Tourism business preparedness, resilience and disaster planning in a region of high seismic risk: the case of the Southern Alps, New Zealand

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Tourism business preparedness, resilience and disaster planning in a region of high seismic risk: the case of the Southern Alps, New Zealand

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This article examines tourism business disaster planning in areas at risk from low-frequency/high-consequence natural disasters. It presents empirical findings from a tourism business survey in the Southern Alps of New Zealand, an area with high seismic risk that supports a tourism industry comprising many micro-sized, owner-operated businesses. The Alpine Fault is a 450 km geological structure running the length of the Southern Alps, and is considered overdue for a M7.8–8.0 earthquake. A survey of tourism business operators revealed generally poor levels of perceived preparedness and actual planning for a future earthquake disaster, particularly amongst micro-sized businesses. The presence or absence of business resilience ‘tools’ was investigated, all of which are more common in businesses with higher incomes. The article draws on tourism disaster planning and business resilience literature to outline an alternative approach to disaster planning for small tourism-reliant communities. It describes community-based efforts to prepare in two remote Southern Alps townships, lending support to the concept of collective, community-led disaster planning.

Keywords: disaster planning; tourism; earthquakes; resilience; community; Alpine Fault

Introduction

Disaster planning and crisis management for tourism businesses has received a great deal of academic attention in light of recent destructive natural disasters (Faulkner, 2001; Hall, 2010; Laws & Prideaux, 2005; Laws, Prideaux, & Chon, 2007; Pför, 2009; Ritchie, 2009). The tourism sector is vulnerable to the impacts of large disasters. Tourism development takes place in areas at risk from natural hazards, in combination with rapid sensationalised reporting of disasters in the global media (Faulkner, 2001). As a consequence, tourism interests may be subjected to prolonged reduction in visitation, damage to critical infrastructure and negative media attention, the effects of which can resonate within the industry for many years after a disaster (for example, Huang & Min, 2002; Huang, Tseng, & Petrick, 2007).

New Zealand is a geologically young and active country, which is prone to a range of natural hazards, illustrated most recently by the continuing earthquakes in Christchurch (since 4 September 2010). The South Island of New Zealand is transected by a major
plate interface, which has existed for the past 25 million years (Norris, Koons, & Cooper, 1990; Norris & Cooper, 2001; Sutherland et al., 2007). The Alpine Fault marks the position of the plate boundary along the spine of the Southern Alps, spanning a distance of 450 km from Springs Junction to Milford Sound (Figure 1). The palaeoseismic history of the Alpine Fault involves large but infrequent $M_{7.8–8.0}$ earthquakes approximately every 300 years (Berryman et al., 2012; Sutherland et al., 2007). The last known event was in 1717 AD. Local and regional councils around the Southern Alps have prioritised regional hazards, and while flooding is the most frequently occurring hazard on the western side of the Alps, an Alpine Fault earthquake is considered to pose the greatest risk of damage from a single event (DTEC Consulting, 2002).

International tourists contributed $NZ9.7 billion to the New Zealand economy (Year End March 2011), making tourism the country’s second largest foreign exchange earner after the dairy industry (Statistics New Zealand, 2011). Tourism activity in the Southern Alps region is predominantly nature-based, with more than 90% of businesses defined as small or micro (i.e. fewer than 19 employees) (Orchiston, 2010). The number of total visitors to the West Coast region in 2011 was 2.5 million, hosted by a permanent population of 31,000 (Generosa & Dixon, 2011). Tourism activity contributed

Figure 1. The South Island of New Zealand showing the field area, the Alpine Fault and tourism destinations in the region.
$99.1 million to regional GDP Year End March 2011, down 4% from the previous year (Generosa & Dixon, 2011). The study area for this research encompasses the Southern Alps along the full extent of the Alpine Fault, from Milford Sound in the south to Greymouth in the north (Figure 1).

This article presents empirical data from a quantitative study investigating the perceptions, preparedness and resilience of tourism operators to a future large earthquake in the Southern Alps of New Zealand. The study offers insights into tourism operator’s understanding of the risk posed by the Alpine Fault, and their perceived level of preparedness for a future event. Four research questions are used as a platform for discussing community-based disaster planning:

1. Are tourism operators aware of the risk and potential consequences of a future Alpine Fault earthquake for their business enterprise?
2. How do Southern Alps tourism operators perceive their current level of preparedness for a future Alpine Fault earthquake?
3. Are business resilience tools such as staff induction, business continuity insurance, staff training, evacuation and disaster planning being used by tourism operators?
4. Do operators have a strong sense of community belonging?

Issues around community cohesion were investigated to elucidate whether community-based collaborative planning practices could be a useful alternative to the current emphasis on individual business planning.

Tourism and seismic risk in the Southern Alps

Tourism in the Southern Alps exists within a physical-ecological system that has high seismic potential. Understanding the vulnerability and resilience of the tourism system to earthquakes is a very important step towards improving regional economic and social resilience. Tourism in the Southern Alps has developed in scale and complexity in recent years, with the destinations of Queenstown and Milford Sound being amongst the most popular in the New Zealand. Tourism attractions in the region are predominantly nature-based, alongside adventure and heritage activities. Destinations in the Southern Alps comprise operations of varying sizes and scales, from large organisations to owner-operator enterprises with few employees. Table 1 defines small to medium enterprises (SMEs), according to the European Commission and relevant New Zealand-based definitions (European Commission, 2003). In New Zealand, SMEs are broadly defined as businesses with fewer than 19 employees (Ministry of Economic Development, 2009), however, Cameron and Massey (1999) provide a more detailed breakdown into medium- (50–99 employees), small- (6–49 employees) and micro-sized (<5 employees) businesses. It is the latter definition that is adopted for this research since it offers a finer

<table>
<thead>
<tr>
<th>Business size</th>
<th>European Commission</th>
<th>NZ&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Cameron and Massey (1999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>&lt;10</td>
<td>&lt;19</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Small</td>
<td>&lt;50</td>
<td></td>
<td>6–49</td>
</tr>
<tr>
<td>Medium</td>
<td>&lt;250</td>
<td></td>
<td>50–99</td>
</tr>
</tbody>
</table>

<sup>a</sup>Ministry of Economic Development (2009).
instrument for categorising business size in a region with a high proportion of micro-sized businesses.

The tourism sector in the Southern Alps is particularly at risk from a future large Alpine Fault earthquake for a number of reasons. Tourism activities take place within a zone less than 90 km from the Alpine Fault, and at times right alongside it (e.g. Franz Josef, Figure 1). Road access to the western side of the Alps can only be achieved via alpine passes (Haast and Arthur’s Passes, and the Te Anau-Milford Highway), through steep, forested, landslide-prone terrain. It is common for visitors to enter the West Coast via Arthur’s Pass and exit through Haast Pass (or vice versa), and this tourist circuit is vulnerable to interruption when one or both passes are closed (Orchiston, 2012). Tourism destinations around the Alps are sparsely populated and relatively remote (∼50,000 residents in total). For example, road access to Milford Sound is a 240 km return journey via the Te Anau-Milford highway with no settlements en route, which traverses a 940 m high mountain pass prone to avalanches and rock fall.

If the 1717 AD Alpine Fault earthquake were to occur today, the repercussions would be severe. In the aftermath of a M8 earthquake, the region will experience an immediate drop in visitation due to lack of access, damage to tourism infrastructure and negative international media exposure. A disaster of this scale will quickly exceed the capabilities of local/regional emergency response groups, and a national or international effort will be required to execute a sufficiently rapid response to the Southern Alps region. The ‘footprint’ of an earthquake this size would produce serious damage to critical infrastructure, buildings and roads and cause lengthy interruption to human activities (Orchiston, 2012; McCahon, Dewhirst & Elms, 2006).

Because of the geography of the West Coast, communities are separated by large rivers, and damage to road bridges could result in enforced periods of isolation after a large earthquake (Orchiston, 2012). As a result, immediate response efforts will be the responsibility of the communities themselves, providing a critical role in caring for stranded tourists. This will place a major strain on local resources where residents can be outnumbered by tourists in some places by a ratio of more than 1:10. For example, Franz Josef has a permanent population of 330, but can host several thousand visitors per day in peak season.

Crisis and disaster planning in tourism

Definitions of the terms ‘crisis’ and ‘disaster’ have become relatively well established in the academic discourse from an organisational perspective (Faulkner, 2001; Glaesser, 2003; Laws & Prideaux, 2005; Laws et al., 2007; Pforr, 2009; Ritchie, 2009). Crises tend to refer to an event that leads to negative business outcomes, which are in part exacerbated by lack of preparatory or planning action by managers (Faulkner, 2001). In contrast, disasters are sudden and unpredictable catastrophes, over which a business has very limited control (Faulkner, 2001), typified by natural events such as floods, earthquakes or cyclones. Comfort (2005, p. 338) described disasters as representing ‘the interdependent cascade of failure triggered by an extreme event that is exacerbated by inadequate planning and ill-informed individual or organisational actions’.

Faulkner (2001, p. 138) suggests that the distinction between crisis and disaster is largely a function of the root cause of the event; what follows in terms of response, recovery and adaptation is ‘essentially very similar’ in both instances. Pforr (2009) notes the complexity of the academic discourse on crisis and disaster management from a tourism perspective, with each sub-sector addressing their specific contexts and issues. In addition, plans typically focus on response and recovery issues, rather than mitigation and readiness.
on the 4Rs spectrum (readiness, reduction/mitigation, response and recovery), resulting in a reactive approach to planning (Wang & Ritchie, 2010). This article addresses disaster planning for a business interruption involving a sudden onset, low-frequency/high-consequence (LF/HC) earthquake disaster.

According to Prideaux (2003), tourism operators do not consider disaster planning to be an essential part of business management, particularly in areas with no recent history of natural disasters. Ritchie, Bentley, Koruth, and Wang (2011) reported a reluctance of business managers to take a more strategic response to crisis management, choosing a reactionary approach rather than detailed, prescriptive planning. Poor levels of disaster planning are likely a result of a lack of awareness of planning methods and inadequate resourcing within small-scale businesses (Drabek, 1994, 1995; Hystad & Keller, 2006; Webb, Tierney, & Dahlhamer, 2002). Hystad and Keller (2008) and others confirm that larger businesses are more likely to plan for disasters than smaller businesses, which is seen as a function of the capacity and human resource available to larger enterprises. Ritchie et al. (2011, p. 381) reported that a significant proportion of accommodation business managers in the Australian tourism industry claimed to have undertaken some form of recent crisis planning, and that their businesses were ‘well prepared to cope with crisis’. However, in reality, the research highlights that crises were frequently dealt with in a reactive sense, and the planning process was not embedded into the organisation’s strategy. Cioccio and Michael (2007, p. 2) reported poor contingency planning in the Victorian tourism industry for routine bushfire hazards with operators observed to ‘cope with’ rather than ‘manage’ after the bushfires of 2003.

While business preparedness is influenced by the perceptions of risk and motivation to prepare amongst owners or managers (Drabek, 1994, 1995; Webb et al., 2002), the role of business size cannot be underestimated. Webb, Tierney, and Dahlhamer (2000) studied disaster preparedness amongst a large population of 5000 private-sector firms in communities across the USA, and found larger businesses had an increased capacity to get prepared; for example, the capacity to employ staff dedicated to business preparedness. Ritchie et al. (2011) found in a study of accommodation operators in Australia that larger businesses reported higher levels of crisis planning and preparedness. Drabek (1994, 1995) reported on a population of 185 tourism executives in the USA, and found that the characteristics of the business (e.g. size, complexity, ownership) are a stronger determinant of preparedness than the risk perceptions of business managers.

To date, the disaster planning literature has offered prescriptive methods for destinations or businesses to develop their crisis plans. For example, Ritchie (2009, p. 113) suggests that pre-disaster preparedness should include ‘the formulation of a Crisis Management Team, the development of manuals and procedures, staff training and simulation exercises’. Attention is also placed on media communication following disasters (Faulkner, 2001), and chain of command and leadership considerations (Cassedy, 1991). What is not always made clear is whether these planning approaches are designed to fit businesses across the full range of sizes and scales. Cioccio and Michael (2007) also note the importance of business size, and suggest that small tourism businesses are frequently left out of the disaster planning discourse. Plans are described generically as business planning tools, but quite clearly the detail of some disaster plans simply does not match the capability and resourcing of many small or micro-sized businesses.

Faulkner (2001) developed a tourism disaster management framework to identify the key planning requirements for both communities and organisations. The framework highlights the need for a coordinated approach as a prerequisite for effective planning, involving broad consultation across all tourism and other stakeholder groups. It describes the various
phases of the disaster process, with management elements and strategies for each phase. The framework begins with the pre-event phase, when mitigation and planning measures should be undertaken. Next, Faulkner (2001) describes the prodromal phase when the disaster is imminent, at which point warning systems and an emergency operations centre should be deployed. Then the emergency phase (when the disaster has taken place) is followed by the intermediate (i.e. response phase) and long-term (i.e. recovery phase), and ends with the resolution phase where routine is restored or a new improved state is established (Faulkner, 2001).

Faulkner’s framework provides a useful tool for most disasters; however, LF/HC earthquakes differ from other events because they come without warning. Thus, the prodromal phase involving mobilisation of warning systems and a command centre when the disaster threat is imminent does not exist for earthquakes. As a result, there is an urgent need for tourism and community leaders to prioritise pre-event planning measures, so that mitigation and planning efforts have been thoroughly examined and, where possible, tested prior to disaster. For example, the Californian ShakeOut earthquake exercise was developed to improve state-wide earthquake preparedness by simulating a real earthquake (Jones & Benthien, 2011; Porter et al., 2011). It provides an excellent opportunity to test systems and planning for earthquake disasters, and more recently the event has been replicated in New Zealand (West Coast ShakeOut in 2009, and the Great New Zealand ShakeOut in September 2012, (Orchiston, Manuel, Coomer, Becker, & Johnston, in press)). In addition, the development of potential disaster scenarios during the pre-event phase is critical to understanding future seismic risks, and this is particularly relevant for regions such as the Southern Alps, where there are sufficiently well-constrained palaeoseismic histories to generate probabilistic hazard assessments (Orchiston, 2012).

Resilience
Resilience is a widely used term across disciplines that has been applied more recently to the tourism context (Biggs, Ban, & Hall, 2012; Biggs, Hall, & Stoeckl, 2011; Carpenter, Westley & Turner, 2005; Marshall, 2010; Marshall et al., 2012). Carpenter et al. (2005) described the challenges in applying the resilience concept from a traditional science perspective to a social-ecological context, and introduced the term ‘resilience surrogates’ to infer particular aspects of resilience that cannot be directly observed. Biggs (2011) tested this concept in a social-ecological setting by using surrogates to measure enterprise resilience in the reef tourism industry around Great Barrier Reef. Lifestyle identity was noted to be a significant determinant of enterprise resilience, relating to the emotional attachment that small business owners have to their work and lifestyle. The study also noted the importance of innovation and adaptation in building resilience to crises (Biggs, 2011).

From a business perspective, Seville et al. (2006) and Ritchie et al. (2011) suggest that careful business planning can lead to greater resilience against natural disasters by improving the continuity of business operations in the event of a disaster. Businesses that are well prepared can continue to function through a disaster, instead of simply recovering from one (Paton & Johnston, 2006). Nelson, Adger, and Brown (2007, p. 397) consider that resilience should provide ‘flexibility during times of disturbance’, and an ability to take advantage of the opportunities that are presented in the new situation. In doing so, the emphasis is more on a system being flexible, rather than maintaining stability, which is especially relevant to areas at risk from large earthquakes with significant inherent uncertainty in terms of social-ecological outcomes (Folke, Hahn, Olsson, & Norborg, 2005).
The concept of resilience is closely tied to adaptive capacity. Nelson et al. (2007, p. 406) acknowledge the importance of scale in a discussion of adaptive capacity, in regard to (a) the length and scale of perturbations, (b) the spatial scale at which the perturbations occur and (c) the organisational scale. A future earthquake will impact tourism-reliant communities for a prolonged period (1–2 years or greater) as a result of damage to access, and negative media driving prospective tourists away from the region (Orchiston, 2012). The scale of the perturbation will be widespread, and is likely to impact the entire Southern Alps region. The organisational scale under discussion within the tourism sector is predominantly micro/small-sized businesses. They will face significant challenges and will have to quickly adapt to the new post-earthquake reality, including damaged transport and infrastructure networks, and reduced visitor flows.

Community disaster planning

Community-based planning for disaster has a long history, particularly in the USA (Dynes, 1994). In its earliest forms, planning was undertaken in a militaristic fashion where the chaotic nature of disasters was managed using a ‘command and control’ style. This was seen as particularly useful in communities with no experience of disasters. Community or local planning in the 1980s became typified by writing lengthy procedural documents and standard operating procedures, or ‘paper planning’ (Kartez & Lindell, 1987). The North American style made its way into other cultural settings, such as Australia and New Zealand in the 1980s (Pearce, 2003).

Over the past decade, much greater emphasis has been placed on encouraging local participation in the development of local plans (Comfort, 2005; Pearce, 2003). Parallels may be drawn between the community planning discourse and the concept of sustainable tourism development (Hall, 2000; Plog, 1991; Simpson, 2001; Swarbrooke, 1999; Taylor, 1995), sharing issues of sustainability, local involvement and participation in the development of the tourism product. Alongside, this evolution has been a move away from response and recovery planning towards issues of mitigation and preparation for future events (Faulkner, 2001; Ritchie, 2008). To be successful, this form of local level planning has been found to require both top-down policy planning, coupled with bottom-up strategies for implementing mitigation measures (Pearce, 2003; Chen, Liu and Chan, 2006).

This research set out to investigate whether community-led collaborative disaster planning in small tourism-reliant communities could offer a useful alternative to independent business planning. There are many challenges and obstacles to successful community disaster planning. Grybovych and Hafermann (2010) suggest it requires ‘the development of local capacities and place-based strategies rather than imposing cut-and-dry models from elsewhere’ (p. 356). Paton, Ronan, Johnston, Smith, and Johnston (2003) suggest that the degree to which individuals get involved in community activities is closely tied with positive self-efficacy and enhanced personal preparedness. Complacency can be a major obstacle, particularly in areas with LF/HC hazards such as earthquakes (Chen et al., 2006). In addition, building sufficient trust in the process, which may be brought to the community from external agencies in the first instance, could be a significant obstacle until community ownership of the process is established.

Method

A postal survey to all tourism operators in the Southern Alps region was distributed in May 2008. The study area extended from Te Anau and Milford Sound in the south to Greymouth
in the north, incorporating areas both east and west of the Southern Alps, including Arthur’s Pass, Queenstown, Wanaka and Mt Cook (Figure 1). Survey questions addressed three key areas of enquiry; risk understanding and awareness (risk perceptions), preparedness (both as a business owner/operator, and from a community perspective) and the resilience of tourism businesses to a future large earthquake. In addition, demographic questions were asked in order to build a profile of respondents, and to enable cross-tabulation with other key survey questions, including gender, age, living situation and level of education. It should be noted that data collection took place in May/June 2008, prior to the Christchurch earthquakes.

During the development of the survey instrument in 2007/2008, there was very little empirical research on tourism business resilience, and the use of resilience measures in the social sciences was in its infancy. This research used an application of the resilience ‘surrogates’ concept described by Carpenter et al. (2005) to investigate tourism business resilience to a future earthquake disaster. For the purpose of this research project, and after consultation with Resilient Organisations (a research cluster investigating organisational resilience at the University of Canterbury) five business resilience ‘tools’ (or surrogates) were identified: business continuity insurance, staff induction, evacuation, disaster planning and staff training. The presence or absence of these simple resilience strategies offers an indication of the level of planning and preparedness for a significant business interruption, or threshold-crossing event. The threshold in this case is a future Alpine Fault earthquake, which has the potential to cause major interruptions to normal business operation.

The tourism industry encompasses a number of different and overlapping component parts involved in the provision of hospitality (accommodation, food, beverage and related services), transport, recreation, activities and attractions (Brotherton, 1999; Leiper, 1979). For the purposes of this research, tourism businesses were included in the sample if they engaged in relatively lengthy interactions with the tourist/client (e.g. overnight stay, visitor transport, attractions and activities), which excluded retail, food and beverage providers. A total of 536 operators were identified as fitting the criteria, comprising 291 activities/attractions and transport operators and 245 accommodation providers.

A pilot survey to 50 randomly selected operators from the mailing list generated a response rate of 66%, using one reminder postcard after a period of 2 weeks and a replacement survey 2 weeks later (an adaptation of the Total Design Method developed by Dillman (1991)). Adjustments were then made to improve the reliability of the survey instrument before it was implemented across the total sample population. The follow-up process was the same as the pilot survey, which generated a final response rate was 51%, or 251 valid responses. Frequency and descriptive analyses were performed for the majority of the survey questions, as well as cross-tabulations supported by Chi-square tests of significance (when \( p < 0.05 \), providing cell counts and minimum expected counts were sufficient). Unless specified, the results reported here are from questions that used closed responses, on a Likert scale from strongly agree to strongly disagree, with uncertain at the mid-point.

Results

Profile of Southern Alps tourism businesses

Table 2 profiles survey respondents with respect to tourism sub-sector, length of time in business, gross annual turnover, and whether or not the owner/operator had a second job outside their tourism venture. Survey responses were spread across the three tourism
business sectors; accommodation (48.6%), activity/attraction (43.3%) and transport (8%). Micro businesses, or those employing fewer than five staff, comprised 49.6% of businesses in the Southern Alps (Table 3). Recent research on tourism and business preparedness has tended to focus on SMEs (Ritchie et al., 2011), thus a significant contribution of this article is presenting empirical data on micro-sized enterprises. The proportion of medium-sized enterprises in the sample is larger than the New Zealand business profile (Table 3), which may generate minor bias in the results.

Three quarters of respondents were full-time tourism operators, with the remaining 25% having a second job. Twelve per cent had secondary employment throughout the year, while for 7% it was seasonal. The remaining 6% did not state the nature of their secondary employment. The rate of secondary employment was found to decrease as business income increased (Figure 2), with 80% of business owners in the $50,000 per annum income category taking on extra work, as compared with 10% of operators whose business earned $500,000 per annum.

Tourism operators were most likely to be 41–64 years old (67%), with 28% between 21 and 40 years and 4% older than 65 years. Males and females comprised 58% and 42% of the sample, respectively. Level of education ranged from a high-school qualification only (35%), to vocational or trade qualifications (31%), undergraduate degree (28%) and postgraduate degree (7%) from a total of 247 responses. The sample was over-represented by those with a University qualification as compared with the general population (Statistics New Zealand, 2006).

Table 2. Business profile of survey respondents, shown as per cent.

<table>
<thead>
<tr>
<th>Survey responses by sector</th>
<th>Activity/Attraction</th>
<th>Accommodation</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of time in business</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 year</td>
<td>43.3</td>
<td>48.6</td>
<td>8.0</td>
</tr>
<tr>
<td>1–2 years</td>
<td>2.8</td>
<td>22.3</td>
<td>5.0</td>
</tr>
<tr>
<td>3–5 years</td>
<td>7.4</td>
<td>18.2</td>
<td>15.0</td>
</tr>
<tr>
<td>6–10 years</td>
<td>14.8</td>
<td>26.4</td>
<td>15.0</td>
</tr>
<tr>
<td>&gt;11 years</td>
<td>26.9</td>
<td>14.9</td>
<td>20</td>
</tr>
<tr>
<td>Secondary employment</td>
<td>48.1</td>
<td>18.2</td>
<td>45.0</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under $50,000</td>
<td>16.7</td>
<td>8.4</td>
<td>16.7</td>
</tr>
<tr>
<td>$50,001–$100,000</td>
<td>7.8</td>
<td>8.4</td>
<td>11.1</td>
</tr>
<tr>
<td>$100,001–$250,000</td>
<td>13.7</td>
<td>18.7</td>
<td>11.1</td>
</tr>
<tr>
<td>$250,001–$500,000</td>
<td>18.6</td>
<td>26.2</td>
<td>33.3</td>
</tr>
<tr>
<td>More than $500,001</td>
<td>43.1</td>
<td>38.3</td>
<td>27.8</td>
</tr>
</tbody>
</table>

Table 3. Tourism SME proportions in the Southern Alps of New Zealand compared to total New Zealand enterprises (based on the SME definition of Cameron & Massey (1999)).

<table>
<thead>
<tr>
<th>Business size</th>
<th>Tourism SMEs in Southern Alps (%)</th>
<th>Proportion of SMEs in NZ (%)a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>49.6</td>
<td>89.1</td>
</tr>
<tr>
<td>Small</td>
<td>39.9</td>
<td>9.9</td>
</tr>
<tr>
<td>Medium</td>
<td>10.8</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

aAll enterprises as in February 2008, based on the number of salary and wage earners in the business (from Ministry of Economic Development, 2009).
Research Question 1: Are tourism operators aware of the risk and potential consequences of a future Alpine Fault earthquake for their business enterprise?

Threat knowledge refers to an individual’s awareness and understanding of natural hazards in their region (Johnston, Bebbington, Lai, Houghton, & Paton, 1999). Operators were asked to rank the risk posed by a number of natural hazards that could occur in the Southern Alps in order to highlight how the risk of earthquakes was considered within the broader ‘hazardscape’ in the region. Earthquakes were considered to have the greatest potential to impact on their livelihoods (89% of operators selected likely or very likely), as compared with floods (71%) and storms (70%). Two thirds of tourism operators stated that earthquakes posed a considerable threat to their business, with increased risk perceived by those living in regions closest to the fault zone. However, almost half of the sample considered the next earthquake will happen between 30 and 50 years into the future; in other words, outside the lifetime of the majority of the sample population, and their business enterprise.

The survey explored tourism operator perceptions of the immediate response and recovery phase of a future Alpine Fault earthquake, and their understanding of the consequences of a large earthquake for their business. Almost half the sample disagreed that ‘things should get back to normal quickly’ after a large earthquake, with more than 80% agreeing that visitor numbers may drop for many months. Operators were asked how long it would take for them to reopen their business, and 43% considered this could happen within 4 weeks. Transport providers were significantly more likely to perceive they could reopen within 1 week of an Alpine Fault event (42%), as compared with the accommodation (9%) and activity/attraction (14%) sectors ($\chi^2 = 0.2627, df = 10, p = 0.003, n = 234$). In contrast, almost 20% of accommodation businesses indicated they might never reopen, as compared with 10% of activity/attraction and 5% of transport providers.

Figure 2. The relationship between level of business income and the uptake of resilience tools in Southern Alps tourism operations.
Research Question 2: How do Southern Alps tourism operators perceive their current level of preparedness for a future Alpine Fault earthquake?

Two thirds of respondents agreed or strongly agreed that getting prepared for an earthquake would help their business recover after the event. The statement ‘It is unnecessary to prepare for an earthquake because assistance will be provided by the council/emergency services’ generated strong negative opinion, with 93.5% disagreeing or strongly disagreeing. Operators were also strongly negative towards the statement ‘An Alpine Fault earthquake will be too destructive to bother preparing for’, with 77.9% disagreeing or strongly disagreeing.

Operators were asked to rank their own perceived levels of preparedness, as compared with the preparedness of their community, their tourism business, local council and Civil Defence. Based on mean scores, tourism operators perceived their own business as being the least prepared to deal with an Alpine Fault earthquake, followed by their community and themselves as individual. Civil Defence ranked as the most prepared. Operators were most likely to place the responsibility for getting prepared on themselves as individuals, rather than transferring the responsibility to external bodies, such as local government authorities or emergency services.

Key demographic variables were cross-tabulated with a suite of personal and business preparedness questions, which generated only weak correlations with no statistical significance (in agreement with Lindell & Whitney, 2000; Lindell & Perry, 2000). Cross-tabulations between prior experience and a range of preparedness statements produced only one statistically significant result. Almost 40% of respondents had experienced a damaging earthquake (n = 248), and tourism operators with prior experience showed significantly higher perceived levels of personal preparedness than those with no experience (χ² = 0.16, df = 3, p = 0.003). Wang and Ritchie (2010) concur that past experience of crises situations results in greater likelihood to engage in future crisis planning.

Research Question 3: Are business resilience tools such as staff induction, business continuity insurance, staff training, evacuation and disaster planning being used by tourism operators?

Business resilience tools designed to plan for and mitigate against future business interruption were assessed in the survey. Of the 247 responses, 19% of respondents confirmed they have a disaster plan for their business. The types of issues included in disaster plans varied substantially between operations. Emergency procedures, safety plans and evacuation were noted by several operators, while others specified the types of disasters that were covered, such as floods, fire, earthquakes, rock fall or pandemic. Several operators mentioned crisis management plans, while others offered more detail about the content of their plans, including chain of command, media communication, water safety, utilities, food and water storage, data backup and guest communication.

Disaster planning occurred across different types of tourism businesses with varying income levels, but 61% of operators with a plan fell into the highest income bracket (χ² = 0.138, df = 4, p = 0.008) (Figure 2). Attraction and activity operations were the most likely to have disaster plans (26%, n = 107), as compared with transport (15%, n = 20), and accommodation providers (13%, n = 118). Tourism operators running a business for less than a year were the least likely to have a disaster plan (9.7%), as compared with mature businesses operating for more than 11 years (28%).

Staff training about what to do in an emergency was carried out by 49% of tourism businesses (n = 229); however, the nature and extent of training was not specified. An
induction for new staff was being used by 72% of operators \((n = 250)\), with 31% of these confirming there was a section about natural disasters in their induction. Activity and attraction owners were most likely to have an induction (75%), as compared with accommodation (71%) and transport (65%). The specific nature of the induction process was not investigated, particularly whether it was a formal or informal process. Evacuation drills were used by 40% of tourism business \((n = 250)\), predominantly in the accommodation (52%) and activity and attraction (34%) sectors. Again, business income was a significant determinant for businesses to run staff training, inductions and evacuation drills (Figure 2).

Business continuity insurance had been purchased by 63% of tourism operators in the sample \((n = 243)\), while 33% had no insurance, and 4% were uncertain. Of the 153 operators who were insured, 86 respondents indicated the length of their cover; 38% (33 respondents) stated their insurance policy covered a 1-year period, while 19% were covered for 6 months, and 13% for less than 3 months. Thirty per cent did not know how long their insurance cover lasted. Purchasing insurance was found to increase with business income; 52% of businesses with insurance were from the highest earning bracket (more than $500,000 per annum), and a quarter in the second highest income bracket \((\chi^2 = 0.593, df = 8, p = 0.000)\) (Figure 2). Accommodation providers were the most likely to have insurance (80%), as compared with activity and attraction (52%) and transport operators (21%).

**Research Question 4: Do operators have a strong sense of community belonging?**

The survey asked a range of questions investigating aspects of community, including sense of loyalty to others, feelings of belonging, and their involvement in community initiatives. The suite of community belonging questions was developed by Leonard, Johnston, and Paton (2004) for an investigation into community issues in a Southern Alps community, and they were replicated for this study to enable data comparisons. In general, there was a strong sense of community belonging amongst tourism operators. The majority of respondents did not want to move out of their community, with more than 80% stating that they plan to remain in their current location for a number of years. There was a high degree of loyalty to the people in their community, coupled with a strong sense of belonging, and a perception that their neighbours would help them in the event of an emergency. Regional differences were noticeable but not statistically significant.

Disaster planning in communities has frequently been found to begin with individuals simply thinking and conversing about the risks posed by local hazards (Mileti & Fitzpatrick, 1993; Ronan, Johnston, & Paton, 2001). Tourism operators in the Southern Alps spoke most frequently to their own families about earthquake preparedness (63%), followed by employees (33%) and other business owners (19%). Conversations within their own business were more common (35% selected ‘sometimes’ or ‘regularly’) as compared with talking with other business owners they knew (15%).

**Discussion**

A significant obstacle in terms of disaster planning within the tourism sector in the Southern Alps is the LF/HC nature of Alpine Fault earthquakes. It has the net effect of lowering the salience of seismic risk for tourism operators and attenuating the perceived risk posed by the fault. It is important to acknowledge the outcomes of an earthquake of this magnitude will be catastrophic for the tourism industry in the short to medium term, and clearly even businesses with the best disaster planning will be swamped in the aftermath. Few places on earth today are immune from natural hazard events. Biggs et al. (2011) address the concept
of future uncertainty in terms of major disasters, and describe the possibility of cascading and interlinked environmental crises events in an increasingly connected world. They conclude that human society must learn to tolerate significant future uncertainty, and improve response and recovery mechanisms to deal with future events. Much effort is currently being invested in developing robust hazard assessments (where possible), and improving forecasts for natural earth processes. It is critically important to communicate this scientific knowledge in appropriate ways for local governments and key stakeholders, so that efforts by the scientific community can directly translate into improved mitigation and preparation for at-risk communities.

While tourism operators in the Southern Alps are aware of the likelihood of a future Alpine Fault event (even though most still place the probability of an earthquake outside their own lifetimes), they lack an understanding of the consequences of a $M_8$ earthquake for their business in terms of the indirect impacts that will reverberate within the region for a prolonged period (Orchiston, 2010). For example, tourism operators are overly optimistic about how long it may take to reopen their business. Transport operators in particular tend to believe that as long as their vehicles are roadworthy they should be able to recommence business operations immediately. In reality, damage to road infrastructure combined with a prolonged drop in visitor numbers will seriously affect the transport sector (Orchiston, 2012). In sum, while reopening a business may be possible, making it profitable in the months following an Alpine Fault earthquake will be very challenging.

Tourism operators were uncertain about the adequacy of their current level of preparedness, and there are a number of potential reasons for this. At the time the survey was administered there had been no major earthquakes in the South Island since 1968 (Inangahua), thus even if some degree of planning had been conducted, plans were never tested by a real situation. The long period without a damaging earthquake has resulted in complacency. Lack of planning is also likely to stem from poor understanding of how to build an appropriate level of preparedness, particularly in micro and small businesses. Lindell and Whitney (2000) and Paton et al. (2003a) highlighted that both individuals and business owners lack the necessary knowledge and resources to implement preparedness strategies. In addition, the investment of time and money required to run a business results in preparedness issues competing with other more immediate and important issues (Lindell & Whitney, 2000; Paton et al., 2003a). Clearly, for many tourism operators the day-to-day running of a business takes precedence, leaving little capacity to engage in strategic planning for disasters.

Tourism businesses have a number of tools they can utilise to improve their preparedness and resilience for future disasters. The two most commonly used resilience tools, particularly for larger businesses, are continuity insurance and staff induction. Cioccio and Michael (2007) similarly found that tourism business owners in Victoria choose continuity insurance as their best available response to a potential crisis, even in light of the expensive nature of the product. However, as a result of several natural disasters in 2011 (Japan and New Zealand earthquakes, and the Australian floods) global reinsurance companies are increasing premiums (Guardian, 2011), on top of significant rises over the past decade (Cioccio & Michael, 2007). Indeed, some large Southern Alps tourism businesses were found to have made the strategic decision not to purchase continuity insurance, instead choosing to spread the risk across a number of tourism products in their portfolio. Micro businesses, in contrast, were found to be significantly less likely to insure their business, and in effect are relying on other fall-back options illustrated by the high proportion of operators maintaining a second job alongside their business enterprise.
Johnston et al. (2007) found that staff induction was an under-utilised resource through which to educate staff, with the potential to significantly improve post-disaster business outcomes. Tourism operators around the Southern Alps, and in other areas worldwide with known risk from natural hazards, should be encouraged to educate and train their staff about natural hazard risks and what to do in the event of a disaster. Specific details of the induction processes used by tourism operators were not investigated in this study, but fewer than half of those with an induction made any mention of natural disasters to new staff. In the Southern Alps region many tourism workers are foreign nationals, with a limited understanding of the tectonic environment in New Zealand. It is important to instil some knowledge of the possible risks so employees are better prepared to help themselves and others in the event of a future Alpine Fault earthquake.

Business income is a key indicator for all the resilience factors, including insurance, disaster planning, staff training, evacuation and induction. Increased length of time in business also showed a positive correlation with disaster planning; new operators were less likely to engage in planning activities as compared with more established businesses. Cioccio and Michael (2007) concur that the size of the business is a significant determinant of disaster preparedness, with larger businesses most likely to have plans and strategies, and smaller businesses generally having more informal plans, or no plans at all.

The resilience tools described in this article can offer organisations at a range of scales increased flexibility in their approach to responding to a significant business interruption. For example, purchasing continuity insurance allows the operator the opportunity to fund business recovery, which could improve their ability to capture opportunities presented in the post-crisis environment. Training and inducting staff to understand how to manage a natural disaster could save lives or at least improve the quality of life of those caught up in the disaster. Informal or formal disaster plans will assist tourism operators in formulating how they might respond to a crisis situation.

From the data presented, SMEs are less likely to adopt resilience planning measures as compared with larger businesses, and could, therefore, be considered less resilient. However, one great advantage of being a micro business is the ability to be flexible and adaptable in the face of a large disaster. For example, tourism development in the Southern Alps has grown rapidly over the last decade years, and many operators have recent work experience in agriculture and other primary industries. Many reported that their contingency plan was to simply close their business and return to work in another industry until the tourism industry recovered.

The findings of this research confirm that developing disaster plans places an unrealistic demand on the time and resources of small- and micro-sized tourism business owners, and at present is simply not part of most tourism business management practices. Recent disasters have led to increasing business insurance costs, and this coupled with the relative powerlessness of individual operators to mitigate against HC disasters suggests that alternative business disaster planning approaches are needed. The interconnectivity of tourism networks between businesses, communities and individuals has the ability to increase vulnerability, but it also has the potential to enhance resilience if the network can act collectively and proactively towards mitigating and preparing for disaster. Lessons can be taken from the stakeholder-led coordinated destination management approaches developed in the 1990s, designed to achieve sustainable tourism development (Hall, 2000; Plog, 1991; Simpson, 2001; Taylor, 1995).

In reality, efforts to address planning for disaster are currently developing organically in Southern Alps communities. In Fox Glacier and Franz Josef over the last 5 years community leaders have started to address the lack of disaster planning. Both of these communities
are geographically remote, tourism-reliant towns that have adopted a collaborative approach to planning for future disaster. Community leaders in Fox Glacier have developed an Emergency Response Plan (ERP), which utilises the capacity and capability of individuals or organisations in the local area. The plan revolves around the ability of the township to provide the necessary welfare and support to locals and visitors. A purpose-built facility was installed to provide a base for emergency response agencies, housing stores of food, first aid equipment, blankets and other provisions in the event of a worse case scenario situation in which large numbers of visitors are stranded in the town. Their plan adopts an ‘all hazards’ approach, including the threat posed by storms/floods, landslides, road accidents or an Alpine Fault earthquake. As a result, the township has significantly improved their ability to cope with a range of scenarios, and improved their resilience through collaboration and community engagement.

Franz Josef initiated the development of the Glacier Country Crisis Management Plan in late 2011. From the outset, it was acknowledged that no organisation involved in a crisis or disaster should work in isolation, and that there was a need for partnership between the tourism industry, government and community in a multi-agency coordinated approach. Franz Josef, in contrast to Fox Glacier, sought external help in developing their ERP, designed to ‘maximise the potential for the continuity of normal business’ in light of high-frequency events. The emphasis is on tourism response and recovery, and managing the potential negative media that arises during incidents involving tourists, or tourism destinations.

While neither of these case studies can be considered best practice in terms of detailing all phases of disaster management planning, the attempts of community leaders to develop ERPs in South Westland over the last 5 years highlights their growing awareness of the vulnerability of the tourism industry to a range of threats, and the heavy reliance of the community on tourism income. It is too soon to evaluate the efficacy of these plans, however, it must be acknowledged that attempts to prepare and plan are now underway, which provides a critical starting point to improving community resilience to disaster. Future research attention needs to be focused on measuring and monitoring plan efficacy, particularly in terms of the key organisational relationships upon which they are based, and whether community participation and ownership of the process has been successfully incorporated into the planning process.

Conclusion

The Southern Alps of New Zealand is a region with known seismic risk, and with a tourism industry comprising a high proportion of micro businesses. This article concludes that business size is a key determinant in the uptake of resilience tools such as continuity insurance, staff training, induction and disaster planning, and that micro businesses are choosing not to develop formal disaster plans. Previous research has described disaster planning strategies, but in reality detailed planning lacks relevance for micro-business operators. The results from this study suggest that tourism operators in many communities in the Southern Alps are strongly loyal and committed to where they live, and to the people whom they live alongside. There is significant potential to draw upon this strong community cohesion to work towards a common disaster preparedness goal. Community-based tourism disaster planning is an emerging phenomenon in the region. Disaster plans developed and maintained by local communities build resilience through enhanced networking and by giving individuals a sense of contributing to a common goal. Future research should move beyond traditional academic outputs towards finding ways to communicate and assist communities in developing their resilience to future disasters.
References


