Disaster Recovery Annotated Bibliography - Mitigation

This document was developed to provide information on the state of knowledge on disaster recovery. This document includes a list of articles collected in the Fall of 2018. To obtain relevant articles, a list of keywords was used to search Google Scholar and University Library Databases. These keywords were: “community disaster recovery”, disaster recovery”, “post recovery planning” “pre disaster planning”, and “national planning recovery”. An additional search of academic journals that are related to the planning field was then undertaken to ensure that articles from these journals were not overlooked. These journals included: Journal of the American Planning Association, Journal of Planning Education and Research, Applied Geography, Land Use Policy, Environment and Planning A, Planning Theory, Progress in Planning. After collecting articles, each article was then systematically reviewed to ensure relevance. The articles needed to address community level recovery (including issues related to housing, economic, infrastructure, planning, etc.) or note issues that affect recovery outcomes (e.g., differences in housing outcomes for rental versus owned housing). Next, we reviewed the reference list of identified articles to determine if any articles had been missed in the initial collection process. If there were additional articles that were missed, we collected the information and searched for the title of the article. After processing each article, the articles were then compiled into the Zotero software.

The Zotero bibliographic database is open to the public to view at: https://www.zotero.org/groups/2278263/recoveryguidancetamu/items

Mitigation

Articles that discuss the role of hazard mitigation (i.e., long-term activities and projects that reduce disaster impacts) in disaster recovery.


Problem, research strategy, and findings: Resilience has become an important planning goal for state and local government, providing a policy arena in which to integrate historic preservation and disaster mitigation, but significant questions remain about that relationship. There has been no study of coordination between preservation and hazard mitigation planning at the state level, and there is no widely available methodology for assessing the flood exposure of historic resources. In this study, we use mixed methods to address these two issues. We evaluate the degree to which state historic preservation plans and state hazard mitigation plans reflect an effort to connect planning processes or goals. We then use the states of Kentucky, Florida, and Colorado to assess the suitability of publicly available spatial data for identifying flood-exposed historic resources, paying special attention to the National Park Service’s Certified Local Government (CLG) program and the National Trust’s Main Street program. We find that historic preservation and disaster planning are unevenly integrated at the state level. While publicly available data are often effective in identifying historic resources located within floodplains, the
usefulness of these data vary based on location and resource type. We find that CLG and Main Street communities may be well positioned to take a leadership role in planning for the protection of historic resources from floods.


Problem: Even if significant reductions in global greenhouse gas emissions are achieved, some amount of climate change appears to be inevitable. Local, regional, state, and federal planning and regulation should begin to address how to adapt to these changes. Purpose: This article presents a policy synthesis of adaptation planning issues, using California as a case study. We examine the institutional and regulatory challenges and tradeoffs that climate change poses in six particularly vulnerable areas: water resources, electricity, coastal resources, air quality, public health, and ecosystem resources. We discuss obstacles to adaptation planning and successes overcoming these barriers, and suggest how planning can incorporate adaptation. Methods: This article presents a policy synthesis of adaptation planning issues, drawing on our recent research on California’s experience and related literature. We summarize the results of six studies that draw on quantitative and qualitative information gathered through surveys, interviews, and literature review. Results and conclusions: Planners should use forward-looking climate data that include higher water and air temperatures, sea-level rise, and increased numbers of extreme events like heat waves, floods, and wildfires when making decisions about future development, infrastructure investments, open-space protection, and disaster preparedness. Climate change will exacerbate conflicts between goals for economic development, habitat protection, and public safety, requiring stronger interagency coordination and new laws and regulations. Takeaway for practice: Local and regional planners can help society adapt to a changing climate by using the best available science, deciding on goals and early actions, locating relevant partners, identifying and eliminating regulatory barriers, and encouraging the introduction of new state mandates and guidelines.


Problem, research strategy, and findings: Land use planning is key to mitigating natural hazards and the effects of climate change. Communities adopt multiple plans that directly and indirectly address hazard mitigation; the integration of local plans can significantly affect future community vulnerability to hazards. We develop a resilience scorecard to assess the degree to which the network of local plans targets areas most prone to hazards and then evaluate the coordination of local plans and test it in Washington (NC), a community vulnerable to coastal floods and projected sea-level rise. We find that local plans are not fully consistent and do not always address the areas in a community most vulnerable to floods or sea level risks; moreover, some plans actually increase physical and social vulnerability to hazards. While these results indicate the validity of a resiliency scorecard, we were forced to use a narrow range of vulnerability indicators; better data would improve the process. Takeaway for practice: Planners can assume a crucial role in improving planning for hazards by using the scorecard to identify conflicts among local plans, assessing whether local plans target areas most vulnerable to specific hazards. Planners can inform the public and decision makers about missed opportunities to improve local hazard mitigation planning. To support such important efforts, the U.S. Federal Emergency Management Agency
and other federal agencies should consider developing additional databases that are widely applicable and available.


State policy designed to stimulate reluctant local governments to take risk reduction actions has mixed results. Incentive and collaborative policies meet with considerable variation in local responses. Direct state regulatory policy is effective in especially high risk areas, but has limited geographic coverage. Planning mandates induce widespread local response to natural hazards, but local implementation varies considerably, with differences in the effects of mandated design features. The article suggests that different regulatory and incentive policy mixes be used to entice local involvement. Policy mixes should be adapted to the differences in local governments’ commitment and technical capabilities.


Prompt and efficient responses against natural hazards are needed to build cities capable of withstanding disasters, namely resilient cities. This study aims at presenting and testing synthetic resilience indices over a real urban center threatened by multiple hazards, for which a global overview of city performance is requested. An integrated framework is proposed for quantitative resilience assessment by way of time-independent synthetic indices. The approach proposed is in accordance to the complex network theory and uses a global indicator of the system connectivity to assess the city functioning also in case of network disruption. Resilience is evaluated as a proxy for systemic urban damage by modeling a city ecosystem as a hybrid social-physical network. Seismic and landslide scenario analyses are performed for the city of Sarno, Italy. A probability-based approach is used to compute urban vulnerability. Subsequently, to highlight changes in results according to the type of disaster, a recovery strategy is simulated to assess efficiency and damage states in each recovery stage, and urban resilience.


Problem, research strategy, and findings: Stakeholder participation facilitates efficient identification of recovery needs, dynamic exchange of information, and consolidation of diverse perspectives as well as builds long-term trust and social capital between stakeholders. Yet, planners often fail to use the full potential of participatory planning when they are caught in the fast-paced, uncertain, and complex post-disaster environment. We draw lessons from case studies on recovery planning after three major disasters: the Indian Ocean tsunami (2004), Hurricane Katrina (2005), and the Wenchuan earthquake (2008) in China. We collected qualitative data about participatory planning using key informant interviews with stakeholders, supplemented by field observations, records of planning meetings, and government documents. We find that stakeholder participation in disaster recovery planning can happen in nontraditional yet effective ways, including indirect representation and active opposition. Disasters can rebalance power relationships and create more opportunities for participation by marginalized groups. Stakeholders’ participatory behaviors evolve over the course of recovery due to shifting priorities, intensified resource competition, and the difficulty of using “normal” participatory mechanisms. Takeaway for practice: Stakeholder participation, a time-consuming process, can actually speed up
recovery in the long run. Planners must critically examine the local community’s social and power structures, identify potential for nontraditional participation, tap into networks of indirect representation, and adapt to the changing landscape of actors and local interests to contend with the challenges of participation in disaster recovery and make use of new opportunities as they arise.


This report addresses the strengths and weaknesses of the Federal Emergency Management Agency’s management of the hazard mitigation component of the Public Assistance Program within the Gulf Coast states impacted by hurricanes Katrina and Rita in 2005. It is based on interviews with Federal Emergency Management Agency, grantee, and subgrantee employees and officials; direct observations; and a review of applicable documents. The recommendations herein have been developed to the best knowledge available to our office, and have been discussed in draft with those responsible for implementation. We trust this report will result in more effective, efficient, and economical operations. We express our appreciation to all of those who contributed to the preparation of this report.


The purpose of this document is to provide a resource that communities can use to identify and evaluate a range of potential mitigation actions for reducing risk to natural hazards and disasters. The focus of this document is mitigation, which is action taken to reduce or eliminate long-term risk to hazards. Mitigation is different from preparedness, which is action taken to improve emergency response or operational preparedness.


Problem, research strategy, and findings: Conventional hazard mitigation and pre-disaster recovery planning processes typically begin with hazard scenarios that illustrate probable events and analyze their impacts on the built environment. The processes conclude with responses to the hypothetical disruption that focus on “hardening” buildings or structures or removing them from threatened areas. These approaches understate the importance of natural and social sources of adaptive capacity. Three “proof-of-principle” exercises designed to strengthen the Federal Emergency Management Agency (FEMA)’s Risk MAP (Risk Mapping, Assessment, and Planning) process in Washington State suggest how better to conduct hazard mitigation and recovery planning. Each begins with workshops where stakeholders identify built, natural, and social assets that contribute to human wellbeing (HWB) before introducing earthquake scenarios that affect HWB. Participants then identify assets that could facilitate adaptation to changed circumstances (a “new normal”). Participants discuss how these assets would achieve the goals of comprehensive community planning as well as hazard mitigation and recovery from disaster. Neighborhood-scale social organization emerges as an important priority. Takeaway for practice:
Asset-based approaches enable communities to better recover from disaster and adapt to a post-disaster “new normal.” By premising planning discussions on a more holistic set of assets, communities can balance physical recovery goals with qualities that help them to adapt to future change. Furthermore, thinking about recovering before an event actually occurs can enlarge the menu of mitigation strategies. Planning for adaptation can also help communities achieve many non-risk-related objectives.


As people cluster on the coast in increasing numbers, coastal populations become more vulnerable to severe damage from catastrophic coastal storms. The authors contend that current public policy has proved unable to cope with the growing problem, and in response they present a comprehensive analysis of coastal storm hazards, standard policy approaches, and promising new means of managing coastal growth. Catastrophic Coastal Storms offers a solution to the policy problem by proposing a merger of hazard mitigation with development management, basing this on extensive surveys of at-risk coastal locations and case studies of post-hurricane recovery. Starting with the local level of government and proceeding to state and federal levels, the authors propose a strategy for overcoming the formidable obstacles to safeguarding the shoreline population and its structures from hurricanes and other severe storms.


Disaster recovery involves a delicate balance between mitigating risks posed by future hazards and acquiescing to the desire of the community to return to normal. Even the best plans and policies put forth under such conditions often do not address all factors that are critical for successful recovery. If there are no plans, it becomes much more difficult to assess a community’s recovery progress over time. In communities lacking robust planning capacity, metrics that characterize a community’s baseline and post-disaster status may serve as a roadmap to inform the best use of limited resources and focus energy and attention where it is most needed. To assist with this, a disaster recovery tracking tool comprised of 79 metrics was developed and tested to determine if it could be used to characterize recovery progress, identify problems with recovery, and support proactive recovery planning to improve future recovery and resilience.


Disasters impact communities and individuals and disrupt social-technical systems and community functions. Consequences of disasters can be minimized if communities and people reduce their vulnerabilities and increase their resilience. Disaster response received significant attention from the
researchers and practitioners alike. In a sense it is easy to study short term disaster response. Investment in immediate disaster response also makes sense for policy makers. Unfortunately research on disaster recovery is very limited and it is considered the ignored phase of emergency management and existing knowledge and applied research of this phase is seriously lagging behind compared to what is required today. Disaster recovery is usually perceived and understood as a slow phase that begins after critical decisions and needs are met after a disaster. There is also a perceived notion that the government agencies at all levels have committed resources more to disaster response and relief efforts and less to recovery (and mitigation) efforts. Thus it is important to pay heed to this crucial phase of managing disasters. Recovery is a long process that offers ample opportunity to rebuild and redevelop resilient and sustainable communities. The chapter highlights that a shared effort to redevelop, restore, and rebuild a community requires effective intergovernmental and cross-sector collaboration and cooperation. Recent recovery experiences in the US, especially post-Katrina, have shown a considerable lack of coordination between different government agencies as well as political conflicts in planning and executing recovery efforts. The complex nature of recovery planning and efforts requires pre-disaster and post-disaster collaboration between different stakeholders including private, public, nonprofit organizations and citizens. This chapter focuses on collaborative governance principles applied to disaster recovery using the recent National Disaster Recovery Framework (NDRF) in the U.S. as an example. The development of NDRF is also included briefly in the chapter. This chapter is important to gauge the usefulness of a national level recovery framework. This framework may assist in altering the general perception about the Federal government’s lack of effort and planning towards disaster recovery.


This is the second of two special issues in Progress in Planning exploring emerging research agendas in planning. It brings together scholars from diverse schools working on new areas of research and application in urban design and planning. Emergent research agendas include both novel areas of research and important shifts in the direction of a research area. The challenge for planning schools is to reflect critically on these changes and develop long-term research agendas that can better position our field in society and academia, and provide a basis from which to assess our academic programmes. The chapters in this issue display the different scales and fields of planning, including planning for: disaster recovery; climate change, especially opportunities for mitigation; shrinking cities in the First World; and rapidly urbanising informal and impoverished cities in the global South. At the same time, the chapters identify research areas that respond to major social and environmental changes. Olshansky and Chang highlight the increasing losses from catastrophic disasters, and address the need for disaster recovery planning. Wheeler, Randolph and London focus on climate change, and, noting the urgency of action now, their research agenda emphasises opportunities for planners to develop research and policies to reduce greenhouse gas emissions. Hollander, Pallagst, Schwarz and Popper look at increasing economic and population trends in many First World cities that result in city ‘shrinkage’. They present new opportunities for improving cities’ green space networks and natural features, and for research. The trebling of urban population in African cities by 2050, in conditions of poverty and informality, is the major trend driving Parnell, Pietriese and Watson’s chapter. They present an agenda for new planning theories and for supporting empirical research to address the actual conditions of African cities.
The study described in this report focuses on developing an educational tool for illustrating concepts of community recovery, and identifying data collection and research needs for more refined recovery models in the future. A conceptual framework of disaster recovery, guided by insights from the empirical literature, is introduced. The resulting model focuses on simulating recovery processes, rather than on estimating dollar losses. It emphasizes the dynamic or temporal processes of recovery; simulates impacts at the individual agent level of analysis; relates recovery across business, household, and lifeline infrastructure sectors; relates recovery across individual, neighborhood, and community scales of analysis; highlights the key role of lifeline systems in recovery; and is designed to explore the complex consequences of mitigation, planning, and policy decisions. The model was applied to both a hypothetical community and to an area affected by a real earthquake, Kobe, Japan, and it was able to replicate broad trends from the disaster. The next step in this research is to formalize the insights obtained in the development and application of this model as recommendations for future research and development.


This paper sets out the foundations for developing robust models of community recovery from earthquake disasters. Models that anticipate post-disaster trajectories are complementary to loss estimation models that predict damage and loss. Such models can serve as important decision support tools for increasing community resilience and reducing disaster vulnerability. The paper first presents a comprehensive conceptual model of recovery. The conceptual model enumerates important relationships between a community’s households, businesses, lifeline networks, and neighborhoods. The conceptual model can be operationalized to create a numerical model of recovery. To demonstrate this, we present a prototype computer simulation model and graphical user interface. As the model is intended for decision support, it is important to involve potential users in model development. We conducted a focus group involving Puget Sound, Washington, area disaster management practitioners to elicit local insight about community recovery and model development needs, using the prototype as stimulus. Important focus group issues included potential model inputs, useful recovery indicators, potential uses of recovery models, and suitable types of software systems.


One could argue that the nature of our housing stock is a key determining factor in the ability of our citizens to manage risk, be resilient to various natural and human events, and to recover from these events. Recent research has been examining current challenges posed by our housing stock and exploring potential solutions from a range of perspectives. The aim of this paper is to discuss key findings from recent built environment research in Australia to initiate cross-sectorial discussion and debate about the implications and opportunities for other sectors such as emergency management and insurance.

In recent years earthquakes and their secondary hazards have claimed the largest number of lives of all large natural disasters. Some of the world’s most earthquake-prone zones are also areas of high population density. The impact is magnified by vulnerability factors including non-enforcement of building codes, knowledge gaps, urban poverty and poor governance capacity to manage and reduce earthquake risks. Poor security of land tenure and property rights increases the vulnerability of people and affects their ability to respond to natural disasters. Earthquake recovery and reconstruction provides very significant challenges for land agencies, with these challenges differing from one country to the next due to differences in the local context. Drawing on contrasting case studies in Haiti, Nepal and New Zealand this paper identifies the common post-earthquake land administration functions and challenges that may apply to many contexts. These lessons provide land agencies and other key stakeholders with a summary of the challenges an earthquake poses for land administration at different post-disaster stages. We also discuss the policy and regulatory, institutional, operational and preparedness lessons for land administration. From these lessons we propose a framework for evaluating the earthquake-responsiveness of a land administration system. This framework can be used by a land agency in an earthquake prone region, or where an earthquake has recently occurred, to assess what challenges to land administration might occur in the event of an earthquake, and the preparedness of their land administration system.


Planners have long believed as an article of faith that land use planning can reduce damage from natural hazards. After evaluating the relationship between the seismic safety elements of comprehensive plans prepared in the Los Angeles region of California and damage caused by the 1994 North-ridge earthquake, we provide evidence that this faith is not misplaced. The State of California requires every local government to include a seismic safety element in its comprehensive land use plan. The 1994 Northridge earthquake provided an opportunity to evaluate the extent to which the quality of state-mandated, locally prepared seismic safety elements reduce earthquake damage. We found that fewer homes were damaged when local governments had developed high-quality factual bases, formulated goals for improving seismic safety, crafted regulatory policies to manage development in hazardous areas, and advanced policies that made the public aware of seismic risks. We conclude that including a high-quality seismic safety element in land use plans can reduce property damage associated with seismic events. Our work has broad implications for land use planning.


Sustainable redevelopment following disasters has been a main policy objective of post-disaster recovery efforts over the past few decades. Yet, nine years after the 1999 Marmara earthquake in Turkey, the redevelopment of risky housing areas is still a point of debate on the urban planning and disaster mitigation agenda. However, planning studies on mildly and moderately damaged areas located in the centre of Istanbul are ongoing. This article presents the evidence of a pilot project undertaken by Zeytinburnu Municipality, Istanbul, four years after the Marmara earthquake.(2) The aim is to generate a debate on the preconditions required for a sustainable urban regeneration approach in the post-disaster recovery phase. The results of the pilot project underline the importance of capacity building in sustaining social capital, strengthening the legal framework, restructuring planning regulations, and managing the
housing redevelopment process by taking advantage of a window of opportunity afforded by the disaster recovery period.


The focus of this article is on communities recovering from a major disaster, i.e., an event that is large and damaging enough to warrant receiving a presidential declaration.... The role of local officials in shaping the value dimensions of community recovery will be described.


The need to consider disaster risk reduction at the time of recovery is well-recognized. Viable disaster risk reduction measures should resolve the root causes of predisaster vulnerabilities. Accordingly, we investigated the recovery from the impact of Cyclone Aila in Koyra Upazila, Bangladesh, which was severely damaged by this 2009 cyclone. Our research focused on understanding pre-Aila vulnerabilities to cyclone impact and examined the degree of inclusion of vulnerability reduction measures within the recovery process. A composite methodology that included an institutional survey, key informant interviews, collection of the judgment of experts, focus group discussions, and a score-based quantification technique was adopted. Through a process of understanding pre-Aila vulnerabilities, recognition of the root causes of these inherent weaknesses, and identification of appropriate measures for pre-Aila vulnerability reduction, a set of 23 indicators were selected to represent the most desirable vulnerability reduction measures to implement during recovery. A score-based technique was applied to measure the degree of inclusion of vulnerability reduction within the recovery with respect to the indicators. The scoring result shows that the degree of inclusion of vulnerability reduction within the recovery was poor. The result specifies that among the 23 indicators of potential vulnerability reduction measures, 10 are completely missing and the rest are only partially included. The overall findings imply that the Koyra community continues to live with a vulnerability similar to that of the pre-Aila period.


This book explains key lessons learned from diverse disaster situations and analyzes them within the framework of governance, education, and technology, providing a framework for disaster recovery as a development opportunity. In post-disaster situations, different types of resources are put into the affected region, varying according to technical, financial, intellectual, and community resources. If properly implemented, disaster recovery can change the context of risk-reduction approaches; if not, it can create additional hazards. In some countries, the post-disaster recovery process has even changed the socio-economic and political context of the affected region and country. The book has 21 chapters and is divided into four parts: governance and institutional issues (five chapters), education and learning issues (four chapters), technology and innovation issues (five chapters), and cross-cutting issues (five chapters). The final chapter provides an analysis of the key topics. The primary target groups for this book are students and researchers in the fields of environment, disaster risk reduction, and climate change studies. The book provides them with a good idea of the current research trends in the field and furnishes basic
knowledge about these vital topics. Another target group comprises practitioners and policy makers, who will be able to apply the knowledge collected here to policy and decision making.


Disaster recovery represents the least understood aspect of emergency management, from the standpoint of both the research community and practitioners (Berke, Kartez, & Wenger, 1993; Rubin, 1991). When compared to the other widely recognized phases of emergency management, that is, preparedness, response, and mitigation, scholars have yet to address fundamental questions, while practitioners have failed to establish an integrated policy framework or utilize readily available tools to improve disaster recovery outcomes (Berke et al., 1993; May and Williams, 1986; Miletí, 1999). Since the 1990s the concept of sustainability has been adopted by hazards researchers and applied to mitigation (Berke, 1995a; Burby, 1998; Godschalk, et. al., 1999; Miletí, 1999), recovery (Becker, 1994a; Berke, Kartez, & Wenger, 1993; Eadie et al., 2001; Oliver-Smith, 1990; Smith, 2004; United States Department of Energy, 1998), and to a lesser extent preparedness and response (Tierney, Lindell, & Perry, 2001). While recognized as a meaningful paradigm among scholars and a limited number of practitioners, achieving sustainable recovery following disasters is not a widespread phenomenon in the United States, owing in large part to the current recovery model in practice today. It is therefore the intent of this chapter to describe an improved policy implementation framework focused on achieving sustainable recovery. Emphasis is placed on the analysis of the United States model of recovery and the development of specific recommendations to improve the process. Key issues and research questions are identified in order to advance this agenda, including the need to develop a theory of recovery that emphasizes specific factors that facilitate or hinder this approach. Next, a review of the literature highlights the fact that while past research has addressed several recognized dimensions of sustainable recovery, the research has not been linked to a unifying theory that helps to clarify our understanding of how sustainable recovery can be achieved.