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The Impact of Earthquake on Small Business Performance: Evidence from Small Accommodation Services in Ranau, Sabah

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Abstract

The earthquake which occurred on the 5th of June 2015 in Ranau, Sabah was considered to be the most devastating incident not only to the residents but also to local small businesses in the district. The aftermath caused tragic deaths of 18 people on Mount Kinabalu, physical damages of buildings, and lifeline disruptions as well as day-to-day business activities, including the hotels and resthouses. Numerous studies have been focusing on the damage assessment and risk quantification of natural disaster aftershock, but there is a lack of studies on the impact of earthquake on small business performance in terms of physical and emotional aspects before, during and after disaster. Much is still unknown the actual condition of small accommodation businesses in Ranau due to earthquake, especially in terms of operation status and recovery strategy to survive in their business. Therefore, this study aims to explore from the perspectives of manager of accommodation services in Ranau, Sabah about their business performance and strategy before, during and after the earthquake. A structured face-to-face interview was conducted with 33 managers of hotels, resorts and homestays in Ranau, which the list were drawn from the Sabah Tourism Board. The analysis of data revealed that the earthquake caused severe impact on their business performance in terms of operation, physical and emotional aspects. In addition, internal recovery strategies were more preferable than the external support for their business recovery. It

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is hoped that this study may provide valuable insights to small tourism-related business and related agency to develop effective measures to prepare and support the business before or after natural disaster.

Keywords: Small Business, Accommodation Services, Ranau Earthquake, Recovery Strategy

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1. Introduction

Natural disasters like earthquakes can often disrupt the day-to-day activities of a business enterprise that suffered from the damages, which in turn, will also affect the performance of the enterprise. Many previous studies on earthquake aftermath have been focused on the numerical and geological methodology to measure the overall impact of the disaster in terms of the values of loss and risk intensity (Wang, et al, 2012; Koh, et al, 2009). Similarly, several studies on the impact of earthquake in tourism sector have emphasised on the quantitative impact, like loss in revenue (Huang & Min, 2002) and tourist arrivals rate (Mazzocchi & Montini, 2001). However, there is still lack of extant studies explore the impact of earthquake to small-scale accommodation business which play a major role in contributing to the socio-economic growth in many countries. In addition, there is little studies focus on exploring respondent's experience and perceptions about the impact of earthquake to their day-to-day activities for pre-disaster, during and post disaster. It has been recognised in many previous studies on business performance that individual's behaviours like perceptions, experiences and processes have largely been employed in order to gather a more complete picture of the phenomenon under investigation, rather than seeking statistical significance (Jones, 1988; Miles & Huberman, 1994; Ritchie, et al, 2007). Therefore, this current study aims to investigate the impact of earthquake on business performance of small-scale accommodation services in Ranau, Sabah, taking into account the quantitative and qualitative impact for pre-disaster, during and post-disaster of earthquake. In addition, this study presents respondents' preferred recovery strategy to mitigate the impact.

Figure 1: The affected area of Ranau earthquake in Sabah



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Source: Borneo Post (2015)

Ranau district has been a major tourism attraction in Sabah for its temperate weather and scenic landscape was struck by a deadly earthquake on the 5th June 2015, the strongest to affect Malaysia since 1976 (Figure 1). The aftermath of the earthquake has affected about 200 families in Ranau and Kota Belud who suffered after mudslides destroyed their homes, farms and plantations as well as disrupted water supply. It is believed that the residents in less repeated earthquakes region are less resilience towards earthquakes compared to those in constantly large earthquakes region like China, Japan, and Philippines (Lubkowski, 2015). Therefore, in Malaysia, particularly in Ranau, Sabah, it was certainly a tough aftermath for the residents, including the small-scale businesses in the district that they have to struggle for the social and physical recovery. It was also reported that the business operation of hotels, lodges and homestays which located around Kundasang and Ranau have been badly affected due to outages of lifeline facilities like telecommunication, electricity and transportation. Table 1 shows the number of visitors to Kinabalu Park, one of the major attraction places near Ranau in year 2015.

Table 1: Number of Visitors to Kinabalu Park, Sabah in 2015

Tourist	Jan-Mac	Apr-Jun	Jul-Sept	Oct-Dec
Local	129,161	108,719	68,869	149,986
International	26,811	19,952	23,230	16,494
Total	155,972	128,671	92,099	166,480

Source: Sabah Tourism Board (2015)

Surprisingly, it is found that although the total arrivals for July to September has dropped 28 percent after the earthquake happened in early Jun, the total number of visitors has substantially increased approaching end of the year. This is in line with previous studies on the impact of earthquake to tourism sector in Sri Lanka which found that the damage to industries such as tourism-related business was particularly severe, and recover quickly (Robinson & Jarvey, 2008). Notwithstanding, it is still useful to explore in this study, to what extent the earthquake affects both physical and social aspects of business performance as well as the recovery decisions managers make to mitigate the loss. Therefore, the precise objectives of this study are:-

i. To discover the impacts in business performance of small accommodation business in Ranau before, during and after earthquake.
ii. To identify the level of disruptions of earthquake in terms of business operation, physical facilities and employee emotional.
iii. To explore the strategies planned by manager for business recovery.

2. Literature Review

2.1. The Impact of Earthquake on Small Businesses

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Study on natural disasters and small businesses throughout the world stated that small businesses are highly vulnerable to natural disasters (Kaushalya, Karunasena & Amarathunga, 2014; Orhan, 2016; Sarmiento, Hoberman, Ilcheva, Majano, Poggione & Duran, 2015). In addition, the size of the business is a significant predictor for an overall business recovery by implying that, the larger the business, the higher the chances to recover faster in comparison with small businesses (Chang & Falit-Baiamonte, 2003; LeSage, Pace, Lam, Campanella & Liu, 2011; Tierney,1997 & Webb, 2002). One of the reasons is because smaller businesses have less financial and technical resources to reduce and cope with risk, including the physical and emotional recovery aspects (Corey & Deitch, 2011). In addition, limited access to capital and lack of geographic diversity can mean that small businesses are more likely to suffer long-term impacts after a disaster (Wasileski et al., 2011). Cochrane (1992) points out that an extremely important factor in the recovery effort is the ability of the small business to survive and succeed after being hit by disaster due to the reason that business provide jobs, good and services and tax money to the community.

Most of the damages and loss that have been highlighted in many previous studies on the impact of earthquakes includes environment (flood, landslide), social (e.g. health, education, food safety), infrastructure (buildings, transport, telecommunication, energy) and production (agricultural, industry, retail, tourism) (Kazama & Noda, 2012, Koh, et al, 2009). Infrastructure damages due to natural disasters has always been recognised as a cause of financial distress for small businesses. It can lead to temporary businesses closing down and usually require substantial amount of cost and time to restore operations (Zhang, et al, 2004). Previous studies in developed countries reported that more than one-third of small enterprises do not reopen their businesses after a disaster and more than a quarter close down within two years after the disaster (Turner et al., 2007). For instance, a large number of small business went out of business after the Hurricane Katrina and 7900 businesses remained closed a year after the disaster struck (Dietch & Corey, 2011; LeSage at al., 2011). Furthermore, Liu, Xu and Han (2013) mentioned in their studies that after Wenchuan province in China was hit by earthquake in 2008, the effect was significant to the small and medium size businesses, as they never resume operation Furthermore, it took 36 months the shortest time their business required to recommence and fully recover.

In other case, some evidences from developing country like Sri Lanka (Robinson & Jarvey, 2008) and Indonesia (Pribadi, 2005) reported that nearly two-third of small businesses earned less revenue after the disaster than before the events. In Pakistan, a total of 300,000 small businesses were affected by the 2010 flood and this implied that such businesses were not prepared for unexpected situations and natural hazards (Asgary, Anjum & Azimi, 2012). The impact of disaster to small businesses are not just direct physical happened at the time of the disaster, it may include other problems such as extended periods of business interruption, difficulties with shipping and receiving products, revenue declines due to loss of customers, and other operational problems (Tierney & Webb, 2006). Looking at the previous literature, it is shown that study on impact of disasters, businesses in general and on small business in particular, derived from the studies conducted in developed countries (Asgary et al., 2012). Little evidences are available on such issues in rural area context specifically focused on tourism-related sector. Therefore, this study tries to fill the gap by investigating changes in business performance of small accommodation services, in terms of operations, physical infrastructure and emotional aspects before, during and after the disaster specifically in Ranau, Sabah.

2.2. Natural Disaster Recovering Strategies for Businesses

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Smaller organisations (those with fewer than 20 full-time employees) were more vulnerable to a negative impact on revenue than larger organisations. The most disruptive factor to businesses following the aftershocks was seen to be issues with customers, including decreased customer numbers, customers needing different services than those provided, and decreased spending (Stevenson, Vargo, Seville, Kachali, McNaughton & Powell, 2011). Logically, small businesses experience more obstacles than large firms and chains in re-establishing pre-disaster levels of operations. This is because small firms are more likely to be located in non-engineered buildings, depend primarily on neighbourhood customers, lack the capacity to design and implement hazard management programs, lack the financial resources needed for recovery, and lack access to governmental recovery programs (Alesch & Holly 1996; Alesch, et al., 2001; Dahlhamer & Tierney 1996; Durkin, 1984; Kroll et al., 1990). In a comprehensive survey and empirical analysis of business recovery after various natural disasters in the U.S. between 1992 and 2000 (two hurricanes, one earthquake, one wildfire, one tornado, and eight flooding events), Alesch, Holly, Mittler, and Nagy (2001) found that marginal busi¬nesses prior to the disaster event were much more likely to not reopen after the disaster even when the disaster event was not catastrophic.

Disaster recovery planning of an organisation is one of the recovery strategies under business continuity plan (Doughty, 2001) and usually involves activity of planning and preparing necessary strategies to minimize business loss and to ensure continuity of business operations. Small businesses are usually regarded to be more susceptible to natural hazards than larger firms, due to its limited range of risk-management mechanism they possess, especially in terms of safety and contingency system, insurance, technological and financial resources that can slowdown the restoration of business operations (Vitez, 2009). Therefore, some small businesses are more preferred to undertake less complicated and less expensive recovery strategies over technically difficult or time-consuming efforts (Webb, Tierney & Dahlhamer, 1999). In fact, some studies reported that some owner-managers make strategic decision to close or slow-down their business operations for a year at the early state after disaster rather than go through the effort of restarting the business (Durkin, 1984; Kroll, et al, 1991). It is believed that the age and size of business play as important factors influencing the kind of recovery strategies of a firm (Webb, Tierney & Dahlhamer, 1999). Therefore, this study attempted to assess the nature and extend of business recovery strategies planned by managers of small accommodation services surveyed in this study. This current research assesses the initiation phase of recovery strategies plan of post-earthquake by looking at two main areas, the internal and external recovery strategies.

2. Methodology

This study investigates from the perspectives of manager of small accommodation services in Ranau, Sabah about their business performance before, during and after earthquake and recovery strategies from the disaster. Small-scale face-to-face structured interviews were carried out among 33 managers of small accommodation businesses, including hotels, lodge, inn, resorts and homestays in Ranau. Ranau was chosen as the scope of study as the district was directly affected by the deadly earthquake in 2015. The list of sample was drawn from the Sabah Tourism Board, based on the availability and approachability of the companies to be involved in the study. All responses from respondents were recorded on a hard copy questionnaire by the interviewer. The questions included dichotomous and attitudinal of 4-point Likert Scale ranging from 1 (not at all) to 4 (very disruptive). Attitudinal questions were used to ask respondents' perceptions on the level of impact of earthquake to their business performance. Descriptive test was used as the main analytical techniques in this study to explore the rate of impact of earthquake on

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business performance including the number of visitors, change in revenue, number of employees and hours of operation as well as the level of disruption towards business operation, physical facilities and emotional aspects. The analysis of data revealed that the earthquake caused severe changes on business performance in terms of operations, physical, and emotional aspects.

3. Results and Discussion

3.1. Respondent's Profile

A total of 33 respondents among the managers of small accommodation services in Ranau, Sabah involved in the study. Table 2 shows that the respondents are mainly the male (66.7 percent), more than one-third of them (33.3 percent) have working experience in hotel industry six to ten years, followed by 21.2 percent with working experience less than three years. Majority of these small accommodation services (90.9 percent) have been in operations for at least five years or less, with most of them employ not more than 50 employees in their business. Mainly respondents mentioned the main market for their business is local tourist from Malaysia (51.5 percent).

Table 2: Respondent's Profile (n=33)

Respondent's Profile		Quantity	(%)
Gender	Male	22	66.7
	Female	11	33.3
Working Experience in Hotel & Tourism Industry	Less than 3 years	7	21.2
	3 to 5 years	6	18.2
	6 to 10 years	11	33.3
	11 to 20 years	6	18.2
	More than 20 years	3	9.1
Number of Employee	Less than 5	6	18.2
	5 to 49	19	57.6
	50 to 99	8	24.2
Years of operation	Less than 3 years	18	54.5
	3 < 5 years	12	36.4
	5 years and above	3	9.1
Main Market	Local tourist	17	51.5
	Domestic tourist	7	21.2
	Foreign tourist	9	27.3

4.2. Business Performance Before, During and After Earthquake

Figure 2 shows the impacts in business performance of small accommodation business before, during and after the earthquake, in terms of changes in number of guests, percentage of revenue, occupancy rate, employee attendance and hours of operation. During the week of earthquake aftermath, only trivial effect appears on business performance of small accommodation business surveyed. The result shows that

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majority respondents reported a slight reduction about 40 percent in number of guest, and reduction about 41 to 60 percent in revenues. Notwithstanding, larger reduction was found for occupancy rate and employee attendance, which experience reduction about 61 to 80 percent, respectively. It is also found that more than three-quarter (76 percent) mentioned their premise remained open for fewer hours during the week.

As depicted in Figure 2, one week after the disaster had happened, the impact of the earthquake was noticeably affect the business performance, especially in terms of visitor attendance at their premise. Majority of the respondents reported a week after the disaster happened, there was no visitor arrived at their premise whilst none of their employee came to work. Consequently, nearly two-third (62 percent) of the surveyed premises experienced zero revenues during the week though 72 percent of them open their business. Some respondents mentioned that they suffered this unsatisfactory performance of their business operation almost for almost two months. In fact, only small proportion of the respondents reported that they managed to recover their business performance three months after the earthquake, in terms of employee attendance and longer hours of operation. This impact is in line with studies done by Webb, Tierney and Dahlhamer (1999) who found that the most common operational disruptions after earthquake is the inability of employee to get to work mainly due to lifeline lost and emotional effect. Nevertheless, Kroll, et al., (1991) in their study on the impacts of Loma Prieta earthquake in the City of San Francisco suggest that employment drops in hotel employment after earthquake as short-term effects and have lasted only a few months.

Impressively, six months after the earthquake, it is found that there is considerable improvement in the business performance for all surveyed respondents, where mainly respondents reported full recovery from the disaster. Majority respondents mentioned they only face 'slight reduction to no changes' in number of guest coming to their premise (91 percent), percentage of revenues (76 percent), occupancy rate (42 percent) and employee attendance (54 percent). Robinson and Jarvey (2008) in their study on the impact of earthquake to tourism sector in Sri Lanka found the small tourism business face severe impact and recover faster compared to other sector. It is believed that adventure visitors would love to come to the affected area to see with their own eyes the damaged site. Nevertheless, it is found that 67 percent of them still not able to open their premise as usual since the earthquake hit their district. This is logic as most of the accommodation businesses involved in this study are still at their early start-up stage and have been in operation for less than three years. It is believed that small business at early start-up stage are more vulnerable and have less financial and technical resources to recover from disaster (Corey & Deitch, 2011; Zhang, et al, 2004).

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Figure 2: Business Performance, Before, During and After Earthquake

CHANGES IN BUSINESS PERFORMANCE	BEFORE	DURING	AFTER DISASTER			
			1 WEEK	1 MONTH	3 MONTHS	6 MONTHS
No. of Guests						
No guests at all			78%			
Reducing 61% to 80%			22%	80%	42%	
Reducing 41% to 60%				20%	24%	
Reducing 40% and less		100%			20%	9%
Slight reduction to no changes	100%				14%	91%
Percentage of Revenue						
No Revenues at all			62%			
Reducing 61% to 80%			39%	39%	58%	24%
Reducing 41% to 60%		58%		36%	24%	
Reducing 40% and less		42%		24%	18%	
Slight reduction to no changes	100%					76%
Occupancy Rate						
No Occupants at all			90%			
Reducing 61% to 80%		67%	10%	73%	73%	9%
Reducing 41% to 60%		33%		27%	24%	18%
Reducing 40% and less					3%	30%
Slight reduction to no changes	100%					42%
Employee Attendance						
No Employees at all			100%	21%	9%	3%
Reducing 61% to 80%		46%		39%	21%	43%
Reducing 41% to 60%		30%		27%	27%	
Reducing 40% and less		24%		12%	42%	
Slight reduction to no changes	100%					54%
Hours of Operation						
Close permenantly			15%			
Close temporary		15%	12%	3%	9%	
Remain open - fewer hours		76%	27%	36%	27%	10%
Remain open - longer hours			21%	33%	48%	57%
Remain open as usual	100%	9%	24%	24%	12%	33%

4.3. Level of Impacts of Earthquake on Business Operation, Physical Facilities and Emotional Effects

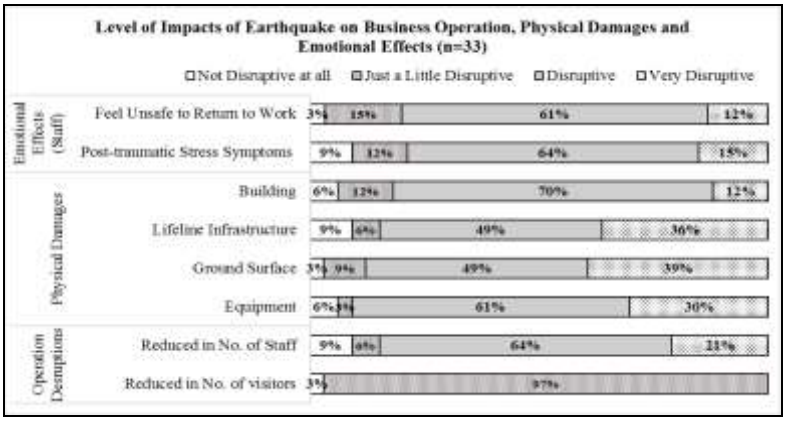
Figure 3 shows the level of impacts of earthquake in terms of operation disruptions, physical damages and emotional effects among staff, ranging from 1=not disruptive at all to 4=very disruptive. It is found that the largest impact of earthquake suffered by the surveyed accommodations was in terms of operation disruptions (average responses=80.5 percent, followed by emotional effects among staff (average responses=62.5 percent) and physical damages (average responses=52.25 percent). In relating to operation disruptions, reduction in number of visitors received the largest responses among the

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respondents (97 percent). This is mostly due to of physical damages, especially the damages of equipment (91 percent) and post-traumatic stress symptoms among staff (79 percent) which was viewed by mainly respondents to disrupt and delay business operations.

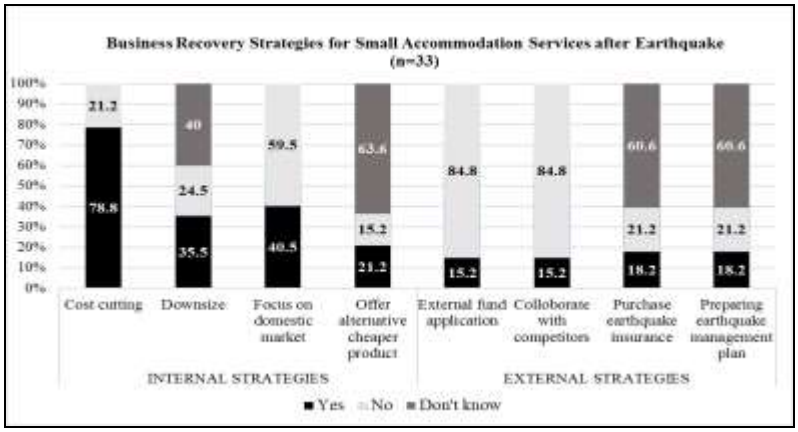
Figure 3: Level of Impacts of Earthquake on Business Operation, Physical Damages and Emotional Effects



4.4. Business Recovery Strategies

The respondents were asked about the business recovery strategies plan to minimize loss and to continue the business operations after earthquake. The result shows that vast majority (96 percent) of the respondents reported they do not have emergency service personnel in their premise to cope with the disaster during and after the earthquake. In fact, all of them reported they did not receive assistance after the earthquake, including from the local government especially regarding recovery strategies for their business. Therefore, the study aimed to investigate what kind of recovery strategies that managers of small business make, including the internal and external strategies. Figure 4 provides data on the business recovery strategies that have been planned by managers of small accommodation services in Ranau to overcome the business loss after the earthquake.

Figure 4: Business Recovery Strategies for Small Accommodation Services after Earthquake



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It is found that most respondents employ internal strategies compared to external strategies to recover from the losses. This involves cost cutting being the most prevalent strategies (78 percent), followed by focus on domestic market (40.5 percent), downsize of business (35.5 percent) and offer alternative cheaper product (21.2 percent). As expected, majority of those whom plan for internal recovery strategies are among the managers of company with less than 5 years of operation. It is believed that new company usually plan for less cost and less time-consuming recovery strategy. In relating to external recovery strategies, the result shows that majority of the respondents perceived 'No' and 'Don't Know' for fund application, collaboration, insurance purchasing and earthquake management plan for their business. This result is in line with a comprehensive survey and empirical analysis of business recovery after various natural disasters in the U.S. between 1992 and 2000 (two hurricanes, one earthquake, one wildfire, one tornado, and eight flooding events) by Alesch, Holly, Mittler, and Nagy (2001) who found that the traditional precautions aimed at protecting life and property within a disaster area like financial support and insurance coverage were not correlated with post-disaster business survival.

3. Conclusion

This paper summarises findings from those studies in three main areas: (i) the impacts of earthquake on business performance of small accommodation business for before, during and after earthquake, (ii) the level of disruptions of earthquake in terms of business operation, physical facilities and employee emotional and (iii) the business recovery strategies after earthquake. The study reveals that mainly small tourism business surveyed in Ranau managed to recover from the earthquake aftermath within a month, and able to minimize the financial losses and physical damages 6 months after the earthquake. This study is parallel to previous studies on earthquake in developing country by Robinson and Jarvey (2008) who found that the earthquake aftermath damage to industries such as small tourism-related business was particularly severe, and recover quickly compared to larger firm. In relating to level of impact of the earthquake on the business performance, it is found that although physical damages can have a major negative effect on business operations of small businesses, emotional effect has also contributed significantly to business interruptions and subsequent financial losses, especially due to post-traumatic symptoms. Previous studies reveal that people suffering post-traumatic stress symptoms may avoid conversations or certain locations or even people who will remind them of the recent trauma (Chou, et al, 2004). Thus, they may feel unsafe to go out for work. It is believed that the emotional damage can be mend through appropriate motivational treatment organised by the owner-manager or related post-disaster assistance agencies. In this study, reduction in staff attendance at work is the most dominant impact of earthquake tough after 3 months of the disaster. It has contributed significantly to business losses of the company for not able to continue its business functions. It is interesting to find that all respondents reported that they do not receive any post-earthquake aids from emergency service personnel or from the government agencies. This is not surprising as previous research found that some small firms that used post-disaster assistance were significantly more likely to be worse off following the earthquake than firms using no aid (Webb, Tierney & Dahlhamer, 1999). This study shows that the internal recovery strategies like cost saving, downsizing and niche marketing are more preferable by most managers surveyed over the external recovery strategies. Finally, the analysis of the impact of earthquake on business performance in this study is limited in that it focuses primarily on small business in one sector only, i.e. accommodation services, as well as only involves several disaster impacts. Nevertheless, this study has

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contributed to the literature in relating to disaster recovery process and strategies for small business in rural Malaysia which is still under-research. This study hopes to provide relevant insights on the variation in level of impact of earthquake and types post-recovery strategies of small businesses in rural areas, which can be used for other small businesses in Malaysia after disaster. In future analyses, we hope to explain further on the outcomes of the proposed recovery strategies on their business performance by incorporating data on broader quantitative and qualitative results.

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