



## Exploring disaster resilience within the hotel sector: A systematic review of literature



Nancy A. Brown<sup>a,\*</sup>, Jane E. Rovins<sup>a</sup>, Shirley Feldmann-Jensen<sup>b</sup>, Caroline Orchiston<sup>c</sup>,  
David Johnston<sup>d</sup>

<sup>a</sup> Joint Centre for Disaster Research, Massey University, New Zealand

<sup>b</sup> School of Criminology, Criminal Justice, and Emergency Management, California State University, Long Beach, CA, USA

<sup>c</sup> Centre for Sustainability, University of Otago, New Zealand

<sup>d</sup> Joint Centre for Disaster Research, Massey University/GNS Science, New Zealand

### ARTICLE INFO

#### Keywords:

Disaster  
Resilience  
Tourism  
Vulnerability  
Sustainability  
Crisis

### ABSTRACT

Within the tourism industry, the hotel sector's vulnerabilities are multi-faceted. This literature discussion scrutinizes how disaster and resilience is framed for the tourism sector, and, more specifically, how the concepts can be applied to the hotel sector. A synthesis of the literature points to the importance of prioritizing disaster resilience building for the hotel sector. The body of literature regarding disasters, tourism, and more specifically hotels, has increased over the last 20 years, still improvements in the hotel sector's disaster preparedness and do not appear to be on the same trajectory. Illustrating the predicament of the contemporary hotel industry serves to open a discussion about the value of building resiliency to disaster for hotels. As the numbers of people affected by disasters grows, the importance of providing actionable information to limit the severity of these events on communities also escalates in pace.

### 1. Introduction

An important aspect of the world's increasing interconnectedness is the ease and frequency of travel. Increased numbers of tourists traveling to places of varying risk has exposed new and uncertain vulnerabilities to the tourism sector [79]. Tourism is vulnerable to disaster because it relies upon infrastructure, the ability to move around freely, and people's perceptions of safety [62].

Within the tourism industry, the hotel sector's vulnerabilities are multi-faceted. A hotel's physical infrastructure (buildings, water, power, sanitation) may be at risk from a variety of natural and man-made hazards placing staff and guests at risk. Beyond guest and staff safety, a hotel's ability to continue operations and profitability is often at risk in disasters. The hotel's surrounding environment (sea, forests, natural beauty) can be affected by hazards making their locale less desirable for future tourist in the short term [5]. Hotel vulnerabilities are complex and factors that contribute to risk are often the tourist motivation to visit.

Disastrous events can influence tourist's choices of destinations [24]. Management of destination image, disruption from extreme weather, and event impacts causing slow recovery may all affect tourism destinations negatively [94]. Examples of this influence can

be seen in: the 2001 Foot and Mouth Disease outbreak, which is estimated to have cost the United Kingdom tourist industry between USD\$3.3 billion and USD\$4.2 billion due to decreased numbers of tourist traveling to the countryside [93]; the 2003 Severe Acute Respiratory Syndrome (SARS) epidemic which coincided with Japanese outbound tourism dropping as much as 55% in one month [15]; and Hurricane Katrina's impacts on New Orleans which resulted in 1409 tourism and hospitality businesses shutting down- affecting 33,000 hospitality employees, a decrease of USD\$15.2 million per day in business and leisure travel expenditures [72]. These examples highlight how disastrous events can affect tourism.

People's perceptions can be negatively influenced by media coverage of an event [19,24,54,72]. In the aftermath of the 2004 Boxing Day Tsunami, the hotel industry in Phuket, Thailand successfully reopened 80% of their hotels within a week, only to see occupancy rates drop to 10% [29]. Decrease in tourism can also be due to facility availability and access. In 2005, following Hurricane Katrina and the New Orleans levees failure, the lodging industry in New Orleans, which included an estimated 38,000 rooms, was almost completely shut down [91]. Following a second major earthquake in five months (February 2011) Christchurch, New Zealand lost two-thirds of their hotel inventory [64]. Aggravating the influence of disasters on tourism further is the

\* Corresponding author.

E-mail address: [n.brown1@massey.ac.nz](mailto:n.brown1@massey.ac.nz) (N.A. Brown).

increasing interdependence of the tourist industry, where a negative event in one location can affect the tourist economy of many countries [43]. For example, the 2010 Icelandic Volcanic Ash Cloud caused disruption to air travel throughout Europe [66]. “Tourism destinations in every corner of the globe face the virtual certainty of experiencing a disaster of one form or another at some point in their history” ([24], p. 135).

Illustrating the predicament of the contemporary hotel industry serves to open a discussion about defining disaster resiliency for hotels. A cross-disciplinary lens may provide an opportunity to identify connections between the hotel sector’s needs (ensuring safety and security of guests and staff as well as remaining operational and profitable) and disaster resilience building. The purpose of this article is to examine the literature and explore important disaster resilience and hospitality industry concepts that can be applied specifically to the hotel industry.

Defining key terms including disaster and resiliency within a hotel context begins with an examination of the literature. These definitions form the basis for discussion of both disaster effects on hotels and disaster resilience building within the hotel sector. The review synthesizes current concepts of disaster resilience building in the context of the hotel sector, and extracts concepts to inform further development in building disaster resilience into the hotel sector.

Search word of *disaster* and *hotel* provided 143 peer reviewed articles, after duplicates and articles not on topic were eliminated. Additional articles and grey literature were captured through reviews of selected articles reference lists. In total 352 articles and papers were identified and thematically coded for this literature review.

## 2. Basic definitions

In order to discuss disaster resiliency, as it applies to the hotel sector, it is important to first explore the literature aimed at defining these terms. The objective is to synthesize common definitions for disaster and resilience as they will apply to this discussion.

### 2.1. Disaster/Crisis

The concepts of disaster and crisis, as applied to tourism businesses, have been examined by many scholars [1,17,24,58,79]. Rockett [84] writes that definitions may be transient over time, but can serve our current need and allow for common understanding. The most prevalent definitions adopted by authors of tourism sector research has been Faulkner’s [24] concept that *crises* often have a component that could have been controlled by the group being affected (e.g. management failing to react to events in a way that minimizes effects), while *disasters* occur suddenly and the actual trigger event is out of the control of those affected (e.g. an earthquake hitting a populated area). Ritchie [80] recognises that an overlap can occur, when leadership actions during a disaster then develop into a related crisis, thus confusing the concepts. Some authors chose not to tackle the distinction of disaster and crisis but instead use the terms alternately or simultaneously [80].

[56] describes disasters as events that are the result of interaction with the physical environment, the social and demographic characteristics of the community within the physical environment, and the built environment the community constructed. Disasters are often predictable, and in some cases avoidable [56]. While many disastrous events are not controllable by human societies, affects may be minimized through action.

Disasters are often described as a cycle with phases leading from one to the next. A common cycle is the 4 R’s; reduction, readiness, response, and recovery [55]. In this spectrum one *reduces* (or eliminates) possible risks, *readies* for risk that cannot be reduced or eliminated, *responds* to events with the readied preparation, and works toward *recovery* after the event, including reducing or eliminating possible threats. Faulkner

[24] provides six phases of disaster in a tourism disaster management framework. These phases include: 1) pre-event, where action is taken to reduce effects of, or eliminate, potential events; 2) prodromal, the time immediate prior to an imminent disaster where warnings and plans are initiated; 3) emergency, the actual disaster response activities; 4) intermediate, where short term issues are resolved and return to normal is being planned; 5) long-term recovery, a continuation of previous phase; and 6) resolution, the final phase where normal activities resume and review of events takes place. In both of these disaster management cycles the concept remains that the management process begins prior to the onset of an event with planning and risk reduction, continuing through to learning lessons and applying those lessons to future planning.

A key concept in the discussion of disaster is that disasters are social disruptions [85]. The disruption to human society causes the event to be termed a disaster- even though a physical event such as an earthquake may begin the cycle. For example, a magnitude 6.5 earthquake that occurs in an undeveloped and unpopulated part of the world is of little consequence. The same earthquake in a developed area has the potential to cause severe disruption and may be termed a disaster.

The term disaster can also illustrate a lack of capacity to manage an event. As a description of the resources needed to stabilize the event, a disaster requires recruitment of resources from outside of the affected community [97] & Caribbean Alliance for Sustainable Tourism CAST [96]. Examining an event in terms of resources required to respond illustrates that disruption to human systems is integral to defining a disaster. A small hotel with limited resources could experience a disaster that a larger hotel with greater resources might have been able to handle internally with minimal disturbance.

For the purposes of this discussion, the definition proposed by Faulkner [24] will form the basis for defining disaster with additional wording taken from [56], and Rodriguez, Quarantelli, and Dynes [85]. For the remainder of this discussion disaster is defined as:

A sudden event where the trigger is outside the current control of the affected area (community and/or business), the event disrupts the function of that area and requires additional resources (other than those available within the area) to respond to and recover from the event.

### 2.2. What is resilience?

The concept of resilience has been explored over many decades among a range of disciplines, including ecology, engineering, psychology, and social science [22,27,3,36,40,47,48,58]. It is worth highlighting that the meaning of resilience, at its heart, remains similar across disciplines, but the nuances and values vary based on application.

The root *resiliere* comes from the Latin ‘to jump back’; however, in the context of disasters affecting societies this definition falls short, as it may not be possible to go “back” to the state prior to the disaster [67]. Going back to the previous state may also be undesirable, if it means building back to the same vulnerabilities [23]. Resilience is a dynamic condition.

Many scholars have worked toward finding a shared meaning of resilience. However, in order to study resilience one must first define: resilience by whom; and resilience to what [17,47,7]. A universal understanding of resilience is not possible:

Without frameworks tailored to specific populations, levels of analysis, phase of disaster, and even the unique disaster context, our ability to advance the science of disaster response toward more resilient communities is limited ([60], p. 233).

For each group, and each circumstance, the meaning of resilience can take on new dimensions. Exploring some of the different ways resilience has been applied can be a constructive process toward

defining disaster resilience for hotels. Resilience definitions vary based on the context. The following discussion explores literature concerned with resilience within the context of systems, organisations, economics, and communities in an effort to understand how resilience may apply to the nexus of disasters and hotels.

### 2.2.1. Systems resilience

Resilience concepts for systems have undergone numerous interdisciplinary scholarly reviews [14,17,2,39,58,61,70]. Further insights are gained from research in physics, mathematics, psychology, and psychiatry, and ecology by Aldunce et al. [2], whose work showed that resilience is not just bouncing back to the previous state, instead resilient systems have the capacity to change and adapt to new stresses, and create a new norm from which to continue forward.

Resilience in complex adaptive systems (CAS) differs from engineer-based systems resilience. Engineer-based systems resilience looks at returning to previous state of functionality [87]. CAS theory considers a move to a new normal that allows functioning to continue. Four characteristics that help a CAS to be resilient include:

“...capacity for creative innovation, flexibility in relationships between the parts (of the system) and the whole, interactive exchange between the system and its environment, and a crucial role for information in evolving complexity” ([12], pp. 159–160).

A CAS can also vary in size and components, moving, expanding and contracting as needed. In the case of hotels, groups of internal departments working together can function as a CAS, and those same groups working with external partners can also be a CAS. Those same groups unable to be innovative, flexible, and collaborate in the face of disaster can delay response and recovery.

The ability of a system to adapt and change is critical in our understanding of resilience as applied to larger groups, including business organisations like hotels. Tourist destinations can be conceptualized as “... a human-environment system” ([5], p. 956). During an unfolding disaster a hotel's management and staff must understand the possible risks to the business, guests, and surrounding area, and have the capacity to cope with those possibilities exists.

### 2.2.2. Organisational resilience

Organisational resilience considers physical properties as well as organisational structure and capacities [17]. Resilient organisations are able to overcome adversity and continue forward, often thriving as they reinvent themselves [18]. Building organisational resilience includes “...reducing the consequences of failure and assuring business/service continuity under adverse conditions” ([87], p. 79).

In studies of resilient organisations, a few common traits have been proposed. Resilient organisations question assumptions about their environment constantly and are competitive [40]. Da.hles and Susilowati [18] write there are three components to a business's resilience: survival, adaptation, and innovation- all working together to make an organisation resilient. For hotels, these actions translate into understanding changing risks in a variety of contexts, and working to limit those risks constantly.

Resilient organisations employ adaptive strategies in a rapidly changing environment; the adaptations may fundamentally change the organisation in some ways, but allow it to survive into the future [18]. Organisational structure and culture influence adaptive capacities [102]. As an example, Comfort [12], in her study of the 1994 Northridge Earthquake response, found the response's networked organisational structure and flexible leadership allowed for higher functioning and quicker decision making. When organisations are too rigid and systematic, with too many layers of bureaucracy, they are less able to create adaptation strategies during dynamic events [12,8]. Sawalha [88] studied resilience of insurance companies in Jordan. Findings included that the Jordanian business model characterised by centralized power and hierarchy, with low levels of autonomy and delegation

worked at cross-purpose with resiliency. Organisational structure, adaptability, culture, and flexibility features may all influence hotel disaster resilience. Large hotel chains may have organisational hierarchies that make quick decision-making, flexibility, and adaptive strategizing difficult.

Despite the fact that organisations rarely prioritize resilience building, A. V. Lee et al. [40] argue that many traits of a resilient organisation are also traits of successful organisations. Obstacles to building resilience in organisations include a lack of tangible ideas and concepts for businesses to adopt or adapt for their organisation [52]. These challenges have slowed progress in building resilient organisations. It may be possible to overcome some of these impediments by focusing on the intersection of resilient organisations and successful organisations. Resilient organisations have improved response to more common daily challenges because they have an increased self-awareness, greater ability to manage their vulnerabilities, and are adaptive and innovative [2]. Capitalizing on this idea a hotel may be able to build success commercially while building disaster resilience.

In making a case for organisational resilience building, A. V. Lee et al. [40] proposes adaptive capacity building and pre-planning as components to becoming increasingly resilient to disaster. Paton and Hill [68] also suggest the ability of an organisation to adapt and change predicts a business's ability to survive post disaster. Organisations need to integrate elements of resilience into their daily philosophy to improve response in the face of adversity [88]. Integrating resilience management into everyday business practices through “encouraging increased situation awareness, improved adaptive capacity, and better identification and management of keystone vulnerabilities” is also important ([52], p. 84). Thus, the research points to the importance of organisation's adaptive capacity in building resilience.

### 2.2.3. Economic resilience

Economic resilience is another element of disaster resilience building within the hotel sector. Economic resilience is defined as the “... ability or capacity of a system to absorb or cushion itself against damage or loss” ([86], p. 228). Hotels are fundamentally businesses that must maintain financial viability to continue operations.

There are two distinct areas of business resilience: the customer considerations and the supply considerations [87]. Customer-side resilience takes into account disruptions in customer's service, while supply side looks at service disruptions in supply chains. Both of these areas are important to disaster resilience for hotels. Additionally economic resilience can be broken into two separate measures: static economic resilience concerns the ongoing ability of an organisation to function; and dynamic economic resilience refers to the flexible capacity of organisations to reorganize and stabilize quickly.

An important economic resiliency implication is that local tourism businesses are critical to the wider community economy in terms of providing jobs and customers for other businesses [18]. Additionally, hotels that can remain operational in the aftermath of a hazard event often maintain strong occupancy through services provided to response and recovery teams [21,25,75,83].

The individual business resilience is at micro level of an economy. The industry's resilience (e.g. tourism) is at the meso-economic level, and the community's resilience is the macro-economic level [87]. Accordingly, organisational resilience is linked *and* connected to community economic resilience.

### 2.2.4. Community resilience

Community resilience to disaster is the ability of a group to mitigate and withstand the effects of disaster, however, there is little consensus regarding the components and processes that enable communities to be disaster resilient [9,69]. write that a community's disaster resilience is built on, “... efficacy, problem-focused coping, and a sense of community...” Community resilience has also been defined as “...a process linking a network of adaptive capacities (resources with dynamic

attributes) to adaptation after a disturbance...”([58], p. 127). These characteristics are identified as: 1) economic development - equitable distribution of economic resources within a group; 2) social capital - relationships as resources; 3) information and communication - creating common meaning and understandings and systems to move information in times of stress; and 4) community competence - the ability to make decisions and take actions as a collective. These diverse facets point to the complexity of community resilience.

Organisations and communities are inextricably linked [52]. Resilient businesses assist a community in maintaining social continuity in the aftermath of disaster [57]. Resilient organisations improve the ability of communities to respond to disasters [40,52,88]. Looking at community resilience as a basis for developing a model for building resilience in the tourism sector, Bec et al. [3] use a definition of community resilience that included a group's ability to harness resources to adapt to change [7]. reviews definitions of community resilience and finds “...they refer to “community” as a large social group...” While an imminent and potentially disastrous event can pose incredible challenges for a hotel operation, disaster preparedness and resilience building can mitigate the consequences [39]. A hotel is an integral part of its larger community, but may also its own community. Building resilience requires participation by all stakeholders, across sectors.

Disasters happen to all members of a community at the same time, and recovery must happen together as well [58]. Building communities that are resource and capacity rich, and helping them understand risk is at the heart of resilience building.

Furthermore, planning ways to overcome potential hazards allows communities to take advantage of, and enhance, those qualities and capacities already available to their communities.

The sheer number of components that combine to form a community makes assessing dimensions and indicators for community resilience more difficult [17]. discuss the “multifaceted nature of resilience”, which poses challenges in designing assessment to manage the disaster resilience building process. Furthermore, conditions of resilience are dynamic, not static, so evaluation of components and measures is required on a consistent basis [71]. However, resilience in communities can be enhanced through preparedness planning, risk awareness, and communication [17,37,70]. Hotels, seen through the community resilience lens, are multifaceted groups and need dynamic and collaborative analysis, preparedness, and communication ideas for handling potential disasters.

Based on a composite of ideas presented in this discussion the definition of hotel resilience to disaster in the context of this discussion will be:

A dynamic condition describing the capacity of a hotel, together with its stakeholders, to assess, innovate, adapt, and overcome possible disruptions that may be triggered by disaster.

### 2.3. Disaster resilience and vulnerability in the hotel sector

Resilience and vulnerability are often linked in research; however, they are not opposite ends of the same spectrum [17,7]. It is possible to be vulnerable in some ways, and resilient in others. Vulnerability to disaster describes the extent to which a person, community, organisation, or system is susceptible to negative effects from a hazard [5]. Understanding vulnerabilities to disaster is an integral part of assessing capacities to overcome potential disastrous situations and implementing risk reduction measures.

One danger in equating resilience to vulnerability is the resultant circular thinking, “a system is vulnerable because it is not resilient; it is not resilient because it is vulnerable” ([36], p. 40). Both terms are defined by the specifics (who, when, and what) of the situation [7]. For example, elderly people are often considered a vulnerable population, however in some situations they prove to be resilient due to their array

of experiences to draw from and reduced expectations that the government will come to their rescue [74]. Circumstances can alter resilience and vulnerability of people and groups and requires careful assessment.

Vulnerability is a condition that is evaluated in a pre-disaster setting, resilience is evaluated by post-disaster outcomes [86]. Understanding vulnerabilities that exist in a community is fundamental to building resilience in a community, and ultimately steps to mitigate those vulnerabilities must be taken to build resilience [34]. Enhancing adaptive capacities in tourism destinations can decrease certain vulnerabilities and build resilience [76]. “...the concepts of vulnerability, adaptive capacity and resilience are linked: enterprises that are less vulnerable and have more adaptive capacity are likely to be more ‘resilient.’” ([6], p. 649). Reducing vulnerabilities and embracing sustainable practices are critical to developing disaster resilience [17]. Hotel's evaluation of their vulnerabilities can improve their adaptive capacities and build disaster resilience.

The Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) highlights that disaster continues to hamper efforts to improve sustainability in many economies (United Nations Office for Disaster Risk Reduction [98,99]. The new framework reiterates the essential need of public and private enterprise, and refocuses efforts upon reducing disaster risk and building resilience at all levels.

Specifically the framework challenges the tourism industry to “promote and integrate disaster risk management approaches...given the ...heavy reliance on tourism” in many parts of the world ([98,99], p. 20). Sawalha, Jraisat, and Al-Qudah [89] writes that hotels in Jordan are less likely to allocate resources to activities that do not show an ability to generate profits short term. Short-term thinking can result in response-oriented approach to disaster management. Building disaster resilience for the hotel sector is works in tandem to the objectives and goals of the SFDRR.

### 2.4. Sustainability and disaster resilience in the hotel sector

Sustainable tourism considers what tourism, as a part of a bigger system, works toward sustaining, rather than how to sustain tourism activities (S [51].). In a hotel, actions taken in the course of business that are unsustainable may ultimately make the operation of the business unsustainable too. For example, a hotel that does not account for the health of the local reef in planning tourist activities may damage and degrade the reef making their facility less desirable to snorkelers and reef enthusiasts.

“One way to reduce the susceptibility of communities to loss from hazard consequence is to create a community that is sustainable and resilient” ([32], p. 40). A disaster resilient community contributes to that community's sustainability [36]. Resilience and sustainability may use different avenues and methodologies but they work toward the same goals [42,78]. To achieve sustainability a community should “maintain and, if possible, enhance environmental quality” ([90], p. 79). Sustainability can be natural resource centric, but the objective is continued function with no depreciation of quality of life [49]. A shift that emphasizes sustainable practices may ultimately be good for hotels business in the long term.

While there exists much common ground between sustainability and resiliency, Redman [78] suggests that some objectives may be in conflict and the study of these two subjects should remain independent. This opposing view considers that the adaptive cycle of resilient systems may adopt a new norm that is not sustainable long term, in order to continue functioning in the short term. When building resilience to disasters short-term, non-sustainable adaptations are often critical for survival and a part of the process. For example, in a hotel context consider adaptations like petrol powered generators to maintain minimum critical functionality, while this is a non-sustainable solution it is also often a short-term solution required to maintain operations.



### 3. Disasters and the hotel sector

The body of literature regarding disasters, tourism, and more specifically hotels, has increased over the last 20 years, yet improvements in the hotel sector's disaster preparedness have not kept pace. Ritchie [81] outlines the need of all tourism organisations to assess their vulnerabilities and risks, placing increasing emphasis on planning and prevention, as opposed to the more common focus on response and recovery strategies. There is a need for businesses to consider how they are creating and/or enhancing risks and act to minimize these effects (United Nations Economic and Social Commission for Asia and the Pacific ESCAP [95] S.awalha et al. [89] studied five star Jordanian hotels and found that disaster management was considered a response and recovery activity, as opposed to a proactive management of variables to decrease the possibilities and severities of risks. Faulkner [24] brings to light that few tourism organisations recognize the importance of risk reduction, planning and preparedness.

A history spanning decades of incidents and accidents in the hospitality industry was published in the Cornell Hotel and Restaurant Administrative Quarterly [16]. The account included many well-publicized disasters such as the 1980 Las Vegas fire in the MGM Hotel and the 1982 eruption of Mount Saint Helens (tourism effects on the Pacific Northwest). This 1985 journal editorial explained that the hospitality industry was learning from each of these events, and hotels (as well as restaurants) were reducing their disaster risk with each event. A disagreement is evident in the literature regarding improved disaster management. Some literature reflects that hotels are reviewing past incidents and attempting to learn lessons [16], and other literature contradicts this assertion [20].

Procedures and plans for handling disasters were found to be non-existent in a 1997 survey conducted by Drabek, where 827 hotel guest who had experienced disastrous circumstances participated [20]. Kwortnik [38] argues that the industry seems to be repeating the same mistakes repeatedly, based on a study of some hotel's reactions to the 2003 Blackout in the eastern United States. Chien and Law's [10] article discussed the hotel industry's widespread concern of the spread of SARS, and the lack of guidance for hotels on epidemic topics. During the 2003 SARS, Hong Kong experienced an 80% decrease in tourism as a result of this epidemic [10]. These examples highlight that implementing lessons learned in disaster preparedness for the hotel industry may be low priority.

Preparedness planning helps to ensure resources needed for response and recovery are available, by deciding in advance who will do what, when, and where in different circumstances (United Nations Environmental Programme UNEP [97]. Complete preparedness planning for disasters can also reduce risk [73,80]. writes, "...taking a more strategic or holistic approach to disaster planning and preparation may reduce the likelihood of linked events, 'escalation' or the 'ripple effect' occurring due to the chaotic and complex inter-relationships within an open tourism system." Furthermore, preparedness planning for disasters by the tourism industry should be integrated and viewed as essential in a world where growing numbers of disasters are impacting tourism [81].

The uncertainty of hazards complicates the ability to develop detailed preparedness plans [80]. Even though control over natural forces is rarely possible, the effects of these events on communities can be mitigated and diminished through preparedness efforts. "...surprise is an inevitable event whose magnitude and rippling consequences can be anticipated through knowledge, emerging tools, consensual social collaboration, and preparations to be flexibly innovative" ([13], p. 273). In recent years, building disaster resilience in organisations and communities has been studied as one way to combat the unpredictability of disasters.

Disaster related research for the tourism industry tends to be response and recovery centric, with less attention paid to the preparedness and preventative possibilities [10,24,31,39,4,50,79,102]. The

academic discourse on crises and disasters in the tourism sector is often reactive in its approach. Hall [28] reviewed the literature concerning economic and financial tourism crises between 1977–2010 and found surges in literature following events like oil shortages and the 2001 attack on the World Trade Center in New York. Combating the response centric focus, some authors have worked to develop frameworks that describe pre-disaster emergency response planning and post-disaster activities.

Frameworks, models, and planning techniques have been explored and developed for the tourism industry, and to a lesser extent hotels ([24,31,45,5,50,65,77,79,92,102]. The tourism industry is encouraged though the growing literature to take action to improve their ability to survive and even thrive in the aftermath of a disaster. In practice, however, a response focused attitude toward disasters seems to continue to be prevalent in the tourism sector.

The recent Hotel Resilient programme provides guidance to strengthen disaster resilience for the hotel sector through design and promotion of a certification programme [100]. The certification is focused on larger properties, with a more guidance-oriented approach for smaller hotels. The programme, sponsored by the UNISDR, GIDRM, and PATA aims to build resilience to disaster though encouraging disaster risk reduction strategies in three categories, with 18 sub-categories [35]. These categories include building location, design and structural elements, systems design to warn and minimize risk, (e.g. fire protection and evacuation systems), and management risk reduction planning components, which include training, drills, communications planning, and continuity planning.

The Hotel Resilient programme is currently piloting in Indonesia, the Maldives, Myanmar, the Philippines, and Thailand [101]. A scoping study, of interviews with 17 hotel and tourism professionals, explains that a hotel's disaster risk and resilience is not currently a priority for guests; however, guest's general interest in safety is increasing. The existing barriers to the programme were consistent with the literature; interviewees identified cost, time, and capacity as potential obstacles to engaging in a certification programme [101].

This programme offers a great step forward for hotels; however, focus is on disaster risk reduction strategies (e.g. infrastructure, warning, and risk reduction planning). While disaster risk reduction is a component of disaster resilience, this initiative does not seek to address other possible components of organisational resilience. These include organisational structure and flexibility [102,18], adaptive capacity [40,102], and less tangible resources such as social capital [37]. Qualities such as sense of community and self-efficacy improve resiliency [26,37], and may be more influenced by organisational culture than disaster risk reduction strategies. Unfortunately, the Hotel Resilient programme does not delve into these subjects.

Building preparedness and resilience to disasters in the tourism sector lacks significant progress [31,45]. For example, in 2006, Hystad and Keller [31] did a follow-up study, three years after a major forest fire affected tourism businesses near Kelowna, British Columbia, Canada. In the original study, 104 tourism businesses were surveyed regarding their preparedness for disaster. The original 2003 study concluded the businesses were not prepared for a forest fire, although an occurrence of an event like this fire was highly probable [30]. The 2006 follow-up study identified 38% (up from the previous study showing 26%) of those businesses in their study had a disaster management plan. Further analysis of the data revealed that the majority of those businesses had only informal planning. The study's conclusion was that tourism businesses lack the will to improve and develop their own contingency planning ([31], p. 157).

Hotel staffs, along with the organisations, are unprepared to face disasters that may affect hotels. Staff members were found to be lacking information on disaster practices and hotels failed to carefully assess their risks [102]. Mahon, Becken, and Rennie [44] suggest tourism employees may not have confidence that their employer's plans are sufficient to be effective in the face of disaster. The inclusion of

stakeholders, including staff, in disaster management activities is important for the success of preparedness planning and emergency response.

Disaster planning undertaken by accommodations managers in Australia was reported to be at 74.9% in a study by Ritchie, Bentley, Koruth, and Wang [81]. However, the authors recognize the study, while positive trend in increased disaster planning, relied on self-reporting by accommodations managers and did not detail the extent to which the planning had been done. The reactive, rather than proactive, management of disasters and that plans were not necessarily embedded in their organisation was a point [63] research highlighted.

Hotels in New Orleans, post-Hurricane Gustav, were closed for up to 7 days, with the median being 3 days [39]. Full service, food and housekeeping, was not restored for 6–12 days following the hurricane (only 6% reported loss of power as reason for delay). Lack of staff to run the operation was found to be the primary cause. Lamanna et al. [39] examined New Orleans hotels' response to Hurricane Gustav in 2008. The study showed that while 80% indicated they had a written plan for hurricane evacuation, only 54% involved their staff in the process and 58% had procedures for training staff. 46% provided an annual exercise for the staff to participate. New Orleans hotels have capitalized on lessons learned from previous hurricanes, yet they still have much room for growth and improved resilience. Based on these reviews it is clear that tourist organisations, including hotels, are not proactively assessing, and planning, to minimize their risk to disaster.

### 3.1. Increased disaster risk existing in the hotel sector

Communities must consider carefully the role they play in creating some of the billion dollar losses attributed to disasters [56]. This idea, viewed through a tourism lens, serves to illustrate that hotels may play a role in creating their risk. High-risk locations and attraction of guest unfamiliar with the area combined with inattention to staff training and preparedness planning can be an expansive and lethal combination. The accommodation sector is vulnerable to disaster based on its 24/7 model and sensitivity to external factors [82]. Hotels are often located in high-risk locations based on guest preference to vacation in coastal or alpine environments [53,62,81].

As an industry, the tourism sector has been found to avoid openly discussing hazards of any sort [11]. The marketing literature of hotels is designed to entice guests, thus chooses to minimize any risk potential while highlighting local activities and positive features. Tourist can be particularly vulnerable in a disaster due to their lack of familiarity with the region, customs, hazards, and local language [33,39,46,53,59]. This lack of familiarity and knowledge can inhibit their ability to take protective actions. It has been argued that lack of community and business preparedness, and official tsunami warnings exacerbated the effects of the 2004 Indian Ocean Tsunami [45]. Guests and locals alike simply did not recognize the immediate danger (as the water receded unexpectedly) and the critical need to head to higher ground.

Beyond commercial enterprise, caring for communities, environments, or assist in social development is an organisations responsibility, often termed corporate social responsibility [29,41]. In addition to the above responsibilities, Henderson expands on this concept, stating that visitors to an area need to be supported and oriented to their new environment. Hotels have a corporate social responsibility to have plans to care for, and keep safe, their staff and guests [29].

A study of hotels in Thailand, following the 2004 Boxing Day tsunami, looks further into corporate social responsibility. Common traits of socially responsible organisations included, "...investment and involvement in social welfare... compliance with official regulations and a willingness to exceed these...education and engagement of customers and staff about social and environmental issues of concern ([29], p. 232). The hotel sector's responsibility must include placing high value on ensuring the safety of their staff and guests, while also improving their organisation's ability to come through disastrous events

and continue to be operational and profitable [29].

Hotels have a responsibility to understand their risk and vulnerabilities- and create strategies to prevent or mitigate events stemming from predictable disasters [44]. The expansion of the tourism industry gives rise to the need for disaster preparedness and investigation of ways to return to operative capacity [97,96]). Disaster resilience building can decrease effects of events, improve life safety, and get hotels back to operational status.

### 3.2. Building disaster resilience in the hotel sector

The hotel sector's around the clock, 365 day a year model elevates the importance of disaster resiliency. Guests will always be present, as will staff. Disaster resiliency for hotels may translate into lives saved, as well as business reputation. However, the idea that disaster preparedness plans, disaster risk reduction activities, and disaster resilience building are separate activities from commercial concerns is reflected in the literature. An example of this disconnect may include managing a profitable hotel business; yet, managers do not prioritize planning for continued operations following a disaster. Competition for support and funds can be difficult as preparedness planning and resilience building are hard to quantify in regards to return on time and investment [40,52]. Furthermore, tourism operators may not be making headway due to the already voluminous workload, leaving little time to pursue new planning avenues [63].

Promoting benefits to building disaster resilience that also work toward improved profitability and functionality may improve the buy-in from management. One study of hotel stock prices indicated socially responsible actions can improve a hotel company's short and long term profitability [41]. Illuminating the value of building resilience- for both day to day operations and in times of disaster may also promote a greater understanding of what a resilient organisation truly looks like [52]. "...elements of resilience and competitive excellence share many of the same features...", for example, organisations with these characteristics constantly scan for and interpret changes or risks in the environment and develop adaptations as needed [40], p. 31). Disaster resilience building may be a tandem feature of competitive business practice.

The academic literature on resilient organisations suggests that business continuity plans are essential and should provide a range of functions: 1) management and information systems to continue as needed for core business functions; 2) management's ability to transition from routine to crisis mode; and 3) preparedness plans that are designed to ensure operating capacity and capability even under extreme conditions created by a disaster ([68], p. 251). Business continuity planning is focused on establishing a strategic plan to re-establish key business operations to ensure business survival [57]. Business continuity planning may include such things as audits of facilities, identifying key persons, developing prevention strategies, and acquiring insurance to cover potential losses [57]. In addition, preparedness planning for organisations must include how to operate in unusual conditions, such as lack of water or power. Resilient enterprises analyse disruptions to find positive actions that will carry the business forward.

The ability to plan for and manage disastrous situations ought to be integral to management training for tourism professionals [102]. Disaster planning may be integrated into a business's strategic management and planning as the two concepts share the objective of long term survival of an organisation [102]. Strategic plans allow for quicker reaction. Lack of planning can result in slow decision-making and slow action plan formulation following an incident. Delays can exacerbate the impact. At the same time planning can be challenged by the chaotic nature of an unfolding disaster [79].

There is an overlap between business continuity planning, strategic management, and resilience building. However, building resilience also considers flexibility, social capital, and innovation in ways that business

continuity planning and strategic management may not. Clearly if managers are building disaster resilience in their continuity and/or strategic planning, an opportunity to shift the paradigm toward improved disaster resilience exists. Tourism's essential and integral ties to the community require a level of responsibility to maintain operative capacity [29]. The ability for a business within a community to continue to operate during a disaster is foundational to the overarching recovery of the wider community [52].

#### 4. Conclusion

A synthesis of the literature points to the importance of prioritizing disaster resilience building for the hotel sector. As the numbers of tourists affected by disasters grows, the importance of providing actionable information to limit the severity of these events on communities, including hotels, also escalates in pace. The literature discussion above scrutinizes how disaster and resilience are framed for the tourism sector, and how these concepts apply to the hotel sector.

Resilience to disasters for the hotel sector is a dynamic condition describing the capacity of the organisation, together with its stakeholders, to assess, innovate, adapt, and overcome possible disruptions triggered by disaster. Integrated into building disaster resilience for hotels is disaster risk reduction activities (including structural and non-structural analysis that looks at operational and service factors from an all hazards perspective), and preparedness. Sustainability of hotel policies and actions need scrutiny.

Improving resilience requires building adaptive capacity, creating flexible organisations and fostering an organisational culture that promotes self-efficacy, innovation and questions the status quo. To promote building resilience, all stakeholders at every level of the process must be involved. An interactive exchange of ideas promotes growth of social capital and builds resilience. Clarified framing and simple tools can promote a hotel's ability to understand, measure, and build resilience, moving more hotels toward embracing disaster resilience as an objective of value- worth the time, effort, and resources required.

#### References

- [1] A.R. Albattat, A.P. Mat Som, Emergency preparedness for disasters and crises in the hotel industry, *SAGE Open* 3 (3) (2013) 1–10, <http://dx.doi.org/10.1177/2158244013505604>.
- [2] P. Aldunce, R. Beilin, J. Handmer, M. Howden, Framing disaster resilience: the implications of the diverse conceptualisations of “bouncing back”, *Disaster Prev. Manag.* 23 (3) (2014) 252–270, <http://dx.doi.org/10.1108/dpm-07-2013-0130>.
- [3] A. Bec, C. McLennan, B.D. Moyle, Community resilience to long-term tourism decline and rejuvenation: a literature review and conceptual model, *Curr. Issues Tour.* 19 (5) (2015) 431–457, <http://dx.doi.org/10.1080/13683500.2015.1083538>.
- [4] S. Becken, K.F.D. Hughey, Linking tourism into emergency management structures to enhance disaster risk reduction, *Tour. Manag.* 36 (2013) 77–85, <http://dx.doi.org/10.1016/j.tourman.2012.11.006>.
- [5] S. Becken, R. Mahon, H.G. Rennie, A. Shakeela, The tourism disaster vulnerability framework: an application to tourism in small island destinations, *Nat. Hazards* 71 (1) (2013) 955–972, <http://dx.doi.org/10.1007/s11069-013-0946-x>.
- [6] D. Biggs, C.M. Hall, N. Stoekli, The resilience of formal and informal tourism enterprises to disasters: reef tourism in Phuket, Thailand, *J. Sustain. Tour.* 20 (5) (2012) 645–665, <http://dx.doi.org/10.1080/09669582.2011.630080>.
- [7] P. Buckle, Assessing social resilience, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006, pp. 88–104.
- [8] S. Celik, S. Corbacioglu, Interorganizational coordination: analysis of 2011 Van earthquakes, in: N. Kapucu, C.V. Hawkins, F.I. Rivera (Eds.), *Disaster Resiliency: Interdisciplinary Perspective*, Routledge, New York, New York, 2013, pp. 308–333.
- [9] A. Chandra, J. Acosta, S. Stern, L. Uscher-Pines, M.V. Williams, D. Yeung, ... L.S. Meredith, Building Community Resilience to Disasters: A Way Forward to Enhance National Security (Tr 915), 2011. Retrieved from Santa Monica, CA: <[http://www.rand.org/content/dam/rand/pubs/technical\\_reports/2011/RAND\\_TR915.pdf](http://www.rand.org/content/dam/rand/pubs/technical_reports/2011/RAND_TR915.pdf)>.
- [10] G.C.L. Chien, R. Law, The impact of the severe acute respiratory syndrome on hotels: a case study of Hong Kong, *Int. J. Hosp. Manag.* 22 (3) (2003) 327–332, [http://dx.doi.org/10.1016/S0278-4319\(03\)00041-0](http://dx.doi.org/10.1016/S0278-4319(03)00041-0).
- [11] E. Cohen, Death in paradise: Tourist fatalities in the tsunami disaster in Thailand, *Curr. Issues Tour.* 12 (2) (2009) 183–199, <http://dx.doi.org/10.1080/13683500802531141>.
- [12] L.K. Comfort, Risk and resilience: Interorganizational learning following the Northridge Earthquake of 17 January 1994, *J. Contingencies Crisis Manag.* 2 (3) (1994) 157–170, <http://dx.doi.org/10.1111/j.1468-5973.1994.tb00038.x>.
- [13] L.K. Comfort, A. Boin, C.C. Demchak, Resilience revisited: an action agenda for managing extreme events, in: L.K. Comfort, A. Boin, C.C. Demchak (Eds.), *Designing Resilience: Preparing for Extreme Events*, University of Pittsburgh Press, Pittsburgh, PA, 2010, pp. 272–284.
- [14] L.K. Comfort, A. Boin, C.C. Demchak, Resilience revisited: an action agenda for managing extreme events, in: L.K. Comfort, A. Boin, C.C. Demchak (Eds.), *Designing Resilience: Preparing for Extreme Events*, University of Pittsburgh Press, Pittsburgh, PA, 2010.
- [15] M. Cooper, Japanese tourism and the SARS epidemic of 2003, *J. Travel Tour. Mark.* 19 (2–3) (2005) 117–131, [http://dx.doi.org/10.1300/J073v19n02\\_10](http://dx.doi.org/10.1300/J073v19n02_10).
- [16] Cornell Hotel and Restaurant Administrative Quarterly, The bad news, *Cornell Hotel Restaur. Adm. Q.* 26 (1) (1985) 87–91, <http://dx.doi.org/10.1177/001088048502600114>.
- [17] S.L. Cutter, L. Barnes, M. Berry, C. Burton, E. Evans, E. Tate, J. Webb, A place-based model for understanding community resilience to natural disasters, *Glob. Environ. Change* 18 (4) (2008) 598–606, <http://dx.doi.org/10.1016/j.gloenvcha.2008.07.013>.
- [18] H. Dahles, T.P. Susilowati, Business resilience in times of growth and crisis, *Ann. Tour. Res.* 51 (2015) 34–50, <http://dx.doi.org/10.1016/j.annals.2015.01.002>.
- [19] N. de Saumarez, The Indian Ocean Tsunami, *Tour. Hosp. Plan. Dev.* 2 (1) (2005) 55–59, <http://dx.doi.org/10.1080/14790530500072278>.
- [20] T.E. Drabek, Understanding tourists during disaster, *Aust. J. Emerg. Manag., Summer* (1997) 14–18.
- [21] T.E. Drabek, Disaster evacuations: Tourist-business managers rarely act as customers expect, *Cornell Hotel Restaur. Adm. Q.* (2000) 48–57.
- [22] J.R. Eiser, A. Bostrom, I. Burton, D.M. Johnston, J. McClure, D. Paton, ... M.P. White, Risk interpretation and action: a conceptual framework for responses to natural hazards, *Int. J. Disaster Risk Reduct.* 1 (2016) 5–16, <http://dx.doi.org/10.1016/j.ijdr.2012.05.002>.
- [23] A.-M. Esnard, Taking action in uncertain environments: connecting resilience to hazards, in: N. Kapucu, C.V. Hawkins, F.I. Rivera (Eds.), *Disaster Resiliency: Interdisciplinary Perspectives*, Routledge, New York, NY, 2013, pp. 121–125.
- [24] B. Faulkner, Towards a framework for tourism disaster management, *Tour. Manag.* 22 (2001) 135–147.
- [25] B. Faulkner, S. Vikulov, Katherine, washed out one day, back on track the next: a post-mortem of a tourism disaster, *Tour. Manag.* 22 (2001) 331–344.
- [26] K.K. Finnis, D. Johnston, J.S. Becker, K.R. Ronan, D. Paton, School and community-based hazards education and links to disaster-resilient communities, *Reg. Dev. Dialog.* 28 (2) (2007) 99–108.
- [27] C. Folke, S. Carpenter, B. Walker, M. Scheffer, T. Chapin, J. Rockström, Resilience thinking: Integrating resilience, adaptability and transformability, *Ecol. Soc.* 15 (2010) 4.
- [28] C.M. Hall, Crisis events in tourism: subjects of crisis in tourism, *Curr. Issues Tour.* 13 (5) (2010) 401–417, <http://dx.doi.org/10.1080/13683500.2010.491900>.
- [29] J.C. Henderson, Corporate social responsibility and tourism: hotel companies in Phuket, Thailand, after the Indian Ocean tsunami, *Int. J. Hosp. Manag.* 26 (1) (2007) 228–239, <http://dx.doi.org/10.1016/j.ijhm.2006.02.001>.
- [30] P.W. Hystad, P. Keller, Disaster management: Elowna tourism industry's preparedness, impact and response to a 2003 major forest fire, *J. Hosp. Tour. Manag.* 13 (1) (2006) 44–58, <http://dx.doi.org/10.1375/jhtm.13.1.44>.
- [31] P.W. Hystad, P.C. Keller, Towards a destination tourism disaster management framework: long-term lessons from a forest fire disaster, *Tour. Manag.* 29 (1) (2008) 151–162, <http://dx.doi.org/10.1016/j.tourman.2007.02.017>.
- [32] D. Johnston, J. Becker, J. Cousins, Lifelines and urban resilience, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Springfield, IL: Charles C. Thomas, 2006, pp. 40–65.
- [33] D. Johnston, J. Becker, C. Gregg, B. Houghton, D. Paton, G. Leonard, R. Garside, Developing warning and disaster response capacity in the tourism sector in coastal Washington, USA, *Disaster Prev. Manag.* 16 (2) (2007) 210–216, <http://dx.doi.org/10.1108/09653560710739531>.
- [34] N. Kapucu, C.V. Hawkins, F.I. Rivera, Disaster resiliency: interdisciplinary perspectives, in: N. Kapucu, C.V. Hawkins, F.I. Rivera (Eds.), *Disaster Resiliency: Interdisciplinary Perspectives*, 1st ed., Routledge, New York, New York, 2013.
- [35] B. Khazai, Hotel Resilient. Paper presented at the Asian Business Forum 2016, Bangkok, Thailand, 2016. <[http://www.adpc.net/igo/contents/blogs/ABF2016/download/presentation/Day%202\\_21%20Apr%202016/04\\_Technical%20Session%204/01\\_AsianBusinessForum\\_Hanna%20Maier\\_Bijan%20Khazai\\_Hotel%20Resilient.pdf](http://www.adpc.net/igo/contents/blogs/ABF2016/download/presentation/Day%202_21%20Apr%202016/04_Technical%20Session%204/01_AsianBusinessForum_Hanna%20Maier_Bijan%20Khazai_Hotel%20Resilient.pdf)>.
- [36] R.J.T. Klein, R.J. Nicholls, F. Thomalla, Resilience to natural hazards: how useful is this concept? *Environ. Hazards* 5 (1) (2003) 35–45, <http://dx.doi.org/10.1016/j.hazards.2004.02.001>.
- [37] A.H. Kwok, E.E.H. Doyle, J. Becker, D. Johnston, D. Paton, What is ‘social resilience’? Perspectives of disaster researchers, emergency management practitioners, and policymakers in New Zealand, *Int. J. Disaster Risk Reduct.* 19 (2016) 197–211, <http://dx.doi.org/10.1016/j.ijdr.2016.08.013>.
- [38] R.J. Kwornik, Safeguarding hospitality service when the unexpected happens: Lessons learned from the blackout of '03, *Cornell Hotel Restaur. Adm. Q.* 46 (1) (2005) 13–39, <http://dx.doi.org/10.1177/0010880404272018>.
- [39] Z. Lamanna, K.H. Williams, C. Childers, An assessment of resilience: disaster management and recovery for Greater New Orleans' hotels, *J. Hum. Resour. Hosp. Tour.* 11 (3) (2012) 210–224, <http://dx.doi.org/10.1080/15332845.2012.668653>.



- [40] A.V. Lee, J. Vargo, E. Seville, Developing a tool to measure and compare organizations' resilience, *Nat. Hazards Rev.* 14 (1) (2013) 29–41, [http://dx.doi.org/10.1061/\(asce\)nh.1527-6996.0000075](http://dx.doi.org/10.1061/(asce)nh.1527-6996.0000075).
- [41] S. Lee, S.-Y. Park, Do socially responsible activities help hotels and casinos achieve their financial goals? *Int. J. Hosp. Manag.* 28 (1) (2009) 105–112, <http://dx.doi.org/10.1016/j.ijhm.2008.06.003>.
- [42] D. Lerch, Six Foundations for Building Community Resilience, 2015. Retrieved from Santa Rosa, CA: <http://www.postcarbon.org/wp-content/uploads/2015/11/Six-Foundations-for-Building-Community-Resilience.pdf>.
- [43] Z. Maditinos, C. Vassiliadis, Crises and disasters in Tourism Industry: Happen locally- affect globally. in: Proceedings of the Paper Presented at the Management of International Business and Economics Systems, (MIBES) Conference, 2008. [http://mibes.teilar.gr/ebook/ebooks/maditinos\\_vassiliadis%2067-76.pdf](http://mibes.teilar.gr/ebook/ebooks/maditinos_vassiliadis%2067-76.pdf) (Accessed 22 March 2016).
- [44] R. Mahon, S. Becken, H. Rennie, Evaluating the business case for investment in the resilience of the tourism sector of small island developing states. Background Paper Prepared for the Global Assessment Report on Disaster Risk Reduction, 2013. Retrieved from <http://www.preventionweb.net/english/hyogo/gar/2013/en/bgdocs/Mahon%20et.al.%202012.pdf>.
- [45] R. Malhotra, U. Venkatesh, Pre-crisis period planning: lessons for hospitality and tourism, *Worldw. Hosp. Tour. Themes* 1 (1) (2009) 66–74, <http://dx.doi.org/10.1108/17554210910949896>.
- [46] P. Mantyniemi, An analysis of seismic risk from a tourism point of view, *Disasters* 36 (3) (2012) 465–476, <http://dx.doi.org/10.1111/j.1467-7717.2011.01266.x>.
- [47] P. Martin-Breen, J.M. Anderies, Resilience: A Literature Review, 2011. Retrieved from [https://docs.google.com/document/d/1xclnW\\_w0lqblScN\\_2KwMCF024sR4Q-9JXx6CAcYL\\_go/edit](https://docs.google.com/document/d/1xclnW_w0lqblScN_2KwMCF024sR4Q-9JXx6CAcYL_go/edit).
- [48] A.S. Masten, J. Obradovic, Competence and resilience in development, *Ann. N.Y. Acad. Sci.* 1094 (2006) 13–27, <http://dx.doi.org/10.1196/annals.1376.003>.
- [49] J.S. Mayunga, Understanding and applying the concept of community disaster resilience: A capital-based approach. Paper Presented at the 2007 Summer Academy Megacities: Social Vulnerability and Resilience Building, 22–28 July, Munich, Germany, 2007. [https://www.u-cursos.cl/usuario/3b514b53bc4025aaf9a6781047e4a66/mi\\_blog/r/11\\_Joseph\\_S\\_Mayunga.pdf](https://www.u-cursos.cl/usuario/3b514b53bc4025aaf9a6781047e4a66/mi_blog/r/11_Joseph_S_Mayunga.pdf).
- [50] B.N. McCool, The need to be prepared: disaster management in the hospitality industry, *J. Bus. Hotel Manag.* 01 (02) (2012), <http://dx.doi.org/10.4172/2324-9129.1000101>.
- [51] S. McCool, R. Butler, R. Buckley, D. Weaver, B. Wheeler, Is concept of sustainability utopian: Ideally perfect but impracticable? *Tour. Recreat. Res.* 38 (2) (2015) 213–242, <http://dx.doi.org/10.1080/02508281.2013.11081746>.
- [52] S. McManus, E. Seville, J. Vargo, D. Brunson, Facilitated process for improving organizational resilience, *Nat. Hazards Rev.* 9 (2008) 81–90, [http://dx.doi.org/10.1061/\(ASCE\)1527-6988/2008/9/2/81](http://dx.doi.org/10.1061/(ASCE)1527-6988/2008/9/2/81).
- [53] K. Méheux, E. Parker, Tourist sector perceptions of natural hazards in Vanuatu and the implications for a small island developing state, *Tour. Manag.* 27 (1) (2006) 69–85, <http://dx.doi.org/10.1016/j.tourman.2004.07.009>.
- [54] C.A. Mendoza, J.G. Brida, N. Garrido, The impact of earthquakes on Chile's international tourism demand, *J. Policy Res. Tour., Leis. Events* 4 (1) (2012) 48–60, <http://dx.doi.org/10.1080/19407963.2011.636923>.
- [55] Ministry of Civil Defence & Emergency Management, The 4Rs, 2017. Retrieved from <http://www.civildefence.govt.nz/cdem-sector/cdem-framework/the-4rs/>.
- [56] D. Mileti, *Disasters by Design: A Reassessment of Natural Hazards in the United States*, Joseph Henry Press, Washington D.C., 1999.
- [57] T. Moore, R. Lakha, Business continuity management: principles and approaches, in: T. Moore, R. Lakha (Eds.), *Tolley's Handbook of Disaster and Emergency Management; Principles and Practice*, 3rd ed, Elsevier Ltd, Oxford, UK, 2006, pp. 1–39.
- [58] F.H. Norris, S.P. Stevens, B. Pfefferbaum, K.F. Wyche, R.L. Pfefferbaum, Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness, *Am. J. Commun. Psychol.* 41 (1–2) (2008) 127–150, <http://dx.doi.org/10.1007/s10464-007-9156-6>.
- [59] North-Eastern Atlantic and Mediterranean Tsunami Information Centre (NEAMTIC), A guide of tsunamis for hotels, 2012. Retrieved from Paris, France: <http://neamtic.ioc-unesco.org>.
- [60] B. Nowell, T. Steelman, The role of responder networks in promoting community resilience: toward a measurement framework of network capacity, in: N. Kapucu, C.V. Hawkins, F.L. Rivera (Eds.), *Disaster Resiliency: Interdisciplinary Perspectives*, Routledge, New York, NY, 2013.
- [61] C. Orchiston, Tourism and seismic risk: perceptions, preparedness and resilience in the zone of the Alpine Fault, Southern Alps, New Zealand, (Doctoral dissertation), University of Otago, 2010. Retrieved from OUR Archive <http://hdl.handle.net/10523/395>.
- [62] C. Orchiston, Seismic risk scenario planning and sustainable tourism management: Christchurch and the Alpine Fault zone, *J. Sustain. Tour.* 20 (1) (2012) 59–79, <http://dx.doi.org/10.1080/09669582.2011.617827>.
- [63] C. Orchiston, Tourism business preparedness, resilience and disaster planning in a region of high seismic risk: the case of the Southern Alps, New Zealand, *Curr. Issues Tour.* 16 (5) (2013) 477–494, <http://dx.doi.org/10.1080/13683500.2012.741115>.
- [64] C. Orchiston, J.E.S. Higham, Knowledge management and tourism recovery (de) marketing: the Christchurch earthquakes 2010–2011, *Curr. Issues Tour.* 19 (1) (2014) 64–84, <http://dx.doi.org/10.1080/13683500.2014.990424>.
- [65] A. Paraskevas, Aligning strategy to threat: a baseline anti-terrorism strategy for hotels, *Int. J. Contemp. Hosp. Manag.* 25 (1) (2013) 140–162, <http://dx.doi.org/10.1108/09596111311290264>.
- [66] C.F. Parker, Complex negative events and the diffusion of crisis: lessons from the 2010 and 2011 Icelandic Volcanic ash cloud events, *Geogr. Ann.: Ser. A, Phys. Geogr.* 97 (1) (2015) 97–108, <http://dx.doi.org/10.1111/geoa.12078>.
- [67] D. Paton, Disaster resilience: building capacity to co-exist with natural hazards and their consequences, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006, pp. 3–10.
- [68] D. Paton, R. Hill, Managing company risk and resilience through business continuity management, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006, pp. 246–266.
- [69] D. Paton, D. Johnston, Disasters and communities: vulnerability, resilience and preparedness, *Disaster Prev. Manag.* 10 (4) (2001) 270–277, <http://dx.doi.org/10.1108/eum0000000005930>.
- [70] P. Buckle, Assessing social resilience, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006.
- [71] D. Paton, G. Kelly, M. Doherty, Exploring the complexity of social and ecological resilience to hazards, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006, pp. 190–212.
- [72] D. Pearlman, O. Melnik, Hurricane Katrina's effect on the perception of New Orleans leisure tourists, *J. Travel Tour. Mark.* 25 (1) (2008) 58–67, <http://dx.doi.org/10.1080/10548400802164905>.
- [73] L. Pennington-Gray, B. Thapa, K. Kaplanidou, I. Cahyanto, E. McLaughlin, Crisis planning and preparedness in the United States tourism industry, *Cornell Hosp. Q.* 52 (3) (2011) 312–320, <http://dx.doi.org/10.1177/1938965511410866>.
- [74] J.A. Pooley, L. Cohen, M. O'Conner, Links between community and individual resilience: evidence from cyclone affected communities in North West Australia, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006, pp. 161–173.
- [75] S.M. Pottorff, D.D.M. Neal, Marketing implications for post-disaster tourism destinations, *J. Travel Tour. Mark.* 3 (1) (1994) 115–122, [http://dx.doi.org/10.1300/J073v03n01\\_08](http://dx.doi.org/10.1300/J073v03n01_08).
- [76] K. Price-Howard, P.J. Holladay, Resorts, resilience and retention after the BP oil spill disaster of 2010, *J. Tour. Insights* 5 (1) (2014), <http://dx.doi.org/10.9707/2328-0824.1044>.
- [77] B. Prideaux, The need to use disaster planning frameworks to respond to major tourism disasters, *J. Travel Tour. Mark.* 15 (4) (2004) 281–298, [http://dx.doi.org/10.1300/J073v15n04\\_04](http://dx.doi.org/10.1300/J073v15n04_04).
- [78] C.L. Redman, Should sustainability and resilience be combined or remain distinct pursuits? *Ecol. Soc.* 19 (2) (2014), <http://dx.doi.org/10.5751/es-06390-190237>.
- [79] B.W. Ritchie, Chaos, crises and disasters: a strategic approach to crisis management in the tourism industry, *Tour. Manag.* 25 (6) (2004) 669–683, <http://dx.doi.org/10.1016/j.tourman.2003.09.004>.
- [80] B.W. Ritchie, Tourism disaster planning and management: from response and recovery to reduction and readiness, *Curr. Issues Tour.* 11 (4) (2008) 315–348, <http://dx.doi.org/10.1080/13683500802140372>.
- [81] B.W. Ritchie, *Crisis and Disaster Management for Tourism*, Channel View Publications, Bristol, UK; Buffalo, NY, 2009.
- [82] B.W. Ritchie, G. Bentley, T. Koruth, J. Wang, Proactive crisis planning: lessons for the accommodation industry, *Scand. J. Hosp. Tour.* 11 (3) (2011) 367–386, <http://dx.doi.org/10.1080/15022250.2011.600591>.
- [83] B.W. Ritchie, J.C. Crotts, A. Zehrer, G.T. Volksy, Understanding the effects of a tourism crisis: the impact of the BP Oil Spill on regional lodging demand, *J. Travel Res.* 53 (1) (2013) 12–25, <http://dx.doi.org/10.1177/0047287513482775>.
- [84] J.P. Rickett, Definitions are not what they seem, *Risk Manag.* 1 (3) (1999) 37–47.
- [85] H. Rodriguez, E.L. Quarantelli, R. Dynes, H. Rodriguez, E.L. Quarantelli, R. Dynes (Eds.), *Handbook of Disaster Research*, Springer Science + Business Media, LLC, New York, New York, 2007.
- [86] A. Rose, Economic resilience to disasters: toward a consistent and comprehensive formulation, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006, pp. 226–248.
- [87] A. Rose, E. Krausmann, An economic framework for the development of a resilience index for business recovery, *Int. J. Disaster Risk Reduct.* 5 (2013) 73–83, <http://dx.doi.org/10.1016/j.ijdr.2013.08.003>.
- [88] I.H.S. Sawalha, Managing adversity: understanding some dimensions of organizational resilience, *Manag. Res. Rev.* 38 (4) (2015) 346–366, <http://dx.doi.org/10.1108/mrr-01-2014-0010>.
- [89] I.H.S. Sawalha, L.E. Jraisat, K.A.M. Al-Qudah, Crisis and disaster management in Jordanian hotels: practices and cultural considerations, *Disaster Prev. Manag.* 22 (3) (2013) 210–228, <http://dx.doi.org/10.1108/dpm-09-2012-0101>.
- [90] R.O. Schneider, Hazard mitigation: a priority for sustainable communities, in: D. Paton, D. Johnston (Eds.), *Disaster Resilience: An Integrated Approach*, Charles C. Thomas, Springfield, IL, 2006, pp. 66–87.
- [91] M. Singal, R.E. Wokutch, S. Ho, S.K. Murrman, Coping with Katrina: Fairmont's response to Hurricane Katrina, *Bus. Case J.* 17 (2) (2010) 1–22.
- [92] S. Sydner-Bouso, K. Stafford, M. Tews, H. Adler, Toward a resilience model for the hospitality and tourism industry, *J. Hum. Resour. Hosp. Tour.* 10 (2) (2011) 195–217, <http://dx.doi.org/10.1080/15332845.2011.536942>.
- [93] D. Thompson, P. Muriel, D. Russel, P. Osborne, A. Bromley, M. Rowland, ... C. Brown, Economic costs of the foot and mouth disease outbreak in the United Kingdom in 2001, *Rev. Sci. Et. Tech. De. L'Office Int. Des. Epizoot.* 21 (3) (2002) 675–687.
- [94] C.-H. Tsai, T.-c. Wu, G. Wall, S.-C. Linliu, Perceptions of tourism impacts and community resilience to natural disasters, *Tour. Geogr.* 18 (2) (2016) 152–173, <http://dx.doi.org/10.1080/14616688.2016.1149875>.
- [95] United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), Disasters without Borders: Regional Resilience for Sustainable Development, 2015. Retrieved from <http://www.unescap.org/sites/default/files/Full%20Report%20%20%5BLow-Res%5D.pdf>.



- [96] United Nations Environment Programme (UNEP), & Caribbean Alliance for Sustainable Tourism (CAST), Disaster Risk Management for Coastal Tourism Destinations Responding to Climate Change: A Practical Guide for Decision Makers, 2008. Retrieved from Paris, France: <[http://www.preventionweb.net/files/13004\\_DTIx1048xPADisasterRiskManagementfo.PDF](http://www.preventionweb.net/files/13004_DTIx1048xPADisasterRiskManagementfo.PDF)>.
- [97] United Nations Environmental Programme (UNEP), Disaster Risk Reduction: A Toolkit for Tourism Destination, 2008. Retrieved from Paris, France: <[http://www.preventionweb.net/files/13875\\_DTIx1116xPADisasterRiskReductioninA.pdf](http://www.preventionweb.net/files/13875_DTIx1116xPADisasterRiskReductioninA.pdf)>.
- [98] United Nations Office for Disaster Risk Reduction (UNISDR), Hotel Resilient: Strengthening the Resilience of the Tourism Sector, 2015. Retrieved from <[https://www.unisdr.org/2015/docs/asiapacific/HotelResilientFactsheet\\_2015.04.pdf](https://www.unisdr.org/2015/docs/asiapacific/HotelResilientFactsheet_2015.04.pdf)> (Accessed 22 March 2016).
- [99] United Nations Office for Disaster Risk Reduction (UNISDR), Sendai Framework for Disaster Risk Reduction 2015–2030. 2015. Retrieved from <[http://www.preventionweb.net/files/43291\\_sendaiframeworkfordrren.pdf](http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf)>.
- [100] United Nations Office for Disaster Risk Reduction (UNISDR), Global Initiative on Disaster Risk Management (GIDRM), & Pacific Asia Travel Association (PATA), Hotel Resilience: A Certification Scheme for Hotels and Resorts to Reduce Climate and Disaster Risks and Strengthen Resilience Across Tourism Destinations in the Asia-pacific Region, 2014. Retrieved from <<https://www.rts.ch/emissions/les-coulisses-de-l-evenement/6394336.html/BINARY/Hotel%20Resilient%20Factsheet.pdf>>.
- [101] United Nations Office for Disaster Risk Reduction (UNISDR), Pacific Asia Travel Association (PATA), & Global Initiative on Disaster Risk Management (GIDRM), Developing Strategies to Strengthen the Resilience of Hotels to Disasters: A Scoping Study to Guide the Development of the Hotel Resilient Initiative, 2015. Retrieved from <[http://www.unisdr.org/files/45258\\_scopingstudyhotelresilientinitiativ.pdf](http://www.unisdr.org/files/45258_scopingstudyhotelresilientinitiativ.pdf)>.
- [102] J. Wang, B.W. Ritchie, A theoretical model for strategic crisis planning: factors influencing crisis planning in the hotel industry, *Int. J. Tour. Policy* 3 (4) (2010) 297, <http://dx.doi.org/10.1504/ijtp.2010.040390>.