuan Earthquake Rehabilitation and Reconstruction is the final recovery plan, and is equally comprehensive (see following page).

Government structure for implementation and accountability

The State Council set up a sub-unit of the Post-Wenchuan Earthquake Rehabilitation and Reconstruction Coordination Group inside the General Headquarters of Earthquake Relief – the highest level disaster recovery coordination body – to guide the overall planning strategy immediately after the earthquake. During the implementation phase of the post-Wenchuan earthquake recovery, the State Council assigned the People's Government of Sichuan Province, where the largest and most seriously earthquake-affected area was – to take up the overall responsibility for reconstruction in the Sichuan Province.

The Sichuan Province established a Post-disaster Rehabilitation and Reconstruction Commission with the Party Secretary-General and Provincial Governor as co-directors, under which were seven special recovery coordination groups. The Gansu

Categories	Issues
Reconstruction foundations	Disaster area overview; Challenges; Disaster loss; Favorable conditions
Overall requirements	Guiding thought; Reconstruction targets; Basic principles
Spatial layout	Reconstruction zoning; Industrial layout; Land use layout; Urban-rural layout; Demographic layout
Urban-rural housing	Rural housing; Urban-town housing
Urban-town construction	Public facilities; Historic and cultural conservation
Rural construction	Agricultural production; Rural infrastructure; Agricultural service system
Public service	Education and research; Culture and sports; Employment and social security; Health; Cultural and natural heritage; Social management
Infrastructure	Transport; Irrigation; Telecommunication; Energy and resource
Industrial recovery	Industry; Commerce and trade; Cultural industry; Tourism Finance
Disaster prevention and mitigation	Disaster prevention; Disaster relief and mitigation
Ecological Environment	Ecological rehabilitation; Land treatment and rehabilitation; Environmental improvement
Psychological rehabilitation	Humanistic care; National spirit
Policies	Fiscal policy; Financial policy; Industry policy; Aid policy; Tax and fee policy; Land policy; Pairing assistance; Other policies
Financing	Capital demand and raising; Fund allocation; Innovative financing
Implementation	Organization and leadership; Classified implementation; Monitor and check; Planning management ; Materials provision

***Figure 1**: Master Plan of Post-Wenchuan Earthquake Rehabilitation and Reconstruction*
Source: State Council

Province and the Shanxi Province, in which smaller areas were hit by the earthquake, also established their own Post-disaster Rehabilitation and Reconstruction Leading Group. Under them the municipal or prefectural governments were responsible for frontline implementation. Thus, a hierarchical government structure was formed to head, coordinate and implement the post-disaster planning and recovery efforts as follows:

Levels of Government	Responsibilities
Central Government	Guide implementation of recovery plans; Coordinate policy actions; Study and solve key issues in the reconstruction process.
Provincial Government	Lead, organize and coordinate the implementation of the recovery plans; Monitor and check the process and outcomes
Municipal or Prefectural Government	Carry out the specific recovery tasks and projects

***Figure 2**: Hierarchical government structure formed to head, coordinate and implement the post-disaster planning and recovery efforts*
Source: Richard Hu

Mobilizing resources to aid post-disaster relief and reconstruction

The central government invented a so-called 'pairing assistance' program, allocating 18 wealthy provinces and province-level municipalities to assist the relief and reconstruction for a specific area or a specific relief and reconstruction task. These provinces and province-level municipalities assigned cadres and experts, provided capital and materials, and established joint industrial projects to aid recovery in their pairing disaster areas. By April 2009, 2,418 joint projects had been launched, and RMB 56.5 billion (US$ 8.3 billion) was channeled into the disaster areas through this 'pairing assistance' program. In total these pairing provinces and province-level municipalities sent more than 30,000 people to work in the disaster areas, helped relocate 16,000 students, and generated 330,000 local jobs.

Another way to mobilize national resources was to encourage donation from all walks of society. After the earthquake, a total amount of RMB 76 billion (US $11 billion) in donations was received, which was used for either disaster relief or post-disaster reconstruction. Many individuals and organizations donated funds to build public services directly, such as schools, libraries, and hospitals.

DISCUSSION QUESTIONS

1. Identify the pros and cons of a planning process run by a national government, as highlighted by this case study.
2. Ultimately, the national government was forced to move people from the affected areas. This process was difficult for the residents and local agencies. Can you identify some ideas or approaches that help to move communities to new locations post-disaster?

Setting the scene for the New Orleans recovery planning process

Steven Bingler, Concordia

Following Hurricane Katrina in New Orleans, disaster recovery planning took many different turns. The planning started in October, 2005 when the State of Louisiana, in association with the American Planning Association (APA), the American Institute of Architects (AIA) and the National Trust for Historic Preservation, convened a three day 'Louisiana Speaks' summit in New Orleans. The summit explored national and international best practices for rebuilding levees, public schools, housing and other infrastructure. Panel discussions and break-out sessions were also conducted for more specialized planning issues, such as historic preservation and 'green' building design. In November 2005, a second planning initiative by the Urban Land Institute (ULI) engaged a national team of planners and academicians to develop the first set of specific concepts and recommendations for rebuilding. The work of the ULI planners was incorporated into a third planning phase led by the Urban Design Committee of the Bring New Orleans Back Commission convened by Mayor Ray Nagin. The plan was presented in January 2006 to an overwhelming backlash

of community opposition that caused both the mayor and city council to withdraw their support for the project. The New Orleans City Council soon initiated the New Orleans Neighborhoods Plan to address immediate needs in 43 of the city's 73 most devastated neighborhoods. In August 2006, a fifth planning process was initiated by the Greater New Orleans Foundation that would consolidate all of the previous planning work through an extensive community-based planning initiative known as the Unified New Orleans Plan (UNOP). The UNOP plan was completed in late January 2007 and subsequently approved by Mayor Nagin, the City Planning Commission, City Council and Louisiana Recovery Authority in August of 2007.

The Unified New Orleans Plan followed three guiding principles. The first required that the plan would be data driven. Second it would incorporate the best national and international planning practices. Third it would be transparent and open to all residents and community stakeholders. In addition, the mayor mandated that participation in the plan must include citizens living outside of the city in what had by then come to be called the 'Diaspora', and that every attempt would be made to solicit the engagement of all racial and ethnic groups in proportion to the population of New Orleans before the storm. The Greater New Orleans Foundation (GNOF) retained Concordia LLC to act on its behalf to facilitate the UNOP planning process and a special GNOF donor advisory committee was created to monitor the work. The Rockefeller Foundation, a principal funder for the project, also provided a full time staff liaison. Concordia also worked with the Greater New Orleans Foundation and City Council to identify a nine member Community Support Organization (CSO) to hold monthly public hearings and oversee all aspects of the plan's progress. Concordia then worked with the City Planning Commission to assemble a team of four national advisors with prior experience in disaster recovery and neighborhood development. The city planning staff determined that ten district plans would be developed in a way that could incorporate all 73 of the city's highly individualized neighborhoods. Concordia and GNOF issued an RFP for urban designers and architects. Twelve firms were chosen to work at the citywide, planning district and neighborhood levels to produce the plan.

To get the project underway, Concordia assembled the planning teams in a pavilion at City Park for a 'matchmaking' session with residents and neighborhood organizations. More than 400 local residents participated in the two-day event. Each planning team was invited to present its experience and explain how it liked to work. Based on feedback from participants, planners were assigned to each of the district and neighborhood sites. Then a planning calendar was developed. Included were four sets of ten district level meetings (40 meetings total) and three large citywide 'community congress' meetings that were open to the city's full population. America Speaks was retained to assist with the facilitation of the community congress meetings, which in one case included more than 1,500 citizen/residents assembled at the New Orleans Convention Center; another 800 participating via live broadcast television feeds to remote assemblies in Atlanta, Dallas, Houston and Baton Rouge; and simultaneous podcast connections to another 16 Diaspora cities nationwide.

The city planning staff participated in meetings with the UNOP planning team at the planning commission's offices in city hall. The primary outcome of the UNOP

plan was a list of infrastructure and other specialized projects for each planning district, along with a strategy for consolidating and clustering public facilities.

This clustering concept was further developed in the newly formed Recovery School District's subsequent School Facilities Master Plan. Completed in September 2008, the school facilities planning process analyzed the demographic need and physical condition of the 127 school sites owned by the Orleans Parish School District. The resulting sites needed to fall within a one half-mile radius of every child and family in the city. As requested by a large majority of citizen-stakeholders, each of these school sites will ultimately become community schools, providing public access after school hours and on weekends to its auditoriums, libraries, gymnasiums and sports fields. When these schools are joined by a clustered nexus of community health clinics, public parks, healthy grocery stores, community gardens and other neighborhood programs, the benefits become even more apparent. Included in the paybacks is a more equitable system of access for the 30 percent of residents who do not own an automobile. The nexus community network also delivers more environmentally sustainable and healthy walkable options for those citizens who do own cars. And finally, the costs to build and operate sewerage, water, drainage, housing, public transportation and other public infrastructure are reduced. A first phase of $700 million in FEMA reimbursements was allocated to renovate or build the first 29 schools. Additional work was undertaken to identify sites and funding for community based health clinics and other priority projects for advancing nexus development.

DISCUSSION QUESTIONS

- What are the principles of civic involvement that you can derive from this case?
- How do you measure success in civic engagement, given than even in this case some people who were displaced to other states said they were not involved and the process was a sham?

Planning for disaster mitigation: reconstruction following the 2009 bushfires in Victoria, Australia

Michael Buxton and David Mercer

On February 7, 2009, ('Black Saturday') the most devastating bushfires in Australia's history occurred, mainly in the peri-urban region of Melbourne. The fires killed 173 people injured 400, and made 7,000 people homeless, burning across 430,000 hectares in the state of Victoria. Four serious fires affected the Melbourne peri-urban area, while two others affected the fringes of other major metropolitan centers.

Over 30 percent of the 79 municipalities in Victoria are peri-urban, including some parts of 17 of the 31 municipalities that make up the capital city, Melbourne. This peri-urban area is recognized as one of the most fire-prone in the world. Even

though Victoria comprises only three percent of Australia's land mass (227,600 sq kms), it has sustained around 50 percent of the economic damage from bushfires. Melbourne's peri-urban region also is undergoing considerable growth in population and housing. This combination of high fire risk and population growth has proved to be consistently lethal.

While small towns and dispersed rural dwellings proved to be the most vulnerable sites on Black Saturday, suburban areas also proved susceptible. On February 7, for example, one fire destroyed over 50 houses and burned to within 1.5 kilometers of the centre of Bendigo, a major regional city, while another destroyed a similar number of dwellings on the edge of Melbourne, in Narre Warren.

Increasing risks

The increase in population in moderate to high fire risk areas is the major factor increasing risk to people and property from bushfires. Largely unregulated land use decisions have led to this population increase around metropolitan Melbourne and major provincial centers. Melbourne's peri-urban region contains almost one million people in regional cities, townships and on dispersed rural-residential and larger rural lots. The location of future population growth is emerging as an important issue, as the population is increasing by 1.8 percent annually in many parts of this area, compared to the rest of regional Victoria at 0.8 percent. Meanwhile, it has been calculated that six percent of dwellings in Australia, in or near urban centers, are vulnerable to the bushfire hazard.

Immediately after the Black Saturday fires, the State and Commonwealth governments undertook to perpetuate the settlement status quo by committing to the wholesale reconstruction of damaged or lost dwellings in situ. But by January 2010, only 60 percent of the households that had lost their homes in the 2009 fires had decided to rebuild on the same site. A further 20 percent had left permanently and 20 percent were undecided.

Land use planning as a disaster mitigation tool

The current planning system is designed to facilitate development and reduce regulation. This does not provide the means to anticipate and reduce harm to residents from future bushfires. By contrast, the Victorian government has introduced regulatory policy to control coastal development, because of the risk of inundation through rising sea levels. But little consideration has been given in Australia to prohibiting residential development in areas of high bushfire risk. The most notable example of successful prohibition is the establishment of a fire buffer zone in the Dandenong Ranges on the eastern fringe of Melbourne. Extensive compulsory acquisition and restructuring of residential lots occurred during the 1970s and 1980s with the objective of separating residential development from areas of high fire risk. This prevented tens of thousands of people from developing fire-prone lots and saved many lives and much damage to property. Without the revival of such policies, many thousands more people will build on existing small lots and newly subdivided lots in dangerous locations. However, in recent decades, Victorian governments have avoided such programs and introduced or maintained a permissive planning regime.

After the 2009 fires, the Victorian government introduced some changes to the building and land use planning approvals processes to facilitate rebuilding. It allowed residents to clear vegetation, without the need for a permit, including trees within 10 meters of a house, shrubs up to 30 meters, and vegetation up to four meters either side of fence lines with the consent of a neighbor. It also introduced a new residential building standard statewide, AS 3959. The aim is to improve the capacity of a building to withstand higher temperatures from bushfires. It provides a more detailed risk assessment for building sites by assessing a site and building against six bushfire risk categories. The standard also includes consideration of the Fire Danger Index. A bushfire attack level (BAL) is determined for a site and the construction methods most suited to the assessed level applied. The government estimates that fewer than 10 percent of building permits will be at the highest risk levels. The government also removed the need for a planning permit for temporary dwellings and where a house is being replaced on the same site unless an overlay planning control applies. These measures caused some controversy, particularly removing the need for planning approval for vegetation removal which, if implemented by residents, would lead to the removal of all vegetation in many of Melbourne's fringe suburbs with little reduction of risk.

The Royal Commission into the Black Saturday fires established a process to consider evidence on the adequacy of the current land use planning system, policies and practices. The Commission accepted that land use planning must play a significant role in reducing risk, proposing a 'retreat and resettlement' policy. It recommended purchase of the most vulnerable land, and the adoption of stronger regulatory planning to restrict development substantially in high risk areas. It proposed the use of such techniques as limits on new subdivision and dwellings, the restructuring of existing small lots in fire-prone areas, minimum lot sizes and the transfer or purchase of development rights. Counsel assisting the Commission identified that existing policy and institutional arrangements were characterized by fragmentation and reactive, incremental decision-making and that these contributed to the inadequacy of existing responses. Only integrating management of bushfire risk into high level strategic land use planning can provide the means for government to anticipate harm to people in high risk areas. There is little evidence that Australian governments are learning from history, and are prepared to introduce the changes in governance necessary to prevent or limit further loss of life and property damage from catastrophic bushfires in Australia.

DISCUSSION QUESTIONS

1. The Victorian government has not acted to reduce risk by preventing or limiting development by increasing planning regulation or developing a strategic settlement policy. Neither has the national government implemented a policy on the potential role of land use planning to reduce risk. How could a better result be achieved?
2. Why?

How stakeholder participation improved Indonesia's recovery plan

Joe Leitmann

Following the devastating Indian Ocean tsunami and earthquakes that struck Aceh Province and the island of Nias, the Government of Indonesia undertook two participatory planning exercises – a damage and loss assessment and development of a blueprint or master plan for reconstruction. Both of these exercises were led by the National Development Planning Ministry (BAPPENAS) and involved hundreds of participants. This case study especially focuses on the latter activity to demonstrate how stakeholder participation improved one specific aspect of the recovery plan.

During a two-week period in January 2005, around 150 government, national and international experts assembled to prepare the damage and loss assessment of the tsunami's impact in Indonesia. They were drawn from key government line ministries, BAPPENAS itself, Indonesian universities and NGOs, United Nations agencies, bilateral and multilateral donors, and private sector firms. Using a time-tested methodology developed by the Economic Commission for Latin America and the Carribean (ECLAC) , these experts were organized into sectoral groupings (housing, education, transportation, environment, etc.) and coordinated by the World Bank. This approach produced a rapid analysis in time for a previously scheduled meeting of the Consultative Group for Indonesia in mid-January that enabled donors to pledge their support for the reconstruction. Damages and losses were calculated at $4.5 billion, with the most affected sectors being housing, agriculture and fisheries, infrastructure, and the environment (*BAPPENAS 2005*).

This experience was instrumental in convincing the government that a similar participatory approach would be useful in designing the master plan for recovery. Beginning in late January 2005, a total of 12 sectoral working groups were established to prepare the inputs for a blueprint to guide the reconstruction process. Each working group was led by a Government of Indonesia agency with participation from government, national and international staff.

Initially, the group that was dealing with spatial planning decided that it was important to protect coastal communities from the threat of future tsunamis. The group was particularly influenced by spatial planners from the Ministry of Public Works who proposed that 'exclusion zones' be created along vulnerable coastal areas that would prevent people from rebuilding in an area of up to one kilometer from the sea. Maps were drawn up to indicate a scheme where mangroves would be planted immediately offshore, fishponds and parks would be developed immediately onshore, some low-density facilities would be allowed near-shore, and housing could be established further inland.

This seemingly rational concept was integrated into the working group report and then shared at a series of public consultations where it was roundly criticized. At an international forum of local governments in Medan, North Sumatra in early March 2005, experts pointed out that a similar scheme had been attempted in Sri Lanka prior to the tsunami and that it had been widely ignored as unacceptable by

local villages. Then, in consultations of affected stakeholders in Aceh later that same month, it was outright rejected for several reasons: a) coastal communities did not want to be divorced from their source of livelihoods (the sea); b) families who had lost their homes did not also want to lose their last asset (their plot of land on or near the coast); c) communities did not want to lose their heritage by having to find and move to an inland area; and d) the risk of another tsunami was seen as too low to justify exclusion and relocation.

The working group heard the messages from the consultation process and went back to the drawing board to come up with a more workable solution. In the end, the exclusion zone concept was dropped in favor of a preparedness approach whereby communities could rebuild along the coast but would be provided with an early warning system, increased awareness about disaster risk reduction and access to escape routes (*Wilkinson 2005*). While the master plan was largely not consulted in the initial reconstruction process (and subsequently revised in 2008), the new approach to spatial planning was implemented.

DISCUSSION QUESTIONS

1. What went wrong here and what principles outlined in the Strategy and Planning chapters of the book were violated in this planning process?
2. How would you have undertaken this planning process to gain acceptance of such a drastic change?

Chapter 3: Managing Partnerships to Support Recovery

Joe Leitmann

Post-disaster recovery has a thousand parents, whether the recovery is a success or a failure. A range of partners can, and usually does, contribute to the recovery process at the local, national, and international levels, depending on the magnitude of the catastrophe. Partnership can be classified as occurring in at least four different modes: Recovery planning; recovery financing; technical assistance; and capacity building. Partnerships that occur through these different modes can add value to the recovery process by:

- Addressing the financing gap between available finances and resources that are needed for recovery;
- Filling the knowledge gap by bringing good practice to bear on challenges that arise during the recovery;
- Accelerating the speed of the recovery through creative interventions that remove or circumvent bottlenecks;
- Strengthening institutions for managing the recovery by reinforcing existing capacity and building new capacity where needed; and
- Improving governance by giving voice to stakeholders in the planning and implementation of recovery.

This chapter elaborates on why partnerships are important to disaster recovery by outlining the range of partners, categorizing the different modes of partnership, and examining how partnerships add value. Failing to manage partnerships and external involvement effectively, on the other hand, can lead to some seriously flawed outcomes.

Range of partners

Recovery partners can be simply classified at four levels:

- Local (municipal governments, local NGOs, community groups, local private sector);
- National (national NGOs, Red Cross/Crescent societies, foundations, corporations, academia, the military, celebrities);
- International (bilateral and multilateral aid agencies, the United Nations organizations, international NGOs, the international Red Cross community); and
- Virtual (Internet and Web-based networks of individuals and organizations at the local, national and/or international levels that are formed to facilitate relief and recovery).

These levels are not isolated from one another, with actors at one level typically interacting with those at other levels. For example, academic partners can cooperate with local and national community organizations or international and local Red Cross organizations typically work together in the recovery process.

Local partners

Local organizations and individuals are almost always the first responders after a disaster strikes. In the recovery process, they play a critical role in several ways:

- Providing a voice to local stakeholders in the recovery process;
- Sharing local knowledge for planning and implementing the recovery;
- Offering the social capital that facilitates reconstruction; and
- Helping local people deal with the psychological and emotional impacts of trauma.

At the same time, local partners usually cannot rebuild without assistance from the outside. Their institutional, human, and financial capacities are often significantly diminished by the impact of a catastrophe. They may also face particular challenges, such as politicization or an inability to manage larger-scale functions.

For example, when Hurricane Mitch caused nearly $4 billion of economic loss in Honduras, municipal governments were often key partners in the recovery process. Mayors and their municipalities were capable of organizing their communities, responding to immediate needs during the relief phase, undertaking realistic planning, obtaining land for rebuilding, and identifying critical infrastructure for repair.

Following the disaster, local governments organized themselves in mancommunidades, or municipal associations, to advocate for and manage responses to shared problems, including disasters. Some of the challenges of partnering with municipal governments following Hurricane Mitch included:

- Low capacity for project implementation in some municipalities;
- Political partisanship (mayors acting in accordance with their political aspirations more than the needs of their constituencies); and
- The conflict between the local and national land registries.

It was also necessary to find a workable balance between local initiative and a strong central capacity for data gathering and management, planning, and setting and monitoring of overall criteria and standards.

National partners

National entities like state/provincial governments and national NGOs can be highly effective partners in disaster recovery, particularly if their capacities have not been diminished by the catastrophe. These actors can increase their impact in the recovery process when they coordinate among themselves as well as cooperating with partners at different levels. For example, corporations can work with government

agencies at the national, regional and local levels to facilitate small business recovery through: Provision of technical assistance to help businesses adapt to post-disaster market conditions; creation of strategies to minimize business relocation and loss of customer base; and implementation of credentialing programs to minimize instances of contractor fraud (*Czerwinski 2009*).

International Partners

Major disasters can overpower the capacity of national governments to respond and may require the assistance of the international community. Certain international actors specialize in immediate response, including several international NGOs, the Red Cross family, UN organizations such as the World Food Program, UNICEF, and the Office for Coordination of Humanitarian Affairs, and foreign military forces. The latter can be especially effective during the relief effort because of their rapid-response, logistical, and organizational capacities.

For example, during the emergency response following the Indian Ocean tsunami, 16,000 foreign military personnel were deployed in Aceh and joined 27,000 Indonesian soldiers to bury bodies, clear debris, re-establish services, and provide medical care (*Masyrafah and McKeon 2008*). However, foreign military assistance is also politically sensitive, as evidenced by Myanmar's rejection of readily-available food, medical, and other aid following Cyclone Nargis. During the reconstruction phase, these partners, along with bilateral and multilateral donors, can provide a range of needed support that is covered in the following section on 'Modes of Partnership'.

Following many disasters, the International Federation of Red Cross and Red Crescent Societies (IFRC) brings partners together as the key agency with country-level Red Cross organizations for both relief and recovery. For example, following the tsunami in Indonesia, the IFRC and the International Committee of the Red Cross (ICRC) partnered with the Indonesian Red Cross (PMI) and 22 national Red Cross agencies to provide nearly one billion US dollars of assistance, making it the second largest source of recovery finance following the Government of Indonesia. Support was provided for:

- Rebuilding permanent houses and providing transitional shelter;
- Building and rehabilitating hospitals, clinics and schools;
- Providing water, sanitation and community health services; and
- Expanding the capacity of the PMI and its staff (Red Cross Assistance of Disasters 2009).

The ICRC successfully coordinated across the diverse actors in its membership, as well as with the recovery agency and the UN, to deliver these activities. It was less open to cooperating with other actors, choosing to establish its own technical working groups rather than participating in the broad sectoral coordination process established by the wider range of development partners.

Virtual partners

Crisis Commons, Geo-Can, Ushahidi, Open Street Map, and Random Hacks of

Kindness all utilize open source programming and the expertise of a global pool of volunteer programmers, scientists, and technical experts to provide fast help in disaster areas. Crisis Commons brought together programmers to develop applications that helped people on the ground in Haiti to find earthquake victims buried under rubble.

Geo-Can used high-resolution optical, thermal infrared and topographic images to assess building damage. Ushahidi is a platform that was originally developed to report violence after the 2008 elections in Kenya. The program has now spread widely and is used in very different contexts such as election monitoring, reporting of corrupt behavior by officials, and tracking the stockouts of essential medicines in Eastern Africa. In Haiti it was used to track emergencies, threats, and logistics.

Open Street Map is a map database that collected aerial and satellite imagery to provide up-to-date maps for relief operations in Haiti. Random Hacks of Kindness is a collaboration of Microsoft, Yahoo!, Google, the World Bank, and NASA, where disaster relief experts and software engineers work together on technology solutions for disaster response.

Institutional frameworks

Partnerships can be organized according to a range of institutional frameworks that may be established prior to the disaster or tailored in response to a specific event. These institutional arrangements can be characterized as:

- National coordination: In the US, the Federal Emergency Management Agency (FEMA) provides funds for public and individual assistance, and coordinates among federal agencies. The private sector supplements this support through insurance coverage for homeowners and businesses for disaster losses.
- Committee approach: Following the Kobe earthquake, committees were established at the national, prefecture and city level for planning and coordination. A number of temporary technical committees were also set up at the local level to support the process of reconstruction.
- Dedicated agency: After massive catastrophes such as the Indian Ocean tsunami and the 2005 Pakistan earthquake, governments often establish a new institution to guide and coordinate the recovery process. These include the Task Force to Rebuild the Nation (TAFREN) in Sri Lanka, the Rehabilitation and Reconstruction Agency (BRR) in Indonesia, the Earthquake Rehabilitation and Reconstruction Agency (ERRA) in Pakistan, and the Interim Haiti Recovery Commission (IHRC).
- International coordination (Cluster approach): After the Indian Ocean tsunami, the UN developed sectoral clusters of stakeholders (especially UN agencies, NGOs and international organizations) to coordinate during the relief and early recovery phases. The standard clusters are: Protection; Camp Coordination and Management; Water Sanitation and Hygiene; Health; Emergency Shelter; Nutrition; Emergency Telecommunications; Logistics,

Education; Agriculture; and Early Recovery. The cluster approach has been applied effectively in subsequent major disasters in the developing world and has become a standard operating procedure for the UN during crises.

- Multiple institutions: In response to the 1999 Marmara earthquake, the Turkish government created two central agencies, the General Directorate of the Management of Emergencies and the General Coordinating Office of Disaster Reconstruction. The administrative complexity was later increased with the establishment of a rescue and emergency general directorate in the Ministry of the Interior, a general directorate for emergency management connected to the Prime Minister and an independent National Earthquake Council.

Developed countries such as the US and Japan generally have institutional resources, local governments, legislative arrangements, and insurance markets that are adequate for supporting recovery and reconstruction. In developing countries which face catastrophes, existing institutions, legislation and private insurance arrangements are often overwhelmed by the challenge and may require specialized arrangements (*Vatsa 2009*).

Universities as a resource in recovery

Universities that have some existing links to government practice are ideal collaborators in disaster management (be these links with the broader university or with a particular school/institute). Clearly, all applied schools, from engineering to medicine and public policy, offer excellent resources. When the disaster is nearby, these schools can offer their expertise quickly and directly though the relationships they have built up over time.

There is also scope for schools that are geographically distant from the tragedy to offer specialized expertise. The University of Pennsylvania's Curex program in New Orleans is an excellent example of exporting real estate and urban development expertise to the setting of a disaster. In the best of worlds, university institutes that are to be involved in recovery have melded the recovery program into their ongoing mission with government and community. This requires some reliable funding stream that supports both disaster preparation and recovery activities, and which can be enhanced as needs arise.

Figure 1 on page 58 - 59 sets out a range of different ways universities may be engaged in a recovery process. No university operates solely from any single approach, and universities do not offer these services in a vacuum. Government at some level is almost always the client but in some cases the wider community, non-profits and other actors might well be the primary clientele for the recovery services. These are only meant to be archetypes and not tight definitions, and this typology can and should be expanded on.

The roles universities play in recovery are very closely related to their basic mission and their institutional capacities. But the larger message is that disaster recovery is not yet seen as central to university research or service missions. Even changes at

UNIVERSITY MODEL	DEFINITION	ROLE EXAMPLE	
Institutionally Engaged	University is centrally engaged in the civic arena with defined office and senior leadership	University has a Vice President for Government and Community Affairs with a set of articulated activities and investments in the local/state civic sphere	
Institutes or Schools as the Fulcrum for Engagement	The University has a set of identifiable institutes or programs that can be mobilized to meet the challenges of the situation	The School of Public Policy or Planning may have useful capacities	
Consortia	A group of Universities in the same setting have a set of programs that work together	In an emergency these institutional networks are mobilized into a single framework	
Expertise	University staff and faculty have expertise the community can access	University uses its communications or other information systems to inform community and government of resources	
Neutrality	University uses its neutral science and empirical perspective to assist with difficult issues	University has a set of experts or think tanks that on a regular basis deal with policy issues such as Law or Policy Clinics	
Capacity Building	University has programs and institutes with the ability to export skills and training that enhance local expertise and institutions	University has some form of external education programs that can be easily mobilized	
Advocacy	Various units of the University act as advocacy for projects and programs that benefit low income or other disadvantaged groups	These units usually nominate themselves (Law, Public Health) because they are aware of the general under service to certain groups or become aware of actual cases	
Ad hoc	In this case the University takes no active role but parts of the University provide a collection of interested faculty or students	Most universities that are distant from the tragedy take on this mode	
Freelance	University staff or students make decisions on their own to develop projects and volunteer	Universities usually have a volunteer center that can be used as a resource but this activity has no formal university base	

	RECOVERY APPROACH	GOVERNMENT/COMMUNITY CONNECTIONS
	University mobilizes the entire institution and all of its resources to deal with the recovery mission. Example: University of Southern California in Los Angeles acts as the home base for post Rodney King riot rebuilding program	City or state places its resources in the University and uses it to launch the recovery. City/state recovery offices located on or near the campus and campus resources ranging from project management to government grants and programs run by the University
	University provides or focuses its efforts through these organizations to immediately make them available to work with local institutions. Example: University of California at Berkeley with its Architecture and Urban Planning re-plan Bay Area post-earthquake	In this case the local/state and other organizations usually have a long term set of relationships with the University staff and there is mutual understanding and respect. The University provides needed information and advice to government
	Many different sets of skills are required in a disaster but they need to be coordinated to be fully and effectively used. Example: NYU-New School, City University of New York consortium post 9-11	In this arrangement the Universities and governments nominate the leadership of the Consortia and it organizes a central resource center so that the resources of the entire set of institutions can be used effectively
	Experts are employed as consultants and advisors on technical issues in recovery Example: In Katrina/Rita the Corp of Engineers, State Gov't and various community groups used expert advice on levee reliability and future options	Selecting University experts is useful when the experts are well known and highly regarded so that policy is re-shaped through this approach
	When there is debate over various important and sensitive issues the University can be the neutral to advise all parties as to the best direction. Example: UCLA Real Estate Institute used to settle issues of estimating damages from Northridge Earthquake	For the University to play this role the government and community must have a history of positive interaction
	Institutes used existing organizations to train local community leaders as well as adding capacity to local government. Example: Post Katrina, Harvard's JFK School and Penn's Urban Institute with its Curex program that assisted in developing new professionals for the recovery	Community organizations can gain skills from these outside resources. Government officials can and should go to training programs both to enhance their skills and as a way of reducing post disaster fatigue
	Race and class conflicts always grow post disaster. Example: Milano Graduate School work with Hispanic and undocumented workers post 9-11	Local/State and federal governments are always wary of such groups unless the University makes sure that they stay within bounds of social responsibility
	Since the University is not based in the area it is hard to make an institutional connection Example: Post Katrina professorial teams from several universities like Georgia Tech, Brown, Dartmouth took on areas of New Orleans as laboratories of recovery	
	The entire Gulf Coast had many volunteers from local and distant universities across the world	Governments see such resources as useful but very taxing since there is no connecting point for these individuals

Figure 1: *University Roles in Recovery*

the margin are not easy for universities. The organization and staff direction of most tertiary institutions will require substantial examination before they will be able to maximize their utility in recovery. Complicating all of this is the fact that disasters are short, but recovery is a long-term activity. Few, if any, universities are prepared for a five to 20-year commitment for the recovery of any locality.

Each of the roles described above has it merits. An essential first step is for every university to develop a predetermined, coherent internal approach to both disaster and recovery assistance that the institution can offer to communities both locally and at a distance. Every university can become involved in capacity building at some level and use its curricular resources to prepare people in some aspect of recovery, from engineering to dealing with post-disaster social trauma.

Big donors and celebrities

After every crisis, movie stars, big business magnates and important personalities rush in with their own solutions, often before the government or others responsible can develop a clear plan. One asset these high profile individuals bring is highlighting attention to the situation. But the liability is that they are bigger than the problem and need a great deal of attention to ensure they don't undermine the efforts of the rescue and rebuilding team.

There is no easy formula to deal with such personalities, because they take up media and institutional space, and often have their own media access, which they use to intervene in ways that aren't always helpful. In addition, their interest may wane as the slow, long recovery gets underway, leaving their projects for the recovery managers to deal with long afterward.

There are several proven ways to deal with these 'partners'. First, hire a media team to fashion clear, clean messages about what is needed for the recovery. This team should be separate from the city's existing political media staff, as the political media that focuses on the political issues and personalities frequently makes matters worse.

It is better to have a small local firm, which knows the people and the local culture, to get a media approach organized using social media first and broadcast media later. In its flood recovery, Queensland used social media so effectively that many big names had to stand down because the government appeared to be on top of the issues and penetrating all markets.

Second, establish an official ambassador to the high profile personalities, someone who knows the media and the private sector well. Usually, this person is an ex-mayor or ex-corporate chair who commands considerable respect. They usually answer to such a call readily and put their own team to work to help shape the story. They must be kept closely in the loop on the recovery if they are to be effective.

Third, develop a clear list of things the community needs and wants and get that message out globally, so that unwanted equipment and supplies donated by big givers don't clutter warehouses and distract from the recovery efforts.

Modes of partnership for post-disaster recovery

The key modes of recovery partnership are:

- **Recovery Planning**: Participatory planning for post-disaster reconstruction requires the involvement of many different players – representatives of the affected stakeholders, technical experts, state/provincial and national government officials, and sources of finance;
- **Recovery Financing**: Rebuilding following the physical damage and economic losses of a disaster is usually a costly proposition that requires multiple sources of finance from private banks and insurance companies, public agencies and, in the case of developing countries, from the international community;
- **Technical Assistance**: Both recovery planning and implementation benefit from technical support to ensure that international good practice can be applied to the local situation in order to improve the quality, impact and speed of reconstruction; and
- **Capacity Building**: Local capacity for providing services and infrastructure can be decimated following a disaster so there is both a short-term need to augment institutional abilities as well as a longer-term need to rebuild local institutions.

Adding value and learning lessons from partnerships

Partnerships for post-disaster recovery add value to the process by addressing the financing gap between reconstruction needs and immediately available finance. They also fill the gap between what is known locally and internationally about reconstruction, and accelerate the pace of recovery through coordination, cooperation and removal of barriers. Such partnerships strengthen institutions so that they are more capable of managing the recovery, and improve governance by giving voice to stakeholders in both recovery planning and implementation. This final section of the chapter characterizes each of these 'value add-ons' and draws lessons for managing these partnerships.

Addressing the financing gap

One notable difference between recovery in low-income countries and developed economies is the lack of formal insurance coverage by households and businesses. For example, about half of the losses resulting from both Hurricane Andrew in Florida and the Northridge earthquake in California were covered by formal insurance, while less than 15 percent of losses resulting from the Indian Ocean tsunami were covered (*de Mel et al. 2008*).

Lessons

Reconstruction can be delayed if adequate financing is not available. This can be overcome by: Reconfiguring existing projects and programs in the disaster-affected area; drawing on government sources of standby financing; and mobilizing external

assistance from donors and NGOs that can flow outside of the government budget to support government policies and programs.

Filling the knowledge gap

When reality gets turned on its head after a disaster, good information is at a premium – it is needed urgently but is hard to obtain. Partnerships can help fill the knowledge gap right from the outset with the preparation of a Post-Disaster Needs Assessment (PDNA), which combines damage and loss economic analysis with a more survey-based approach to basic needs. During the reconstruction, financial tracking, combined with monitoring of a results framework and/or reconstruction standards, can be used to gauge the ongoing performance of reconstruction activities and the recovery program as a whole. Finally, important information can be generated by conducting a post-reconstruction evaluation, both to assess final performance and to learn lessons for reducing the risk and responding to future disasters.

Lessons

1. Build communities – the initial rush to provide shelter can result in rebuilding structures, not communities. In addition to structures, attention must be paid to local infrastructure (water, sanitation, transport, electricity, waste management), livelihoods, and social and religious facilities.
2. Pick the right partners – partners should be chosen based on their proven ability to deliver good practices. Conversely, inexperienced but perhaps well-financed partners can actually reduce the quality and pace of recovery.

Accelerating the speed of recovery

The pace of reconstruction can be hindered or hampered depending on how well partnerships are managed. For example, the lack of local-national coordination in the initial post-Hurricane Katrina response was later reflected in various aspects of the recovery phase and contributed to making rapid reconstruction problematic. On the other hand, countries that have established effective coordination mechanisms for local, national and even international coordination, have fared better in implementing a swifter recovery (for example, Japan after the Kobe earthquake, Indonesia after the tsunami and the Yogyakarta earthquake, Pakistan after the earthquake).

Lessons

1. Coordinate partnerships – a multitude of well-meaning partners may want to contribute to the recovery process but, if uncoordinated, they can work at cross-purposes. These potential roadblocks to speedy recovery can be overcome by formal and informal coordination mechanisms.
2. Incorporate disaster risk reduction (DRR) – resilience to the next disaster can be increased at a relatively low cost by building DRR into the recovery process. This includes greater public awareness, early warning systems, more resilient infrastructure, more responsive services, better location of facilities, and institutional coordination for disaster response.

Strengthening institutions for recovery management

Local institutions often suffer from severely reduced capacity following disasters, losing staff, buildings, equipment, and records. National institutions can be similarly affected, as was the case following the January 2010 earthquake in Haiti. In order to ensure the long-term sustainability of recovery and ensuing development, partnerships must incorporate a focus on strengthening local institutional capacity.

Lessons

1. Involve local authorities – local governments, along with communities and NGOs, are often the first-responders following a disaster and are accountable for eventual management of the reconstruction process. Strong local governments should be acknowledged leaders in the recovery, while weaker local governments may require significant capacity building. When reconstruction is handed over from stronger partners to local government, the local authority must be prepared to receive, manage, and maintain assets that are being transferred.

2. Consider whether to manage recovery through dedicated institutions – recovery from a major disaster may call for the creation of a dedicated institution or authority (a recovery 'czar'). The costs and benefits of this approach need to be weighed carefully, but quickly.

Giving voice to stakeholders

Communities represent the social capital upon which recovery is based. Community representatives, organizations and leadership should be involved in all key activities such as land reallocation, settlement planning and housing construction/repair. Public participation may increase transaction costs in the short run but will improve the overall quality and effectiveness of the recovery effort.

Lessons

Establishing regular mechanisms for communication can help to strengthen the voices of those affected. This can occur in different ways, such as by having representatives of different stakeholder groups participate formally in the governing bodies that plan and implement the recovery, and creating complaint-handling systems, hotlines, media talk shows, roadshows, and other opportunities for beneficiaries to provide feedback on the pace and quality of the reconstruction.

Lessons for building partnerships

Siembieda (2010, *this volume*) has identified a number of principles that can facilitate effective partnerships before disasters happen:

- **Train local people prior to an event:** Training helps people to organize themselves, identifies leaders, and creates a larger number of first responders. In short, it creates a network that represents valuable social capital when a disaster strikes.

- **Create capacity to receive assistance from unconventional sources**: Networks within communities can be identified and developed to become partners with NGOs, foundations, faith-based organizations, and other groups to support reconstruction that complements or supplements government action.

- **Set up local governmental linkages prior to a disaster**: Better coordination within local agencies and between municipalities can be established on an ongoing basis and will facilitate cooperation in the event of a disaster.

- **Plan for disasters**: during the reconstruction, disaster resilience and preparedness should be mainstreamed in projects and programs; for example, new housing should be disaster-resistant and community education efforts should include disaster awareness training.

MANAGING PARTNERSHIPS: A CHECKLIST FOR RECOVERY MANAGERS

PRE-EVENT

- Train local people to organize themselves and create networks before a disaster strikes.
- Create the capacity to receive assistance from unconventional sources to finance recovery.
- Set up linkages within and between local governments in disaster-prone areas.
- Mainstream disaster resilience and preparedness in existing projects and programs.
- Fill the financing gap by ensuring that funds are immediately available for relief and recovery.
- Fill the knowledge gap by having data, trained staff and management information systems in place.

POST-EVENT

- Address the financing gap by reconfiguring existing activities, drawing on standby resources and mobilizing external assistance.
- Fill the knowledge gap by conducting a post-disaster needs assessment, tracking financial flows, monitoring recovery indicators, and preparing a post-reconstruction evaluation.
- Accelerate the pace of recovery by establishing effective coordination mechanisms at the local, national and international levels (if necessary) and between these levels.
- Strengthen institutions for recovery management, especially by involving local authorities and considering whether to create a dedicated recovery body.
- Give voice to stakeholders by involving affected groups in recovery planning and implementation.

In addition, one could draw on these lessons for disaster risk reduction and add:

- Addressing the financing gap: by ensuring that funds are immediately available to help finance both relief and recovery, e.g. by expanding access and use of disaster insurance, putting lines of credit in place that can be drawn down in emergencies and establishing an ongoing fund that can receive contributions in the event of a major catastrophe.

- Filling the knowledge gap: by having key background studies and databases completed, staff who are trained in conducting PDNAs and management information systems in place that can track recovery financing and investments.

Further reading

The cases and resources section for this chapter includes:

- A detailed case study by Reardon of an effective partnership between a national NGO and an academic coalition following Hurricane Katrina;
- Leitmann's review of the institutional partnerships created after the Haiti earthquake;
- Siembieda's discussion of Nicaragua, which offers an example of how the challenges associated with coordinating recovery in developing countries can be overcome; and
- A case study by Gough on how communications mechanisms can assist with inter-agency collaboration in the recovery period, as occurred in Mississippi after Hurricane Katrina.

Cases and Resources for Chapter 3

Community/university/city post-disaster partnerships: a postcard from new orleans' lower 9th ward

Kenneth M. Reardon

University involvement in recovery

In early September of 2005, I received a call from the National Director of the Association of Community Organizations for Reform Now (ACORN), who was attempting to secure planning and design assistance for the residents of New Orleans' heavily-damaged eastside neighborhoods. As the then Chair of Cornell University's Department of City and Regional Planning, I first consulted with our students and faculty regarding their willingness to become actively involved in resident-led recovery efforts in New Orleans. Our planning students and faculty voiced unanimous support for this effort, which we named the New Orleans Planning Initiative (NOPI).

During the coming weeks, I collaborated with Jane Brooks of the University of New Orleans and Rob Olshansky of the University of Illinois at Urbana-Champaign to organize a special session on post-disaster planning in New Orleans at the Annual Meeting of the Association of Collegiate Schools of Planning in Kansas City, which was designed, in large part, to mobilize planning and design schools to partner with ACORN chapters in New Orleans that were becoming increasingly involved in post-disaster recovery planning.

Representatives of 17 planning schools, the Association of Collegiate Schools of Planning, and the American Planning Association participated in this hastily convened forum. The majority of schools attending this session agreed to work with various local chapters of New Orleans ACORN and to assist the organization in recruiting academics to participate in ACORN's Katrina Survivors Association's Rebuilding the Gulf Conference.

The 40 planning and design faculty members who participated in ACORN's Conference provided the 150 ACORN leaders who attended this event with a list of more than 50 research projects that they believed could advance New Orleans' major recovery efforts. ACORN's leaders responded to the academic planners proposed research agenda by challenging the representatives of the assembled planning schools to work with their chapters in the Lower and Upper 9th Wards, Gentilly, New Orleans East, Broadmoor, and Lakeside neighborhoods to prepare and implement comprehensive recovery plans that would allow their members and neighbors to return home.

As the conference came to a close, three Cornell planning faculty members agreed to work with ACORN's Lower 9th Ward members and leaders on a series of immediate relief and recovery-related research, planning, and design projects. In an effort to prepare our students and ourselves for practice in this very challenging and largely unfamiliar professional setting, we quickly organized a half-semester course that offered planning volunteers with a basic introduction to New Orleans'

ecological, economic, social, and planning history. Thirty-eight students and faculty participated in this seminar that emerged as the major organizational vehicle for recruiting volunteers and raising funds to support resident-led relief and recovery in the Lower 9th Ward. This was the first of 12 New Orleans-focused planning, design and management courses that Cornell's Department of City and Regional Planning organized to address the direct service, policy research, urban planning and design needs identified by ACORN's Lower 9th Ward Chapter.

What made the Lower 9th Ward different

While questions were being raised about the desirability of rebuilding the Lower 9th Ward, given its potential vulnerability to future storm damage, residents were struggling with a number of unique challenges that other neighborhoods did not face. In the weeks and months following Hurricanes Katrina and Rita, the Lower 9th Ward's residents, institutional leaders, business operators, and property owners were denied access to their properties. On several occasions, contractors hired by the city were dispatched to demolish sections of the Lower 9th Ward, despite the fact that structures within these areas had not been appropriately inspected.

The city's delay in certifying the safety of the Lower 9th Ward's water supply prevented residents from gaining access to FEMA trailers, which significantly complicated their efforts to return home. While schools and health clinics were quickly re-opened in other parts of the city, the Lower 9th Ward remained without these and many other critical services, discouraging many people from returning to the area.

The serious environmental, economic, and social problems that Lower 9th Ward residents endured for decades prior to Hurricanes Katrina and Rita, along with the extended period of time these same residents were subjected to post-Katrina deprivations, highlighted the need to build a broad base of political support among local residents and their allies to insure the adoption and implementation of any resident-generated recovery plan. This was especially true if the goal of such a plan was to dramatically transform conditions within the Lower 9th Ward rather than simply restore them to their pre-Katrina conditions.

However, several factors complicated these efforts to promote resident involvement in the recovery planning efforts. Many local residents and neighborhood leaders had invested considerable time, effort, and political capital in a recent effort to devise a new comprehensive development plan for the city that was never officially adopted and implemented, leaving them frustrated and disappointed. In addition, residents were acutely aware of planned shrinkage proposals that called for a reduction in the size of the city's footprint and would feature the systematic withdrawal of services from areas like the Lower 9th Ward, which were designated unusually vulnerable to future storms.

The involuntary evacuation of the Lower 9th Ward's entire population to locations far from New Orleans also greatly complicated efforts to involve residents in the recovery planning process. This was especially true in situations where family members had been split up and/or moved to multiple transitional housing facilities

in a relatively short period of time. The trauma experienced by families trying to unite, secure decent transitional housing, apply for short-term relief, and determine if and how they might return to the city, left many families with little time and energy to become involved in resident-led recovery planning efforts.

Developing a three-part strategy for citizen participation

Working with ACORN's Lower 9th Ward members and leaders, we devised a three-part strategy for promoting broad-based citizen participation in the recovery planning process. First, ACORN made a commitment to providing a free house gutting and de-molding service. The visible evidence of families restoring their homes with ACORN's assistance encouraged others to do likewise and to become involved in the subsequent ACORN-sponsored planning process.

By successfully undertaking a series of small, doable, and highly visible improvement projects like this, community development professionals overcame a significant barrier to community change – residents' cynical belief that nothing will happen.

Second, our department organized four separate planning studios to conduct research on issues that were complicating the residents' initial recovery efforts. This step involved recognition that residents were often too overwhelmed by the physical requirements of gutting their homes, businesses, and churches and psychologically drained by filing insurance claims and benefits applications to participate in a recovery planning process. By volunteering to undertake these research projects, we "earned our license" to operate as both good neighbors and partners. The projects that we undertook included:

- A review of alternative high-reliability/low-cost methodologies for assessing the structural integrity of residential buildings;
- An econometric model for determining the optimal mix of paid versus unpaid staff on building demolition, rehabilitation, and new home construction;
- An investigation into alternative urban design strategies for re-weaving the isolated pockets of the Lower 9th Ward where residents had begun to return together; and
- A feasibility study for re-opening a recently-abandoned public market to serve as a source for high-quality, low-cost, and culturally-appropriate fresh foods.

Third, our students worked with ACORN's leaders to prepare a Manual for Community-Based and Resident-Controlled Neighborhood Planning. Several weeks after completing this publication, we submitted a joint-proposal to provide comprehensive recovery planning services in response to a city-issued Request for Qualifications for Comprehensive Neighborhood Recovery Plans. Joining with students and faculty from Columbia University and the University of Illinois at Urbana-Champaign, we proposed the creation of a new community/university partnership involving these three institutions, ACORN, and ACORN Housing, to undertake the completion of a comprehensive recovery plan for one of the city's officially-designated planning districts.

Assisting citizen participation in UNOP

In August 2006, we were notified of our selection as one of the five senior consulting organizations working on the creation of the Unified New Orleans Plan (UNOP). From September 2006 to January 2007, nearly 90 Cornell, Columbia, and University of Illinois students and faculty worked with ACORN members and neighborhood leaders to complete the following: an in-depth study of past plans; detailed analyses of recent population and housing trends; structural assessments of more than 3,000 building lots; interviews with 90 local business owners; inspections of more than 25 public spaces; and interviews with 270 returnees.

The analysis of these data by participating students, faculty and leaders of ACORN's Lower 9th Ward and City-Wide Executive Committee resulted in a comprehensive recovery plan: *The Peoples' Plan for Overcoming the Hurricane Katrina Blues: A Strategy for Creating a More Vibrant, Just, and Sustainable Ninth Ward.* The extraordinarily positive response this plan received from local residents, their elected officials, and the press resulted in its quick adoption by the New Orleans Planning Commission and the City Council.

The plan was unique among post-Katrina plans in that it did not try to restore the 9th Ward to its pre-hurricane state by rebuilding basic infrastructure systems, encouraging housing rehabilitation, and supporting small business re-openings. Instead, recognizing the serious environmental, economic, and social problems confronting this community pre-Katrina, the Peoples' Plan sought to transform the community through a comprehensive redevelopment strategy that gave equal attention to the community's social and physical capital needs.

Those who participated in the Peoples' Plan view Ed Blakely's March 2007 decision to direct $140 million of the available $1.1. billion in CDBG funding for community revitalization to the Lower 9th Ward as one of the plan's greatest legacies. They view the ongoing partnership involving ACORN, ACORN Housing, Cornell, Columbia, and Illinois as another important outcome. Finally, they consider the positive example this process provided of how similar community/university partnerships can contribute to future economic and social recoveries as a significant contribution to the field of recovery management.

DISCUSSION QUESTIONS

1. How does this case follow the planning principles set out in the book?
2. What do you think are the key lessons from this approach? What are the key gaps?
3. What are the advantages/limitations for a university playing the roles described here?

Tailoring financing partnerships to match conditions in Haiti

[Adapted by Joe Leitmann from haiti reconstruction fund 2011]

The devastating January 12, 2010, earthquake in Haiti generated an enormous outpouring of international support. Governments, private entities, non-governmental organizations, creditors, and multilateral agencies around the world mobilized substantial resources to support relief and recovery. Some of these contributors have the capacity and desire to manage their own resources on the ground with the Government of Haiti (GoH). Others prefer to combine their support in a multi-donor effort to help finance the recovery.

In response to a March 2010 request from the Government of Haiti, the Inter-American Development Bank, the United Nations and the World Bank, along with contributing donors, established a multi-donor fund called the Haiti Reconstruction Fund (HRF). The role of the HRF is to provide financing for the GoH's post-earthquake Action Plan for National Recovery and Development of Haiti and related initiatives. At the GoH's request, the International Development Association (IDA) of the World Bank Group serves as Trustee for the Fund. From March to June 2010, the World Bank worked with the GoH, IDB, UN, and contributing donors to create a governance structure and mobilize resources so that the HRF could become operational.

The objective of the Fund is to support the mobilization, coordination and allocation of contributions to improve basic living conditions in Haiti and build the capacity of the Government of Haiti in the longer term. To meet this objective, the HRF coordinates its activities with the Government of Haiti, and especially the Interim Haiti Recovery Commission (IHRC).

Pooled contributions from donors provide grant financing for priority activities that are in line with the GoH's Action Plan for National Recovery and Development, are endorsed by the IHRC and approved by the HRF Steering Committee. The HRF grant approval process, which consists of six simple steps, is aligned with the IHRC project review process to maximize efficiency and facilitate coordination.

The HRF was designed to operate in the challenging context of post-disaster Haiti. Prior to the earthquake, Haiti was emerging from a long history of poverty, inadequate governance, uneven foreign assistance, corruption, and instability. The disaster exacerbated all of these factors. These challenges had to be taken into consideration when the HRF was designed so that it could operate effectively in a very difficult post-disaster environment. The table below summarizes the issues faced and how the HRF has responded.

ISSUE	NEED	HRF RESPONSE
Damage from earthquake affected every sector of society and economy	Ability to respond to a wide range of reconstruction needs, including budget support	Work with Partner Entities that have a broad set of comparative advantages
Government capacity seriously weakened at all levels	Build capacity and authority by putting the Government in a leadership role	Government chairs HRF Steering Committee and IHRC sets the priorities for financing
History of corruption and inefficiency	Need for transparent and accountable procedures	Funds flow through Partner Entities who appraise and supervise each activity
Previous aid did not always produce sustainable, high-quality results	Apply international good practice for project design, financial management, procurement, environmental and social safeguards, monitoring, etc	Policies and procedures of the Partner Entities, embodying international standards, are used for each activity
Many reconstruction needs are urgent	Ability to make funding decisions and transfer resources quickly	Adherence to tight performance standards to enable rapid response
Capacity to implement is hampered by many factors	Need to work with entities that have a proven capacity to deliver results	Flexibility to support a range of implementing agencies (Govt., NGOs, UN, private sector, etc)
HRC is a unique and untested approach for coordinating the recovery	Importance of working closely and productively with the IHRC	HRC sets HRF financing priorities; HRF Secretariat is co-located with IHRC; HRF meetings are synchronized with IHRC meetings

***Figure 1**: Design Factors for effective HRF Operation*

This tailored approach has paid off. The HRF has become:

- The largest source of unprogrammed funding for the reconstruction of Haiti, with 20 percent of all reconstruction finance being channeled through the HRF;
- An international partnership led by the Government of Haiti and the Interim Haiti Recovery Commission;
- An effective mechanism for raising money (US$352 million so far) and allocating financing for reconstruction (US$237 million for fourteen activities during the first year);
- A means of strategically closing financing gaps to achieve a balanced recovery; and
- An efficient mechanism with rapid, flexible procedures and low operating costs.

Recovery of housing in Nicaragua (Ocotal)

William Siembieda

Nicaragua has been affected by one-quarter of all highly destructive natural hazard events to strike Latin America. Hurricane Mitch caused extensive river flooding and forced hundreds of families living in irregular settlements to abandon their destroyed houses. In the municipality of Ocotal, population 31,000, half the population lives below the poverty line, and 20 percent live in conditions of extreme poverty. Rapid urban expansion led many poor families to settle in the Dipilto River flood plain on the city's limit, and all of their houses were destroyed.

Key recovery points

A decentralized approach was adopted to manage the recovery. The municipality was the focal point for the recovery process, keeping strict financial control of the international aid and managing the execution of critical action proposals for the victims through an Emergency Committee. As central government funding was delayed, local leaders were required to take charge, and they remained in control throughout the recovery. The integration of physical recovery (houses and infrastructure) with economic recovery (jobs) was accomplished by the municipality using funding from the central government and donor communities to build a local adobe brick factory. The factory employed local community people and the bricks produced were used for construction of a new neighborhood on a land parcel outside of the river flood zone.

Key actions

Recovery was handled by the municipality through the application of a strong land use planning and relocation strategy, efficient construction of homes and basic infrastructure, and by promoting the resettlement project. During the emergency phase, the Emergency Committee was activated, followed by the local Civil Defense agency. In 1999 and 2000, a local network linked to the Emergency Committee was organized, known as Pueblos Unidos de Ocotal. Through the construction, ownership and operation of the brick factory, the municipality had the means to implement a holistic recovery strategy that included improved shelter, employment and disaster mitigation measures.

Early in the recovery, a group of organizations and local entities acknowledged the municipality's leadership and authority and volunteered their efforts in the hurricane damage assessment. Owing to the lack of immediate federal assistance, local organizations managed the aid received, establishing their own networks to distribute the donations provided for the hurricane and flood victims. The ability to organize, assign tasks and focus on key needs provided important reassurance and signs of progress for the community.

Resourcing mistakes made by the central government once federal aid began to flow reinforced the ongoing need for strong municipal decision-making. For example, the reconstruction of a bridge over the Dipilto River that didn't reflect the

Pan American Highway specifications aggravated the situation, and resulted in the solicitation of external Swiss funding to build a replacement bridge in accordance with technical requirements.

The municipality also established a Municipal Prevention, Mitigation and Disaster Attention Committee. External NGOs provided training in disaster matters and participated in the development of community diagnosis and risk mapping, as well as assisting the Committee in the creation of the Preparation and Disaster Attention Plan and the Prevention, Mitigation and Disaster Attention Plan for the Municipality of Ocotal. The municipality now has a digital database that contains risk-factor information for each one of the city's 22 neighborhoods and a local flow chart of actions to take during emergencies.

A key mechanism that enabled the new neighborhood's construction was the partnerships the municipality had with NGOs prior to Hurricane Mitch. For example, the UNPRHU (whose main office has been in Ocotal for over 10 years) has established important relationships with the population's organized sectors and the municipal mayor, and has worked in the construction of homes and helped to promote employment. Similarly, the Humboldt Center worked on the community's risk management and environmental recovery.

DISCUSSION QUESTION

- This is an example of 'bottom up' planning; why does it seem so much more effective than top down planning approaches? Is it a question of weak higher levels of government or better ideas and capacities at the community level?

Learning to collaborate in post-Katrina Mississippi

Meghan Z. Gough

Following Hurricane Katrina, five localities in Jackson County, Mississippi learned how to collaborate for recovery and land use planning by adopting a multi-jurisdictional emergency response structure. Several strategies were employed by the incident management team assigned to work with these localities that mended and created relationships, built trust, and institutionalized collaboration. This approach offers a number of lessons for establishing collaboration in emergency response that can positively impact politics, relationships, and efficiency for subsequent recovery and land use planning efforts.

Incident management teams

Disasters are typically characterized by an influx and involvement of organizations and government agencies that do not normally work together. To minimize the disorder and increase the efficiency of responses involving multiple and overlapping agencies, a system for coordinating and managing personnel and resources is necessary. The Incident Command System (ICS) originated in California as a method to allow multiple jurisdictions to respond to wildfires effectively and to remove barriers that prevented inter-jurisdictional collaboration. An ICS is a standardized system that divides emergency response into uniform functions across jurisdictions to streamline organizational structures, establish consistent terminology, and

ensure compatible communication processes. In response to Hurricane Katrina, the Mississippi Emergency Management Agency requested assistance from California through a state-to-state mutual aid agreement for disaster recovery. Within days incident management teams (trained responders specialized in implementing the ICS) were dispatched to Mississippi.

On September 15, 2005, the East Bay Incident Management Team arrived in Jackson County, tasked with utilizing an ICS structure to remove barriers that might prevent the county and the cities of Gautier, Moss Point, Ocean Springs, and Pascagoula from working together. The team organized the five jurisdictions into geographic branches, with the emergency response for each jurisdiction divided into five key recovery functions for recovery (debris removal, housing, infrastructure, medical, public safety). This organizational structure applied independently to each jurisdiction and served as the final operating structure under the direction of the East Bay team.

At the completion of its two-week assignment, the East Bay team recognized that while the structure of the ICS was successful in removing the technical barriers between jurisdictions, it did not address political and institutional barriers to working together. Organized in geographic branches, the individual jurisdictions began dealing with their own recovery issues and soon found themselves competing with each other for the same state resources. Instead of seeking ways to work together to get the state to fulfil their recovery needs, some jurisdictional leaders were calling congressional members directly on behalf of their own jurisdictions when resources were slow to arrive. Politics and inter-jurisdictional conflict were limiting the success of the incident command system structure.

A unified structure

On September 29 the Region II Incident Management Team (Team II) arrived in Jackson County. In addition to being trained in the ICS, this team was selected for its members' experience in managing conflict and strained relationships between jurisdictions. Their task was to build on the existing ICS and expand it to create a unified command, with the goal of bringing together the incident commanders of the individual jurisdictions to coordinate decisions and responses. This new structure linked the jurisdictions functionally instead of geographically, thereby providing a forum for working together, agreeing on common objectives and strategies, sharing information and resources, and increasing the efficiency of the response. The unified command approach would equip the jurisdictions to manage future recovery efforts collaboratively without further direction from the California teams.

Team II confronted many political obstacles to implementing this unified command. They quickly realized that long-standing political issues had been obstructing the potential for the five jurisdictions to work together – not only on a daily basis, but also during emergencies. An aggravated relationship existed between the county and the cities, characterized by turf wars and control issues, and the cities were starting to make decisions alone because they did not want to be ordered around by the county. In addition, a contentious political rivalry between two jurisdictions prevented them from sitting in the same room together.

Political disputes were also exacerbated by emotional issues associated with the personal losses suffered by jurisdiction staff members from the hurricane. It was apparent to Team II that to implement the ICS successfully, it was necessary to foster trust and social capital with and between the jurisdictions and provide proof that working together in the ICS structure could benefit the jurisdictions individually and collectively.

Building relationships

Team II employed a number of strategies to build trust and convince the jurisdictions of the merits of working together. It held a number of informational sessions on obtaining multi-jurisdictional grants and the coordination and sharing of resources and disaster cost reimbursement. The most influential strategy employed by Team II was the interactive process of developing the new organizational chart for the unified command. It had already identified a functional branch structure for the unified command, but unlike any activity the team had participated in previously, this process required the jurisdictional leaders to engage in an interactive procedure that facilitated the sharing and distribution of their individual resources. As one team, the jurisdictions identified the best people within their respective local governments to be in charge of each of the five functional branches. Then the branches were staffed by a representative from each of the five jurisdictions, weaving together the collective resources of each jurisdiction.

Placing their collective resources on table, the process encouraged the local government leaders and their staff to think regionally instead of individually. The tangible result of the process was a collectively completed organization chart based on talents within the cities and county. The important intangible result was the much-needed development of trust and social capital among the jurisdictions.

The Region II team was only on site for two weeks, so it faced limited time to implement the unified command. To solidify the transition, in the first week the unified command team shadowed the incident management team, whose members showed them how to carry out the function of their new unified command structure. The second week required the unified command team to lead and gain confidence in its ability to run meetings and briefings while following the new structure.

The unified command team of jurisdictional leaders officially took control of the recovery during week two, facilitating new ways to understand and reframe their identities in relation to recovery and planning for the larger region.

The Jackson 5: thinking like a region

The process of organizing and establishing a unified command resulted in the creation of a strong network of relationships that cross jurisdictional boundaries. One indication of the bonds formed during those two weeks is the decision of the jurisdictions to call themselves the 'Jackson 5' – the five local governments within Jackson County. The local governments are quick to credit the leadership and processes of the incident management teams for helping them see the benefits of collaboration and interdependence in the early days of the recovery. The process helped the jurisdictions to develop a strong sense of camaraderie during this tough

time, as well as providing much-needed reassurance that other local government leaders were facing similar challenges and dealing with them in similar ways.

The act of bringing the jurisdictions to the same table, and challenging them to consider their resources as an interdependent region, was transformative and instrumental in opening up subsequent collaboration opportunities. Because they all benefited from the process, the jurisdictions have continued to meet regularly outside of the official recovery. In 2006, the city and county officials in Jackson County toured Chattanooga, TN together to learn about land use planning ideas that can result from working together. In 2008, when some of the mayors in the original unified command team left office, the new political leadership was welcomed in and introduced to the inter-jurisdictional approach.

The success of the incident management teams sent to Jackson County, Mississippi may be attributed to three key factors. First, the teams were well-trained in ICS and had extensive experience managing the politics of multi-jurisdictional collaboration. They understood the political issues creating obstacles between the jurisdictions, but remained neutral mediators while applying their methodology for recovery. Second, the teams were able to adapt the incident command structure to meet the needs of the jurisdictions. When a geographically branched structure began to fail, they transitioned to a functionally branched unified command structure that built relationships and transitioned control of the response to the local leadership. In doing so, the structure inherently created inter-governmental ties and helped establish a culture of collaboration. Finally, the incident management team mentored the unified command throughout the process and checked in periodically afterwards. This personal connection and motivation was essential for morale and ensured the continuation and success of the unified command.

***Figure 1**: Unified command in Jackson County*

Source: Meghan Z Gough

DISCUSSION QUESTIONS

1. Regional collaborations arise in disasters and sometimes continue post-disaster. What potential do these collaborations offer beyond emergency services?
2. Do you know of other examples of good continuing regional post-disaster collaborations?

Chapter 4: Disaster Recovery Managers

ROLAND ANGLIN*

Disaster recovery is a process defined by fluid beginning and end points. Generally speaking, the recovery process lasts between 12 and 36 months, a period defined by the birth and death of the organizations charged with managing the effort. This process fits well with the Project Management Body of Knowledge (PMBOK) now often used in many management disciplines. The central elements of PMBOK are used in this chapter not only as a descriptor, but also to frame the elements the process should incorporate to increase the probability of successfully restoring or enhancing a place that has been destroyed.

Much of the information used as a base for our analysis comes from interviews with recovery managers who have led recovery efforts all over the world. While they are a selected group, their thoughts and recollections help us flesh out the links between project management as a concept and frame the process of recovery from a disaster.

Defining project management in relation to the recovery process

Project management is the planning, organizing and directing of resources, broadly defined, to achieve an objective. Central to project management is the calibrated, yet flexible allocation and management of human and technical resources, linked to a time schedule. This distinguishes project management from an ongoing program or administrative concerns, such as a company division or a public agency. Programs or other ongoing administrative entities have no defined sunset, nor are allocated resources necessarily tied to specific timing and tasks in a defined plan.

Project management has gained currency in recent years for many reasons. The private sector often uses this method to manage the decreasing length of product life cycles. In a competitive market, companies develop projects and project teams that are outside routine programs or product divisions in order to encourage innovation and bring products to market in short time frames – often 18 months or less.

The public sector is using project management to tackle tough issues that might not get due attention if left to the routine mission and operation of public agencies. Another major issue that seems well suited to project management is that of sudden changes in capacity requirements, such as in the aftermath of a disaster. As one recovery expert says about the Indian Ocean tsunami:

> *"The magnitude of the post-tsunami recovery was unprecedented, and an unprecedented entity was needed to coordinate within the government*

* With assistance from Allison Harris, Christopher Jones, and Kenya Crummel

and also because there was so much assistance flowing in from official development sources and from the NGO community. There was, at first, a concern about the central government's ability to respond to the disaster, because local government had been weakened after 30 years of civil war. The region hit by the tsunami was devastated economically, politically, and socially, so it was up to the central government to make many decisions. However, the problem was that the central government was not very present, because of the civil war, so there was a strong military presence but little else. None of the key ministries was able to step up to the plate, so there were early discussions about the need for a specialized institutional arrangement that then became the recovery agency." (Leitmann interview 2010)

Blakely points out that the recovery entity, conceived as a project, can take many different forms depending on the circumstances:

"One example sees the recovery effort embedded within the existing government emergency management apparatus. Management or direction of the effort may just be carried out from the mayor's office. A director/coordinator of recovery is in charge of the effort and responsible for coordinating all existing agencies to conduct their specific roles in the recovery process while still fulfilling their regular operations. The director/coordinator must also manage the disaster site and the creation of a recovery plan. This can involve the original emergency staff but often involves new personnel. Another example sees the creation of an office of recovery management within the government that has full responsibility for recovery. These responsibilities include raising and appropriately allocating public or private funds and prioritizing recovery activity. This office and its manager are also responsible for producing the recovery plan. Then there is the example of an external recovery agency that is separate from the existing government operation and just runs the recovery. Establishing such an organization is similar to outsourcing recovery. A recovery agency requires the following: a settlement program that includes social welfare and housing; an infrastructure component for streets [and public transportation]; an environmental component; and a management component to coordinate all of the different work. The relationship between the political structure and this agency - sometimes this agency is a contractor that reports to the assistant city manager or deputy director. Or the manager of this agency can report directly to the mayor and city council." (Blakely interview 2010)

Blakely stresses that: "The model chosen depends on the administrative context and capacity of the affected place and the needs of the 'sponsor,' the political agent ultimately charged symbolically or through electoral mandate for recovery" (*Blakely interview 2010*). But none of the models mentioned by Blakely or others in the literature accepts, as routine, one line department taking full responsibility for implementation.

The role of the sponsor

Identification of the sponsor is central to good project management and usually not complicated in the clear designation of the person or agency. The sponsoring agent usually has authority and control over the initial assignment of the project, the time frame for completion and allocation of a budget and other resources. The use of project management, as a model process, must take into account the multiplicity of sponsors when grafted onto a political process, especially one that is federated. The role of the project manager will be discussed shortly, but the success of any such manager is keenly tied to the strength and support of a clearly defined sponsor or sponsors.

Take the example of constructing a recovery project and process after Hurricane Katrina. The challenges experienced by government, at all levels, during and immediately after the storm are well documented (*Brinkley 2006*). Some characterize the events as a failure of government. Dig deeper and the issues were the challenges of governance in a federated system with checks and balances, prerogatives of institutional power, and a dash of the local context thrown in (*Anglin 2010*). That context, replete with widespread fear of local capacity (or lack thereof), masked the question of who the sponsor was as the process of recovery began (*Brinkley 2006*).

Different levels of government began implementing disjointed and overlapping recovery efforts. The local, state, and federal government each had their own set of advisors, contractors and intentions, as evidenced by the parallel planning processes. FEMA focused primarily on safety and developing 100-year-flood planning maps. Meanwhile, the state and local governments started developing competing recovery plans that had their own provisions for safety and flood planning, separate from FEMA's (*Kates 2006*).

When discussions later turned to paying for recovery, the federal government wanted to provide resources through its main funding mechanism for local government, the Community Development Block Grant (CDBG), but it wanted assurances from the state that the resources could be accounted for and not diverted. Louisiana state government, slated by statute to receive CDBG resources, in turn feared that the New Orleans city government would not be a good steward, so it set up its own recovery agency to hold the resources until plans could be put in place by New Orleans and other affected parishes.[1] This was a reasonable proposition, but state and local politics, along with the chaos brought by the Katrina, led to a spate of planning processes.[2] Some of the processes claimed legitimacy based on the authority of the expertise they brought in to help, others were thrown up by local government trying to assert authority in a turbulent environment, and local communities too were fighting for a say in how their communities would be rebuilt.

The fear, doubt, and multinucleated centers of power and influence not only prolonged the process, but created an almost untenable situation when the center

1 This entity is called the Louisiana Disaster Recovery Authority and for some time functioned as the authorizing agent for recovery, but it could not really function as an implementing agency due to its lack of practical and statutory authority on the ground.

2 Part of the challenge in the aftermath of Katrina was that New Orleans, with the most concentrated property damage, had no master plan in place to guide routine development, much less recovery after a disaster.

of recovery gravity shifted inevitably to local government. The sponsor morphed from the traditional holder of resources and authority in the project management paradigm, to a cacophony of interests at the local, state, national and international levels. The lesson, therefore, is that the sponsor often cannot be sharply defined during the recovery process, and it takes special skills to navigate multiple sponsors.

Project leadership: the key to effective recovery process

It was difficult to identify the prime sponsor in the case of Katrina, and that complicated the recovery manager's job when the City of New Orleans eventually assumed primary responsibility for recovery. But does this mean identification of a clear sponsor is impossible because of the political and administrative context of any given country? No. The Katrina example is perhaps at one extreme. But even in a typical case, if there is such a thing, multiple sponsorship is the norm. The question is how to manage multiple centers of authority. This leads us to the discussion of the recovery manager. The skills that any successful recovery manager will require are:

- Political;
- Flexibility and adaptation;
- Technical competence;
- Management;
- Ability to execute the recovery; and
- Communication expertise.

Each of the above is discussed briefly in the sections below.

Political skill

Political experience and acumen are essential to guide the recovery process. Management skill follows a close second, but forced to choose between the two, political skill wins. The definition of political skill is complex. Certainly, recovery managers – much like other managers – must have the skill to manage organizational politics. And like managers of a brand product, public agency, or corporate assignment, the recovery manager needs the expertise to build political alliances in the environment and mange his or her given political position in the hierarchy. As Toshikazu Ota, one of the key recovery managers for the Kobe earthquake put it: "Managing a recovery process is heavily dependent on the human network that the recovery chief brings to the effort. This network is built up over years and is central to cutting through layers of administration that would delay forward movement in the short run" (*Ota comments at Managing Disaster Conference 2010*).

This 'human network', or social capital, is both a skill and an asset in a situation where much needs to be accomplished in a compressed period of time. There is less room to make even the smallest political misstep. So recovery managers, at least at the top rung, must have gone through life and professional experiences that prepare them for this 'compressed', more demanding, period of duty (*Rubin and Barbee 1985*).

Flexibility and adaption

Recovery mangers must quickly learn to work effectively within the city's governmental and social structure. They require the flexibility to adapt to the culture of the work assignment. Flexibility, along with an understanding of the environment, allows recovery mangers to navigate the conflict that often arises among the different levels of government during disasters. Following a disaster, localities often receive financial assistance from both the state and federal governments, and: "With assistance comes increased interaction among officials at all levels of government. Because of the considerable involvement of other levels of government in a disaster that essentially is a localized event, the quality of intergovernmental relations has a major influence on the efficiency of the local recovery" (*Rubin and Barbee 1985, 58*). However, the various levels of government often have different and sometimes competing views of the disaster recovery process and their roles within that process (*Rubin and Barbee 1985*). It is the recovery manager's job to navigate national, local, and international administrative contexts. A high political IQ is imperative, but so is the ability to navigate and master administrative complexity and the nuances of power.

Technical competence

The need for skills such as people management and leadership does not negate the technical skills needed for the job. Technical knowledge of economics, planning, civil engineering, and project management are central and cannot be compromised in the selection of a recovery leader.[3] "It is the learned technical skills that keep recovery managers grounded and help them create a clear path to recovery out of the chaotic aftermath" (*Ota comments at Managing Disaster Conference 2010*). To summarize, the recovery leader cannot delegate understanding of how sewer systems and other categories of infrastructure work. The manager has to understand small details such as road grading and asphalt mix, not to mention the economics of choosing materials for damaged infrastructure. Managers with these technical skills and experience can grow in their leadership skills, but the repertory of technical knowledge needed to complete the recovery process successfully, severely limits the possibilities of a management generalist.

Risk management

Risk management can be divided into two equally important subsections: managing existing risk and protecting against anticipated risk. The former is complicated by the fact that there is a demand for response before there is time for a complete assessment. Therefore, during the time between the disaster and completion of the assessment, the management skills of those leading the recovery effort are rigorously tested. An effective manager must adapt to and address the changing real and perceived risks.

After recovering from the initial shock of experiencing a disaster, the affected community has a unique opportunity to change the course of its future (*Pardede 2010*). The aftermath of a disaster yields useful data on system failures that allow

3 In our discussions with top-level recovery managers, the recurring theme is the technical nature of the recovery process. As one recovery manager said, "The public relations aspect of the job is fine and important, but at the end of the day, you need to be able to make decisions about sewer replacement, roads, and what to replace or not to replace based on cost-benefit analysis" (Blakely interview 2010).

recovery managers to identify high-risk locations. Officials can use this data to protect their cities against future risk. The recovery process also exposes weakness in areas not related to infrastructure, such as housing, economy, and workforce development. Using the disaster recovery process to address such risk is a process the UN's disaster response branch has named Build Back Better (*Kennedy et al. 2008*). It is important to establish communities that are cognizant of potential risks and equipped with the proper skills to address them; this aids the recovery process and paves the way for more sustainable cities with resilient futures.

For example, before Hurricane Katrina, New Orleans was a city facing significant problems, so any recovery plan would seek not only to remediate hurricane-related damage, but also to address the city's long-standing problems. New Orleans' population had been declining for more than 40 years before the storm. Issues of social inequity, hazard safety, sustainability, and the economy accompanied that of the declining population. The New Orleans Redevelopment Authority (NORA) was responsible for creating a master plan that would address and improve upon the existing problems. To do this, NORA decided to undergo a highly participatory process where public input was gathered at multiple steps during the drafting process before being approved by city leaders. Managing this process was not easy, and it took almost five years from the time of the storm for the city to approve the final plan.

After the storm, between the completion of the restoration phase and the approval of the recovery plan – which took nearly four years – different sets of stakeholders conducted separate, but not necessarily coordinated, recovery efforts. The people in charge of the recovery plan attempted to improve on pre-Katrina New Orleans conditions. The finalized plan contains visions for livability, opportunity, and sustainability (*NORA 2010*). 'Livability' refers to creating vibrant neighborhood centers, green infrastructure, and historic preservation. 'Opportunity' addresses the city's desire to have a well-trained workforce, a diverse economy, and increased investment. 'Sustainability' provides plans for New Orleans to be a resilient green city and incorporate more sustainable and equitable transit options. The plan reflects NORA's identification of preexisting issues and inclusion of community input on the appropriate steps to move forward. Recovery managers will work to fulfil the long-term visions while preserving and commemorating the culture of this unique city.

Management ability

The communication and coordination processes necessary for effective disaster recovery (see Chapter 6), along with the necessary intergovernmental and public–private partnerships that must be fostered (see previous chapter), require recovery managers to have excellent management skills. The types of issues that can arise for recovery managers are similar to those in other situations where social coordination is necessary. There is a division of knowledge among involved parties and there are often difficulties processing available information into usable forms (*Sobel and Leeson 2007, 520*).

An area of recovery that can be particularly challenging to manage is public-private partnerships. These partnerships are critical to present-day disaster recovery efforts. Recovery managers and public organizations manage the disaster recovery process,

but the related tasks and activities are often carried out by private organizations such as contractors. Recovery managers must manage these relationships without jeopardizing public information or the local government's hierarchies.

Again, the Indian Ocean tsunami recovery proves instructive. In the time since the tsunami, there have been significant accomplishments and challenges in the recovery process. One of the most important aspects of the recovery process in the region was the rebuilding of the housing stock. By 2006, about one year after the incident, 150,000 houses had been built, and transitional housing had been provided for the majority of those who were still displaced. Although housing is only one aspect of the region's recovery, the exercise of trying to replace dwelling units has proven to be a test of management efficacy, bringing with it challenges in areas including land use, economic stimulus, available labor pool, and environmental sustainability.

Many programs were implemented after the tsunami in an effort to manage the housing situation. One housing program in particular was intended to both build housing and spur the economy. Under this program, people without previous construction experience were able to participate in a cash-for-work scheme (*United Nations Development Program 2005*). While this did directly inject cash into the population: "The speed of construction with an unskilled workforce learning new construction and collaboration methods was slower than had been expected by the beneficiaries as well as by organizations doing the construction," (*Kennedy et al. 2008, 27*).

The slow pace of reconstruction caused problems for beneficiaries, as the funding agencies wanted tangible results, which could be listed as accomplishments, by the end of their fiscal year. Additionally, the lack of skilled workers meant there were relatively few experts who could resist outside pressure to reconstruct things back just as they were before the disaster. For example, there was pressure to build masonry houses, despite their comparatively poor seismic and thermal performance. A recovery manager must account for such challenges; the cash-for-work program, for example, could have benefited from the expertise of loaned talent to manage and assist the less skilled workers. If the workforce had been better supported, those involved in the program may have been able to devise a way to 'build back better' instead of succumbing to international pressure to use building techniques inappropriate for the area. Again, helping agencies bring their own agendas may not be good for the community. For recovery managers, anticipating such problems is key. What sets an exceptional manager apart is his or her ability to manage all of the foreseen and unforeseen problems.

Skills for executing the recovery

A recovery manager's job is to execute a plan that will allow a place to operate once again without the need for recovery managers (*Blakely interview 2010*). A recovery manager can influence the: "Pace, location, type, density, design, and cost of redevelopment," (*Berke, Kartez, and Wenger 1993, 2*). With such influence, it is imperative for a manager to know how to prioritize and execute recovery plans. Each disaster presents a unique set of challenges, and a recovery manager must possess the ability to manage those challenges. An international school for disaster managers

is a good place to start, with the World Bank and the UN as obvious candidates to run such a program. Although disaster recovery is a team effort that spans multiple sectors and organizations, an effective manager can steer the city toward the proper path. The developing body of knowledge about disaster recovery should address several issues to assist recovery managers with this execution process:

- Facilitation of cooperation among stakeholders and organizations, using generally accepted management techniques applied to disaster recovery;
- Transparency and accountability in decisionmaking; and
- Personnel management techniques for high-pressure situations.

Responsibilities of a project manager/director:

- Accounts to executive sponsors for schedule, budget, and quality of all project elements;
- Leads high-level sessions for project plan and schedule development;
- Reviews/approves project plans for conformance to program strategy and program plan and schedule;
- Acts as the communications conduit to executive sponsors and program steering committee and conducts periodic briefings/status updates; and
- Escalates decisions to sponsors as necessary.

TEN KEYS TO LEADERSHIP IN TIMES OF DISASTER

Yasushi Aoyama

Professor Aoyama was Vice-Governor of Tokyo from 1999-2003. He was in charge of evacuating and finding emergency housing and support for the residents of Miyake Island, where a massive volcano erupted in September, 2000.

1. **BE ACCESSIBLE AT ALL TIMES**
   Mobilization for recovery cannot begin when the leader is out of communication with subordinates and others key to the process.

2. **POSSESS A DEEP KNOWLEDGE OF THE INSTITUTIONAL AND ADMINISTRATIVE CONTEXT**
   A leader's most powerful weapon in times of disaster and the recovery period is a working knowledge of the relevant legal, institutional, and administrative framework for decision impacting their role. What one needs to know is who does have the required expertise, and where and how such information can be accessed.

3. **GATHER AND SYNTHESIZE INFORMATION WITH THE BIG PICTURE IN MIND**
   According to the report of the National Commission on Terrorist Attacks Upon the United States (also known as the 9/11 Commission), the CIA and the FBI had received warnings on at least 10 different occasions that a major attack was in the offing, but the heads of the departments receiving those warnings had simply passed them on as isolated, fragmented bits of information, and they were never acted upon. It is important both for a leader and for an organization to "connect the dots" by synthesizing disparate pieces of information with the big picture in mind.

4. **CULTIVATE INSIGHT INTO HUMAN CHARACTER**
   During a crisis, leaders have to communicate with people from different agencies and organizations. In short time, they may face difficult negotiations regarding roles and responsibility with someone from a different organizational culture who possess a different

system of ethics and a different technical vocabulary. A sensitivity and knowledge of human behavior and interests can help avoid miscommunication that can blossom into divisive conflict.

5. **BE PREPARED TO REVISE ANY DISASTER PLAN AS CIRCUMSTANCES DICTATE**
Disasters often occur when one least expects them, and in a manner that no one anticipated. Why, then, do we bother drawing up disaster plans? We do it because the measures outlined can be adapted to various circumstances, and because our experience is reflected in them. In addition, the very process of disaster planning improves the readiness of everyone involved. When a disaster actually occurs, a leader should use a disaster plan prepared in advance as the basis for proceeding yet remember at all times to remain flexible and adapt each measure to the situation as required, since actual disasters invariably differ in some way from the situation envisioned in the plan.

6. **RECRUIT AN AIDE INTIMATELY FAMILIAR WITH THE LOCAL GEOGRAPHY AND SOCIETY**
Disaster measures are not addressed to earthquakes, flooding, or volcanic eruptions. They are addressed to human beings and human society. All disaster measures are implemented in the context of a particular locale with its own unique geography and human society. Any effort to apply general rules mechanically without taking these local conditions into consideration is bound to fail. Even if one possesses a certain familiarity with the area in question, it is still best to enlist as an aide someone with an intimate knowledge of the local geography and society. Choose someone who you believe can truly be of assistance, without regard to that person's profession or position.

7. **ASSIGN HIGHLY COMPETENT PERSONNEL TO DEAL WITH THE MEDIA**
Disaster victims get most of their information from the news media – newspapers, television, radio, and so forth. For this reason, disaster prevention agencies need to place considerable importance on their function of providing information to the media. In responding to a disaster, moreover, one needs to secure the cooperation of various other agencies, which also get much of their information from the media. The same holds true for the general populace, and the support of the public is required for effective implementation of disaster countermeasures. For these reasons, when responding to a disaster, one should assign highly competent personnel to deal with the media.

8. **BE AWARE THAT DISASTERS CREATE EXTRAORDINARILY STRESSFUL CONDITIONS, NOT ONLY FOR THE VICTIMS, BUT ALSO FOR POLITICIANS, ADMINISTRATORS, AND MEMBERS OF THE MEDIA**
Victims of a disaster are subject to stress that often demands special care. But surprisingly few people appreciate that politicians, administrators, and front line personnel are under extraordinary stress as well. The need to make quick decisions with insufficient information and to risk their own well being on behalf of others can strain people's nerves to the breaking point. A leader must constantly reflect and find time to recharge to avoid burn out and becoming inured to the needs of the public.

9. **UNDERSTAND THAT MANY ACTIVITIES ARE BETTER HANDLED BY LOCAL VOLUNTEERS THAN BY GOVERNMENT**
The 2000 volcanic eruption on Miyakejima resulted in the evacuation of all the island's residents for a period of four and a half years. During that long period of exile, we placed the residents in existing Tokyo-area communities and were thereby able to solve the problem of solitary deaths—that is, situations where evacuees become isolated and die unattended and alone. This outcome would have been unlikely had the government taken direct charge of the evacuees. The government might be good at classifying and recording the evacuees' strength or fragility at any given time, but it is not equipped to respond nimbly and flexibly to daily changes in the health and circumstances of each individual. A leader must be cognizant of the fact that there are many tasks best entrusted to citizens.

10. **OUTCOMES ARE IMPORTANT, BUT PROCESS IS IMPORTANT TOO**
In recent years much emphasis has been placed on outcomes as a means of objectively assessing government performance. This approach has served as a wake-up call for government, but we should not allow it to obscure the fact that citizens' fundamental expectations of government center on process. Government can gain and maintain the people's confidence by demonstrating that it is doing all it can, even if its efforts should fail to yield the desired results. Leaders need to strike a careful balance by valuing outcomes even while maintaining a fundamental emphasis on process.

Communication skills

Communication is an important and challenging part of any political and policy process, including recovery after a disaster. For a recovery effort to be successful, there must be clear and effective communication among organizational stakeholders, which include public agencies, nonprofits, NGOs, and the private sector (see also Chapter 6).

Managers can present well and write well, or they cannot. In the latter case, on-the-job training is not an option. The manager has to come to the recovery process with well-honed communication skills. But the possession of communication skills is not the end game; knowing what to do with these skills conditions success or the perception of failure, even when the recovery manager is an effective communicator. Again, the recovery manager has to know the recovery context and be able to identify the communications leverage point to get work started.

Communities with strong networks of communication prior to a disaster are often better positioned for recovery following a disaster (*Kapucu 2006, 210*). In such communities, boundary-spanning organizations are a great resource to the recovery manager. Boundary spanners are organizational members who link their organization with their environments (*Kapucu 2006*). Because boundary spanners maintain communication and share information with various groups and organizations within a specific location, they are well placed to aid recovery managers with the establishment of a recovery plan that includes the entire community.

While boundary spanners can help the recovery manager, we should not forget that such managers must be comfortable boundary spanners themselves. In addition to communicating with public and private organizations and officials directly involved in the recovery effort, recovery managers must also communicate their plans and progress to the public. The recovery manager must communicate directly with the community, for example, by holding town-hall style meetings and using emerging social media to help his or her cause.

Another available resource for citizen communication is the press. While the press regularly researches and reports on recovery after major disasters, recovery managers can work with the press to use it as a communication resource. By keeping the press as informed as possible about recovery plans, managers can increase the possibility that their message will get through to the public. Management of the press, however, is a learned skill resulting from significant prior experience as a public or private manager. Press management is not a skill that can be acquired and applied effectively within the disaster moment.

In a closed political, social, and cultural environment (such as New Orleans, for example) it is imperative to use boundary-spanning organizations and people to carry the message. The recovery manager has to intensify the search for people and organizations of influence, win them over, and let them act as ambassadors for the recovery process. In essence, this is the management of communications and politics. The recovery manager not only needs the ability to communicate the vision for recovery, but also must understand and utilize the centers of influence.

Because of the public nature of disaster response and recovery, bilateral communication between the recovery managers and the general public is essential. The recovery manager's ability to communicate directly in his or her own developed style is central, but so is the acumen to choose the right strategy for each recovery context.

Closing out the recovery

Disaster recovery can be: "Considered as a single project," with a set of tasks and objectives: "Ending after its implementation and completion," (*Ota, Maki, and Hayashi 2009, 271*). It is a generally accepted principal in project management that a phase or project ends once the deliverables and objectives associated with that phase or project have been completed. It is therefore necessary for recovery managers, during the initial planning phase at the beginning of the recovery process, to identify those objectives and deliverables that will signify the end of the recovery process, or at least their role in that process.

Administrative closure is a project management process that is useful during the closeout of a recovery effort. Administrative closure should occur at the end of each phase of the project, as well as at the end of the project itself. It is during administrative closure that the recovery team documents project results, collects records, analyzes success, and presents this information along with a final report to the officials with whom they have been working. The end result of the administrative closure is the 'project archives' – a complete set of records and documents related to the recovery process to which public officials can refer whenever necessary.

Recovery managers should also use the project closeout as an opportunity to promote risk awareness in the communities in which they work. Recovery managers strive to address the risk of future disasters during the recovery from past disasters, but it is impossible to make any community entirely risk-proof. During project closeout, recovery managers should conduct an assessment of the completed recovery plan, identifying and analyzing future risks to the community. A report of findings from this assessment should be included in the project archives for future reference and use by public officials. Finally, the end of a recovery effort is also a time for celebrating the rebirth of a previously devastated community; this is an important way to move forward while engaging those who have been affected (*Wailoo et al. 2010*).

Lessons for disaster management

In the wake of disaster, various parties have competing views of how the affected area should recover. "The conflicting policy goals of rapid recovery, safety, betterment, and equity and their relative strengths and weaknesses largely reflect experience with large disasters in other places and times," (*Kates et al. 2006, 14659*). Because of their project management and technical skills, recovery managers are considered 'jacks of all trades' (*Blakely interview 2010*) who are best qualified for the informed decisionmaking required for redevelopment. This chapter identifies project management skills that recovery managers must master to ensure efficacy and presents specific examples of disaster recovery efforts so that current recovery managers can draw from the experiences of others.

Section Two: Social, Cultural and Economic Recovery

No recovery will be successful if it fails to engage the public in equitable and meaningful ways. The challenge for recovery managers is how to achieve this goal, while still maintaining the momentum and efficiency of the recovery process. All three chapters in this section engage with this question, providing insights into why attending to the 'soft infrastructure' during the recovery process is just as important, if not more so, than rebuilding the 'hard infrastructure' to be contemplated in Section Three.

With this in mind, Aoyama and Sasaki's chapter situates social and cultural considerations at the very core of the recovery process. Using this framework, the chapter demonstrates how successful social recovery programs require long term planning and innovative approaches to engage a diverse range of individuals and community organizations.

Also central to recovery is the need to establish a culturally appropriate 'recovery dialogue', which ties together the disparate elements of the process in meaningful and comprehensible ways. As Horne argues in Chapter Six, any recovery manager who can successfully achieve this communications goal will minimize the animosity, distrust, fear and uncertainty that can otherwise make even the simplest of recovery tasks almost impossible to implement.

Like culture and communications, economic considerations also underpin every aspect of the recovery process. In Chapter Seven, Voith provides a powerful argument that good economic recovery decisions are always guided by the underlying goal of balancing equity and efficiency of reinvestment.

Musicians' village, a symbolic rebuilding project in New Orleans
Source: Laura Crommelin

Chapter 5: Restoring Community Identity and Social Capital

Yasushi Aoyama and Kazuyuki Sasaki

Social and cultural context is central to recovery after a major disaster. Disasters generate emotional distress, and this has to be dealt with in order for community well-being to be restored. We provide illustrations of this process, offer a template on which to base this ongoing process of many years, and discuss the need to set aside resources for continuance of this important and essential process.

Post-disaster recovery means restoring communities

In the aftermath of a disaster, it may be easy to place tangible considerations like economic and infrastructure recovery at the top of the list of priorities. However, recent research and the experiences of our authors demonstrate how important social and cultural recovery is to the overall recovery process, as the following excerpt by Voith considers:

> *"Traditionally, the literature on disasters has identified a number of factors which can accelerate or impede recovery. Some scholars have postulated that the amount of physical damage from the disaster best correlates with recovery speed, while other studies have attempted to connect the population density in the affected areas with pace of rebuilding, or argued that the uneven distribution of wealth in a city or town is the major cause of delayed post-disaster recovery.*
>
> *Recently, scholars have instead begun to link the speed and effectiveness of the recovery processes to the levels of trust and social capital in a community. Three specific mechanisms have been found to allow for communities with denser social networks to implement a faster recovery. These include:*
>
> - *Social ties can act as form of 'informal insurance' that allow victims to draw upon a ready-made support network for financial, physical, and logistical guidance;*
> - *More politically active and better connected communities can better mobilize to present their demands and to extract resources from authorities; and*
> - *Pre-existing social networks raise the cost of 'exiting' from a community and increase the likelihood that residents will stay and work together to articulate their demands to authorities and overcome obstacles to recovery.*

Controlling a number of factors, including economic status, levels of welfare dependence, damage, socioeconomic inequality, and geographic conditions, Aldrich (2010) confirmed that the amount of social capital in a neighborhood most strongly determines recovery rates.[1] A comparison between two similar neighborhoods within Kobe during and after the quake illustrates how stronger social networks accelerate recovery. While the two neighborhoods were physically, demographically, and geographically similar, it was clear that one of the communities had significantly higher levels of social capital. In the immediate post-disaster period, the community with the higher levels of social capital was able to organize and coordinate their firefighting efforts quickly, while the other neighborhood was not. The differences also extended into the later post-disaster recovery period. The neighborhood with higher levels of social capital could undertake a tremendous number of rebuilding activities that the other neighborhood could not. These activities included establishment of a company for community development, a signature collection campaign for the construction of public housing for disaster affected people, the preparation of joint housing proposals and the establishment of a daycare center.

Paired comparisons across nine neighborhoods in Kobe from 1990 to 2008 revealed that social capital – more than economic conditions, earthquake damage, population density, altruism, or geography – proved critical over the long term. Other research on the aftermath of the Kobe earthquake found that the often random assignment of displaced survivors to temporary housing post-quake disrupted existing social ties, which may have been responsible for slower recovery times. This research suggests that grouping survivors from the same area together in temporary housing shelters and long term housing can ensure the existing stocks of social capital are not further damaged, thereby possibly speeding recovery times."

Re-establishing the community's way of life

In 2008, the leaders of several Japanese groups that had assisted in relief and recovery following the volcanic eruptions that led to the 2000 evacuation of Miyakejima, visited New Orleans to meet and talk with community leaders involved in that city's recovery efforts after Katrina. During that visit, one experience in particular left a particularly deep impression on the Japanese group.

During a meeting between Japanese and American leaders at the Ashé Cultural Arts Center, a funeral procession passed by, accompanied by rousing jazz music. As soon as they heard the band approaching, people at the center rushed out into the street and danced with the group until the procession had passed.

In New Orleans it is customary to send the dead off with jazz, the art form born in the city. "Here in New Orleans, we grow up with the lively sound of jazz from the minute we're born," explained one resident. "That's why, when we send off our dead,

1 Note that in another co-authored article (2008) Aldrich suggests that social capital was like a double edged sword after Katrina: both with benefits and downsides (slowing down housing recovery).

we do it festively, with jazz." Unfortunately, those who died while taking shelter in Houston and other cities were denied such a farewell. In post-disaster recovery, it is not enough to restore a city to its former physical state. Post-disaster recovery is only complete when the residents return home and resume their normal lives – including re-establishing unique cultural traditions like New Orleans' jazz funerals.

In Miyakejima, one couple in their eighties headed back to the island as soon as the evacuation order was lifted. During their four-and–a-half years on the Tokyo mainland, they lived rent-free in municipal housing, surrounded by neighbors who attended to their welfare – visiting, bringing them prepared food, and so forth. Although aware that they would have none of this to rely on once they moved back, they could hardly wait to return to the island and resume a life of plowing the fields and harvesting shellfish from the seashore, with only each other depend on. This is what the social element of post-disaster recovery is all about – allowing people to return to living their lives the way they want to, not in a way dictated by the state.

At the New Orleans–Miyakejima meeting, the discussion focused on why people return to a place where disaster is sure to strike again. Mayor Hirano of Miyake Village said: "The infrastructure may be broken, but not our spirits. That's why we go back." The Americans explained that their love for the culture of New Orleans had drawn them back. The residents of these two locales may speak different tongues, but they shared the same determination to rise above disaster.

Local communities are the key to re-establishing the way of life

Towards the eastern lake district from downtown New Orleans, there is a neat little settlement built in the midst of the swampland. This is the ethnic Vietnamese community centered on the Mary Queen of Vietnam Church. The church's pastor is Father Vien Nguyen, who came to the United States when he was 12 years old.

New Orleans is home to many Vietnamese refugees. The ethnic Vietnamese of the city form a close-knit community whose members make their living in business, farming, and fishing. Like the African Americans served by the Ashé Cultural Arts Center, the ethnic Vietnamese in this area were in danger of losing their entire community and way of life after Katrina. These residents have tackled the problems facing them boldly and are not only bringing the community back to life, but are also making the most of the opportunity to help other people of Vietnamese descent put down solid roots in the New Orleans area. A group of able young men and women are taking the initiative in dealing with a wide range of problems, with Father Vien's strong leadership guiding them towards creative and farsighted approaches. It seems the community has become stronger and more tightly bonded than ever, thanks to the existence of a center, where everyone from children to seniors in their nineties, can congregate and take part in community activities.

The word one hears again and again from the members of this group is 'self-sufficiency.' The community now supplies most of the farm and marine produce it consumes and has stored up enough food supplies to live self-sufficiently for one month the next time a disaster like Katrina strikes.

The purpose of post-disaster recovery is to allow people to return to their previous lives, and for this to occur, the most important thing is the revival and restoration of the local community. The activity centered on Mary Queen of Vietnam Church is a vivid illustration of this principle. As Oliver-Smith (2005) notes, reviving a local community is a sensitive task that is not easily achieved through planning, because communities need to evolve, rather than being constructed. Planners face the challenging task of finding ways to allow this process to take place organically, within the broader context of the recovery process.

***Figure 1**: Examples of local attachment in New Orleans*

Source: Laura Crommelin

Maintaining community ties during an evacuation

Leaving emergency shelter management to the residents

In Japan, when an evacuation advisory or directive is issued after a disaster, the local government is responsible for establishing and operating emergency shelters. What typically follows is a spate of media reports on the shelters' problems: not enough miso soup to go around, lack of access to bathing facilities, and so forth.[2] Frequently, television reporters appear at the emergency shelter, asking the evacuees if they have been inconvenienced in any way, to which people reply that they lack this and that. These interviews then become the top TV news stories of the day.

Aware of the danger, local governments these days pour their efforts into the setup and operation of temporary disaster shelters when their top priority should be: Rescuing people who have not evacuated the site for whatever reason; minimizing secondary damage from landslides, mudslides, flooding of rivers, and so forth; and taking initial steps toward recovery.

Instead of this approach, local governments should limit their role to the provision of shelter facilities and supplies and leave the management of the shelters to the residents themselves. To facilitate such an arrangement, regular disaster drills should include training for the setup and operation of emergency shelters, instead of focusing solely on smooth evacuation. It would also be advisable to consult closely with residents to determine what equipment and supplies will be needed at the shelters and ensure that it is kept on hand.

It should be noted, however, that while sanitary and bathing facilities need to be furnished in advance, food and bedding will arrive from neighboring municipalities and be distributed to everyone within a day or two, even if logistical problems prevent such supplies from being distributed in the earliest stages of a disaster. Residents should be informed of this. In times of disaster, the worst enemy is panic. Evacuees will fight over supplies if they think there may not be enough to go around, but they will remain calm and orderly if they are confident that there is an adequate supply. Another issue to consider is how pets may be accommodated in temporary shelters, as companion animals can be a great source of comfort during the post-disaster period, but may cause tensions between evacuees if not managed carefully.

Fostering community ties among long-term evacuees

If an extended evacuation is required, the next question to be addressed is how evacuees will live until they can return home. If the evacuation is of short duration, it is not difficult for a community to continue as a coherent unit. In the aftermath of Hurricane Katrina, the Vietnamese community of New Orleans continued to act collectively and maintained community ties. This, in turn, contributed to the neighborhood's relatively rapid reconstruction.

However, when evacuees are unable to return home for a matter of months, they

2 These specific examples are from the 2004 Niigata-Chuetsu Earthquake, but the basic pattern can be seen in the wake of most Japanese disasters.

are generally dispersed and can no longer live together as a community. In these cases, one of the key challenges is maintaining community linkages and lines of communication. The Miyakejima disaster provides a helpful case study in this regard.

The volcanic eruptions that began in 2000 led to the evacuation of all 3,800 residents of Miyakejima for a period of four-and-a-half years. Instead of building temporary housing to shelter the evacuees during this time, the government settled the evacuees in various municipal housing complexes in and around Tokyo, where they lived rent-free for the entire duration. The obvious rationale for this system was that municipal housing – which, in Japan, is very conscientiously managed and maintained – would provide superior facilities and a better living environment than temporary housing. But another advantage is that each municipal housing complex has a strong neighborhood organization in the form of a residents' association, and the members of these associations looked after the welfare of the scattered Miyakejima evacuees.

One of the major issues that has arisen time and again in the wake of natural disasters in Japan is the occurrence of solitary deaths (natural deaths in which the victims die alone, and the bodies are not discovered until later) among evacuees. After Miyakejima, not a single solitary death occurred. This was because community members looked after the refugees.

Nonetheless, this system inevitably led to the dispersal of communities. Despite efforts to locate evacuees close to friends, relatives, and neighbors, villagers inevitably found themselves scattered after the evacuation, at least when compared to their former situation. This posed a challenge in terms of maintaining community ties and keeping members in contact with one another.

The Miyakejima Disaster Tokyo Volunteer Relief Center rose to the challenge immediately after the evacuation by compiling a telephone directory of evacuees at their temporary addresses. This was a vital service, since government agencies, even if they had access to accurate information, would not have been able to release it because of privacy issues. The Miyakejima Disaster Tokyo Volunteer Relief Center gathered the contact information from the residents and secured their permission to share it.

Another valuable contribution of the Volunteer Relief Center was the get-togethers it organized every few months, events where displaced islanders were able to renew friendships and share information. Held in the schoolyard and gymnasium of an elementary school in Minato-ku, Tokyo, the gatherings were attended by more than 1,500 evacuees out of the 3,800. Rejoicing to see one another again in good health, the participants made the most of these hours to update one another and chat together sociably. Food tents lined the schoolyard, offering such fare as tempura of ashitaba plants (a local specialty). The food was provided by volunteer groups from across Japan.

Even the several dozen buses the Volunteer Relief Center chartered to transport Miyakejima evacuees to these get-togethers were paid for by donations from private businesses and organizations. The group took no money whatsoever from the

government. Government administrators attended the gatherings to listen to the evacuees' requests and keep them up-to-date on volcanic activity and the progress of reconstruction work on the island, but that was the extent of official involvement. Having nongovernmental groups take a leadership role was a plus in terms of maintaining a sense of community.

Civic groups and their central role in post-disaster recovery

Market Umbrella is a New Orleans–based nonprofit organization that sponsors the open-air Crescent City Farmers Market, where area farmers and watermen sell tomatoes, strawberries, lettuce, flowers, fish, shrimp, and other products directly to consumers. The name Market Umbrella is a reference to the idea that an open-air market requires nothing more than a vacant space and a large umbrella.

As explained by Market Umbrella Executive Director Richard McCarthy, public markets give residents not only access to farm-direct produce but also places and opportunities to meet and pull themselves together during times of disaster. In this way, a direct link between producers and consumers can give heart to both. Consumers confirmed this assertion. "Coming to this market and seeing people I know gives me a big lift," one shopper said. This is one reason McCarthy was determined to reopen the market as soon as possible after Katrina. But another purpose of the open-air market is to provide a sales outlet for producers. For this reason, McCarthy raises operating funds from nonprofits and other sources and charges vendors only about $20 a day in rent. At present, about eight public markets are held in various neighborhoods of New Orleans during the week. Similarly, during the recovery on Miyakejima, volunteers organized the Heart Society and sold such local products as soy-prepared ashitaba and nori (laver) through Tokyo co-ops. The profits were used to assist residents experiencing economic hardship.

Another focus of civic action in New Orleans since Katrina has been education, particularly charter schools. Mardele Early, the principal of Lake Forest Charter School, had been a principal at a New Orleans public school before Katrina hit. She had long been interested in charter schools, which have greater autonomy than conventional public schools over curriculum and other aspects of school policy. Although she lost her own house in Katrina, she applied to the Louisiana state government to renovate a former public school building in a northeastern neighborhood in New Orleans and open a charter school there.

State officials initially rejected her application on the grounds that the residents of the district had yet to return. But Early persevered, arguing that unless schools were open, people would be unable to return, even if they wanted to. In April 2006, half a year after the disaster, the school opened with nine teachers and 66 students. Today, Lake Forest offers classes from kindergarten to eighth grade for over 400 students, with a 50-plus teaching staff. Special programs are offered for students with high scholastic aptitude, and the school now ranks among the state's higher achievers.

Early reminds students each morning of the significance of the eagle in their school emblem – the heights to which they all can fly, whatever obstacles or setbacks

they may encounter. Over 80 percent of the students are from families whose low income qualifies them for free school lunches. Funding to build new facilities and purchase innovative textbooks comes largely from private donations. Raising such funds is one of Early's most important and demanding tasks.

The role of volunteerism in disaster recovery

Volunteerism in Japan has attained new heights today, as the following vignette shows. Volunteers are a constant presence, whether laboring away at manual tasks or applying their specialized knowledge and skills.

VOLUNTEERISM AFTER THE VOLCANO

The activities undertaken in support of the residents of Miyakejima opened a new chapter in the history of volunteerism in Japan.

When residents began returning to Miyakejima in February 2004, the Tokyo Volunteer Network for Disaster Relief assigned teams of 55 volunteers to one-week shifts to assist residents with the task of moving back in. Corporate employees, public employees, and students volunteered in large numbers, giving up their paid vacation or using volunteer leave to participate in the program.

Initially, the plan was for volunteers simply to help carry furniture and other household items, but when they arrived they were faced with the grueling task of shoveling away the hardened ash that covered entranceways, yards, and kitchen gardens. By the time they boarded the ferry back to the mainland, their muscles ached, but the 55-member shifts continued as scheduled until the moving process was more or less complete, six months later.

Today the Tokyo Volunteer Network continues to provide services for Miyakejima residents, not so much by providing support as by organizing social activities at the Kaze no Ie ('House of Wind') – an old architectural training facility that the Architectural Institute of Japan has made available for the purpose.

Traditionally the three elements of volunteerism have been: That it be carried out voluntarily; that it performs a public service; and that it be carried out without compensation. Civic activity in Japan has developed dramatically since those days, and this must be kept in mind when considering the nature of collaboration between local civic groups and government agencies. Today, the three essential elements of volunteerism are independence, active involvement, and continuity.

The principle of independence should apply both to the volunteers and to the people they serve. It means that citizens must take the initiative in organizing and coordinating activities, but it also means that rather than simply lend a helping hand, volunteers must respect and foster the independence of those they seek to assist. Active involvement means not simply sending money or goods, but going directly to the site and contributing one's own expertise or physical labor. Continuity is the most difficult thing to achieve in volunteer work. It means sustaining those efforts by somehow integrating them into the work or educational environment.

The work carried out by the Tokyo Volunteer Center for Disaster Relief (or Miyakejima Disaster Tokyo Volunteer Relief Center) on behalf of the residents of Miyakejima embodies independence, active involvement, and continuity – the three key elements of volunteerism today. Particularly noteworthy in relation to the principle of independence is the fact that all the work carried out by the center originated with ideas proposed by residents of the island or by the volunteers themselves. For example, the plan to turn the AIJ's training facility on Miyakejima

into a meeting place for residents and volunteers after the evacuees returned home emerged as a natural outgrowth of the volunteers' work and experience to that point.

Of course, it is not always smooth sailing. Volunteer leaders involved in the Miyakejima recovery worried about money, fretted about inclement weather disrupting their events, and, more than anything, continually asked themselves whether they were doing enough and doing the right things. However, it is a truism that the fear is often greater than the danger. And because they were in a position to receive direct feedback from residents, the volunteers were able to correct problems as they went along.

In the musical Miss Saigon, Vietnam veterans seeking volunteers to help the children of American troops orphaned in Vietnam do not say: "Help them," but: "Help me try." The Tokyo Volunteer Center for Disaster Relief was able to secure the cooperation of people all over Japan in its long, arduous campaign because it maintained this same spirit of humility. The great number of people who took part in the Miyakejima campaign is also testimony to the degree to which the spirit of volunteerism has taken root in Japan. In that sense, the Miyakejima campaign has rewritten the history of volunteerism in Japan.

Lessons for social and cultural recovery

Urban recovery management is, at its heart, a people science. The key driver for rebuilding a city is rarely the economy or the natural environment, it is the importance of the place to the people who live and work there. Unfortunately, despite this reality, the intangible nature of the human aspects of recovery can mean they end up taking a back seat to more measurable goals like rebuilding infrastructure. In fact, there is no reason these intangible and tangible goals cannot be achieved simultaneously. As this chapter suggests, the best way to reestablish community effectively is not to think of it a distinct task in itself, but rather as a policy that must shape the process used to achieve material recovery tasks. By giving the community a role of some kind in every important part of the recovery effort, the recovery manager will also be helping the community to rebuild itself in a way that leaves it feeling engaged, empowered and proud. Of course, to incorporate community involvement successfully in this way requires great understanding and sensitivity to the psychological and emotional trauma that disasters cause. This is not an easy task, but it is an essential one.

Further reading

The cases and resources section for this chapter includes:

- An analysis by Irvine of the valuable social and emotional role companion animals can play during the disaster recovery period;
- An examination by Siembieda of the important role civic groups can play in the reconstituting community, with reference to Mexico City;
- A case study by Aten which examines further cases of how faith-based organizations assisted in the social recovery of Gulf Coast communities after Hurricane Katrina;
- A brief analysis by Ganapati of how planning processes can become more participatory, with reference to Turkey; and
- A piece by Ward considering how to achieve one of the keys to speedy social recovery – the return of children to school in the affected areas.

Cases and Resources for Chapter 5

Helping people by including companion animals in disaster planning

Leslie Irvine

Research consistently documents the benefits that companion animals have on the psychological well-being of their guardians. Interacting with and caring for animals can decrease loneliness and improve confidence and self-efficacy (see *Wood et al. 2007* for a review). The shared daily routines create a sense of mutual dependence. Dogs, in particular, because they require regular walks, reduce isolation by serving as 'social facilitators' (*Messent 1983*), bringing even strangers together in conversation. The ability of animals to foster interaction has been useful in therapeutic settings, where their presence can encourage withdrawn patients to talk. In addition, numerous studies have found that interaction with animals, even simply petting them, lowers blood pressure, which is a common measure of well-being. Moreover, relationships with companion animals have benefits that defy measurement. They have many of the same features of friendships and parent-child relationships, but bring unique experiences not found among our human friends and family (*Irvine 2004*). Animals bring trust, responsibility, joy, laughter, and play into people's lives.

In a disaster, people will delay evacuating if they cannot take their animals with them. Most emergency shelters do not allow animals, except for those assisting the disabled. Separation from one's animals in the aftermath of a disaster can be stressful on many levels. Concern for an animal's welfare can compound the anxiety suffered by evacuees already under serious strain. A study of evacuees from Hurricane Katrina found a strong relationship between mental health and the status of their companion animals (*Hunt et al. 2008*). Loss of a companion animal was associated with higher levels of psychopathology, including depression and Post Traumatic Stress Disorder (PTSD). Thus, two of the most serious problems of disaster management – evacuation failure and the psychological well-being of survivors – can be addressed by incorporating animals into emergency and recovery plans. In particular, establishing 'pet friendly' shelters, which house animals on the same site as, but separate from, human evacuees, can meet the needs of people and animals.

Hurricane Katrina taught powerful lessons about the need to allow people to evacuate with their animals. Prior to Katrina, research associated the likelihood of evacuation with the strength of the human-animal bond (*Heath et al. 2001*). Guardians who provided better care for their animals were more likely to take them along when leaving an evacuation zone. But in Katrina, many responsible guardians were forced to abandon their animals. One of the most poignant images is of a small, white dog named Snowball being torn from the arms of a sobbing young boy during the evacuation of the Superdome. The Louisiana Society for the Protection of Cruelty to Animals estimates that over 15,000 animals were rescued from the homes and streets of New Orleans. Most were never reunited with their families; many went to new homes after a massive nationwide transfer effort. Although the number of animals who died is unknown, estimates place it in the thousands.

The main lesson of Hurricane Katrina is that allowing people to evacuate with their animals can benefit humans and animals. Not having to worry about an animal's welfare can reduce psychological stress. The animal's presence can provide emotional support. Caring for the animal's needs can provide a sense of normalcy. It can take people's minds off their own situations, offering much-needed relief from stress. Research suggests that the comfort provided by animals may be especially important for those who have few other sources of social support (*Lowe et al. 2009*). The unique support animals can provide has initiated programs such as the HOPE Animal Assisted Crisis Response, which brings certified therapy dogs to disaster settings in the United States to interact with responders, volunteers, and evacuees. As one of the founders reported: "It's easy to pet the dog for just a few minutes to forget how tragic everything is" (*Heller 2003*). For people who have lost everything – their homes, belongings, and sometimes even their friends and family members – companion animals can provide valuable psychological support.

DISCUSSION QUESTIONS

1. Why are animals so important in the recovery phase of a disaster? Should government be involved? If so, why?
2. What are some of the lessons in the first three chapters that can be used to manage animals during a recovery?

Mexico city earthquake recovery – colonia guerreo

William Siembieda

The two 1985 Mexico City earthquakes (8.1 and 7.5) caused 10,000 deaths and destroyed more than 400,000 dwelling units. In the Colonia Guerrero neighborhood, 700 single room occupancy units were damaged and 35 people lost their lives.

Key recovery achievements

Three hours after the Mexico City earthquake, this working class, mostly renter-occupied neighborhood completed a damage assessment and was in contact with city government and faith-based and aid organizations to start recovery. Strongly organized prior to the earthquake, the neighborhood was capable of receiving federal and donor funds directly and forming community-building companies (enterprises) to demolish and to construct housing for displaced residents, allowing them to remain over the long term. The reconstruction effort provided local jobs and job training, and some ownership began to replace renter status. There was strong leadership by women. A strategy of temporary shelter inside the neighborhood (parks and streets) was utilized.

The role of the local civic group in this recovery

The Colonia Guerrero Neighborhood Organization (UVCG) was created in 1976 to protect resident rights to remain in the neighborhood and for upgrading the safety of deteriorating rental housing. The UVCG supported a communitarian recovery program that included training workshops in different areas to provide new sources

of labor (carpentry, blacksmithing, electricity), organization of consumer groups (to obtain food directly from the producers) and the promotion of cultural activities and sports. One characteristic of effective social capital was the active presence of women at the same level as the men. The earthquake event was a means to actually improve shelter quality, acquire ownership for some households, demolish dangerous buildings, and to provide needed jobs.

Each block has a directive committee that participated in the UVCG assemblies, and this structure led to the extraordinary preliminary assessment of damage and local need completed three hours after the earthquake. The neighborhood received significant support from Casa y Ciudad, an NGO, and from Jesuit priests from Los Angeles parish. As part of the overall governmental response, 371 deteriorating and damaged properties were expropriated.

By 1985, the UVCG had nine years of organizational experience. The technical (construction aspect) and legal (apartment leasing) consultation increased the community's capacity to meet emerging disaster created needs. Restoration of old structures, which included wall reinforcement and roof replacement, was important in the prevention of greater damage and loss of homes. Residents refusing to stay in temporary shelters, instead camping out in the plazas and streets, was a sign of the deep-rooted sense of community affinity, and a desire to quickly rebuild and improve the community.

DISCUSSION QUESTIONS

1. What are the principles of effective neighborhood engagement described and how do they relate to the concepts set out in the first thee chapters of the book?
2. How do you know when you have adequate community engagement?

A faith-based task force model for disaster recovery

Jamie Aten

Religiousness and spirituality are often highly involved in dealing with and recovering from traumatic life events like disasters. Through collaborations with faith-based groups and organizations (eg, churches, synagogues, faith-based non-profits), which have historically played an integral sociopolitical, economic, and psychological role in responding to large-scale trauma, disaster organizations can modify traditional skill sets in novel ways to intervene at a community level. This piece examines the usefulness of an interfaith task force model for organizing faith-based responses to disasters, based on the author's work with and research on the Mississippi Coast Interfaith Disaster Task Force (IDTF) post-Katrina.

Qualities of effective collaboration

On the whole, faith communities have been underutilized in most local, state, and federal disaster response plans and strategies. However, religious and spiritual groups are often some of the first groups to actually respond to 'on the ground' needs immediately following a disaster, and some of the last groups to leave areas affected by disasters.

Based on lessons learned over the last 30 years, there are several steps that should be taken by disaster organizations considering working with faith communities:

- Getting to know local community and religious leaders, as success often rests on a trusting relationship;
- Being culturally appropriate, and showing respect to the unique religious and spiritual beliefs of faith communities;
- Focusing on community strengths, helping each faith community see how they might contribute to the recovery based on the skills and resources of their congregation;
- Facilitating bi-directional collaboration, where both disaster organizations and faith communities respect what each has to offer and refer to one another; and
- Promoting a cyclical approach, which includes identifying needs, strengths and resources, implementation, obtaining outcomes, follow-up, and refinement of responses.

Possible faith community disaster interventions

By their very nature, faith communities and faith-based groups often have built-in infrastructures and components (both formalized and non-formalized) that may be maximized to prepare for and respond to disaster. For example, most faith communities have personnel, ministries, programs, facilities, networks, and communication strategies that can offer: (a) spiritual guidance, (b) meaning, (c) economic resources, and (d) social support to their members and their community at large. Further, most faith communities and faith-based groups have relationships with other community, regional, national and international organizations (eg, clergy associations, denominational affiliations) that can be leveraged to provide a concentrated response at local affected areas. Examples of possible ways disaster organizations and faith communities can work together include:

- Capacity building interventions which facilitate post-disaster communication, continuity of operations, partnerships with disaster organizations, sharing of resources, and the establishment of post-trauma roles and facility uses;
- Training and education interventions that integrate religious and spiritual teachings and resources, coping strategies, common reactions to trauma, and referral guidelines;
- Emotional and spiritual support interventions, consisting of psychological first-aid for religious communities, pastoral care and counseling, faith-based case-management, hope-focused teaching and preaching, and meaning-making strategies; and
- Advocacy interventions, comprised of giving faith communities a 'voice' for the underserved or vulnerable, assistance in hosting advocacy events, media relations, collecting and sharing data/facts, and research and grant work.

An exemplar model for interfaith disaster response

IDTF's vision is to demonstrate how people of different faith can come together in a cooperative and compassionate spirit to nurture the creation of a community that

will help those least able to help themselves. Following is an overview of ways that IDTF was able to facilitate effective collaborations between interfaith groups and disaster organizations following Hurricane Katrina. Examples of successful disaster interventions that stemmed from faith communities and disaster groups working together are also highlighted.

- **Capacity Building and Communications**: Most of the disaster recovery organizations in the Mississippi Gulf-Coast region are small and under-resourced. IDTF has provided critical opportunities for organizations to get training, share resources, and form partnerships. IDTF has sponsored a series of Disaster Recovery Organization Summits in which clergy, mental health professionals, case managers, volunteer managers, advocates, and disaster relief professionals meet to organize and develop a true regional response to the disaster. For example, an ongoing bi-monthly learning collaborative was established to provide networking and relationship building opportunities for professionals (eg, clergy, mental health professionals, disaster relief workers), community members, and agencies. Participants are encouraged to share disaster related problems or challenges facing their communities, followed by group problem solving or resource sharing.

- **Spiritual and Emotional Support**: Many disaster recovery workers were personally affected by Katrina, losing their homes and community support. In addition, these workers listen to personal accounts of devastation on a daily basis and emotionally take on the burdens of those they are assisting. IDTF provides seminars, retreats, and support so that disaster recovery workers can be emotionally, spiritually and physically healthy. For instance, a two-day clergy self-care retreat has been offered to religious leaders and their spouses who were affected by Katrina, with workshops and breakout sessions focused on burnout issues, meditation, reflection, and relaxation.

- **Disaster Spiritual and Emotional Care Training**: IDTF also provides training for clergy, mental health professionals, case managers, volunteer managers and disaster relief workers. National and local community experts have conducted the trainings. The trainings have sought to enhance knowledge and skills competencies. For example, a two-day disaster mental health summit has been organized, with an emphasis on bringing together clergy and mental health professionals. Three tracks have been offered on pastoral care, mental health, and clergy-mental health collaboration. Approximately 350 participants have attended the summit annually since Katrina.

- **Casework and Case Management Services**: IDTF staff helped organize the Long Term Recovery Committees (LTRCs) and Unmet Needs Roundtables. IDTF staff served as a representative for several Disaster Recovery Organizations (DROs) during the roundtable process. This ensured that DROs were represented and that funds, materials, and volunteer labor could be committed at the Unmet Needs Roundtables. Faith communities were also recruited to assist in service delivery activities. For example, in 2007, IDTF changed its role from DRO support to advocating for more

funding and support for all of the LTRCs. For example, IDTF organized an all-day Katrina Summit for service providers, community members, and potential funding agencies. Training, lessons learned, and current case management needs were highlighted.

Putting people before recovery plans

N. Emel Ganapati

While undertaking public participation is not an easy task for policy makers under 'normal' circumstances, it is an even more difficult undertaking in post-disaster contexts. The lessons outlined here for undertaking participatory initiatives are based on the housing recovery process undertaken in Gölcük district, Kocaeli, in Turkey after the earthquake on August 17, 1999. There were three sets of barriers to meaningful public participation in Turkey in the housing reconstruction process: (a) institutional barriers; (b) those related to the disaster recovery practitioners; and (c) those related to the disaster survivors.

Institutional barriers

In Turkey, planners do not have a legal responsibility to seek participatory input. Turkey's urban development law (3194) only stipulates that plans should be open to public review for at least 30 days after completion and that those who are negatively impacted can litigate. Therefore, planners did not pursue a participatory approach to housing reconstruction.

By contrast, the World Bank pursued a participatory approach to housing reconstruction to meet the unique needs of the displaced population, as well as to ensure their confidence in their new housing units (*World Bank 1999*). Through a consulting firm, the World Bank held two rounds of public meetings in the earthquake zone. The World Bank's participatory meetings were well received by the earthquake survivors since they were relatively informative in the context of Turkey's planning environment. Perhaps for the first time, someone was explaining things to the survivors and providing them with information on what to expect from their new homes. However, the input received from the public meetings (eg, cultural unsuitability of housing design and inadequate housing size) was not incorporated into the housing reconstruction plans, owing to inflexible terms and conditions of the World Bank loan. The World Bank's project appraisal document (1999) had specified almost all aspects of the housing units to be built, leaving no or little room for changes in the plans based on the input from the participatory exercises.

Barriers related to disaster recovery practitioners

There were three barriers related to disaster recovery practitioners which hindered public participation in the recovery process. The first barrier was the practitioners' assumption that they should rebuild urgently. It is true that there is often an imperative to rebuild in a speedy manner following a disaster so that the survivors could achieve some level of normalcy in their lives. However, such urgency hinders participatory initiatives, which may be time consuming, but rewarding in the end. Besides, disaster survivors may not necessarily share the same urgency with recovery practitioners after every disaster. They may be willing to wait a little longer if such a wait were to result in better outcomes (eg, better housing).

The second barrier was that disaster recovery practitioners did not pay enough attention to people's affective attachments to their pre-disaster city. Survivors often refuse to relocate to another location following a disaster. They prefer to rebuild their city in the same form as their old city, even if they are aware of the risks involved. Recovery practitioners can better enable public participation once they honor people's attachment to their communities and develop their post-disaster recovery plans by taking such attachment into account.

The third barrier had to do with the narrow definition of the public by recovery practitioners. For instance, in the World Bank's housing reconstruction project in Gölcük, the public was defined as beneficiaries of that particular project. Such a narrow definition excluded other relevant stakeholders, such as the local government, community organizations and businesses in the area. These groups also wanted a voice in recovery processes, since housing reconstruction projects reshape development in their communities. Roles of such groups could be complementary to the roles played by project beneficiaries: if project beneficiaries participate in the planning and design of their immediate surroundings and houses, other stakeholders could have a say in planning activities like the location of permanent housing areas, schools, shopping, and health facilities.

Barriers related to survivors

There were also important barriers to participation related to disaster survivors. Disaster survivors are often willing to participate in post-disaster planning processes to have a say in the recovery of their neighborhoods or cities. However, in the immediate aftermath of disasters, they may not be psychologically ready to take part in participatory initiatives, since they may still be grieving for their losses.

Unfortunately, there is no guidance in the literature on when disaster survivors will be ready to participate. However, the importance of understanding the psychological readiness of disaster survivors to participate is essential for recovery practitioners. Another barrier related to disaster survivors was that they were skeptical of recovery processes and did not believe that the plans prepared by government officials were in their best interests. Such skepticism arises when disaster survivors lose trust in the government and officials after a disaster (eg, owing to failures in search and rescue). Such skepticism and lack of trust may prevent disaster survivors' involvement in recovery.

Suggested courses of action

To enable public participation in post-disaster contexts, there is clearly a need for institutions (laws and regulation) that allow for meaningful public participation in the first place. In addition, recovery planners can enable public participation by doing the following:

- Do not assume a sense of urgency after every single disaster (the context matters!);
- Honor people's attachment to place while developing recovery plans;
- Broaden the definition of the public to include relevant stakeholders;

- Take into account the psychological readiness of disaster survivors to participate; and
- Try to build and strengthen trust between the officials and disaster survivors.

Among these, perhaps the most difficult aspect is to build trust. Yet, even small steps taken by recovery planners could help them build and strengthen people's trust in recovery processes. These small steps could include, for instance, standing back, listening, and learning from the survivors as well as speaking a language free of technical jargon that the survivors can understand. In sum, recovery planners need to put the people before their plans.

Schools and students in disaster recovery

Mike Ward

Following a crisis or disaster, getting students back to school quickly is uniformly believed to be important to their sense of well-being and therefore to the overall health of the community.

School staff members

A key variable associated with getting students back to school is having staff prepared to do the same. Care and attention to the needs of staff members is a duty owed by school leaders; attending to these needs also helps these staff members to address the needs of students.

Hurricane Katrina destroyed the homes and possessions of many school district staff members. Student outmigration also reduced demand for teachers in the affected areas and impacted personnel budgets. The personal and emotional impact of the disaster on school staff members was thus compounded by uncertainties about their employment. Pragmatically speaking, it is in the interest of the district to ensure that staff members feel supported and secure in their employment. In the absence of this, they may either seek employment elsewhere or, in areas of teacher shortage, be recruited away. Sack and Keller (*2005*) describe how recruiters from outside Hurricane Katrina's impact zone lured veteran teachers away with offers of pension transfers and seniority status.

Faculty and staff recommendations

1. Implement communication protocols such as website updates, emails, telephone trees, and written communiqués for staff members.

2. Monitor staff check-ins and implement plans for locating those who have not been in touch after the crisis. Provide information frequently on dates and times to report to school (or an alternate location), and responsibilities to be fulfilled.

3. To the extent practicable, hold staff members' jobs harmless for the current school year. This is a matter of law/policy in many places, and it is a humane and practical policy. The budget policies of the nation, states and school districts should ensure that funds exist to address such contingencies.

4. Provide sessions to update staff on recovery efforts and on avenues through which the staff members, who may themselves be impacted, can receive assistance.

Student impact

Children are affected by disaster in unique and profound ways. Following Hurricane Katrina, the most severe impact upon students included personal losses and homelessness. The Ocean Springs School District of Mississippi offers a stark example of this impact. Prior to the storm, there was one homeless student on the district's roster; after Katrina, over 1,000 students were reported as homeless (*Hurt 2006*).

Getting students back to school in the wake of a crisis or disaster is a priority. Restoring a sense of normalcy is no small part of this concern. The stresses associated with disaster can produce a number of physiological ailments, including eating and digestive disorders, and even cardiovascular and respiratory irregularities (*Gaffney 2006*). Psychological manifestations in children can include fears for their own safety, and anxieties about being abandoned. Following Katrina, one school administrator reported: "The psychological damage is unbelievable – one child whose family lost everything came back to school and, when he saw his desk, he ran to it and hugged it. It was the only personal thing he had left."

It is important for schools to be prepared for the impact of the disaster on the performance and behavior of students. Following Hurricane Katrina, Ward et al. *(2008)* found that Mississippi students who had been displaced were more likely to be non-promoted and more likely to drop out. They also found that rates of absenteeism, suspension, and expulsion from school were higher among displaced students. In Louisiana, those principals who noted problem behaviors among students indicated that displaced students were more likely to act out in some fashion (*Pane et al. 2006*). Tardiness and absenteeism, quarreling with schoolmates, being disrespectful to teachers, and even being physically aggressive with other students were typical of such behavior. On the other hand, they tended to be less involved in positive activities such as student organizations and sports (*Pane et al. 2006*).

Schools are also typically more responsive to the problems of students in the immediate aftermath of a disaster than later on. Two years after Hurricane Katrina, RAND researchers who tracked mental health services in Gulf States noted that the storm's psychological effects were: "Not only larger than they were, but they're growing." Problem behaviors among students may not occur immediately. In the second year following Hurricane Katrina, suspensions and expulsions increased to levels significantly higher than pre-Katrina rates.

These delayed manifestations are more problematic because they occur at a time when teachers may no longer be aware of which students are among those most heavily impacted by the crisis. In the immediate aftermath of a disaster, teachers, counselors, and administrators may be well aware of those students who have suffered most. However, as traumatized students move grades/forms, their new teachers may be unaware of the needs of these children. Counseling and mental health supports may have been reduced as school personnel move on to other issues of concern. Sustained counseling and mental health supports are important, however, to ensure that those

students most seriously impacted by tragedy get the assistance that they need in order to be successful in school. The observation of a state school superintendent is instructive: "Two years out from the tragedy is the most difficult psychologically. There's a weariness that sets in."

Student care recommendations

School personnel should know who, among their students, was displaced or otherwise profoundly impacted by the disaster/crisis. Mechanisms for tracking such students from one year to the next and from district to district, and even state to state, are important. Even more important is the communication about the needs of these students that occurs between the previous teachers/service providers and the new ones. Because they possess comprehensive information systems, state departments of education are usually well-positioned to aid districts in the identification and provision of support to such students.

School staff members should be aware that the academic achievement of traumatized students is likely to decline. Since displaced students are more likely to be educationally disadvantaged prior to the disaster, the compensatory educational strategies developed for struggling learners may need to be intensified and sustained longer for these children.

Because of the increased likelihood of problematic behavior among students who have been traumatized by disaster, school staff members need to know who these students are, to watch for signs of trauma, and to provide intervention services for students. Expanded counseling and mental health services should be implemented. Other agencies, particularly those that address children's health and mental health issues, should assist.

Conclusion

Sound planning and effective implementation after a disaster determine to a great extent whether or not an expeditious resumption of schooling can be accomplished. Restoring a sense of normalcy is essential to the welfare of students, but in the case of a profound disaster, this can't be accomplished entirely in the short-term. The effects of the disaster linger in the minds of many students, and their need for support will linger well after the visible signs of the disaster have been cleared away. A quote from a senior state education officer in the wake of one disaster says volumes: "Some school people say, 'Let's get back to normal…these kids just need to suck it up and deal with it.' There have to be strategies or we're not going to be successful. The public needs to acknowledge that it's an issue that requires public attention and public resources" (*Ward et al. 2008*).

DISCUSSION QUESTIONS

1. Who are the most vulnerable people post recovery and why?
2. How are these vulnerable groups best dealt with?
3. Find an example of a recovery program that did work with vulnerable people well; what lessons can we learn from it?

Chapter 6: Informing Recovery

Jed Horne

As this chapter will show, recovery communications is a broad-ranging concept. Messaging calculated to inform a mass audience post-disaster is not limited to official announcements by government leaders or the work of traditional media such as newspapers, radio, TV, and the like, important as they are. Equally germane are the broad gestures and symbolic representations through which a municipality or region defines itself and focuses its energies. In the communications context, therefore, the term 'recovery leaders' includes not just government officials, but also church, foundation, business, cultural and community leaders – anyone, in short, whose voice is likely to rise above the clamor that follows a catastrophe.

THE MESSAGE OF MARDI GRAS

The debate was heartfelt on both sides: less than five months after the disaster, should New Orleans hold its annual carnival, the mid-winter weeks of parades, debutante balls, drinking and mayhem that culminate in Mardi Gras?

Foes of Mardi Gras 2006 denounced the "insensitivity" of those who now proposed to pay millions to stage and police the carnival, assuming those millions could even be found. If nothing else, respect for the dead required suspension of the annual revelry, they argued.

Kill carnival, the festival's proponents countered, and you were pronouncing the death of the city itself. In their view, Mardi Gras would be a signal to the world and to the city's scattered residents that New Orleans still had a pulse. Moreover, even a frail and diminished carnival would put at least a little cash in the coffers of hotels and restaurants staggering from cancellation of the fall convention season in a city heavily dependent on tourism.

It was a decision of a type that has been debated in cities and regions around the globe as they recover from disaster: in essence, whether to nurture civic events and rituals emblematic of the city in the eyes of the world before catastrophe struck, or whether to yield to a more funereal mood by way of acknowledging that much was lost and that much about the old order must be reconsidered.

In New Orleans' case, carnival prevailed – a particularly cathartic and frenzied carnival, at that. Parades given to satirical themes took up their task with special zeal, creating a new pantheon of civic heroes and demons to laud or exorcise. And those drawn by loyalty – or morbid curiosity – to visit the 2006 instalment of New Orleans' most famous civic ritual got non-stop schooling in the nature of disaster and the city's enormous needs. The message was beamed around the globe by reporters and TV crews who turned up to see how the city resolved the raging debate over the seemliness of a carnival against the backdrop of municipal ruin.

It was a strategic decision that could easily have backfired, if, for example, the city's indulgence in traditional frivolity had eroded support for New Orleans in Congress, choking the flow of aid urgently needed for housing, levee reconstruction and other sobering considerations.

Some of those who saw callousness in a carnival so fast on the heels of destruction and death will never be appeased. But in hindsight, the decision to plow forward with as big a celebration as possible appears to have been significant to the city's recovery, both in terms of economics and, perhaps more importantly, morale. A message had been communicated within and beyond the city: New Orleans might actually survive the catastrophe of Katrina.

The importance of symbolism

In New Orleans, the message of a revived carnival was one of resilience, a way not just of declaring, but of demonstrating that something essential to the city's pre-disaster spirit – its past – was still alive. In other settings the municipal ritual may be a post-disaster innovation that speaks to a changing future.

Kobe Luminaire, the Japanese festival of lights, fell in December 1995, roughly a year after the terrible Hanshin-Awaji earthquake, and it has since come to occupy a place similar to carnival in the Japanese port's municipal calendar.

Brick-and-mortar projects can have comparably symbolic importance, of course. In New Orleans, debate as intense as the one over Mardi Gras erupted around the governor's decision to spend millions on a fast-track campaign to reopen the Superdome stadium in time for the local football franchise, the New Orleans Saints, to play home games just a year after Katrina. Though tens of thousands of citizens were still displaced and even homeless, the season opener offered proof that the city was capable of its old exuberance. For a worldwide television audience, the energy in the stadium, intercut with reports on the city's accomplishments and needs since disaster struck, was global messaging of a value commensurate with the cost of the stadium's rehabilitation – enough to silence those who had questioned that investment.

Controlling misinformation

That some recovery initiatives have symbolic meaning beyond themselves does not mean recovery leaders can assume that their messages will be clearly or universally understood. As surely as disaster ravages the built and natural environment, it can make for dissonance and confusion in the realm of communications.

Hurricanes are meteorological vacuums that suck the ocean up and roll it onto land. The information-age analogue is a vacuum of another sort. It was created during Katrina by the collapse – near or complete – of the region's communications infrastructure: cell telephone towers, newspapers, radio, television, police frequencies, everything. This vacuum seemed to draw forth all manner of demons from the collective subconscious – bigotry, panic and the proliferation of myths and simple falsehoods that flourish amid great fear and in the absence of ways to verify the truth.

The reality of the damage and chaos in New Orleans was horrific enough, but some reporters lost all sense of proportion and portrayed storm survivors as barbarians at best, animals at worst. Among the falsehoods which enjoyed brief or lasting currency were that rape and throat-slittings had been epidemic; that police had tracked down and summarily assassinated hundreds of suspected outlaws; and that the white elite had deliberately blown up the levees in order to expel a burdensome population of low-income African-Americans, and so on.

As a result, an important task early in the Katrina recovery period was an exercise in self-correction by major media. Following the lead of the local paper, the Times-Picayune, national news sources including the New York Times, the Washington Post and the Los Angeles Times, devoted considerable effort to a humbling review

of their reporting on Katrina, some of which had been marred by exaggeration and misinformation about a city in tumult. The falsehoods – the reports of mass rape, for example, or of bodies lashed together like balsa rafts and allowed to float out into the Gulf – took root in the media barrage and then in the popular imagination. It also infected Capitol Hill, where support for federal assistance was desperately needed and invidious images of New Orleans were seriously counterproductive. The process of setting the record straight was voluntary and greatly to the credit of reporters and editors who participated. But in the absence of self-correction, public officials would have been wise to monitor the reporting and goad media to perform this function – or do it themselves – if misinformation became apparent.

The deluge of misinformation was built not just of rumors repeated often enough to gain the force of reportable fact, but also through exaggerated public statements passed on by city officials. The falsehoods undercut the emergency response in the storm's immediate aftermath. Shots fired by storm survivors trying to attract the attention of rescue teams were misinterpreted as shots fired at rescue workers by hapless citizens stereotyped as monsters of depravity, and as a consequence rescue efforts were briefly suspended, adding to the death toll.

One response to the collapse of the region's communications infrastructure has been to accelerate the pace of making its component parts 'interoperable.' This means emergency service personnel, including police, firefighters, elected officials and emergency managers, can better coordinate their movements. Equally importantly, they can backstop each other when dubious or alarming reports need to be confirmed or refuted. A move toward interoperability among emergency response networks is surely a wise one in any jurisdiction at risk of disaster.

But for the purposes of this discussion, the period of emergency response in New Orleans – about a week in duration – is of less interest than the long-term recovery from Katrina that continues more than five years later. And recovery, too, has been haunted and undermined by stereotyping, myth-making and bigotry, all of which are at their heart examples of miscommunication. Recovery leaders should expect this kind of thing and should be prepared to root it out systematically or risk seeing recovery agendas distorted or undone.

Were the levees deliberately blown up in New Orleans? They were not; the points of failure were far more numerous than conspiracy theories could possibly explain. But for political reasons, Mayor Ray Nagin declined to refute the myth emphatically. Finally, during congressional testimony a senator grew tired of such insinuations and obliged Nagin to disown the myth once and for all, which he sheepishly did.

Hindsight makes it easy to see that New Orleans would have been better served by a mayor who understood from the start how badly myth and misinformation were poisoning public discourse. The excuse that recovery managers are too busy to deal with public ignorance underestimates its destructiveness. In Tokyo, after the 1923 earthquake, rumors of well-poisonings and other mischief by foreign nationals provide another example of paranoid or xenophobic ideation that confounds recovery and social cohesiveness. The hope may be that in due course such foolishness will expire of its own dead weight, but the reversion to reason and common sense can be

a long time coming in the absence of aggressive efforts by political and other leaders to clear the air.

Sober stewardship

Leaders need to defuse systematically the falsehoods and distortions that can derail or complicate recovery efforts. Katrina served as a reminder that when it comes to communications with the public, government officials and civic leaders wear at least two hats in a recovery. They are looked to, both by media and the general public, as sources of reliable information urgently needed by storm victims who are trying to decide whether to leave town for good or rebuild their lives, homes and businesses within the area. But these same civic leaders also occupy a bully pulpit from which to appeal for federal and philanthropic resources.

To achieve the first of these goals – the provision of reliable information – requires those in charge to recognize the value and importance of good and timely communications, and to create and resource an appropriate communications team for the task. The management of the communications effort after the Grand Forks floods provides an example of how this can be successfully managed.

As well as taking a professional approach to managing how their staff communicates with the public, recovery leaders need to think carefully about their own role within recovery communications. In particular, they need to temper the urgency of their appeals for help with demonstrations of sober stewardship of the public purse. This requires assuring both benefactors and victims that recovery is possible and that aid will be well husbanded. As Katrina demonstrated, these twin functions – alerting the world to the scope of disaster and appealing for aid – can cancel each other out if not kept in thoughtful balance.

After Katrina, a classic misstep was committed early on when officials, including Louisiana's two US senators, presided over creation of a wish-list for government assistance that topped out at an extravagant $250 billion – a multiple of what the city was destined to receive. Congressional leaders joined newspaper editorialists in decrying the list as an extreme overreach. They accused it of including a plethora of long-term state projects only vaguely tied to disaster recovery. The pushback was even more hostile after it was revealed that legislative lobbyists had a shaping hand in the document. Conservative partisans did not hesitate to cite the $250 billion request when developing a depiction of Louisiana in general and New Orleans in particular, as corrupt, grasping and – under Democratic leadership – out of sync with the Republican hegemony then prevailing in Congress and the White House. Republican Mississippi made more modest requests for aid and then, ironically, was showered with federal largesse greater than Louisiana's share, as measured per capita. Months passed before grudging increases in allocations for Louisiana began to reflect that the state had sustained far greater damage than its neighbor. It seems likely that an initial appeal better attuned to verifiable needs and a shrewder assessment of national sympathies would have been more immediately useful to Louisiana.

At the municipal level, a cry of desperation into a talk radio host's microphone initially helped establish Mayor Nagin's reputation as a passionate, no-nonsense

leader. "Get off your asses" and deal with: "The biggest disaster in American history," he howled at leadership in Baton Rouge and Washington. Nagin was not alone. Wrong-headed messaging bedeviled governance up and down the food chain. Few instances had more toxic effect than the photograph of President George W. Bush shown peering out the window of Air Force One as it passed over storm and flood-ravaged New Orleans while the President returned to Washington from a lengthy summer vacation in Texas. Perhaps the intent was to convey that a President operates at a level of authority and responsibility far above the needs of any one municipality. But instead it radiated aloof indifference to what was, after all, the worst disaster to have afflicted an American city since the San Francisco earthquake roughly a century prior.

If survivors and media alike craved down-to-earth leadership capable of frank communication, the need was met most successfully by the popular 'hero' of Katrina's immediate aftermath: Lt. Gen. Russel Honoré, the man who led the US Army into New Orleans to restore order and complete the evacuation, however belatedly. To the delight of reporters and the relief of citizens desperate for information, Honoré did not use press aides to handle his messaging – something he had tried with unsatisfactory results years earlier in Korea after a local woman was raped by a US soldier. This time, Honoré took the microphone himself on a daily basis to make bluntly credible assessments of progress or the lack of it. The lesson here is that recovery leaders should make themselves directly available to media and the public. While a well-organized and available communications program is one aspect of effective recovery communication, creating an aura of transparency and candor by those at the top of the political chain is equally important. Candor – so long as it is detached from the hysteria that characterized Mayor Nagin's early pronouncements – is certainly worth more than carefully crafted messages that seem aloof, self-serving, and engender skepticism.

Communications missteps by government officials endanger not only the government's recovery efforts, but can also undermine the work of NGOs and other third parties assisting with recovery.

Saturation campaigns

Some post-disaster venues have looked well beyond rooting out myths and misinformation as they crop up in media reports and public discourse. Instead or in addition, governments and NGOs have sought actively to reshape public consciousness itself, through comprehensive propaganda campaigns.

In post-war Bosnia, for example, the recovery was undermined by ethnic and religious sectarianism which, to some recovery workers, seemed almost as pernicious as the divisiveness that had led to war in the first place. The difference was that in place of violence, the persistent resentment expressed itself in an enervating self-pity and passivity among the general population. According to Rick Barton – who was at the time on location in Bosnia and is presently US ambassador to the United Nations – this blunted the impact of the investment by the US Agency for International Development (AID) that was meant to spark economic resurgence, political participation, and the re-creation of a self-sustaining social infrastructure.

The strategy in Bosnia adopted by AID's Office of Transition Initiatives relied on a staple of all-American marketing: a saturation ad campaign. Rather than issue recovery messages and see whether the news media paid any attention, OTI decided to buy airtime and thus control more completely messages on a variety of topical issues. Some spots involved a small cast of comic actors portraying cartoonish characters all packed into a Yugo compact. One ad targeted the recrudescence of political subdivisions in the former Yugoslavia, such as the laws that required a separate license plate at every regional border crossing. The comedy team's mocking solution: the requisite license plates were mounted on a rotating spit bolted to the rear bumper. Another ad, attacking the persistence of regional passports, showed members of the national soccer team being eliminated from play, one by one, for lack of proper documentation – a testament both to the diversity of the team and the folly of political balkanization.

These ads and others like them drew on a template developed in Indonesia in the late 1990s, as the Asian financial crisis pushed Java to the brink of political and economic disintegration. To tamp down resurgent tribalism that threatened national unity, one campaign attacked lock-step bloc-voting. A Javanese fisherman became a national icon as he coyly announced that his vote in an upcoming election might come as a surprise to fellow tribesmen. In another, a father expressed admiration for a daughter's independence as she contemplated which candidate to back at the polls.

In Bosnia, the economic crisis depressed TV rates, stretching AID's relatively small ($5 million to $10 million) messaging budget. Barton, who figured prominently in both the Bosnian and Indonesian campaigns, reckons that future propaganda campaigns of this sort and huge savings lie in use of social networks accessed through the internet.

Collection and use of data

Recovery is crucially dependent on solid data, and leadership should prioritize the collection and promulgation of such data. Access to accurate, timely information will help recovery leaders avoid many pitfalls, particularly the risk of spreading misinformation. The counterweight to official posturing and overstatement in the post-Katrina environment was a variety of information services, many of them digitized and accessible on-line. Non-profit, commercial, government-run or quirkily independent, they proved highly valuable to the recovery process, both as sources of raw data and as forums, bringing shattered communities and interest groups into coalescence.

Just as they are advised to set up a mechanism for systematically refuting misinformation and myths that may be dogging post-disaster work, recovery managers should be certain that accurate and continuously updated data are available – not just to government, but to non-profits and the business sector as well.

At the grassroots level, the Katrina recovery spawned an information service called Louisiana Rebuilds. With funding from major national philanthropies and foundations, in the early stages Louisiana Rebuilds was a kind of bulletin board on which far-flung storm evacuees found precious information about the status

of their neighborhoods and on which they posted appeals for word about missing friends and colleagues. Over time, the site (now www.GNOInfo.com) added further information, ranging from tips on how to access government services to an inventory of contractors in the building trades, footnoted with complaints or praise from those who had hired them.

Though non-governmental at heart, Louisiana Rebuilds initially bore the brunt of heavy – and nearly overwhelming – traffic from people seeking to contact the Road Home program, the state service tasked with distributing billions in federal dollars to property owners whose housing had been destroyed. As an adjunct service it has lasted several years into the recovery. Louisiana Rebuilds also took to radio with regularly updated one-minute announcements conveying tips on recovery programs and how to access them.

For a service that combines the best of both government boosterism and hard-nosed recovery data, one might look to the 12-month reports published by the Victorian Bushfire Reconstruction and Recovery Authority. The fourth such release, published in February 2010, was a 68-page booklet rich in photography, graphics, articles and data.

The pros and cons of the commercial media

On the for-profit side of the ledger, Katrina happened to coincide with commercial media's ongoing shift to internet sites, providing an avenue of access parallel to traditional messaging by broadcast or the circulation of printed newspapers and magazines. The change was crucial to the post-Katrina information flow in two ways, the first being that with broadcast operations knocked out and newspaper trucks unable to reach – or even locate – subscribers and newsstand customers, information flow continued, at least to that part of the media audience able to access the internet. Secondly, the internet made these traditional media much more interactive. Sites associated with broadcasters and publishers turned a portion of their internet presence into digital bulletin boards on which survivors posted messages, posed questions and rebuilt a sense of community within the Diaspora of Louisianans scattered to 50 states.

As broadcast capacity was restored, newspapers and talk radio proved the most potent commercial media, both in terms of morale building and information. Through endless on-air stints and an intelligent sifting of fact and fantasy, WWL radio commentator Garland Robinette emerged as a strong voice of hope amid the city's ruin – a role performed more recently by Mario Viau's Signal FM station in Port au Prince, after Haiti's 2010 earthquake. In print, a humorist named Chris Rose, then with the Times-Picayune, tinctured his columns with equally strong doses of sentimentality and civic pride to become a sort of conscience of the recovery. Readers flocked to his message of love for New Orleans, hope for its resurrection, and frustration at missteps along the way – temporarily driving his on-line audience to many times its former size.

The bulletin-board function of both non-profit and commercial media was perpetuated and regularized in later months and years of the post-Katrina recovery

through audience call-ins, online commentary and informal blogging responsive to the published or broadcast work of staff reporters and commentators. The result was greatly augmented citizen access to public debate over recovery issues.

Public access invigorates debate, but comes with a caveat. While much benefit flowed from online bulletin boards and the like, directors of for-profit media may find themselves pondering one issue not limited to post-disaster milieus: whether to suppress some postings. Louisiana's experience was that access to commercial websites proved especially enticing to bigots, whether they expressed racial or ethnic hatred overtly or in coded language.

While editors hoped balance would be provided by postings from contributors expressing the polity's full gamut of opinions, these environments instead established themselves as the domain of divisive, low-brow commentary rarely capable of constructive additions to the recovery debate. Government censorship, even if it were permitted under American law, would have been decried. But some privately owned sites made the decision to reject this sort of audience input. Others weighed the bad against the good and decided to uphold the principle of open access, although not without frequent moments of embarrassment.

Creating a culturally sensitive 'recovery dialogue'

Recovery is inevitably a balancing act, and recovery managers need to understand and respect the socio-cultural context in which they're working. A successful recovery manager quickly recognizes that when designing recovery programs and communicating them to the public, cultural sensitivity is essential to a successful outcome. Finding ways to accommodate cultural concerns into recovery projects, and engaging the public in this process of cultural adaptation, is an effective way of ensuring the broader 'recovery dialogue' speaks to locals and receives their support. This, then, is recovery communications on a big picture scale – ensuring the broader message of the recovery process is one that appeals to and engages those most affected by the disaster.

As well as implementing public engagement processes like the one discussed above, the process of building a meaningful recovery dialogue requires undertaking culturally sensitive recovery actions. In a preservation-minded place like New Orleans, for example, the public will hunger for signs that the old order is being restored, even those aspects of the old order that proved horribly vulnerable and, thus, contributed to disaster. At its most dubious, this yearning for restoration will fixate on the rehabilitation of houses in a dangerous flood plain and celebrate such folly as a measure of population rebound. The countervailing force draws strength from evidence of progressive, even radical, transformation.

Tremendous and well-justified anxiety that incompetent management would impair New Orleans' trove of historic housing and municipal buildings (the art deco Charity Hospital among them) was offset by excitement over promising new visions. One was the possibility of a bio-medical complex in which Charity and the

Veterans Administration hospital would combine resources to create a new teaching hospital and research facility – but at the expense of a residential neighborhood of older houses that would have to be torn down. Another, less controversial but equally radical departure from tradition was the cluster of environmentally 'green' houses that sprang up in the most flood-ravaged parts of the Lower Ninth Ward with funding from movie actor Brad Pitt's Make it Right Foundation. Some skeptics scratched their heads over the avant-garde architecture; others questioned the wisdom of encouraging resettlement of an area that had flooded so deeply, but the community members who accepted Pitt's largess seemed to love their new homes and that redressing their victimization and limited access to recovery funds had been his principal concern.

An equally bold statement, more about community than about avant-garde architecture, was made by Habitat for Humanity's 'Musicians Village'. Artists and other low-income residents deemed important to New Orleans' cultural revival gained title to their new homes by sweat-equity investments in the construction of trim new units clustered on pilings that lifted them above flood levels.

Some of the same tension between veneration of the past and a yearning for a brighter future figured in debate over what to do with the city's public housing projects. Prior to Katrina, these dilapidated, government-run ghettos had few fans. But with the wrecking ball poised over what was left of them after Katrina, a significant minority of New Orleans preservationists and community activists seemed to experience a sudden spasm of deep affection. Picketing and other expressions of opposition escalated into an assault on a closed-door session of the New Orleans City Council evocative of a 1960s anti-war demonstration. The modernists prevailed and the projects were mostly torn down, to be replaced by an updated paradigm: mixed-income housing built in rows which once more respected the city street grid from which the old projects had been separated.

The devil is in such details of cultural sensitivity. Isolating the public housing projects from the surrounding street grid had been consistent with the garden apartment movement of the early-to-mid 20th century and met with favor at the time. But with hindsight it is clear this also isolated groups that had already been marginalized by race and poverty, and hastened ghettoization of these communities. It was therefore deeply symbolic that designs for the new communities restored some of the original street grid and reconnected public housing to the surrounding community.

In the Maldives, a post-tsunami housing effort by the Red Cross foundered initially owing to a failure to bring intended occupants – women in particular – into the recovery conversation. In a mid-course correction, the Red Cross solicited input from the women and redesigned the fishermen's cottages to reorient them with regard to sunlight, the ocean and the placement of their kitchens. A housing effort similarly marred by lack of cultural fluency occurred in Alaska, where efforts on behalf of an Inuit community resulted in structures with conventional bathrooms. The Inuit soon reasserted their traditional preference for steam and sweat baths, and began using the modern bathrooms as storage bins.

Not that every recovery dialogue seeks slavish re-creation of indigenous traditions, once successfully grasped. The rebuild at Tamil Nadu, India, after the 2004 tsunami pivoted on a bold innovation: the housing was put in the name of women occupants. As a group, the women were seen as better stewards of family wealth than a male population prone, authorities feared, to drinking and gambling. The early evidence is that the change has been empowering of women, many of whom are now guiding their daughters toward higher education. And the men in the family are proving to be more deferential to their wives than traditional arrangements required.

Denial and remembrance

A final aspect of building a successful recovery dialogue is gauging the need for civic totems and ritual, in particular those rituals that perpetuate awareness of disaster and provide a focus for grieving. As well as bringing the community together, monuments and rituals of this kind are a way of communicating to the community that the people running the recovery understand what the victims have been through, and that lessons have been learned from the disaster.

Aside from its economic significance as part of a dramatic waterfront development, Kobe's extraordinary earthquake museum doubles as a living monument to the dead and a way for residents to process their emotional trauma. Similar institutions for remembering disaster and researching ways to mitigate it have cropped up around the world. From Hawaii's Pacific Tsunami Museum to the Italian museum devoted to 1988's Stava Valley tailings dam collapse, to earthquake museums in Armenia, Algeria, China and elsewhere around the world, recovering communities are learning not to forget disasters but to engage in their commemoration and close study. And, in addition to the museum infrastructure, are cultural artifacts that include quilts, songs, gardens and other monuments in honor of those who survived and those who did not.

Hurricane Katrina Memorial, New Orleans
Source: Laura Crommelin

A decade after 9/11, Lower Manhattan awaits a comparably official focus for grieving and remembrance, beyond the cavernous hole that attracts tourists to the place where the towers once stood. The emotional need for such a visitor center is evident in the traffic already drawn to a private and idiosyncratic exhibit assembled in his 14th Street studio by photographer Gary Suson, a documentarian granted special access to the twin towers site by the New York Fire Department in the months following the attack.

Interestingly, New Orleans never created salient public monuments to Hurricanes Betsy (1965) or Camille (1969), the only recent storms with local impact remotely

comparable to Katrina. It would be simplistic to suggest that the subsequent failure to upgrade the city's flood defenses adequately stemmed from a mass psychology of denial. It is heartening to note, however, that a museum to Katrina is already opening in the Presbytere, a building at the heart of New Orleans' most revered historic district, the French Quarter. And Biloxi, Mississippi, another epicenter of Katrina's destruction, also plans a museum. Biloxi's storm exposure is harder to mitigate. But in New Orleans, historians will be interested to note whether the museum heightens public awareness enough to overcome the Bush administration's lackluster commitment and force the federal government to build a state-of-the-art flood defense around the city, one that integrates stronger levees with fully recuperated adjacent marshlands.

Lessons for communicating recovery

As this chapter has shown, managing recovery communications involves a great deal more than just issuing press releases and creating photo ops. If handled intelligently, communications can have a pivotal impact on public morale and community resilience. Recovery leaders would be wise to take messaging seriously. This means paying close attention to the following issues:

- The importance of symbolism to recovery;
- The need to control misinformation;
- The need to convey a sense of sober stewardship;
- The pros and cons of commercial media;
- The benefits of using data productively; and
- The need to construct a culturally appropriate 'recovery dialogue'.

Further reading

The Cases and Resources section for this chapter includes:

- A case study by Lawther which considers a somewhat depressing example of miscommunication in the Maldives after the Indian Ocean tsunami;
- A piece by Horne about the valuable informative role played by the Greater New Orleans Data Center after Hurricane Katrina; and
- Two examples of recent post-disaster communications programs that were largely successful – one in NYC (as recounted by Anglin) and the other in Grand Forks (as recounted by Johnson).

Cases and Resources for Chapter 6

Miscommunication in post-tsunami reconstruction in the M. Kolhufushi Maldives

Peter M. Lawther*

A steamy day in May 2006 on Kolhufushi Island, Maldives, was to be the lowlight of my two years in the island nation managing post-tsunami reconstruction for the Red Cross. That day I came to understand how difficult a recovery program can be to implement, and how it can be derailed when communication processes are either lacking or are deliberately hijacked.

On that day, I supervised the removal from the island of all construction equipment and materials, items that had been delivered to undertake the reconstruction of houses destroyed by the tsunami. Barely a sod had been turned, and the project was over. The sorrow, despair, disillusionment and confusion on the faces of the island inhabitants is still etched in my mind; expressions that silently asked: "Why are you leaving? What about our homes, our futures?" It was not a pleasant illustration of the power of humanity.

How it came to that point is still not completely clear to me, and I can only recount my interpretation of events. To do so, it is important to understand the history of Kolhufushi Island. Until a few generations ago, it was two islands with two communities, separated by a narrow body of water. Over time, the body of water altered and the islands became so close together that the remaining passage was filled in to create one island. However, whilst their physical homelands may have been joined, two distinct communities remained. The differences between the two were to have an impact on events post-tsunami.

Kolhufushi was one of the most severely damaged islands in Maldives, with 16 people killed from a population of approximately 1200. Homes and public buildings were damaged, together with local livelihoods resulting from the loss of fishing vessels, equipment and shops. Most of the population moved into temporary shelters, where they received government subsidized food and electricity. As is common after a natural disaster, the authorities saw an opportunity to 'improve' the pre-existing physical conditions within the community. A new land-use plan was created which envisaged people moving to new homes on new plots of land. The authorities announced that all destroyed homes would be rebuilt. People took this to mean that all homes would be rebuilt by the Red Cross, which had agreed to reconstruct homes on the island. However, the mandate of the Red Cross was to reconstruct only those homes that were completely destroyed by the tsunami, and it was not clear at the time precisely how many homes had been destroyed. There were believed to be approximately 170 houses on the island prior to the tsunami, and this was the number that was originally planned to be reconstructed, and which the community understood would be reconstructed. However, it subsequently became apparent

** The views expressed in this article are entirely those of the author, and not those of the Red Cross / Red Crescent Societies*

that some of the 170 counted were simply vacant plots, so the number became 144. Then it became apparent that only approximately 60 of these houses were completely destroyed, so this became the new number to be rebuilt by the Red Cross, with the remainder to be done by the national government (which had no resources to do so). In addition, the Red Cross would not build houses for people who did not want to relocate to new plots on the new land use plan.

The community was confused. They could not understand why the number of houses to be reconstructed kept changing. There were numerous complaints about the list of 60, with allegations of list stacking and favoritism amongst local leaders. They did not have faith in local government to construct the additional houses they were promising. The situation eventually boiled over at a community meeting in January 2006, which ended in near violence and rocks thrown at the venue in protest. Threats of sabotage were made by members of one of the communities if the Red Cross attempted to commence the project. The confused and heated situation was used by some as a vehicle to open up old wounds and further divide the two communities.

It was an impossibly complex situation in which to deliver effective communications; too many stakeholders, too many agendas, all within an envelope of a distinct language barrier. The Red Cross team agonized as to how it could resolve the situation. However, in the end, we were caught up in something bigger than we could resolve. Painfully, it left us with no choice but to depart the island, and leave the Government to fix the situation.

When I left Maldives at the end of 2007, the situation was unchanged. I understand that it is still the same, with people living in temporary shelters. As I reflect on this unfortunate occurrence, I ask myself how we could have avoided it. We rebuilt homes on five islands in Maldives, including new land use plans, without these problems. So what happened in Kolhufushi? Whilst there were local political issues at work which were beyond our control to manage, I believe the lack of a harmonious and robust communication strategy was also to blame.

First, unchecked statements of political gusto regarding reconstruction were made shortly after the tsunami. These were made without the involvement of the implementing agency (Red Cross), but clearly remained at the forefront of people's thinking. After the Red Cross became involved it was difficult to deliver a unified message, as government officialdom was not keen to visit the island, resulting in ongoing confusion and rising tension. Second, the subsequent communications were confined to community meetings, and therefore subject to misinterpretation and sabotage.

The lesson here is that such communication needs to be implemented through more than one medium. In particular, oral communications need to be supported by written mediums such as newsletters, bulletin boards etc. Such an approach might be termed 'information triangulation', whereby the receiver can verify the message that is being transmitted. This approach was used on subsequent Red Cross programs with some success.

Furthermore, in a later project it became clear that a mono-Agency approach to

communication was preferable, as consistent information could be delivered to communities. In this latter instance, the Red Cross was placed at the communication 'crossroads' between the community and central government. While this approach placed delicate responsibilities upon the shoulders of the Red Cross staff in the field, ultimately in this revised communications strategy was successful. The effort and skill required to make this approach successful should not be underestimated, however, nor the underpinning relationship of trust required with the community.

However, in the case of Kolhufushi, the damage had been done in the early days after the tsunami. Subsequent rectification attempts only compounded the confusion and distrust. Whilst a harmonious and robust communication strategy might not have been enough to overcome the complexity of the issues at play on Kolhufushi, it undoubtedly would have reduced such complexity, and in turn helped to ameliorate the confusion and tension. This would have assisted both the community and implementing Agency to focus on the recovery process and how it could have been advanced.

Focus on fact: greater new orleans community data center

Jed Horne

The Greater New Orleans Community Data Center website (GNOCDC) had been up and running for several years prior to Katrina, but disaster sharply improved its game. In an alliance with the Brookings Institution, a non-government think tank based in Washington, DC, GNOCDC gained acceptance among media and government officials as a reliable and convenient source of recovery metrics on everything from crime to restoration of utility services, to the persistence of abandoned structures in need of demolition.

GNOCDC was not a government agency, though much of the information it aggregated was drawn from public sources and required maintaining a collegial relationship with City Hall. The data service nonetheless sustained a reputation for integrity and there was no disputing the value of the task performed in simply pulling disparate data streams into coherence and easy accessibility. The relationship with government worked both ways. If GNOCDC depended on a genial relationship with city hall in order to secure uncontested access to public records, the city was able to exploit GNOCDC's credibility. For example, New Orleans cited GNOCDC data in persuading the US Census Bureau to increase interim estimates of the city's population rebound. Accurate population data are a pivotal factor in formulas for the allocation of US federal aid, but they are also useful to businesses and non-profits trying to calibrate the appropriate scale of post-disaster grants and investments.

The Brookings/GNOCDC collaboration yielded something called the Katrina Index (later renamed the New Orleans index), a compendium of definitive facts and figures about the ongoing recovery. Monthly releases eventually slowed to semi-annual updates of the Index as the situation stabilized. But four years after Katrina,

GNOCDC remained a cutting-edge recovery asset able to contribute data vital to debates such as the one in late 2009 over whether commuter patterns between the city and its suburbs indicated a dearth or an overabundance of tax-subsidized low-income housing in New Orleans.

DISCUSSION QUESTION

1. What is the major lesson that comes out of this data and information approach?

Lower manhattan: public involvement in a culturally sensitive recovery process

Roland Anglin

The aftermath of the September 11 terrorist strikes offers another look at how communication skills can be employed in the recovery process. Understanding the sensitivity required for effectively managing the rebuilding process in one of the world's major cities, the Lower Manhattan Development Corporation (LMDC) established systems of bidirectional communication with the public; not only keeping the public abreast of developments, but also providing multiple forums in which to hear the public.

New York City stakeholders were able to participate in the recovery process through a variety of means. LMDC conducted more than 75 public meetings, so that those who wanted to could state their concerns and desires for the future of Lower Manhattan and honor the memory of the lives lost on September 11. LMDC received tens of thousands of comments from those meetings, as well as additional comments and suggestions sent in from around the world. LMDC sponsored the creation of a website, marketing materials, informational kiosks placed at strategic downtown locations, and print materials with updates so that residents, employees, and visitors had access to the latest information about the rebuilding process, ongoing construction projects, and the Lower Manhattan community. LMDC also placed advertisements in newspapers, posted draft plans on its website, summarized projects proposed in the plans, and distributed hard copies of the draft plans in English, Spanish, and Chinese to civic and neighborhood-based organizations throughout Lower Manhattan. LMDC distributed thousands of flyers and conducted extensive outreach to victim's families to solicit public input on the design concepts and the creation of a permanent memorial (*LMDC Progress Report 2005*).

Despite LMDC's efforts to create a space where stakeholders could offer input on the vision for the World Trade Center site, not everyone has been satisfied with the rebuilding process. Some question just how much the public's opinion influenced the decision-making process, especially given the power dynamics of the stakeholders, including both billion-dollar corporations and civic associations. In fact, at times, the LMDC was the subject of intense public criticism, particularly focused around the delay in completing the memorial. As in New Orleans, public criticism abounded

even when there were articulated structures in place to hear public and stakeholder concerns. However, these articulated communication structures helped ensure the continual flow of information in an extremely complex political environment in the aftermath of an intense national tragedy. The general perception was that LMDC was doing an effective job.

Recovery communications after the 1997 grand forks flood

Laurie Johnson [*excerpted from johnson 2009*]

Prior to the city's catastrophic flood of April 1997, the City of Grand Forks did not have a communications department or staff dedicated to public information, media, and communication activities; most of such actions were handled by various department staff, particularly in the Mayor's and Chief Administrator's offices. In May 1997, members of the business community organized themselves to provide input and advice to the Mayor and City officials. Formally recognized as the Mayor's Task Force on Business Redevelopment, this organization made an early recommendation that the city hire a communications staff. This recommendation was also reflected in the management section of the city's six-month recovery action plan (prepared in June 1997 and adopted by the City Council in early July 1997). The plan had a specific element for recovery communications that aimed to: "Enhance communication throughout the recovery process, by ensuring opportunities for meaningful citizen participation in both the recovery planning and implementation; and, by capitalizing on the many important local resources and networks…and state and federal personnel experienced in public information, marketing and campaigning" (*City of Grand Forks 1997*).

Both the Federal Emergency Management Agency (FEMA) and US Housing and Urban Development (HUD) provided technical assistance for the city's recovery communication efforts. FEMA deployed more than 100 Community Relations Officers who conducted over 30,000 door-to-door visits during the first months of the disaster to inform residents of the federal assistance programs available (*FEMA 2007*). It also assigned a senior staff member to work for Grand Forks' Mayor for six months, helping to plan for and implement recovery decisions (*Natural Hazards Center et al.1999*). Communications with the City Council, the Mayor's Task Force on Business Redevelopment, and the newspaper and media were also part of this assistance. FEMA and the North Dakota Department of Emergency Management also worked with the city to publish a weekly newsletter, called Recovery Times, during the initial months of the disaster.

HUD-funded recovery management consultants to the city helped it to develop a Communications Plan for Flood Recovery dated July 21, 1997 and form a Public Information Center (PIC) in the Mayor's office in the summer of 1997. The PIC helped to centralize and coordinate public communication efforts across various departments (*Kweit and Kweit 2004, 360*). The PIC developed a weekly newsletter for residents housed in FEMA trailers. It also developed a monthly newsletter, called Recovery Road (later Forks Focus) which had its first issue in January 1998. It was

sent to approximately 22,000 homes and apartments for two years (*City of Grand Forks 2006*). The PIC also worked with the US Army Corps of Engineers (USACE) in conducting a series of neighborhood and citywide meetings to present the USACE's alternative proposals for the flood protection project.

The PIC still exists as part of city government. It administers the city's website, broadcasts coverage of the weekly City Council meetings, interfaces daily with media outlets, and issues press releases and other public information. It also serves as a resource for citizens, city departments, the City Council and the Mayor. The City of Grand Forks' Recovery Briefing Book (*2006*), developed for other disaster-impacted cities by the current and former leaders on lessons learned from the 1997 flood, acknowledged the importance of the PIC's work in providing consistent and repetitive communications with citizens and the media, ensuring progress and also managing expectations.

Chapter 7: The Economics of Recovery

Richard Voith

Disasters affect the economy in two ways: there are economic costs of damage to infrastructure, including human capital; and there are economic losses in terms of reduced productivity, resulting in negative growth or a decline in regional or domestic product. This chapter focuses on the latter economic aspect of disaster recovery. In this context, minimizing capital losses, maximizing available funds, and allocating recovery investments are the central economic themes in disaster recovery.

Economic recovery needs to be considered from both short and long term perspectives. In the short term, there are crucial issues of allocating resources to save lives, prevent disease, keep the peace, and provide shelter – human and physical capital loss minimization. In the long term, the key concerns are funding recovery and allocating funds equitably and efficiently. Capital replacement and reinvestment will shape the post-disaster recovery economy.

Short term response and long term recovery are not unrelated. Short term responses may constrain longer term choices or they may set the stage for long term economic success. For example, researchers have found that preserving social networks was very important to successful recovery following earthquakes in Japan. Based on this finding, they argued that provision of shelter and relocation activities should be made in such a way that preserves prior social networks. In the US, where households tend to be relatively mobile, it is unclear as to whether such social networks would be important. The experience of Katrina, however, makes it clear that the perceived (un)fairness of short term disaster response shaped local political attitudes in ways that constrained future recovery efforts in New Orleans.

Over the long term, economic recovery from disasters raises four central questions:

1. What is the most efficient way to invest new financial resources made available in response to the natural disaster?
2. Who benefits from investment in economic recovery?
3. How is recovery funded and how is the cost of the capital losses shared?
4. How can the economy be re-positioned to meet the needs of a dynamic global economy?

Immediate Response

From the earthquake experiences in Haiti and Chile, one can see that the most important factors in a successful response to severe natural disaster are institutional capacity and prior preparation. The focus of this book, however, is on actions after the event. Institutional capacity and prior preparation constrain these actions and shape potential responses.

Short run responses to natural disasters need to focus first on saving lives, prevention of disease, keeping of the peace, and provision of shelter. In the most severe cases, such as the Haiti earthquake, there are simply insufficient national resources to address the extent of the devastation, in the short term or in the long term. Disaster response in situations such as Haiti, therefore, becomes international in character, with all of the challenges of coordinating multiple international governments and international human service organizations. Foreign countries and private groups providing non-profit assistance may have multiple objectives, including ones that may extend beyond that of providing short term aid. Chaotic environments offer significant potential for inefficiency, or worse – the pursuit of objectives potentially inconsistent with short term recovery.

The nature of short run disaster response depends not only on the severity of the disaster, but on its scale relative to the scale of governmental and private institutions. The 2010 earthquake in Chile was severe, yet the Chilean government and private entities had resources available to aid recovery, especially when compared to the Haiti earthquake or the 2004 Indian Ocean tsunami. Similarly, Hurricane Katrina and the Kobe earthquake were devastating relative to the scale of resources in the cities of New Orleans and Kobe and their neighboring communities, but not relative to the resources of the US and Japanese governments and private organizations. In contrast, despite the horrific toll of 9/11, the economic losses associated with the attacks were relatively modest compared to the scale of even the overall New York City economy. Mobilization of resources in situations where the scale of the disaster is modest relative to the scale of governments and institutions is clearly easier within a single nation, state, or city. Still, successful coordination has often proved difficult even with institutions such as FEMA in the United States, whose mission is disaster response.

Kobe was among the world leading steel shipping ports prior to the earthquake. Steel shipping for the auto industry is a very competitive business. So by the time Kobe had restored its capacity, a dozen other ports had captured the trade which Kobe previously enjoyed. As the Kobe example opposite illustrates, beyond saving lives and property, the goal of immediate disaster response should be to sow the seeds for new economic growth. Economic growth may require adaptation to a new economic reality, and adaptation will require trust in institutions and leaders to enable that adaptation. Part of the trust that is needed to ensure successful adaption can either be created or destroyed in the immediate responses to economic disasters.

Recovery in the long run: efficient and equitable reinvestment

Efficiency concerns center around the question of how to allocate resources so that the economy achieves the maximum level of economic output over the planning horizon. This simple statement masks a great deal of complexity. What is the economy? Is it the local neighborhood affected by the disaster, such as downtown Manhattan in the case of 9/11? Or is it the city of New York? In the case of Katrina, is it the city of New Orleans or the state of Louisiana? Is the economy a concern of the city, the entire region, the state, or the nation? What is the planning horizon for recovery?

Is it near term survival or adjustment to long run maximum advantage? To what extent can government policies influence economic recovery? Should government take an active role in shaping the path to recovery or should the government let 'the market' determine the path of recovery? The answers to these questions will shape fundamental economic recovery policies.

KOBE ECONOMIC DEVELOPMENT [EXERPTED FROM GAO 2008]

The Kobe earthquake had lasting effects on several industries, including the port and small businesses. The port of Kobe, Japan's leading container shipping port, sustained heavy damage to almost all container berths. Port repairs took almost one year to complete, during which time the port disruption was estimated to be an amount equivalent to the income of 40,000 workers. The city of Kobe completed its port restoration by March 1997. However, port activity stalled at around 80 percent of pre-earthquake levels… The negative impact of damage to the local economy and regional exports, in addition to the relocation of many container cargos to other ports during the port of Kobe's closure, contributed to its decline. Further, changing trends in the international trade industry introduced increased competition from other Asian ports. As a result of these factors, the port of Kobe has not fully recovered […]

Recognizing the need to diversify Kobe's economy from its traditional port and manufacturing businesses, the city took steps to attract and develop several new industries. Kobe recognized that it could benefit from new infrastructure projects to change the industrial base of the city. Soon after the disaster occurred, the city conducted a study to assess economic conditions in Kobe. This study showed that although some of the economic challenges the city faced were a result of the earthquake, a more fundamental problem was Kobe's continued reliance on 'old economy' industries, such as shipbuilding, steel, and shoe manufacturing. With this information, the city, in coordination with Hyogo prefecture, targeted new industries – such as medical, pharmaceutical, robotics, and information technology companies – to establish businesses in the region.

To attract companies from these targeted industries, the city of Kobe and Hyogo prefecture offered loans, subsidies, tax incentives, and inexpensive office space. Further, these jurisdictions proposed reductions in existing government regulations for the medical and information technology sectors. These plans allowed foreign researchers to work in Kobe without overly rigorous visa regulations. Additionally, the city sought to remove regulations that prevented foreign firms from participating in the medical industry and thereby encourage the entry of foreign researchers and businesspeople. Overall, Kobe and Hyogo achieved success in diversifying its economy. About ten years after the earthquake, over 285 new companies moved to the city, 40 of which were foreign firms. Additionally, six public facilities – including centers for business, developmental biology, and heath care – had relocated to the city.

Virtually every question above is a question about equity as well as efficiency. How we answer each question will affect who pays for recovery, and who benefits. Can local governments adopt local policies to fund disaster recovery? To what extent should local disaster areas receive subsidies from state and federal governments? Should these subsidies benefit existing residents and industries or should they be invested in sectors with the greatest returns and be used as an engine of change?

Choosing economic recovery policies that balance equity and efficiency concerns requires an informed discussion of the potential of policies to foster economic recovery (in terms of economic output), the implications of those policies for the distribution of income and wealth, and the costs associated with addressing concerns about the equity of the distribution. In a perfect world, government policy would seek to maximize national output, and address distributional concerns based on the largest economic pie possible. Unfortunately, there is both political and economic competition for resources and at all levels of government and geography.

Growth and equity in the pre-disaster economy

The performance of an economy prior to a natural disaster, in terms of both economic growth and equity, should play an important role in deciding how to approach economic recovery choices. The path to recovery should be different for local economies that were experiencing dynamic growth and had an acceptable distribution of the fruits of the economy and those communities that have low incomes, little prospect for increases in aggregate income and unequal distribution of income. Creating a plan for disaster recovery therefore requires an understanding of the pre-disaster trajectory of the economy, the factors both positive and negative contributing to that trajectory, as well as potential opportunities in the post-disaster world.

When formulating an economic recovery strategy after a disaster, leaders should first examine several issues to reposition the local economy in a global context:

PRIMARY CONSIDERATIONS	***SUPPLEMENTARY CONSIDERATIONS***
What were the growth sectors in the economy?	Are those sectors likely to continue to grow?
What were the static and declining sectors?	Are those sectors likely to continue to stagnate?
What were the key social, institutional, political and technological factors affecting economic performance?	Can these factors be changed?
What were the trends in human capital?	• Is the region aging? • Is it a net loser or gainer from migration and immigration flows? • What is the education level of the workforce?
Is the geography of production and housing shifting over time?	• Are those geographical shifts likely to be affected by the disaster? • Are those geographical shifts desirable?
Are there changes in technology that are likely to affect competitive advantages?	
Are preferences changing?	• As a result of changing culture? • Changing wealth? • Changing ethnicity? • Age of the population?
Is local infrastructure in good condition?	What infrastructure is crucial to the success of the local economy?
What social infrastructure is crucial to the region?	• Are major institutions involved in community decisions? • Has local government created a fiscal and legal basis for growth? • Is the local culture conducive the economic adaptation?
Does the region have natural advantages?	• Resources? • Location?
What forces are likely to retard successful adaptation?	• Entrenched interests? • Inappropriate regulation?
Has the disaster fundamentally changed the locale's comparative advantage?	

The Civic Alliance to Rebuild Downtown New York examined these types of issues prior to creating their recommendations for recovery from 9/11.

IDENTIFYING KEYS TO RECOVERY IN LOWER MANHATTAN: ECONOMIC DEVELOPMENT

[Excerpted from A Planning Framework to Rebuild Downtown New York, by the Civic Alliance to Rebuild Downtown New York, 2002]

The future of Lower Manhattan will be determined by a combination of market forces and policy decisions. Global demand for finance and other services, changing workforce and space requirements for different industries, along with changes in demographics and consumer preferences, will frame the range of possibilities. How Lower Manhattan responds to these changes will be influenced by policy choices that determine how much development it can absorb, what kind of development is stimulated, and how attractive Lower Manhattan is to different types of activity [...]

All of these challenges extend beyond the issues involved in rebuilding Lower Manhattan, and our ability to address them through the rebuilding process is finite. Other government actions – from education policies to tax laws – will have a great impact on these issues, and an unpredictable economy constrains what plans for Lower Manhattan can accomplish. However, rebuilding Lower Manhattan should play a central role in a broader economic strategy. Downtown's vitality and mix of activities will have a major impact on how well New York competes with other regions, what types of jobs we create, and who within the region will benefit most [...]

Lower Manhattan has several key functions that would be difficult or impossible to replace. No other place in the region can replicate Downtown's combination of commercial density, transit use, history, waterfront and location. From its earliest days as a bustling hub of trade and finance to its paramount role at the end of the 20th Century as a global financial capital, Lower Manhattan has provided a world renowned address for a complex cluster of financial, trade and business services. It gives New York City a second central business district, providing location options that no other region possesses. It also links communities in Brooklyn, Staten Island and parts of New Jersey that are not as accessible to Midtown, making these communities highly dependent on a robust Downtown economy while providing a large and qualified workforce to Lower Manhattan.

The future of Lower Manhattan's economy will be largely defined by three broad sectors-financial services, professional & creative industries, and culture & tourism. All of these sectors include both large and small businesses, generate export income for the city and region, and help support many of the retail and neighborhood businesses that provide employment for local residents […]

Transit enhancements will be the most important determinant of Lower Manhattan's future as a Global Center and Regional Hub. Downtown's pre-September 11 transit links made it the highest density business district in the world, but growth was limited by overcrowding, poor connections among lines and to some parts of New York City, and the lack of direct commuter rail service. The extent to which this network is restored, improved and expanded will largely determine how many workers, visitors and residents Lower Manhattan can support. Transit enhancements will also be the major determinant of how other job centers and communities in New York and New Jersey develop in relation to Lower Manhattan.

The pre-September 11 diversification of Lower Manhattan is likely to continue and could help to integrate its global, regional and community functions. The same market demands that led to an increase in residential and non-financial commercial activities Downtown are likely to be intensified in the wake of September 11. This diversification will also help support a vibrant 24-hour community that is important to all of Lower Manhattan's potential growth sectors. Research indicates that 24-hour districts support higher value office activities, and that they are also critical to attracting a high-quality creative workforce. Generating significantly higher visitor spending is also dependent on expanding retail, restaurants and other consumer activities. Greater diversity of employment and housing opportunities for a broader range of income groups can help to improve career and housing options and reduce income disparities.

Financial services will continue to be an important component of Lower Manhattan's economy, but its size and functions could change considerably. The concentration of key institutions from the stock exchange to clearinghouses makes it likely, but not certain, that Lower Manhattan will continue to be the central market place for the region's and nation's securities trading and investment banking. Some continued decentralization is likely […]

IDENTIFYING KEYS TO RECOVERY IN LOWER MANHATTAN: ECONOMIC DEVELOPMENT *continued*

Other knowledge-based industries have the potential to expand as a key force in Lower Manhattan's economy. The growth of specific industries is difficult to predict, but education, research, design-oriented professional services and the commercial development of new technologies could form a dynamic network in the next century, just as the network of banking, securities, insurance, legal services and accounting did in the 20th century. These industries are likely to be a major source of regional growth, and Lower Manhattan has the location, density and diversity to become a central hub for the region's creative industries.

Culture and tourism have considerable growth potential from both foreign and domestic visitors. Tourism is likely to be a growing industry for New York City, and Lower Manhattan already has a strong foundation of historic and cultural sites. The World Trade Center memorial is likely to draw millions of additional visitors to Lower Manhattan each year […]

The citywide demand for housing is likely to fuel a continued expansion of Lower Manhattan's residential population, but both its rate of growth and composition will depend considerably on housing policies and land use decisions. These decisions include whether to encourage or restrict residential conversions, the extent of public investment in low, moderate and middle-income housing, and the availability and quality of public schools, parks and other public services. Critical decisions include how much and what type of new residential development to encourage in areas with growth potential, such as the areas south of the World Trade Center site and the far west side of SoHo. They also include policy decisions on how to best preserve and improve publicly-assisted housing for low and moderate-income residents of Chinatown and the Lower East Side, and how to best use available federal, state and local subsidies.

Of course understanding the past is no guarantee of the future (as investment prospectuses always say). Markets and budget constraints have a way altering the best of plans.

Investment in poorly performing economies

Recovery in communities with poorly performing economies – ones with little physical, human, and social capital and/or inequitable distributions of income and wealth – pose much more serious challenges for economic recovery, for several reasons. First, there are few resources available for anything but consumption, and historically the economy has not attracted external private investment. Second, rebuilding infrastructure without other fundamental change in the economy is unlikely to yield significant increases in private investment. Finally, the need to adapt and change to have a successful economy will almost certainly create more economic dislocation. Entrenched interests will oppose change, and fearful, impoverished populations are unlikely to trust institutions that have seldom acted in their interest.

Recovery in places like Haiti is therefore extremely challenging: The extent of physical destruction is large; there are minimal indigenous financial and physical resources; human capital is limited; and institutions are corrupt and mistrusted. The extent of rebuilding required is beyond the indigenous capacity, even if the economy functioned reasonably well.

In order for poorly functioning economies to recover from additional hardship from disasters, it is important that the issues of institutional and social capacity are addressed in addition to the reinvestment in bricks and mortar. There are several issues that need be addressed:

1. What public investment, including physical and human capital, has the greatest potential for creating economic growth?
2. Are the public institutions in place to assure an efficiently functioning market economy?
3. How can people be assisted to adapt to a changing economy?
4. How can a reasonable distribution of income be generated while preserving incentives?

These issues suggest that a significant focus of recovery efforts should be on human and social capital development. It is likely that the success of recovery efforts depends significantly on the way recovery aid is used, rather than solely on the amount of aid. Rieko Kage provides interesting cross country evidence on recovery from World War II in which she finds that those countries suffering the greatest damage recovered at the most rapid rate, aid (on a per capita basis) was not related to recovery, and there was a great deal of dispersion in the rates of recovery across countries (*Kage 2009*). Kage hypothesized that the ability of countries to productively use aid was one of the reasons for this dispersion.

It seems likely that recovery from disaster will be more successful in areas that invest in public and social infrastructure that enable markets to efficiently allocate private resources. In many areas, this is very challenging because of both entrenched, wealthy interests and the lack of social cohesion that is common in areas with widely divergent income and wealth distributions.

Equity: who benefits from economic recovery

If successful recovery requires adaptation, there will be winners and losers in the process. The likely distribution of the benefits of recovery will affect the political support for recovery efforts and the success of the recovery itself. Issues of winners and losers manifest themselves in recovery in both rich and poor societies. Kallick (*2006, reproduced in this volume*) contrasts two kinds of policies: ones that help prevent layoffs and distribute money to workers, and ones that allocate funds to businesses without directly benefitting workers. In general, recovery policies, even if they are economically efficient, may result in shifts in the economy that benefit some at the expense of others. It is important that disaster policies not only embrace economic efficiency, but also invest in assisting the successful adaptation of those adversely affected by the changing, recovering economy. Addressing dislocation is likely to be particularly important when those being adversely affected – including those whose jobs are permanently gone – are low income earners who may not have economic safety nets to carry them through the adjustment process, or lack the appropriate skills to succeed in a new career in a new industry. This suggests that policies should not only seek to create employment opportunities, but also assist in retraining or otherwise helping workers increase their human capital.

In less developed economies, concerns about adaptation and equity are likely to be even more important. Is disaster relief skimmed in part to line the pockets of entrenched interests? Will transformative investments result in losses for significant segments of the population? Addressing issues of dislocation are likely to be a prerequisite for successful adaptation following a disaster in less developed economies.

Insurance and moral hazard

While economic recovery from natural and man-made disasters inevitably raises issues of efficiency and equity, these questions cannot be completely separated from the issue of insurance, whether explicit public or private insurance contracts or implicit agreements of cost sharing among governments. The issue of public or private insurance contracts and intergovernmental cost sharing agreements are, from one perspective, moot following a disaster: either insurance contracts or cost sharing agreements were in place and provided some post-disaster relief or they were not in place and did not provide relief. However, in the long run, the role of insurance in disaster recovery cannot be ignored.

One of the key issues in recovery economics is who insures against disaster. To what extent have people insured against disasters through private insurance? In the case of 9/11, there was considerable private insurance paid to victims although litigations over private insurance claims continue to this day. In the cases of two earthquakes in Japan, Chuetsu and Kobe, there was a vast difference in the extent of private insurance, and significantly different challenges followed the disaster. In Chuetsu, private insurance was provided though an association that included most residents and provided a direct source of funds for recovery, in addition to public and private funds. In Kobe, however, only three percent of residents were covered by private insurance so recovery efforts were significantly dependent on governmental largess, private donations, and personal wealth.

To the extent that private insurance is inadequate or simply does not exist, what are the appropriate roles of local, state or national governments in addressing disaster losses? What are the appropriate roles of the various levels of government and the roles of private non-profit support? How should these funding sources be coordinated? Although individual disasters are unique events, disasters occur repeatedly over time and therefore policy makers should be cognizant of potential moral hazard inherent in providing disaster relief. Policies choices should not provide incentives for behavior that makes the next disaster even more expensive. For instance, when the state or federal government subsidizes insurance in regions that have a high risk of hurricane damage, more people will choose to live in and build homes in the area than otherwise would. If they had to bear the full cost of the risk, some would live elsewhere, and those who chose not to move would likely invest less in their housing. Thus, shielding residents from the true cost of risk through insurance subsidies may result in damages that are much greater when a disaster strikes.

Measuring recovery progress

As disaster recovery efforts progress it is important to have some means to measure progress. From an aggregate perspective, the tools to measure disaster

recovery are the same tools with which one normally measures economic progress: population growth; per-capita GDP; unemployment; and health and education related outcomes like infant mortality and high school graduation rates. However, due to the idiosyncratic nature of disasters it is difficult to come up with a baseline against which improvements in these measures should be judged. If a large city is devastated by an earthquake and they experience 15 percent unemployment in the first quarter after the event, and 12 percent unemployment in the next, is that satisfactory progress? However, these measures should provide some guidance, and in functioning democracies, voters will ultimately determine whether local and national governments have created satisfactory progress.

On a micro level, measuring the success of specific disaster relief is fraught with difficulty as simply auditing and reporting of recovery expenditures can be difficult, as seen in Thayer's discussion of auditing and reporting of recovery expenses. One approach that avoids the counterfactual question of 'what would have been in absence of the policy' is to set specific and reasonable goals for the long term recovery effort, and measure the extent to which the goals have been met (*Thayer 2010, this volume*). For example, goals might include the following:

1. A timeline for expenditures, for instance a predetermined amount of funds spent before some date.

2. Discrete goals like the completion of a specific building or infrastructure component, including a date and budget for that completion.

3. A minimum and/or maximum amount of payroll, which could also be broken out into job types or income categories.

As Thayer argues, determining how the auditing of the recovery expenditures will be conducted can be complex, with multiple organizations, agencies and jurisdictions involved. Planning in advance for how this auditing will be done will make this task easier in the event of a disaster.

In summary, progress should be measured both by using aggregate measures and by looking at the individual components of recovery, including specific project auditing. Inevitably, the best way to ensure accountability is to ensure fair and free elections, as the people who can best tell a successful recovery from failed recovery are those that must live it, and therefore have to most to gain and to lose.

Efficient investment in a dynamic marketplace

The destruction of physical, human and social capital resulting from disaster inevitably lowers the potential of the local economy. However, because of the need to reinvest, disasters also provide the opportunity to realign the economy to be more competitive in the future. Successful post-disaster economic adaptation depends upon having: Sufficient capital to reinvest; institutions that allow capital to flow to investments with the highest return; and mechanisms that insure that benefits of reinvestment are equitably shared.

Local economies that had sufficient savings or significant human capital, resource,

or location advantages are more likely to have access to financial capital to reinvest to rebuild physical infrastructure. For these communities, the choices are relatively straightforward: reinvest in the public infrastructure that fostered prior successful private sector investment. The basic task for these communities is to assemble sufficient public capital to provide the productive environment for private investment that had existed in the past. Moreover, these efforts to rebuild should be supported at the national level since the marginal benefit of infrastructure reinvestment should be high. In other words, the investment of public capital will result in large, productive private investments. Even in highly developed economies, however, the wheels of public reinvestment can prove to be creaky and difficult to navigate.

Lessons for economic recovery

Crafting an economic recovery strategy is not a one-size-fits-all exercise, but there are key elements to be addressed in any recovery. A central focus should be on creating an economically competitive environment, which requires an understanding of the area's potential future competitive advantages, investment in physical and human capital to support those advantages, the creation and maintenance of institutions and networks required to support private investment, policies that assure sufficient sharing of benefits to maintain support for these institutions, and efforts to assist economically dislocated individuals adapt to the new economic reality. Disaster recovery programs should be designed with well-defined objectives so that progress can be measured, adjustments can be made and program legitimacy can be maintained.

In many cases, disaster areas will be unable to garner sufficient resources locally to support effective recovery strategies. In the absence of virtually universal private insurance contracts, intergovernmental revenue sharing and private philanthropy are likely to be needed to recover economically. Without well-defined sharing arrangements in place prior to the disaster, assembling and managing these funds is likely to be problematic and inefficient, which suggests that one element of disaster preparedness should be a careful delineation of revenue sharing in the event of a disaster. Finally, it should be recognized that less developed countries, especially those with wide disparities in income distribution and poorly functioning institutions, are likely to find economic recovery even more challenging. Following disasters in these countries, external funders would do well to assist in the development of legitimate institutions and provide support for human capital development and adaptation in their recovery efforts.

Further reading

The cases and resources section for this chapter includes:

- A case study by Kallick on the challenges associated with recovery in a high-road economy (New York);
- A discussion by Thayer about the practice and pitfalls of auditing and reporting recovery expenses; and
- A piece by Leitmann on managing recovery financing, with reference to the Multi Donor Fund in Indonesia.

Cases and Resources for Chapter 7

Rebuilding a high-road economy

David Dyssegaard Kallick [*Excerpted from White, A and Eisinger, P (eds) 2006*] *

New York City after the World Trade Center attacks was in an economic freefall. The job chart looked like a patient in intensive care, already in decline in early 2001 as a recession took hold and afflicted by a dangerous downward spike in September. More than 200,000 jobs were lost in the wake of 9/11, about half of them specifically due to the terrorist attack, according to officials. Job loss was across the economic spectrum: High-wage earners in finance; middle-wage earners in some airport-related jobs; and mostly low-wage earners in hotels and restaurants. A majority of the job losses citywide was in occupations paying an average of less than $11 an hour. Chinatown alone saw a shocking 25 percent drop in employment after 9/11.

In post-9/11 New York, everyone, it seemed, wanted to be part of deciding how to rebuild. The myriad of normally fragmented civic groups in the city quickly came together into a few big networks that developed close working relationships.[1] Much of the action necessarily focused on architectural designs for reconstructing the World Trade Center site. But the civic groups also insisted that government pay attention to jobs. In the short run, people wanted jobs to counter the huge employment downturn. And in the long run, they wanted solid, middle-class jobs in a diversified economy – not the polarized pre-9/11 job market, in which a handful of Wall Street brokers made millions while restaurant, copy shop, and retail employees were stuck in low-wage, dead-end positions.

Set the tone during the clean-up

In a disaster zone, among the first workers hired after the immediate rescue effort will be clean-up crews. The wages, benefits and working conditions of these workers send an important message about priorities and ground rules for rebuilding the economy. Are employees union or non-union? Is emphasis placed on hiring local workers, or are people brought in from outside? Are jobs open to women and people of color? What happens to these workers when the cleanup is complete?

In New York, the clean-up was a staggering challenge: the remains of the downed buildings burned for months and there were huge steel beams that needed to be moved – each time dangerously shifting the rubble. "There was no manual of how to handle this unprecedented, uncontrolled demolition," said John Spavins, a spokesperson for the New York City Department of Design and Construction. "In addition to the fact that there were the bodies and the body parts, for weeks, the firefighters were still fighting fires."

The city divided the disaster site into four sectors, and hired a different private

*Milano, the New School for Management and Urban Policy, New York, NY

1 The primary civic coalitions besides 9/11 family members were the Labor Community Advocacy Network to Rebuild New York—a group I coordinated—the Civic Alliance to Rebuild Downtown, New York New Visions, Rebuild Downtown Our Town, and the Rebuild Coalition with a Spotlight on the Poor, as well as Imagine New York, which led a direct public outreach effort. Ron Shiffman of the Pratt Institute Center for Community Environmental Development played an important role in linking all these groups together.

construction firm for each sector. Each company's workforce was fully unionized and there was also a significant presence of unionized public-sector technical employees on site. Because these were emergency, no-bid contracts, the city hired independent auditors and put in place substantial cross-checks to guard against corruption. For the construction workers, these were good jobs, paying solid middle-class wages – a fact that added to efficiency, savings and health and safety benefits since workers were confident, well trained, professional and worked in close coordination to get the job right the first time round. Proof of the benefit of hiring experienced workers at fair wages was in the result: the cleanup of Ground Zero was completed by June 2002, at a lower cost and faster pace than anyone imagined and with very few broken bones, hurt backs or other immediate worksite injuries (*Langewiesche, 2002*).

Unfortunately, as Dave Newman of the New York Committee for Occupational Safety and Health points out, the risk of exposure to environmental toxics was downplayed by the Environmental Protection Agency, and the Occupational Health and Safety Administration failed to enforce its respiratory standards, so today thousands of workers are seriously and unnecessarily ill.) The clean-up in the area immediately surrounding Ground Zero, by contrast, was carried out largely with non-union day laborers, who were paid lower wages and given no training or protection whatsoever.

The clean-up effort is one of the first, most visible signs of a city getting back on its feet. But construction will be an expanded part of a post-disaster economy for years to come. Setting good standards for wages, benefits, and training is a win-win solution. It can increase efficiency and add confidence that the job will be done right; and it can provide good jobs and career opportunities for a significant number of displaced workers and residents.

Maintain government stability and create an economic stimulus

In New York, a combination of borrowing and tax increases made it possible for both the city and state to minimize the extreme impact of cutbacks in local services, despite the loss of billions of dollars in tax revenues. In addition, federal and state 'automatic stabilizers' kicked in to aid displaced workers and their families, including unemployment insurance, emergency Medicaid and FEMA's mortgage and rental assistance program (which was cancelled between 9/11 and Katrina). It is worth noting that private charities were a small fraction of the total aid given, making up just seven percent of the total benefits, with government contributing 42 percent and insurance 51 percent (*Dixon and Stern 2004*).

In addition to the normal functioning of government, it would be logical after a disaster to make a concerted effort to allocate additional funds to stimulate the local economy. Public spending "primes the pump," as John Maynard Keynes put it; it gets the flow of earning and spending, demand and production going again. In New York, the organized civic networks formed a broad consensus around how best to prime the pumps in a way that also kept the focus on long-term rebuilding objectives such as upgrading parks, commissioning public art, establishing emergency safety plans for schools and providing training to unemployed workers. Better late than never, about $500 million was ultimately dedicated to these types of efforts, out of

the $2 billion Community Development Block Grant allocated by Congress to the Lower Manhattan Development Corporation (LMDC), a new public authority set up to guide the rebuilding process and administer the federal grant (and to operate outside the normal system of legislative checks and balances, with a board appointed by the mayor and governor).

While the spending on public goods was welcome, the greatest need for pump priming was when the job losses were greatest, early in the decade. This $500 million was earmarked in 2005 and only partially spent in 2006. For years, LMDC's funds were tied up in political wrangling, with only a small trickle making their way out, often to projects connected with members of the corporation's board (*Reconstruction Watch 2004*).

The right way to support business…and the wrong way

In New York City, the economy continued to decline rapidly after 9/11. With people losing jobs at a frightening pace, advocates and government officials focused on saving existing jobs as much as on creating new ones.

Two contrasting strategies claimed to address job retention. The first gave temporary federal grants to local businesses to stem job losses and was largely successful, and tied financial support directly to hiring or retaining individual workers. The second strategy provided grants to businesses in the disaster zone, theoretically to attract and retain jobs, but it was in fact an indiscriminate handout to businesses designed as a pass-through to landlords, and only resulted in higher rents.

The successful, temporary grant program involved $33 million in federal funds that Congress approved for the Emergency Employment Clearinghouse, a joint project of labor unions and business leaders. Led by the Consortium for Worker Education, a union-affiliated nonprofit workforce development organization, the project aimed to stem the immediate losses many local businesses suffered after the World Trade Center disaster. Advertised through a combination of direct marketing and outreach through local partners, the program was available to any business that could demonstrate business lost due to 9/11. Many more businesses applied than could be accommodated by the program.

The clearinghouse provided 90-day grants to help companies through the short-term disruption in their business. If outside funds could help them keep workers through the tough time after 9/11, the theory went, the companies would be more likely to retain them once business picked up again. The strategy helped businesses by helping workers, providing a short-term bridge through an emergency period without opening the door to long-term corporate subsidies.

To maximize the positive impact on the labor market, these funds were steered as much as possible to 'high road' employers – those that paid decent wages, had good benefits and ran sustainable enterprises. "With the limited resources we had, we knew we weren't going to be able to help everyone; we needed to have objective, rational criteria for who got support," said Bruce Herman of the Consortium for Worker Education, who directed the clearinghouse. "One of the criteria was whether the employers provided health insurance. If they had health insurance at low or modest

cost to employees, then we would put them at the front of the line, and we also would be willing to provide a greater subsidy." Another criterion was decent wages. "We were not going to use federal dollars to subsidize sweatshop jobs," Herman said.

The history of giving subsidies to companies in the hopes they will retain workers has been fraught with abuse, cleverly characterized in the title of an early 2001 report by the Center for an Urban Future as "Payoffs for Layoffs." Typically, companies receive the subsidies, then go ahead and do what they would have done anyway: hire or fire employees; commit to the area or pull out after taking government money. To avoid giving money to businesses who either did not truly need it or who could not survive in the long run, the clearinghouse put safeguards in place to ensure that employers used the money to retain workers who would otherwise have been fired, and to steer the money to viable businesses.

The program's managers required companies to open their books and demonstrate a clear loss due to 9/11. Staff at the clearinghouse worked closely with businesses on a sector-by-sector basis, so they became familiar with business practices in the industry and with individual companies. Despite all the safeguards, however, the possibility of employers playing the system was a significant issue. "I'm not a fan of wage subsidy without real, hard, monitored outcomes," says Herman. And, he adds: "A program like this needs to be considered as a stimulus, not a long-term subsidy," (*Consortium for Worker Education 2004*).

The post-9/11 business support on which far more money was spent – and with far less positive effect – was Business Attraction and Retention Grants. Using federal money from a flexible Community Development Block Grant, the city and state wrote almost $500 million in checks to any business that stayed in or moved to Lower Manhattan. If a business signed a lease in the designated 'Liberty Zone,' it got cash from the program; if it signed outside the zone, it did not.

The program had three fundamental flaws. First, the grants were not targeted to enterprises that had lost business because of 9/11; they were available to every business in or moving to the area. Second, what companies really needed was more people coming downtown to buy things and do business in the area. Spreading $500 million around in grants to businesses did not do much to help the businesses; but spending $500 million could have gone a very long way on parks, public events, streetscape improvements and the kind of investment that would attract people to the area. Third, while the grants were given to business owners, they were given upon signing a lease; most of the federal cash ultimately found its way into landlords' pockets, with little benefit to the business owner. As real estate reporters quickly noted, rents went up inside the Liberty Zone by about the same amount as businesses received in grants. This was less a job-retention program than a government-financed lease-signing bonus aimed at propping up rents. Indeed, the program's most effective supporters were lobbyists from the Real Estate Board of New York. When rents are pushed up by vibrant business activity, that is usually a good sign for an area; when they are pushed up by government subsidy, that is just bad policy.

Would the companies that got the grants have left without the grants? Not if you believe American Express spokesman Tony Mitchell. After American Express took

a grant of $25 million, Mitchell said: "Our decision to return downtown, which has been our home for more than 150 years, was not predicated on financial incentives." However, he added: "Once those financial incentives became available, we chose to participate, as did other companies." In other words, American Express received a huge government subsidy for doing what it would have done anyway (*Reconstruction Watch 2002*).

DISCUSSION QUESTIONS

1. This approach in New York shows the tensions between speed and equity. Can you suggest ways of achieving both?
2. Are there laws that should be put in place to deal with situations like this or should administrators be given the right to use their own judgments? Provide pros and cons for both approaches.

Financing a disaster recovery

Ralph E. Thayer

The process of financing a disaster recovery is given very little attention in pre-disaster simulation exercises. After a disaster, new revenue streams complete with reporting and other procedural requirements and limitations may come as a shock to a local entity and those monies may not be readily available for rapid use in the recovery. Any city has, over time, inherited a rather stringent set of regulations that govern the raising of monies and their expenditure. Historically, limitations have been set on the raising of taxes (by popular vote in almost all instances) and on the expenditure of monies (by public bid including provisions for protest of subsequent awards). An example is a 'fiscal note' that may be required to accompany borrowing or other new expenditures, the purpose of which is to look to the future of those funding commitments.

A disaster occurs

Into this web of precariously balanced revenues and expenditures comes a disaster, which may have many fiscal ramifications. Normal revenue streams are interrupted or even eliminated, for an unknown duration. An example might be sales tax collections in an area in which business are unable to operate or consumers not allowed to visit – or both.

Some information systems that govern the actual collection of monies (payment of tickets online) or the expenditure thereof (general accounting functions) may be compromised by damage or destruction to hardware or records, if offsite storage has not been practiced allowing possible use of a remote location.

Essential personnel in the fiscal/MIS offices may be unable to return for a wide variety of reasons (house destroyed, family issues, health), while contract personnel may be legally barred from approving city/entity expenditures.

Outside and inside money to be kept separate and reported in a like manner

On top of these significant challenges, there are often barriers associated with how recovery funding is provided. To use a well known US example, FEMA's Public Assistance Program, far and away their largest component, provides reimbursement monies for controlled expenditures for the repair or replacement of eligible buildings and facilities. For a city/jurisdiction fiscally able to 'front' the repair and replacement costs with local funds, this may be a workable solution providing the reimbursements are made accurately and timely. There are serious flaws in this process however.

Most communities experiencing a disaster of more than minor proportions simply lack revenues that can be used for replacement or repair costs, because this would mean transferring funds from one (restricted) account into another and then replacing it when the reimbursement arrived. This sounds rather simple but in practice, is complex, requiring an online cash management system that very few jurisdictions have in place.

In New Orleans, there was a further complication: the City Attorney took the position that the City Charter (circa 1954) did not permit the issuance of any contract until and unless funds sufficient to repay the entire contract amount were obligated into a fund earmarked for that purpose and no other. Since FEMA Public Assistance is based on reimbursement for expenditures already made, this blocked the city's recovery and is still an impediment. Other local entities may discover, to their dismay, similar impediments and post disaster remedy of these barriers is problematic, given the disruptions to the political system.

FEMA monies are sent to the state, which passes on the funds to the city/jurisdiction. This is not a simple pass-through as the state is legally responsible to the federal government for the proper expenditures of those funds. If improper expenditures are subsequently found, the state will be required to make restitution. To avoid this outcome, states have developed additional requirements to accompany the passage of recovery monies to local entities. In some instances, the views of FEMA and the state as to eligible expenditure differ radically and the local entity is caught in the middle with funds being retained until a solution is reached. An example is the state of Louisiana insisting that the practice of contracting for architectural/engineering services used by the city of New Orleans does not meet the requisite guidelines for recovery expenditures, while FEMA takes precisely the opposite position, finding no contracting issues.

Endless reporting and auditing

There is no argument that an audit of recovery expenditures should certainly occur. However, multiple jurisdictions have funds involved in a recovery and there is no current agreement amongst funding agencies, at least in the United States, that one agency will take the lead on the audit and the others will abide by the outcome. In New Orleans, there were Audits by the State Legislative Auditor, the US Department of Homeland Security (of which FEMA is a component), and the Department of Housing and Urban Development for the Disaster Community Development Block Grants, and other Federal agencies (such as the Department of Transportation) that

put special (other than normal appropriation) monies into the disaster. These audits focused on individual Project Worksheets of which there are over 1,400 and counting.

Since most jurisdictions were unable to front major recovery expenditures, one concession was to permit advances for construction work to replace or repair eligible facilities up to the level permitted (obligated) on the FEMA Project Worksheet. However, the process by which the level of eligible damage is derived is not a reimbursable expense and a local entity may expend considerable money and effort to make its case that the actual disaster related damage is far more extensive than that developed by a FEMA project officer.

A closing note on financing recovery

It is obvious that the 'back end' of recovery involving the post-disaster awarding of contracts, monitoring thereof, and retention of necessary records to audit standards has received much less attention than the more exciting recovery actions, such as rescue of stranded persons or quick restoration of civil order and essential infrastructure. However, this situation begs for remedy: in each disaster, going back a decade or more, there are many actions being pursued by FEMA to recapture monies spent on critical items such as debris removal, which were approved by the team then in place but have since been deemed ineligible by persons coming late to the problem. Earlier action might have headed off this endless legal wrangling.

The Federal Office of Management and Budget has long practiced a single federal audit whereby one federal agency audits federal funds received by a jurisdiction and provides the results to the operating agencies. A similar action to resolve the multiple audit requirements of disaster recovery monies would seem a major and logical step forward.

DISCUSSION QUESTIONS

1. This business of accounting seems way too complicated in an emergency. Can you propose a better way of doing things that gets the job done and protects the public interest?
2. Should FEMA be the agency both during the disaster and after the disaster to handle issues of recovery finance?

Recovery financing: the multi donor fund as a flexible tool

Joe Leitmann

In the weeks following the tsunami, the government of Indonesia was inundated with an outpouring of international generosity as individuals, NGOs, companies, governments, and international organizations donated billions of dollars for relief and reconstruction. At the January 2005 Consultative Group on Indonesia meeting between the government and donors, the Minister of National Development Planning thanked the international community for its support but acknowledged that the government was having a hard time incorporating the demands associated with the contributions. She suggested that willing donors should pool their money in one fund to help minimize transaction costs and maximize synergies.

In February 2005, the Ministry of Finance requested that the World Bank organize and operate a multi-donor trust fund (MDTF) to help finance the reconstruction. Over the next two months, a fund was designed that sought to incorporate good practice from previous post-disaster and post-conflict MDTFs. This included:

- Appraisal and supervision of projects through partner agencies that went beyond the World Bank to also include the Asian Development Bank and UN agencies;
- Flexibility to implement projects through the government, UN agencies and NGOs depending on the nature of each investment;
- Governance through a steering committee that included representation from central and local government, the partner agencies, key donors, and local civil society;
- Going beyond approval of reconstruction grants to serve as a forum for donor coordination and dialogue on recovery policy between the government and the international community; and
- Government leadership of the grant approval process.

These features were integrated into the design of the Multi Donor Fund for Aceh and Nias (MDF) and endorsed by government and participating donors.

The MDF received its first contributions in April 2005 and became operational the following month when the newly formed Rehabilitation and Reconstruction Agency (BRR) came into existence. The MDF grouped 15 bilateral and multilateral donors together who eventually pooled $700 million in grant financing for the reconstruction. At its first meeting in May 2005, the MDF's steering committee approved its first four project concepts that covered land administration, housing and community development in rural and urban areas.

The MDF demonstrated its value as the largest source of un-earmarked financing for the reconstruction. The government and other donors largely committed their resources for specific recovery projects and programs. This resulted in a situation where gaps emerged between what was needed in each sector to build back better (as identified in the damage and loss assessment and the recovery master plan) and what was being pledged on a sector-by-sector as well as a geographical basis (see Figure

1). Sectoral gaps were identified in housing, communications, energy, environment, water resource management, and transportation while a geographic imbalance emerged with inadequate financing available for recovery on the islands of Nias and Simeulue as well as along the west coast of Aceh. The MDF became a flexible tool to allow the government to fill the sectoral and geographic gaps and achieve a more balanced reconstruction.

The MDF is largely seen as a successful example of reconstruction finance. The gap-filling principle became the hallmark of its recovery finance policy, along with criteria that sought to guarantee quality recovery through attention to issues of poverty, gender, geographic balance, environment, and post-conflict sensitivity. It also provided an institutional space for donor coordination and policy dialogue. The MDF's mid-term review concluded that it is on track in achieving results, has been a successful mechanism for post-disaster funding and coordination, and is relevant and responsive to government priorities (*MDF 2009*).

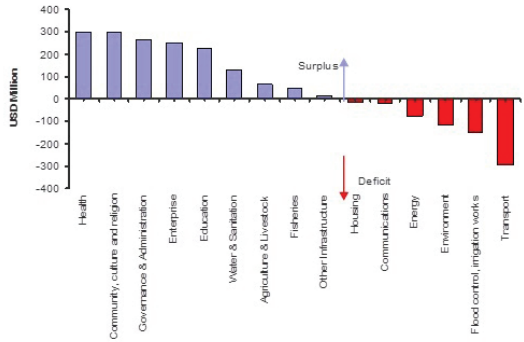

Figure 1: *Sectoral Surpluses and Deficits in Reconstruction Finance for Aceh*

Source: Masyrafah and McKeon 2008

Section Three: Physical Recovery

This section concerns the final phase of rebuilding. In Chapter Eight, Maki argues that housing is as much a social and economic necessity as it is a physical space. He examines the dimensions of housing throughout the disaster recovery cycle, from the initial shelter post-crisis through to the rebuilding of communities. In cases where the pre-disaster site is no longer fit for habitation, Maki identifies how housing recovery becomes fraught with social and political issues that must be addressed before a successful outcome can be achieved. This analysis is supplemented by a collection of international case studies in the Cases and Resources section, which provides illustrations of different available forms of post-disaster housing and best practice throughout the various stages of rebuilding.

In the final chapter, Fisher and Neuman point out that the largest inhibitor to a successful physical rebuilding process is out of sight, usually underground – the infrastructure that delivers power, energy and water to homes and communities. Rebuilding this infrastructure takes the same kind of forethought that its original development required, as its highly interconnected nature poses the greatest challenge to rebuilding it effectively. The authors provide a template of issues to be considered when determining what infrastructure needs to be reconstructed early to kick-start the resurrection of a community.

Community water feature in Kobe, Japan. Source: Laura Crommelin

Chapter 8: Recovery of Housing

Norio Maki

A social survey of victims of the Kobe earthquake (*Tatsuki 2007*) showed that housing recovery was the first priority of individual recovery for the first five years. Not only for affected people but also for governments, housing recovery is the major project for a long term recovery.

Housing recovery begins with life in an emergency shelter. Next, people move to interim housing such as a relative's home or temporary housing supplied by the public sector. Finally, victims acquire new permanent housing, either at the place where their previous home stood, or at a new location. This chapter considers housing recovery polices for these three stages of recovery, by examining cases of long-term housing recovery from around the world.

Housing as the first priority in a long term recovery process

Because housing is a core element of daily life, recovery of housing is one of the key goals in long term disaster recovery. Until people have their living arrangements restored, they will not feel as if life can go on as before, making housing recovery one of the biggest tasks of a long term recovery. For example, after the Indian Ocean tsunami, almost half of Indonesia's recovery budget of US$ 1.1 billion was used for individual housing recovery.

***Figure 1**: Temporary housing in Kinglake, Australia, after the 2009 bushfires*
Source: Laura Crommelin

The importance of housing recovery for the affected population means that decisions about how, where and when to rebuild housing will often be very contentious. However, difficulties for recovery managers can begin even before these decisions are made, if emergency and temporary housing arrangements are not carefully managed.

Structure of housing recovery

Decision making units and location

There are two key questions to be resolved before housing reconstruction can proceed after a disaster. The first question is who should make decisions about new housing arrangements – individuals or the community at large? The second question is where should the housing reconstruction be located – rebuilding on the disaster site, or moving from the original place to a safer location?

On site individual housing is the most common form of housing reconstruction, meaning that those who lost their houses in the disaster reconstruct their home at the original site. However, some people move from the disaster zone permanently, for reasons such as fear, lack of money for rebuilding, or because they have established a new life elsewhere during the evacuation. Many people permanently moved from the impacted area in the case of the Kobe earthquake, and also after Hurricane Katrina. These are examples of housing recovery policy being driven by individual decision making.

Yet while this is the primary model, in some cases housing recovery policy can be driven by neighborhood community level decision making. Redevelopment of neighborhood communities can become the focus of the recovery project when the level of damage is very significant. Large scale development or land use readjustment can be achieved when the damage means that it is necessary to clear all the houses in the stricken area. Sometimes, the whole community will move to another place to construct a safer neighborhood or town.

These four options – individual housing reconstruction, relocation, community redevelopment/land use readjustment, and community resettlement – are the main alternatives available for housing recovery. Disaster managers should decide how to manage housing recovery based on an understanding of the pros and cons of these approaches.

Who is the target of housing recovery support?

The first goal in housing recovery is to clarify the target of housing support: who should get public support for housing recovery, homeowners or tenants? A 'loss basis' analysis suggests the homeowner should receive the most support, because tenants did not suffer any loss of personal property. This approach of providing direct support to homeowners – usually through a direct housing supply, or a subsidy for housing recovery – was used after the 1999 Turkey earthquake, the Indian Ocean tsunami, and Hurricane Katrina. However, because of the housing stock shortage caused by a disaster, tenants also have difficulties finding new housing in the impacted area, and are often forced to stay in interim housing for a long time. After the 1999 Turkey earthquake and the Indian Ocean tsunami, the governments extended the

target of direct housing supply to tenants. There are economic concerns about direct housing recovery support, which could reduce incentives for building safer houses and obtaining appropriate insurance. The US therefore uses insurance premiums as a disaster mitigation incentive for home owners, with reduced premiums for those who have introduced increased safety features into their homes.

Another approach to answering this question is to use a 'needs basis' analysis, whereby the public sector supports housing recovery for those who do not have the capacity to undertake their own housing recovery. This may include groups such as low income earners and elderly families. Underpinning this policy is the basic understanding that housing is private property, and the government does not make any compensation for losses of private property.

In Japan, the main housing disaster recovery support offered is public housing supply for low income victims. Low interest loans arranged through a quasi-governmental banking cooperation was the only public housing recovery support available for home owners after the Kobe earthquake. The few home owners who had earthquake insurance were able to secure conventional local funding for housing reconstruction in the same locations.

The community may also include squatters who have no formal rights. As Mukherji (*2010, this volume*) notes, there are good reasons why non-owners – including squatters – should still be considered in housing recovery policies:

> *"Recovery policies that push for renter and squatter housing usually face the question of why public policy, which may include financial assistance for rebuilding, should include groups that do not own private property and do not pay property taxes. There are two main reasons why it is important to include a policy framework for all housing groups.*
>
> *The first reason is that renters comprise nearly one-third of the urban population (Gilbert 2008). In developing countries, renters and squatters together make up between 30 to 70 percent of the urban housing market (Pugh 2001, 2000). With such high percentages of the urban housing market serving renters and squatters, it is difficult to justify a post-disaster housing recovery policy that addresses only private property owners [...]*
>
> *The second reason is that housing is a critical component of the overall economic recovery of a community after disasters. A house, whether it is a privately owned property, a rental unit, or a squatter dwelling, is more than just a shelter. It is often a place for economic activities, and it deeply impacts the earning capacity of a household. According to Comerio (1998, 161): "Timely housing recovery is a component of economic recovery". Communities who cannot recover their housing standards after a disaster have fallen back economically. Thus, it is not just the economic recovery of households that is critically tied to housing, but the economic recovery of the entire urban region. This includes renter and squatter housing, as these groups are an important part of the urban economy."*

The challenge of land ownership in housing recovery

The other contentious issue is that of land ownership, which is critical to all four cases. For individual housing recovery, fixing the boundary of a housing lot often causes disputes among neighbors. In the case of tsunamis in particular, the boundary issue can prove problematic as houses are washed away and boundary markers disappear. Acquiring land for safer resettlement also causes conflict. For example, extensive debate among tribes about land ownership for resettlement sites occurred in the case of the 1998 Papua New Guinea tsunami disaster. A solution was found to similar problems which arose in Indonesia after the Indian Ocean tsunami.

RESOLVING POST-TSUNAMI LAND TENURE ISSUES IN INDONESIA

Joe Leitmann

Resolving land tenure concerns was one of the first necessary steps along the critical path to enabling rebuilding to begin in Aceh. With the loss of land titling information, the death of many residents in certain communities and the shift in land contours along the coast, there was a need to re-establish land rights before homebuilding could commence. The World Bank partnered with the National Land Agency (BKN), with a grant from the Multi Donor Fund, to design and implement the Recovery of Aceh Land Administration System (RALAS) project. The project began with a community land adjudication process in hundreds of villages and neighborhoods, where surviving residents worked with facilitators to agree and map out land ownership. BKN then agreed to respect this process and use the outcome to process and issue formal land titles. This gave households confidence about their land claims and enabled home reconstruction to begin. By the end of the reconstruction period, BKN had issued over 200,000 formal titles based on the community-driven process (*World Bank 2010c*).

Returning to the question of managing recovery for housing owners, the following sections examine housing case studies reflecting the four types of housing recovery discussed above: Individual housing reconstruction; individual relocation; community redevelopment/land use readjustment; and community resettlement.

On site individual reconstruction

Destroying the local housing market?

The need for a huge amount of housing emerges after a disaster, and considerable housing reconstruction must be conducted simultaneously. Building construction levels for the two years following the Kobe earthquake were almost double those of 1994. Thanks to this rapid rate of housing reconstruction, the need for new housing disappeared in just three years.

However, a sudden and significant need for housing supply can have serious effects on the local housing market. Local builders cannot cover all the housing reconstruction demands after a natural disaster, and they may also be personally affected by the disaster. This means builders from other areas must play a major role in the housing reconstruction process. This, in turn, has a negative impact on the local housing market. Normally, housing construction demand in a developed urban

area is stable, and builders get jobs mainly in the renovation and renewal of existing housing in the market. In Kobe, many older damaged houses were reconstructed within a short period of time, often using outside labor. Once this process was completed in 2001, the demand for renewal of older housing declined, and this trend will continue for some time. It has had a serious negative impact on the business of local builders. In a similar way, the use of demolition services as a tool to manage housing reconstruction after a disaster can have a significant impact on the local housing market.

Core housing as a tool for adapting to new environments

After the Indian Ocean tsunami, Indonesia's central government published a long-term recovery plan called the 'Blue Print', in April 2005. It describes the plans for housing recovery:

> *"Providing to the survivors who want to return to their original places assistance in cash or in kind equal to: A. Rp.28 million for heavily damaged or destroyed houses, Rp.20 million for slightly damaged houses; B. Assisting the provision of housing and its supporting basic facilities and infrastructure for the survivors from the disaster who prefer to move to a new place (resettlement); and C. Completing assistance and providing housing for the survivors from the disasters within less than 2.5 years." (Republic of Indonesia 2005, IV-16)*

In the implementation phase, homeowners were the target of housing recovery assistance in the form of direct housing unit supply. There was no housing support for renters. There was no spare housing stock within the affected area, meaning renters could not leave interim housing (provided in local barracks). Eventually, the government extended housing recovery assistance to renters.

The type of housing supply used for renters in Indonesia is called 'core housing', which was also used for housing squatter residents at the time of slum clearance during the 1970-80s. Only the core of the housing – the building structure, the kitchen, and the toilet – is installed at the time of construction, and residents renovate the rest of these houses themselves based on their circumstances, access to finances, number of family members, etc. In Indonesia, almost 110,000 core houses were supplied by 2008 by multi-sector organizations such as NGOs and governments.

Core housing is now the style of housing recovery used in many developing countries. It has been used for housing supply in other countries impacted by the Indian Ocean tsunami, and other disasters such as the 1990 Pinatubo volcanic eruption in the Philippines.

Housing recipients' efforts to renovate and adapt their housing to the new environment offer a good index by which to monitor whether they have recovered from the disaster mentally. Those who have ongoing trauma often never renovate their houses. In this sense, core housing can be seen as both a housing solution and a way to support victims' emotional and social recovery from disaster.

Moving out of the community

Breaking social ties

The key scheme for housing recovery assistance in Japan is public housing supply for low income people. After the Kobe earthquake, the government constructed 38,200 new public housing units. It worked hard to construct as much public housing as possible in the affected Kobe downtown area, but some units were constructed in the surrounding suburban environs, owing to the shortage of land. To allow the reconstruction of public housing downtown, the interim housing complexes were predominantly located in the suburban area; 49,800 of these interim housing units were constructed and used for five years before residents could return downtown. This is similar to the process of housing recovery policies in developing countries.

Of those who finally settled in downtown public housing units, 55.2 percent were living in interim housing supplied by government before moving to public housing. They began their post-disaster housing process in public shelters or at their neighbors, moved to interim housing in the suburban area (leaving their original community), before finally coming home to public housing. This means lots of moves, and the need to adapt to new environments and establish new social ties both in the interim housing and in the new public housing. With each move, these residents lose their social ties to their former neighborhood community; this can cause several issues such as solitary deaths, or no community activities being established at the public housing. To resolve those problems, the Japanese government assigned community facilitators for each public housing facility.

As a result of the post disaster housing policy that constructed permanent public housing downtown, the average distance of victims from their original location was 5.76km (median 2.65km), and 53.6 percent live in public housing that is within 3km of their original residence (less than one hour walking distance).

Funding to individuals

The Road Home Program was established to support housing recovery in Louisiana after Hurricane Katrina. This program compensates private property owners for housing reconstruction costs up to US$150,000. There are three options for obtaining

***Figure 2** : Public housing in Kobe*

Source: Norio Maki

a housing recovery grant: Reconstruct at the original location; sell the existing house and move elsewhere within Louisiana; sell the existing house and leave Louisiana (which results in a 40 percent reduction of the grant). The grant amount was calculated based on the pre-disaster value of the house, with any other grants from FEMA – such as a flood insurance payment – deducted from the Road Home grant.

Almost 150,557 families were eligible for the Road Home grants, and 127,538 families had received grants as of June 24, 2010. The total amount of payments under the program is US$8.64 billion, and the average payment is US$66,026. The breakdown across the three options is over 90 percent of participants opting for reconstruction, with the smallest percentage choosing to relocate out of state (less than two percent) (*Office of Community Development, State of Louisiana 2010*). Thus it is clear that by far the most popular decision about housing recovery through the Road Home Program was staying and rebuilding in the same neighborhood.

In some affected communities, however, more than 30 percent of families left the neighborhood. For example, in St. Bernard Parish, 36 percent of people sold their house to the state and moved elsewhere. The Road Home program, which allows private home owners to sell their property to the state, could thus be seen as having accelerated the trend of moving out from the neighborhood. This causes serious negative effects to those who remain and are working toward the recovery of affected neighborhoods. Thus, while direct individual assistance for housing recovery may support positive individual housing decisions, it can have a negative effect on broader community recovery efforts.

***Figure 3**: Road Home Program*			***STAY AND REBUILD***		***SELL TO STATE****	
DATE	***PARISH***	***TOTAL CLOSING***	***NUMBER***	***%***	***NUMBER***	%
05/28/09	Jefferson	24,117	23,972	99	145	1
	Orleans	44,602	39,919	90	4,683	10
	Plaquemines	2,948	2,721	92	227	8
	St. Bernard	11,548	7,334	64	4,214	36
	St. Tammany	10,763	10,614	99	149	1
Total		93,978	84,560	90	9,418	10

** Source: Brookings Institute, 2009*

Community/Neighborhood redevelopment

Rebuilding a safer community

In addition to public housing supply, land use readjustment is a core tool for housing recovery after a disaster in Japan, as it allows the reclamation of 10-15 percent of private land for public use (such as roads and parks). Through this mechanism, disaster provides a chance to renew vulnerable existing urban areas that are densely

occupied by old housing without any public space. Land use readjustment was used to achieve this renewal after the 1923 Kanto Earthquake, and many land use readjustment projects were also undertaken during the recovery from the 1995 Kobe earthquake. To achieve positive outcomes in Kobe, community consensus building was essential, and a neighborhood community development organization was created in each project area. These organizations held stakeholder participation workshops at which drawings for land use readjustment and development plans for each neighborhood community were prepared.

This collaborative process takes longer than housing recovery by individuals, because it needs consensus building among community members. However, human ties among neighborhood communities will be maintained, and consensus building discussions and workshops can result in long-term stewardship for a neighborhood community.

Figure 4: *Water feature prepared for the community through land use readjustment*
Source: Norio Maki

The Matsumoto area in Kobe, which suffered both earthquake and fire damage, successfully completed its land use readjustment project after nine years. Within the project, residents planned a water feature in their community, a decision that reflected the trouble the community had experienced with water shortages for firefighting and domestic use during and after the disaster. Today, this water stream continues to be cleared and maintained by community members and is a core feature of the community.

Design guidelines

It takes a long time to complete community development projects such as land use readjustment and urban redevelopment for disaster recovery. Delays have a serious impact on individual recovery rates, and some people will leave their community in

order to achieve personal recovery. Though individual recovery of housing is faster, it does not normally contribute as effectively to developing safer, more appealing and more energy efficient communities as does land use readjustment. Nonetheless, some improvements may be made during the process of individual housing recovery if community design guidelines are provided. These guidelines for disaster recovery usually include topics like safer building and community design.

Design guidelines set out a future vision for housing recovery, but do not mandate compliance with the guidelines, so people will follow the guidelines according to their economic status, and housing reconstruction progress.

Guidelines for safer buildings are commonly distributed during the disaster recovery period; for example, for earthquake disasters, a guideline for seismic safety building would be distributed, while for floods, flood-proof building guidance is developed.

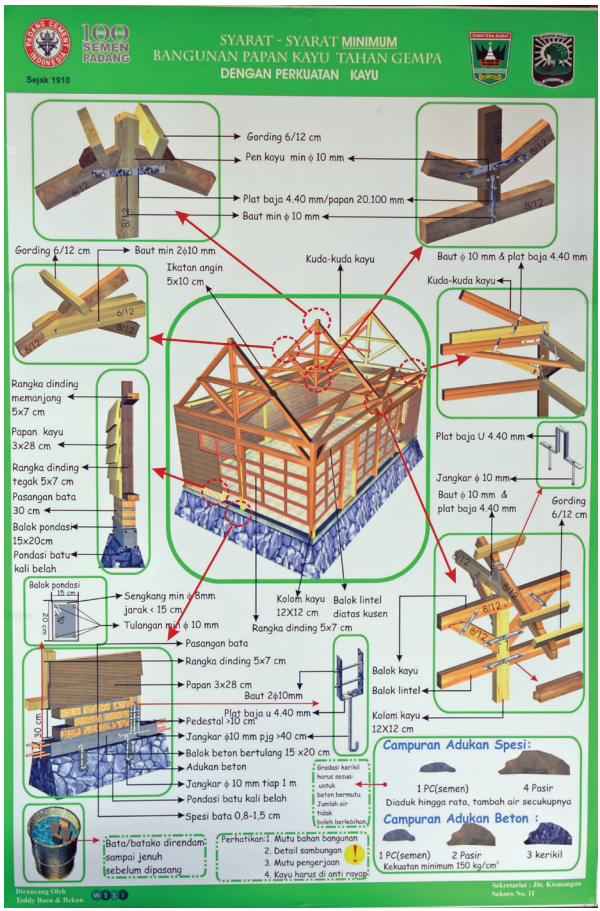

Figure 5: *Design guideline for seismic safety building after the 2009 Padang Earthquake, Indonesia*
Source: Norio Maki

Though building code amendments are a more direct way to ensure the rebuilding of safer buildings, the country's enforcement system may not necessarily be sufficient; this is especially the case in developing countries. In these circumstances, distributing posters and brochures about how to make safer buildings is an effective alternative.

Community design guidelines for disaster recovery are commonly used in the US. When Santa Cruz, California, was hit by the 1989 Loma Prieta Earthquake, the city developed design guidelines for downtown recovery. These guidelines define building styles such as Spanish and Victorian, and dictate building colors. Based on the design guideline, coordinated downtown design has been achieved for more than 20 years. It takes a long time to complete housing recovery, and one of the key lessons learned is that it is important not to rush this process.

Rapid recovery can undermine the sustainability of local economy. Slow but stable recovery, based on design guidelines developed through community consensus, can be a good tool to ensure appropriate and sustainable community and housing recovery.

Community resettlement

Moving towns for safer communities

Turkey suffered serious damage from two consecutive earthquakes in 1999. Prior to these disasters, the country had a unique system for housing recovery: the government gave new houses to those who lost their houses through natural disasters. This system was revised to create an earthquake insurance system after 1999, based on recommendations from international organizations. For victims of the 1999 earthquakes, the Turkish Government developed large housing complexes.

Adapazari City used this housing recovery scheme strategically. Before the earthquake, this city was located on a lake, and it experienced significant damage because of soft soils, which amplify earthquake shaking. After the 1999 earthquake, housing recovery was concentrated in a new town located on the hill behind the city, part of the suburban area of the old city.

The height of buildings in the downtown area was limited to three stories. Buildings in this area are mixed use, with the first story used as businesses and the upper stories used as housing. Ten years after the event, the process of moving the community from the vulnerable lakeside area to the safer suburban area has been successfully completed. Zoning laws that move people gradually from the high-risk area have worked very well for developing a safer community.

Resettlement strategies must provide services for daily life

Resettlement from high-risk areas to safer places is usually discussed in recovery planning, but there are not many successful projects like the Turkish example just discussed. Usually, the proposed resettlement site is eventually abandoned as residents are replaced by non-victims, and victims are also eager to move back to

Figure 6: *New Adapazari Town Development for Disaster Victims*
Source: Norio Maki

their original settlement area. Resettlement is most often proposed for recovery from tsunami disasters, because the mitigation countermeasures for tsunamis are very simple – leaving the area near the sea.

In 1994, Flores Island, Indonesia, suffered from a tsunami. The government decided to resettle those who lived in seaside areas to a site in the hillside. The main targets of this resettlement program were the fishing communities living above the sea – one on the mainland, the other on an island called Babi. Those who moved from Babi Island to the mainland remained in the resettlement site, but the community that had been moved from a different part of the mainland eventually returned back to their original village.

The key reason for these different outcomes was the elementary school – the school from Babi Island had been moved to the resettlement site. Though the community from the mainland could find other schools on the mainland, thereby giving them more flexibility to move back to their original village, there was no alternative for the Babi Island community.

Thus the former island inhabitants continued to use their original village for fishing but kept their living arrangements in the permanent houses at the resettlement site on the mainland. This was the best option available if they wished to continue to send their children to school.

Similar outcomes occurred at resettlement sites for victims of the 1998 Aitape tsunami disaster, Papua New Guinea. Thus, it is clear that if a resettlement program is to be successful, significant social services in addition to housing need to be moved to the new location and should no longer be available at the previous, dangerous location.

Lessons for housing recovery

People want to return to their homes for sentimental, financial and status reasons, often without regard to the danger involved in doing so. Politically it is very difficult for any government to alter community locations and housing choices, meaning the recovery organization may receive little political support for any relocation plan. To manage this potential minefield, recovery managers must do several things:

1. Carefully consider how funding for housing recovery will be distributed. Will land/house owners be the primary recipients? What steps must be taken to ensure renters and squatters are also given adequate assistance?
2. Pay close attention to the management of land ownership and tenure issues.
3. Listen to the community on how to go about restoring housing in a way that not just rebuilds shelters, but also re-knits communities (and ensure these lessons are passed on to the international aid organizations and volunteer groups also involved in housing reconstruction).
4. To the extent politically possible, balance this understanding and acknowledgement of community desires against the need for increased protection against future disasters.

Further reading

The cases and resources section for this chapter includes:

- A case study by Lindell of the challenges associated with providing temporary housing in New Orleans following Hurricane Katrina;
- A detailed examination of the effectiveness of the core housing provided in Banda Aceh after the Indian Ocean tsunami, by O'Brien and Ahmed;
- A counterpoint by Leitmann about alternative approaches to providing core housing, as used in Indonesia;
- A piece by Comerio on housing lessons learned from the Loma Prieta and Mexico City earthquake recoveries; and
- A case study by Holbein which demonstrates the challenges of the housing demolition process after Hurricane Katrina and how this affected recovery of the housing market.

Cases and Resources for Chapter 8

Katrina trailers: a cautionary tale about the challenges of temporary housing

Mike Lindell

Unprecedented demand

Disasters frequently damage and destroy so many housing units that many households must remain in temporary housing for an extended period of time before permanent housing can be rebuilt. In the US, when there are available rental properties within commuting distance of a displaced household's pre-disaster location, FEMA simply provides financial assistance for this rental housing. However, when the local supply of existing temporary housing is inadequate, FEMA will provide temporary housing units (THUs) in the form of mobile homes and travel trailers.

The devastation resulting from Hurricane Katrina displaced an estimated 600,000 households and ultimately led FEMA to provide approximately 144,000 THUs. Approximately 90 percent were located at displaced households' pre-disaster addresses (*Garratt and Stark 2009*), a locational policy that was consistent with FEMA's practice and the preferences of households displaced in previous disasters. Relocation to people's pre-disaster home sites facilitates their resumption of normal patterns of work, schooling, and interaction with family and friends, as well as the recovery of local businesses which need both workers and consumers (*Bolin 1982*). Household and business recovery, in turn, supports the resumption of government services and maintains local government revenues.

Hurricane Katrina created a crisis for FEMA emergency managers who were, quite reasonably, unprepared for temporary housing demand of this magnitude. Even in the nation's most severe urban disasters of the past 50 years, there has only been a need for a few thousand THUs (*Comerio 1998a*). In these cases, urban areas have had sufficient rental vacancies to absorb most of the displaced households. The greatest previous demand for THUs – around 16,000 units – had occurred after the four 2004 Florida hurricanes. However, many of those THUs were still in service in Florida when Katrina struck, so there was a shortfall of nearly 140,000 units. This was filled by purchasing existing units from dealers across the country and by contracting with manufacturers to build additional units.

The formaldehyde crisis

The allegations of formaldehyde in the THUs created a secondary crisis for FEMA emergency managers. There had been no evidence of air quality problems in THUs during the three decades or more that FEMA had been providing temporary housing after disasters. Given this long history of safe operation, FEMA emergency managers were cautious in deciding what course of action to take in responding to the initial reports of formaldehyde. This caution seems reasonable because an effective emergency manager should assess a threat once it has been detected and

should choose appropriate population protection and hazard mitigation actions after considering the efficacy and resource requirements of each action (*Lindell and Perry 1992*).

Although critical newspaper accounts and a congressional report made it seem that FEMA was exceptionally slow in responding to the potential formaldehyde threat, other evidence indicates that FEMA emergency managers' response was typical of many organizational crises in public and private sector organizations (*Boin and 't Hart 2006*). In this instance, FEMA emergency managers faced substantial variation among THUs in exposure levels, substantial variation among individuals in susceptibility to formaldehyde, and no relevant standard on formaldehyde exposure limits in residential housing.

Challenges to decision-making posed by the formaldehyde crisis

The choice of a course of action for managing the potential threat of formaldehyde in THUs was complicated by the inverse relationship between formaldehyde safety, on the one hand, and support for community recovery, financial cost to THU occupants, and financial cost to FEMA, on the other hand. Increasing formaldehyde safety tends to undermine community recovery because it is the THUs with the highest formaldehyde exposure levels (travel trailers) that provide the greatest support for community recovery, as they can be located on pre-disaster home sites. Similarly, increasing formaldehyde safety tends to increase electricity costs for THU occupants in running the air conditioners needed to ventilate, cool and dehumidify their units.

Finally, increasing formaldehyde safety tends to increase the financial cost to FEMA in moving households from THUs into alternative temporary housing. FEMA emergency managers were responsible for considering and weighing all of these objectives, not just formaldehyde safety, in developing and implementing a temporary housing plan. Ultimately, FEMA emergency managers chose a policy that involved ventilation, cooling and dehumidification, together with exchange of units at some occupants' requests. They also recommended that THU occupants consult their physicians if they suspected formaldehyde health effects, especially if they had vulnerable members in their households.

Another important part of FEMA's trailer policy was to work with federal partner agencies to disseminate information about formaldehyde and recommended protective actions. FEMA emergency managers collaborated with other agencies that had more expertise in assessing chemical exposure levels and their health effects. Working with FEMA, these agencies used multiple channels to disseminate messages that identified: The warning source, nature of the threat, expected location, timing and magnitude of impact; potential consequences of exposure; high-risk groups that require special actions; environmental cues (in this context, personal health symptoms); and recommended protective actions (*Lindell and Perry 2004*).

Transition to permanent housing

Finally, FEMA emergency managers attempted to limit the duration of displaced households' formaldehyde exposure. They moved displaced households from temporary shelter to temporary housing and then to permanent housing in a

reasonably timely and effective manner, given their limited control over the operating conditions. Delays occurred, in part, because some local jurisdictions passed ordinances preventing the siting of THUs in their communities immediately after Hurricane Katrina (*Aldrich and Crook 2008; Davis and Bali 2006*). Moreover, affected communities appear to have lacked disaster recovery plans (*cf. Lindell, Prater and Perry 2006; Schwab et al. 1998*) and the magnitude of destruction required considerable time for debris clearance and infrastructure restoration (c*f. Phillips 2009*). In addition, households seeking to recover from disasters typically encounter delays in obtaining building permits and building inspections (*Wu and Lindell 2004*) as well as securing financing for reconstruction and agreements with building contractors (*Peacock and Girard 1997*).

Finally, a dramatic increase in the number of construction projects, compared to the time before the disaster, created severe shortages in equipment and materials that further delayed the reconstruction process. In the case of Hurricane Katrina, there was an extraordinary amount of competition for these resources in part because of the six other hurricanes that struck that same year (*Weiss 2006*).

Lessons for the future

Ultimately, FEMA experienced severe criticism of its Katrina trailer policy and is currently a defendant in a class action lawsuit seeking nearly a billion dollars in damages. Unless there is coordinated national planning, the temporary housing debacle that occurred after Hurricane Katrina is likely to be repeated after the next catastrophic natural disaster. A number of lessons emerge:

1. Local, state, and federal planners need to engage in systematic pre-impact recovery planning (*Lindell et al. 2006; Phillips 2009; Schwab et al. 1998*) by first estimating the likely number of displaced households and the likely number of local vacancies and then developing plans for the placement of temporary housing and the construction of permanent housing.

2. Planners should develop Recovery and Mitigation Committees that determine procedures for expediting building safety inspection, debris clearance, and utility restoration (*Lindell et al. 2006*). They should also work to integrate hazard mitigation into disaster recovery by minimizing the siting of either temporary or permanent housing in hazard-prone areas and increasing the construction of permanent buildings and infrastructure that can withstand disaster impacts (*Evans-Cowley and Gough 2007*).

3. Planners also need to develop programs for risk communication that can be used in the aftermath of disasters (*Lindell and Perry 2004*). In particular, they need to establish crisis communications teams that plan and train to prepare themselves for disaster response. Only if it is well communicated will a post-disaster housing policy meet the needs of its community. Even a safe and effective temporary housing program can lead to public castigation and lawsuits if it is poorly communicated and confusingly implemented.

DISCUSSION QUESTIONS

1. What could and should FEMA have done sooner with better results?
2. If you are a manager in charge of a recovery and you know a housing project is all wrong but people need to be housed, what could and would you do?

Addressing the needs of renters and squatters

Anuradha Mukherji

For the past several decades, the general approach to post-disaster urban housing recovery has focused largely on the recovery of homeowners. In most instances housing recovery policy has either ignored the housing needs of low-income groups like renters and squatters, or has crafted policy solutions that are inappropriate to their housing needs (*Mukherji 2010*). There is a critical need to approach housing recovery using a comprehensive policy framework that includes all three groups – homeowners, renters, and squatters.

In practice, however, governments rarely pursue comprehensive housing recovery policies after disasters. This can be attributed to a number of factors. First, governments hesitate to enter or intervene in housing markets because housing is considered a product for private consumption through private market mechanisms. Second, governments in developing countries are highly reluctant to open the can of worms that is the messy arena of squatter housing. Addressing this issue would mean dealing with a host of problems around land titles, as well as conflicts and struggles around urban land. Third, public housing policies favor private property ownership. For example, in the United States, the federal government has, historically, privileged homeownership as a virtue (*Wright 1983; Hayden 1985; Jackson 1985*). State bias towards homeownership as the eventual goal of every household has resulted in a general neglect of the rental housing market (*Gilbert 2008; UNCHS 2003; Krueckeberg 1999*) and has come at the expense of alternative housing solutions such as affordable public housing. These trends have also affected post-disaster housing recovery policies.

In fact, this bias has put governments in a Catch-22 situation. Ideally states would like the private market to take care of housing reconstruction, and sort out winners and losers. But in post-disaster situations, such an option is usually politically unpalatable, and most policy reactions have fallen into two categories:

1. An approach that is in line with policies that encourage the privatization of housing markets. This means leaving recovery almost completely to the private market. Here homeowners, renters, squatters all fend for themselves.

2. An approach that allows limited public intervention, most of which is biased towards private property owners. This usually means limited public financial

assistance to rebuild private housing, with renters and squatters mostly left to their own devices. Alternatively, financial aid may be mainly for homeowners, but with some assistance to renters and squatters through subsidies, land titles, or rental vouchers.

But such solutions for renters and squatters are few and far in between. Also, they are often inadequate and inappropriate because they do not really address the unique needs of these housing groups. Moreover, public assistance cannot be a long-term solution. Disasters have an enormous impact on urban housing because housing constitutes the largest portion of built structures in any community (*Comerio 1998*). As a result, not surprisingly, it also represents the largest segment of the cost of post-disaster recovery. Currently, almost 50 percent of the World Bank's post-disaster reconstruction loans are used for housing (*Freeman 2004*), and this money eventually comes out of the taxpayer's pocket. So the longer public housing assistance is required, the longer the costs of the disaster will continue to be borne by taxpayers.

Comerio and Freeman point out that neither the public sector nor the private market by itself can provide unlimited funds to address housing loss. Instead, with increasingly tight public budgets, the limited amount of public funds available for post-disaster reconstruction should be reserved for public infrastructure rebuilding and for providing some housing assistance to low-income groups. However, political realities after catastrophic events, in particular the enormous public pressure on governments to provide public assistance for housing after disaster events, have ensured that this approach remains unfeasible in most instances. It is thus even more critical to have a systematic approach for housing recovery – given the realities of public pressures and limited public funds.

A systematic approach can be achieved through a comprehensive housing recovery policy that outlines a strategy for the recovery of all housing groups. A few guiding principles in such an approach would be:

1. Recognizing the need to address housing recovery not just for private property owners – homeowners – but also other housing groups like renters and squatters.
2. Linking housing recovery to the economic recovery of a community. Leaving any group to fend for itself, or ignoring low-income shelter and housing needs, is not a viable option if the objective is long-term economic recovery of an urban region.
3. Focus policy not on replacing lost housing units or rapid distribution of assistance, but instead on understanding shelter and housing needs among different groups. This would require carrying out immediate damage and needs assessments block-by-block and neighborhood-by-neighborhood among communities impacted by the disaster.
4. Considering a range of available options, so that the policy framework is based on a combination of methods and approaches such as public-private partnerships, low-interest loans, micro finance, and perhaps some public subsidies. Multiple solutions are necessary because the needs are varied among homeowners, renters, and squatters, and indeed, even within each of these non-homogenous groups.

5. Minimizing re-settlement or relocation of disaster affected communities. Households generally prefer staying within their own familiar neighborhoods and communities after disasters. Moreover, moving people from locations that are close to their jobs rarely works. Where relocation is absolutely necessary, it should be based on incentive mechanisms.
6. Pursuing an owner-driven approach, where communities are given the choice to rebuild themselves with the ability to access technical, material, and financial assistance. This means that households have direct control and supervision over construction of their house, with local artisans, building contractors or contract laborers doing the actual construction work. After the 2001 Gujarat earthquake in western India, owners built almost 200,000 houses (approximately 87 percent of destroyed homes) under this policy guideline crafted by the Gujarat state government (*Barenstein 2006*). This highly successful approach gave complete control and decision-making powers to homeowners regarding the choice of building materials, the construction process, and the house design.
7. Crafting public assistance according to the needs of different housing groups, not a one-size-fits-all package.
8. Including mitigation strategies into long-term housing recovery.

Resident-initiated modifications to reconstruction housing in Banda Aceh

Dr. David O'Brien and Dr. Iftekhar Ahmed*

Introduction

The scale of devastation caused by the Indian Ocean earthquake and tsunami was extraordinary. In excess of 160,000 Indonesians were killed and 500,000 made homeless in Aceh Province. In the days and weeks following the disaster people from around the world united to provide support – more than seven billion US dollars were pledged for both long and short-term reconstruction projects in all affected countries. A significant proportion of this funding was allocated to the construction of new houses in the provincial capital of Banda Aceh. In the following years more than 100,000 new houses were built by many hundreds of international and Indonesian non-government organizations (NGOs).

Generally speaking the reconstruction agencies worked successfully in short time frames and under great international pressure to assist in rebuilding communities. They were asked to follow a template specified by the Indonesian Government to build basic houses with one or two bedrooms, a living room, washroom/toilet and provide space for food preparation. However there is evidence that residents did not consider the reconstruction houses as 'complete' and the vast majority of owners have, in the following years, modified their houses to suit their own specific needs. What types of modifications have residents initiated in the years after reconstruction? What might these modifications tell us about user needs? This case study investigates the user initiated modifications to suggest how future reconstruction houses – wherever they

* *The authors extend their thanks to Catherine Elliott, the Aceh Research Training Institute, and the Syiah Kuala University team led by Hilda Mufiaty. They also acknowledge the financial support of the Rafael Vinoly Architects Research Program and Ned Kaufman for his assistance.*

might be located – may be designed to more closely accommodate the specific needs of the residents.

Key modification outcomes

There is a key set of categories under which the modifications made by residents can be understood: the overall size of the house; the potential for commercial activities; and the demonstration of the resident's status and the creation of social space.

Overall size

By a significant margin the most common modification has involved the residents expanding the overall size of the house and the facilities it has to offer. The vernacular houses built in this province in the decades preceding the 2004 tsunami were commonly well in excess of 100m^2, many were double storey and their large size enabled extended families to live under one roof (*Dall 1982*). By contrast Indonesian Government agencies such as BAPPENAS and the Ministry of Public Works stipulated that reconstruction houses were to conform to a six by six meter footprint with no specific requirement for internal kitchens or bathrooms large enough for water storage and bathing (*Steinberg 2007*). These basic housing units have subsequently required residents to compromise traditional ways of living and their traditional housing culture. Our survey suggests that 95 percent of the occupied houses have been extended by residents to remedy these deficiencies with the most common modifications including additional bedrooms, larger living rooms and the inclusion of service areas such as bathrooms and kitchens.

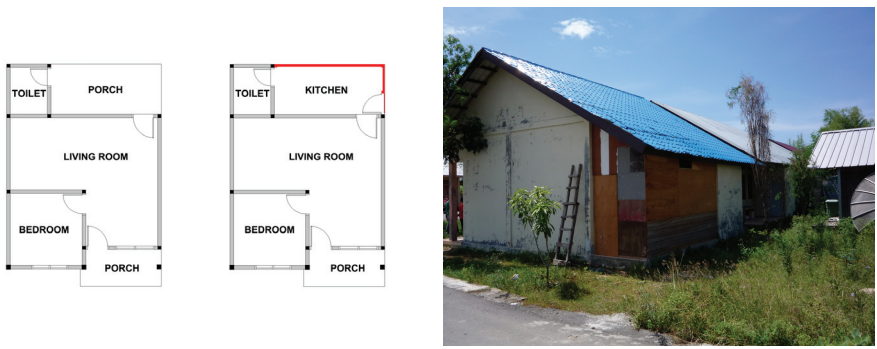

Figure 1: *This ADB house is shown right in its unmodified form. The plan on the left shows the modified house with the most simple of additions. Timber framed and plywood clad walls have been added to the porch at the rear of the house. The existing concrete slab and roof made this an inexpensive modification that now provides residents some privacy when entering the bathroom as well as security for their cooking equipment*
Source for all figures: David O'Brien

As most residents live in bungalow styled houses the most efficient way to increase the amount of enclosed space is to add rooms at the rear or side of the house. However, in some cases, agencies such as Uplink, Muslim Aid and Bank Mandiri have built house on stilts with an open-air undercroft – opening the possibility for residents to build walls to enclose this undercroft space. This is a very economical way for the residents to enlarge their enclosed living areas as the floor and roof structure already exists and expenses are limited to constructing new walls only.

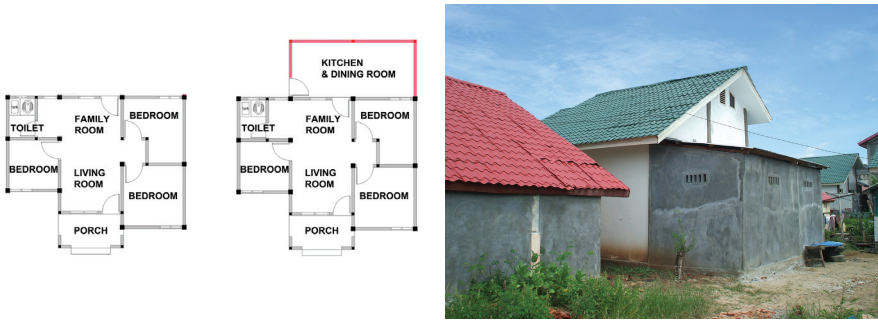

Figure 2: This house, built by the Saudi-funded agency Saudi Charity Campaign (SCC), is shown right in its unmodified form. The house is far larger than the average reconstruction house, with more bedrooms and higher ceilings. The modified plan, on the right of the plan, shows that a new room with cooking and dining facilities has been built to the edge of the property boundary at the rear of the house

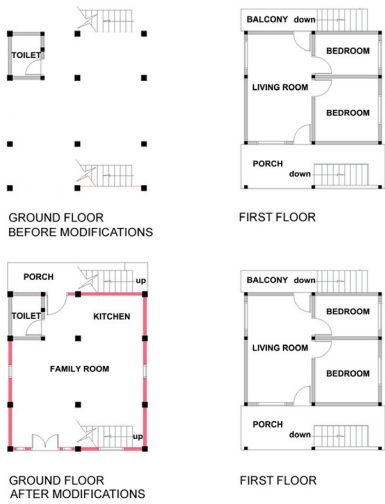

***Figure 3:** The residents of this Bank Mandiri house are in the process of enclosing the undercroft space to provide a new kitchen and living area. Progress is slow and until further finances can be generated the proposed windows have been blocked with sheets of plywood*

The strategy of appropriating the undercroft space and building new walls to create living areas and bedrooms is dependent on the long-term viability of the house. Residents viewed houses built by Uplink and Bank Mandiri as relatively well made as they use reinforced concrete frames that will last many years. However the Muslim Aid houses were built with poor quality timber frames and asbestos cement panels. Residents do not expect these houses to last for a long time, and those that can are building independent structures that can be retained after the poorly constructed houses need to be demolished.

Potential for commerce

It is common for clusters of houses to be serviced by residents who have modified their houses to include space for commercial enterprises such as shops and restaurants. Some house types, such as the larger Saudi Charity Campaign (SCC) houses, are easily modified with the wall removed between the two bedrooms to create one large space. Other house types built on more substantial plots of land enable residents to extend the house beyond its original footprint, attaching additional rooms or possibly adding a freestanding structure.

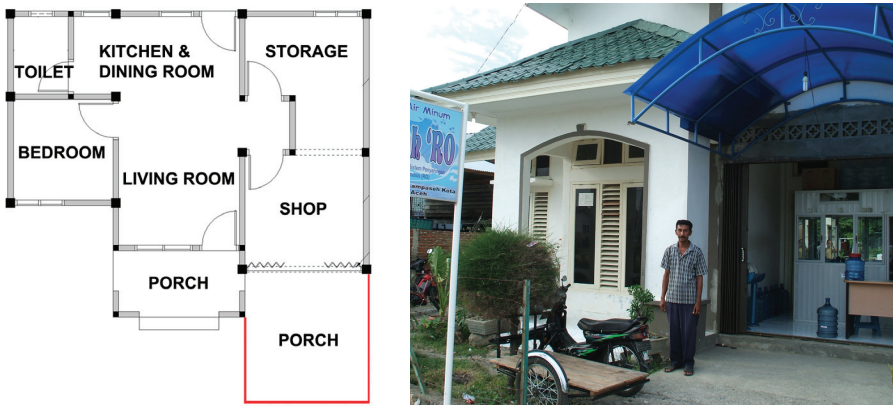

Figure 4: *A comparison with the unmodified plan shown previously in Figure 2 reveals that the owner of this SCC house removed the wall between the two bedrooms to create one large internal room to hold the shop's stock – in this case bottled water. A new bright blue awning and the front sign make this shop stand out from the surrounding houses*

Figure 5*: The first image shows a timber and corrugated iron shop built between the house and the side fence at the Tzu Chi Village. Each street of 32 houses in this development has one or two of these tiny shops. The second image shows a more substantial shop and the new decorative porch under construction at the development built by the Turkish Red Crescent. This porch has become a community focal point and people come to gather and discuss daily events*

Demonstration of resident's status

The Acehnese are well aware that perceptions of status are measured by the methods and levels of sophistication used by residents when modifying their houses. Using decoration on prominent additions to the house's façade is one popular way of demonstrating higher levels of status. Size is obviously important, but so too are choices of materials and their level of refinement.

In all cases reviewed where the residents have chosen to improve their social standing with these types of façade improvements, they have only done so after making other substantial modifications to their house. As important as these types of improvements are as a demonstration of their social standing they have only been undertaken once other modifications have been completed to increase the overall size of their house.

Creation of social space

Social networks – and the spaces that enable these networks to take place – are of key importance in Acehnese communities. With reconstruction houses now significantly

smaller than traditional vernacular houses new spaces have been required for groups of residents to gather. The mosque continues to serve this role for males and almost every community has rebuilt its own mosque. However secular space for informal activities is also required – particularly for female members of the community.

***Figure 6**: The heads of both of these households have prominent positions in government (policeman and administrator) as well as in their community. The façades of their houses reflect this – on the left we see a substantial new front portico added to a Bank Mandiri house and on the right we see an ADB house with a new portico that includes highly decorated front doors, a façade lined with tiles and decorative plants in the garden*

***Figure 7**: On the island of Pulau Weh many residents of the Pria Laot Village, rebuilt by the German Red Cross, have built pavilions in the front yard from scrap timber and thatch. These spaces are predominantly occupied by groups of female residents throughout the day to socialize and undertake domestic chores*

***Figure 8**: These informal social spaces are not required to be substantial. On the left we see a platform of recycled timber under a Muslim Aid house where the residents sit close to the road and have casual conversations with passers-by. On the right a bench seat under a shady tree beside the shop allows for informal gatherings at the Tzu Chi Village*

Conclusion

Within a three- to four-year time frame the housing built by reconstruction agencies working in the aftermath of the Indian Ocean tsunami was able to meet the immediate accommodation needs for the residents of Aceh Province. However it is now clear that this housing did not accurately reflect these resident's long-term needs or aspirations and the vast majority of the occupied houses have since been modified by their owners.

The most common modifications involve increasing the size and functionality of the house, its potential to provide additional income through commercial enterprises, its capacity to demonstrate and enhance the owners' status, and enabling the household to facilitate space for communal social activities. It is recognized that the types of residential households in Aceh Province are quite varied and that they are dynamic over time – as were the houses built in the decades preceding the tsunami. Hence households have tended to prioritize needs in many different ways and combinations of these common modifications are often selected to work together. It is usual to see, for example, a household that has included modifications that increase its size, provide space for commercial activities and, at the same time, improve the residents' status.

Given that the act of modifying the housing provided by reconstruction agencies is of such importance to residents, agencies working in reconstruction projects could do well to consider this at the time they conceive the initial design – not just of the house itself but also the way it is located on the site and its proximity to neighbors. Evidence has shown that some of these houses are quite simple to modify – the Bank Mandiri houses require only some additional walls to enclose the lower floor and the ADB house can have the kitchen area enclosed quite economically. 'L' shaped houses enable residents to easily enclose the space between each 'wing'. These types are examples of how the reconstruction agency empowered the residents by enabling them to easily improve their own housing. However other types are more limited in their enablement and scope – primarily because the plot of land was small or inadequate materials were used in construction.

The small houses built by the reconstruction agencies can be viewed as 'core' houses with the expectation that individual households will modify them over time. Such an approach allows agencies to spread their resources to cover a large number of beneficiaries and acts as a foundation for long-term incremental housing development. However such an approach is problematic in the seismically active context of Aceh. Modifications should be designed for earthquake resistance and it is highly unlikely that this occurs with an ad hoc approach.

In addition, non-engineered extensions can undermine the integrity of a robust core house (*Boen 2008*). Whilst the modifications described here have undoubtedly helped enable the Acehnese meet many of their aspirations, the lack of ongoing professional support may well endanger them in any future disaster. Many of these houses now face further risks and pose a threat to their inhabitants in this highly earthquake-prone location.

DISCUSSION QUESTIONS

1. Renters and squatters represent an important constituency but how do you serve them if homeowners' and shop owners' needs have not been met?
2. Housing is more than shelter. It represents the reconstruction of the social and economic community. How so? And how do you develop a program to take advantage of housing as a social and economic tool building on the examples here in this case?

Counterpoint: rebuilding 140,000 houses through post-tsunami partnerships

Joe Leitmann

The examples in the previous case study represent the classic 'top-down' approach of contractors providing cookie-cutter houses to households. The resulting dwelling thus did not often correspond to the needs of the household. At the same time, an alternative model of owner-built, community-controlled housing development and grant-financed construction yielded over 13,000 new houses in Aceh with a high degree of owner satisfaction. More importantly, this model was later used in Yogyakarta to rebuild 140,000 homes after the earthquake in less than one-and-a-half years, as well as in Pakistan. Partnerships for technical assistance were instrumental in delivering these dwellings through a number of different models that are examined here.

On the tsunami and earthquake-devastated island of Nias, the Asian Development Bank (ADB) worked with local communities to protect the cultural heritage of the island by rebuilding traditional houses. The project worked through contracts with community development groups in which beneficiaries built their own houses. The ADB provided technical assistance for architectural design, training of community facilitators and leaders, and development of the contracts. The reconstruction agency (BRR) disbursed the funds for the purchase of building materials and skilled labor. Nearly 500 traditional homes were rebuilt in this manner in 2007-08 with a high degree of beneficiary satisfaction (*BRR 2009a*).

The German Development Bank (KfW) partnered with a local NGO, Mamamia (an acronym for People's Welfare through Equitable Partnerships) to provide technical and financial support to rebuild 5000 houses in 51 communities. The German consulting firm GITEC provided technical assistance to support a community design-and-build process for wood plank or cinderblock houses, water supply systems, sanitation, and access roads. The approach involved rural labor, use of base camps, community planning, owner-built housing, and issuance of a land entitlement certificate. Between 2006 and 2007, 4500 houses were rebuilt in three districts of Aceh Province (*BRR 2009a*).

By December 2006, about 60,000 houses in Aceh and Nias had been either completed

or were nearing completion with the involvement of more than 100 organizations. Many started building without much experience or an overall approach, some dropped out, others postponed their start-ups, and, in the worst cases, poorly constructed and sited houses were built. To capture and learn from this situation, UN-Habitat partnered with the local Syiah Kuala University to gauge experience with housing reconstruction and beneficiary satisfaction. This resulted in important lessons being learned such as:

- Transitional shelter should be provided early and allow people to return to their homes;
- Community-based housing can respond quickly to urgent needs, deliver better results and satisfaction than other methods, and achieve relief at an early stage; and
- NGOS, while often learning by doing, built a large number of houses in affected villages, thus unwittingly facilitating large-scale resettlement of people to untested sites without security of tenure.

This and other experiences were summarized in technical assistance given by UN-Habitat to the BRR for developing consensual guidelines on land mapping, pricing indicators, equitable options for renters and squatters, and community-empowered resettlement (*BRR 2009a*).

Rebuilding safe and appropriate housing after disasters in California and Mexico

Mary C Comerio

The catastrophic January 12, 2010, earthquake damage in Port-au-Prince, Haiti and its surrounding communities is a poignant reminder of the difficulties that many countries and regions have faced in planning for disaster recovery. Losses in the Indonesian tsunami, earthquakes in China, India, Pakistan, Italy or Turkey, were equally devastating for the millions of people who were affected.

In the immediate aftermath of the Haiti earthquake, attention was focused on the devastation as well as the poverty and the weak local government, as if every building and every institution has suddenly disappeared and 'outside' agencies and/or governments would need to 'take charge' of the Haitian recovery.

Certainly, for the emergency period, which would last for several months, the heavy lifting by American troops and international aid organizations was critical and necessary. Food, water and medical care were desperately needed and the logistics of moving and distributing that aid requires the management and resources of international bodies.

Planning for recovery, however, is a more complex and subtle task. Recovery is more than rebuilding infrastructure, businesses and housing, it is also about people and social institutions. While the physical reconstruction efforts are often daunting in themselves, there are good examples of housing recovery programs that link better

quality housing with good community planning. In each of these cases, a key element is distributed recovery – the ability to spread rebuilding efforts among many local actors and to link-in technical assistance from NGOs to enhance safety standards and building construction. As the following examples demonstrate, the distributed rebuilding concept works at many scales.

Watsonville, California, after the October 17, 1989, Loma Prieta earthquake

The M7.1 earthquake rocked the San Francisco Bay Area and did extensive damage in Watsonville and Santa Cruz, which were close to the epicenter. Damage was estimated at $7.4 billion and was concentrated in three sectors: highways and bridges, residential structures and public facilities. Nearly 12,000 housing units were lost or severely damaged and another 30,000 sustained some damage.

In the Santa Cruz/Watsonville area about 3,000 housing units were destroyed and the city of Watsonville lost 850 (10 percent) of its 8,100 housing units in the earthquake. These were primarily small single family wood-frame dwellings concentrated in the downtown that were knocked off their foundations. In less than one year, 75 percent were repaired or replaced. How did they do it?

Watsonville is a small agricultural town with a population of 30,000, of which 50 percent are Hispanic, primarily farm workers and cannery workers. The occupants of the heavily damaged homes were primarily Hispanic and 40 percent were owner occupied. More than 75 percent were considered affordable housing units. Largely occupied by extended families, these houses typically had one permanent owner-tenant, as well as informal subtenants who might be relatives or friends – some legal, some illegal; some permanent, some migrant workers. Because housing was in short supply before the earthquake, it was not uncommon to find 20 to 40 persons living in one house, with some individuals and families in garages and chicken coops. During the post-earthquake inspections, officials found as many as 300 illegal dwellings.

Watsonville was considered a poor backwater, and many assumed that the loss of housing combined with losses in three downtown commercial blocks would devastate the city and it would never recover. Watsonville was compared to Coalinga, California, a town that never really recovered after an earthquake in 1983.

However, Watsonville's mayor recognized that the affected population did not have earthquake insurance, and were too poor to qualify for traditional bank loans or even many federal programs such as Small Business Administration (SBA) or Federal Emergency Management Agency (FEMA) home repair loans. The one source of unrestricted financing that the city had available was a local Earthquake Relief Fund, which received donations from individuals, corporations, foundations and a sister-city in Japan. These donations totaled one million dollars. The Red Cross supplemented this fund with $2.5 million for affordable housing and services for earthquake victims. The city gave away the money in small grants (typically $20-$40,000) to the owners of heavily damaged homes. The financing came with a message: we will be 'easy' on building permits and 'tough' on inspections.

The city recognized that the earthquake gave it an opportunity to improve the

conditions of the city's housing stock - bringing damaged houses (and illegal units) up to code and improving earthquake and fire safety in the process. Equally important, the city recognized the importance of making financing rapidly available. The small grants allowed owners to buy building materials and hire local workers. The funding also provided materials for a variety of NGOs and faith based groups (eg the Mennonites, the Christian World Relief Committee, Habitat for Humanity and others) who brought in volunteers to assist with the rebuilding effort. Many week-ends were marked by volunteer construction workers involved in 'barn-raising' new residences. The close-knit character of the Latino community and the willingness of neighbors and volunteers to help contributed to the spirit of self-reliance. Equally important, the city used the building inspection process as a vehicle for technical assistance, insuring the construction was done properly, even if it was done with unskilled labor (*Comerio 1998a, 1998b, 1992*).

Mexico City after the September 19, 1985 earthquake

The magnitude 8.1 earthquake's epicenter was 400 km from Mexico City, yet it shook the city for approximately two minutes, as the soft soils of the lakebed underlying the city amplified the shock waves. Official estimates of 7,000 dead and 76,000 housing units destroyed (with 180,000 units damaged) were probably low. The economic loss was estimated at US$ 4 billion with losses concentrated in infrastructure, housing and public buildings such as hospitals, schools and government offices. The majority of the damage was concentrated within three of the sixteen districts that comprise the Federal District. Although the damage represents only a tiny portion of the housing in Mexico City, the physical and social concentration of damage, combined with severe housing shortages, created a difficult sheltering and recovery problem.

Two very different kinds of housing were damaged in the earthquake. The first was large, multistory apartment buildings such as Nueva Leon building and the Multifamiliar Juarez, each of which collapsed, killing thousands of inhabitants. These were built as part of a government low-cost housing program designed to alleviate overcrowding and unsanitary conditions in the central city. The second type of building damaged was the much smaller apartment buildings known as viviendas or tenements. In some cases, the viviendas comprised a set of individually rented rooms surrounding a common courtyard with shared cooking and bathroom facilities. In two of the heavily damaged neighborhoods, the Cuauhtemoc and Venustiano Carranza, it was found that eight to ten people were living in units of 23 to 40 square meters. These overcrowded tenements housed working families at minimal (controlled) rents – equivalent to nine percent of the monthly minimum wage. Owners of the slum properties had no incentive to rebuild.

While architects and planners had long recognized the blighted conditions in the dense and dilapidated central neighborhoods, the inhabitants of these areas were happy with the inexpensive rents, strong family and community ties, and access to transportation, jobs and shopping. The slum was a popular and desirable location for working-class and middle-class Mexican families.

When residents organized politically and refused to be moved to a new town outside the city center, the Mexican government, supported by a World Bank loan and

concessions in the national debt restructuring by the IMF, decided to rebuild and sell the subsidized units to the disaster victims. Victims were temporarily housed in tin structures in the streets, land was expropriated and some 88,000 housing units were repaired or rebuilt in a two-year period. An additional 7,400 units were repaired by private charities and NGOs.

Institutions responsible for government programs were rapidly created. The National Reconstruction Commission, headed by the president, was formed within two weeks of the event and out of this four different housing programs were established, each with a broad-based decision making capacity and the participation of academic, social, professional and technical groups as well as community leaders. To organize the rebuilding program, the federal government ordered a decree to expropriate 3,569 plots and created the Renovacion Habitacion Popular (RHP) as a legally autonomous agency with a two-year life span. This decision acknowledged the rights of the families to remain in their neighborhoods and set the stage for the distributed rebuilding program. More than 280 architectural and engineering firms were engaged to conduct damage assessments and develop plans for the expropriated sites. Reconstruction plans were jointly developed by technicians and the community with the understanding that a basic prototypical housing unit and building were the foundation for every plan for every site.

The basic apartment was a 40m^2 two-bedroom unit in a three-story building with a single entrance gate. The prototypical schemes allowed for the processing of 800 building permits per month and construction methods were monitored by a single team of project engineers and inspectors who were part of RHP. At the same time, the many architects involved adapted the basic plan for each site, adjusting building massing and colors of individual buildings to create unique urban and social spaces.

The special relationship between the national government and the city cleared the path for a high level management structure. At the same time, the cohesive central-city communities were vocal advocates for their own housing concerns. The interplay of these forces produced the government housing program; however, the delivery of the new housing within two years was only made possible by the unique dispersion of work among many local architects, engineers, and building contractors (C*omerio 1998a, 1997*).

Common threads

In both the small town of Watsonville and mega-city of Mexico City, the housing recovery programs had much in common. Both recognized the need for earthquake victims to remain in their local communities. Both took advantage of community input. Both used the available financing to develop construction programs that dispersed the design and construction work among local professionals. Both were expedient.

While many would look at the Watsonville and Mexico City rebuilding programs and see them as locally specific, it seems that there are important lessons to be drawn from these and other rebuilding experiences where rebuilding was spread among many local actors with centralized funding support and technical assistance.

For example, in the Maharashtra earthquake in India in 1993, over one million residents were rendered homeless. Approximately 67 villages were completely destroyed and there was extensive damage to 1,300 villages in the Latur and Osmanabad districts. The condition of housing in the area prior to the earthquake was extremely poor and the government of Maharashtra committed to a massive rebuilding program which included a commitment to improving the living standard of those affected.

The scale of the losses dictated the use of a variety of approaches. In areas which bore the brunt of the devastation, contractors built new houses in relocated villages. In other areas, NGOs were involved in the reconstruction, but the largest component of the effort was an owner-builder program. Housing funds, largely provided by the World Bank, accounted for 58 percent of the program's budget and included relocation of 52 villages, reconstruction of 22 villages, and in-situ strengthening of houses in 2,400 villages. The remaining budget was dedicated to infrastructure, economic and social rehabilitation, technical assistance, training, and equipment (*EERI 1999*).

In any major disaster, the planning for recovery needs to start even before the emergency situation is under control. At the same time that national governments and international aid organizations are stabilizing the disaster situation, teams from these agencies should be identifying the functioning local government agencies, NGOs, faith-based organizations and other social and community institutions that exist and have knowledge of the impacted area. These groups are critical to recovery planning.

There are some major tasks that need to be undertaken in the emergency phase, such as:

- Debris removal which will require lots of heavy equipment, but can also be a source of local jobs;
- Inspection of damaged and undamaged buildings which will require some outside experts to map and inventory conditions, but local teams of architects, engineers and university students can also be mobilized;
- Quick repairs of lightly damaged buildings which will allow some people to be re-housed and some organizations to establish a base of operations;
- Rebuilding infrastructure which can involve alternative systems for power and water supplies, which again employ local workers; and
- Establishing multiple distribution centers for the sale of construction materials which will allow individuals and families to build for themselves, especially if technical assistance is available.

These and many other tasks need coordination, and the will to help disaster victims help themselves. Instead of assuming that the 'victims' are helpless, it is important to recognize that while many thousands need help, others can be tapped to work on rebuilding their own communities. Historically, institutionally planned and built post-disaster housing has been criticized for its lack-of-fit with local needs. The World Bank has recently published *Safer Homes, Stronger Communities, A Handbook*

for Reconstructing after Natural Disasters, whose first principal is: "… empowering people to rebuild their housing, their lives and their livelihoods…" (*Jha et al. 2010*).

How does the notion of distributed rebuilding apply to the situation in Haiti or Indonesia or any other impoverished country? The World Bank, the UN, the US government and many others will help to fund Haiti's recovery, but the most important aid will be the planning and coordination that takes advantage of local organizations and institutions – universities, NGOs, churches, etc – to develop distributed networks for health care, education, and social services as well as construction materials and assistance. Rebuilding after disasters takes time and effort, but if local people are engaged and involved, the distributed rebuilding efforts will provide jobs as well as skills. Further, the capacity building will provide the basis for rebuilding a better future.

DISCUSSION QUESTIONS

1. What is a lesson you can take from each of the above cases and how would you use it?
2. Find some other examples like these in post-recoveries and draw four or five observations from them (use YouTube as a source).

Utilizing demolitions after a disaster

Andrew Holbein

Demolition has been one of New Orleans' most important recovery tools after Katrina. The federal and city governments have removed thousands of structures, which has stabilized neighborhoods, encouraged residents to rebuild and sparked economic development.

Despite its effectiveness, there are drawbacks to conducting a large number of demolitions. Property owners lose one of their most valuable assets and a community's historic fabric is threatened. These issues underscore the need to conduct demolitions strategically and transparently. This study looks at the approach the government took after Katrina and lessons that can be applied to other recovery efforts.

Using a phased approach to demolitions

The different approaches to demolition used by government officials during different stages of the recovery can roughly be divided into three phases:

0-9 months after the disaster

When Katrina struck, 80 percent of New Orleans flooded and hundreds of buildings were damaged beyond repair. Some structures collapsed while others were washed off their foundations and into the street. These buildings were the first to be targeted so citizens could safely reenter the city and recovery workers could access all areas.

9-24 months after the disaster

After these structures had been removed, officials focused on less severe buildings that were destabilizing neighborhoods. This included abandoned structures that

were beginning to mold, lose walls and breed mosquitoes and rats. Infrastructure, businesses and homes were beginning to be rebuilt and these buildings could have stifled the growing momentum.

24-54 months after the disaster

During this period demolition was used to support large recovery plans and economic development. Officials were placing strategic recovery projects around key public assets and historically vibrant corridors. The goal was to stabilize these targeted areas and turn them into anchors of recovery for the surrounding neighborhoods. In the Lower Ninth Ward neighborhood, for example, a new community center and school were matched with street-scaping and road repairs. This was supported by the demolition of nearby abandoned buildings. Officials also focused demolitions on major commercial thoroughfares that had been centers of economic activity but were now depressed by blight.

It was becoming clear that there would be a glut of vacant properties and the market wasn't going to reabsorb a large amount of non-historic structures. Vacant lots were seen as easier to maintain, more attractive and easier to sell than lots with deteriorated structures.

Managing and paying for demolitions

After most major disasters, the federal government will initially manage and pay for demolitions, with responsibility shifting to the local government over time. This was the case after Katrina, when New Orleans' city government was crippled and disorganized. The city was not in a position to pay for the demolitions and city staff had never managed this large a demolition effort. Pursuant to the Stafford Act of 1988, the Army Corps of Engineers took over management of the demolition process and the Federal Emergency Management Agency (FEMA) paid for it.

Managing the demolition process involved identifying properties for demolition, submitting properties to historical architecture review commissions, notifying property owners, processing appeals from home owners, conducting environmental reviews, acquiring demolition permits and ordering utility disconnects. Local and national contractors were hired to conduct the actual demolitions.

Two-and–a-half years after Katrina the federal government hired Beck Disaster Recovery Inc. to manage the demolitions. There were advantages to using a private company as Beck improved records management and customer service for residents. Under Beck's management city staff began taking a larger role in the demolition process, identifying which properties should be demolished and handling appeals from property owners. Mayor Ray Nagin was able to secure several extensions for the federal government to continue paying for the demolitions. This ended in March 2009, three and a half years after Katrina, when the city became responsible for all future demolitions.

Establishing a legal framework for demolitions

One of the most important issues for demolition is creating a strong process for owner notification, appeals, record keeping and environmental reviews. This will

help ensure that property rights are respected and government agencies are protected from lawsuits. Officials can use pre-existing demolition standards or adopt new ones that are more relevant to a post disaster conditions.

New Orleans followed different protocol during different phases of its recovery. Immediately after Katrina, the Mayor signed an executive order that allowed collapsed buildings to be removed immediately. Most owners could not be located and the city did not attempt to locate individual owners. Instead it placed general notification of its intent to demolish dangerous structures in newspapers throughout the region. Although this jump-started recovery, it created a sense of distrust towards the city government that permeated future demolition efforts.

After collapsed buildings were removed, government officials developed new standards for the thousands of remaining abandoned structures. On February 1, 2007, the City Council passed an 'Imminent Health Threat' ordinance, which said that the city could demolish severe structures 30 days after the owner had been notified by mail and postings on the internet, newspaper and on the property. Owners could stop the demolition by cleaning the inside of the structure, ensuring that all entry points were secured and cutting the grass. Historic review committees approved demolitions in historic neighborhoods and environmental monitors inspected each property and monitored demolitions.

In March of 2008, as blight became less severe, the city reverted to its pre-Katrina demolition process. This increased notification standards and required properties to go through a lengthy hearing process before they are demolished.

Balancing recovery needs with historic preservation

New Orleans experienced a constant tension between residents who lived near blighted properties and preservationists. Neighbors wanted properties demolished quickly because they endangered their health and safety, while preservationists believed that demolitions threatened the historic fabric of the city.

Officials took several steps to create a proper balance between these interests. A checks and balances system was used to make decisions about properties that were in poor condition but not collapsing. Properties were identified by the City's Code Enforcement Department and then evaluated and approved by historic review commissions. Neighbors were able to give input and could appeal decisions to the City Council. Contractors salvaged historic elements and resold them to builders and non-profit organizations. The city also cleaned and boarded many properties so they could remain in reasonable condition until they were redeveloped.

Redeveloping and maintaining vacant lots

One of the biggest problems with demolition is that it can leave neighborhoods dotted with empty lots, creating a sense of abandonment. Recovery officials must address this issue by helping owners rebuild, encouraging redevelopment by new owners, transforming lots into green space and maintaining vacant properties. This has been especially true for New Orleans. Some areas, such as certain neighborhoods

in New Orleans East, have weak real estate markets and little demand for properties, so a lot can sit vacant for years.

The government's main effort to help owners rebuild after Katrina was the Road Home Program. Funded by the federal government and implemented by the State of Louisiana, it gave owners the option of receiving a grant to fix the property, selling the property to the state or using a grant to relocate to a different property in Louisiana. While the program has helped thousands of residents rebuild, it has been criticized for moving slowly and for lack of transparency.

Properties that were sold to the state have been transferred to the New Orleans Redevelopment Authority (NORA). NORA first offered to sell these properties to adjacent homeowners who can use them to increase their lot size. If neighbors don't purchase the properties, they are bundled together and sold to for-profit and non-profit developers, or used for green space.

NORA also has the power to expropriate abandoned properties. However, this powerful tool was weakened when Louisiana voters, fearful of government land grabs after Katrina, approved a constitutional amendment that put burdensome requirements on the expropriation process.

New Orleans has also launched a three-million dollar effort to maintain vacant lots until they are redeveloped. Property owners are charged for the cost and payments are put back into the program. However, this funding will only last for several years and city officials will struggle with lot maintenance for longer than that.

Lessons learned

Significant lessons learned include:

1. The city was criticized for not making enough of an effort to locate and notify property owners. Officials should adopt extensive notification requirements and ensure that they have enough staff to meet these standards.

2. Officials should include neighborhood groups in the decision-making process about what properties should be demolished. These citizens have a good sense of what properties are impeding recovery and can help find property owners.

3. If demolition funds are limited, focus on stabilizing major thoroughfares. These thoroughfares have a larger effect on recovery than isolated residential areas.

DISCUSSION QUESTIONS

1. Many cities do not reach their former populations post-recovery, so how can – and should – demolitions be used with this knowledge?
2. Demolition creates a negative image of a community; how can you turn this around?

Chapter 9: Restoring Infrastructure

Peter M. J. Fisher and Michael Neuman*

Restoring infrastructure is perhaps the central precursor to recovery. Without transport, power, telecommunications, water and sewerage services, proper governance cannot be reinstated, hospitals and clinics will remain on their knees, businesses cannot restock and recover, homes cannot be rebuilt and reoccupied, nor schooling recommence. Life and work cannot restart without functioning infrastructure of all types, whether provided by the private or public sectors.

Yet as our modern infrastructure systems become increasingly complex and interconnected, the process of restoration, and particularly the process of prioritizing restoration, becomes increasingly challenging.

For example, early reconstruction of transport links is needed to ship in the supplies and recovery personnel needed to begin the restoration process, with local access necessary to allow people to reach health care facilities. At the same time, immediate repair of water supply is critical for medical treatment, as well as sanitation. But electricity is usually essential in order to restore water supply, as it powers drinking water pumps and water treatment plants.

Meanwhile, coordinating the effective restoration of any services without access to a working telecommunications system is close to impossible.

In these challenging circumstances, how best to prioritize infrastructure recovery tasks? And how best to balance the need to restore services as quickly as possible against the need to build in greater systemic resilience against future disasters?

***Figure 1**: Railway track and bridge destroyed by the Black Saturday firestorm outside Melbourne, Australia, February 2009. Source: Adam Taylor*

*Thanks are due to Stuart Allison, Ross Scott, and Len Puglisi for their review of the manuscript

Defining infrastructure

Infrastructure is a term applied to a system of physical facilities that underpin human life and settlement. Whether distributed or centralized and whether in public or private ownership, these systems support urban development and economic activities in countless ways and are deeply embedded in society and our daily lives (*Neuman 2005*).

In the context of disaster recovery, the core infrastructures in urban settings are:

- Utilities – gas and electricity, water supply and sewerage;
- Civil engineered works – roads, bridges, dams, drains, canals, seaports, airports, subways and railways; and
- Telecommunications – line and cell telephones, cable networks, internet-broadband radio and television.

Hospitals and clinics can also be considered core infrastructure as they are lynchpins of the early stages of disaster recovery. Facilities such as schools, universities, libraries, police, and emergency services, which form the balance of a community's infrastructure, are also of great significance to social recovery (see, for example, the discussion of the role of schools in Chapter 5).

However, as restoration of these forms of infrastructure is reliant on the prior re-establishment of the core infrastructure described above, we classify these community facilities as 'secondary infrastructure', and they are not the main focus of this chapter.

Another secondary form of infrastructure which should not be overlooked is so-called 'green infrastructure' – trees, river systems, parks and other natural habitats that are often ignored owing to the focus on hard infrastructures. This green infrastructure is soft-wired into many built environments, providing therapeutic and ecological services such as cooling of built environments, water filtration, abatement of run-off, and pollination of crops. The importance of maintaining and restoring green infrastructure can be seen in both the Hurricane Katrina and Grand Forks flood disasters.

The two stages of infrastructure recovery: immediate and long-term

While in practice there is no clear dividing line between when the immediate phase of recovery ends and the long-term phase begins, thinking about these two stages as distinct processes is helpful, as they present some different challenges.

Immediate infrastructure recovery

Infrastructure recovery that falls into the immediate category is often restored within hours or days of the disaster occurring. As a result, re-establishment of this infrastructure may be considered part of the intermediate restoration period – the

overlap period between the rescue and recovery phases – rather than a true recovery task. Common tasks during this period include:

- Reconnecting electricity, gas and water supply chains and telecommunications services that may have been deliberately disconnected for safety reasons, or have sustained only light damage;
- Clearing otherwise serviceable roads/waterways/access routes of debris, in order to allow rescue and restoration access; and
- Establishing temporary infrastructure to compensate where more significant infrastructure damage has been sustained (see the box below for examples of the kinds of temporary infrastructure that can be very useful in these circumstances).

The exact nature of these immediate restoration tasks will depend on a range of factors, such as type and severity of disaster and size and nature of the affected area, including factors like weather conditions, range of access options and demographics of the local community etc.

Another factor will be the degree of damage to particular types of infrastructure (is it possible to quickly restore, or is a full rebuild required). A further aspect that will affect immediate restoration tasks is if the impact has traveled out from the central/localized damage points in the affected area, thereby creating secondary affected areas (for example, damage such as a broken water main or a knocked out power station can cause problems in areas far from a disaster's epicenter).

Ownership of the infrastructure affected is a further consideration – is it publicly or privately owned? In the latter case, the restoration may be automatically undertaken by private providers with little direct involvement by relevant authorities.

These immediate restoration/recovery tasks tend to occur with little debate, as soon as possible. As a result, this kind of infrastructure restoration may have been completed before an official recovery manager is appointed. However, the interconnected nature of infrastructure means that decisions made during these early stages will necessarily shape the options available for rebuilding infrastructure during the longer-term recovery period.

For example, the early installation of high quality, effective temporary infrastructure may enable greater flexibility in restoring long-term infrastructure, by allowing the time to develop more resilient solutions rather than simply restoring the status quo.

Long-term infrastructure recovery

The process of long-term infrastructure recovery offers opportunities to install new-generation equipment and facilities and to move away from old methods of organization. For example, rather than centralized wastewater treatment, a transition can be made toward distributed wastewater treatment, or to on-tap treatment for drinking water. Similarly, a shift could be made to on-site solar or wind generation, with the excess uploaded to reduce demand on infrastructure grids and increase

EXAMPLES OF TEMPORARY INFRASTRUCTURE

Inherent to a restoration strategy will be the provision of temporary infrastructures, before repair or replacement by a permanent element. The Bailey Bridge (a portable pre-fabricated truss bridge) and the pontoon bridge, both used by the military to cross watercourses, are classic examples of this kind of temporary infrastructure. More contemporaneous examples include portable diesel or solar generators and water treatment systems. Electric generators, medical field tents, and water tank trucks are a few other instances of temporary infrastructures, usually provided by the private sector. Satellite communications technology can also prove invaluable where copper- and mobile-based telecommunications infrastructure has been incapacitated.

Excess standard size shipping containers (Figure 2) are excellent; they are easily transportable among many modes of transportation and are of sufficient size, durability and low cost to serve a wide range of purposes in disaster recovery, including temporary shelter. Arranging "on demand" access to such units in advance of a disaster can allow infrastructure recovery to proceed in faster and more efficient fashion.

Figure 2: *A mobile water treatment system is one possible temporary infrastructure use for shipping containers*
Source: Peter Chamberlain, South East Water

self-reliance and resilience in disaster recovery. Likewise, recovery offers an opportunity to adjust infrastructure to take into account pre-existing changes in the urban environment. For example, after the 1989 Loma Prieta earthquake, San Francisco chose not to rebuild the waterfront Embarcadero Freeway. This decision acknowledged the systemic changes that had occurred in the city – particularly those of local neighborhood renewal and gentrification, and improvements to public transportation systems – that meant the freeway was no longer considered appropriate or necessary infrastructure.

Of course, there will be constraints – most notably time and funding – that will limit the extent to which such changes can be implemented. Nonetheless, disaster recovery is a most opportune time to revisit conventional design in the light of technological advancement and changing urban contexts. Disruption is a given in any infrastructure upgrade; using externally caused disruptions as a chance to undertake systems upgrades allows something good to come out of a disaster. At the very least, the long-term recovery process should ensure that restored equipment has a lesser carbon footprint and possesses increased hardiness with respect to climate change.

As discussed in more detail below, there is also a rare opportunity to eliminate or reduce dangerous interdependencies within or between infrastructure networks.

While a city with excellent public transport or sea freight access may not consider rebuilding roads to be particularly important, others – like auto-reliant Los Angeles after the Northridge earthquake – will consider freeways a top-level priority (*GAO 2008*). This local specificity makes identifying a general scheme of priorities to be followed in all disaster recoveries challenging. Nonetheless, it is possible to identify factors that should be considered in any urban infrastructure recovery planning process, whatever the size, location or nature of the disaster. While these factors may ultimately be given very different priority in different disasters, it is nonetheless essential that they be taken into account. In addition to the factors discussed above in the context of immediate restoration, some of the key considerations are:

- How long and how challenging the debris removal and demolition process will be;
- Whether, and how soon, temporary infrastructure needs to be replaced;
- The likelihood/expected frequency of a recurrence of the disaster (thus dictating the need for building in greater system resilience);
- What local-scale weaknesses exist in different types of replacement infrastructure;
- What network-scale weaknesses exist between different types of replacement infrastructure;
- The funding available for infrastructure recovery; and
- Specific cross-recovery considerations, i.e. the relationship between infrastructure and other aspects of recovery, particularly housing and the economy, which may also be reshaped in the aftermath of the disaster.

Debris removal and demolition

Re-establishment of all infrastructure relies on timely and effective long-term debris removal and demolition processes. These clean-up activities can present economic, social and political challenges that need to be carefully considered. In the case of large-scale disasters, such as Hurricane Katrina and the 2011 Japanese tsunami, debris removal and demolition can take months, or even years, meaning a strategic approach is required to ensure this does not interfere more than necessary with the process of rebuilding essential infrastructure.

Transition from temporary to permanent infrastructure

The extent to which temporary elements are replaced will depend upon policy decisions as to whether the affected areas are to be rebuilt, and the cost-effectiveness of permanent replacement. It also relates to the degree of centrality required for the permanent infrastructure. For example, water supply and sewage treatment infrastructure is typically highly centralized, while temporary provisions are frequently distributed systems. Importantly, these temporary systems may be more resilient in the face of a recurrence of a disaster, and should, therefore, in some cases be carefully considered as a model for future permanent infrastructure.

Resilience

Resilience means a reduced likelihood of damage and failures to critical infrastructure, systems and components; lowered consequences in terms of fatalities, physical damage and economic and social impacts; and reduced time for restoration to pre-disaster levels. Resilience enables infrastructure to withstand a recurrence of the event or multiple but different events. The Multidisciplinary Center for Earthquake Engineering Research (MCEER) constructed the following methodological framework around the concept of resilience:

MCEER'S FRAMEWORK OF RESILIENCE (2008)

The concept of disaster resilience considers four fundamental properties:

Robustness: Strength, or the ability of elements, systems, and other units of analysis to withstand a given level of stress or demand without suffering degradation or loss of function;

Redundancy: The extent to which elements, systems, or other units of analysis exist that are substitutable, i.e. capable of satisfying functional requirements in the event of disruption, degradation, or loss of function;

Resourcefulness: The capacity to identify problems, establish priorities, and mobilize resources when conditions exist that threaten to disrupt some element, system, or other established priorities and achieve goals; and

Rapidity: The capacity to meet priorities and achieve goals in a timely manner in order to contain losses and avoid future disruption.

This framework includes four Dimensions of Resilience:

Technical: The ability of physical systems (including all interconnected components) to perform to acceptable/desired levels when subject to disaster;

Organizational: The capacity of organizations - especially those managing critical facilities and disaster-related functions – to make decisions and take actions that contribute to resilience;

Social: Consisting of measures specifically designed to lessen the extent to which disaster-stricken communities and governmental jurisdictions suffer negative consequences due to loss of critical services due to disaster; and

Economic: The capacity to reduce both direct and indirect economic losses resulting from disasters.

Thus, resilience objectives should result in specific tasks that improve performance in each of these dimensions, thereby lessening negative impacts on communities.

Local scale weaknesses

Different components of each piece of infrastructure can have different susceptibilities. For example, potable water supplies requiring high levels of system integrity will have different susceptibilities when sourced from dams as opposed to groundwater or desalination plants. Resilience requires infrastructure to be selected so that the impact of these local scale weaknesses is minimized, reflecting a close understanding of the local area, particularly specific geographic considerations. Thus, when rebuilding infrastructure after a disaster, intricately engineered infrastructure components should be selected according to their degree of inbuilt hardiness in the face of the specific extreme conditions they are likely to confront. What works for one city may be the worst possible option for another. The objective should be to build safer and smarter systems that can survive foreseeable hazards.

Network scale weaknesses

One of the key challenges of restoring infrastructure is that close ties exist between different infrastructures, and even within a given class of infrastructure. So, for example, railways cannot be restored without access roads leading to the damaged tracks, and highways are needed to ferry in components. There will also be network interdependencies. Recent work (*Buldyrev 2010, Fisher 2010*) on how a cascade of failures involving interdependent networks can occur, highlights the need to reconsider this interdependence when designing robust networks. If this risk is not addressed, a random failure can have catastrophic results. On the fragility of complex networks, Vespignani (*2010*) has noted:

> *Life as we know it in the modern world is more and more dependent on the intricate web of critical infrastructure systems. The failure or damage of electric power, telecommunications, transportation and water-supply systems would cause huge social disruption, probably out of all proportion to the actual physical damage. Although urban societies rely on each individual infrastructure, recent disasters ranging from hurricanes to large-scale power outages and terrorist attacks have shown that the most dangerous vulnerability is hiding in the many interdependencies across different infrastructures. Relatively localized damage in one system may lead to failure in another, triggering a disruptive avalanche of cascading and escalating failures.*

Special measures may be needed to isolate networks so that they can continue to function when there are failure points in related networks, or to isolate parts of a single network when there are failure points elsewhere in the same network. Disaster recovery plans and scenario planning offer scope to design out dangerous interdependencies between services like water, power and telecommunications. The interconnectivity of parallel complex systems requires interoperability, which comes from considering all the systems together, in addition to considering their individual components.

Budgetary restraints

The overall cost of infrastructure improvements will almost always be a limiting factor. In this regard, the criteria that emerge from undertaking a systematic prioritization process will help decide optimal funding sequences. Differences will inevitably exist as to what is practicable in advanced economies vis-à-vis developing economies. Relocating telecommunications, power cabling, water and sewerage mains in a utilities tunnel deep under earthquake-prone zones, as has occurred in Tokyo, would unfortunately be impossibly expensive for many developing countries. But where rebuilding using such disaster-minded infrastructure is achievable, there is a real prospect of lessening cascade failures in the event of a recurrence.

In addition, infrastructure replacement can be a good opportunity to get the private sector, and private financing, involved in recovery efforts. Arrangements such as public-private partnerships (PPPs) offer a mechanism to encourage new economic development while ensuring sufficient financing to provide the public with resilient, environmentally friendly new infrastructure developments.

Cross-recovery considerations

Interconnections need to be taken into account not only in determining new relationships between different pieces of infrastructure, but in considering how any new infrastructure fits with broader recovery goals. If the recovery strategy involves a new location or a fundamental shift in the region's economic focus, it will not be appropriate to simply rebuild the same infrastructure as before. For example, as discussed in Chapter 7, the loss of port traffic to Kobe resulting from the 1995 earthquake meant that the city needed to realign its economy permanently towards high-tech industries. In these circumstances, a shift of priorities occurred away from further development of the port infrastructure. Similarly, the decision to move the city center in Adapazari City, Turkey, to safer ground (see Chapter 8) necessitated the creation of an entirely new urban infrastructure system.

Pre-disaster infrastructure planning

This web of issues presents a real long-term planning challenge, the magnitude of which will depend in large part on whether the affected town or city has undertaken pre-disaster infrastructure planning. While this is true in all areas of disaster recovery, the complexity of modern infrastructure systems means pre-disaster planning is perhaps more important to infrastructure recovery than any other area. For this reason, while the planning period is generally outside the remit of this book, it is worth making an exception to note a few key preparatory steps that can make infrastructure recovery far simpler.

First, it is important to know what infrastructure exists, and what state it is in. A disaster recovery plan should be able to draw upon pre-existing digital mapping of the location (GPS coordinates) and an inventory of components likely to have been impacted by the event, including their capacity and durability.

This type of inventory is costly and time-consuming to prepare, yet is essential for proper recovery. The use of geospatial raster data processing software such as LIDAR permits preparation, display and enhancement of images and provides answers to specific geographical questions. However, given that this requires a significant degree of intergovernmental and inter-utility coordination, and much lead time, the application of such infrastructure mapping systems varies widely even across developed countries.

Second, it helps to have a pre-existing infrastructure priority agenda which can assign a recovery order to follow. This includes planning around whether to restore various infrastructures to a pre-existing or higher standard. This prioritization process should also consider what should not be done at all; that is, whether any existing infrastructure should not be restored if extremely vulnerable.

The demarcation of high risk regions – coastal frontage, flood plains, areas prone to hurricane/typhoon/cyclonic disturbance or a regional predisposition of vegetation to wildfire – is a useful part of this process.

A third requirement is an inventory of resources that can be drawn on for the recovery process (i.e. machinery type, location, owner and contact details). Stand-by equipment is needed until repair of or replacement by a permanent element. Another vital requirement is the pre-determination of infrastructure recovery roles: who does what.

Included here are not only a personnel/managerial inventory, but also a communications strategy that enables all public and private infrastructure players to communicate effectively and continuously in the face of the possible damage to all extant communications networks. This includes back-up systems with all pertinent persons and entities being pre-authorized and with their contact information programmed into existing and back-up systems.

Finally, preventive work can be undertaken in the form of pre-disaster mitigation. Both the private and public sectors should be engaged in this exercise, and should partner so that one does not impede the other during actual recovery. Key here is a retrofit of core or critical infrastructures to make them more resilient to the rising number and increasing severity of hazardous events.

There are compelling reasons to try to decouple or at least decentralize power, transport and telecommunication networks, many of which are becoming more and more interconnected, thus exposing communities to the possibility of cascading failures. There are numerous examples of when such pre-disaster work has successfully enhanced resilience, including the wildfire design standards used for houses in Australia, the United States, Greece and Spain, and the tsunami/storm surge structures constructed in Japan and Sri Lanka.

Lessons for infrastructure recovery

Fixing infrastructure it is a priority in overall recovery, as recovery operations depend critically on infrastructure, especially power, water, transportation and telecommunications. Mere replacement of the system that existed prior to the disaster is not always sufficient for a range of reasons. Most systems around the world today are under capacity, and thus under-serve their communities. They are also suffering from maintenance backlogs. Their condition is typically old and deteriorating. Replacement with new and improved systems that respond to new demands and new criteria are essential. The new criteria include energy efficiency, carbon neutrality, sustainability, resiliency, and incorporate demand management measures to reduce unnecessary consumption. Resiliency may entail decentralization of centralized systems by distributing components of the infrastructure into a redesign of the overall network. This may involve the intelligent decoupling of integrated systems. This redesign of the network needs to be considered carefully, to balance the potentially competing aims of decoupling for resilience with integration for sustainability. Integration is often a key aim of sustainability, where the outputs of one network become the profitable inputs of another network. Converting output (waste) to input

reduces waste and pollution. The opportunity to introduce such improvements is one of the few positive outcomes of a natural disaster.

The rising toll of damage from extreme weather events alone is a compelling reason to build a greater degree of resilience into existing infrastructure, especially in known high risk locations. Such planning may represent an extraordinary opportunity to lower the risk substantially in some settlements, thereby lessening the overall recovery workload. GPS driven data assembly, software assisted mapping and real time satellite monitoring further add to the ability to limit ongoing disruption and restore infrastructure to an improved level. And, if not before, then certainly in the wake of a disaster, there is an opportunity to modernize systems by reengineering infrastructures, their facilities and equipment, as well as using nature services as 'free' infrastructure.

FURTHER READING

The cases and resources section for this chapter includes:

- A prioritization matrix by Fisher and Neuman considering the different types of infrastructure discussed in this chapter, and some of the challenges associated with their restoration;
- Two vignettes about the Grand Forks flood, the first looking at infrastructure recovery priorities (Johnson), the second looking at how green infrastructure was enhanced to increase resilience (GAO);
- A case study by Hanna which demonstrates the challenges of the post-disaster clean-up process, which is often required before infrastructure recovery can proceed; and
- A final, timely reminder by Fisher of why infrastructure recovery planning is so important, entitled "Building for a cantankerous planet".

PROTECTING AND RESTORING INFRASTRUCTURE: A CHECKLIST FOR RECOVERY MANAGERS

PRE-EVENT

- Compile an inventory of machinery type, location, owner and contact details.
- Generate a map showing locations of infrastructure and their at-risk status.
- Provide for real-time monitoring of key items of equipment that is protected from being destroyed in the disaster itself.
- Retrofit items with a level of protection where the hazard or hazards are known.
- Acquaint rescue organizations such as fire services with all of above.

POST-EVENT

- Assess the state of various infrastructure categories by remote sensing and on-ground surveillance.
- Provide for temporary restoration through portable equipment etc. This allows time for a more comprehensive assessment of permanent infrastructure recovery priorities.
- Consider all relevant factors to determine the extent of permanent restoration.
- Assign priorities for restoration.
- Advise providers/utilities through regular briefing meetings.

Cases and Resources for Chapter 9

Rebuilding infrastructure in Grand Forks

General infrastructure

Laurie Johnson [*excerpted from Johnson 2009*]

When the devastating floods struck the city in April 1997, the City of Grand Forks owned and maintained the City's water, wastewater and stormwater systems; electricity, gas and telecommunications were privately managed. Infrastructure rehabilitation was a major component of the city's six month recovery plan (prepared in June 1997 and adopted by the City Council in early July 1997). The plan outlined programs to: "Complete the clean-up, repair, and rehabilitation of the City's infrastructure and restoration of public services to pre-flood conditions before November 1, 1997" (*City of Grand Forks 1997*). The City's six-month programs aimed to:

- Expedite repair of the damaged water treatment plant, restoring running water in 13 days and drinkable water in 23 days; full restoration took over one year to complete;
- Complete repairs (to pre-flood conditions) of the water distribution and treatment systems;
- Clean, repair and rehabilitate the street network; and
- Initiate repair and rehabilitation of the stormwater and sewer systems.

In all, about $42 million in local, state and federal funds were spent to repair or replace damaged sewer and water lines, streets and other infrastructure (*City of Grand Forks 2008*). The City of Grand Forks' Recovery Briefing Book (*2006*), developed for other disaster-impacted cities by the current and former leaders on lessons learned from the 1997 flood, recommends: "Turning on the basic infrastructure to homes," such as electricity and potable water, since this is the first sign of a return to normalcy for most residents.

To do this, cities will need: "Many contractors and structured plans that address neighborhoods – or grids – one at a time since these utilities require that each home/property must be occupied or monitored to avoid additional damage" (*City of Grand Forks 2006*).

In the rebuilding, the City installed Global Positioning System (GPS) monitoring devices and the city developed centimeter-accurate GIS drawings of the distribution lines for the water, stormwater and sewer systems (*DLT Solutions 2008*). It also established a wireless network to help automate the city's water storage and pump facilities (*City of Grand Forks 2008*). Also, in 1999, a pavement maintenance database of street-level photographs was developed for every road in the City, taken by a van equipped with a low-hanging camera and a GPS device.

Green infrastructure

[*excerpted from GAO 2008*]

After the flooding, Grand Forks and East Grand Forks took steps to address their cities' lack of an adequate flood-control infrastructure to help reduce damage from future flooding of the Red River. The US Army Corps of Engineers assisted both cities in the construction of new flood protection consisting of levees and floodwall systems. The Grand Forks levees have a diversion channel to redirect water around to the west side of the city. Its flood walls were elevated an additional three feet, making it possible to add clay to levy to provide more protection in the event of severe flooding. In East Grand Forks, officials explained that the city built a nonpermanent floodwall that can be taken down and assembled when needed, because of concerns about keeping the city open to the view of the river.

In December 1998, Grand Forks and East Grand Forks jointly agreed to create a 'greenway,' which would manage the impact of rising river water, as well as providing a natural space located between the levee system and river banks for recreational uses. For example, the greenway includes trails, golf courses, boat-ramps, campgrounds, athletic fields, and a wildflower garden. These infrastructure improvements, including the greenway and permanent river dikes, have successfully reduced property damage in subsequent floods. During a severe flood in 2006, Grand Forks only incurred minor infrastructure and property damage, as compared to the damage suffered in the 1997 flooding.

Prioritising infrastructure – further considerations

Peter Fisher and Michael Neuman

The table on the following page suggests priorities for recovery of items within each category, followed by commentary as to the possible bearing of each on recovery. As noted in the chapter, one of the key challenges of restoring infrastructure is that close ties exist between different infrastructures, and even within a given class of infrastructure. There will also be local considerations which will affect prioritization decisions. Nonetheless, this matrix may provide a helpful starting point for this important process.

Infrastructure	*Components*	*Restoration priority*	*Rationale/Explanation*
Hospitals & clinics	Buildings Equipment Helicopter pads	High High High	Mental health services also extremely important
Roads	Streets Highways Bridges Tunnels Fuel	High High High Medium High	Where these access hospitals, clinics etc To move in supplies/equipment For supply of restoration vehicles
Airports	Runways/tarmacs Terminals	High Medium	Sufficient to move in equipment Helicopter pads important if no airport near affected area
Ports	Wharfs/piers Cranes	Medium Medium	May be set far away from the affected area
Railways	Stations Freight terminals Roadbeds Bridges Tunnels	Low High High High High	Not needed for freight movement
Water	Dams Treatment plants Aqueducts Pipe networks	Medium High High High	 Longer disablement possible Portable plants can substitute Water essential for hospitals, infrastructure cooling as well as personal use
Telecommunications	Phone lines Internet cabling Cell phone towers TV and radio towers	Medium Medium High Medium	Cell phones as alternative Wireless as alternative
Electricity	Power stations Transmission lines Substations Distribution lines	High High Medium Medium	Portable generators possible in local neighborhoods but permanent supplies are needed for core infrastructure such as pumping drinking water, wastewater treatment plants, railways, etc.
Gas	Gas plants Supply Mains Local Networks	Medium Medium Low	
Sewerage	Pipe networks Pumps WWTPs (wastewater treatment plants)	Medium Medium Medium	High interdependence with water supply
Drainage	Culverts and pipes	Low	Up priority to H if health risk (disease), flooding or storm surge
Solid and Hazardous Waste	Trucks Materials Recovery Facilities Landfills Toxics disposal	Medium Low Low High	Links with trucks/vans
Eco-Services	Trees, habitats, waterways, etc	Low	

Victorian bushfire clean-up program

Christine Nixon and John Hanna, VBRRA

The clean-up situation

Under the State's existing emergency management arrangements, clean-up was designated as a responsibility of municipal government and needed to be addressed in their Municipal Emergency Management Plans. Importantly, the focus of this role is on the removal of hazards, such as unsafe structures and animal carcasses, and providing equipment for earth moving and transporting heavy materials. Property owners would be expected to take responsibility for clearing their own home and business sites, drawing on insurance payments as part of their rebuilding process.

This approach was unlikely to succeed in the current situation. While some communities were only lightly affected, others had significant property damage. For example, the town of Marysville, which is located 100 kilometers northeast of Melbourne, suffered more than 40 fatalities, lost most of its 400 dwellings and had its commercial centre virtually wiped out.

Across the fire affected regions, people were traumatized, communities had scattered to temporary accommodation, many home owners were uninsured or under-insured, and vehicle access to a number of properties was disrupted. Compounding these problems, some municipal governments had been hard hit themselves, with staff and elected representatives suffering personal loss, municipal resources stretched by relief efforts and multiple communities seriously affected.

Under these circumstances, it was evident that, without assistance, clearing the sites would not start for some time. Further, the clean-up would be severely constrained and could take years to complete in less affluent communities with high levels of uninsured and under-insured property owners, or for businesses where the local economy was severely disrupted. It could also be expected that traumatized owners would find it difficult to negotiate complex individual contracts with salvage companies, resulting in longer lead times and higher than normal charges for clean-up services, thus further exacerbating delays.

The immediate concern, however, was that the destruction of homes, businesses and other buildings had generated or exposed a range of environmental risks and hazardous substances. Foremost among these were asbestos, which was particularly prevalent in the many older buildings located in the bushfire affected areas, and chromated copper arsenate, which was used to treat timber in fence posts, decking and exterior wall cladding. Other hazards included gas cylinders, industrial, household and farm chemicals, unstable structures and falling trees.

The continuing presence of these hazards would constitute a major and unacceptable health and safety risk, both for owners trying to return to their properties and for neighbors subjected to wind-blown and water-borne pollutants. Their removal would require careful handling and safe and environmentally sound disposal of the waste material.

The results

It was for these reasons that VBRRA advocated a speedy, comprehensive and government funded and coordinated approach to the clean-up. VBRRA prepared a proposal for government consideration based on these sound arguments but, given the still emerging reports on damage across the State, it was essentially without a firm scope, cost or methodology.

On February 27, 2009, in a decision that acknowledged the massive scale of the disaster and the looming risk to public health and safety, the Victorian and Commonwealth Governments announced a jointly funded clean-up program. Their commitment was to offer to clear all affected properties at no cost to owners and without seeking reimbursement from insurance payouts. Participation would be voluntary and owners who had already arranged for their own clean-up using a licensed contractor would be reimbursed.

Speed was essential. VBRRA issued a selective tender for a managing contract to three leading companies, giving them 24 hours to respond. The preferred tenderer was selected the next day and an agreement was reached on the following day. The contract was signed in just six days from the issue of tender.

The stated objective was to complete the clean-up in six months, but effective completion was announced on July 7, a period of just four-and–a-half months. In this time, 3,053 properties had been cleared and a further 360 owners were reimbursed for clearing their own properties, at a total cost of around $92 million. Over 325,000 tonnes of material had been loaded and transported to appropriately prepared landfill sites around the State by up to 600 workers, with 158 crews achieving over 300 site clearances per week at the height of the operation. A further 56,000 tonnes of concrete and nearly 12,000 tonnes of steel were recycled.

The program was widely regarded as a success under very challenging conditions and a good example of innovative and agile government in action, given the significant uncertainties and risk involved in committing to such a major operation. Its inherent complexity was exacerbated by the need to balance speed of planning and implementation against probity, risk management and community expectation.

The widespread and highly visible destruction of properties left by the bushfires was widely seen as detrimental to community morale and to the process of rebuilding. In response, the clean-up program offered one of the first and most visible signs of recovery and a major step back towards normality.

The approach

While the clean-up program agreed by the government was to be voluntary, every means possible would be used to encourage participation as the full benefit would only be achieved if there was comprehensive coverage. The contractor would need to engage closely with the community and individual owners, respecting the owners' timing and site-specific requirements. At the same time, site clean-up standards would need to be developed and new arrangements for transporting and disposing of the waste material required rapid formulation and agreement with the environmental protection, health and work safety authorities.

The scale and urgency of this program demanded a high degree of flexibility, trust and goodwill between the government and the contractor, as there was no time available to fully quantify the extent of the task, the approach to be taken or the required budget before signing the contract of engagement.

In Victoria, major public sector projects routinely use fixed-price contracts, with the contractor taking on the risk in relation to the price of the works. However, this was not feasible for the clean-up program because of the many unknown factors, including the number of properties that would choose to participate and the highly variable clean-up cost per property.

In this situation, it was considered appropriate that VBRRA adopt a 'managing contractor' arrangement as it allowed for considerable flexibility. Grocon, the appointed private contractor, would manage the operation of the works on behalf of the Authority, including engagement of sub-contractors, and would then be reimbursed for the cost of the works undertaken.

This managing contract arrangement allowed VBRRA to focus on what should be included in the service and how it was to be delivered, while being assured of a professional job at the best possible price. It also allowed the Authority to be responsive to community concerns and expectations while managing the complexity and associated risks of the project.

The clean-up program presented a valuable opportunity for local employment, which had been severely disrupted by the bushfires. The contactor was required to employ local people wherever possible and this was supported by establishing a register for local workers, community information sessions and specific training to help people gain the necessary qualifications to meet operational and work safety standards.

However, stringent requirements were necessary for insurance cover, appropriate machinery and specialized skills for dealing with the range of hazardous materials. The contractors also needed to demonstrate value for money. These conditions, coupled with the size and complexity of the task, meant that not all contractors could be drawn from the vicinity. Despite these constraints, approximately 68 per cent of work was undertaken by locally based sub-contractors and work crews.

The program was designed to meet community-wide health and safety objectives, as well as the needs of people whose homes had been either damaged or destroyed in the bushfires. The service was delivered in a way that recognized the different requirements of the owners and effectively meant that each property constituted a separate project with unique conditions that needed to be documented and communicated to work crews.

Community liaison officers were employed and trained by Grocon to make initial contact with home owners after they had registered for the program. They discussed the owners' needs and expectations and what could realistically be delivered. This included searching for personal items, any structures to be excluded from the clean-up and whether the owners wished to be on-site on the day of the demolition. In this way, the service could be delivered in close cooperation and consultation with property owners, allowing work crews to be fully briefed and respectful of individual needs and circumstances.

The community liaison officers established an important relationship with the property owners, representing VBRRA and Grocon and working alongside other personal and community support staff. They also reported regularly to community meetings, becoming a trusted source of information on progress and the immediate issues they were dealing with. Their role was so highly appreciated by owners that some liaison officers were retained by VBRRA following the conclusion of the program to provide a range of practical design and construction advice for those who were moving towards rebuilding their homes.

Conclusions

A comprehensive clean-up program is critical to public health and safety and an important step in community recovery but it must balance the government's desire for quick resolution against the capability, readiness and individual needs of often highly traumatized property owners. Responding sensitively to these needs is essential to achieving desired social as well as environmental outcomes.

If left to property owners, clean-up will be slow and patchy at best. To achieve rapid action following a large scale disaster, government will need to initiate and coordinate the program. However, it must be accepted that the extent and scope of the work required may initially be unclear, requiring flexibility in both funding and the approach taken.

Without effective community engagement and frequent, consistent communications, the clean-up process is likely to be misunderstood and distrusted by the affected communities. Their level of distress may be increased, reducing their willingness to participate and making the contractor's job more difficult. Expectations need to be well managed and this will be assisted by clear and prompt communication about the program, clarifying the processes involved, providing sufficient information about eligibility and minimizing changes during the program.

DISCUSSION QUESTIONS

1. How do we link the Grand Forks example with the list developed by Fisher and Neuman?
2. Do you rebuild old infrastructure or take longer and reposition a community with new better infrastructure? Give an example of a community that put it back as it was and one that took a different direction.

Building for a cantankerous planet

Peter Fisher [*First appeared in the National Times, October 11, 2010*]

In recent times we have seen Russia burning and choking, Pakistan was turning into an inland sea, and China was losing whole hillsides. An article by Anthony Giddens and Martin Rees in noting these events, called for a renewed drive to wake the world from its torpor about the dangers of global warming. But there's a further concern as to how both existing and future assets can be protected from climate shock.

We can learn from the four dimensions of 'resilience' proposed by American geographer Robert Kates who published a paper on the reconstruction of New Orleans after Hurricane Katrina. He called for these dimensions – anticipation, vulnerability reduction, response and recovery – to be etched into the psyche of infrastructure designers as they grapple with an increasingly cantankerous planet.

And it's clear that rising populations are only creating more hazardous situations still, especially where settlements extend onto fire-enhancing ridge lines, the side of mudslide prone hills, beach fronts vulnerable to storm surge, not to mention the long-recognized folly of living on flood plains.

We're learning, too, that just small shifts in physical variables can test the mettle of buildings and items of hard infrastructure if not the natural versions. For example, a recent study by the US National Research Council, "Potential impacts of climate change on US transportation" noted that a 25 percent increase in wind gusts can produce a 700 percent increase in damage to engineered structures.

In fact, the design standards used to protect our existing roads, railway tracks, bridges, drains, etc. against environmental shock are no longer so exceptional – the once-in-10-years municipal flood, for example, can become a 'several times a year flood'.

And things such as railways, power grids, water supply and sewerage plants, etc, are increasingly interlocked, especially through computer and telecommunication networks. This makes for a further layer of vulnerability if they're not inoculated against the possibility of a hiccup in one system spilling over into failure in another, potentially triggering a disruptive avalanche of cascading and escalating failures. The key elements of Victoria's electricity and transport infrastructure, which wilted and died during the January 2009 heatwave, are a small example of the chaos that can emerge.

Meanwhile, the natural disasters that have struck Britain, Australia and America over the past few years have led to a search for ways to protect critical infrastructures and business continuity from these ravages. Both here and in the UK strategies are taking form to get better co-ordination between government, devolved administrations, regulators, owners and/or operators. These political and administrative changes are the minimum called for, but it should be realized that some tough prioritizing of commitment to new financial arrangements will also be necessary – and often in these circumstances, additional upgrading and maintenance programs may not appear very sexy for politicians.

A recent article in the science journal *Nature*, 'Overshoot, adapt and recover', has suggested that small levels of adaptation including upgrades to infrastructure, could protect against at least 10 percent of the risk of harm. One example would be to vary the coolant in older train air-conditioners so they won't drop out when temperatures hit the 40s. Another, more costly upgrade, such as putting power lines underground in bushfire prone areas, might deal with half the problem.

Then there are the confusing weather patterns that can affect popular perceptions of long term climate risk and willingness to pay for big engineering solutions. A few wet years have raised storage levels to 99 percent capacity in south-east Queensland leading to public ridicule of a 2.5 billion recycling plant; its purified water being dumped into the Brisbane River. In Sydney, where the storage level is at 58 percent capacity, there is vocal criticism of the cost of 'unnecessary operation' of the desalination plant at Kurnell. And, now in Melbourne the annual payment of $570 million for the Wonthaggi desalination plant against the backdrop of flooding rains. But over in the West, where a decline in rainfall first became apparent two decades ago, little has changed. The chief executive of Perth's Water Corporation has even said that with rainfall totals dropping and the amount received becoming more variable, dams were becoming redundant as a means of capture, storage and supply.

Hedging against eventually running out of water is far more thorny than, for instance, a buyback of land on ridge lines as recommended by the Bushfires Royal Commission. But building a very large desalination plant, rather than examining a variety of distributed solutions such as electricity generation, has made the local situation worse. And the Wonthaggi plant's proximity to a coastline identified by CSIRO as very susceptible to storm surge, could in time, see it become one of the first significant victims of sea level rise.

More reason for the four dimensions of 'resilience' as we grapple with an increasingly cantankerous planet.

DISCUSSION QUESTIONS

1. How might the four dimensions of resilience apply to your local city or region?
2. How do local elements of resilience connect with global industrialization?

Conclusion: What We Know And What We Still Need To Learn

Disaster response is a multifaceted process, with three distinct but overlapping stages: rescue, emergency restoration and recovery. The final stage – recovery – is the longest and most important. It involves both rebuilding and restoring the life and livelihood of the inhabitants, as well as repositioning the place to be better prepared for future events and disasters.

Strategy before action

It is clear that successful recovery from disaster is dependent not only on knowing where a community wants to go, but also where the community was before the disaster. In most instances, communities have physical, social or economic issues that needed to be addressed well before the disaster struck. These can range from a declining economy and infrastructure, as in New Orleans prior to Hurricane Katrina, to land tenure issues and land use planning, as in Aceh.

No matter what level of destruction the disaster brings, recovery requires a longer-term holistic approach that takes these pre-existing concerns into account.

Listening to community members carefully as they articulate both their fears and their aspirations is the bedrock of a good recovery strategy. Recovery organizations must see themselves as both listening and implementation bodies. They must demonstrate balance between these two roles, making clear that while people's experiences are extremely important, objective data are an essential source of information as well, helping us to understand why this event took the toll it did, and what future events might be anticipated.

Good strategies have many aspects in common. They set out a new shared vision that incorporates both past and future needs. They also set out guiding principles for how the people are to be included in the recovery process, and the ground rules for how the planning process will be formulated. Furthermore, they articulate the intended end goals for the recovery and identify how these goals will be transformed into a plan of action.

The plan

Post-disaster plans are the road maps to action. Unlike many urban land use plans that list lofty goals with no clear means to achieve them, the recovery plan is a practical tool that must lay out the action steps required to get the place, the people and the economy up and functioning again. While initial restoration of basic infrastructure, including housing, is at the top of the list for community restoration, the need to restore the economy is also fundamental.

The plan should lay out not just what to do to get the economy going again, but also the best ways to reposition the economy for the future. Good plans take long looks

into the future and build in new infrastructure, thus enabling the community to play new roles in the global economy.

Furthermore, a good plan sets timelines and details how benchmarks can be measured. Given the long term nature of recovery, the plan should clearly articulate short, medium and long term goals. This provides the people with a realistic sense of the recovery process and the capacity to judge whether reasonable progress is being made.

Resources and partners

In our globalized age, recovery is a collaborative exercise between the affected nation, region and localities, as well as the international giving and expertise communities. In many cases the resources that flow to disaster areas fail to meet the needs of those affected, thus sometimes becoming a burden rather than an aid. It is important for the recovery organization to articulate clearly the needs of the area and the best means for getting the appropriate goods to the intended people. There are a few key steps for achieving this:

1. Identify and balance the different skills and resources local, national and international partners bring to the recovery process. A coherent and strategic approach to managing these partnerships will allow financing gaps to be covered, resources to be allocated efficiently, and donors and volunteers to feel their contributions are worthwhile and valued.

2. Ensure local knowledge is incorporated into the recovery program and bring in external expertise where available/required. Knowledge and expertise are needed to do myriad things, from mapping exactly where the damage is greatest, to accessing highly technical information to re-establish health care, education and other facilities. Both local and international universities can be very useful in this task, bringing contending forces together to fashion future directions for the communities, and providing university students as volunteers to assist in recovery projects.

3. Empower local community organizations. Organizing people to help themselves effectively is another vital resource in recovery. There is never enough money or other resources, so the communities that recover best will be the ones that have been empowered to capitalize on their own money and manpower, as the people in Nicaragua demonstrated after Hurricane Mitch.

Management challenges

Successful recovery management is not an ad hoc process. It involves many of the established principles and approaches of project management, while also taking into account the particularly political and emotional nature of the recovery process. A recovery manager's job is to execute a plan that will allow a place to once again operate without the need for recovery managers.

To achieve this, the recovery manager has to demonstrate a broad set of skills:

- Political nous;
- An ability to ensure transparency;
- Flexibility and adaptation;
- Technical competence;
- Traditional management skills; and
- Communication skills.

The complexity of the recovery process requires a recovery manager to be (or quickly become) a 'jack of all trades', as well as someone who brings both local understanding and familiarity with international best practice. To ensure the availability of such highly skilled leaders, we now need an international school for disaster managers. Although disaster recovery is a team effort that spans multiple sectors and organizations, an effective manager can steer the locality toward the proper path to achieve this team goal.

People first

Recovery management is a people science. People form a deep attachment to their localities, meaning disruption in the physical setting can cause deep traumas in the human psyche. During this time the psychological and political pressures on politicians is to defy nature and announce rebuilding in the same place and in the same manner as the past. For a successful recovery to occur, recovery managers must be seen to be incorporating this powerful desire to return into their planning processes, while still ensuring the present and future safety of the community remains a priority.

The tools needed to achieve this balance include:

- A commitment to listening to, and implementing, community needs as a priority, including a community's desire to stay together if possible during the evacuation period;
- A focus on empowering local communities to assist themselves in a manner consistent with broader community goals; and
- A coherent strategy for managing and capitalizing on volunteer and celebrity participation in recovery.

Communicate, communicate, communicate

Modern communications are so powerful and diverse that both real and ill-informed data move at the same pace and can have similar impacts. So, for recovery to succeed it is vital that clear messages be asserted through well-designed media campaigns by official communicators.

The following are crucial in this respect:

- An acknowledgment of the fundamental importance of symbolic acts in the recovery process (such as building memorials and reinstating cultural festivals, if this is what the community wants);

- A strategy to control misinformation, which will come as rumors or masked as official communications. Almost nothing is more vital in this regard than establishing a trustworthy 'face' of recovery, such as General Honoré in New Orleans or Premier Anna Bligh in Queensland;

- An appreciation of the powerful linking role the commercial media can play in monitoring the recovery process, while also understanding that the media's desire to 'make stories' can at times cause havoc with broader communications strategies;

- An understanding of how to use data productively, in a way that conveys the actual progress of the recovery on a continuing, objective and measurable basis; and

- Perhaps most of all, an ability to construct a culturally appropriate 'recovery dialogue', which can incorporate and 'explain' new issues that arise while also linking diverse achievements to the broader recovery process.

In sum, there can never be too much communication, as long as it is designed not to improve the image of the political actors but to convey the continuing direction, plans and goals of the recovery process.

Economics of recovery

The soft underbelly of recovery is economics. Recoveries seldom enhance the economic position of places, even though they can provide rare opportunities to do just this. Instead, while the community is 'out of action' other communities often benefit from their absence by usurping the damaged place's economic activities. As a result, we emphasize the need for recovery to examine how to reposition and not merely just restart the local economy. Furthermore, the sometimes ruthless nature of global economic redistribution means equity and efficiency must put be at the center of any economic recovery, with a balance found between these two potentially competing goals.

As the economy is reshaped, mechanisms have to be put in place to retrain the local workforce and increase local businesses' abilities to compete. National and local government financial assistance is needed to facilitate this transformation, and processes must be created to manage these funds effectively. The recovery itself is an economic engine that can use local skills and local business to stimulate the local economy, as well as act as a springboard for new industries. And since no community is an economic island, it has to communicate its new directions quickly, so the world commercial system can embrace the direction, as well as provide the resources for it to get there through financial assistance.

Housing rights, goals and difficulties

Few issues are more important than housing in post-disaster rebuilding, given the central role of appropriate living arrangements to people's sense of well-being. At the same time, however, the emotional and community aspects of housing make its

reconstruction more contentious than other forms of infrastructure. To navigate this complexity, recovery managers must consider a range of social and political issues, including:

- Which of the four main approaches to housing recovery (individual housing reconstruction, relocation, community redevelopment/land use readjustment, and community resettlement) is the best alternative for this community, in terms of safety, reestablishing ties, and providing future economic opportunity?
- How should funding be distributed so as to encourage residents to return and reward those who have invested in their community, while ensuring equity for low income and non-permanent residents?; and
- How will the housing policies implemented encourage community involvement and respond to community desires?

Successful approaches to these questions need to recognize that housing is as much a social as a physical infrastructure, and any attempts to impose new housing approaches that are not adapted to community needs are bound to fail.

Rethinking and replacing infrastructure

Restoration of infrastructure is complicated by the complexity and interconnected nature of modern systems. Recovery managers must balance competing objectives; on one hand, basic systems like electricity must be restored as soon as possible, as a basis for almost all other aspects of recovery; on the other hand, the fact that basic infrastructure was destroyed or seriously damaged suggests a need to re-think how and where it is rebuilt.

Getting the balance right will depend to a large extent on how much pre-disaster mapping and innovation planning has occurred. However, even after the event, the thoughtful use of temporary infrastructure may allow the time to incorporate improvements and innovations into the rebuilt permanent infrastructure. In either case, a key first step is to create an infrastructure inventory that considers the roles and priorities for all forms of infrastructure in the region. We offer some thoughts on how to set these priorities, but the local situation will dictate what is done when and how.

Coordination in infrastructure replacement is also critical. This coordination crosses institutional and sectorial boundaries, and requires recovery managers to have a clear understanding of the relationship between public and private infrastructure providers and operators. Recovery schemes which incentivize private operators to act in ways which benefit the broader infrastructure recovery goals, are one tool to achieve a successful result.

Finally, the replacement of infrastructure presents long run economic opportunities for the community post-disaster. New, smarter infrastructure systems can save money and reduce environmental damage. More importantly, new or replacement systems can – and should be – made more resilient than the systems previously in place.

Closing thoughts

On one hand disasters cause enormous loss and difficulties that are harmful to a community. On the other hand, they can provide opportunities for rethinking many aspects of how communities are organized, and may facilitate addressing long-standing social and economic inequalities. While institutional and economic development, geography, politics and luck all play a part, the quality of leadership provided during the recovery period is the key variable in determining whether these opportunities are seized.

We see this book as providing a beginning, rather than an end, to the conversation of how best to lead and manage disaster recovery. By outlining a broad conceptual framework for the recovery period, this book takes an initial step in the direction of crafting the body of knowledge necessary to build the recovery field. More information and more collaborative learning will deepen this field as it emerges, particularly through the development of more detailed case studies in each of the nine key areas we have identified.

As the catastrophic outcome of the March 2011 earthquake and tsunami in Japan has demonstrated, even the best-prepared nations will still have to confront the recovery process at some point in the future. While pre-disaster planning and mitigation will always play essential prophylactic roles, a well-managed recovery is itself one of the best forms of protection we have against future disasters. We hope this book will play a small but important role in helping us to achieve such positive disaster recovery outcomes sooner rather than later.

Contributing Editors

Roland Anglin

Roland Anglin is the Executive Director of the Initiative for Regional and Community Transformation at the Edward J. Bloustein School of Planning and Public Policy at Rutgers University in New Jersey. Prior to joining the IRCT, Dr. Anglin spent eight years at the Ford Foundation, as the program officer responsible for community development and subsequently as Deputy Director for Community and Resource Development. Dr. Anglin has authored three books: *Promoting Sustainable Local and Community Economic Development; Katrina's Imprint: Race and Vulnerability in America*; and *Building the Organizations that Build Communities: Strengthening the Capacity of Faith and Community-Based Development Organizations*.

Yasushi Aoyama

Yasushi Aoyama, Professor in the Graduate School of Governance Studies, Meiji University, teaches international policy, crisis management, disaster recovery, and policy development at the local government level. From 1967 to 2003 Professor Aoyama worked in the Tokyo Metropolitan Government, including as Vice-Governor of Tokyo from 1999-2003, where he was in charge of evacuating and finding emergency housing and support in Tokyo for the residents of Miyake Island, where a massive volcano erupted in September, 2000. He is a leading thinker in Japan's burgeoning non-profit sector, combining years of experience in government work and a commitment to public service. Professor Aoyama is also the author of many books and articles on government and governance.

Eugénie Birch

Eugénie Birch is the Lawrence C. Nussdorf Professor of Urban Research and Education at the University of Pennsylvania and Co-Director of the Penn Institute of Urban Research. Professor Birch teaches planning history and global urbanization and has long been active in professional organizations, having held positions as President of the Association of Collegiate Schools of Planning, President of the Society of American City and Regional Planning History and co-editor of the *Journal of the American Planning Association*. She is currently President of the International Planning History Society and co-chair of UN-HABITAT's World Urban Campaign. Professor Birch has published widely on contemporary urban revitalization, including recent books *Global Urbanization* and *Rebuilding Urban Places After Disaster: Lessons from Hurricane Katrina* (both co-edited with Susan M. Wachter).

Edward J. Blakely

Edward J. Blakely is Honorary Professor of Urban Policy in the United States Study Centre at the University of Sydney, Australia. He has held academic positions in teaching, research, academic administration, and economic development policy for more than 30 years, including Dean of the Robert J. Milano Graduate School of Management and Urban Policy at the New School and Dean of the University of Southern California School of Policy, Planning, and Development. He is a leading scholar and practitioner in the fields of planning and local economic development. Dr. Blakely served as a policy advisor to the mayor of Oakland and advisor to the Los Angeles Public School District, and worked on recoveries in Oakland, San Francisco, Los Angeles and in New York. He has served on the Board of Directors of the American Planning Association, the Nature Conservancy, and the Fulbright Association. In January 2007, Dr. Blakely was appointed by the Mayor of New Orleans to head the recovery effort following the devastation of Hurricane Katrina.

Peter Fisher

Peter Fisher is a climate change adaptation specialist and Adjunct Professor in the School of Global Studies, Social Science & Planning at RMIT University, Melbourne. His writing is frequently published in Australian publications including *The Age*. He has played a key part in presenting short courses for water professionals from South East Asia and is currently working on another edited compilation with Dr. Blakely on sustainability.

Haruo Hayashi

Haruo Hayashi is a Professor in the Kyoto University Graduate School of Informatics and Director of the Research Center for Disaster Reduction Systems at Kyoto University's Disaster Prevention Research Institute. Professor Hayashi's academic background is in social psychology, looking at the psychological effects of disaster and recovery. He has been closely involved with numerous disaster recoveries in Japan and has published widely on disaster-related topics, including serving as editor for a recent special edition of the *Journal of Disaster Recovery* on the role of ICT in building disaster resilient societies.

Jed Horne

Jed Horne was city editor of New Orleans' daily newspaper, the Times-Picayune, when Katrina struck and was awarded two Pulitzer Prizes for his part in coverage of the disaster. Horne's reporting from Kobe, Japan, on recovery prospects for New Orleans was honored by the American Planning Association. *Breach of Faith* (*Random House 2006*) was declared "The best of the Katrina books" on National Public Radio. An earlier book, *Desire Street* (*Farrar Straus & Giroux 2005*) about a Louisiana death penalty case, was a finalist for the American Bar Association's Silver Gavel Award. A graduate of Harvard University, Horne is a resident of New Orleans and rural Mississippi.

Joe Leitmann

Joe Leitmann is the Manager of the Haiti Reconstruction Fund, a US$500 million endeavor to finance post-earthquake recovery through the Inter-American Development Bank, the United Nations and the World Bank. He also founded and managed the US$700 million Multi Donor Fund for Aceh and Nias to provide strategic financing for post-tsunami reconstruction. With over 25 years of experience at the World Bank, Dr. Leitmann has specialized in post-disaster recovery as well as urban environmental management, climate change mitigation and adaptation, tropical forest management, and sustainable energy for the poor. He holds a PhD in City and Regional Planning from the University of California, Berkeley and a Master's in Public Policy from the Kennedy School of Government at Harvard University. Dr. Leitmann is the author of *Sustaining Cities: Environmental Planning and Management in Urban Design*.

Norio Maki

Norio Maki is an Associate Professor at the Disaster Prevention Research Institute, Kyoto University. He is the co-author of numerous academic publications on disaster recovery and housing, on topics such as *Process of Housing Damage Assessment: The 1995 Hanshin-Awaji Earthquake Disaster Case*; and *Proposal for the Effective Building Damage Assessment for Disaster Management*.

Michael Neuman

Michael Neuman is Professor of Sustainable Urbanism in the Faculty of Built Environment at the University of New South Wales, Australia. His academic research and teaching focuses on sustainable design in city, regional, and environmental planning, and he has recently published two books, *The Futures of City Regions* and *The Imaginative Institution*. He has served on the editorial boards of *Town Planning Review* and of the *Journal of Architecture and Planning Research*, as well as the Governing Board of the Association of Collegiate Schools of Planning, and the Boards of the American Planning Association in Texas and California.

Kazayuki Sasaki

Kazayuki Sasaki is an Associate Professor in the Graduate School of Governance Studies at Meiji University, Tokyo. Along with Professor Aoyama, Dr. Anglin and Dr. Blakely, Mr Sasaki was a participant in the disaster recovery workshop "Learning from Disaster: Miyakejima and New Orleans" held in New Orleans in 2008.

Richard Voith

Richard Voith is Senior Vice President and Principal of Econsult Corporation, which provides economic research and statistical & econometric analysis in support of litigation, business and policy-making. Dr. Voith's previous positions include Economic Advisor at the Federal Reserve Bank of Philadelphia and Vice Chairman of the Board of the Southeastern Pennsylvania Transportation Authority (SEPTA).

Laura Crommelin

Laura Crommelin is a Ph.D. candidate in the Faculty of Built Environment at the University of New South Wales, Australia. Her research considers the role of city branding in reshaping urban identity in post-industrial cities in Australia and the US.

K. Iftekhar Ahmed

K. Iftekhar Ahmed has worked extensively in Bangladesh, Pakistan, Philippines, Sri Lanka and Vietnam as well as Germany, India, UK and USA. He has worked extensively as a consultant on building and disaster related projects for several international agencies including the United Nations Development Programme (UNDP), Asian Coalition for Housing Rights (ACHR), International Telecommunications Union (ITU), European Commission Humanitarian Assistance office (ECHO) and Bill Gates Foundation. His work had been nominated for the Aga Khan Award for Architecture 2004.

Jamie Aten

Dr Jamie Aten is the Rech Endowed Chair and Associate Professor of Psychology at Wheaton College, Illinois. Dr. Aten's primary area of research interest is the integration of psychological science and theology, with a focus on disaster mental health and trauma. He is also the director of the College's Humanitarian Disaster Institute, which undertakes research designed to better equip communities to deal with trauma, as well to assist the carers charged with helping those communities to recover.

Steven Bingler

Steven Bingler is the founder of Concordia LLC, a community planning and architectural firm in New Orleans, Louisiana. Under his leadership, Concordia's projects span a wide range of building types from the New Orleans Contemporary Arts Center in New Orleans to the Henry Ford Academy in Dearborn, Michigan. Concordia also managed the Unified New Orleans Plan, a comprehensive strategy for the redevelopment of the city of New Orleans after Hurricane Katrina. In recent years, Mr Bingler has served as a special consultant to the Office of the Secretary of the US Department of Education for policy related to the design of schools as centers of the community. Research alliances have included the MIT Media Lab, Harvard University's Project Zero, the University of New Mexico, National Aeronautics and Space Administration, the Thornburg Institute, Appalachian Education Lab and the West Ed Research Lab.

Michael Buxton

Michael Buxton is a Professor in the school of Global Studies, Social Science and Planning at RMIT University in Melbourne, Australia. Prior to joining RMIT in 1998, Professor Buxton worked in senior management roles within the Planning and Environment agencies of the Victorian government, including as head of the intergovernmental process for developing Australia's National Greenhouse Strategy. His research interests include international environmental law, integrated transport planning and natural resource use.

Mary C. Comerio

Mary Comerio is an internationally recognized expert on disaster recovery. She is a Professor in the Department of Architecture at U. C. Berkeley and served as Chair from 2006 through 2009. As an architect, she has designed numerous public and private facilities including market rate and affordable housing. Her research focuses on the costs and benefits of seismic rehabilitation (particularly housing), post-disaster recovery and reconstruction, and loss modeling. She has worked with the UN Environment Program on disaster recovery in China and Haiti. She is the author of *Disaster Hits Home: New Policy for Urban Housing Recovery*, (*U. C. Press, 1998*).

N. Emel Ganapati

N. Emel Ganapati is an Assistant Professor in Public Administration at Florida International University. She holds a PhD degree in planning from the University of Southern California in Los Angeles. Dr Ganapati's research interests are in disaster recovery, public participation, and international planning. Prior to joining FIU, she taught at the University of Southern California and the University of Miami. Her articles have appeared in leading planning and disaster journals such as the *Journal of the American Planning Association* and the *International Journal of Mass Emergencies and Disasters.*

Meghan Z. Gough

Meghan Z. Gough worked as a planning consultant and an academic researcher in coastal Mississippi after Hurricane Katrina in 2005. She led the development team of the award-winning Smart Growth Guide for Harrison County, and wrote the "Intergovernmental Cooperation" chapter of the Harrison County Comprehensive Plan, which was honored by the Sun Herald Design Award in Planning for its use of best practices in planning. Gough also completed case research on factors influencing intergovernmental collaboration in a post-Katrina Mississippi. Gough is now on Assistant Professor of Urban and Regional Planning at Virginia Commonwealth University.

John Hanna

John Hanna was previously an Executive Advisor to the Victorian Government, and served as Executive Advisor, Legacy, Intelligence and Transition for the Victorian Bushfire Recovery and Reconstruction Authority (VBRRA), working on the recovery from the 2009 Victorian bushfires.

Andrew Holbein

Andrew Holbein studied Economics at Wesleyan University in Connecticut before moving to New Orleans in 2006. He began working for the city's Office of Recovery Management in April 2007 and as a project manager he has played a central role in managing demolitions and implementing new housing standards for the city.

Richard Hu

Richard Hu is an Assistant Professor of Urban and Regional Planning at the University of Canberra. Richard's academic experiences included The University of Sydney and UC Berkeley. Richard's earliest professional experience was as a practising urban planner in China. Richard's research interests include disaster recovery, urban economics and competitiveness.

Leslie Irvine

Leslie Irvine is Associate Professor of Sociology at the University of Colorado at Boulder. Her research focuses on the various roles of animals in society. She conducted research on animals in disasters following Hurricane Charlie in 2004 and Hurricane Katrina in 2005. She is the author of *Filling the Ark: Animal Welfare in Disasters* (2004).

Laurie Johnson

Laurie Johnson, PhD AICP, is founder and principal of Laurie Johnson Consulting | Research in San Francisco, CA. She has 20 years of experience in urban planning and disaster-related consulting, management and research and has written extensively about the economics of catastrophes, land use and risk, and disaster recovery and reconstruction. Dr. Johnson has either researched or consulted in the recovery following many of the world's recent major urban disasters, including the 2011 Japan, 2010 Chile and 2008 China earthquakes. In 2006, she was a lead author of the recovery plan for the City of New Orleans following Hurricane Katrina and coauthored the book, *Clear as Mud: Planning for the Rebuilding of New Orleans*. In 1997, she was a lead recovery planner for the City of Grand Forks, ND following catastrophic flooding earlier that year. In 2009, she obtained a Doctor of Informatics degree from Kyoto University, Japan, and excerpts of her dissertation "Developing a Management Framework for Local Disaster Recovery, A Study of the U.S. Disaster Recovery Management System and the Management Processes and Outcomes of Disaster Recovery in three US Cities" are included in this book.

Peter Lawther

Peter Lawther is an independent construction management consultant and researcher. He has over 20 years' experience gained in Australia, Indonesia, Maldives, Samoa, Singapore, Solomon Islands, Sri Lanka, Thailand and United Kingdom, spanning the commercial, academic and humanitarian sectors. Peter is a specialist in multi-cultural environments including value enhancement, knowledge and skills transfer, staff capacity building, education and training. He was construction manager for the British Red Cross Maldives recovery program following the 2004 Indian Ocean tsunami. Peter has authored many publications and conference presentations and is currently undertaking a PhD study of the relationship between post-disaster reconstruction and recovery, considering inputs, processes, stakeholder influence and impact, at the University of Melbourne. Peter is a Fellow of the Australian Institute of Quantity Surveyors, a registered construction delegate of the Australian and British Red Cross Societies, Registered Engineers for Disaster Relief Australia, and a member of the Australasian Evaluators' Society.

Michael K. Lindell

Mike Lindell is a Professor at the Texas A&M University Hazard Reduction & Recovery Center. He has over 35 years' experience in emergency management, including extensive research into the ways individuals and organizations respond to hazards and disasters. He has served on three National Academy of Science/National Research Council committees and is currently a member of the US Advisory Council on Earthquake Hazards Reduction.

David Mercer

Dave Mercer is an Associate Professor in the School of Global Studies, Social Science and Planning at RMIT University, Australia, where he also holds the position of Program Director for the Masters of International Urban and Environmental Management. Dr Mercer's key research interests are natural resource management and environmental policy. His expertise in environmental research and teaching was recognized in 1999 when he was elected as a Fellow of the Environment Institute of Australia and New Zealand. He has worked on a number of major research projects related to disaster recovery, including a study of Australian peri-urban regions, and a study identifying lessons arising from the Indian Ocean tsunami recovery.

Anuradha Mukherji

Anuradha Mukherji is an Assistant Professor in Urban and Regional Planning at East Carolina University (ECU). She holds a PhD in Architecture from the University of California at Berkeley. Her research focuses on policy mechanisms, financial instruments, and social networks that communities utilize to respond to and recover from disaster events. She is particularly interested to understand community resilience, recovery, and adaptation to disaster events and increasingly the impacts of climate change. Prior to joining ECU, Dr Mukherji taught at Boston University.

David O'Brien

David O'Brien practiced as an architect before joining the Faculty of Architecture, Building and Planning at the University of Melbourne in 1996. He has since worked in community development projects in rural Thailand, Indonesia, Papua New Guinea and Australia's Northern Territory. Dr O'Brien has advised in the construction and evaluation of prototype houses alongside builders, engineers, sociologists, government agencies and aid workers. His primary research interest lies in the relationships between architectural technology and indigenous housing needs with a focus on environmental and cultural sustainability.

Kenneth Reardon

Kenneth Reardon is the Director of the Graduate Program in City and Regional Planning at the University of Memphis. He completed his PhD at Cornell University, where he previously held the positions of Associate Professor and Chair of the Department of City and Regional Planning. Professor Reardon is recognized as an expert in community organizing, neighborhood revitalization, and university-community partnerships in planning.

William Siembieda

William Siembieda is an internationally known disaster mitigation planner. He was a key member of the team that prepared the highly acclaimed 2007 and 2010 State of California Multi-Hazard Mitigation Plans. His work on the legislative framework led to the first of its kind Federal District of Caracas (Venezuela) Mitigation and Preparedness Plan. In 2008 he conducted studies of long-term disaster recovery studies in Niigata (Japan) and pre-disaster planning studies in Nara Prefecture (Japan). His four-country Central America study of 15 poor communities demonstrates how they choose a paradigm for disaster recovery and provides insight into successful long-term recovery.

Dr Siembieda is Professor of City and Regional Planning, California Polytechnic State University and holds a PhD degree in Urban Planning from the University of California, Los Angeles. His academic writing includes: *Contemporary Urbanism in Brazil: After Brasilia* (2009); and *Recovery from Disasters: Challenges for Low Income Communities in the Americas* (2005).

Ralph E. Thayer

Ralph E. Thayer, PhD is Professor Emeritus of Urban Planning and Public Administration at the University of New Orleans. He served as director of the School of Urban and Regional Studies for nine years and then as academic director of both the Bachelors in Interdisciplinary Studies and BS/MS in Urban Studies programs. Over his career, he served as a Planning Commissioner, as a Presidential appointee to the Oversight Board of the Resolution Trust Corp. and as a member of the Board of Supervisors of the Southern University A&M System. Following his retirement from the university, he served in the Orleans Recovery Foundation as the director of Federal-State Reimbursement for the City of New Orleans. He is a graduate of Hobart College, the Maxwell School of Syracuse University, and the University of Pittsburgh. He continues to work in disaster recovery consulting in several Gulf coast communities and works with environmental organizations in the Mobile AL area.

Michael E. Ward

Mike Ward is an associate member of the graduate faculty at the University of Southern Mississippi. He and colleagues at the university have conducted extensive research into the impact of Hurricane Katrina upon students. In 2004, he concluded his second four-year term as State Superintendent of the Public Schools of North Carolina. Dr Ward also serves as a consultant to state public education officers on matters related to leadership, strategic planning, performance coaching, and assessment of student achievement.

Additional acknowledgements

First of all, we want to acknowledge all of the above collaborators in this work. We canvassed widely through our own sources and resources for contributions. We received more than we have used. Some of these not included in the book will be on our website.

Secondly, our strong thanks have to go to our financial and resource partners:

- The Penn Institute for Urban Research at the University of Pennsylvania, which provided staff and funding for this project, led by Eugénie Birch as a co-editor.
- The Initiative for Regional and Community Transformation at the Edward J. Bloustein School of Planning and Public Policy, Rutgers University, which hosted the team and provided financial support for the efforts, including editorial services.
- The Japan Society, in cooperation with the Japan Foundation's Center for Global Partnership, which provided hosting and financial support for the effort. The assistance provided by staff members, particularly Betty Borden and Ruri Kawashima, has been far above and beyond our expectations.
- The United States Studies Centre at the University of Sydney, which co-hosted the Sydney-Melbourne meetings and provided support for the lead editor, as well as the research associate (Laura Crommelin).
- The School for Global Studies, Social Science and Planning at RMIT University – especially Dave Mercer, Michael Buxton and Amaya Alvarez – for hosting the Melbourne meeting and providing considerable drafting assistance on various cases and chapters.
- The Victorian Bushfire Recovery and Reconstruction Authority (as it then was), and in particular John Hanna, for assisting with the Melbourne meeting and tour of the bushfire-affected regions.
- Kyoto University's Research Center for Disaster Reduction Systems, which hosted the Kyoto meetings and made many of the local arrangements for the Japan meeting as well as hosting the lead editor for much of 2010 as visiting scholar.
- Meiji University, Tokyo, for hosting the Tokyo meetings and working on the Japanese contributions for the book.
- The World Bank – for help in identifying materials and resources for inclusion.

The book is an edited work, and we thank all the editors for their best efforts in producing a work that is broad in scope and for a diffuse audience. Finally, we thank our publication colleagues, especially Emily Hough, Editor in Chief of *Crisis Response Journal* and *IAFPA Bulletin*.

Cited References

INTRODUCTION

2009, 'Paris Heat Wave Offers Lessons on Climate Change', *The World*, December 9, **www.theworld.org/2009/12/09/paris-heat-wave-offers-lessons-on-climate-change**

Angel, S, Sheppard, S and Civco, D 2005, *The Dynamics of Global Urban Expansion*, The World Bank, Washington, DC

Amaratunga, D and Haigh, R 2010, 'Disasters and the built environment: towards a mature discipline', *International Journal of Disaster Resilience in the Built Environment*, vol.1, no.1, **www.emeraldinsight.com/journals.htm?issn=1759-5908&volume=1&issue=1&articleid=1845978&show=html**

Callinan, R 2009, 'Record Heatwave Hits Australia', *Time Magazine*, February 2, **www.time.com/time/world/article/0,8599,1876299,00.html**

Ferran, L 2011, 'Terror Report: Attacks Up, Deaths Down in 2010', abc News, August 18, **http://abcnews.go.com/Blotter/terrorism-report-attacks-deaths-2010/story?id=14335774#.TvppvjUjHp4**

Gregory, JM, Huybrechts, P and Raper, SCB 2004, 'Threatened loss of the Greenland ice-sheet', *Nature*, vol. 428, no. 6983, p.616

Llanos, M 2011, '2011 already costliest year for natural disasters', *msnbc.com*, 12 July, **www.msnbc.msn.com/id/43727793/ns/world_news-world_environment/t/already-costliest-year-natural-disasters**

Mayor of London 2010, *The Draft Climate Change Adaptation Strategy for London*, Public Consultation Draft, Mayor of London, London, UK

Mayor of London 2010a, *Consultation Draft Replacement London Plan,* Mayor of London, London, UK

Robine, J, Cheung, S, and LeRoy, S 2008, 'Death Toll Exceeded 70,000 in Europe During Summer of 2003', *Compte Rendus Biologies*, vol.331, no.2, pp.171-178

United Nations 2010, *World Urbanization Prospects*, the 2009 Revision, Department of Economic and Social Affairs, New York, NY

United Nations 2008, *World Urbanization Prospects*, the 2007 Revision, Department of Economic and Social Affairs, New York, NY

Vos, F, Rodriguez, J, Below, R and Guha-Sapir, D 2010, *Annual Disaster Statistical Review, The Numbers and Trends*, Center for Research on the Epidemiology of Disasters, Brussels, Belgium

World Bank 2010, *Systems of Cities Harnessing Urbanization for Growth and Poverty Alleviation*, Washington, DC

CHAPTER 1

Reconstruction and Rehabilitation Agency for Aceh and Nias (BRR) 2009b, *Supervision: Eradicating Corruption with No Tolerance*, BRR Book Series, Banda Aceh, Indonesia

Regional Plan Association 2001, 'Civic Planning Initiative for Rebuilding the World Trade Center District', New York, NY, October
www.nyplanning.org/docs/RPADraftforDiscussion.pdf

CHAPTER 2

BAPPENAS (National Development Planning Ministry) 2005, *Indonesia: Preliminary Damage and Loss Assessment – The December 26, 2004 Natural Disaster*, BAPPENAS and international partners, Jakarta, Indonesia

Olshansky, R and Johnson, L 2010, *Clear as Mud*, APA Press, Chicago, IL

Republic of Indonesia 2005, *Master Plan for the Rehabilitation and Reconstruction of the Regions and Communities of the Province of Nanggroe Aceh Darussalam and the Islands of Nias, Province of North Sumatra*, Government of Indonesia, Jakarta, Indonesia

Wilkinson, F 2005, 'Coastal Design and Tsunami Mitigation for Shelter/House Reconstruction on the West Coast Aceh', Paper presented at International Symposium – Disaster Reduction on Coasts, Monash University, Melbourne, Australia, 14-16 November

CHAPTER 3

Czerwinski, SJ 2009, 'Disaster Recovery: Past Experiences Offer Recovery Lessons for Hurricanes Ike and Gustav and Future Disasters', Testimony before the Subcommittee on Emergency Communications, Preparedness, and Response, Committee on Homeland Security, U.S. House of Representatives, Washington, DC, 3 March, ***www.gao.gov/new.items/d09437t.pdf***

De Mel, S, McKenzie, D and Woodruff, C 2008, 'Enterprise Recovery after Disasters in a Low-Income Country' World Bank Working Paper, The World Bank, Washington, DC

Haiti Reconstruction Fund 2011, 'Rebuilding Together: First Annual Progress Report,' World Bank, Port-au-Prince, July

Masyrafah, H and McKeon, J 2008, 'Post-Tsunami Aid Effectiveness in Aceh: Proliferation and Coordination in Reconstruction', Working Paper 6, Wolfensohn Center for Development, Brookings Institution, Washington, DC

Vatsa, K 2009, 'Post-disaster Recovery and Reconstruction: A Survey of Institutional Issues' (unpublished paper)

CHAPTER 4

Anglin, RV 2010, 'The Ship of State: framing an understanding of Federalism and the Perfect Disaster,' in K Wailoo, K O'Neil, J Dowd, and R Anglin (eds) *Katrina's Imprint: Race and Vulnerability in America*, Rutgers, The State University of New Jersey, New Brunswick, NJ

Berke, PR, Kartez, J and Wenger, D 1993, 'Recovery after Disaster: Achieving Sustainable Development, Mitigation and Equity', *Disasters*, vol.17, no.2, pp.93-109

Brinkley, D 2006, *The Great Deluge: Hurricane Katrina, New Orleans and the Mississippi Gulf*, William Morrow, New York, NY

Kapucu, N 2006, 'Interagency Communication Networks During Emergencies', *The American Review of Public Administration*, vol.36, no.2, pp.207–225

Kates, RW, Colten, CE, and Leatherman, SP 2006, 'Reconstruction of New Orleans after Hurricane Katrina: A Research Perspective', *Proceeding of the National Academy of Sciences of the United States of America*, vol. 103, no.40, pp.14653–14660

Kennedy, J, Ashmore, J, Babister, E and Kelman, I 2008, 'The Meaning of 'Build Back Better': Evidence from Post Tsunami Aceh and Sri Lanka', *Journal of Contingencies and Crisis Management*, vol.16, no.1, pp.24–36

Pardede, TS 2010, 'Planning Issues in Recovery Aceh Post-Tsunami 2004', Sharing Meeting on Post Disaster Recovery Planning, DPRI Kyoto University, May 8

Ota, T, Maki, N and Hayashi, H 2009, 'Evaluating Planning Process of the Kobe Recovery Plan Based on Project Management Framework', *Journal of Disaster Research*, vol.4, no.3, pp. 271–281

Rubin, CB and Barbee, DG 1985, 'Disaster Recovery and Hazard Mitigation: Bridging the Intergovernmental Gap', *Public Administration Review*, vol.45, pp.57-63

Sobel, RS, and Leeson, PT 2007, 'The Use of Knowledge in Natural-Disaster Relief Management', *Independent Review*, vol.11, no.4, pp.519–532

United Nations Development Program 2005, 'The Post-Tsunami Recovery in the Indian Ocean', Bureau for Crisis Prevention and Recovery, April, **www.alnap.org/pool/files/UNDP_Recovery_Lessons_Learned.pdf**

CHAPTER 5

Aldrich, D 2010, 'Strength through Networks: Social Capital in Post-Crisis Recovery', Paper given at the Association for Asian Studies Annual Meeting, Philadelphia, PA, March

Aldrich, D and Crook, K 2008. 'Strong Civil Society as a Double-Edged Sword: Siting Trailers in Post-Katrina New Orleans' *Political Research Quarterly*, vol.61, no.3, pp.379-389

Gaffney, D 2006, 'The aftermath of disaster: Children in crisis', *Journal of Clinical Psychology*, vol.62, no.8, pp.1001-1016

Heath, SE, Kass, PH, Beck, AM and Glickman, LT 2001, 'Human and Pet Related Risk

Factors for Household Evacuation Failure during a Natural Disaster', *American Journal of Epidemiology*, vol.153, no.7, pp.659-665

Heller, PJ 2003, '"Seeing heart" dogs offer cheer', **www.disasternews.net/news/article.php?articleid=1604**

Hunt, M, Al-Awadi, H and Johnson, M 2008, 'Psychological Sequelae of Pet Loss Following Hurricane Katrina', *Anthrozoös*, vol.21, no.2, pp.109-121

Hurt, A 2006, 'Hurricane Katrina's impact on the Ocean Springs School District', Presentation delivered at The Eagle Institute for School Leaders, Hattiesburg, MS, April

Irvine, L 2004, *If You Tame Me: Understanding our Connection with Animals*, Temple University Press, Philadelphia, PA

Lowe, SR, Rhodes, JE, Zwiebach, L and Chan, CS 2009 'The Impact of Pet Loss on the Perceived Social Support and Psychological Distress of Hurricane Survivors', *Journal of Traumatic Stress*, vol.22, no.3, pp.244–247

Messent, PR 1983, 'Social Facilitation of Contact with Other People by Pet Dogs', in A Katcher and A Beck (eds), *New Perspectives on Our Lives with Companion Animals*, University of Pennsylvania Press, Philadelphia, PA, pp.37-46

Oliver-Smith, A 2005, 'Communities after Catastrophe: Reconstructing the Material, Reconstituting the Social' in SE Hyland (ed), *Community Building in the Twenty-First Century*, School of American Research, Santa Fe, NM

Pane, J, McCaffrey, D, Tharp-Taylor, S, Asmus, G, and Stokes, B 2006, *Student displacement in Louisiana after the hurricanes of 2005: Experiences of public schools and their students*, RAND Education, Santa Monica, CA

Sack, J, and Keller, B 2005, 'Teachers ponder job prospects as districts come recruiting', *Education Week*, vol.25, no.5, p.14

Ward, M, Shelley, K, Kaase, K, and Pane, J 2008, 'Hurricane Katrina: A longitudinal study of the achievement and behavior of displaced students', *The Journal of Education for Students Placed at Risk*, vol.13, no.2-3, pp.297-317

Wood, L, Giles-Corti, B, Bulsara, MK and Bosch, DA 2007, 'More Than a Furry Companion: The Ripple Effect of Companion Animals on Neighborhood Interactions and Sense of Community', *Society and Animals*, vol.15, no.1, pp.43-56

World Bank 1999, *Project appraisal document on a proposed loan in the amount of US$505 million to the Republic of Turkey for Marmara Earthquake Emergency Reconstruction Project,* World Bank, Washington, DC

CHAPTER 6

City of Grand Forks 1997, *The First Season of Recovery, Grand Forks' Flood Recovery Action Plan*, *Action Plan Period: June 1 through November 1, 1997*

City of Grand Forks 2006, *Recovery Briefing Book*, *Grand Forks, North Dakota: Flood*

Recovery Brief, Informational Resources and Recovery Lessons Learned, **www.downtowndevelopment.com/pdf/Recovery_Briefing_Book.pdf**

Federal Emergency Management Agency (FEMA) 2007, 'FEMA Fact Sheet, 1997 North Dakota Flood', April 16

Johnson, LA 2009, 'Developing a Management Framework for Local Disaster Recovery: A study of the US disaster recovery management system and the management processes and outcomes of disaster recovery in 3 US cities', Dissertation prepared in partial fulfillment of the Doctoral Degree, Graduate School of Informatics, Kyoto University, March

Kweit, MG and Kweit, RW 2004, 'Citizen Participation and Citizen Evaluation in Disaster Recovery', *The American Review of Public Administration*, vol.34, no.4, pp.354-373

Lower Manhattan Development Corporation (LMDC) 2005, *LMDC Progress Report 2001–2004*, LMDC, New York, NY

Natural Hazards Center, University of Colorado 1999, 'An Assessment of Recovery Assistance Provided After the 1997 Floods in the Red River Basin: Impacts on Basin-wide Resilience, International Red River Basin Task Force', International Joint Commission, Ottawa, Canada, May

CHAPTER 7

Civic Alliance to Rebuild Downtown New York 2002, 'A Planning Framework to Rebuild New York', September, **www.rpa.org/civicalliance/pdf/Framework0827.pdf**

Consortium for Worker Education 2004, *Pulling Together After 9-11: The Emergency Employment Clearinghouse*, Consortium for Worker Education, New York, NY

Dixon, L and Stern, RK 2004, *Compensation for Losses from the 9/11 Attacks*, RAND Institute for Civil Justice, Santa Monica, CA

Government Accountability Office (GAO) 2008, 'Disaster Recovery: Past Experiences Offer Insights for recovering from Hurricanes Ike and Gustav and Other Recent Natural Disasters', Report to the US Senate Committee on Homeland Security and Governmental Affairs, US Government Accountability Office, Washington DC, September

Kage, R 2009, 'Rebuilding from World War II: A Preliminary Assessment of Damage and Recovery', Paper presented at the Social Science History Conference, Long Beach, CA, November 15

Masyrafah, H and McKeon, J 2008, 'Post-Tsunami Aid Effectiveness in Aceh: Proliferation and Coordination in Reconstruction', Working Paper 6, Wolfensohn Center for Development, Brookings Institution, Washington, DC

Multi Donor Fund for Aceh and Nias (MDF) 2009, *Five Years after the Tsunami: Continuing the Commitment to Reconstruction*, MDF, Jakarta, Indonesia

Langewiesche, W 2002, *American Ground: Unbuilding the World Trade Center*, North Point Press, New York, NY

Reconstruction Watch 2004, 'They're in the Money, We're in the Dark", Good Jobs NY, New York, August

Reconstruction Watch 2002, 'Breaking it Down: Business Assistance Programs for Lower Manhattan,' Good Jobs NY, New York, NY

White, A and Eisinger, P (eds) 2006, *Cities At Risk: Catastrophe, Recovery and Renewal in New York and New Orleans,* Milano the New School for Management and Urban Policy, New York, NY

CHAPTER 8

Aldrich, DP and Crook, K 2008, 'Strong Civil Society as a Double-Edged Sword: Siting Trailers in Post-Katrina New Orleans', *Political Research Quarterly*, vol.61, no.3, pp.379-389

Barenstein, JD 2006, 'Housing reconstruction in post-earthquake Gujarat: A comparative analysis', Humanitarian Practice Network Paper 54, Overseas Development Institute, London, UK

Boen, T 2008, 'Reconstruction of houses in Aceh, three years after the December 26, 2004 tsunami', Proceedings of the International Conference on Earthquake Engineering and Disaster Mitigation, Jakarta

Boin, A and 't Hart, P 2006, 'The Crisis Approach' in H Rodriguez, EL Quarantelli and RR Dynes (eds) *Handbook of Disaster Research*, Springer, New York, NY, pp.42-54

Bolin, RC 1982, *Long Term Family Recovery from Disaster*, University of Colorado Institute of Behavioral Science, Boulder, CO

Comerio, MC 1992, 'Hazards Mitigation and Housing Recovery: Watsonville and San Francisco One Year Later', in Y Aysan and I Davis (eds), *Disasters and Small Dwellings*, James and James, Science Publishers, London, UK, pp.127-135

Comerio, MC 1997, 'Housing Issues After Disasters', *Journal of Contingencies and Crisis Management*, vol.5, no.3, pp.166-178

Comerio, MC 1998, *Disaster Hits Home: New Policy for Urban Housing Recovery,* UC Press, Berkeley, CA

Comerio, MC 1998a, 'Housing Repair and Reconstruction After the Earthquake' in M Celebi (ed), *The Loma Prieta, California, Earthquake of October 17, 1989—Building Structures*, US Geological Survey Professional Paper 1552-C, US Government Printing Office, Washington DC, pp.C161-C168

Dall, G 1982, 'The Traditional Acehnese House' in J Maxwell (ed), *The Malay-Islamic World of Sumatra*, Monash University, Melbourne, Vic

Davis, BC and Bali, V 2006, 'Not in My District: The Placement of FEMA Trailer Parks', Paper presented at the Sixth Annual State Politics and Policy Conference, Texas Tech University-Lubbock, May 19-20, **www.olemiss.edu/depts/political_science/state_politics/conferences/2006/Papers/DavisandBali.pdf**

Earthquake Engineering Research Institute (EERI) 1999, *Lessons Learned Over Time: Innovative Earthquake Recovery in India*, EERI Oakland, California

Evans-Cowley, JS and Gough, MZ 2007, 'Is Hazard Mitigation Being Incorporated into Post-Katrina Plans in Mississippi?', *International Journal of Mass Emergencies and Disasters*, vol.25, no.3, pp.177-217

Freeman P K 2004, 'Allocation of post-disaster reconstruction financing to housing', *Building Research and Information*, vol.32, no.5, pp.427–437

Garratt, D and Stark, JW 2009, 'Post Katrina Disaster Response and Recovery: Evaluating FEMA's Continuing Efforts in the Gulf Coast and Response to Recent Disasters', Statement before the House Transportation and Infrastructure Committee Subcommittee on Economic Development, Public Buildings, and Emergency Management, US House of Representatives, Washington DC, February 25, **www.fema.gov/pdf/about/testimony/022509_testimony.pdf**

Gilbert, A 2008, 'Slums, tenants and homeownership: On blindness to the obvious', *International Development Planning Review*, vol.30, no.2, pp.i–x

Hayden, D 1985, *Redesigning the American Dream: The Future of Housing, Work, and Family Life*, W.W. Norton, New York, NY

Jackson, KT 1985, *Crabgrass Frontier: The Suburbanization of the United States*, Oxford University Press, New York, NY

Jha, AK with Barenstein, JD, Phelps, PM, Pittet, D and Sena, S 2010, S*afer Homes, Stronger Communities: A Handbook for Reconstructing after Natural Disasters*, The International Bank for Reconstruction and Development, The World Bank, Washington, DC

Krueckeberg, DA 1999, 'The grapes of rent: A history of renting in a country of owners', *Housing Policy Debate*, vol.10, no.1, pp.9–30

Lindell, MK and Perry, RW 1992, *Behavioral Foundations of Community Emergency Planning*, Hemisphere Press, Washington, DC

Lindell, MK and Perry, RW 2004, *Communicating Environmental Risk in Multiethnic Communities*, Sage, Thousand Oaks, CA

Lindell, MK, Prater, CS and Perry, RW 2006, *Fundamentals of Emergency Management*, Federal Emergency Management Agency Emergency Management Institute, Emmitsburg, MD

Mukherji, A 2010, 'Post-earthquake housing recovery in Bachhau, India: The homeowner, the renter, and the squatter', *Earthquake Spectra*, vol.26, no.4, pp.1085-1100

Office of Community Development, State of Louisiana 2010, 'The Homeowner Assistance Program Week 208 Situation & Pipeline Report', State of Louisiana

Peacock, WG and Girard, C 1997, 'Ethnic and Racial Inequalities in Hurricane Damage and Insurance Settlements' in WG Peacock, BH Morrow and H Gladwin (eds), *Hurricane Andrew: Ethnicity, Gender and the Sociology of Disaster*, Routledge, London, UK, pp.171-190

Phillips, BD 2009, *Disaster Recovery*, CRC Press, Boca Raton, FL

Pugh, C 2001, 'The theory and practice of housing sector development for developing countries, 1950-99,' *Housing Studies*, vol.16, no.4, pp.399–423

Pugh, C 2000, 'Squatter settlements: Their sustainability, architectural contributions, and socio-economic roles', *Cities*, vol.17, no.5, pp.325–337

Reconstruction and Rehabilitation Agency for Aceh and Nias (BRR) 2009a, 'Case Study: The Scattered Beads', BRR Book Series, Banda Aceh, Indonesia

Republic of Indonesia 2005, *Master Plan for the Rehabilitation and Reconstruction of the Regions and Communities of the Province of Nanggroe Aceh Darussalam and the Islands of Nias, Province of North Sumatra*, Government of Indonesia, Jakarta, Indonesia

Schwab, J, Topping, KC, Eadie, CC, Deyle, RE and Smith, RA 1998, *Planning for Post-Disaster Recovery and Reconstruction,* PAS Report 483/484, American Planning Association, Chicago, IL

Steinberg, F 2007, 'Housing reconstruction and rehabilitation in Aceh and Nias, Indonesia – rebuilding lives', *Habitat International*, vol.31, no.1, pp.150-166

Tatsuki, S 2007, 'Long-term Life Recovery Processes Among Survivors of the 1995 Kobe Earthquake: 1999, 2001, 2003, and 2005 Life Recovery Social Survey Results', *Journal of Disaster Research*, vol.2, no.6, pp.484-501

United Nations Center for Human Settlements (UNCHS) 2003, *Rental housing: An essential option for the urban poor in developing countries*, UNCHS, Nairobi

Weiss, NE 2006, *Rebuilding Housing after Hurricane Katrina: Lessons Learned and Unresolved Issues*, Congressional Research Service, Washington, DC

Wright, G 1983, *Building the Dream: A Social History of Housing in America*, MIT Press, Cambridge, MA

World Bank 2010c, *Recovery of Aceh Land Administration System Project: Implementation Completion Report*, Washington, DC

Wu, JY and Lindell, MK 2004, 'Housing Reconstruction after Two Major Earthquakes: The 1994 Northridge Earthquake in the United States and the 1999 Chi-Chi Earthquake in Taiwan', *Disasters*, vol.28, no.1, pp.63-81

CHAPTER 9

Buldyrev, SV, Parshani, RP, Stanley, G, Eugene, H and Havlin, S 2010, 'Catastrophic cascade of failures in interdependent networks', *Nature*, vol.464, no.7291, pp.1025-1028

City of Grand Forks 1997, *The First Season of Recovery, Grand Forks' Flood Recovery Action Plan, Action Plan Period: June 1 through November 1, 1997*

City of Grand Forks 2006, *Recovery Briefing Book, Grand Forks, North Dakota: Flood Recovery Brief, Informational Resources and Recovery Lessons Learned*,

www.downtowndevelopment.com/pdf/Recovery_Briefing_Book.pdf

City of Grand Forks 2008, *Information on City governance, 1997 flood preparations, damage and recovery*, **www.grandforksgov.com**

DLT Solutions 2008, *Grand Forks, N.D. Comes Back from Massive 1997 Flood With Citywide GIS from Autodesk*, Autodesk

Fisher, P 2010 'When everything's connected, one fault can be catastrophic', *The Age,* 21 June, **www.theage.com.au/opinion/society-and-culture/when-everythings-connected-one-fault-can-be-catastrophic-20100620-yp56.html**

Government Accountability Office (GAO) 2008*, Disaster Recovery: Past Experiences Offer Insights for recovering from Hurricanes Ike and Gustav and Other Recent Natural Disasters*, Report to the US Senate Committee on Homeland Security and Governmental Affairs, US Government Accountability Office, Washington DC, September

Johnson, LA 2009, "Developing a Management Framework for Local Disaster Recovery: A study of the U.S. disaster recovery management system and the management processes and outcomes of disaster recovery in 3 U.S. cities," Dissertation prepared in partial fulfillment of the Doctoral Degree, Graduate School of Informatics, Kyoto University, March 2009

MCEER 2008, *Engineering resilient solutions*, *1997-2007*, University of Buffalo, Buffalo, NY

Neuman, M 2005, 'Infrastructure' in R Caves (ed.), *Encyclopedia of the City*, Routledge, London, UK

Vespignani, A 2010, 'Complex Networks: the fragility of interdependency', *Nature*, vol.464, no.7291, pp.984-985

FURTHER READING

Agency for Toxic Substances and Disease Registry (ATSDR) 2007a, *Health Consultation: Formaldehyde Sampling at FEMA Temporary Housing Units*, *Baton Rouge*, *Louisiana*, ATSDR, Atlanta, GA

Agency for Toxic Substances and Disease Registry (ATSDR) 2007b, *An Update and Revision of ATSDR's February 2007 Health Consultation: Formaldehyde Sampling at FEMA Temporary-Housing Trailers, Baton Rouge, Louisiana, September-October, 2006,* ATSDR, Atlanta, GA

Al-Nammari, FM and Lindell, MK 2009, 'Earthquake recovery of historic buildings: Exploring cost and time needs', *Disasters*, vol.33, no.3, pp.457-481

Aoyama, Y 2007, 'Public-Private Cooperation in Livelihood Support for Victims of the 2000 Miyakejima Eruption,' *Journal of Governance Studies*, vol.4, pp.41–97

Araujo, A and Quesada-Aguilar, A 2007, *Gender Equality and Adaptation*, Women's Environment and Development Organization, www.gender-climate.org/pdfs/FactsheetAdaptation.pdf

Badenhausen, K 2008, 'America's most miserable cities', 30 January, **www.forbes.com/2008/01/29/detroit-stockton-flint-biz-cz_kb_0130miserable.html**

Barakat, S 2003, *Housing reconstruction after conflict and disaster,* Humanitarian Practice Network Paper 43, Overseas Development Institute, London, UK

Birch, EL 2011, 'Design of Cities for Women' in AI Meleis, EL Birch and S Wachter (eds), *Women's Health and the World's Cities*, University of Pennsylvania Press, Philadelphia, PA

Birch, E and Wachter, S 2006, *Rebuilding Urban Places After Disaster: Lessons from Katrina*, University of Pennsylvania Press, Philadelphia, PA

Bolin, R 1976, 'Family Recovery From Natural Disaster: A Preliminary Model', *Mass Emergencies*, vol.1, no.4, pp.267–277

Bolin, RC and Bolton, P 1986, *Race, Religion, and Ethnicity in Disaster Recovery*, University of Colorado Institute of Behavioral Science, Boulder, CO

Bolin, R and Stanford, L 1991, 'Shelter, housing and recovery: a comparison of US disasters', *Disasters*, vol.15, no.1, pp.24-34

Bollin, C, and Khanna, S 2007, *Review of Post Disaster Recovery Needs Assessment and Methodologies: Experiences from Asia and Latin America,* Report, United Nations Development Programme

Brookings Institute 2009, 'New Orleans Index, July 2009', **www.brookings.edu/reports/2007/08neworleansindex.aspx**

Bushfire CRC 2009, *February 7 2009 Fires. Research Findings – Final Report*, Post-fire Research Taskforce, Melbourne, Victoria

Buxton, M, Haynes, R, Lechner, A and Butt, A 2009, *Submission to Bushfires Royal Commission*, Melbourne, June

Campanella, TJ 2006, 'Urban Resilience and the Recovery of New Orleans', *Journal of the American Planning Association,* vol.72, no.2, pp.141–146

Centers for Disease Control and Prevention (CDC) 2008a, *Interim Findings on Formaldehyde Levels in FEMA-Supplied Travel Trailers, Park Models, and Mobile Homes*, CDC, Atlanta, GA

Centers for Disease Control and Prevention (CDC) 2008b, *Final Report on Formaldehyde Levels in FEMA-Supplied Travel Trailers, Park Models, and Mobile Homes*, CDC, Atlanta, GA

Centers for Disease Control and Prevention/Federal Emergency Management Agency (CDC/FEMA) undated, *Formaldehyde Levels in FEMA-Supplied Trailers: Early Findings from the Centers for Disease Control and Prevention*, CDC/FEMA, Atlanta, GA and Washington, DC

Centre for Research on the Epidemiology of Disasters 2008, 'Turkey country profile—Emergency events database (EM-DAT)', retrieved July 28, 2011, **www.emdat.be/country-profile**

Charles, J 2010, 'For many in Haiti, there's nowhere to call home', *Miami Herald*, March 4

Chen, K and McAneney, J 2004, 'Quantifying bushfire penetration in urban areas in Australia', *Geophysical Research Letters,* vol. 31, L12212

Clinton, WJ 2006, *Lessons Learned from Tsunami Recovery: Key Propositions for Building Back Better*, United Nations Secretary-General's Special Envoy for Tsunami Recovery, United Nations, New York

Clode, D 2009, *A Future in Flames*, Melbourne University Press, Melbourne, Vic

Council of Australian Governments 2004, *Report of the National Inquiry on Bushfire Mitigation and Management*, Canberra, ACT

Commonwealth Scientific and Industrial Research Organisation 2007, *Climate Change in Australia*, Technical Report, Aspendale, Vic

Cutter, SL, Barnes, L, Berry, M and Burton, C 2008, 'A Place-Based Model for Understanding Community Resilience to Natural Disasters', *Global Environmental Change*, vol.18, no.4, pp.598–606

Cutter, SL, Boruff, JB, and Shirley, WL 2003, 'Social Vulnerability to Environmental Hazards', *Social Science Quarterly*, vol.84, no.2, pp242–261

Cutter, SL, Emrich, CT, Mitchell, JT, Boruff, BJ, Gall, M, Schmidlein, MC, Burton, CG and Melton, G, 2006, 'The Long Road Home: Race, Class, and Recovery from Hurricane Katrina', *Environment*, vol.48, no.2, pp.8–20

Davis, D 2003, 'From welfare benefit to capitalized asset: the re-commodification of residential space in urban China' in R Forrest and L Lee (eds) *Housing and Social Change*, Routledge, London, UK, pp.183–198

Davis, I 1979, *Shelter After Disaster*, Oxford Polytechnic Press, Oxford, UK

De Sherbinin, A, Schiller, A and Pulsiper, A 2007, 'The Vulnerability of Global Cities to Climate Hazards' *Environment and Urbanization*, vol.19, no.1, pp.39-64

Donner, WR 2008, 'Decision Making as Community Adaptation: A Case Study of Emergency Managers in Oklahoma', *Disasters*, vol.32, no.2, pp.292–302

Dynes, RR 2006, 'Social Capital: Dealing with Community Emergencies', Disaster Research Center at University of Delaware, **www.hsaj.org/?article=2.2.5**

Enarson, E 1999, 'Women and Housing Issues in Two US Disasters: Case Studies from Hurricane Andrew and the Red River Valley Flood', *International Journal of Mass Emergencies and Disasters*, vol.17, no.1, pp.39-63

Federal Emergency Management Agency (FEMA) undated, *Important Information for Travel Trailer Occupants*, FEMA, Washington, DC

Federal Emergency Management Agency (FEMA) 2008a, *FEMA's Ongoing Response to Formaldehyde*, FEMA, Washington, DC

Federal Emergency Management Agency (FEMA) 2008b, *Formaldehyde Timeline*, FEMA, Washington, DC

Fengler, W, Ihsan, A and Kaiser, K 2008, 'Managing Post-Disaster Reconstruction Finance: International Experience in Public Financial Management', Policy Research Working Paper 4475, The World Bank, Washington, DC

Forrest, R and Hirayama, Y 2009, 'The uneven impact of neoliberalism on housing opportunities', *International Journal of Urban and Regional Research*, vol.33, no.4, pp.998–1013

Fountain, H 2010, 'Flawed Building Likely a Big Element', *New York Times*, 13 January, **www.nytimes.com/2010/01/14/world/americas/14construction.html**

Frey, WH and Singer, A 2006, *Katrina and Rita Impacts on Gulf Coast Populations: First Census Findings*, Brookings Institution, Washington, DC

Gelling, P 2009, 'Bumpy Journey to Rebuild Aceh after Tsunami', *New York Times*, 25 December, www.nytimes.com/2009/12/26/world/asia/26iht-tsunami.html?pagewanted=all

Gilles, J 2010, 'In Weather Chaos, A Case for Global Warming', *New York Times*, August 15, pp.1, 14

Goering, J, Stebbins, H and Siewert, M 1995, *Report to Congress: Promoting housing choice in HUD's rental assistance programs*, HUD-PDR-1543, U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Washington, DC

Good Jobs New York 2004, *Reconstruction Watch*, Good Jobs New York, New York, NY

Gruntfest, E 1995, 'Long Term Social and Economic Impacts of Extreme Floods', Report, November 1995, **www.engr.colostate.edu/~jsalas/us-italy/papers/34gruntfest.pdf**

Haas, JE, Kates, RW and Bowden, MJ 1977, *Reconstruction Following Disaster*, MIT Press, Cambridge, MA

Hajer, MA 2005, 'Rebuilding Ground Zero. The Politics of Performance', *Planning Theory & Practice*, vol.6, no.4, pp.445–465

Hirayama, Y 2007, 'Reshaping the housing system: Homeownership as a catalyst for social transformation' in Y Hirayama and R Ronald (eds), *Housing and Social Transition in Japan*, Routledge, London, pp.15–46.

Huang, Y and Jiang, L 2009, 'Housing inequality in transitional Beijing', *International Journal of Urban and Regional Research*, vol.33, no.4, pp.936–956.

Hug, S, Kovats, S, Reid, H, and Sattherwaite, D 2007, 'Editorial: Reducing the Risks to Cities from Disasters and Climate Change', *Environment and Urbanization*, vol.19, no.1, pp. 3-15

Hughes, R and Mercer, D 2009, 'Planning to Reduce Risk: The Wildfire Management Overlay in Victoria, Australia', *Geographical Research*, vol.47, no2, pp.124-141

Hyogo Prefecture Government 2003, *Community Survey of Post Disaster Public Housing*, Hyogo Prefecture Government, Hyogo, Japan

International Federation of Red Cross and Red Crescent Societies 2009, *Aceh Rises Again: How the Red Cross & Red Crescent Helped Provide the Keys to a New Future,* IFRC, Geneva

Jernelöv, A 2010, 'How to defend against future oil spills', *Nature*, vol.466, no.7303, pp.182-183

Kosareva, N and Struyk, R 1993, 'Housing privatization in the Russian Federation', *Housing Policy Debate*, vol.4, no.1, pp.81–100

Kreimer, A, Arnold, M and Carlin, A 2003, 'The Behavior of Retrofitted Buildings During Earthquakes: New Technologies' in *Building Safer Cities: The Future of Disaster Risk*, World Bank, Washington, DC, pp.293–299

Leeson, PT and Sobel, RS 2007, 'The Use of Knowledge in Natural-Disaster Relief Management', *Independent Review*, vol.11, no.4, pp.519-532

Leitmann, J 2007, 'Cities and Calamities: Learning from Post-disaster Response in Indonesia', *Journal of Urban Health*, vol.84, Supp., pp.144-156

Lloyd-Jones, T 2006, *Mind the Gap! Post-Disaster Reconstruction and the Transition from Humanitarian Relief*, RICS, London, UK

Lower Manhattan Development Corporation (LMDC) 2007, *World Trade Center Memorial and Cultural Program General Project Plan*, LMDC, New York, NY

Lucas, C 2009, *Climate Change Impacts on Fire Weather*, Centre for Australian Weather and Climate Research, Melbourne, Vic

Maddalena, RL, Russell, M, Sullivan, DP and Apte, MG 2008, *Interim Report: VOC and Aldehyde Emissions in Four FEMA Temporary Housing Units,* Lawrence Berkeley National Laboratory, Berkeley, CA

Masood, S and Drew, K 2010, 'Warnings of More Floods Add to Pakistani's Misery', *New York Times*, 13 August, p.A6

McCullough, D 1987, *The Johnson Flood,* Simon & Schuster, New York, NY

McGranahan, G, Balk, D and Anderson, B 2007, 'The Rising Tide: Assessing the Risks of Climate Change and Human Settlements in Low Elevation Coastal Zones', *Environment and Urbanization*, vol.19, no.1, pp.17-37

McLeod, R 2003, *Inquiry into the Operational Response to the January 2003 Bushfires in the ACT*, ACT Government, Canberra, ACT

Meleis, A, Birch, E and Wachter, S 2011, *Women's Health and the World's Cities*, University of Pennsylvania Press, Philadelphia, PA

Meissner, A, Luckenbach, T, Risse, T, Kirste, T, and Kirchner, H 2002, 'Design Challenges for an Integrated Disaster Management Communication and Information System', Paper presented at The First IEEE Workshop on Disaster Recovery Networks (DIREN 2002), New York City, June 24

Moritz, MA, Moody, TJ, Krawchuk, MA, Hughes, M and Hall, A 2010, 'Spatial variation in extreme winds predicts large wildfire locations in chaparral ecosystems', *Geophysical Research Letters*, vol.37, L04801

Morrow, BH 1997, 'Stretching the Bonds: The Families of Andrew', in WG Peacock, BH Morrow and H Gladwin (eds), *Hurricane Andrew: Ethnicity, Gender and the Sociology of Disaster*, Routledge, London, UK, pp.141-170

Murie, A 2009, 'The modernization of housing in England', *Tijdschrift voor Economische en*

Sociale Geografie, vol.100, no.4, pp.535–548

Nakagawa, Y, and Shaw, R 2004, 'Social Capital: A Missing Link to Disaster Recovery', *International Journal of Mass Emergencies and Disasters*, vol.22, no.1, pp.5–34

Nas, PJM 2003, 'Ethnic identity in urban architecture: Generations of architects in Banda Aceh' in R Schefold, G Domenig and P Nas (eds), *Indonesian Houses*, vol. 1, KITLV Press, Leiden, The Netherlands

Nigg, JM, Barnshaw, J, and Torres, MR 2006, 'Hurricane Katrina and the Flooding of New Orleans: Emergent Issues in Sheltering and Temporary Housing', *Annals of the American Academy of Political and Social Science*, vol.604, no.1, pp.113–128

Nigg, JM (ed) 1998, *The Loma Prieta, California, Earthquake of October 17, 1989—Recovery, Mitigation and Reconstruction,* US Geological Survey, Washington, DC

Office for the Coordination of Humanitarian Affairs (OCHA) 2006, *Exploring key changes and developments in post-disaster settlement, shelter and housing, 1982-2006*, No. OCHA/ESB/2006/6, http://sheltercentre.org/library/exploring-key-changes-and-developments-post-disaster-settlement-shelter-and-housing-1982-200

Oliver, P and Yasemin, A 1987, *Housing and culture after earthquakes: A guide for future policy making on housing in seismic areas*, Oxford Polytechnic, Oxford, UK

Oliver-Smith, A (ed) 2009, *Development and dispossession: The crises of forced displacement and resettlement*, School for Advanced Research Press, Santa Fe, NM

Oliver-Smith, A 1991, 'Successes and failures in post-disaster resettlement', *Disasters*, vol.15, no.1, pp.12-23

Oliver-Smith, A 1990, 'Post-disaster housing reconstruction and social inequality: A challenge to policy and practice', *Disasters*, vol.14, no.1, pp.7-19

Olivier, J and Peters, J 2010, *Total CO_2 Emissions in 2009,* Netherlands Environmental Assessment Agency, Bilthoven, the Netherlands

Olshansky, RB, and Johnson, LA 2010, *Clear as Mud: Planning for the Rebuilding of New Orleans*, APA Planners Press, Chicago, IL

O'Quinn, J 1987, 'Touching Greatness: Aspect of star worship', Paper presented at the annual meeting of the American Psychological Association, Boston, May 3–6

Padget, T 2010, 'Chile and Haiti: A Tale of Two Earthquakes', *Time Magazine*, March 1, **www.time.com/time/printout/0,8816,1968576,00.html**

Pathirage, C and Thurairajah, N 2009, *Inspiring Sri Lankan Renewal and Development*, RICS, London, UK

Peacock, WG, Morrow, B and Gladwin, H 1997, *Hurricane Andrew: Gender, Ethnicity and the Sociology of Disasters*, Routledge, London, UK

Perry, RW and Lindell, MK 2007, *Emergency Planning*, John Wiley, Hoboken, NJ

Peterson, D 2002, 'Suburbs now awash in fees', *Minneapolis Star Tribune*, November 26, p.1a

Phillips, BD 1993, 'Cultural Diversity in Disasters: Sheltering, Housing, and Long-Term Recovery', *International Journal of Mass Emergencies and Disasters*, vol.11, no.1, pp.99-110

Phillips, BD 1998, 'Sheltering and Housing of Low-Income and Minority Groups in Santa Cruz County after the Loma Prieta Earthquake' in JM Nigg (ed), *The Loma Prieta, California, Earthquake of October 17, 1989—Recovery, Mitigation and Reconstruction*, U.S. Geological Survey, Washington, DC, pp.17-28

Pollard, A 2010, 'Power in Doubt: Aid, Effectiveness and Harmonization Amongst Donors in Indonesia', doctoral dissertation, University of Cambridge, UK

Prime Minister's Office–Crisis Management Center (PMO-CMC) 2000, *Depremler 1999*, PMO-CMC, Ankara, Turkey

Quarantelli, EL 2005, *The disaster recovery process: What we know and do not know from research*, Disaster Research Center, University of Delaware, Newark, DL

Rodriguez, H and Aguirre, BE 2006, 'Hurricane Katrina and the Healthcare Infrastructure: A Focus on Disaster Preparedness, Response, and Resiliency', *Frontiers of Health Services Management*, vol.23, no.1, pp.13–23

Ross, S, and Yinger, J 1999, 'Sorting and voting: A review of the literature on public finance', in P Cheshire and ES Mills (eds), *Handbook of regional and urban economics,* vol. 3, North Holland, Amsterdam

Schilderman, T 2004, 'Adapting traditional shelter for disaster mitigation and reconstruction: Experiences with community-based approaches', *Building Research and Information*, vol.32, no.5, pp.414–426

Siembieda, W 2002, *Choosing a Paradigm for Disaster Recovery,* Center for Disaster and Humanitarian Assistance*,* University of South Florida, Tampa Bay, FL

Souza, K 2008, 'Declaration of Kevin Souza, 14 May 2008', In Re: FEMA Trailer Formaldehyde Products Liability Litigation, U.S. District Court, Eastern District of Louisiana

Teague, B, McLeod, R and Pascoe, S 2009, *2009 Victorian Bushfires Royal Commission*, *Interim Report*, Parliament of Victoria, Melbourne, Vic

Telford, J 2004, 'Learning Lessons from Disaster Recovery: The Case of Honduras', Disaster Risk Management Working Paper Series No. 8, The World Bank, Washington, DC

Tobin, GA, Bell, HM, Whiteford, LM and Montz, BE 2006, 'Vulnerability of Displaced Persons: Relocation Park Residents in the Wake of Hurricane Charley', *International Journal of Mass Emergencies and Disasters*, vol.24, no.1, pp.77–109

United Nations Development Program, *UNDP and the Indian Ocean Tsunami Recovery Post Disaster Recovery: Main Characteristics*, **www.undp.org/cpr/disred/documents/tsunami/prbriefing/maincharact.pdf**

UN-HABITAT 2010, *State of the World's Cities 2010-2011*, Nairobi

US Department of Commerce 1997a, *County government finances*, Bureau of the Census, Washington, DC

US Department of Commerce 1997b, S*tate government finances*, Bureau of the Census, Washington, DC

Waugh, W and Tierney, K 2007, *Emergency Management, Principles and Practice for Local Government,* Second Edition, ICMA Press, Washington, DC

Wolff, EN 1998, 'Distributional consequences of a national land value tax on real property in the United States' in D Netzer (ed), *Land value taxation: Can it and will it work today?*, Lincoln Institute of Land Policy, Cambridge, MA

World Bank 1999, *Project appraisal document on a proposed loan in the amount of US$505 million to the Republic of Turkey for Marmara Earthquake Emergency Reconstruction Project*, The World Bank, Washington, DC

World Bank 2010a, 'Managing Post-Disaster Aid', Haiti Earthquake Reconstruction Note, GET-DRM Team with GFDRR

World Bank 2010b, 'Managing the Recovery', Haiti Earthquake Reconstruction Note, GET-DRM Team with GFDRR

Yaoxian, Y 2002, 'Chinese Experience with Post-Natural Disaster Reconstruction', China Architectural Design and Research Group,
www.grif.umontreal.ca/pages/i-rec%20papers/ye%20yaoxian.pdf

Yelvington, KA 1997, 'Coping in a Temporary Way: The Tent Cities', in WG Peacock, BH Morrow and H Gladwin (eds), *Hurricane Andrew: Ethnicity, Gender and the Sociology of Disaste*r, Routledge, London, UK, pp.92-115

USEFUL WEBSITES

- Asia Disaster Preparedness Center (**www.adpc.net**)
- Center for International Disaster Information (**www.cidi.org**)
- Center for Reconstruction and Development (**www.rec-dev.com**)
- Crisis Commons (**www.crisiscommons.org**)
- International Crisis Group (**www.crisisgroup.org**)
- Disaster Relief (**www.disaster-relief.org**)
- Disaster Resource Network (**www.disaster-resource.com**)
- Disaster Response Network (**www.apa.org/practice/programs/drn/index.aspx**)
- Global Facility for Disaster Reduction and Recovery (**www.gfdrr.org**)
- Inter-Action (**www.interaction.org/disaster-response**)
- International Federation of Red Cross and Red Crescent Societies (**www.ifrc.org/what/dp/mitigate.asp**)
- Natural Hazards Center (**www.colorado.edu/hazard**s)
- Open Street Map (**www.openstreetmap.org**)
- PAHO Program on Emergency Preparedness (**www.paho.org/english/PED**)
- ProVention Consortium (**www.ifrc.org/en/what-we-do/disaster-management/**)
- Random Hacks of Kindness (**www.rhok.org**)
- Relief Web (**www.reliefweb.int**)
- UN International Strategy for Disaster Reduction (**www.unisdr.org**)
- UNDP Bureau for Crisis Prevention and Recovery (**www.undp.org**)
- Ushahidi (**www.ushahidi.org**)
- World Bank (**www.worldbank.org**)