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Duan Biggs, C. Michael Hall & Natalie Stoeckl

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The resilience of formal and informal tourism enterprises to disasters: reef tourism in Phuket, Thailand

Duan Biggsa, C. Michael Hallb and Natalie Stoecklc

aARC Centre of Excellence for Coral Reef Studies, James Cook University, Townsville, Australia; bDepartment of Management, University of Canterbury, Private Bag 4800, Christchurch, New Zealand; cSchool of Business, James Cook University, Townsville, Australia

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This paper explores the resilience of vulnerable tourism sectors to disasters in a period of global change and interdependence. The coral reef tourism industry is highly vulnerable to natural disasters and economic and political shocks. The paper also explains why enterprise resilience is central to sustainable tourism management, for economic, socio-cultural and environmental reasons. It extends the concepts of ecological and social resilience to that of enterprise resilience. Using scenarios and interviews with key enterprise staff, the study contrasts the levels of resilience of formal and informal reef tourism enterprises, and the factors associated with the enterprise resilience in Phuket, Thailand, following the 2004 tsunami and the 2008 political crisis. Informal enterprises reported better financial condition in a crisis scenario and higher levels of social capital in the form of government, family and community support than formal enterprises. Formal and informal enterprises both enjoy high lifestyle benefits from reef tourism, which supports resilience. Most formal enterprises had part foreign ownership/management (61%); no informal enterprise had any foreign ownership or management. Management policies supporting reef tourism should consider local nuances and the importance of lifestyle benefits for both formal and informal enterprises, and take steps to enable enterprise flexibility and cost-cutting during crises.

Keywords: tourism; tsunami; financial crises; livelihoods; political crisis; coral reefs

Introduction

Concerns have been raised about the vulnerability of the tourism industry to threats including financial and economic instability (Cohen & Neal, 2010; Henderson, 1999; Ritchie, Amaya Molinar, & Frechtling, 2010), political crisis (Cohen & Neal, 2010; Henderson, 2007; Ritchie, 2004), the increasing price of oil (World Economic Forum, 2009; Yeoman et al., 2007) and accelerating global environmental change (Gössling & Hall, 2006; Gössling, Hall, & Weaver, 2009; Gössling, Hall, Peeters, & Scott, 2010; IPCC, 2007; Millennium Ecosystem Assessment, 2005; Ritchie, 2009; Rockstrom et al., 2009; UNWTO & UNEP, 2008). There is particular concern over how these threats may lead to crises and shocks to the society (Hall, 2010). Due to environmental feedbacks, economic market linkages and the flows of resources and people, these shocks may spread rapidly from the point of origin to distant parts of the globe and interact in novel and unexpected ways (Adger, Eakin, & Winkels, 2009; Biggs, Biggs, Dakos, Scholes, & Schoon, 2011; Hall, 2010).
For example, global travel was affected by the international security concerns following the 2001 attacks on the United States and the SARS outbreak in Asia in 2003 (Hall, Duval, & Timothy, 2004). The global financial crisis of 2008–2009 originated in the US housing market but quickly spread to affect the availability of credit across most of the global economy (Brunnermeier, 2009). The response options and the ability of vulnerable segments of the tourism industry to cope with the shocks and changes associated with global and regional change are therefore of growing importance (Hall et al., 2004; Henderson, 1999, 2007; Ritchie, 2004, 2009).

Coral reef tourism, a type of nature-based tourism, plays an important and growing role in the economies of tropical maritime countries (Access Economics, 2007; Ahmed, Magnayon Umali, Chong, Rull, & Garcia, 2007; Andersson, 2007). However, threats to coral reef ecosystems from anthropogenic environmental change are particularly acute, including coral bleaching and ocean acidification, over-fishing, fertiliser and sediment runoff, coastal development and poorly managed tourism activities (Andersson, 2007; Hall, 2001; Hughes et al., 2003). The dangers to coral reef ecosystems have raised concern over the future of the coral reef tourism. The uncertainties facing coral reef tourism are, however, not restricted to the threats facing reef ecosystems. As with other forms of tourism, reef tourism is also impacted by socio-economic crises such as international security concerns, economic recessions and resource price shocks (Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005; Adger et al., 2009; Gössling & Hall, 2006; Hall, 2010). Understanding the response characteristics and the ability of reef tourism to cope with disturbances is therefore of particular importance.

The resilience concept emerged from the ecological sciences (Gunderson & Holling, 2002; Holling, 1973) and has attracted increasing attention among tourism researchers as a framework for understanding society’s ability to cope with crises, systemic shocks and change (de Sausmarez, 2007; Farrell & Twining-Ward, 2004; Smith & Henderson, 2008; Strickland-Munro, Allison, & Moore, 2010). But the somewhat limited literature on resilience in tourism systems thus far has included only conceptual and qualitative studies on the value of the resilience concept to understanding tourism (Farrell & Twining-Ward, 2004) and qualitative applications of the concept to protected area and community-based tourism (Ruiz Ballesteros, 2010; Strickland-Munro et al., 2010). This paper presents an empirical investigation of the resilience of tourism enterprises – an innovative contribution to the literature.

Resilience is defined as the ability of a system to maintain and adapt its essential structure and function in the face of disturbance while maintaining its identity (Cumming et al., 2005; Holling, 1973). The resilience concept is thus useful for understanding how the tourism industry and its enterprises could respond effectively and adapt positively to increasing global change and disturbances (Farrell & Twining-Ward, 2004; Tyrrell & Johnston, 2008). This is particularly so because resilience theory recognises the inherent uncertainty in predicting the impacts of global change and the complex and dynamic nature of how individuals, organisations and society may respond to these impacts (Gallopin, 2006; Marshall, 2010).

The concept of social resilience is related to ecological resilience and is the ability of groups or communities to cope with external stresses and disturbances, while maintaining their functional characteristics and defined identity (Adger, 2000). The social resilience concept implies the existence of two or more alternative stable states, characterised and controlled by different structures, functions and processes. It is a complex concept that encompasses uncertainty (Adger, 2000). The thresholds or tipping points that lie between different states are dynamic and hard to pinpoint. For this reason, changes from one state
to another often come as a surprise. The “tipping point” or point of transition between two stable states is called a threshold; once a threshold into an alternative state is crossed, a return to the earlier state can be difficult or impossible (Walker, Holling, Carpenter, & Kinzig, 2004).

These alternative stable states occur at different scales. For example, at the scale of a small maritime country or province, society may shift from a situation in which the main form of economic activity is reef tourism to a new stable state in which the main form of economic activity is casino tourism. Similarly, at the enterprise scale, an enterprise may shift from solvency to insolvency, or it may have the capacity to shift from one core business activity, such as reef tourism, to another. The concepts of ecological and social resilience can extend to that of enterprise resilience. At the scale of individual actors, a focus of increasing research on resilience (Gelcich, Edwards-Jones, Kaiser, & Castilla, 2006; Marshall, 2010), organisations such as business enterprises are important subjects of study not only because of the need to improve understanding of their individual capacity to survive, but also because they are a core component of community resilience (Ahmed, 2006; Colussi, 2000).

This paper focuses on resilience at the scale of reef tourism enterprises. A reef tourism enterprise is an entity consisting of one or more individuals delivering a service to visitors to earn an income and profit by taking visitors to visit and experience reef attractions by boat (Biggs, 2011). The paper focuses on enterprises that use boats to take visitors to reefs because of their central role in coral reef tourism. A resilient reef tourism enterprise is defined as one that is able to maintain or grow its existing level of employment and income and stay operating in reef tourism in the face of one or more shocks or crises. By this definition, an enterprise that stays operating in reef tourism, without drastically downsizing, is able to maintain its “identity” (see Cumming et al., 2005). An enterprise that fails, drastically downsizes or substantially diversifies the nature of its operation out of reef tourism is viewed in this study as changing its identity and not displaying enterprise resilience. This paper thus focuses on the enterprise as the scale of resilience analysis and an enterprise that closes down or shifts out of reef tourism has crossed a threshold or tipping point into an alternative stable state. A resilient enterprise is one that is able to remain in a stable state, maintaining or growing its income and employee numbers despite disturbance.

The resilience concept overlaps to a large degree with the concepts of vulnerability and adaptive capacity (Gallopin, 2006; Miller et al., 2010). Resilience, with its origins in systems ecology, has a more systems-oriented approach, whereas the concepts of vulnerability and adaptive capacity focus more on the actors and their response to change (Miller et al., 2010). Specifically, vulnerability is the susceptibility of a system to disturbances and is determined by exposure and sensitivity to perturbations and the capacity to adapt (Adger, 2006; Gallopin, 2006; Nelson, Adger, & Brown, 2007). The more vulnerable an individual, enterprise or community is, the more extreme the impact of a given shock will be. If that individual, enterprise and/or community also has little adaptive capacity, then that shock is more likely to generate a sustained, permanent change of state. Hence, the link to resilience: if an individual, enterprise or community is vulnerable and has little adaptive capacity, then a shock is more likely to shift it from one “state” to another.

Specifically, this paper explores the resilience of formal and informal enterprises in Phuket, Thailand, by asking the following research questions: (1) What are the differences in the factors associated with resilience as identified through a literature review between formal- and informal-sector enterprises? (2) Which of the factors associated with resilience as identified through a literature review can predict enterprise’s stated response to a crisis scenario? (3) Are there differences between formal and informal enterprises in their
response actions, and the factors that enabled their survival through the 2004 tsunami and the 2008 political crisis?

Phuket, Thailand, is an ideal location to study the resilience of reef tourism: Phuket and Thailand have experienced a number of disasters over the last 15 years. The two most substantive crises in the past decade – and chosen for in-depth analysis here – were the 2004 tsunami (Cohen, 2009) and the political crisis of 2008, which temporarily closed Bangkok’s Suvarnabhumi airport and exacerbated the effect of the global financial crisis and affected tourism through 2009 (Cohen & Neal, 2010; Tourism Authority of Thailand, 2010). The 2004 tsunami led to over 5000 confirmed deaths in Thailand and 250 deaths on Phuket island. Property damage on Phuket was estimated at US$250 million (Phuket Picture 2005). The formal sector of dive tourism industry in Phuket lost an average of 64 diving days (days with divers in the water) per enterprise (Main & Dearden, 2007). International tourism arrivals in Phuket fell by 67.2% in the first half of 2005, following the tsunami (Henderson 2007). Out of 85 dive enterprises, seven (8.2%) shut down completely and sixteen (18.8%) drastically downsized their operations (Main & Dearden, 2007). At the national scale, the tsunami led to a 1.5% drop in international tourism arrivals in 2005 (Tourism Authority of Thailand, 2008). International arrivals to Thailand then increased by 20% in 2006 and 4.7% in 2007 (Tourism Authority of Thailand, 2008). The political crisis of 2008–2009 led to a 3.5% decrease in international arrivals to Thailand during 2009 (ASEAN, 2010).

Importantly, none of the studies on crises and tourism in Thailand (or any other study of reef tourism) investigated the resilience of different types of reef tourism enterprises – arguably, the most important distinction being enterprises involved in the “formal” and “informal” sectors. The informal sector is primarily composed of small-scale self-employed entrepreneurs and enterprises (Aguilar & Campuzano, 2009; Macias & Cazzavillan, 2009). An informal tourism enterprise is often the major source of cash income for a family, as part of a broader livelihood strategy, including subsistence agriculture or fishing (Tao & Wall, 2009). The informal sector is further characterised by easy market entry, family ownership, unregulated and competitive markets, intensive labour and dependence on indigenous resources (Kermath & Thomas, 1992; Mead & Morrissson, 1996). Informal tourism enterprises typically have lower capital investments and are more likely to close down for short periods and then start up again (Mead & Morrissson, 1996; Rogerson, 2005, 2008). The households involved are also likely to have diverse livelihood strategies, with tourism being one component (Tao & Wall, 2009). In contrast, formal-sector enterprises (hereafter called formal enterprises) tend to be licensed, registered for taxation, officially enumerated and often eligible for government subsidies. As economies develop, some informal tourism enterprises transition into the formal tourism sector. Yet studies of the informal sector are much less numerous than on the formal sector, and information on enterprise entry and exit characteristics are harder to obtain (Cukier & Wall, 1994).

The distinction between formal and informal enterprises is thus important in this context because (1) many of the livelihood benefits in low- and middle-income countries accrue through the informal economic sector (Dahles, 2002; Henderson & Smith, 2009; Liu & Wall, 2006; Meyer, 2008; Nemasetoni & Rogerson, 2005; Wahnschafft, 1982), and (2) formal and informal enterprises differ significantly in make-up and are thus likely to respond differently to crises. This research, therefore, also highlights differences between the resilience of formal and informal enterprises in Phuket’s reef tourism industry to large external crises or disturbances.

The research presented in this paper is especially relevant to sustainable tourism management. It addresses the economic aspects of the triple bottom line of sustainable development, an area often omitted by researchers in sustainable development (Dwyer, 2005; Stensland
& Baardsen, in press; Weaver & Lawton, 2007). It is closely linked to the use of tourism as a tool for social and cultural conservation and regeneration, for poverty alleviation and for the support of environmental conservation – in this instance, coral reef conservation (Coghlan, in press).

Literature review

Prior research on crises in Phuket and Thailand

Because of the importance of tourism to the Phuket and Thai economy, there have been numerous studies of tourism crises (McDowall & Wang, 2009; Zhang, Qu, & Tavitiyaman, 2009), although most have not sought to explicitly differentiate between the responses of formal and informal tourism enterprises to such crises (Henderson and Smith, 2009, being a significant exception). The impacts of the Asian financial crisis were examined by Henderson (1999) and Prideaux (1999). Rittichainuwat and Chakraborty (2009) studied the perceived effects of terrorism, SARS and bird flu on Thailand's hospitality industry, while the tourism-related effects of the 2004 tsunami attracted considerable attention (e.g. see Calgaro & Lloyd, 2008; Cohen, 2008, 2009; Gurtner, 2006; Kelman, Spence, Palmer, Petal, & Saito, 2008; Main & Dearden, 2007). Cohen and Neal (2010) explored the interrelationships between different forms of crises and their effect on Thai tourism. Studies on the effects of crises on specific formal tourism sectors include the convention and meetings industry (Campiranon & Arcodia, 2007; Sangpikul & Kim, 2009) and gaming policy (Jitpraphai, Hall, & Carr, 2006). There are limited studies on the vulnerability and resilience of informal small-scale tourism enterprises to the 2004 tsunami (Calgaro, 2005 and Calgaro & Lloyd, 2008 are notable exceptions). The studies on the vulnerability and resilience of the informal sector more broadly in South-East Asia, in the aftermath of the 2004 tsunami, focus on traditional livelihood strategies, such as fishing and farming (Larsen, Miller, & Thomalla, 2008; Thomalla, Larsen, Zou, & Miller, 2008).

Several studies specifically examined the effects of crises at Phuket, especially post tsunami. Ichinosawa (2006) noted the potential secondary impact of “reputational disaster”, although Rittichainuwat's (2008) study of post-tsunami changes in visitor motivation suggested that these were not as great as feared. Henderson (2005, 2006) provided insights into the recovery responses of the hospitality sector, and Main and Dearden (2007) into the tsunami's impact on the dive industry. Henderson and Smith (2009) noted the resilience of the informal sector following the tsunami and the potential contribution of informal commerce to resort success. Kontogeorgopoulos (2009) argued that ecotourism activities such as kayaking were one of several contributing reasons for the continuing growth of tourism in Phuket despite natural disasters and political instability.

Enterprise resilience

As noted earlier, the concepts of vulnerability, adaptive capacity and resilience are linked: enterprises that are less vulnerable and have more adaptive capacity are likely to be more “resilient”. Based on the factors associated with the resilience of reef tourism enterprises in Australia (Biggs, 2011), and a literature review, we identified the factors associated with the adaptive capacity, vulnerability and resilience of enterprises. We indicate how each factor has been incorporated into this study.
Enterprise age and experience

An enterprise’s age positively affects its likelihood of future survival because enterprises are more likely to close down in the first years of their operation (Bosma, van Praag, Thurik, & de Wit, 2004; Hall & Williams, 2008). Young enterprises face many challenges when starting up, such as gaining access to customers, coordinating and defining roles and developing trust and loyalty among employees, and acquiring financial capital and resources (Hall & Williams, 2008). Older enterprises are more likely to have dealt with a systemic shock in the past, and have therefore developed the experience, skills and self-confidence to better plan for and manage future shocks (Kalleberg & Leicht, 1991). However, older enterprises may also display rigidity and lack capacity to adapt (Fritsch, Brixy, & Falck, 2006). A direct measure of enterprise age was used in this study due to the limited knowledge on the relationship between age and survival of informal-sector enterprises.

Social capital

A high level of social capital can provide a buffer for both formal and informal enterprises in the face of crises. The core idea of social capital is that the social networks of individuals and enterprises, underpinned by shared norms, trust and reciprocity, can provide support to enterprises in difficult times (Jones, 2005). Investment in building social capital is also important in fostering business growth and success (Bosma et al., 2004; McGehee, Lee, O’Bannon, & Perdue, 2010). We consider four different types of social capital. First, the social capital that exists between the different levels of government and its subjects; second, the social capital that exists between family members and friends; third, the social capital that exists between reef tourism enterprises and local community groups; and fourth, the social capital that exists between enterprises in the reef tourism industry, which enables them to work together during a crisis.

Financial condition and access to finance

Access to finance and a healthy financial condition are integral to enterprise survival and success. However, the understanding of financial condition and the measurement of profit are inconsistent between formal and informal enterprises (Aguilar & Campuzano, 2009). Informal enterprises often do not include the cost of their own labour or family members or the depreciation of working capital in their calculation of profit. Access to finance is often more difficult for informal enterprises because they do not have legal recognition and often little to offer for loan collateral. This study used an enterprise owner’s or manager’s perceived access to finance and his/her expected annual income in a crisis scenario as measures of financial capital.

Human capital

Skills and human capacity are integral to the success of an enterprise (Bosma et al., 2004). Informal tourism enterprises are characterised by a lower level of formal training and managerial skills relative to formal-sector enterprises (Liu & Wall, 2006; Petersen, 2007). Human capital in this study is defined as the skill-sets and capacity of individuals to respond and adapt to change. Human capital was measured through the reported confidence of owners and managers in their ability (and the ability of key staff, where they have staff) to adapt and manage successfully in crises.
Lifestyle benefits

Small tourism entrepreneurs, particularly in non-urban areas, are often driven by lifestyle considerations that alter the entry and exit characteristics of enterprises beyond pure finance/profit (Ateljevic & Doorne, 2000; Shaw & Williams, 2004). Often, tourism entrepreneurs in the formal and informal sectors of popular tropical reef tourism locations have visited those locations prior to settling there for lifestyle reasons (Collins, 2008; Williams, Shaw, & Greenwood, 1989) and may therefore be willing to receive lower amounts of income in order to continue to engage in an activity that delivers lifestyle benefits to them. We used a number of single-item questions to measure the extent to which lifestyle considerations were important to enterprise owners and managers.

Methodology

Phuket and its reef tourism enterprises

The island province of Phuket is situated in the Andaman Sea and is historically Thailand’s main centre for reef and dive tourism. Reef tourism in Phuket grew quickly during the 1980s and 1990s – from fewer than 10 commercial dive enterprises in 1980 to 85 enterprises in 2002 (Main & Dearden, 2007). Although new Thai dive destinations such as Krabi, Koh Tao and Khao Lak have emerged over the past decade, Phuket still dominates the reef tourism and dive market and has the most dive enterprises. Tourism in Phuket is distinctly seasonal, driven by the south-western monsoon, which brings rainy, stormy and unpredictable weather from May to late October. Phuket’s high season for reef tourism typically falls between October and late April. Many of formal and informal enterprises downsize or close down for the low season.

The formal-sector enterprises usually own or have the capacity to lease one or more larger boats, or speedboats, which can cover substantially greater distances than the longtail boats used by informal enterprises. Formal enterprises typically have part foreign ownership or management. The owners and managers of formal enterprises often return to their home country during the off season. Formal enterprises tend to have a storefront and numerous agents that they market through, in addition to websites and international marketing networks and travel markets.

The informal enterprises base their longtail boats at a range of popular tourist beaches, primarily on Phuket’s west coast, and they rely largely on walk-in customers. Some have small self-made signs advertising their services. The staff of the formal enterprises are mostly able to communicate in one or more international language (e.g. English, German, Japanese), whereas international language skills are limited among informal enterprises. The informal entrepreneurs typically augment their income during the low season through fishing, farming or a second job. However, evidence from nearby Khao Lak suggests that rapid tourism development can erode the availability of alternative income sources as land available for agriculture reduces due to tourist developments and thus individuals become more reliant on their income derived from tourism (Calgaro, 2005).

Construction of the survey instrument

The survey tool was based on an interview questionnaire developed by the primary author for reef tourism operators on Australia’s Great Barrier Reef. It was adjusted for the Thailand context after discussion with enterprises and researchers in Phuket. The survey was designed to collect information about (1) each of the key factors identified within the literature review
as being likely to affect enterprise resilience (e.g. age; social, financial, human capital; lifestyle benefits), and (2) the actions taken and factors which different types of enterprises felt contributed to or enabled their survival of the 2004 tsunami and 2008 political crises. A copy of the survey instrument used for the formal sector can be found as an appendix on the online version of this paper; the informal-sector instrument is very similar and has been omitted for space reasons.

The survey was translated into Thai to interview enterprises in which the interviewers spoke only Thai. The Thai language questionnaire was piloted by the research assistants, and the responses were discussed to counter interviewer bias and ensure response consistency, and for comparison with the formal-sector interviews. Interviews typically took 30–40 minutes but varied from 20 to 90 minutes.

All types of “capital” were measured on a five-point Likert scale (Likert, 1967), where respondents were asked to indicate the extent to which they had access to different indicators of capital (e.g. access to finance, managerial expertise, social capital). The Likert scale responses in response to statements were: 1 = strongly disagree, 2 = disagree, 3 = average/indifferent, 4 = agree and 5 = strongly agree. Enterprise age was recorded in years.

Scenarios of systemic shocks were also presented during the interviews, in which respondents were asked to provide an indication on how they would respond and whether they would exit the reef tourism industry in the face of 10%, 30% and a 50% slump in tourist revenue for a period of 12 months. Enterprise resilience was measured with a binary variable of whether or not enterprises would stay in the reef tourism sector in the face of the largest systemic shock scenario – i.e. the one associated with the 50% reduction in tourist revenue. A lack of enterprise resilience was also measured with two variables using a five-point Likert scale: “I am looking for opportunities to move out of the reef-based tourism sector” and “Life has become more difficult in the reef-based tourism sector”. Open-ended questions were used to collect information about the effects of the 2004 tsunami and the combined effects of the global financial crisis and the Thai political crisis and airport closures in 2008 and 2009. Enterprises were also asked to comment on factors that they thought had enabled them to survive the associated slumps in tourism and the actions they took in the face of these crises.

**Locating and contacting enterprises**

A complete list of all the reef tourism enterprises in the formal sector in Phuket was compiled. An initial list of enterprises was obtained from Sakanan Platong, a researcher at Prince of Songkla University in Hat Yai. This list was checked and augmented through Internet searches using the Google and Yahoo search engines by searching for the enterprise name and by using the terms “diving” and “snorkelling” and the names of the main tourist destinations within the study area. The list was further corroborated through membership lists of the Thailand Dive Association, the Greenfins Thailand project (http://www.greenfins.net/thailand-4.aspx) and the Professional Association of Diving Instructors (PADI) website (http://www.padi.com/scuba/). Further checks were made for accuracy and completeness by the interviewees. In an attempt to sample the entire formal enterprise population, each listed enterprise was contacted at least three times by email and telephone to enquire about their willingness to participate and to establish a time for an interview. Of the 68 formal enterprises listed and contacted, 46 enterprises (68%) agreed to participate in the study.

The informal enterprises were contacted by Thai researchers from Prince of Songkla University and the Phuket Marine and Coastal Resource Conservation Centre. Interviewers
visited each of the beaches where informal enterprises are based on Phuket’s south and west coasts until all those present had been interviewed. A total of 57 informal enterprises were surveyed. According to local expert judgement, the informal enterprises surveyed were representative of the total population of informal enterprises operating in Phuket during the high season (S. Plathong and P. Buapet, Prince of Songkla University, personal communication, Phuket, Thailand, 2009).

**Interviews**

All surveys were conducted through semi-structured face-to-face interviews by the primary author and four Thai research assistants. The interviews had a fixed list of questions, but respondents were able to provide more detail on any topic if they chose (Bernard, 2002; Jennings, 2005), thus enabling the collection of both qualitative and quantitative data. Interviews were conducted at the end of the 2009 high season; responses were recorded on custom-made forms.

**Analysis**

Three separate analyses were undertaken – each addressing one of the key research questions: Mann–Whitney $U$ tests were used to test for differences in variables associated with factors identified in the literature as influencing vulnerability and adaptive capacity (and thus, enterprise resilience) across different tourism enterprises (those in the formal and informal sector) (research question 1). Binary logistic regression was used to address research question 2 and to explore the relationship between the stated response of an enterprise (exit or stay in the industry) to a hypothetical, substantial and systemic “shock” and the other factors identified in the literature as influencing enterprise resilience. The 50% shock scenario was selected for analysis, because in such scenarios, access to social and financial capital is most important for enterprise survival. The independent variables included the age of the enterprise and the Likert scores associated with social, financial and human capital. A backward stepwise variable entry function using the likelihood ratio and the corrected Akaike’s Information Criteria (AIC) was used for the regression analysis (Burnham & Anderson, 2002). The stepwise removal of variables was continued until the most parsimonious model of best fit with the lowest AIC score was achieved. The variance inflation factor for all the variables used in the regression analysis was between 1.04 and 1.33, well below the “cause for concern” level of 2.5 (Allison, 1999). Three different regression analyses were performed, one for the informal enterprises, one for the formal enterprises and one for all the enterprises combined. Finally, the largely qualitative responses of enterprise owners to questions about the 2004 tsunami and the political crisis of 2008–2009 were coded and grouped into similar categories, enabling comparisons across enterprise types (research question 3).

**Results**

**Background: characteristics of Phuket’s formal and informal reef enterprises**

Formal enterprises had between three and 150 employees with a mean of 17.4 ($n = 43$), between one and 30 boats (mean 4.36, $n = 33$) and total client capacities of between 10 and 200 per day (mean = 36.4, $n = 24$). Informal enterprises were substantially smaller, with a maximum of two employees, who were frequently employed on a part-time basis.
only. Informal enterprises had between one and three longtail boats with a mean of 1.13 \( (n = 55) \) and total client capacities of between five and 21 per day (mean = 8.5, \( n = 56 \)). The majority of formal enterprises had part foreign ownership or management (61%), whereas no informal enterprise had any foreign ownership or management.

**Research question 1: differences in factors associated with resilience**

Mann–Whitney \( U \) tests revealed significant differences between formal- and informal-sector enterprises. More enterprises in the formal sector felt that life in the reef tourism industry was becoming harder than enterprises in the informal sector (Table 1). Enterprises in the formal sector expressed a stronger inclination to look for opportunities to move out of the reef-based tourism than enterprises in the informal sector (Table 1). Informal enterprises felt more confident about their financial condition in a shock scenario than formal enterprises. Informal enterprises had higher lifestyle benefit scores on three different measures than formal enterprises (Table 1). Informal enterprises reported higher levels of social capital than formal enterprises, expressed as a higher level of expected support in a shock scenario from government, family and friends and local community groups (Table 1).

**Research question 2: factors associated with the stated response of an enterprise to a hypothetical, substantive “shock”**

For informal enterprises, social capital and access to finance were positively related to respondent perceptions of whether or not they would remain active in reef tourism in a systemic shock scenario (Table 2).

The binary logistic regression analysis of enterprise survival in a crisis for formal-sector enterprises and for all enterprises (formal and informal) combined was non-significant.

**Research question 3: enterprise response to and survival of the 2004 tsunami and 2008 political crisis**

Formal and informal enterprises differed in how they responded to past shocks and in the factors that they perceived enabled their enterprises to survive past shocks. After the 2004 tsunami, the three most common responses by formal operators were cost-cutting and streamlining (54%), strengthened marketing (15%) and downsizing or temporarily closing down (13%) (Figure 1a). The top three responses by informal enterprises were downsizing or temporarily closing down (39%), relying on a second job or subsistence food production (30%) and sourcing additional funding through government support or a loan (17%) (Figure 1b). Formal and informal enterprises differed in the factors that they perceived enabled their survival of the 2004 tsunami. The three most important survival factors reported by formal enterprises (\( n = 25 \)) were commitment and hard work to maintain the lifestyle and enterprise (32%), the availability of past savings to draw on (12%) and the ability to cut costs (12%). The three most important survival factors reported by informal enterprises (\( n = 31 \)) were commitment and hard work to maintain the lifestyle and enterprise (58%), government or NGO support through loans or other means (13%) and the ability to rely on a second source of income or subsistence (10%).

Following the political unrest and airport closures in 2008, which were exacerbated by the global financial crisis, the two most common actions taken by formal enterprises were cost-cutting (68%) and downsizing or temporarily closing down (13%) (Figure 2a). Other responses included sourcing additional financing (4%) and collaborating more closely
Table 1. Comparison of single-item statements between formal and informal enterprises (1 = strongly disagree/very poor, 5 = strongly agree/very good).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Formal (n = 46)</th>
<th>Informal (n = 57)</th>
<th>Mann–Whitney U</th>
<th>Significance (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social capital</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To what extent do you think the support from the following groups will be important in you surviving these shocks?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government support in shock</td>
<td>1.46</td>
<td>2.23</td>
<td>828.500*</td>
<td>0.001</td>
</tr>
<tr>
<td>Family and friends support in shock</td>
<td>2.37</td>
<td>2.93</td>
<td>959.000*</td>
<td>0.016</td>
</tr>
<tr>
<td>Local community group support in shock</td>
<td>1.47</td>
<td>2.73</td>
<td>440.500*</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>Increased collaboration with competing enterprises in shock</td>
<td>2.54</td>
<td>2.29</td>
<td>1180.000</td>
<td>0.448</td>
</tr>
<tr>
<td>Social capital average</td>
<td>1.97</td>
<td>2.56</td>
<td>752.500*</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td><strong>Financial and human capital</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected ability to access additional finance in a crisis scenario</td>
<td>2.44</td>
<td>2.47</td>
<td>1085.500</td>
<td>0.531</td>
</tr>
<tr>
<td>Expected annual income in a crisis scenario</td>
<td>1.28</td>
<td>1.63</td>
<td>865.500*</td>
<td>0.004</td>
</tr>
<tr>
<td>Human capital measured as the average of the statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) The management and key staff in my business have the necessary skills to deal with future changes in reef tourism.</td>
<td>4.089</td>
<td>4.052</td>
<td>1254.000</td>
<td>0.837</td>
</tr>
<tr>
<td>(b) The management and key staff of this business have the self-belief and determination to adapt to and survive future changes in the reef tourism sector.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lifestyle benefits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I love working in reef-based tourism.</td>
<td>4.41</td>
<td>4.82</td>
<td>883.500*</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>I enjoy the lifestyle associated with working in the reef-based tourism sector.</td>
<td>4.23</td>
<td>4.79</td>
<td>718.500*</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>Working in the reef-based tourism sector is an important part of who I am and how I see myself.</td>
<td>4</td>
<td>4.76</td>
<td>693.500*</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td>Lifestyle benefits average</td>
<td>4.20</td>
<td>4.76</td>
<td>547.000*</td>
<td>&lt;0.000</td>
</tr>
<tr>
<td><strong>Measures of a lack of enterprise resilience</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am looking for opportunities to move out of the reef-based tourism sector.</td>
<td>2.15</td>
<td>1.68</td>
<td>1018.500*</td>
<td>0.036</td>
</tr>
<tr>
<td>Life has become difficult in the reef-based tourism sector.</td>
<td>3.85</td>
<td>3.42</td>
<td>966.500*</td>
<td>0.014</td>
</tr>
</tbody>
</table>

*p < 0.05.

with other reef tourism enterprises (4%) (Figure 2a). The three actions taken by informal enterprises in the face of the 2008/9 crisis were relying on a second job or subsistence food production (46%), downsizing or temporarily closing down (39%) and cost-cutting (15%) (Figure 2b). Formal and informal enterprises differed in the factors that they perceived enabled their survival of the political crisis. In addition, although it was not specifically asked, a number of formal enterprises complained about worsening bureaucratic
Table 2. Regression model for informal enterprises that do not exit reef tourism under a 50% systemic shock; the regression model for formal enterprises was not significant.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>Significance</th>
<th>Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to finance in shock scenario</td>
<td>1.058</td>
<td>0.411</td>
<td>6.619*</td>
<td>0.010</td>
<td>2.881</td>
</tr>
<tr>
<td>Social capital average score</td>
<td>1.043</td>
<td>0.431</td>
<td>5.848*</td>
<td>0.016</td>
<td>2.838</td>
</tr>
<tr>
<td>Constant</td>
<td>−5.27</td>
<td>1.70</td>
<td>9.578</td>
<td>0.002</td>
<td>0.05</td>
</tr>
</tbody>
</table>

*p < 0.05.

Figure 1. Actions taken by formal enterprises (a) and informal enterprises (b) in response to the 2004 tsunami.

Complexities and regulations, in particular in relation to the application and renewal of visas for foreign workers, which added a significant cost and management time burden.
The most important survival factors reported by formal enterprises ($n = 14$) were commitment and hard work to maintain the lifestyle and enterprise (14%), the availability of past savings to draw on (14%) and the ability to cut costs (14%), the advantages of being a well-established enterprise (14%) and a strong marketing network (14%). The survival factors reported by formal enterprises are reflected in the following quote given in response to the question “What enabled you to survive the political crisis of 2008 to 2009?”:

70% repeat clients have been important, no real debts – we own everything, business sense and good customer relations.
The most important survival factors reported by informal enterprises \((n = 14)\) were the ability to rely on a second source of income or subsistence \((50\%)\), commitment and hard work to maintain the lifestyle and enterprise \((29\%)\) and the ability to cut costs \((14\%)\).

**Discussion**

This is the first empirical study of enterprise resilience in the reef tourism industry, and one of the few empirical studies on the resilience of tourism enterprises generally. Informal enterprises reported higher scores in three components of resilience than formal enterprises: financial capital, social capital and the level of reported lifestyle benefits. A higher proportion of formal enterprises felt that life in reef tourism is becoming harder than informal enterprises. Formal enterprises also expressed a stronger inclination to look for opportunities to move out of reef tourism. Thus, our tentative finding is that informal enterprises seem to display a higher level of resilience and report higher scores in the components of resilience than formal enterprises in the face of crises.

**Enterprise financial condition**

Informal enterprises reported expectations of a higher relative level of income than formal enterprises in a crisis scenario (Table 1), perhaps because, for them, a large drop in income for an extended period of time is less critical due to their low levels of capitalisation and lower requirements for a steady and continuous income flow relative to formal enterprises. The latter may also explain why 50% of informal enterprises indicated their ability to survive the 2008 political crisis by relying on alternative sources of income or subsistence. Higher levels of capitalisation and investment in buildings and office/boat rentals by formal enterprises meant that high ongoing monthly expenses were a problem when income dropped sharply.

**Social capital and government support**

Informal enterprises perceived that government support during a crisis would be more likely and would be more important in enabling their survival than formal enterprises (Table 1). A higher proportion of informal enterprises indicated that government support enabled their survival of the 2004 Tsunami. This contradicts the literature on the informal sector and studies elsewhere which point to a lack of government support as a constraint on informal-sector enterprises relative to their formal-sector counterparts (Dewhurst & Horobin, 1998; Mead & Morrisson, 1996; Wahnschafft, 1982). This positive perception by informal enterprises may be because small amounts of support can make a substantive contribution to the survival of informal enterprises (Aguilar & Campuzano, 2009). Our finding of lower expectations of government support by formal enterprises echoes the findings of Main and Dearden (2007) post the 2004 tsunami and highlights an area of concern for formal-sector enterprises. Evidence from nearby Khoa Lak suggests that although government tsunami recovery funds were available, the claim limits were too low to make a substantial difference to formal-sector enterprises, which also suffered bureaucratic obstacles and corrupt practices (Calgaro & Lloyd, 2008).

Informal enterprises reported higher levels of social capital in the form of expected support from friends and family and their community in a crisis scenario (Table 1). This may be because Thais, as opposed to foreigners in the case of the formal sector, manage all the informal-sector enterprises. This reflects observations by Ringmar (2005) of the importance
of Thai family networks as a response to difficult social and economic conditions. Dahles (2002) also noted the capacities of micro-entrepreneurs to maximise the power of kinship and social networks in Indonesia.

Formal enterprises reported lower levels of social capital, and because of their foreign links and management, they are more likely to move to another country (or to their home country) and are not as tied to the location as the informal enterprises. Social capital can indicate the embeddedness of businesses and individuals within a community, which enables a work environment that delivers lifestyle benefits (Bauböck & Faist, 2010; Granovetter, 1985; Williams & Hall, 2000).

**Lifestyle benefits**

Both formal and informal enterprises reported high lifestyle benefit scores from participation in reef tourism, although informal enterprises’ scores were slightly higher (Table 1). Hard work and commitment associated with maintaining their enterprise and lifestyle were important factors reported by both formal and informal enterprises in surviving the 2004 and the 2008 crises. The lifestyle factors driving tourism entrepreneurs in high-income countries, such as the UK and New Zealand, are well documented (Ateljevic & Doorne, 2000; Williams et al., 1989). The literature on lifestyle values for informal tourism enterprises in low-/middle-income countries is sparse (Morrison, Carlsen, & Weber, 2008). The high lifestyle benefit scores of informal enterprises is therefore noteworthy, since participation in the informal economy is often seen as an income-generating measure of last resort for individuals unable to gain formal-sector employment (Cukier & Wall, 1994; Losby et al., 2002). The strong lifestyle benefits noted in both informal and formal sectors are relevant to agencies aiming to support reef tourism enterprises. Authorities may have greater success in supporting people to stay in reef tourism enterprises during difficult times than in trying to support a switch to alternative activities with lower lifestyle benefits.

**Crises and managing perception**

The perception and expectation of prospective travellers is important for the resilience of enterprises at a destination, particularly during and after crises (Henderson, 2007). The active marketing and management of perceptions in source markets is particularly important in situations such as the 2004 tsunami and the 2008 political crisis (Cohen, 2008; Henderson, 2007; Ritchie, 2009). Whereas larger formal enterprises have greater capacity to promote their businesses on a global stage, informal enterprises are largely dependent on walk-in customers who are in Phuket already. Enterprises with established global marketing networks can source clients through direct client contact (Main & Dearden, 2007). Enterprises without those marketing networks are dependent on the perceptions of prospective tourists from other parts of the world, perceptions that may be quite removed from the realities of tourist experience on site. Enterprises with established international marketing networks thus have an additional source of resilience to crises that smaller enterprises that depend on walk-in customers do not have (Calgaro & Lloyd, 2008). Promotions for and “perception management” of a destination by tourism bodies for Phuket and Thailand are therefore of particular importance to enterprises dependent on walk-in customers, because they do not have the networks or rapport to convince agents or prospective clients that a situation is stable and favourable for visitation.
Enterprise resilience, vulnerability and adaptive capacity, and study limitations

Due to the overlap between the concepts of resilience, vulnerability and adaptive capacity at the individual actor scale, the findings in this study are also pertinent to enterprises’ adaptive capacity and vulnerability. The resilience concept however explicitly implies the existence of multiple stable states separated by thresholds or tipping points (Miller et al., 2010; Walker et al., 2004). The research presented here, with the reef tourism enterprise as a unit of analysis, has therefore reported on the ability of enterprises to remain in a desirable state (i.e. maintain and grow income and employment) in the face disturbance, rather than transition to an undesirable state of bankruptcy or closure.

The actor-based resilience approach has, however, limitations and needs additional research using alternative frameworks to understand the ability of the reef tourism sector to survive and adapt to crises and change. A number of different interpretations of tourism systems exist (Hall, 2008). Calgaro and Lloyd’s (2008) adaptation of Turner et al.’s (2003) framework provided a useful way to analyse the vulnerability of Khao Lak to the 2004 tsunami and emphasised the importance of a resilient market base and robust marketing strategies in reducing a destination’s overall vulnerability. In contrast, our study drew more on tourism system models that give significant emphasis to the role of tourism businesses as significant actors in the system (Hall & Page, 2010; Leiper, 2000; Leiper, Stear, Hing, & Firth, 2008), as well as the government and community, which were also identified by Calgaro and Lloyd (2008). A thorough understanding of a tourism system’s resilience to crises and change will require multiple approaches, including in-depth studies on economic, political and other issues, including innovation (Biggs, 2011; Hall & Williams, 2008).

Policy recommendations

Our findings demonstrate the importance of a deep understanding of the local context of vulnerable tourism sectors in establishing policies to enhance resilience to major crises. Policies and actions to support formal and informal enterprises in Phuket’s reef tourism industry that do not have a nuanced understanding of the local formal/informal dichotomy may have limited success. Our key recommendations include:

1. Facilitate easy entry and exit from reef tourism over short time frames by minimising entry and exit barriers, procedures and costs.
2. Promote complementary income-earning activities for individuals in informal enterprises.
3. Support both formal and informal enterprises in accessing additional financing during difficult times, noting the lack of access to finance expressed by formal enterprises.
4. Understand the lifestyle benefits experienced by entrepreneurs in both sectors when designing and implementing regulations and incentives.
5. Aid enterprises in existing marketing efforts and deliver a coordinated marketing effort to manage negative perceptions of crises and draw tourists to the region for enterprises dependent on walk-in customers. The Andaman Tourism Recovery Plan exemplifies the best practice here (Calgaro & Lloyd, 2008).

Finally, this paper is one of the first attempts to contrast the resilience and responses of the formal- and informal-sector enterprises of a vulnerable nature-based tourism destination to major disturbances. The paper tentatively concludes that, on average, informal enterprises
display higher levels of resilience in the face of crises than formal enterprises. In addition, our results draw into question some commonly held beliefs about enterprises in both the formal and the informal tourism sector. Our findings are a basis for researchers and policymakers in Thailand and elsewhere to advance a nuanced understanding of resilience in both the formal and the informal sector and enterprises to openly question traditional beliefs about both sectors in the planning and execution of policy and management interventions for tourism.

Notes on contributors
Duan Biggs is a researcher in Tourism and Social Science at the Scientific Services Division of South African National Parks. He has an MSc from the University of Cape Town, South Africa, and did his PhD, studying the resilience of reef-based tourism, in the Program in Resilience and Social-Ecological Systems at the ARC Centre of Excellence in Coral Reef Studies, James Cook University, Townsville, Queensland, Australia.

C. Michael Hall is professor of Marketing at the Department of Management, University of Canterbury, Christchurch, New Zealand. He is also docent at the University of Oulu in Finland and a visiting professor at Linnaeus University, Kalmar, Sweden, and at the University of Eastern Finland, Savonlinna, Finland. He has wide-ranging interests in tourism, regional development, environmental history and change, and gastronomy.

Natalie Stoeckl is professor of Economics at the Cairns Institute and School of Business at James Cook University. Her PhD is from the Australian National University, Canberra, Australia. She is involved in numerous research projects that focus on issues relating to environmental/natural resource management and sustainable regional development.

References


