Tourism Disaster Planning and Management: From Response and Recovery to Reduction and Readiness

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Tourism Disaster Planning and Management: From Response and Recovery to Reduction and Readiness

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Despite the growing number of natural hazards and disasters little research has been conducted on tourism disaster management and planning. Although there have been a growing number of studies in the tourism field on tourism disaster management, most have highlighted, and indeed researched, reactive response and recovery efforts of the tourism industry at the expense of reduction and readiness strategies and initiatives. This paper integrates hazards and emergency planning literature with tourism disaster planning research to examine possible deficiencies and future directions for research in this field. The paper argues that an understanding of tourism disaster planning is only possible through an understanding of literature from the hazards, natural disaster and emergency planning field alongside an analysis of previous tourism disaster planning research. This synthesis suggests a ‘post-disciplinary’ approach to researching and better understanding the problem of tourism disaster planning involving researchers from disciplines such as education, communication, sociology, emergency planning, hazards and tourism. It is hoped that such an approach would lead to a better understanding of tourism disaster planning, reduction and readiness and the development of suitable policies and initiatives from tourism agencies and industry associations to facilitate more effective planning.

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Keywords: tourism, disaster, hazards, planning, risk, preparation

Introduction

Despite the growing number of natural hazards and disasters, and the growing susceptibility of tourism to biosecurity risks and health scares, little research has been conducted on tourism disaster management and planning. As Cioccio and Michael (2007) observed it is the nature of the tourism environment which is often hazardous or offers experiences in volatile settings. Despite the growing threat of natural disasters to tourism businesses and destinations, few tourism businesses are prepared to handle the impacts of such threats (Cassedy, 1991), yet disaster planning should be a core competency of tourism managers (Faulkner, 2001; Hystad & Keller, 2006).

Although there have been a growing number of studies in the tourism field on tourism disaster management, most have highlighted, and indeed researched, reactive response and recovery efforts of the tourism industry at the expense of reduction and readiness strategies and initiatives. Yet more proactive, and more strategic planning approaches to tourism crisis and disaster management have
been proposed (Ritchie, 2004). The lack of focus on tourism disaster planning by researchers and managers is a concern, especially considering that reduction and readiness strategies have been the focus of the natural hazards and emergency planning field for some time. This paper argues that tourism managers must change their thinking from a reactive approach to tourism disaster management toward a proactive planning approach. Furthermore, researchers should focus more effort in understanding the current level of industry reduction and readiness efforts as well as potential barriers or impediments in tourism disaster planning to ensure more effective planning and management are undertaken.

The purpose of this paper is to highlight the urgent need for attention on tourism disaster planning, reduction and readiness. Furthermore, the paper integrates hazards and emergency planning literature with tourism disaster planning research to examine possible deficiencies and future directions for research in the tourism field. The paper argues that an understanding of tourism disaster planning is only possible through an understanding of literature from the hazards, natural disaster and emergency planning field alongside an analysis of previous tourism disaster planning research.

The paper begins by defining natural disasters and presents the case for embracing tourism disaster planning due to the complexity of natural disasters and the open nature of the tourism system. It then outlines key literature from the hazards, natural disasters and emergency management field to consider ways that natural disasters may be reduced, mitigated and prepared for. Synthesis of different discipline areas is important, as Coles et al. (2006: 301) suggest there is a ‘tendency for scholars to restrict themselves to the boundaries of their own disciplines … reflective is a common ignorance of what lies beyond the disciplinary divide’. The first part of this section suggests that an understanding of risk and vulnerability are important in order to develop appropriate reduction and mitigation measures. This is then followed by a discussion on preparedness measures, if prevention is not possible, including an understanding of emergency planning, the nature of precursors and warning systems, and finally, the development of training and simulations for emergency and tourism managers.

The following section of the paper then examines previous research specifically in the tourism disaster field and the current level of reduction and readiness proposed by research in the hazards and emergency planning field. It concludes with some proposed research topics and issues to help focus research and management attention on reduction and readiness strategies for tourism disasters. As suggested by Coles et al. (2006), the paper ends by proposing a post-disciplinary approach (i.e. a direction ‘beyond disciplines’) for researching and better understanding tourism disaster planning. Such an approach has the potential to better understand contemporary tourism research themes, such as tourism disaster planning, through flexible modes of knowledge production, plurality, synthesis and synergy between disciplines (Coles et al., 2006). This approach may help researchers and managers in dealing with complex problems, such as tourism disaster planning, which entail different disciplinary perspectives and levels of knowledge. For more detailed information on the benefits of a post-disciplinary approach to tourism research readers are directed to the work of Coles et al. (2006).
Disaster Definitions

Many of the features attributed to crises are equally applicable to disasters (Faulkner, 2001), and so confusion can occur with common overlaps between the two where a crisis may occur as a direct result of a disaster or vice versa. Kim and Lee (1998) in their paper use the two terms together while Hills (1998) suggests that the boundary between natural and human induced behaviour has blurred. Faulkner (2001) considers the principal distinction between what can be termed a ‘crisis’ and a ‘disaster’ to be the extent to which the situation is attributable to the organisation itself, or can be described as originating from outside the organisation. Thus, a ‘crisis’ describes a situation ‘where the root cause of an event is, to some extent, self-inflicted through such problems as inept management structures and practices or a failure to adapt to change’, while a disaster can be defined as ‘where an enterprise (or collection of enterprises in the case of a tourist destination) is confronted with sudden unpredictable catastrophic changes over which it has little control’ (Faulkner, 2001: 136). Here Faulkner (2001) suggests that crises are able, to some degree, to be controlled and within the influence of managers, whereas disasters are often external and more unpredictable. As Prideaux et al. (2003: 478) suggest ‘disasters can be described as unpredictable catastrophic change that can normally only be responded to after the event, either by deploying contingency plans already in place or through reactive response’. The key point is that external events and change may provide a greater degree of risk and uncertainty than internal events and change (Evans & Elphick, 2005).

Hills (1998) suggests, from an emergency planning perspective, that disasters are sudden and overwhelming events which occur for a limited duration in a distinct location. Although they may be limited by time and location it may take a significant amount of time after a disaster to recover while some victims may never fully recover, if they indeed survive. Therefore, disasters, and can have a profound psychological aspect associated with them. Although disasters induced by natural conditions or ecosystems are beyond the control of humans, vulnerability is a direct result of human activity and living conditions and a disaster is the realisation of a hazard (Smith, 1995), while natural disasters have been termed a humanitarian disaster with a natural trigger (Pelling, 2003: 4).

Many authors have approached the study of disaster management through the application of concepts and theory from sociology, politics, geography, economics, information technology and the physical sciences, suggesting a need to move beyond disciplines using a post-disciplinary approach for future research in this area. Readers are directed to the edited work by Quarantelli (1998), which illustrates how some of these different disciplines perceive or define the term disaster from their own perspectives. Hazards are ‘potential threats to humans and their welfare … risks are the probability of hazard occurrence’ (Smith, 1995: 6), which lead to triggering events causing the disaster situation and possibly influence tourism or tourism destinations.

As Cioccio and Michael (2007: 1) state, ‘[t]he nature of the tourism environment is often hazardous, where it is congruent with exotic scenery, unusual experiences or volatile natural settings. In such a landscape, inevitably in one locality or another, or across whole regions, there occur natural events which disrupt or destroy the physical base for tourism, and so threaten the existence of these
regional enterprises’, not to mention both visitor and local lives. With respect to disasters, there are ranges of natural hazards that may occur as a result of natural or human processes. In both instances, a disaster threatens the existence of a system whether it is a state, social community, government, organisation, natural environment, eco-system or some other established system (including tourism).

**Embracing Tourism Disaster Planning**

Faulkner (2001) notes an increasing number of disasters that affect the tourism industry, ranging from natural to human influenced incidents. In recent years the global tourism industry has experienced many biosecurity threats and natural disasters. Lee and Harrald (1999: 184) state that ‘natural disasters can disrupt the supply and distribution chains for even the best prepared businesses … service businesses are increasingly vulnerable to electrical, communication and other critical infrastructure failures’. Organisations of all shapes and sizes all have to deal with change at some point in their lifecycle, and all destinations will have to deal with a disaster at some stage (Faulkner, 2001). A core competency of managers is therefore to deal with and manage such change brought about by external incidents. As Prideaux *et al.* (2003) note, there is a need for a new research paradigm concerning the forecasting of tourism demand patterns as a result of disaster, crisis and resulting change.

Faulkner (2001) argues that there is a lack of research on disaster phenomena in the tourism industry, on the impacts of such events on both the industry and specific organisations, and the responses of the tourism industry to such incidents. This lack of interest and research is somewhat surprising considering that disaster management, recovery, and organisational continuity are important competencies for managers in both the public and private sector (Lee & Harrald, 1999: 184), and surprising considering the size, economic importance of tourism and its reliance on positive images and perceptions (Henderson, 1999; Santana, 2003). Faulkner (2001: 136) notes that the industry does not seem to make any progress in understanding the importance of disaster management planning due to ‘the limited development of theoretical and conceptual frameworks required to underpin the analysis of this phenomena’. However, there has been a growing interest in this subject area and more research has been undertaken, particularly since the emergence of a number of biosecurity threats and natural disasters in the early part of the 21st century, and the body of knowledge in tourism disaster management is small, but growing.

The need for tourism disaster planning and management emerges when a disaster occurs through some natural phenomena or external human action (such as floods, cyclones, earthquakes, fires or biosecurity threats). According to some authors the current state of the world is directly responsible for an increase in disasters and crises (Berke, 1998; Blaikie *et al.*, 1994; Brammer, 1990). As Richardson (1994) notes our environment has become more crowded and as the population increases pressures such as urbanisation, the extension of human settlement, and the greater use and dependence on technology have perhaps led to an increase in disasters and crises, and in disaster reporting. A UN (2004) report on disaster reduction notes that although the number of affected populations has increased by over three times since 1970, the number of deaths has halved, through reduction and planning measures.
However, the cost of disasters and hazards has been estimated at US$30 billion for 2000, which compares favourably to the US$100 billion in 1999 and US$591 billion for the 1990s alone (Huang & Min, 2002). Hoyois et al. (2007) in their annual statistical review of disasters note a US$129 billion cost for Hurricane Katrina alone in 2005 and an upward trend in cost for disasters generally. The authors also note a large increase in flood and related disasters, which in 2006 were responsible for 59% of all reported disasters with China in 2006 reporting the most number of disasters (38 in total), the most victims in 2006 (more than 88 million), and the most economic damage in 2006 (US$13.5 billion). There is debate over the extent to which this increase is attributable to global warming or climate change.

It is clear why more recent emergency management literature has focused on disaster preparation and the implementation of integrated safety and emergency actions. Due to the growth of disasters and natural hazards a growing emphasis has been given to disaster management and reduction in the last decade through the United Nations declaring 1989 to 1999 the International Decade for Natural Disaster Reduction (IDNDR) under resolution 235 of the General Assembly. For the tourism industry this culminated in a joint publication by the World Tourism Organization and the World Meteorological Organization on natural disaster reduction for tourism. In particular, the publication noted that ‘tourism development is frequently located in areas which are exposed to, or more likely to be exposed to, sudden-onset disasters, in particular in beach and coastal areas, river valleys and mountain regions’ (WTO, 1998: 1). Considering that beach and coastal areas and mountain regions not only host substantial numbers of visitors but also local communities the potential damage of disasters is great. There has been a distinct move away from disaster management to disaster reduction (in the hope of reducing damage to economies and lives), yet few tourism studies on natural disasters fail to examine tourism disaster preparation and planning.

In the tourism literature research has been carried out on natural hazards and disasters generally (Méheux & Parker, 2006), and more specifically on:

- hurricanes (Chandler, 2004; Higgins, 2005; Soñmez & Backman, 1992; Young & Montgomery, 1998);
- flooding and tsunami (Carlsen, 2006; Cheung & Law, 2006; De Sausmarez, 2005; Faulkner & Vikulov, 2001; Garcia et al., 2006; Henderson, 2005, 2007; Ichinosawa, 2006; Reddy, 2005; Sharpley, 2005);
- earthquakes (Huang & Min, 2002; Young & Montgomery, 1998);
- bushfires (by Armstrong & Ritchie, 2007; Cioccio & Michael, 2007; Hystad & Keller, 2006, 2007);
- biosecurity and disease, with an emphasis on the foot and mouth disaster in the UK (see Baxter & Bowen, 2004; Coles, 2003; Irvine & Anderson, 2005; Miller & Ritchie, 2003; Ritchie et al., 2003; Rodway-Dyer & Shaw, 2005; Sharpley & Craven, 2001; Williams & Ferguson, 2005, 2006); and
- biosecurity and disease, with an emphasis on SARS (Serve Acute Respiratory Syndrome), particularly in the Asia-Pacific (see Au et al., 2005; Chien & Law, 2003; Henderson & Ng, 2004; Huimin & Wall, 2006; Kim et al., 2005; McKercher, 2004; Pine & McKercher, 2004; Tse et al., 2006; Wen et al., 2005; Zeng et al., 2005).
However, much of the research and writing on tourism disasters appears to be concerned with response and recovery rather than reduction and readiness, although disaster and tourism disaster/crisis frameworks clearly identify the importance of reduction and readiness as a stage in preventing or planning for such incidents (Faulkner, 2001; Heath, 1998; Ritchie, 2004; Smith, 1995). In an increasingly vulnerable and disaster prone world, this is somewhat surprising. This paper argues that future research and management attention should be placed on planning and preparation for such incidents (a proactive response), rather than responding (a reactive response). Furthermore, organisational learning and managing knowledge from previous disasters is also required for the development of effective reduction and readiness strategies, so research on response and recovery should be linked to planning and prevention strategies.

**Dealing with Complexity to Assist Reduction and Readiness**

Despite the obvious need to understand and control the impacts of such incidents this is not simple for managers because of the chaotic nature of disasters and the uncertainty and lack of information that surrounds them. Furthermore, disasters or crises in other industry sectors (such as agriculture or manufacturing) could have an impact on the tourism system due to its interdependence and linkage with those industry sectors. An oil spill or biosecurity threat can have a major impact on a tourist destination and enterprises. At an organisational level, triggers can also move a ‘simple disaster’ to a major disaster due to interactive complexity creating a chain reaction within an open system (Davies & Walters, 1998) through ‘escalation’ (Heath, 1995; Hills, 1998) and the ‘ripple effect’ (Heath, 1998; Robert & Lajtha, 2002).

Both Ren (2000) and Hills (1998) in the disaster area, note the chaotic and non-linear nature of disasters which have obvious implications for their management and reduction. In fact Hills (1998) believes that because disasters are non-linear, suggesting they follow a series of stages to recovery is a weakness as it ignores the complexity and linked nature of crises and disasters. The comprehensive and linear PPRR (prevention, planning, response, recovery) approach to disaster management has been adopted by policy makers in many countries, who organise disaster management plans around central elements linked to the disaster lifecycle. However, PPRR proposes a sequential approach to dealing with disasters and emergencies where dealing with disaster does not always entail responses that follow a linear order. An integration of PPRR into a broader risk management model may help develop innovative ways of treating risks. Discussions of the non-linear nature of crises and disasters make connections to complexity and chaos theory important, which is discussed in the remainder of this section.

Complexity and chaos theory may provide some insights into crisis and disaster management for organisations in the tourism industry as well as for those in the broader field of disaster management (Pelling, 2003). These theories have emerged as a school of thought to describe how complex systems function (McKercher, 1999) and may provide a framework for pulling together diverse elements and approaches to disaster management, according to Pelling (2003). Crises and disasters illustrate chaotic situations and illustrate the complex interrelationships between human and natural systems (Faulkner, 2001).
Understanding the relationship between cause and effect and the implications of decisions and actions is a complicated process. This is illustrated in the case of the foot and mouth outbreak, which started out as a farming crisis and ended up as a disaster for the tourism industry because of the way that it was handled (see Miller & Ritchie, 2003).

Global change researchers as well as mathematicians, physicists, biologists, chemists, ecologists and economists have been studying chaos since the 1970s (Gleick, 1987) yet tourism academics are well behind (McKercher, 1999), despite the obvious complexity and interdependence of the tourism system. Chaos theory is the study of complexity, which explores non-linear complex systems. Linear systems are closed systems such as computers and aircrafts while non-linear open systems can interact and intermingle between each other such as humans, weather systems and nature. They are unpredictable and dynamic and the future is not determined by the past. As Faulkner and Russell (2000) note, although a Newtonian paradigm has been mostly used in tourism research this research philosophy is more attuned to stable systems and therefore may not be so useful in explaining turbulence and the underlying dynamics of change, inherent in tourism crises and disasters.

Turning points of crises and disasters and the concept of recovery, reconfiguration and change are consistent with chaos and complexity perspectives, which see chaos as a creative process. Chaos realises periods of instability are part of the operation and essential for change to complex systems (Ditto & Manukata, 1995) such as tourism, which evolve abruptly rather than evolving slowly from one state to another (McKercher, 1999) creating panic and fear amongst tourism managers. However, chaos theory may be considered as disorderly but it has underlying order (Gleick, 1987) as the system will regenerate or reconfigure itself. The complex system can adapt because of the ability to self-organise and to respond to external stimuli without external coercion, thus regulating itself (Pelling, 2003), something which the tourism industry appears to achieve after disasters.

To view crises and disasters as an element of chaos means a fundamental shift in how we view such incidents and brings into question whether disasters can be managed effectively due to their chaotic and complex nature. It suggests the need for post-disciplinary research and an integrated approach to disaster and emergency planning. However, it also suggests that tourism systems and disaster planning research in tourism should consider new conceptual and methodological tools to help analyse turbulence more effectively, as the tourism system appears to be in a constant state of chaos. The traditional Newtonian paradigm dismisses chaos as being noise in the system while chaos theory appreciates upheaval as an intrinsic element of complex systems (McKercher, 1999). This discussion of complexity and chaos, suggests that tourism managers and planners should consider taking a more strategic approach to such incidents, dealing with crises and disasters in a flexible but yet holistic manner, and that they should not be afraid of change which is inherent within an open tourism system.

To date few researchers have used a chaos or complexity perspective in understanding crises or disasters. Those that have applied it have done so mostly to help understand natural disasters (Comfort, 1999) or crisis
communications (Murphy, 1996). Only Paraskevas (2006) has used a complexity perspective to help understand the crisis response strategies of a hotel chain dealing with a major food poisoning crisis.

Although this paper agrees that it is impossible to consider every scenario or future development and so undertake a full classical or rational approach to tourism disaster planning and management (and in fact chaos and complexity suggests that this may be difficult), the paper suggests that managers of tourism destinations and organisations should consider, understand and prepare for disasters in a more strategic and comprehensive way in the future. There are several reasons for this. First, as mentioned earlier in the paper, there appears to be a growing number of disasters occurring because of the current state of the world which impact upon the tourism system. Current development models and patterns of globalisation and environmental change may ensure greater susceptibility to natural disasters. Second, there is a need for a more holistic and integrated approach towards disaster planning in tourism systems for both enterprises and destinations. Third, there is a need for organisations and destinations to focus attention away from response and recovery toward reduction and readiness. This requires a paradigm shift toward productive steps to address disaster situations and consideration of possible barriers to effective reduction and readiness for the tourism industry.

Finally, 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. Some pre-planned or thought through strategy that can be modified in light of the type of disaster encountered, can perhaps limit hasty and ineffective decisions which could lead to escalation or the creation of new crises and disasters within individual tourism organisations. The remainder of this paper examines the literature from the hazards, natural disasters and emergency management field to consider ways that natural disasters may be prevented, reduced, mitigated and prepared for. The first part of this section suggests that understanding risk and vulnerability is important in order to develop appropriate reduction and mitigation measures. This is then followed by a discussion of preparedness measures, if prevention is not possible, including an understanding of emergency planning, the nature of precursors, warning systems and the development of training and simulations for emergency and tourism managers. The paper then examines previous research specifically in the tourism disaster field and the current level of reduction and readiness suggested by the literature from these fields outside of tourism. The paper then concludes with some proposed research topics to help focus tourism disaster research and management attention on reduction and readiness strategies, proposing a post-disciplinary (beyond disciplines) approach.

**Disaster Prevention, Reduction and Mitigation**

**Considering risk and vulnerability**

Risk cannot be completely eliminated, however it can be better managed so that vulnerability to such risk is reduced. According to Smith (1995) this often involves some form of risk assessment and management so as to reduce
the element of risk or vulnerability to human property or lives. As Salter (1997) notes this social element related to vulnerability has shifted the emphasis from hazards as physical events to social products. Australia’s National Emergency Management Competency Standards define vulnerability as ‘the degree of susceptibility and resilience of the community and environment to hazards’ (in Emergency Management Australia, 1995). As Alexander (2000) suggests, if the level of risk or vulnerability is significantly greater than the frequency or magnitude of a hazard, then hazard mitigation as a strategy has potential.

Although the number of associated disasters has increased in recent decades and the number of the population threatened by such incidents has grown, the death rate has nearly halved (Huang & Min, 2002) because of disaster and risk mitigation or prevention strategies. However, more can be done in the mitigation and prevention of disasters, and particularly their impact on tourism destinations. Conditions related to populations can create a greater susceptibility and risk of a natural hazard becoming a natural disaster. People who are more vulnerable to such hazards create greater risks that they may encounter a disaster in the future. The UN (2004) describe well the challenge for risk and disaster reduction by suggesting the need to anticipate disasters through previous experience, knowledge and developing awareness for communities to reduce their risk and vulnerability to natural hazards.

Disaster reduction programmes are investments to reduce the likely impact of a disaster and need to be developed by government departments and sectors (such as finance, environment, agriculture, health, education, construction, industry, social protection and community services) as well as scientists, non-government organisations and the general public. As Christoplos (2003) suggests government are uninterested in disaster mitigation or preparedness unless the threat of disaster is imminent. The UN (2004) have developed a disaster risk reduction framework (see Figure 1) which sets out the core components of risk reduction. As discussed earlier, the context for disaster planning and management is associated with the concept of sustainable development, which in a broad and holistic sense encompasses economic, sociocultural, political and environmental elements.

From a tourism disaster perspective, there is a need to consider reducing disasters to save tourism businesses or destinations substantial economic costs if vulnerability or risk can be reduced or managed. Furthermore, a disaster which impacts upon a destination (especially a developing country) could have a major sociocultural impact if the local community are perhaps reliant on income from tourism activities. Politically, government need to be aware of the impacts and tools available to sustain their residents in the long term and should act, while the environment also should be sustained and not impacted negatively through human activity. If local populations, or indeed tourists, can be more respectful of the environment, then hazards and potential disasters may be reduced. These are the more long term aspects that can affect vulnerability. Environmentally unsound practices, global environmental changes, population growth, urbanisation, social injustice, poverty and shortterm economic vision are all attributes that can create vulnerable societies.

Natural disasters are providing a real threat to poverty reduction and sustainable development as relief funding is required, diverting financial resources
away from poverty alleviation. In particular, in developing countries including small islands, natural disasters are having a large impact upon their environmental resources and also their tourism industry, severely impacting upon their livelihoods. Furthermore, as Christoplos (2003: 97) notes ‘efforts to understand how poor people perceive and deal with their poverty have highlighted how their livelihood strategies are often more about addressing vulnerability and handling shocks than about “escaping” from poverty per se’. Therefore, the debate about disaster (and tourism disaster) prevention and reduction should be considered in the broader context and framework of development and sustainable development (and sustainable tourism development).

Risk factors relate to both vulnerability and the likely frequency and magnitude of hazards in a particular destination. Kates and Kasperson (1983) suggest that risk assessment, similar to an organisational risk management framework,
consists of three distinct steps: (1) an identification of hazards likely to result in disasters; (2) an estimation of the risks of such events and finally; and (3) an evaluation of their consequences.

However, as Smith (1995) notes very few questions occur after risk assessment to assess the actual impact of mitigation of protective measures, which constrains our understanding of hazard reduction and their value. Furthermore, the WTO (1998) suggest that any risk analysis and assessment should include the indirect impacts of a disaster including secondary losses from death and injury, loss of function of essential services, loss of markets and interruption to tourism. Risk assessment should not only involve identification, estimation and evaluation of risk but also should consider the ability of the population to cope or deal with such risks and should therefore include this capacity element in any risk assessment equation, such as the following from the UN (2004):

\[
\text{Risk} = \frac{\text{Hazard (H)} \times \text{Vulnerability (V)}}{\text{Capacity (C)}}
\]

or

\[
\text{Risk} = \text{function of (H and V/C)}
\]

Vulnerability can be related to both the vulnerability to the hazard but also a concept called underlying vulnerability (Allen, 2003) that relates to a contextual weakness or susceptibility underpinning daily life (such as market forces and policy trends such as globalisation), which create the vulnerable situation. Vulnerability can include the following four main types: (1) physical vulnerability including aspects such as location, density of population, and design of physical infrastructure, including businesses or populations located in flood plains or houses/businesses built without earthquake resistant building materials; (2) economic vulnerability including the capacity of a destination of individual to respond to huge economic losses that often occur from disasters and is closely linked to debt levels and financial reserves of countries, or a destination whose economy is not diversified and reliant on a small number of economic sectors; (3) ecological vulnerability including elements such as levels of environmental degradation, loss of biodiversity, loss of resilience of the ecological system which could create increased vulnerability to natural disasters; (4) social vulnerability includes organisational and governance structures which combined could cause a greater increase in vulnerability amongst groups such as women, those from ethnic minority groups and disabled people who are often more vulnerable groups of the population during disasters.

An understanding of vulnerability and risk are important in understanding how disasters may be mitigated or prevented, which is discussed in the following section of the paper. Risk assessment requires information concerning natural hazards, previous natural disasters and their responses and there is a direct link (as suggested in Figure 1) between knowledge development and risk assessment/analysis. Risk assessment and analysis, therefore is dependant upon an analysis of the risk likelihood, potential loss, vulnerability and the capacity of the local population to deal or cope with this loss or impact. Risk assessment and analysis may follow the following steps outlined in Table 1.

Gathering information on hazard risks and vulnerability require the collection of data to assist in the development of policies and plans by national governments.
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and insurance organisations. However, data on risk analysis and assessment is often not widely disseminated and although hazard mapping is common it is less common to map the susceptibilities or vulnerabilities of the local community or a tourism destination. For instance, a project in the 1980s which integrated both hazard mapping and vulnerabilities, noted that the main airports of Guatemala are located near high intensity seismic areas (in UN, 2004). Cairns, Australia is one of the few tourism destinations to have produced risk maps using GIS to understand landslide risk (Michael-Leiba et al., 2000).

The development of cost/benefit analysis based on community and government priorities and interests develops acceptable limits of risk. However, risks are dependant upon risk perception and the level of threat anticipated by decision makers (Smith, 1995), often founded on Newtonian science, which searches for interrelationships between variables. As Robert and Lajtha (2002) note risk analysis uses a rational approach considering probability and severity whereas low probability events do occur creating huge damage to society. They suggest the need for more unconventional techniques in the planning for disasters. Local communities can provide their levels of perceived risk, which combined with more objective statistics and data can provide a more accurate data to base decisions upon. The final area of risk assessment is concerned with the development of scenarios and measures which can help government and communities consider the variety of risk reduction measures available to help with the mitigation or reduction of hazards and disasters, which is the subject of the next section of this paper.

### Considering mitigation measures

Mitigation and reduction of hazards and potential disasters is required at an international, national, regional, local and individual level. These different levels indicate that the concepts of vulnerability, risk and capacity could be viewed on many different scales from international to individual. McEntire (1999, 2001),

<table>
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<tr>
<th>Identification of risk factors</th>
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<tr>
<td><strong>Hazard</strong></td>
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<tr>
<td>Determines geographical location, intensity and probability through hazard mapping use of historical data to produce quantitative risk analysis and extreme event analysis.</td>
</tr>
<tr>
<td>Estimates levels of risk</td>
</tr>
<tr>
<td>Evaluates risk</td>
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<tr>
<td>Socio-economic cost/benefit analysis</td>
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<tr>
<td>Establishment of priorities</td>
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<tr>
<td>Establishment of acceptable levels of risk</td>
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<td>Elaboration of scenarios and measures</td>
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Source: Modified after UN (2004) and Smith (1995)
considering the concept of vulnerability, suggests the need for invulnerable development which is broadly defined as vulnerability management.

Strategies need to be developed to address previous and potential future vulnerabilities through a combination of structural and non-structural measures. Although authors such as Allen (2003) believe that reducing vulnerability to natural disasters (or single events) may not help minimise underlying vulnerability (such as economic needs). This emphasises again that the context of disaster reduction and prevention should be seen in the broader context of development and sustainable development. As Christoplos (2003: 96) suggests, development actors downplay vulnerability and tend to emphasis economic development as they link poverty to a lack of income, not human suffering as a result of a variety of vulnerabilities. Invulnerable development is about the planning and implementation of safer development practices, beliefs and behaviour which can act as triggering agents for natural disasters. The focus on vulnerability is because, as McEntire (2001: 194) observes ‘...humans are able to control vulnerabilities – not natural hazards’. Breaking out of vulnerability may require not only new development paradigms but also new ways of conceptualising vulnerability which take into consideration broader social and economic vulnerability, not just vulnerability to specific events or natural hazards.

Community, industry and tourist attitudes toward natural hazards and risk are important to consider. For instance, the public play an important role in prevention and preparedness and should understand how to manage if a natural disaster hits. However, as Larsson and Enander (1997) suggest people tend not to be interested in preparedness and believe that they are less vulnerable than others. The role of social norms and values and the level of preparedness is under researched, especially with respect to tourism, yet vital to help formulate strategies to encourage preparation and response of tourists and locals in vulnerable locations. Different messages and information may be required for the local community, tourism industry and tourists themselves as well as specific segments of each of these groups. According to Hoogenraad et al. (2004) independent travellers and tourists are more vulnerable to natural hazards as they travel outside of formal groups and some may take more risks, while Murphy and Bayley (1989) suggested that tourists tend to ignore risk and show a low level of natural disaster awareness. Yet tourists are widely regarded as being more vulnerable to natural disasters as they are unfamiliar with local conditions and resources (Buckle et al. 2001; WTO, 1998).

Research in the USA suggested that 46% of visitors were unaware of tsunami warning systems compared to 28% of locals and only 19% of visitors had seen tsunami hazard maps (Johnston et al., 2002 in Johnston et al., 2007). A study of backpackers in North Queensland, Australia suggests that backpackers have a low awareness of cyclones and only 30% received information concerning cyclones during their trip, with main information sources including word of mouth and the television (Hoogenraad et al., 2004). The vast majority surveyed did not understand the level of storms or what key characteristics of cyclones were. The researchers suggested the need to provide destination cyclone information in pamphlets and the internet, while information on the characteristics cyclones could be provided in backpacker media (such as guidebooks and backpacker magazines).
Smith (1995: 66) notes three major intentional adjustments to hazards: modifying the loss burden, adjusting damaging events to people, and finally, adjusting people to hazard events. In all of these instances both structural (through engineering and other physical protective measures) and non-structural (through legislation, codes and urban planning) measures can be used by, or imposed on, an industry such as tourism.

Modifying the loss

Modifying the loss burden by spreading the financial burden as widely as possible through relief and insurance schemes. These are loss-sharing or risk-transfer rather than loss-reduction and are perhaps a reactive and limited response to disasters. However, as Smith (1995) notes disaster aid and insurance can be used to a limited extent to encourage future loss reduction. For instance, there is some possibility of insurance not covering some countries or regions if mitigation does not occur according to Salt (2003) who provides examples of hurricanes, volcanic explosions and floods where the insurance industry has demanded action to reduce vulnerability and risk. The UK insurance industry, after a recent series of floods, demanded that the government spend more on flood defences or they would deny cover in various parts of the United Kingdom.

Salt (2003) suggests that due to current changes to climate the insurance industry could, in the future, refuse to claim parts of the world most susceptible to disasters. Furthermore, the UN (2004) observed how international and regional development banks (such as the World Bank), who have provided many of the funds for post disaster recovery, are promoting investment in disaster reduction strategies and plans to assist countries with their economic and social development. Insurance companies may also provide reduction in premiums if businesses engage in hazard mitigation strategies, especially if building codes or land use planning regulations are adhered to. This may work in developed countries where the insurance industry is well developed but may be difficult to implement in less developed countries. Such measures are required to deal with issues concerning economic vulnerability to natural disasters, which have created severe economic problems for tourism industries.

Event modification

A more proactive response to hazards and natural disasters is to reduce losses by adjusting damaging events to people. Some natural hazards can be suppressed at the source through some kind of environmental control engineering. Furthermore, hazard resistant design and emergency measures can safeguard human life and property in high risk areas. However, as Smith (1995) notes, controlling the environment is extremely difficult and can only successfully occur if human prevention can ensure that the hazard is contained. Hazard mapping and knowledge on types of hazards can be used to modify the hazard event itself through creating rock walls in coastal areas, setting off controlled avalanches in mountains, creating dams and flood control reservoirs to prevent river flooding and so forth. This approach is concerned with preventing hazards becoming natural disasters. However, such work may only be effective if begun years in advance of the hazard event, and human
interference can exacerbate or cause subsequent future problems by contributing towards vulnerability and the increased incidence of natural disasters such as floods. For instance, huge hydraulic projects may change landscape references of communities and their perception of risk, thereby increasing vulnerability by reducing the people’s capacity to assess and anticipate hazard-related threats. The construction of engineering works on a river may offer protection from floods and encourage invasion of the floodplain with an increase in risk (Smith, 1995) because of pressures on land for development, including tourism development (WTO, 1998).

For reducing physical vulnerability, important facilities or infrastructure for tourism (such as roads, airports, accommodation stock and communications infrastructure) can be better designed to withstand hazards in the future, while mechanisms can be implemented to make current infrastructure more hazard resistant, although not all can be protected against hazards in high risk areas (Mileti, 1999). For instance, Switzerland has recognised the value of forests in protecting important economic assets (roads, industries, infrastructure, tourism) as well as human settlements and people against avalanches and landslides. The economy provided by the protection afforded by forests was estimated between US$2 billion and US$3.5 billion per year (OFEP, 1999). Infrastructure such as roads and hotels can be made more hazard resistant in high risk areas, dramatically reducing potential losses. As Méheux and Parker (2006) note cyclone shutters and anchoring structures can be used in cyclone prone tourism destinations. The aim of planning, according to the WTO (1998) is to prevent the triggering of hazard and regulate its impact through changes to the physical site of tourism infrastructure reducing the likelihood of a hazard becoming a disaster. Furthermore, low density tourism development in areas vulnerable to flood (such as rivers lakes and coasts) are more likely to lead to a reduction in risk (WTO, 1998). The use of information such as hazard maps or past histories of natural hazards can be used to provide better building codes and design to protect key infrastructure from hazards.

However, hazard resistant techniques can not only be applied to new buildings, but retrofitting (through modifying existing buildings to better protect it or its contents from an event) can occur. Walls that may be susceptible to earthquake damage can be reinforced or braced while heavy furniture can be strapped to walls to protect it from damage, while making walls watertight and fitting flood-resistant doors and windows can protect against floods (Smith, 1995). Rock walls on coastal areas may be created to limit beach erosion and sand dune loss. All of these elements may be necessary in tourist destinations, which are often prone to natural hazards. However, as Smith (1995) rightly notes, the majority of the costs of retrofitting (and mitigation of potential disaster) are borne by property owners and not the government. Incentives may be able to be provided by government to assist those living or working in hazardous locations to implement better design for future constructions (through tax incentives) and for retrofitting for current developments (through some funding schemes to help property owners protect themselves).

Other mechanisms that may be used to reduce the likelihood of ecological disasters could include the development of programmes by government or non-governmental organisations to facilitate good environmental practices in
both developed and developing countries. For instance, conservation projects involving better wetland management or water treatment may help communities to sustain the environment which they are a part of and reduce the likelihood of future environmental disasters which may impact upon the tourism appeal of a destination through directly tackling ecological vulnerability.

Vulnerability modification

The largest group of responses is concerned with modifying human vulnerability by adjusting people to damaging events. This can be through legislation, voluntary acts and through raising awareness of hazard prone locations. Land use planning is one of the largest methods of modifying and reducing vulnerability of humans to hazards. Land-use plans enable local governments to gather and analyse information about the suitability of land for development, so that the limitations of hazard-prone areas are understood by policy makers, potential investors and community residents. Physical and spatial planning has a vital role to play to detect areas which are prone to hazards and restrict their use to reduce vulnerability to disasters. Human settlement planning systems have a major in modifying vulnerability (Sketchly & Sketchly, 2001). This form of planning is usually undertaken at a local governmental level and is vital as population growth expands into areas that are more susceptible to hazards for living of recreational/tourism purposes.

Examples include the growth of populations to coastal areas and the construction of development and ski resorts into mountain areas. By their very nature mountain and coastal areas can be hazardous locations for residents and visitors. Land use planners need to first identify and evaluate high risk areas (through risk analysis/assessment and hazard mapping) before a number of measures can be used to reduce the vulnerability associated with the land use area. Smith (1995: 98–99) notes a number of measures that can be used to reduce vulnerability through land use planning:

(1) Public acquisition of hazard prone land and management of an area for public safety or low density development, or if this is too costly local government may purchase land and either sell it or lease it for low-intensity use or it may exchange hazardous land for safer land elsewhere, if businesses are willing to relocate.

(2) Land zoning can develop zones through regulations and ordinances to again use vulnerable areas (such as areas susceptible to landslides or earthquakes) for low density development or open spaces for parks or grazing.

(3) Public education and voluntary methods which may include guidelines or laws where builders, developers and the like disclose existence of hazards to prospective buyers. Other education tools could include signage, posters, conferences and community workshops to raise awareness of hazards and disaster mitigation.

(4) Financial measures such as tax incentives, loans, insurance or grants or the like can be used to provide an incentive to public and private organisations to use land located in hazard prone areas.

Smith (1995) alludes to the potential conflict amongst stakeholders concerning land use planning and perceptions of land value. This is one of the major issues in
using land use planning to reduce vulnerability to tourism disasters, especially as
tourists and the tourism industry may be attracted to areas which are vulnerable
to natural hazards. Certain countries are heavily dependent upon certain economic
sectors and perhaps need to diversify economically to reduce their vulnerability
if their major or only economic activity is destroyed through a natural disaster. For
instance, small island states located in the Pacific Islands and in the Caribbean rely
heavily on tourism and are also susceptible to hurricanes and cyclones impacting
negatively upon the tourism industry. Other countries may be more reliant on
other economic sectors such as agriculture, and therefore should diversify into
other sectors (possibly even tourism) to limit their economic vulnerability.

**Disaster Readiness**

**Emergency planning**

In conjunction with risk analysis and assessment and the development of
reduction or mitigation strategies comes the development of preparedness
strategies or emergency plans that can help if a disaster or emergency occurs.
This preparation is a key area for providing strength and resilience to disasters
and therefore can reduce the vulnerability of communities (Blaikie *et al.*, 1994).
As Alexander (2000) notes emergency planning and emergency management
need to be viewed as linked activities as planning creates the structure for man-
aging disasters. However, as Quarantelli (1988) suggests, the management of
disasters does not automatically follow from planning because there is often a
gap between planning and actual response to a major disaster. Two main
reasons for this gap are noted by Quarantelli (1988: 374). First, disaster prepar-
edness may be poor in the first instance. If plans are too specific or segmented
then implementation will simply be of poor confused planning. Second, that
management and planning follow different principles. Disaster planning may
assume that management will automatically occur through the implementation
of plans. Good disaster preparedness involves the formulation of plans or
strategies to deal with disasters and emergencies, but disaster or emergency
management is based on tactics, which may follow the general strategy or plan
with changes due to the situation or context of the disaster.

If disasters cannot be prevented or mitigated and do in fact do cause damage
then these strategies and systems can be used to try to limit the damage to
society and business. In the emergency phase of the disaster, emergency and
disaster management will occur, which will most likely use modified tactics
and plans devised during the emergency/disaster preparation phase. As Robert
and Lajtha (2002: 184) note emergency response and disaster plans have many
problems and can be worse than having no plans at all.

there is a need for strategy development and the testing of disaster strategy.
Faulkner (2001) in his proposed tourism disaster framework connects planning
and strategy to specific stages of the tourism disaster lifecycle (see Table 2). He
notes a series of precursors which connect to risk assessment and the creation of
contingency plans as well as factors which help the destination mobilise at the
prodromal stage when it becomes apparent that the hazard is about to hit. The
following sections examine these factors in more detail with regards to disaster
preparation and strategic planning.
Faulkner (2001) proposes a series of precursors which should occur at the pre-event stage of a disaster for more effective tourism disaster management. First, because of the range of private and public sector organisations that are directly and indirectly involved in the tourism system, the development and
implementation of a tourism disaster strategy requires a coordinated team based approach. A designated tourism disaster management team should be established to work in conjunction with various other public sector planning agencies and providers of emergency services in order to ensure that the tourism industry’s action plan dovetails with that of these other parties. Second, consultation both within the tourism sector and between tourism and the broader community should be integrated with other strategic planning processes (such as land use planning and broader economic development plans). Third, Faulkner (2001) stresses the need for commitment between stakeholders and awareness of any plan regardless of how detailed it is.

The plan should also include clear protocols regarding the activation of the strategy and a communication/education programme aimed at ensuring that all parties understand what is expected of them, this is especially important for those organisations and staff involved directly with tourists. In particular, tour operators and resort managers should be involved in strategy development, contingency planning and testing to ensure that their staff and individual tourists are properly informed and/or evacuated in any disaster or emergency situation. Risk analysis and assessment as well as a community capabilities audit should be carried out, as discussed in the previous section of this paper, to examine the likely scenarios and impacts of disasters and during the pre-event stage of the disaster lifecycle. This risk analysis and assessment should also be linked to disaster or scenario specific contingency plans for the management of tourism disasters, discussed below.

Forecasts attempt to detect and evaluate an event as it evolves and attempt to specify the timing, location and magnitude of an impending event. However, the lead time for such warnings are usually short and forecasts are generally limited to warnings given to the general public (Smith, 1995). According to Smith (1995) combined forecasting and warning systems can be effective in averting disaster through short term response, often involving evacuation. Smith (1995) notes three main stages of warning and mobilisation:

1. **Evaluation:** This stage involves detecting the hazard, examining the scale and intensity and then issuing a warning of there is risk involved to people or property. The evaluation task is usually associated with a national agency such as a meteorological agency or geological service if the hazard poses a risk at a regional or national level. The accuracy of the forecast and the lead time between the warning and onset is crucial for the community to take effective action. However, forecasters often have to make difficult decisions in short periods of time, and if they suggest evacuation when no threat occurs, then they may be liable for civil action by affected tourism businesses.

2. **Dissemination:** This requires transmitting the warning from the specialist agency to the hazard zone occupants usually through a media communications (such as TV or radio) or through personnel (such as police, emergency services or neighbours). The WTO (1998) for instance, suggest that tour operators should be involved in destination contingency planning and should be involved in the dissemination of, and response to, warnings and any response.
Response: Loss-reducing actions should be undertaken by those in the hazard prone area. This may include securing facilities, evacuating staff and guests or leaving the hazard area.

Technology has helped improve the detection and warning of natural hazards, although technological failure can result in disaster. Many natural hazards can be warned against through warning systems with the most important way to mitigate risks associated with cyclones through effective warning systems (WTO, 1998). However, smaller localised hazard warning and mobilisation may rest with tour guides or operators. For instance, adventure tourism operators may need to consider staff training in accessing timely information and forecasts and detecting possible risks as a result of natural hazards so that disasters, such as the Interlaken cannoning disaster, do not occur. This is especially important for commercial tour operations as tourists place their trust in tour operators to assess risk and vulnerability on their behalf.

Contingency plans and simulation exercises

The effectiveness of disaster plans will be limited unless those who are required to implement them are directly involved in their development and testing (Quarantelli, 1984). Contingency plans can be developed in advance of a natural hazard or disaster and, in conjunction with risk analysis and assessment, can be useful for targeting vulnerable groups and areas of a tourism destination. Contingency plans can identify specific actions required at each stage of the disaster lifecycle and devise tactical actions (which may be revised in the light of experience, changes to the organisational structures and personnel or changes in the environment), according to Faulkner (2001).

Contingency plans for tourism disasters could include the following five areas, according to the WTO (1998) including employee coordination, protection and assisting guests and staff, travel assistance, emergency shelter coordination and press handling.

Employee coordination

Employees should be aware of their roles and responsibilities in a tourism disaster and resort managers should be aware of what staff members they need and which ones are immediately able to make preparations with their respective families (which may live in the affected area).

Protecting and assisting guests and staff

Guests look to staff for advice and assistance in times of trouble and so in room information should include hazard checklists (such as earthquakes and fire information) in guest rooms. When it is apparent that a hazard will hit, resort managers or staff can distribute specific information packs related to the hazard. Previous experience suggests the need for resort managers and staff to keep guest records to alert the authorities to who is in residence, who has departed and where visitors intended to go. The resort staff should also be trained on dealing with guests who specifically check in or out prior to the onset of a hazard. Evacuating tourists during a hazard has advantages and disadvantages. First, they have a place of origin that they can return to if appropriate and are more responsive to evacuation arrangements. However, they often have
little experience of a natural disaster, have limited familiarity with the area, local practices and maybe even the language. All of these factors may require special attention from tour operators and resort managers.

This uniqueness of tourists involved in disasters is further elaborated by Faulkner and Vikulov (2001: 334) in discussing the Katherine Floods in Australia in 1998, ‘it might be argued that visitors to Katherine at the time were potentially more vulnerable when the disaster hit because they were in a strange and unfamiliar environment, and less independent in terms of the action necessary to ensure their personal safety. On the other hand, it may have been a less traumatic experience for them, because they did not have the same emotional attachment to the place (Katherine) as the residents, and they were not witnessing the destruction of everything they owned’. Furthermore, staff should also consider those guests who are more vulnerable to the impact of a disaster such as the young, elderly or disabled people, and consider specific strategies to deal with their vulnerability. This was also noted by Drabek (2000) whose research suggested the need for specific strategies to deal with non-English speaking guests and guests with pets during a disaster.

**Travel assistance and transport coordination**

According to Drabek (2000) the high level of uncertainty that guests may face as a result of perhaps being less aware of the area may effect their ability to make wise personnel choices. Tourists will look to resort managers or tour operators for information about the status of transport infrastructure such as road, rail and airport facilities and the tourism industry should be able to provide information of travel assistance or transportation.

**Emergency shelter coordination**

Large resorts or even attractions such as museums may serve as emergency shelter either before or immediately after a disaster. Areas of the resort or attraction that are lower in risk should be designated as places suitable for shelter from hazards. Logistical planning of food, sanitary facilities, blankets and space must be identified and prepared prior to any disaster. Furthermore, guests should be made aware of shelter locations.

**Advertising and press communication preparation**

Resorts or industry groups may need to prepare advertising and press communication strategy prior to any disaster. For instance, Caribbean resorts and councils have a stock of advertising copy that need minor alterations to be used as an advertising tool in the recovery process. Similarly, the media will require certain facts and information regarding any disaster and a list of contact people to talk with. Identifying key individuals to talk to including a spokesperson from the Disaster Management Team (DMT) is vital.

**Tourism Disaster Reduction and Readiness Research**

To date most research concerned with tourism disasters has focused on response and recovery, and not reduction, mitigation or readiness. Few studies have been carried out concerning tourists or the effectiveness of tourism disaster planning at a regional or organisational level, with the exception of Drabek (1995, 1996, 1999, 2000), Murphy and Bayley (1989), Faulkner and Vikulov
More recent studies have been undertaken which include industry perceptions of natural hazards (Méheux & Parker, 2006), or research which includes some focus on preparation included alongside research on response and recovery to tourism disasters (see Cioccio & Michael, 2007; Hystad & Keller, 2006, 2007).

Understanding perceptions of risk are important as a precursor to developing tourism disaster planning, according to Méheux and Parker (2006), with higher risk perceptions leading to more advanced planning, mitigation and preparedness. Primary research comparing tourism industry perceptions of natural hazards with secondary data, illustrated that the majority of respondents in an island destination accurately perceived the likelihood of damaging hazard events, with the exception of volcanic hazards which were over estimated, while 27% respectively over estimated the likelihood of a tsunami or sea level rise, perhaps because of a strong history of the potential for these types of hazards (Méheux & Parker, 2006). However, as Cioccio and Michael (2007) note, business owners located in bush fire prone locations who were affected by bush fires in 2003 in northeast Victoria, Australia were not necessarily well prepared for a bush fire disaster. Respondents to research did not consider any scenario planning and were consumed with day to day operations.

Although insurance was widely used and considered as the main method of mitigation, many operators were not covered for loss of business unless their properties were specifically affected. The researchers also noted that actions to reduce the risks were undertaken mostly as they were part of mandatory obligations related to their leases, suggesting the role of legislation as a non-structural mitigation strategy. Similar responses were discovered by Hystad and Keller (2006) who found that despite the location of tourism businesses in an area with a high likelihood of experiencing a bushfire in Canada only 4% of businesses recognised bush fires as a major disaster threat. Only 27% of surveyed businesses were aware of the regional emergency plan and less than 5% were part of that plan, while 26% had their own emergency plan. Furthermore, the local tourism agency (Tourism Kelowna) did not have any disaster management plans in place prior to the bush fire.

Similar to previous studies the authors found that larger businesses were more likely to have disaster plans and procedures. A repeat of this study in 2006 using the same location, found that only 38% of businesses had a disaster management plan (only an 11% increase) and those that were aware of the regional emergency plan rose 5% to 32% of the sample (Hystad & Keller, 2007). Most respondents felt that it was the responsibility of emergency organisations and tourism organisations to prepare for disasters and to respond to such incidents. Whereas tourism businesses felt that they had a more primary and secondary role in post disaster recovery activities. However, as discussed above post disaster advertising and marketing materials can be developed before a natural hazard becomes a natural disaster. One possible reason for a lack of action could be what Drabek (2000) suggests is a perceived lack of responsibility by tourism managers for dealing with natural disasters. As Hystad and Keller (2007) suggest emergency management agencies are the main stakeholders involved in dealing with tourism disasters, with tourism stakeholders involved more in the recovery stage of tourism disaster management. Managers may perceive that
dealing with such events are beyond their control and this may affect the propensity of the tourism industry to effectively prepare for such incidents.

Drabek (2000) undertook a study to compare the perceptions of tourist business managers and guests who were involved in tourism disasters between 1991 and 1994. Drabek (2000) undertook interviews with 603 tourists who were affected by a disaster and 185 executives responsible for a tourism business during a disaster. The results indicated that tourists often received less knowledge of the disaster from the general media and more warning from lodging firm operators and neighbours and also had less warning than local residents before the event actually occurred, limiting their ability to seek shelter. A total of 40% of tourists surveyed claimed that warnings lacked precise information and they therefore sought confirmation from tourism staff, other tourists or relatives in assessing the risk. As Drabek (2000) outlines, unlike people evacuating from their homes who may shelter with friends and relatives, 23% went to public shelters or returned to their home residence (20%), booked into other accommodation (18%), while 39% became trapped in heavy traffic and slept in cars, roadside restaurants and other places. Those that found shelter in public shelters were less satisfied with the arrangement (43% of the sample) compared to those who made it to other commercial accommodation outside the county (82%), stayed with friends and relative in another county (87%) or made it to other commercial accommodation in the same county as the disaster (65%).

Most interesting, Drabek’s (2000) research showed a large gap between the perceptions of the tourism industry and tourists regarding disaster planning. As Table 3 illustrates, these differences existed with respect to the locus of responsibility for disaster planning and policy options for disaster planning. In particular, 50% of tourists surveyed either agreed or strongly agreed that managers had little or no commitment to disaster evacuation planning and 91% agreed or strongly agreed that local government should require accommodation operators to have written disaster-evacuation plans, compared to only 23% and 50% of managers respectively. The results indicate that tourists place a high level of responsibility on tourist businesses and local government to protect their interests in a disaster situation suggesting that simply evacuating guests from their properties is not enough on its own. This is again echoed in questions that asked tourist for recommendations in policies after the disaster, and over half of respondents provided suggestions. As illustrated in Table 4, improvements were suggested with respect to evacuation planning (61% of the sample) and warning procedures (57%) followed by aspects such as information flow and threat information (56% each). It appears from this research that tourists place responsibility for disaster preparedness on tourism managers who in turn place this responsibility elsewhere with emergency management or government authorities as they may not perceive it to be their responsibility.

In the case of Katherine, Faulkner and Vikulov (2001) noted that there was no destination wide disaster plan in place prior to the floods and no tourism specific plan in place, and little coordination occurred between the tourism industry and emergency services. The researchers also noted that in the prodromal stage the community-wide early warning system needed to be supplemented by a tourism-sector system based on a communication tree, to provide messages and instructions being through a predetermined sequence of tourism agencies and
Table 3 Locus of responsibility and policy options – customers’ versus managers’ perceptions (%)

<table>
<thead>
<tr>
<th>Locus of responsibility statements</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Despite some public relations efforts, I suspect that managers of most business firms have little or no commitment to disaster evacuation planning.</td>
<td>3% (27%)</td>
<td>24% (36%)</td>
<td>23% (14%)</td>
<td>41% (22%)</td>
<td></td>
</tr>
<tr>
<td>Unless we were directly ordered by the local government through a mandatory evacuation notice, we probably would not evacuate because we’ve seen too many false alarms.</td>
<td>26% (19%)</td>
<td>41% (29%)</td>
<td>17% (16%)</td>
<td>14% (22%)</td>
<td></td>
</tr>
<tr>
<td>The role of businesses ends with getting customers off property; they certainly are not obligated to provide guests with evacuation-route information, shelter options, or transportation assistance.</td>
<td>47% (38%)</td>
<td>41% (40%)</td>
<td>5% (12%)</td>
<td>6% (7%)</td>
<td></td>
</tr>
<tr>
<td>Local governments should provide more disaster-evacuation training for private-sector tourist executives.</td>
<td>2% (3%)</td>
<td>5% (19%)</td>
<td>30% (16%)</td>
<td>45% (52%)</td>
<td></td>
</tr>
<tr>
<td>Tourist business associations (e.g. hotel and motel trade associations) should demonstrate more interest in disaster-evacuation planning.</td>
<td>1% (3%)</td>
<td>2% (15%)</td>
<td>14% (20%)</td>
<td>48% (45%)</td>
<td></td>
</tr>
<tr>
<td>A major priority for local government following any disaster should be a media-awareness campaign to ensure that prospective tourists know the community has recovered and businesses are open.</td>
<td>2% (1%)</td>
<td>7% (1%)</td>
<td>11% (5%)</td>
<td>50% (41%)</td>
<td></td>
</tr>
</tbody>
</table>


### Policy option statements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Customers</th>
<th>Managers</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local governments should require all firms providing lodging, including RV parks and campgrounds, to have written disaster-evacuation plans.</td>
<td>3% (8%)</td>
<td>1% (8%)</td>
<td>4% (14%) 45% (26%) 46% (24%)</td>
</tr>
<tr>
<td>Disaster planning by private firms should include provision to ensure effective evacuation of special populations (e.g. non-English speaking, individuals with some disability). Note: this item was worded behaviourally in the managerial survey (i.e. 'Our planning had provisions to ensure . . .')</td>
<td>1% (2%)</td>
<td>2% (29%)</td>
<td>6% (37%) 49% (25%) 42% (7%)</td>
</tr>
<tr>
<td>The effectiveness of future evacuations could be enhanced if lodging establishments participated in a disaster-evacuation exercise each year.</td>
<td>1% (8%)</td>
<td>7% (21%)</td>
<td>16% (18%) 43% (37%) 34% (15%)</td>
</tr>
<tr>
<td>Local governments should do more to promote vertical evacuation (e.g. to upper floors of multi-story hotels) in appropriate structures within the community rather than solely urging people to evacuate elsewhere.</td>
<td>7% (13%)</td>
<td>20% (21%)</td>
<td>38% (35%) 27% (26%) 9% (6%)</td>
</tr>
</tbody>
</table>

Note: Managers perception responses are in brackets alongside customer perceptions. All responses are significantly different between customers and managers except for the last statement in the table.

Source: Modified after Drabek (2000: 53)
Current Issues in Tourism

operators, with cross-checks and alternative media contingencies in the event of system failures. A total of 49% of tourists from Drabek’s (2000) study indicated the need for more staff training, suggested that simulation exercises or drills could be useful for staff. Simulations and drills are useful for individual organisations in the tourism industry as well as local and regional tourism organisations. However, Johnston et al. (2007) discovered that only 22% of accommodation establishments in Ocean Shores, Washington, USA were exposed to training on how to respond to hazard events, and only one establishment from 18 had

### Table 4 Customers’ perceptions of disaster-planning improvements

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodging establishments should provide all guests with a brochure that outlines their disaster-evacuation procedures.</td>
<td>4%</td>
<td>3%</td>
<td>5%</td>
<td>33%</td>
<td>55%</td>
</tr>
<tr>
<td>If I ever found a hazard-awareness brochure (e.g. hurricane information and response procedures) in my hotel room, I would not feel comfortable staying there.</td>
<td>52%</td>
<td>41%</td>
<td>4%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Staff from lodging establishments should be prepared to provide disaster-evacuation road information to all guests requesting it.</td>
<td>1%</td>
<td>1%</td>
<td>3%</td>
<td>39%</td>
<td>56%</td>
</tr>
<tr>
<td>Since some people travel with their pets, disaster planners should make some type of arrangement for them when evacuations are required.</td>
<td>3%</td>
<td>8%</td>
<td>22%</td>
<td>46%</td>
<td>22%</td>
</tr>
<tr>
<td>Lodging establishments should have policies that permit a full refund of pre-paid deposits and penalty-free cancellations when their local government has issued any type of a disaster-evacuation advisory.</td>
<td>2%</td>
<td>6%</td>
<td>7%</td>
<td>40%</td>
<td>46%</td>
</tr>
<tr>
<td>If the managers of lodging establishments expect to keep tourists coming back to the area we were visiting, they must modify their refund and cancellation policies related to disaster evacuation.</td>
<td>3%</td>
<td>13%</td>
<td>29%</td>
<td>36%</td>
<td>20%</td>
</tr>
</tbody>
</table>

tsunami training programme. Only one establishment had signage in rooms on tsunami, although all had the legally required signage for fire hazards. Despite the costs associated with preparing and undertaking a simulation exercise or training, the lessons learned can be invaluable as there is often a difference between disaster planning and management (Quarantelli, 1984, 1988).

The tourism industry should perhaps work together to plan and develop simulations based on scenarios to help train staff on disaster management principles and practice. However, more research is required into the barriers and impediments to tourism disaster planning.

Barriers or impediments to disaster planning by tourism businesses, discovered by Hystad and Keller (2007), included a lack of money (68% of the sample), lack of knowledge on what a disaster management plan entails (48%), inability to make changes due to the small size of their businesses (23%) and a perceived lack of cohesiveness in the tourism industry (14%). Johnson et al. (2007) suggest training needs analysis should be undertaken on disaster preparation and planning for the tourism industry, to understand current knowledge levels, barriers to implementing mitigation measures as well as training opportunities. Training could be conducted with sectors of the tourism industry to reduce costs, and improve coordination and control. As Johnston et al. (2007: 211) suggest ‘[g]iven most tourism ventures are privately owned firms, there is a need to establish relationships with owners and operators to convey the importance of emergency planning for their employees (tourism personnel) and their clients (tourists)’. Méheux and Parker (2006) propose an awareness strategy based on persuasive communication for the tourism industry.

Perhaps the blame lies with National Tourist Organisations (NTOs), Destination Marketing Organisations (DMOs), or even industry associations, who may be in a better position to develop awareness amongst their stakeholders, collect data and information on possible disasters and provide training and support for the broader industry. Ritchie and Crouch (2003) observed that DMOs are an important stakeholder in responding to crises and ensuring a competitive and sustainable tourism destination. As Page et al. (2006: 361) note with regards to NTOs and tourism shocks, they have a remit ‘. . . to undertake a leadership role to understand, analyse, plan and manage crises and disasters’, and should prepare contingency and disaster plans. In the same article the attempt by Visit Scotland to consider the impact and possible initiatives to prepare for a potential influenza pandemic was discussed. Furthermore, industry associations can take a proactive role in developing risk and disaster prevention strategies. For instance, Beeton (2001) illustrates that measures can be undertaken as a to reduce the likelihood of a crisis and also reduce insurance premiums for tourism businesses.

However, Méheux and Parker (2006) also suggest that a complex range of factors influence disaster preparedness and may be responsible for a lack of reduction and readiness planning for tourism. Figure 2 illustrates the stage, outcomes, potential indicators and broad influencers on disaster preparedness. This model is useful as it provides some indicators that could be examined in future tourism disaster research on preparedness. Exploring the influence of variables presented in the model, such as experience, values and beliefs, messages, personal attributes and socio-cultural norms would be an important step.
in better understanding tourism disaster preparedness. As discussed earlier in this paper, experience may influence preparation, as could values and beliefs about the likelihood and response to tourism disasters. More research and focus should be placed on understanding tourism industry attitudes and perceptions concerning disaster preparedness and planning, to complement the already growing research on response and recovery of tourism organisations and destinations.

**Conclusion**

As this paper has argued, despite the growing threat of natural disasters to tourism businesses and destinations, few tourism businesses are prepared to handle the impacts of such threats, yet disaster planning should be a core competency of tourism managers. The paper began by defining natural disasters and presenting the case for embracing tourism disaster planning due to the complexity of natural disasters and the open nature of the tourism system. It then outlined key literature from the hazards, natural disasters and emergency management field to consider ways that natural disasters may be reduced, mitigated and prepared for. Understanding risk and vulnerability and their broader links to sustainable development and sustainable tourism are vital and suggest the need for longer term reduction of natural disasters. The concept of
‘invulnerable development’ should be considered in combination with structural and non-structural mitigation measures.

This was then followed by a discussion on preparedness measures, if prevention is not possible, including an understanding of emergency planning, the nature of precursors and warning systems, and finally, the development of training and simulations for emergency and tourism managers. Limited academic attention by tourism researchers and tourism managers has focused on tourism disaster preparation. Due to the nature of the tourism industry comprising a large number of small businesses, this paper has argued that NTOs, DMOs or industry associations have an important role to play in assisting their stakeholders to change their reactive mindset and develop reduction and readiness strategies and initiatives. Recent efforts by such organisations, such as Visit Scotland are promising, but more effort is required.

Further research on a number of topics associated with disaster planning, reduction and readiness are urgently required. Such research can assist tourism managers and policy makers to develop effective policies and strategies. In particular, this paper has suggested that researchers should attempt to understand the current level of industry reduction and readiness efforts as well as potential barriers or impediments in tourism disaster planning. Research from the hazards, emergency planning and tourism disaster planning field suggest that the tourism industry can play an important role in planning for, or reducing natural disasters. However, as Figure 2 illustrates, a lack of awareness, understanding and capacity of tourism managers may be restricting tourism disaster planning. This may be in part due to a lack of experience, certain values and beliefs, personal attributes or social/cultural norms.

Future research should consider a post-disciplinary (Coles et al., 2006) approach to the problem of tourism disaster planning. As Coles et al. (2006) suggest, a more problem-focused approach beyond disciplines based on more flexible modes of knowledge production, plurality, synthesis and synergy, may be important for advancing tourism knowledge in this field. Future research should go beyond discipline boundaries for more detailed research insights, more interesting and valuable methodological approaches. This may be achieved by involving researchers from education, communication, emergency planning, environmental science, sociology, geography (physical and applied) and tourism to better understand the reasons behind tourism disaster planning and preparation levels and problems. As Larsson and Enander (1997) observed, social values and norms may have an influence on disaster planning, and cross cultural studies are suggested to examine these issues. In complex areas, such as tourism disaster planning, a single disciplinary approach is perhaps not significant to advance knowledge and understanding.

Furthermore, as noted in this paper, tourists are often considered more vulnerable in a natural disaster as they are not aware of the local conditions or resources and rely on tourism operators to provide necessary information, which may not be available. Research is urgently required on the hazard and disaster information strategies for different tourist groups and target markets. Each may require separate messages and information located in different sources to ensure that they are read and understood by these groups. Again researchers in the communication, education, media and sociology field could
work with tourism researchers to explore these issues. Awareness campaigns, training needs analysis and other educational programs can be developed once a better understanding of industry and tourist attitudes are held by policy makers.

It is hoped that this paper has made a small contribution to knowledge in the field of tourism disaster planning, which requires further attention from both tourism researchers and managers. It is hoped that a move away from response and recovery to reduction and readiness, coupled with a post-disciplinary approach to research, will assist the tourism industry to more effectively deal with natural hazards and disasters in the future.

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