Chapter 8
Urban Vulnerability and Resiliency to Natural Disasters: An Integrative Tourism Planning Perspective
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Introduction

In an interesting insight, Buckle (2006, 88) noted that:

Resilience and vulnerability are central concepts in understanding the nature of disasters, their impacts, and consequences and methods of dealing with the potential for loss. However, neither concept has been exhaustively explored (despite a clear need for intellectual rigor and conceptual clarity), although much more attention has been given to vulnerability than to resilience.

As a central element of disaster research, this passage highlights the difficulty in assessing resilience and vulnerability given the complex and dynamic nature of human systems, communities, and societies. It is estimated that in the last 10 years, major natural disasters across the globe affected more than three billion people, killed over 750,000 people, and cost about US $600 billion in damages (Birkmann, 2006). These severe disasters have also influenced tourism and related business activity in affected areas (Pezzullo, 2009). Most notably tourism-dependent economies along coastal areas of the United States have confronted serious threats from hurricanes, coastal storms, and environmental catastrophes (Stone et al., 1997; Woosnam and Kim, 2014).

Given this level of human loss and property damage, it is safe to say that our communities could be made more resilient to natural disasters. Natural hazards can have overwhelming short- and long-term impacts on the natural and built environments, ultimately affecting local communities and their social and economic conditions. In this sense, it is worth addressing the concepts associated with a planning-relevant model of disaster outcomes that incorporate community vulnerability and resiliency.

Integrative tourism planning focuses on the ability to pro-actively interact with both supply and demand aspects associated with leisure-based migration (Hall, 2008; Marcouiller, 1997). This unique form of human migration reflects travel to and from destinations with particular leisure interests within two specific yet
distinct tourism planning contexts. First and most obvious, stimulating short-term destination travel is the most prevalent element in local and state level public policies that addresses tourism and, from a tourism planning perspective, is reflective of regional boosterism. This fundamentally non-integrative approach to tourism planning has been criticized as being myopically focused on marketing to stimulate increased levels of visitation (Ivars Baidal, 2004). Disasters can dramatically alter these short-term travel patterns while resiliency planning can affect the ability of short-term leisure travel to rebound following an incident using targeted marketing. A recent example of this is the relatively quick rebound in Gulf Coast tourism following the 2010 Deepwater Horizon Oil Spill, driven largely by promotional and marketing subsidies provided by British Petroleum.

The second, and perhaps more important, element of planning for touristic migration is reflected in long-term destination travel to second homes and retirement travel (for examples, see Hall and Müller, 2004; Roca, 2013; Schewe et al., 2012). It is well known that this second contextual element of tourism planning is concentrated in regions endowed with high levels of natural amenities (Chi and Marcouiller, 2012), many of which are prone to natural disasters (Cutter and Emrich, 2006). These regions include oceanic and freshwater coasts (rivers, lakes, and reservoirs), mountains, and other regions with natural features that reflect hedonic motivators for travel. Certainly, resiliency planning as a component of integrative tourism planning can assist in addressing the needs of longer-term leisure migrants and provide one important linkage to broader scale disaster planning.

This chapter is written to provide an overview of the literature with respect to disaster planning, with a specific interest in the effects of disaster events on amenity-based development and urban tourism. Together with the basic premise that disaster effects are fundamental social process responses that require proactive planning, we develop a conceptual model of disaster loss factors that involves regional exposure and shock within the context of inherent social system vulnerability and resilience. By reviewing the extant knowledge related to natural disasters within a community planning context, we highlight the importance of proactive and integrative tourism planning and public policy to address disaster vulnerability and resiliency.

Following this introduction, our chapter is organized into four subsequent sections. First, we define disaster vulnerability, resiliency, community loss, and planning responses with an emphasis on social frameworks. This is followed with an overview of recent literature on vulnerability and resiliency within a community planning context. This includes both an acknowledgment and a discussion of existing knowledge that significantly contributes to the formation of disaster response in the context of integrative tourism planning. The next section connects indicators of vulnerability, resiliency, and risk in the development of our integrated conceptual planning model of disaster outcomes associated with vulnerability and resiliency particularly relevant to urban tourism. The final section provides conclusions and relevant policy implications.
Understanding “Natural” Disasters within “Social” Frameworks

How we create our communities and where we choose to live determines how resilient we are to the damages caused by hazards (Schwab et al., 2007). Attempts to reduce the impact of natural disasters are fundamentally related to making a more sustainable human settlement. The “crisis” element of a major natural disaster, in the sociological sense, can be thought of as the failure of a social system to support communities in adapting to an environmental event (Vollmer, 2013). Failures are not simply the result of an isolated high impact natural phenomenon. They can be viewed as failures to develop and distribute housing, business services, and community infrastructure capable of withstanding and rapidly recovering from such an event. From this perspective, community recovery from natural disasters can be regarded as a process by which the groups and organizations that comprise the community attempt to re-establish social networks and conduct recuperative elements necessary to return stability to the routines of daily life (Tierney, 2014).

Based on this sociological sense, Rodriguez and Russell (2006: 194) concluded that “disasters are not caused by the ‘natural’ environment but are the result of the social, political, and economic environment[s] and reflect a community’s inability to prepare for and manage the outcomes of such events.” Some communities are better able to prepare for, respond to, and recover from hazard events while others have a limited capacity to resist and recover from the catastrophic effects of a hazard event (Vollmer, 2013). Without pro-active planning, the conventional wisdom is that natural disasters lead to extensive human suffering and significant losses in the economic wellbeing of the affected population.

Community-Level Vulnerability and Resiliency to Natural Disasters and Tourism

Conceptualizing both the event and the social consequences that follow, a disaster can “have a devastating impact on a community by disrupting normal social functions and altering social relationships” (Holcombe, 2010: 119). Natural disasters become a catalyst for much larger social disasters when they separate and displace communities, evidenced by the situation in New Orleans in the wake of Hurricane Katrina (Swan and Bates, 2007). Such a disaster process is socially constructed as being outside of ordinary experiences, overwhelming normal coping mechanisms, disrupting social relations, and temporarily disempowering individuals and communities (Miller, 2012).

Disaster Vulnerability, Community Losses, Planning, and Tourism

The concept of vulnerability to natural disasters relates to the ability of an area to deal with the impact of natural hazards, to withstand the potential negative consequences, and to cope with the resulting damage in a timely manner. In
terms of vulnerability characteristics, Wisner et al. (2004: 11) pointed out that vulnerability can be measured in terms of damage to future livelihoods and social structure (class, caste, ethnicity, gender, and immigration status); not just what happens to life and property at the time of the hazard event. As such, vulnerable communities (groups) are assumed to be those who find it hardest to re-construct their livelihoods following a disaster. This process makes already vulnerable communities more vulnerable to the effects of subsequent hazard events.

Likewise, vulnerability is the likelihood of being negatively affected by perturbation and stress, whether in an environmental or socioeconomic system (Kaspersion and Kaspersion, 2005; Phillips and Morrow, 2007). As expected, many vulnerable communities (food-insecure, water-scarce, resource-dependent, small island states) are highly exposed and poorly equipped to cope with major shocks brought on by natural disasters. In this regard, the vulnerability of human settlements is tied to differing social processes (Cardona, 2004).

The context of social frameworks with respect to the relationship between natural disasters and tourism is a growing focus within research on travel behavior. Tourism planning with respect to disaster response provides the context for numerous studies (Burby and Wagner, 1996; Kelman et al., 2008; Tsai and Chen, 2010) to examine the negative influence of natural disasters on tourism destinations; their focus involves tourists themselves, community residents, and tourism dependent businesses. Woosnam and Kim (2014) analyzed disaster impacts by looking at visitation patterns of 10 coastal park regions in the southeastern United States in hurricane and tourism seasons (June to November) for each year from 1979 to 2004. Results of this research suggest that efforts to lessen vulnerability of tourism-based regional economies also necessitate an effort to reduce unexpected damage through proactive disaster management plans. In addition, based on the impact of the 2004 tsunami around coastal regions of the Indian Ocean, Kelman et al. (2008) highlighted the importance of tourism in locations affected by natural disasters and emphasized the role of tourists in disaster and disaster risk reduction education. Campiranon and Scott (2007) and Ritchie (2009) identify additional factors influencing crisis management in tourism destinations, including cultural differences (power distance, uncertainty avoidance, long or short-term orientation), decision making in crisis management stages, and resources (tourism organization, planning and infrastructure, human resources).

Indeed, natural disasters can have dramatic negative effects on short- and long-term travel patterns and resources (Woosnam and Kim, 2014). Integrative tourism planning that accounts for regional disaster vulnerability can influence the ability of short-term travel to rebound following an incident. Further, long-term amenity-driven migrations to tourism destinations (second homes and retirement travel) are essential elements of residential populations that require specific focus in disaster planning. These populations are often absent, and their residential dwellings may be vacant during essential public participation processes over off-peak tourism seasons. In this sense, an essential linkage
between proactive disaster planning and integrative tourism planning can be helpful in reducing both the risks to and the vulnerability of short- and long-term visitors in disaster prone tourism destination regions.

Vulnerability is a somewhat subjective term indicating the hypothetical, relative likelihood of suffering negative consequences if exposed to an event (or hazard) of a specific strength (amount of energy) or duration. Vulnerabilities can also be thought of as characteristics that determine the ability to absorb the shock of an event. Presumably, communities can lack sufficient resources to cope with disruptions to livelihoods or ill health that may result from exposure to the hazard. Pelling (2012: 148) points out that the urban poor “suffer from a four-fold burden of environmental risk that includes: 1) local public health hazards; 2) localized industrial pollution; 3) inability to adapt to global environmental change including the local impacts of climate change; and 4) particular vulnerability to natural hazards such as earthquakes and storms due to population density.” Community development studies often rely on a livelihood framework to understand “community capitals or assets” (Flora, Flora, and Fey, 2003; Green and Haines, 2012). Encompassing a variety of thematic disciplines (economic, social, human, political, cultural, built and environmental), these community capitals are central to understanding disaster response. The loss or devaluation of settlement, livelihood, assets, social security, and status at the local level from the effects of natural hazards can create new vulnerabilities or risks associated with social discrimination, social exclusion, and violence.

Emphasizing equity in natural disasters, Patterson (2013: 101) proposed that a thorough analysis of the myriad elements that lead to pre-disaster vulnerabilities at the local level are necessary to “design policies, programs, processes, and infrastructure that encompass the needs of all.” Measures to assess circumstances in disasters that deepen vulnerabilities, or create new risks and hazards for some more than others, need to be included. Most community policies before and after disasters have created inequitable school reforms, as well as marginalizing redistricting processes and redevelopment (Patterson, 2013: 101).

Regarding social justice in vulnerability considerations, most deliberations about local social and economic equity (equal access to quality education, affordable housing, health care, job opportunities, legitimacy and trust) are incomplete and can result in key natural disaster losses that need to be addressed when developing social justice principles (Brown-Jeffy and Kroll-Smith, 2009; Jha et al., 2013). For instance, racial segregation in New Orleans made Black communities physically vulnerable to natural disasters due to local government neglect (Angel et al., 2012; Miller and Rivera, 2007). It should be noted that social justice connections to disaster vulnerability are a long-standing phenomenon. During the Mississippi River Flood of 1927, which covered a 27,000-square-mile area from Illinois to the Gulf of Mexico and displaced almost a million people, Smith (2011) pointed to

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1 We also must note that regional vulnerability is considered spatially mutable, namely that locality specific elements (coastal or inland) dictate level of vulnerability.
a focused, limited survivability of African American communities due to flawed drainage systems and a lack of political interest in aiding these communities on the part of the White population.

As part of the social and economic conditions at the local level, planning and public policy components are associated with disaster preparedness and mitigation in the disaster management cycle (Schwab et al., 2007). Important contributions (for example, Nelson and French, 2002) point out that careful attention to natural hazards in the preparation of local comprehensive plans (including hazard mitigation plans) can result in a reduction of disaster-related losses. Identifying dimensions of policy recommendation and citizen involvement, Burby (2005: 68) suggested key planning elements in demonstrating that “local government comprehensive plans and the process of preparing them can result in lower exposure to losses from natural disasters.” These provide the basis upon which resiliency planning and integrative tourism planning for disasters can unfold.

Having community planning and public policy in place before an event to reduce disaster vulnerability involves several elements, which are outlined in Table 8.1. Typically, these include general planning components (local emergency management plans, local land use planning), development regulations (zoning ordinance), building standards (building code), property acquisition (building relocation), critical public facilities, and taxation information dissemination (e.g., Beatley, 2009; Jenkins and Haynes, 2012; Lyles et al., 2014; McAdoo, 2012; McCormick, 2012; Smucker, 2012; Smucker and Wisner, 2007; Underwood and Held, 2012), and are in accordance with disaster types. As for the non-structural flood mitigation approaches, local land use planning techniques allow communities to be more resilient to flooding as suggested by previous studies (e.g., Etkin et al., 2012; Grunfest, 2000; Lyles et al., 2014; Schmuck, 2012). In addition, the infrastructure element (structural measures such as dikes, dams, levees, river bank stabilization, and building elevation) in comprehensive plans provides resilient and adequate infrastructure linked with a hazard mitigation strategy to protect infrastructure in storm events, and to ensure quick recovery and use during emergency situations (e.g., Beatley, 2009; Hadmoko and Mauro, 2012; Jonkman et al., 2012; Lomnitz and Wisner, 2012; Schmuck, 2012). For instance, Galveston County, Texas adopted local emergency management and land use elements within a hazard mitigation plan before being affected by Hurricane Ike.

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2 These elements include: 1) increasing public awareness of the risks hazards pose; 2) assessing the adequacy of existing hazard mitigation measures (building codes, floodplain); 3) using these assessments as a means for citizens and local officials to create a vision for hazard resilience; 4) developing consensus on the need to take action (involving citizens and community intentions); 5) improving the likelihood that community stakeholders and residents will become aware of different hazard reduction approaches; 6) helping to guide the day-to-day decision making of local officials; 7) coordinating the action of various local government departments; and 8) providing the rational nexus between widely varying public interests that deal with safety from hazards.
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<td>• Collapse of structures and secondary hazards such as fire, landslide and tsunami</td>
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<td>• Earthquake early warning system</td>
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<td>• Community-based loss prevention</td>
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**Hydro-meteorological/climatological hazards**

- Extreme Heat and Cold:
  - Vulnerable social status and networks, living and working environments, access to health service
  - Community-based measures in preventing heat-and-cold-related mortality
  - As a long term adaptation, promoting social networks (community-based disaster preparedness)

- Wildfire:
  - Devastation as forests and other rural areas burned by wildfire
  - Overarching legislation, dealing with all aspects of wildfires
  - A single fire/land management organization responsible for wildfire management (e.g., fire-resistant site design)
  - Annual independent monitoring and public reporting on outcomes

- Geophysical hazards:
  - Landslide and other mass movement:
    - Reducing water quality
    - Lessening soil fertility and reducing stream and lake capacity
    - Physical and human loss
  - Earthquake:
    - Collapse of structures and secondary hazards such as fire, landslide and tsunami
    - Performance-based engineering (e.g., improving building practices)
    - Hazard assessment
    - Building code
    - Earthquake early warning system
    - Community-based loss prevention
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<td>Volcanic eruption</td>
<td>Volcanic risk areas (benefits of living in an area-fertile soil, mineral wealth, geothermal energy, tourism potential)</td>
<td>Structural mitigation engineering solution to modify or confine the path of lahar</td>
<td>Jenkins and Haynes (2012)</td>
<td>Adopting new precautionary measures to protect the safety of hotel guests [tourism industry]</td>
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Note: Relevant literature identified in italics.
in 2008 (Bedient, 2012). The plan fostered greater resilience to natural hazards. (But see also Olonitaua and Ibitoyo, 2014.)

Similar to these general disaster responses, other studies (e.g., Carlsen 2006; Faulkner and Vikulov 2001; Garcia et al. 2006; Higgins 2005; Hystad and Keller 2008; Johnston et al. 2007) stressed that warnings targeting tourists and tourism-dependent businesses are imperative to reduce disaster event losses. As part of non-structural mitigation approaches, Tsai and Chen (2010) suggest that disaster management plans and insurance play a pivotal role in mitigating tourism-related losses following disaster events.

Disaster Resiliency, Community Responses, Planning, and Tourism

With an emphasis on disaster risk, resiliency refers to “the capacity of people and systems involved [returning] to a state prior to the occurrence of significant disturbances” (Garmestani et al., 2006: 535). If resiliency is improved, it will require less time to return to some form of normalcy or regular operation (Hamzah and Hampton, 2013). As a consequence, resiliency (another term for coping ability) is dependent on individuals and resources as well as on competencies to manage demands, challenges and changes. Likewise, resilient systems require flexibility and openness to change (Berkes and Ross, 2013; Schmidt and Garland, 2012). This approach assumes the fundamental recognition that future events are unexpected.

On the basis of community resilience to natural disasters, extensive literature (see Cutter et al., 2008; Ewing et al., 2010; Jha et al., 2013; Kapucu et al., 2013; Peacock et al., 2012; Wilkinson, 2012) summarizes resilience related variables to encompass ecological, institutional, social, economic, infrastructure, and community systems. As pointed out by Brody and Gunn (2013), ecological resiliency to flooding relies on a variety of physical characteristics such as floodplain area, soil permeability, wetlands acreage and loss, erosion rates, impervious surfaces, precipitation, and biodiversity characteristics. In addition, Cutter et al. (2008) observed that participation in hazard reduction programs, hazard mitigation plans, emergency services, zoning and building standards, emergency response plans, and continuity of operations plans can be included in institutional system resiliency.

Social and economic resilience, and community competence indicators involve demographic characteristics, social networks, community value cohesion, faith-based organizations, employment characteristics, property values, wealth generation, municipal fiscal elements, health and wellness, and quality of life (Aldrich, 2012; Berkes and Ross, 2013; Ersing and Kost, 2012; Nowell and Steelman, 2013; Zautra et al., 2009). In addition, as described by Cutter et al. (2008), infrastructure resilience factors include lifelines and critical infrastructure, transportation networks, residential housing stock and age, and commercial and manufacturing establishments.
Based on the theoretical foundation of the relationships between social and economic conditions and disaster resiliency, specific locally relevant tools and techniques for enhancing and strengthening community planning (associated with resiliency to natural disasters) were identified in the works of Beatley (2009) and Olsansky and Kartez (1998). As illustrated in Table 8.1, such policies included: 1) land use planning; 2) local infrastructure and public facilities; 3) taxation and financial incentives; 4) conservation and restoration of natural systems; and 5) building and structural resilience.

First, local land use planning as one of the non-structural flood mitigation approaches, allows communities to be more resilient to flooding (Grunfest, 2000). This resiliency is enhanced by emphasizing cluster zoning (and other land use conservation measures) for future development, in accordance with the hazard mitigation strategy incorporating setbacks from natural features like dune systems, levees, flood walls, and wetlands (Beatley, 2009; Brody and Highfield, 2013; Jha et al., 2013). A second element of land use planning for community disaster resilience includes the design of local infrastructure and public facilities (Berkes et al., 2014). This local infrastructure element requires an alignment of land use decisions with public facilities and infrastructure investments determined by the community's carrying capacity, anticipated demands, and financial feasibility (Bedient, 2012). Likewise, in an effort to ensure more resilient facilities, communities need to assess municipal facilities to determine if structures could be strengthened or made more resistant to damage from such catastrophic events. This could include retrofitting for wind resistance, elevating buildings, or raising critical mechanical systems above anticipated flood levels.

When it comes to taxation and financial incentives, Beatley (2009) identified the fact that numerous communities have attempted to enhance resiliency by clustering small subdivisions on larger sized parcels. Through an expedited development review, waivers of permit fees, potentially short-term abatement of property taxes for new homeowners and developers in these areas, and capital improvements to infrastructure systems and neighborhood amenities, such financial incentives will decrease (Beatley, 2009).

The fourth community disaster resiliency policy relates to conservation and restoration of natural systems. In general, maintenance and development of natural vegetation and native land characteristics can improve air quality, provide shade, protect against erosion, lessen the impact of storm water, and serve as a wildlife habitat (Porter, 2000). Especially in coastal regions, restoring natural environmental characteristics allows for marshes and wetlands to provide a buffer from wave action. Likewise, in the recent work of “Greening in the Red Zone,” Tidball and Kraszny (2013) argued that creation of and access to green space confers resilience and recovery in social and ecological systems affected by violent conflict or disaster, and also promotes social health and wellbeing. This form of disaster-sensitive land conservation also serves to enhance tourism resiliency by adding to the supply of local outdoor recreation opportunities. This obvious connection results from a broader view of the tourism product where
additional access to underlying natural amenities serves as the key motivator for leisure travel and subsequent local tourism-sensitive business receipts, as alluded to by Leiper (1979; 2008) and Marcouiller (2013).

A final policy is related to enhancements of structural resiliency, specifically natural hazard mitigation, to enhance drainage capacity and act to reduce recurrence of flooding. A recent example occurred in 2010 after Hurricane Ike. Galveston County, Texas undertook a system-wide cleaning of storm-related deposits with assistance from the Federal Emergency Management Agency (FEMA) (Bedient, 2012). Other infrastructure enhancements include providing curbs and gutters, paving alleyways, and regular street sweeping, which serve to lessen the amount of sand and yard debris entering sanitary systems (Beatley, 2009). Also, storm water retention systems and rain gardens (landscaped areas that hold water until it can be absorbed into the ground) can reduce storm sewer system demands during rain events. Recent studies (Orchiston, 2013) emphasize the critical role of disaster resilience planning in tourism-reliant communities by comparing the presence or absence of tourism business resilience in disaster prone areas. An example of this used resiliency planning relative to earthquake vulnerability in the Southern Alps of New Zealand. While resiliency planning for disasters does necessitate enhanced coordination, it is important to note that its underlying elements and their implementation are not new concepts. Indeed, resiliency planning is truly an extension of sound planning principles long espoused by the planning profession (c.f. Goodman and Freund, 1968). Pro-active approaches by community planners, locally elected public officials, and bureaucrats with respect to resiliency planning are central to its evolution and implementation. This is best summed up by Wagenaar and Wilkinson (2013: 15) with their suggestion of “enacting resilience” with respect to urban policy design discourse:

As more and more public administrators turn to resilience as a frame for urban and environmental policy, the question of how to govern from a resilience perspective is raised.

Conceptual and Planning Relevant Models of Disaster Outcomes

Conceptual models of disaster vulnerability and resiliency are important frameworks upon which we can organize and discuss theoretical relationships. Indeed, these frameworks provide a critical basis upon which empirical models intent on describing the effects of disaster events on communities (vulnerability and risk), the planning response of communities to minimizing losses resulting from such events (resiliency), and integrative tourism and disaster planning over time, are formed.

A proposal for a Resiliency and Vulnerability Observatory Network (or RAVON), developed by Peacock et al. (2008: 4), outlines the imperative “to reduce the vulnerability associated with natural hazards and enhance the resiliency of
Figure 8.1  Integrative tourism disaster planning model

Note: Arrow indicates causal relationships, dotted arrow indicates feedback loop.

Source: Authors.
individuals and communities” through coordination among planning institutions. Others, including the Disaster Resilience of Place (DROP) model (Cutter et al., 2008), the Pressure and Release (PAR) model (Blaikie et al., 1994; Wisner et al., 2004), and the Bogardi, Birkmann, and Cardona (BBC) conceptual framework (Bogardi and Birkmann, 2004; Cardona, 2004), mainly attempt to identify vulnerability or resiliency indicators derived from social and ecological elements in various disciplines.

Building upon this previous literature, we forward an integrative tourism disaster planning model in Figure 8.1. Note from this figure that we have employed spatial and temporal elements to reflect important conceptual insertions where both vulnerability and resiliency can affect event outcomes. Our notations $t_a$, $t_{a-n}$, and $t_{a+m}$ reflect temporal elements where $t$ denotes a point in time when a disaster event occurs, and subscript $a$ represents the variety of locations (communities) affected by the event; $n$ and $m$ indicate time orders, with $t_{a-n}$ reflecting a pre-disaster time period and $t_{a+m}$ reflecting time post-disaster. Note further that we identify $i$ as the interval between disaster events, which is equal to $n+m$. The interval between disaster events can serve as a key element involved in disaster planning effectiveness, as longer intervals can lead to complacency while shorter intervals can lead to increased urgency in resiliency planning.

**Community Vulnerability Planning**

The extent or forcefulness of disaster events makes up the central exogenous shock, while internal elements serve as exposure in the work of West and Lenze (1994). These authors and others outline factors that contribute to the extent of disaster losses (Raddatz, 2007). While the event itself serves as the exogenous shock, critical elements within a disaster-prone region can be thought of as endogenous exposures (or shocks) that exacerbate loss. These include internal conflict, political instability, lack of organized planning, and economic mismanagement (Acemoglu et al., 2003; Ahmed, 2003; Raddatz, 2007). In this spatial and temporal context, the extent of loss attributed to exogenous shock and endogenous exposure at $t_a$ depends on the intensity of the disaster event, exposure (or vulnerability), and the prior disaster experience of the community. Disaster shocks have been defined as exceptional events operating outside “normal” development theory and practice (Baade et al., 2007).

Vulnerability to disaster, conceptualized as a potential for loss, refers to the likelihood of exposure to disaster damage (Etkin et al., 2004). In this context, vulnerabilities ($t_a-1$) during the first stage before a disaster period ($t_a-n$) include numerous characteristics that determine the ability of local institutions to absorb the shock of natural disaster events. Social and economic conditions of a community might have vulnerabilities that make it more likely to suffer significant losses relative to other adjacent, and therefore affected, communities. Conditions

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3 These models are outlined in Table 8.2 and discussed further below.
that lead to increased exposure involve a multitude of items. These can include a lack of disaster preparedness and planning, relatively high unemployment, lower income levels, higher poverty rates, more isolated social networks, weak housing infrastructure, high levels of impervious surface, and low levels of preventive infrastructure (Pelling, 2003; Wisner, 2009). Based on these diverse factors, we can assess the degree of community vulnerability to disaster events.

In addition, community planning and public policy prior to a disaster event (t\text{sub} \text{a}-n) further serve as important vulnerability criteria. These attributes that can serve as important exposures involve the extent to which the community has conducted local emergency management plans, land use planning, development regulations (zoning ordinances), building standards (building codes), property acquisition (building relocation), critical and public facilities, and taxation information dissemination (Beatley, 2009; Berkes et al., 2014; Burby, 1998; Olshansky and Kartz, 1998).

Vulnerability can also involve the extent to which tourism incidence affects community characteristics. Note from Figure 8.1 that we include a more integrative tourism planning process that accounts for past experience with local disaster events. Elements of this integrative tourism planning include stakeholder involvement of both long-term tourism migrants (second homeowners and retirees) and local tourism businesses accommodating short-term destination travelers. Further, education and safety with respect to disaster events can also serve as a source of vulnerability within disaster planning. In the process, it is necessary that the geographical and political characteristics of each community be considered with vulnerability factors that vary in accordance with differing community attributes.

As illustrated in Figure 8.1, the disaster losses element (t\text{sub} \text{a}+1) as the first post-disaster stage (t\text{sub} \text{a}+m) results from interactions among social and ecological systems (human systems, constructed systems, natural resource systems) and their many subsystems (population, culture, technology, social class, economics, politics, infrastructure, and tourism). Disaster losses change a community's social and ecological condition and can affect future exposure to subsequent disaster events. Unlike previous studies focused on vulnerability assessment composed of shocks, exposure, seasonality, trends, institutional structure, and processes (cf. Bogardi and Birkmann, 2004; Bohle, 2001; Chambers and Conway, 1992; Turner et al., 2003), the vulnerability framework outlined in Figure 8.1 addresses an integrated social and ecological sphere within a community-level planning and public policy context.

Community Resiliency Planning

As suggested by Rose (2007: 385), the resiliency of a community to a disaster event includes two properties labeled inherent resiliency and adaptive resiliency. Inherent resiliency is defined as "... the ordinary ability to deal with crises," while adaptive resiliency refers to "... the ability in crisis situation(s) to maintain function on the
basis of ingenuity or extra effort.” The conditions \((t_a+2)\) as a second stage after a disaster \((t_a+m)\) has been addressed in the existing literature (cf. Brody and Gunn, 2013; Cutter et al., 2008; Kapucu et al., 2013; Pelling, 2012; Wisner, 2009) to include social and economic systems (demographic, employment, income, social networks), physical and environmental systems (housing structure, floodplain area, wetlands, impervious surfaces), and community planning and public policy (disaster plans, development regulations, building standards, property acquisition, public facilities, taxation).

Especially when it comes to tourism disaster management and planning, Faulkner (2001) “... stresses coordinated team approaches, consultation and commitment in the disaster management process, but recognizes that natural disasters in particular are triggered by events over which victims have little or no control and that, therefore, their impacts are to some degree unavoidable. However, he [Faulkner] does suggest that their impacts can be moderated by good planning and management practices” (as cited in Cooper and Erfurt, 2007: 243). Within Faulkner’s tourism disaster management framework, six elements of disaster management response involve precursors, mobilization, action, recovery, reconstruction and reassessment, and review. Within our discussion of Rose’s two forms of resiliency, pre- “action” can be associated with “inherent resilience” and the remaining steps (from action to review) can be regarded as “adaptive resilience.”

Further, as an alternative to the sustainable development paradigm, Lew (2014: 14) discusses the role of tourism within disaster planning and points out that “resilience planning has emerged ... to provide new perspectives on community development and socio-ecological adjustments in a rapidly changing world.” In the context of resilience to disaster damage, Rivera and Settembrino (2013) claimed that wealth enables a community to absorb and recover from disaster losses more quickly owing to insurance, social safety nets, social networks, and entitlement programs. Likewise, by integrating various factors of tourism planning within broader socio-cultural, economic, political, and environmental components, communities become more successful in managing disaster risk and mitigating losses that result from disaster events (Chhabra and Phillips, 2009).

Further along in the post-disaster resiliency planning phase, elements of adaptive resiliency become more evident. As a third stage \((t_a+3)\) in the post-disaster \((t_a+m)\) of Figure 8.1, new community conditions damaged by natural disasters will show a considerable number of disaster responses such as natural resource losses, household conditions, and community planning. For instance, examining communities with a more sizable economy before the disaster can be useful in determining whether or not they experience fewer disaster losses and require a shorter amount of time to recover from disasters. In the process of disaster response \((t_a+4)\), communities with an adaptive capacity can mitigate or reduce disaster losses and shorten the period of disaster recovery. As a fifth stage \((t_a+5)\) post-disaster, this process leads to vulnerability reduction and a new disaster preparedness and mitigation stage.
Integrative Tourism Disaster Planning Model

With respect to the tourism literature, disaster planning has become an increasingly interesting line of academic inquiry. We outline select tourism disaster work in Table 8.2. By integrating tourism within both disaster vulnerability and resiliency models (see Figure 8.1), we overcome the limitations presented by models myopically focused on vulnerability assessment. This builds from “The Onion Framework” as suggested by Bogardi and Birkmann (2004) and the Department for International Development’s sustainable livelihood framework (DFID, 1999), which describes vulnerability as associated with different hazard impacts related to economic and social spheres. Also, both the Pressure and Release (PAR) model developed by Blaikie et al. (1994) and Wisner et al. (2004) and the ISDR framework for disaster reduction forwarded by the United Nations International Strategy for Disaster Reduction (UN/ISDR, 2004), attempted to assess the linkage between vulnerability and the development of a potential disaster. In the PAR model vulnerability was considered a process that includes increasing pressure and evolving opportunities. It categorized vulnerability factors into root causes, dynamic pressure, and unsafe conditions. Encompassing environmental, social, and economic spheres with risk assessment, the Bogardi, Birkmann, and Cardona (BBC) conceptual framework, depicted by Bogardi and Birkmann (2004) and Cardona (2004), addressed exposed and vulnerable elements and coping capacity as factors of vulnerability. With an emphasis on risk management, Cardona (2004) divided “risk” into two major categories—hard risk and soft risk. Whereas hard risk indicates potential damage impacts on physical infrastructure and environment, soft risk reflects potential socio-economic impacts on communities and organizations.

Furthermore, the Disaster Resilience of Place (DROP) model (Cutter et al., 2008) derived from the hazard-of-place model (Cutter, 1996; Cutter et al., 2000) designs the integration of vulnerability (antecedent condition) and resiliency assessment with an emphasis on varied factors associated with resiliency (ecological, social, economic, institutional, infrastructure, and community competence). This model includes disaster management cycles such as preparedness, mitigation, response, and recovery. By incorporating the relationship between tourism and resilience, the Scale, Change, and Resilience (SCR) model developed by Lew (2014) suggests four types of change in accordance with the degree of disturbance (from gradual to sudden) and scale of tourism actors (from private entrepreneurs to shared public interests). These change types include: 1) entrepreneur tourism slow change and 2) sudden shock; 3) community tourism slow change and 4) sudden shock. Further, this model encompasses four resilience indicators that include: 1) maintenance program; 2) training and diversification; 3) natural and cultural conservation; and 4) social support system.

As a critique, the SCR model fails to account for risk assessment, comparisons of alternative forms of disaster events, and the role of pro-active and integrative planning in disaster management. The integrative tourism disaster planning model
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outlined in Figure 8.1 addresses comprehensive understandings about community vulnerability and resiliency. In line with integrated social and ecological spheres, this model encompasses risk assessment and compares hazard and disaster in accordance with disaster management cycles. Furthermore, this framework attempts to address the role of disaster management planning in reducing or mitigating tourism development losses, with an emphasis on tourism demand and supply. As described in Figure 8.1, based on the premise of pro-actively interacting with both supply and demand aspects associated with leisure-based migration (Hall, 2008; Marcouiller, 1997), integrative tourism disaster planning (including resiliency planning) addresses short and long-term travel patterns and reflects the ability of short-term and long-term destination travel to bounce back from natural disaster losses (loss of travel attractions, tourism facilities, services and infrastructure, environmental and cultural tourism resources, tourist market, information).

Conclusions

Natural disasters become crises when unambiguous failures of public and private decision making create outcomes that interrupt local activity. Whereas disaster vulnerability reflects the frequency and intensity of naturally occurring large-scale materialized risks, disaster resilience refers to the capacity of people and organizations to develop adaptive responses to perturbations that protect communities from potential loss. Together with the basic premise that disaster effects are fundamental social process responses that require pro-active planning, a conceptual model of disaster loss factors involves regional exposure, shock, and loss within the context of inherent social system vulnerability and resiliency. Specific research questions involve alternative levels of community development and social system status and their influence on disaster resilience.

We develop and discuss a conceptual and integrated model that inserts tourism planning as a key element within disaster planning. This takes on both planning and decision-making frameworks that act to simultaneously minimize vulnerability elements of a community while maximizing resiliency elements. This conceptual model then leads to a host of empirical applications that remain for further research. Based upon a review of the extant literature, three central theoretical hypotheses are proposed. First, disaster damage will have a negative association with social and economic development metrics; second, higher levels of community development will result in lower disaster-related losses, and; third, establishing better planning efforts, social capital, and social justice systems prior to an occurrence of natural disaster will lead to reduced disaster losses. This approach improves on previous work by incorporating tacit stages of development, social capital, social justice, and distributional elements that speak to social and economic inequity. Results from this review of extant knowledge suggest that disaster damage likely has an association with social and economic structures,
and that engaged social capital, more equitable distributional characteristics, and local pro-active planning in-place before a disaster results in lower disaster losses (Pearce, 2003).

In line with this concept of vulnerability and resiliency to disaster and socio-cultural, economic, political, and environmental components in the context of an integrative tourism planning framework, we describe the role of disaster management planning in reducing or mitigating tourism development losses along with tourism demand and supply. In particular, this integrative tourism disaster planning approach can be useful in addressing the ability of short- and long-term destination travel to bounce back from various disaster events. In this respect, our work and subsequent empirical research responds to Ritchie’s (2009, 226) effort to describe the role of planning in tourism crisis and disasters:

Tourism crisis and disaster literature appears to be dominated by response and recovery at the expense of planning and prevention. Such research can assist tourism managers and policy-makers to develop effective policies and strategies.

References


