Towards a framework for tourism disaster management

Bill Faulkner*

Centre for Tourism and Hotel Management Research, School of Tourism and Hotel Management, Griffith University, PMB 50 Gold Coast Mail Centre, QLD 9726, Australia

Abstract

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. Despite this, few destinations have properly developed disaster management plans in place to help them cope with such eventualities. Among the reasons for this is the limited amount of systematic research that has been carried out in the field. This paper addresses this problem by drawing on insights from the broader disaster management literature to produce a generic model for analysing and developing tourism disaster management strategies. A set of prerequisites and principles of effective tourism disaster management planning is also provided. © 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Disasters; Crises; Hazards; Risk; Tourism disaster management plans; Chaos; Recovery

1. Introduction

To the casual observer exposed to the plethora of media that currently inform our daily lives, it appears that we live in an increasingly disaster prone world. This perception has some foundations, at least to the extent that the number of disasters (defined in terms of declarations of disaster areas, economic value of losses and the number of victims) has, in fact, increased in recent decades (Blaikie, Cannon, Davis & Wisner, 1994). However, the same authors point out that the incidence of natural hazard events (earthquakes, eruptions, floods or cyclones) has not increased, while others have suggested that the definition of disasters has become too fluid for statistical time series purposes (Horlick-Jones, Fortune & Peters, 1991). Notwithstanding statistical uncertainties, there is a body of opinion which has attributed the apparent increase in the human toll of disasters to a combination of population growth, increased urbanisation and global economic pressures. (Blaikie et al., 1994; Berke, 1998; Brammer, 1990; Burton, Kates & White, 1978; Donohue, 1982; Hartmann & Standing, 1989) In particular, it is suggested that these factors have either resulted in human settlement and activity being extended into areas which have increased exposure to hazards, or these activities have actually been instrumental in inducing hazards.

In observing that our environment appears to have become increasingly 'turbulent and crisis prone', Richardson (1994) has suggested this might be so not only because we have become a more crowded world, but also because we now have more powerful technology that has the capacity to generate disasters. As the spectre of the Millenium Bug illustrates, for instance, computer failures can bring major computer-driven systems to a standstill instantaneously. The complexity of technology-based systems means that they are more prone to the 'butterfly effect' described by Edward Lorenz (1993) and presented as one of a centrepieces of chaos theory (Gleick, 1987). Small changes or failures in the system can precipitate major displacement through mutually reinforcing positive feed back processes. Mitroff (1988) has alluded to this in his reference to the role of the interaction between information technology and economic systems in creating wild swings in the financial system. The role of technology in exposing humankind to 'natural' disasters is succinctly described in the following remarks by Burton et al. (1978, pp. 1–2):

'In a time of extraordinary human effort to control the natural world, the global toll from extreme events of nature is increasing ... It may well be that the ways

*Tel.: + 61-7-5594-8732; fax: + 61-7-5594-8507.

E-mail address: b.faulkner@mailbox.gu.edu.au (B. Faulkner).

in which mankind deploys its resources and technology in attempts to cope with extreme events of nature are inducing greater rather than less damage and that the process of rapid social change work in their own way to place more people at risk and make them more vulnerable. '…' To sum up, the global toll of natural disaster rises at least as fast as the increase in population and material wealth, and probably faster.'

Whether the incidence of disasters is increasing, or it is simply a matter of each disaster having more devastating effects, as the above summary suggests, it is apparent we live in an increasingly complex world and this has contributed to making us more crisis or disaster prone (Richardson, 1994). Complexity, in this context, refers to an intricacy and coherence of natural and human systems, which complicates the process of isolating cause and effect relationships in the manner so often assumed as being possible in traditional research. For this reason, the boundaries between natural disasters and those induced by human action are becoming increasingly blurred, and this element of disaster situations needs to be taken into account in any analysis of such phenomena (Capra, 1996; Waldrop, 1992). As an area of human activity, tourism is no less prone to disasters than any other. Indeed, it has been suggested that the increased volume of global tourism activity has combined with the attractiveness of high-risk exotic destinations to expose tourists to greater levels of risk (Drabek, 1995; Murphy & Bayley, 1989). Despite this, relatively little systematic research has been carried out on disaster phenomena in tourism, the impacts of such events on the tourism industry and the responses of industry and relevant government agencies to cope with these impacts. Such research is an essential foundation for assisting the tourism industry and relevant government agencies to learn from past experiences, and develop strategies for avoiding and coping with similar events in the future.

One of the reasons so little progress has been made in the advancing of our understanding of tourism disasters is the limited development of the theoretical and conceptual frameworks required to underpin the analysis of this phenomena. The purpose of the current study is to fill this gap, by using the broader literature relating to crises and disaster management as a foundation for such a framework. The first step in this process involves the establishment of a distinction between crises and disasters, which goes some way towards clarifying the complexity issue alluded to above. Community (and organisational) responses to disaster situations are then examined with a view to providing some insights into the essential ingredients of disaster management strategies. Finally, aspects of tourism disasters are examined as a step towards providing a model for developing tourism-specific disaster management strategies.

2. The nature of disasters and crises

Much early management theory assumed relative stability in both internal and external environments of organisations and, therefore, did not provide a firm foundation for coping with change and crises (Booth, 1993). If the implications of change were considered at all, this was viewed in terms of the challenge of coping with gradual (relatively predictable) change, rather than sudden changes which might test the organisation's ability to cope. Such situations might be described as crises or disasters, depending on the distinctions referred to below. Given the specific focus of this paper on tourism sector adjustments to disasters at the destination level, it should be borne in mind that references to 'organisations' in this section apply equally to destinations and host communities.

One perspective on the nature of crises is provided by Selbst (1978), who refers to a crisis as "Any action or failure to act that interferes with an (organisation's) ongoing functions, the acceptable attainment of its objectives, its viability or survival, or that has a detrimental personal effect as perceived by the majority of its employees, clients or constituents". There are two dimensions of the crisis situation emphasised in this definition, which shed light on the distinction between crises and disasters, and the ramifications of these two situations with regard to the responses of organisations and communities. Firstly, by referring to 'any action or failure to act', Selbst implies that the event in question is in some way attributable to the organisation itself. Secondly, it is implied that the event must have detrimental or negative effects on the organisation as a whole, or individuals within it.

Selbst's definition of crises seems to exclude situations where the survival of an organisation or community is placed in jeopardy because of events over which those involved have little or no control. For example, tornadoes, floods and earthquakes can hardly be regarded as self-induced, although communities in vulnerable areas can take steps to minimise the impacts of such events. Thus, for the purposes of this analysis, it is proposed that 'crisis' be used to describe 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. On the other hand, 'disaster' will be used to refer to situations 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. We can therefore envisage a spectrum of events such as that depicted in Fig. 1, with crises located at one extreme and disasters at the other. However, as implied in the introduction, it is not always clear where we locate specific events along this continuum because, even in the case of natural disasters, the damage experienced is often partially attributable to human action.

CRISES   DISASTERS

Scale Or Magnitude Of The Event

Chernobyl   Kobe Earthquake

Exxon Valdez   Lockerbie

Swiss Canyon Incident   Katherine Flood (Australia)

INDUCED BY THE ACTIONS OR INACTIONS OF THE ORGANISATION   INDUCED NATURAL PHENOMENA OR EXTERNAL HUMAN ACTION
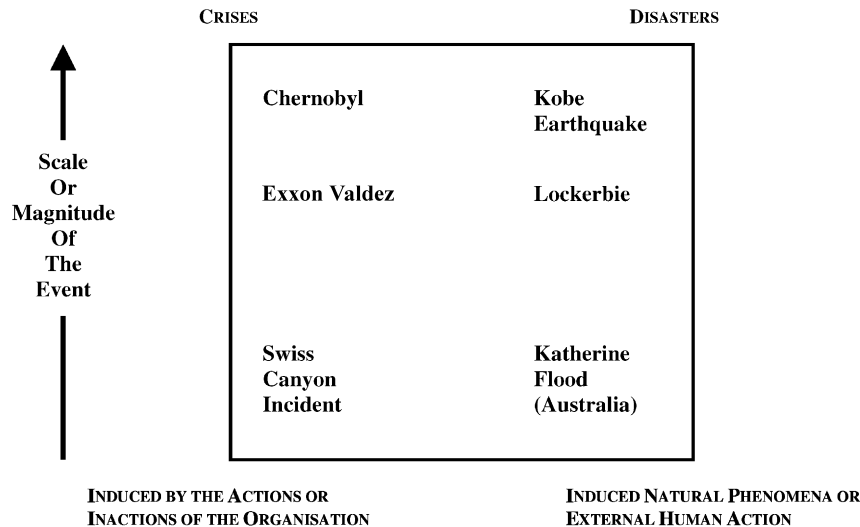
Fig. 1. Crises and disasters.

Good management can avoid crises to some degree, but must equally incorporate strategies for coping with the unexpected event over which the organisation has little control. Frequently, the recognition of a critical problem that might eventually precipitate a crisis becomes a matter of too little too late largely because, as Booth (1993, p. 106) observes, "standard procedures tend to block out or try to redefine the abnormal as normal". This problem is probably more relevant to the genesis of crises, where organisations fail to adapt to gradual change, but it might apply to disaster situations to the extent that the tendency to ignore warnings of an impending disaster often leaves communities unprepared when it actually happens.

Crises and disasters epitomise chaos phenomena as it is described by such authors as Gleick (1987), Peat (1991), Prigogine and Stengers (1985) and Faulkner and Russell (1997) in the tourism context. In terms of Chaos Theory, even apparently stable systems are frequently 'at the edge of chaos', whereby a seemingly insignificant event may be enough to precipitate instability and change on such a scale that the integrity and coherence of the system appears to be threatened. Fink emphasises the ubiquity of the 'edge of chaos' condition in business when he suggested that businesses generally are a crisis waiting to happen — i.e. "any time you're (ie managers) are not in crisis, you are instead in a pre-crisis, or prodromal mode" (Fink, 1986, p. 7). In his view, the essence of crisis management thus becomes "the art of removing much of the risk and uncertainty to allow you to achieve more control over your destiny" (Fink, 1986, p. 15).

The other aspect of Selbst's definition highlighted above concerns its emphasis on the negative and threatening impacts of the event, rather than the possibility of it representing a turning point or opportunity. As Fink (1986) emphasises, the Webster dictionary defini-

tion of a crisis refers to such events as 'a turning point for better or worse'. Crises and disasters therefore have transformational connotations, with each such event having potential positive (e.g. stimulus to innovation, recognition of new markets, etc.), as well as negative outcomes. This is illustrated by seasonal floods in riverine areas of Peninsula Malaysia, which are seen as both hazards and resources (Chan, 1995). The floods bring disruption to communities within the area, but at the same time they replenish the productive capacity of riverine alluvial soils upon which the region's agricultural industry is so dependent.

Again, this is consistent with elements of Chaos Theory, which see chaos as essentially creative, rather than a destructive process. Once a system is pushed past some point of criticality by some crisis or disaster, it may well be destroyed as an entity, it might be restored to a configuration resembling its pre-crisis/disaster state, or a totally new and more effective configuration might emerge. The potential for both destructive and positively creative forces being unleashed by the chaos associated with crises and disasters is illustrated in Berman and Roel's (1993, p. 82) description of reactions to the 1985 Mexico City earthquake:

> "Crises bring about marked regressions as well as opportunities for creativity and new options. They are turning points in which regressive tendencies uncover discrimination (and) resentment about ethnic and socioeconomic differences..: yet they also trigger progressive potentials and solidarity".

The above discussion has provided an explanation of the distinction being drawn between crises and disasters for the purposes of the current study, along with a description of the general characteristics of these phenomena. However, we are no closer to precisely defining

crises and disasters in a form which would enable us to empirically identify when such situations occur. In turning to this issue, it is important that we be reminded that, from an organisational point of view, crises and disasters are essentially very similar and the main distinction between them is a root cause of the problem. The former represent situations where the causes of the problem are associated with on-going change and the failure of organisations to adapt to this, while the latter are triggered by sudden events over which the organisation has relatively little control. Notwithstanding this distinction, most of the features attributed to disasters in the following discussion are equally applicable to crises.

Carter (1991, p. xxiii) defines a disaster as "an event, natural or man-made, sudden or progressive, which impacts with such severity that the affected community has to respond by taking exceptional measures". In his definition of crises, Booth (1993) places a similar emphasis on the necessity of 'exceptional measures' in the community's response by referring to the necessity of non-routine responses, but he adds that stress is created by the suddenness of the change and the pressure it places on adaptive capabilities. Thus, a crisis is described as "a situation faced by an individual, group or organisation which they are unable to cope with by the use of normal routine procedures and in which stress is created by sudden change" (Booth, 1993, p. 86).

Several other authors have attempted to distil the essential characteristics of disaster or crisis situations (Fink, 1986, p. 20; Keown-McMullan, 1997, p. 9; Weiner and Kahn, 1972, p. 21). A synthesis of these contributions produces the following key ingredients:

- a triggering event, which is so significant that it challenges the existing structure, routine operations or survival of the organisation;
- high threat, short decision time and an element of surprise and urgency;
- a perception of an inability to cope among those directly affected;
- a turning point, when decisive change, which may have both positive and negative connotations, is imminent. As Keown-McMullan (1997, p. 9) emphasises, "even if the crisis is successfully managed, the organisation will have undergone significant change";
- characterised by 'fluid, unstable, dynamic' situations (Fink, 1986, p. 20).

Another approach to defining disasters is provided by Keller and Al-Madhari (1996, p. 20), who applied arbitrary statistical benchmarks. Thus, disasters were defined in terms of a threshold number of fatalities (10), damage costs (US $1 million) and number of people evacuated (50). On the basis of this definition, they claim there has been 6000 disasters since 1970, with 4 million deaths and widespread economic costs. This approach has the appeal of providing a solid, unambiguous foundation for defining disasters, and it is appropriate in the context of studies concerned about statistical issues, such as probabilistic prediction of frequency and magnitude of disasters. However, it loses sight of the qualitative factors referred to above, which are present in disaster situations irrespective of whether or not the fatality, damage cost and evacuation thresholds are reached.

3. Community responses and the ingredients of disaster recovery strategies

The reference to both crises and disasters, and the subtleties of the distinction between them, has been useful for the purpose of highlighting how disasters, or at least the severity of their impacts, are to varying degrees influenced by the actions of the individuals, organisations or communities that are affected by them. This section focuses on disasters specifically. That is, those situations where the event which disrupts the routine of the community concerned, and in response to which adjustments have to be made, is triggered externally. We are interested in how communities and individuals respond to these events, and the implications of this for the development of disaster strategies.

From a sociological perspective, the immediate response to a disaster situation has been observed as including several phases (based on Arnold (1980) in Booth, 1993, pp. 102–103).

- shock at both the individual and the collective level, where the unexpected nature of the event and the severity of its impacts cause stress and a sense of helplessness and disorientation. While the stressfulness of the situation may initially impair adaptive responses, it is also a mobilising factor for those involved;
- denial or defensive retreat. Denial being an attempt to reach back to the safety of the known, or an attempt to avoid the crisis by repressing it. Defensive retreat may involve either evacuation from the effected area, or a strategic withdrawal to safe places within the area. Evasive action is taken to ensure safety and this enables those concerned to regroup;
- an acknowledgement represents a turning point whereby the community accepts the reality of the change; and
- adaptation, where the community learns from the crisis, develops new ways of coping and rebuilds.

This sequence is probably as much applicable to the individual level as it is at the collective (i.e. organisational and community) level. Chan (1995) suggests that, beyond the immediate occurrence of the disaster, responses might take one of several broader courses:

- to protect (prevent or modify disasters);
- to accommodate (change human use systems to suit disasters);
- to retreat (resettlement elsewhere);
- to do nothing.

It is hard to envisage situations where the 'do nothing' strategy provides a viable alternative. Even in the case of the random, one-off event, which has a very low probability of recurrence, some sort of recovery plan needs to be implemented so that lingering longer-term impacts of the disaster can be ameliorated. The applicability of the remaining three strategies will clearly depend on the extent of damage caused by the disaster, the probability and frequency of recurrence and the adaptability of the impacted community.

At some point in a disaster situation there needs to be an assessment of the capacity of the community to cope so that the appropriate level of emergency relief can be determined. A more than appropriate level of relief involves wastage and the unnecessary straining of resources, while insufficient external support will exacerbate the effects of the disaster. However, according to Granot (1995), there are few objective measures for assessing a community's resilience in this regard. Geipel (1982) ranked levels of community impact in a manner that implies a continuum between minimal effects and total collapse. The following categories were therefore identified:

- communities which have not suffered and therefore have the capacity to support others which have;
- communities which escape with only limited loss of life and property — community systems remain largely intact and normal built-in elasticity of resources permits self-recovery;
- communities that sustain so much damage that they can only recover with outside help. With such help their own systems are capable of coping and ultimate recovery;
- communities that are devastated so much that community systems collapse.

Granot challenges the notion of a continuum, however, by suggesting that the effect of a disaster on a community might be more appropriately represented in terms of the percolation principle, which sees changing states as being non-linear. He suggests that, "once a certain threshold is crossed in a sufficient number of constituent subsystems, a basic change takes place in the community system as a whole, affecting its overall capacity to cope" (Granot, 1995, p. 6). It is suggested that factors affecting a community's capacity to cope include:

- community background factors (relevant demographic, socioeconomic, political, cultural, organisational and resource level characteristics);

- event factors (objective factors precipitating the cause or causes of the incident); and
- impact factors (immediate discernible outcome, as reflected in such factors as number of casualties, property damage, etc.).

Richardson's (1994) analysis of crisis management in organisations provides another perspective on community adjustment capabilities by distinguishing between 'single' and 'double loop' learning approaches. In the former, the response to disasters involves a reorientation "more or less in keeping with traditional objectives and traditional roles" (Richardson, 1994, p. 5). Alternatively, the 'double loop' learning approach challenges traditional beliefs about 'what society and management is and should do'. This approach recognises that management systems in place can themselves engender the ingredients of chaos and catastrophe, and "organisations must be prepared to manage through the crisis driven era that is, in one sense, given to them but managers must also be more aware and proactively concerned about organisations as the creators of crises". (p. 6)

For the purposes of exploring these issues further and examining the ingredients of disaster management strategies in more detail, it is useful to look at the frameworks that have been used to describe the stages in response to disasters at the community level. Two such frameworks have been produced, one by Fink (1986) and the other by Roberts (1994). These are described in Table 1, where a composite set of stages drawing upon both frameworks is also presented in the first column. The latter set will be utilised as the basis for further discussion because it is more comprehensive.

Community responses to disasters, both during the emergency and afterwards in the recovery period, involve many different organisations (Granot, 1997; Huque, 1998). In this situation, it is not uncommon for competition and rivalry among these organisations to become a major impediment to both coordination and the ability of organisations to respond effectively (Comfort, 1990). In their examination of emergency services responses to the 1989 Newcastle earthquake, for instance, Kouzmin, Jarman and Rosenthal (1995) have noted that ambiguities in the division of responsibilities and the rivalries between various emergency service agencies undermined the effectiveness of their response collectively. These problems arise from, and are intensified by, the scarcity of public resources and the necessity of each organisation to justify its existence in order to obtain a share of these resources.

In addition to this problem, different internal cultures and modus operandi become barriers to communication and co-operation between organisations. As Granot (1997, pp. 309–310) has observed, "Old jurisdictional disputes can often be set aside and left unresolved in normal times, but in emergencies they have a way of

Table 1
Stages in a community's response to a disaster

Composite stages	Fink's (1986) stages	Robert's (1994) stages
1. Pre-event		*Pre-event*: where action can be taken to prevent disasters (e.g. growth management planning or plans aimed at mitigating the effects of potential disasters)
2. Prodromal	*Prodromal stage*: when it becomes apparent that the crisis is inevitable	
3. Emergency	*Acute stage*: the point of no return when the crisis has hit and damage limitation is the main objective	*Emergency phase*: when the effects of the disaster has been felt and action has to be taken to rescue people and property
4. Intermediate		*Intermediate phase*: when the short-term needs of the people affected must be dealt with —- restoring utilities and essential services. The objective at this point being to restore the community to normality as quickly as possible
5. Long term (recovery)	*Chronic stage*: clean-up, post-mortem, self-analysis and healing	*Long-term phase*: continuation of the previous phase, but items that could not be addressed quickly are attended to at this point (repair of damaged infrastructure, correcting environmental problems, counselling victims, reinvestment strategies, debriefings to provide input to revisions of disaster strategies)
6. Resolution	*Resolution*: routine restored or new improved state	

returning as conflicts that prevent coordination" and as "these situations are difficult to resolve in the heat of the moment, it is clear inter-organisational relationships need to be planned ahead and exercised before the actual need occurs". Quarantelli (1982) also sees this as a major challenge in the disaster preparation. However, while coordination between emergency services in the development and implementation of disaster strategies is given lip service, it is seldom reflected in actions (Hills, 1994). On the other hand, Granot (1997) also suggests that inadequate resources often force agencies into a collaborative arrangement under emergency conditions. The extent to which pressure to react to the disaster might force organisations to work together, and thus provide a catalyst for breaking down institutional barriers in the longer term, is not clearly addressed in the literature.

The degree to which emergency services and other organisations can be prepared for disasters is questioned by Huque (1998), who notes that policies and decision-making structures that govern an organisation's activities in normal times may not be appropriate in disaster situations. For example, the hierarchical structure and chain of command under normal conditions is necessary for internal coordination purposes, but the tight time lines for decisions and actions during emergencies may make this structure too unresponsive. Bureaucratic structures and power relationships restrict the ability of organisations to respond promptly and effectively to emergency conditions, and this in itself constitutes a bar-

rier to inter-agency cooperation. Heath (1995) observed how response times of emergency services and government agencies in the case of the 1995 Kobe earthquake were affected by bureaucratic procedures. In this case Japanese cultural orientation toward bottom-up consensus in decision-making also affected the timeliness of the response.

Other factors cited by Heath (1995) as impeding the timeliness and effectiveness of the response in the Kobe case provide some useful insights into some of the key considerations in the development of disaster plans. These included:

- communication failures;
- availability of resources (a common problem as governments and response agencies rarely set aside resources in reserve for infrequent and unpredictable crises);
- deployment of resources at a distance from the impact area can be slow — aggravated by damage to infrastructure;
- the attention and efforts of many affected by the disaster shifts from the big picture to immediate, more local concerns and they resist efforts to redirect their attempts towards more coordinated action. Dispersion of resources becomes a related problem;
- "Even without blocked roads and dispersed response demands, a large magnitude impact will create demands for service that exceeds the capabilities of response agencies." (Heath, 1995, p. 17);

Also, on the basis of his analysis of responses to the Kobe incident, Heath has emphasised the need to incorporate a 'cascaded strategic priority profile' (CSPP), in the disaster planning phase. This approach involves "a rank ordering of tasks and activities that need to be undertaken, moving from the highest to lowest priority" (Heath, 1995, p. 18). CSPPs need to be developed at various levels of managerial operation, from overall to the local level, to provide multiple layers. Furthermore, these must be articulated with each other to avoid waste, duplication and mutually antagonistic actions.

The role of media in disaster management strategies can be crucial to such an extent that it might make the difference between whether or not a difficult situation evolves into a disaster (Fink, 1986; Keown-McMullan, 1997). Media outlets can help by disseminating warnings in the lead up to impending disasters (i.e. where these are predictable) and providing information during the recovery stage. However, they can also hinder emergency operations by spreading false information or criticising these operations in a manner that distracts the emergency service personnel from their task. Thus Fischer and Harr (1994) found that up to 20 per cent of emergency operating centre staff's time in the Andover, Kansas tornado incident was spent on media damage control. Furthermore, adverse media reports had an impact on the decisions made by these staff. In Australia, Christine (1995) has noted the effect of misleading reports exaggerating the extent of the 1993 Sydney bushfires. These experiences highlight the necessity of a media communication strategy involving the early establishment of a centralised source in order to ensure that misleading and contradictory information is not disseminated (Riley & Meadows, 1997).

On the role of the media in disasters in the US, Quarantelli (1996) has observed:

- disaster preparedness planning in mass media is generally poor;
- some of the coordination problems attributed to emergency services agencies are also evident in the press as "local mass media systems consider disasters in their own community as "their" disasters" and 'this is sometimes manifest in tension … between local mass media and national network staff members' (Quarantelli, 1996, p. 6);
- there is a tendency for selective reporting focusing on the activities of formal organisations (with whom the media has established links), rather than emergent and informally organised volunteers;
- television, in particular, is prone to perpetuate disaster myths, such as the persistence of disruption, panic, looting, etc.

Disaster strategies clearly need to articulate a set of appropriate actions for each of the stages described in Table 1. Quarantelli (1984) and Turner (1994) have each commented on the essential ingredients of disaster strategies from two different, but complementary, perspectives. As reflected in Table 2, while the latter provides useful guidelines for the production of the strategy, Quarantelli concentrates more on its actual ingredients and the systems that need to be in place to make it work. By amalgamating the analyses of both authors, therefore, it is possible to produce a more comprehensive structure for producing a disaster survival strategy.

From this brief overview of community responses to disasters, and on the basis of other insights provided by analyses of disaster situations, a number of conclusions can be drawn about important considerations in disaster preparedness generally. These will be revisited in the next section after aspects of tourism disasters have been explored, so that they can be related specifically to tourism disaster strategy development considerations.

Table 2
Ingredients of a disaster survival strategy

Strategy development(Turner, 1994)	Implementation(Quarantelli, 1984)
• Form disaster recovery committee and convening meetings for the purpose of sharing information • Risk assessment (identify potential threats/disasters and prioritise in terms of probability of occurrence — real, likely and historical threats. Perhaps stimulated by a definition and classification of potential disasters) • Analysis of anticipated short- and long-term impacts • Identification of strategies for avoiding/minimising impacts, critical actions necessary, chain of command for coordination, responsibilities and resources • Prepare and disseminate manual and secure commitment from responsible parties and relevant agencies. Relevant contact information must be included	• Holding disaster drills, rehearsals and simulations • Developing techniques for training, knowledge transfer and assessments • Formulating memoranda of understanding and mutual aid agreements • Educating the public and others involved in the planning process • Obtaining, positioning and maintaining relevant material resources • Undertaking public educational activities • Establishing informal linkages between involved groups • Thinking and communicating information about future dangers and hazards • Drawing up organisational disaster plans and integrating them with overall community mass emergency plans • Continually updating obsolete materials/strategies

4. Tourism disasters

Several authors have emphasised the vulnerability of tourist destinations, and thus tourists, to disasters and some have suggested that, in these situations, tourists might be more exposed to danger than anyone else (Drabek, 1995). Murphy and Bayley (1989) suggest that the exposure of tourism to natural disasters is linked with the attractiveness of many high-risk exotic locations, where events such as hurricanes, avalanches and volcanic activity are common. They are also at risk from hijacking and terrorism because, as Lehrman (1986) observes, tourists have become soft targets in a period when increased security measures have made traditional targets (politicians, embassies, etc.) less attractive for terrorists. Furthermore, tourists themselves are often more vulnerable than locals in disaster situations because they are less familiar with local hazards and the resources that can be relied on to avoid risk, and they are less independent (Burby & Wagner, 1996; Drabek, 1992, 1994).

Despite the potentially devastating effect natural and man-made disasters can have on tourism, few tourism organisations at the enterprise or destination level have properly developed disaster strategies as an integral part of their business plans (Cassedy, 1991). In studies of disaster preparedness among tourism industry enterprises in the US, Drabek (1992, 1995) has reported that, while there was a relatively high degree of disaster preparedness among tourism executives, this was qualified by the observation that many had essentially informal (undocumented) strategies in place and these strategies addressed only one type of hazard. Also, the level of staff turnover had not been taken sufficiently into account in the consideration of the frequency of staff education and some misconceptions about disaster effects (e.g. inflated expectations regarding the potential for looting) influenced the planned response. Furthermore, larger firms with more professional senior managers and planning resources tended to be more prepared than the many smaller establishments. Elsewhere, Burby and Wagner (1996) reported a high degree of preparedness among hotel establishments in New Orleans, but this preparedness was compromised by similar reservations as those raised by Drabek.

The critical role of the media in disaster situations has been referred to in the previous section. In tourism context, the impacts of disasters on the market are often out of proportion with their actual disruptive effects because of exaggeration by the media (Cassedy, 1991; Murphy & Bayley, 1989; Drabek, 1992). As Young and Montgomery (1998, p. 4) have observed, " … a crisis has the potential to be detrimental to the marketability of any tourist destination, particularly if it is dramatised and distorted through rumours and the media". Meanwhile, disaster situations provide a fertile ground for misinformation, as disruptions to communications systems combine with publication deadlines to inhibit the verification of reports and the ratings game fosters sensationalism (Milo & Yoder, 1991).

Media reports have the potential to have a devastating impact on disaster-affected destinations because pleasure travel is a discretionary item and, within the mind of the consumer, the "quest for paradise (can) suddenly transform into a dangerous journey that most travelers would rather avoid" (Cassedy, 1991, p. 4). This effect is expressed in econometric terms by Gonzalez-Herrero and Pratt (1998, p. 86) when they suggest that "tourism demand presents a higher elasticity index per level of perceived risk than any other industry because of the hedonistic … benefits customers ascribe to its products and services". By virtue of the power of the media and the tendency for negative images to linger, the recovery of destinations usually takes longer than the period required for the restoration of services to normalcy. This has been observed in a number of case studies, including the 1987 Fiji Coup, the 1989 San Francisco Earthquake, the 1989 Tiananmen Square incident (Cassedy, 1991) and Hokkaido's Mt Usu volcanic eruption (Hirose, 1982). The effectiveness with which the tourism industry in a disaster area handles a crisis, and therefore the degree to which it is prepared for it, has a bearing on how quickly services are restored to normal. However, the speed of the destination's recovery ultimately hinges on the degree to which market communication plans have been integrated with disaster management strategies.

The above observation perhaps explains why some models for tourism disaster plans (see, for example, Young & Montgomery, 1998) tend to emphasise market communication considerations at the expense of other aspects. This approach, however, involves the risk of a counter-productive over-reaction, which is illustrated by Cammisa's (1993) observations regarding the response of Florida tourism authorities to Hurricane Andrew in 1992. Cammisa suggested that, in their eagerness to assure the market that Florida's hotel accommodation had not been affected by the hurricane, tourism authorities overlooked the fact that the rest of the tourism infrastructure in the area had been devastated. Thus, he pointed out that, "rather than face up to this reality, unfortunately "denial" communication emanated from the area" (Cammisa, 1993, p. 294). A similar denial pattern was observed in the response of authorities to the Miami tourist crime incidents in 1992 and 1993. Another form of denial is noted by Murphy and Bayley (1989, p. 38) who highlight the reticence of tourism operators to bring attention to hazards and the need to take precautions, yet "safety drills and messages have become standard features of sea and air travel".

Bearing in mind the distinction drawn between crises and disasters earlier in this paper, many disasters are not predictable and their disruptive effects are generally unavoidable. However, through the development of a

disaster management strategy, many potential hazards can either be totally avoided, or at least their impacts can be minimised as a consequence of the prompt responses facilitated by the plan. Furthermore, confusion and the duplication of effort can be avoided, leading to a more efficient response, while the establishment of a preset plan to guide the responses of those involved results in the potential for panic and stress being reduced (Cassedy, 1991).

As mentioned previously, Young and Montgomery (1998) have provided a model for a detailed crisis management plan, although this tends to emphasise communication aspects. Other more balanced models have been developed by Cassedy (1991) and Drabek (1995). The main ingredients of each of the latter models are identified in Table 3, which reveals contrasting orientations in these two contributions. Cassedy emphasises aspects of the process of developing effective strategies, while Drabek's approach is structured around the sequence of responses that is necessary to cope with the emergency. While each of these authors provides a useful contribution, the cross-fertilisation between their respective contributions has been limited and few insights have

been drawn from the substantial literature on disaster and crises management responses referred to in the earlier sections of this paper.

Another approach to analysing responses to crises is based on operations research, whereby linear programming techniques are used to identify optimal responses (Arbel & Bargur, 1980). While this approach has been effective in systems where the parameters can be tightly specified in quantitative terms (e.g. a manufacturing organisation and individual hotel chain operations), it would appear to be less applicable to a tourist destination. A tourist destination encompasses more loosely connected systems (social, economic, environmental, physical infrastructure) than in the case of a single firm and responses to externally induced shocks must take into account the more fluid relationships between the various parties concerned.

Both the linear programming approach and, to a lesser extent, the other approaches described so far implicitly assume that the events creating the crisis situation are invariably temporary aberrations, and that the primary objective is to restore the system to the pre-existing (pre-shock) equilibrium. However, insights from Chaos Theory perspective described earlier in this paper suggest that this view of crises and disasters may be deficient in two respects. Firstly, some shocks have lingering effects that make the pre-shock equilibrium a redundant (or at least sub-optimal) approach with regard to longer-term sustainability. That is, in terms of the chaos framework, systems are often 'at the edge of chaos' and a single event can set in train a series of positive feedback loops (or chain reaction) which make the pre-event status-quo no longer viable. Secondly, the chaos created by crises can be a creative process, with the potential for innovative new configurations emerging from the 'ruins'. In this sense, crisis can act as a trigger or catalyst for a more vigorous and adaptable tourism industry at a destination. This effect is alluded to in Murphy and Bayley's (1989) reference to the aftermath of the Mt St Helens eruption. Here, recovery measures put in place after the emergency led to additional resources being devoted to tourism development in the affected area, and thus an overall improvement over pre-disaster conditions. The site of the disaster became an attraction in its own right.

Insights derived from the general analysis of disaster and crises management strategies in earlier sections have been combined with those obtained from the more specific examination of tourism disaster strategies in this section to produce a generic framework for tourism disaster strategies in Table 4. The details of this table have been largely dealt with in the preceding discussion. However, the underlying rationale of the framework hinges on several fundamental principles, which warrant some emphasis at this point because they summarise the main conclusions emerging from the study and highlight important implications for future research. These principles

Table 3
Ingredients of tourism disaster strategies

Cassedy (1991)	Drabek (1995)
• *Selection of a team leader*: a senior person with authority and able to command respect (ability to communicate effectively, prioritise and manage multiple tasks, ability to delegate, coordinate and control, work cohesively with a crisis management team, make good decisions quickly)	• Warning • Confirmation • Mobilisation • Customer information • Customer shelters • Employee concerns • Transportation • Employee sheltering • Looting protection • Re-entry issues
• *Team development*: a permanent and integral feature of strategic planning; able to identify and analyse possible crises, develop contingency plans	
• *Contingency plan*: including mechanism for activating the plan, possible crisis, objectives, worst-case scenario, trigger mechanism	
• *Actions*: action plan assignment of tasks, including gathering information and developing relationships with other agencies/groups (govt. agencies, other travel providers, emergency services, health services, the media, the community, the travelling public)	
• *Crisis management command centre*: a specific location and facility with relevant communication and other resources for the crisis management team	

Table 4
Tourism disaster management framework

Phase in disaster process	Elements of the disaster management responses	Principal ingredients of the disaster management strategies
1. *Pre-event* When action can be taken to prevent or mitigate the effects of potential disasters	*Precursors* • Appoint a disaster management team (DMT) leader and establish DMT • Identify relevant public/private sector agencies/organisations • Establish coordination/consulative framework and communication systems • Develop, document and communicate disaster management strategy • Education of industry stakeholders, employees, customers and community • Agreement on, and commitment to, activation protocols	*Risk assessment* • Assessment of potential disasters and their probability of occurrence • Development of scenarios on the genesis and impacts of potential disasters • Develop disaster contingency plans

2. *Prodromal*
 When it is apparent that a disaster is imminent
	Mobilisation
	 • Warning systems (including general mass media)
	 • Establish disaster management command centre
	 • Secure facilities
		Disaster contingency plans
		 • Identify likely impacts and groups at risk
		 • Assess community and visitor capabilities to cope with impacts
		 • Articulate the objectives of individual (disaster specific) contingency plans
		 • Identify actions necessary to avoid or minimise impacts at each stage
		 • Devise strategic priority (action) profiles for each phase
		   ○ *Prodromal*
		   ○ *Emergency*
		   ○ *Intermediate*
		   ○ *Long-term recovery*
		 • On-going review and revision in the light of
		   ○ *Experience*
		   ○ *Changes in organisational structures and personnel*
		   ○ *Changes in the environment*

3. *Emergency* The effect of the disaster is felt and action is necessary to protect people and property	*Action* • Rescue/evacuation procedures • Emergency accommodation and food supplies • Medical/health services • Monitoring and communication systems	
4. *Intermediate* A point where the short-term needs of people have been addressed and the main focus of activity is to restore services and the community to normal	*Recovery* • Damage audit/monitoring system • Clean-up and restoration • Media communication strategy	
5. *Long-term (recovery)* Continuation of previous phase, but items that could not be attended to quickly are attended to at this stage. Post-mortem, self-analysis, healing	*Reconstruction and reassessment* • Repair of damaged infrastructure • Rehabilitation of environmentally damaged areas • Counselling victims • Restoration of business/consumer confidence and development of investment plans • Debriefing to promote input to revisions of disaster strategies	
6. *Resolution* Routine restored or new improved state establishment	*Review*	

are outlined below in terms of the prerequisites for, and ingredients of, effective disaster management strategies.

Prerequisites of effective tourism disaster management planning include:

- *Coordinated, team approach*. Given the range of private and public sector organisations that are directly and indirectly involved in the delivery of services to tourists, the development and implementation of a tourism disaster strategy requires a coordinated approach, with a designated tourism disaster management team being established to ensure that this happens. This team needs 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.
- *Consultation*. To achieve the maximum cohesion, both within the tourism sector and between this sector and the broader community, disaster planning should be based on a consultative process that is both on-going and integrated with other areas of strategic planning (e.g. tourism marketing strategies, urban planning and broader regional economic plans). Apart from the bearing plans in these other areas might have on the exposure of the tourism sector to risk and the measures that might be implemented in the response to a disaster, the individuals directly involved change over time and this affects the 'chemistry' of the coordination process.
- *Commitment*. No matter how thoroughly and skillfully the disaster management plan may be developed, and regardless of the level of consultation that takes place in the process, it will be of limited value if the various parties involved are not committed to it and all individuals who are required to take action are not aware of it. As highlighted below, the plan must therefore contain clearly articulated protocols regarding the activation of the strategy and communication/education programme aimed at ensuring that all parties understand what is expected of them.

Ingredients of the tourism disaster management planning process and its outcomes should include:

- *Risk assessment*. An assessment of potential disaster situations that may emerge and their relative probability of occurrence is an essential first step. This should involve an analysis of the history of natural disasters in the region, along with a scanning of the current and emerging environment and alternative scenarios.
- *Prioritisation*. A cascaded strategic priority profile (CSPP), needs to be prepared, with a rank ordering of tasks and activities that need to be undertaken in response to high-risk events identified in the previous step. Part of this process also involves the prioritisation of actions and the articulation of these across

organisations so that a coordinated response can be developed. In this context, it needs to be recognised that tourists are vulnerable in unfamiliar surroundings and high priority must be placed on their safety.

- *Protocols*. A clearly enunciated set of protocols to ensure the activities of emergency agencies, tourism authorities and operators are properly coordinated needs to be established and accepted by all parties.
- *Community capabilities audit*. An assessment of the community's capacity to cope with specific types of disasters needs to be carried out so that the appropriate level of emergency relief from external sources can be determined. This should involve an inventory of relevant community (physical, financial and organisational) resources, which is also necessary to address other considerations referred to above.
- *Disaster management command centre*. A properly resourced disaster management command centre, as the focal point for the disaster management team's operations is essential. The location and procedures for setting up this facility must be specified in the plan.
- *Media and monitoring activities*. A media communication strategy involving the early establishment of a centralised source is essential in order to ensure that misleading and contradictory information is not disseminated, and to support the coordination of responses. The media often plays a central role in tourism disaster situations, both in terms of providing important information to tourists during the emergency and in the recovery stage when other sectors of the industry and the consuming public need to be informed about the restoration of services. Systems for monitoring the impacts of disasters, and providing reliable information on safety matters and the status of tourism services are therefore necessary.
- *Warning systems*. Once a disaster strategy is in place, the conditions necessary to activate it must be specified, along with the types of hazard in relation to which it is designed (Huque, 1998). Systems for communicating warnings are also important. The incidence of denial among executives (e.g. 'the floods can't affect us because we are on high ground') highlights the need for definitive warning advice (Drabek, 1992).
- *Flexibility*. Certain elements of disaster strategies are applicable to all types of emergencies and might therefore be included as part of a generic framework. However, the exposure of some destinations to certain types of disaster is greater than others and it is essential that these be identified so that responses to the specific impacts and requirements of high-risk events can be planned. Some flexibility is also important, as the precise sequence of actions that are necessary may vary between different types of emergency. Flexibility is also required in the sense that it may be necessary for some organisations to perform functions they do not normally carry out.

● *Involvement, education and review.* The effectiveness of disaster response and recovery plans will be very limited unless those who are required to implement them are directly involved in their development (Quarantelli, 1984). Organisations and the community in general need to be informed about the strategy, and the strategy should be periodically reviewed in the light of reactions to it and new developments. Disaster strategies therefore need to be updated and refined on a continuous basis in order to ensure that new information and/or organisational changes are taken into account. In particular, debriefings after disasters have actually occurred are important so that lessons can be learned from experience.

The final point is particularly pertinent with regard to the longer-term disaster preparedness of a destination. It is to be expected that individuals and communities who have experienced a particular type of disaster are better equipped to respond to similar situations in the future, at least to the extent that, with the benefit of hindsight, they have a better knowledge of the actual impacts of the disaster and how to cope with it. However, as Burling and Hyle (1997) have noted, in the case of disaster planning in the US schools system, few administrators who had actually experienced a disaster transferred the knowledge gained into the disaster strategy development process. This knowledge can only be effectively tapped through a systematic debriefing procedure, with a 'post-mortem' of the event being conducted as a basis for evaluating reactions and refining the strategy.

5. Conclusion

Natural and human induced disasters alike are neither absolutely predictable nor avoidable. Furthermore, while disasters are, fortunately, relatively rare occurrences and they are to some extent random, it is also true that no destination is immune from such events. In response to the near certainty of experiencing a disaster of some type eventually, tourism organisations can devise means for minimising the damage of, and accelerating the recovering from, such events through the development of disaster management strategies. By studying past events, the responses of those affected and the recovery measures adopted, and retrospectively evaluating the effectiveness of these responses, we can develop strategies for coping with similar events in the future. However, the progress made on this front has been limited because the field has lacked the conceptual framework necessary to structure the cumulative development of knowledge about the impacts of, and effective responses to, tourism disasters. This paper has attempted to address this problem by drawing upon the insights from previous research on disaster (and crisis) management in general, in order to construct a generic model for tourism disaster management specifically.

Within this framework, a distinction has been drawn between crises and disasters. The former have their origins in planning and management deficiencies, and in this sense they are self-inflicted. On the other hand, disasters are triggered by events over which the victim has little control and their impacts are, therefore, to some degree unavoidable. However, the distinction between crises and disasters is often somewhat blurred and it is for this reason it has been suggested that they represent opposite poles of a continuum, rather than a dichotomy. While many disasters are attributable to random natural events, which are beyond the control of the most advanced technology, the impacts of these phenomena can be moderated by planning and management practices. Thus, for instance, various tourism destinations are more or less prone to certain types of natural disasters than others, and in these instances action can be taken to either avoid or at least diminish the harmful effects of the event. Apart from avoiding high-risk locations altogether, one of the more obvious steps that can be taken is to assess the risks an individual destination is exposed to and develop management plans for coping with disaster situations in advance.

A logical step in extending the research described in this paper is to use the framework as a basis for examining and analysing actual cases of tourism disasters. This will enable the generic model to be tested and refined, and provide further insights into the peculiarities of tourism disasters. The methodology for doing this will be described in a companion paper, in which the case of the Katherine (Australia) flood will also be examined.

References

Arbel, A., & Bargur, J. (1980). A planning model for crisis management in the tourism industry. *European Journal of Operational Research*, *5*(2), 77–85.

Arnold, W. (1980), in Booth, S. (1993). Crisis *Management strategy: Competition and change in modern enterprises.* New York: Routledge.

Berke, P. R. (1998). Reducing natural hazard risks through state growth management. *Journal of the American Planning Association*, *64*(1), 76–87.

Berman, R., & Roel, G. (1993). Encounter with death and destruction: The 1985 Mexico city earthquake. *Group Analysis*, *26*, 89–91.

Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (1994). *At risk: Natural hazards, people's vulnerability and disasters*. London: Routledge.

Booth, S. (1993). *Crisis management strategy: Competition and change in modern enterprises*. New York: Routledge.

Brammer, H. (1990). Floods in Bangladesh: A geographic background to the 1987 and 1988 floods. *Geographical Journal*, *156*(1), 12–22.

Burby, R. J., & Wagner, F. (1996). Protecting tourists from death and injury in coastal storms. *Disasters*, *20*(1), 49–60.

Burling, W. K., & Hyle, A. (1997). Disaster preparedness planning: Policy and leadership issues. *Disaster Prevention and Management*, *6*(4), 234–244.

Burton, I., Kates, R. W., & White, G. F. (1978). *The Environment as Hazard*. New York: Oxford University Press.

Cammisa, J. V. (1993). The Miami experience: Natural and manmade disasters, 1992–93. In Expanding responsibilities: A blueprint for the travel industry. *24th annual conference proceedings of travel and tourism research association*, Whistler, BC (pp. 294–295).

Capra, F. (1996). *The web of life*. London: Harpers Collins Publishers.

Carter, W. N. (1991). *Disaster management: A disaster manager's handbook*. Manila: Asian Development Bank.

Cassedy, K. (1991). *Crisis management planning in the travel and tourism industry: A study of three destinations and a crisis management planning manual*. San Francisco: PATA.

Chan, N. W. (1995). Flood disaster management in Malaysia: An evaluation of the effectiveness of government resettlement scheme. *Disaster Prevention and Management*, *4*(4), 22–29.

Christine, B. (1995). Disaster management: Lessons learned. *Risk Management*, *42*(10), 19–34.

Comfort, L. K. (1990). Turning conflict into co-operation: Organizational designs for community response in disasters. *International Journal of Mental Health*, *19*(1), 89–108.

Donohue, J. (1982). Some facts and figures on urbanisation in the developing world. *Assignment Children*, 57(8).

Drabek, T. E. (1992). Variations in disaster evacuation behaviour: Public responses versus private sector executive decision-making. *Disasters*, *16*(2), 105–118.

Drabek, T. E. (1994). Risk perceptions of tourist business managers. *The Environment Professional*, *16*, 327–341.

Drabek, T. E. (1995). Disaster responses within the tourism industry. *International Journal of Mass Emergencies and Disasters*, *13*(1), 7–23.

Faulkner, B., & Russell, R. (1997). Chaos and complexity in tourism: In search of a new perspective. *Pacific Tourism Review*, *1*(2), 91–106.

Fink, S. (1986). *Crisis management*. New York: American Association of Management.

Fischer, H. W., & Harr, V. J. (1994). Emergency operating centre response to media blame assignment: A case study of an emergent EOC. *Disaster Prevention and Management*, *3*(3), 7–17.

Geipel, R. (1982). *Disaster and reconstruction*. London: Allen and Unwin.

Gleick, J. (1987). *Chaos: Making a new science*. London: Heinemann.

Gonzalez-Herrero, A., & Pratt, C. B. (1998). Marketing crises in tourism: Communication strategies in the United States and Spain. *Public Relations Review*, *24*(1), 83–97.

Granot, H. (1995). Proposed scaling of communal consequences of disaster. *Disaster Prevention and Management*, *4*(3), 5–13.

Granot, H. (1997). Emergency inter-organisational relationships. *Disaster Prevention and Management*, *6*(5), 305–310.

Hartmann, B., & Standing, H. (1989). *The poverty of population control: Family planning and health policy in Bangladesh*. London: Bangladesh International Action Group.

Heath, R. (1995). The Kobe earthquake: Some realities of strategic management of crises and disasters. *Disaster Prevention and Management*, *4*(5), 11–24.

Hills, A. E. (1994). Co-ordination and disaster response in the United Kingdom. *Disaster Prevention and Management*, *3*(1), 66–71.

Hirose, H. (1982). Volcanic eruption in northern Japan. *Disasters*, *6*(2), 89–91.

Horlick-Jones, T., Fortune, J., & Peters, G. (1991). Measuring disaster trends part two: Statistics and underlying processes. *Disaster Management*, *4*(1), 41–44.

Huque, A. S. (1998). Disaster management and the inter-organizational imperative: The Hong Kong disaster plan. *Issues and Studies*, *34*(2), 104–123.

Keller, A. Z., & Al-Madhari, A. F. (1996). Risk management and disasters. *Disaster Prevention and Management*, *5*(5), 19–22.

Keown-McMullan, C. (1997). Crisis: When does a molehill become a mountain?. *Disaster Prevention and Management*, *6*(1), 4–10.

Kouzmin, A., Jarman, A. M. G., & Rosenthal, U. (1995). Inter-organisational policy process in disaster management. *Disaster Prevention and Management*, *4*(2), 20–37.

Lehrman, C. K. (1986). When fact and fantasy collide: Crisis management in the travel industry. *Public Relations Journal*, *42*(4), 25–28.

Lorenz, E. (1993). *The essence of chaos*. Washington: University of Washington Press.

Milo, K. J., & Yoder, S. L. (1991). Recovery from natural disaster: Travel writers and tourist destinations. *Journal of Travel Research*, *30*(1), 36–39.

Mitroff, I. I. (1988). *Break-away thinking*. New York: Wiley.

Murphy, P. E., & Bayley, R. (1989). Tourism and disaster planning. *Geographical Review*, *79*(1), 36–46.

Peat, F. D. (1991). *The philosopher's stone: Chaos, synchronicity and the hidden order of the world*. New York: Bantam.

Prigogine, I., & Stengers, I. (1985). *Order out of chaos: Man's new dialogue with nature*. Hammersmith: Flamingo.

Quarantelli, E. L. (1982). Social and organizational problems in a major emergency. *Emergency Planning Digest*, *9*(7–10), 21.

Quarantelli, E. L. (1984). Organisational behaviour in disasters and implications for disaster planning. *Monographs of the National Emergency Training Center*, *1*(2), 1–31.

Quarantelli, E. L. (1996). Local mass media operations in disasters in the USA. *Disaster Prevention and Management*, *5*(5), 5–10.

Richardson, B. (1994). Crisis management and the management strategy: Time to 'loop the loop'. *Disaster Prevention and Management*, *3*(3), 59–80.

Riley, J., & Meadows, J. (1997). The role of information in disaster planning: A case study approach. *Disaster Prevention and Management*, *6*(5), 349–355.

Roberts, V. (1994). Flood management: Bradford paper. *Disaster Prevention and Management*, *3*(2), 44–60.

Selbst, P. (1978), in Booth, S. (1993). *Crisis management strategy: Competition and change in modern enterprises*. New York: Routledge.

Turner, D. (1994). Resources for disaster recovery. *Security Management*, 57–61.

Waldrop, M. (1992). *Complexity: The emerging science and the edge of order and chaos*. Penguin: Simon and Schuster.

Weiner, A. J., & Kahn, H. (1972). Crisis and arms control. In C. F. Hermann, *International crises: Insights from behaviour research* (p. 21). New York, NY: The Free Press.

Young, W. B., & Montgomery, R. J. (1998). Crisis management and its impact on destination marketing : A guide to convention and visitors bureaus. *Journal of Convention and Exhibition Management*, *1*(1), 3–18.