Disaster Resilience Planning for Risk Mitigation and Business Continuity.

Noorsidi Aizuddin Mat Noor[1,2], Nurhadina Anati Md Shah[1], Nuramalina Salwa Harun[1], Siti Zaleha Daud[1], Hairul Nizam Mansor[3], Farhana Diana Deris[4], Afizan Mohktar[5]

[1]Real Estate Department, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor, Malaysia

[2]Centre for Real Estate Studies (UTM CRES), Mass Appraisal, Housing and Planning Research Group, Real Estate Department, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor, Malaysia

[3]Department of Built Environment Studies and Technology Faculty of Built Environment, Universiti Teknologi MARA, Perak Branch Seri Iskandar Campus, 32610, Seri Iskandar Perak, Malaysia.

[4]Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia, Malaysia

[5]College of Built Environment, University Technology of Mara, 40450 Shah Alam, Selangor

[5]AFZ Realty Sdn Bhd, 23-1, Jalan Equine 1E, Taman Equine, 43300 Seri Kembangan Selangor

DOI: https://dx.doi.org/10.47772/IJRISS.2025.905000405

Received: 03 May 2025; Accepted: 14 May 2025; Published: 19 June 2025

ABSTRACT

This study investigates the implementation of disaster resilience planning within the context of corporate real estate management (CREM) in Malaysian government agencies. It is important to analyse the current approach, consider its problems and recommend actions that will help the business continue and avoid major risks. Researchers chose a quantitative approach, giving out questionnaires to 150 officers participating in real estate and facilities management in the public sector, and 78.7% of those officers responded. Descriptive and inferential statistics were applied to the data to check for patterns, relate different factors and assess how useful CREM practices were. Currently, there are moderate disaster resilience practices, but issues such as delays from government agencies, a lack of specialists and not enough funds cause major issues. But stakeholders agreed that capacity building, digital technologies and outsourcing are significant aspects for companies. The study shows that resilience planning should be in line with an organisation's strategy, involve key players and take a how to unmoor a boat from shallow water approach. It is evident from the results that having proper policies, leading figures and new ideas is crucial for creating disaster resilience. It provides practical advice and recommendations to policymakers, planners and managerial leaders regarding preparing for disasters. The methodology encourages the public sector to focus on a more proactive approach to resilience in its property operations.

Keywords: Disaster resilience, Real Estate planning, community preparedness, sustainable development, risk reduction

INTRODUCTION

Disaster Resilience Planning is a crucial aspect of ensuring business continuity in the face of disasters, but many organisations and communities are not adequately prepared for their impacts (Noor, 2025). According to the National Institute of Standards and Technology's (NIST), disaster resilience is defined as the ability to

minimise the costs of a disaster and return to its original state as quickly as possible. This involves an outgoing process of planning, organising, training, providing equipment, conducting exercises, assessing performance, and implementing corrective action to ensure effective coordination in responding to incidents.

According to the Climate Change Knowledge Portal, the most common natural disaster that frequently occurs in Malaysia is flooding. Vinekswaran Nair (2023) stated that the floods in Malaysia during 2021–2022 were a devastating natural disaster, resulting in widespread damage, displacement, and loss of life. The study also underscored the urgency for improved disaster preparedness and response mechanisms, as well as the growing impact of climate change on severe weather occurrences. According to a joint study conducted by The World Bank and Bank Negara Malaysia (BNM) (2024), in the event of a once-in-twenty-year flood occurring in 2030, it could cost Malaysia up to 4.1 per cent of its Gross Domestic Product (GDP) and lead to a rise in the unemployment rate by 2.2 percentage points.

As outlined by Antonelli et. al, (2025), disaster resilience planning encompasses not only acute response plans but also long-term approaches aimed at reducing future risk. It includes developing a thorough adaptation strategy that encompasses staff training, prioritised recovery plans, redundant systems, emergency communication plans, and incident command structures. Disaster resilience planning entails a structured approach that includes identifying strategies for resilience, systematically examining them, deciding on the best feasible tools, outlining specifics, planning for action, finding funding, and moving toward implementation. The lack of preparedness and inadequate disaster resilience planning can lead to significant challenges during and after a disaster. The number of businesses that fail to recover from a disaster is significant. According to the Federal Alliance for Safe Homes, 40% of businesses do not reopen after a disaster, and another 25% close a year after the disaster.

The Federal Alliance for Safe Homes also states that 75% of businesses that have no continuity plan fail three years after a disaster. According to the Small Business Administration (SBA), 90% of businesses fail within two years after being struck by a disaster. This highlights the importance of having a comprehensive disaster resilience plan in place to reduce the impact of disasters and ensure business continuity. Moreover, the impacts of disasters are not limited to the immediate aftermath of the event. Disasters can have long-term effects on the affected communities, including economic, social, and environmental impacts. Therefore, it is essential to adopt a long-term perspective in disaster resilience planning, focusing on reducing risks for the future, rather than simply returning the community to pre-disaster condition. This article aimed to identify effective strategies to mitigate risk and ensure business continuity. Not only that, but this article also aimed to determine the benefits of this disaster resilience plan for the continuity of the business.

LITERATURE REVIEW

In today's climate of natural disasters, technological failures, and other acute shocks (Faisal, 2018), disaster resilience planning is essential. Such hazards may impact the company’s system of infrastructure, supply networks, and operations. Enterprises must develop strategies to master the risks and guarantee company outputs in the case of disasters. The recent disasters have emphasised the necessity of better disaster resilience planning (Rose, 2011); however, research has found that resilience assessment enhances the basics of the idea and its manners.

Vakilzadeh and Haase (2020) proposed an improvement in resilience measurement through the use of primary and secondary data. This research says that social capital cuts the effect of disaster damage and speeds up community recovery. The second research theme is community intervention to enhance adaptive capacity and resilience. One way to study community capitals is to increase climate change resistance (Mayer, 2019).

A community’s capitals are assets, skills, relationships, and resources. These factors enhance a community's ability to survive natural calamities. Finally, the research also focuses on the ability to predict, cope with, and adapt to organisational resilience (Vakilzadeh & Haase, 2020). According to Ostadtaghizadeh et al. (2015), environmental scanning and resilience strategies help resilient organisations anticipate risks. Leadership

behaviours and resources, such as a business climate with an emphasis on innovation, help them (Vakilzadeh & Haase, 2020). Such individuals employ these tools and habits to surmount obstacles.

Evolving Strategies and Frameworks in Disaster Resilience Planning

Disaster resilience planning is essential in the face of increasing natural disasters, technological failures, and other acute shocks. It is an attempt by organisations to have continuity and avoid risks. Recent literature clarifies that comprehensive frameworks that ensure risk assessment, emergency preparedness, and adaptive recovery need to be integrated in planning and managing extreme events. For example, the work of Amponsah et al. (2024) was based on a systematic literature review which indicated that most of the disaster resilience literature focuses on spatial planning and flood risk resilience but in European contexts. This presents an obvious geographical bias and serves as a motivation to conduct more diverse case studies to contribute to a deeper understanding of the planning for disaster resilience worldwide.

Additionally, the plan for disaster resilience has highlighted community-based approaches as an important aspect. Such a community intervention has the potential to significantly increase a variety of resilience outcomes (Ostadtaghizadeh et al., 2015). Often, these interventions are based on the use of community capitals, those assets, skills, relationships, and resources that allow communities to endure and recover from natural disasters. The call for community engagement is consistent with a wider trend of participatory planning processes which give importance to the contribution of local capabilities and knowledge in disaster resilience.

Modern disaster resilience planning also has a key role for technological advancement. According to Karaman et al. (2024), the development of resilient communication infrastructures is crucial for these responses. The findings of this research show how important it is to create communication networks that are sustainable and strong enough to handle disasters and recover quickly while also finding affordable and energy-saving solutions that are accessible to everyone. Looking at global examples helps increase the relevance of disaster resilience policies. As a result of the 2011 Tōhoku earthquake, Japan’s local community-wide system for managing disasters showed why it is necessary to warn people and help them evacuate early. It is also used in the Netherlands by the Room for the River programme, which planned how to accommodate floods and keep cities developed. After the recent bushfires in Victoria, Australians have recognised the importance of both mental health assistance and infrastructure projects. They point out that planning specially designed for each community and effective administration can improve a region’s resilience in various ways.

Theoretical Foundations and Practical Applications of Organizational Resilience

Organisational resilience is the ability of an organisation to predict, endure, react to, and bounce back from disruptions. According to Duchek (2020), organisational resilience is a dynamic capability in three stages: anticipation, coping, and adaptation. Using this framework, we can help to structure the proactive thinking through which organisations can learn to better sense threats, more effectively manage crises, and ultimately make a more strategic adaptation to a new reality following a disruption.

Scholars have extensively studied the role of leadership in cultivating organisational resilience. Resilience has been associated with the effect of transformational leadership, as it relates to the ability to inspire and motivate employees to share a common vision. According to Vakilzadeh and Haase (2020), leadership behaviours that encourage creativity and a high level of organisational culture help an organisation become successful in overcoming difficulties. By their research, leaders who inspire adaptability and continuous learning better prepare the organisation for what may not be expected.

In addition, international standards support the integration of resilience in the organisation's strategy. ISO 22316:2017 offers guidelines regarding the organisation's resilience by setting out the principles and attributes that organisations can adopt to improve their resilience. There is a shared vision , clarity of purpose, effective risk management and a culture that facilitates continuous improvement. Following such standards enables organisations to take a structured route to building resilience and be better prepared to manage disruptions.

Recent studies also stress the importance of innovation for organisational resilience. For instance, their research, Vakilzadeh and Haase (2020), reveals that organisations that incorporate innovative practices and technologies are more likely to be successful in the transformation of a changing atmosphere. It is crucial for organisations to create a culture of innovation by allowing their people to come up with creative solutions to their emerging challenges.

Finally, the previous literature regarding disaster resilience planning and organisational resilience makes clear the difficulties in building resilience in the face of a wide range of moving threats. With the integration of comprehensive planning frameworks and considerations for the community's involvement, technological advancement, and adaptive organisational culture, entities will be strengthened to withstand and recover from disruptions. However, this study continue to research and develop context-specific strategies for both community and organisational resilience.

METHODOLOGY

Research Design and Objective

Quantitative research was the approach used for this study to test the current practices, as well as challenges and strategies, of corporate real estate management (CREM) in selected Malaysian government agencies. In a cross-sectional study, data is collected at the point in time to give insight about existing trends and management priorities regarding real estate functions. The major ambition of the methodology was to systematically collect, measure, and analyze numerical data to unveil the positive and negative aspects of CREM implementation in public organizations. The main instrument for data obtained was a structured questionnaire. It was supposed to have the capability to collect quantifiable data that could be statistically analyzed. The survey was broken down into four main sections: (1) general respondent information; (2) current CREM-related practices; (3) challenges CREM faces; and (4) strategies for aspiration or recommendations for improvement. To enable both closed-ended and the Likert scale questions to produce effective results depending on the experiences and perceptions presented by the respondents, the instrument was carefully structured. The survey structure, the number of items in each section, and the data types recorded are summarized in Table 1.

The methodology for the research was chosen to focus on the main purposes: reviewing CREM approaches currently in use, finding problems faced by institutions and suggesting new measures to address them. A quantitative design was chosen because it allowed the team to study patterns in the behaviour of public officials and provided reliable data. By using the questionnaires, the authors could connect the research findings to the study’s analysis and measure important aspects of resilience and risk management.

Table 1 Survey Instrument Structure

Section	Focus Area	No. of Items	Type of Data
1	Respondent Demographics	5	Nominal/Ordinal
2	CREM Practices	10	Likert Scale (1–5)
3	Challenges in CREM	8	Likert Scale (1–5)
4	Strategies for Improvement	7	Likert Scale & Open

This research design allowed for obtaining the identification of correlations and patterns that represent the integration of CREM into the governmental strategic planning. Furthermore, the design ensured the maintenance of respondent anonymity and data reliability throughout the entire work process.

Sampling Method and Data Collection Procedure

Government agencies with a substantial number of real estate assets under management were purposively selected. 150 surveys were distributed to officers in charge of property management, property maintenance,

and facilities planning. Selection of these officers was made from them as per the managerial post and the real estate decision-making process. The response rate of the distribution was 78.7% with 118 respondents out of 150 questionnaires distributed.

It was done over four weeks of data collection. We used formal emails to establish initial contact before physically delivering the questionnaires to the respective agencies. Phone calls and reminder emails were made to follow up with the patient to help with timely and accurate submission. The surveys were collected, and then completed surveys were manually checked for completeness and consistency before being coded for analysis.

Table 2 presents the demographic breakdown of the respondents. They had between 5 to 15 years of working experience, and most of them were in supervisory or managerial positions. The presence of data showed a very fair distribution across different departments and various agencies, and this made them maintain the relative balance of public sector perspectives.

Table 2 Demographic Profile of Respondents

Attribute	**Category**	**Frequency**	**Percentage (%)**
Gender	Male	72	61.0
	Female	46	39.0
Job Position	Executive/Officer	39	33.1
	Manager/Senior Manager	67	56.8
	Director/Top Management	12	10.1
Years of Experience	Less than 5 years	16	13.6
	5–15 years	71	60.2
	More than 15 years	31	26.3

The findings were representative of the larger set of government personnel involved in CREM operations due to the sample size and demographic spread.

Data Analysis Techniques and Statistical Tools

The data that were the outcome of the collection and coding of the data were transferred into SPSS (Statistical Package for the Social Sciences) software for analysis. The main characteristics of the dataset were summarised using descriptive statistics in terms of frequencies and percentages of data, means and standard deviations. Descriptive analysis sought to feed information regarding the current state of CREM implementation and trends based on respondent feedback.

Furthermore, Inferential statistics, such as Pearson Correlation Coefficient and One-Way ANOVA were used to investigate relationships between the variables, e.g., years of experience and perception of CREM challenges. The strength and direction of the relationships between independent and dependent variables (like job role and tenure compared to how challenges are rated and how effective practices are) were examined using correlation analysis. In the case of One Way ANOVA, mean scores of different job levels were compared to determine whether there were statistically significant differences in perspectives.

Cronbach's Alpha was used to test the data's reliability. All the items in the questionnaire scored higher than 0.75 in internal consistency, implying high internal consistency of all major sections of the questionnaire. The analytical process here was rigorous, leaving no doubt about the statistical soundness of the conclusions that were made and contributing to the study's goals.

Key Variables and Analytical Framework

The variables investigated were grouped into the major constructs of (1) CREM Practise Indicators, (2) CREM Challenges, and (3) Proposed Strategic Interventions. Variables in the CREM Practice Indicators included strategic planning involvement, asset lifecycle monitoring, as well as the use of digital management tools. The factors which the Challenges construct assessed were bureaucratic delay, inadequate expertise and lack of budget allocation. The Strategic Interventions category was comprised of such propounded changes as outsourcing, capacity building and centralised databases.

A 5-point Likert scale was used, 1 denoting Strongly Disagree and 5 denoting Strongly Agree, to evaluate each construct. To compare the strengths or weaknesses of the constructs, composite mean scores were determined for each construct. Table 3 shows the mean scores for the three constructs aggregated across the entire sample of 118 respondents.

Table 3 Composite Mean Scores for Key Constructs

Construct	No. of Items	Mean Score	Standard Deviation
CREM Practice Indicators	10	3.87	0.76
CREM Challenges	8	3.92	0.81
Strategic Interventions Proposed	7	4.18	0.69

Table 3 revealed that while current practices received a moderately high rating, the perceived challenges they pose are slightly greater than the actual ones. Yet the highest mean scores were given to the proposed interventions, implying a strong agreement on the relevance and timeliness of these.

Limitations and Ethical Considerations

This methodology was bound to a number of limitations even though it had been planned carefully and executed. Second, there was reliance upon self-reported data, for which there may have been social desirability or overestimation of their performance. They may have rated their practises more favourably in order to bolster the impression of their organisations. Second, although the sample size is large enough for general analysis, some agencies may be so small or highly specialised as to require additional considerations in the application of the testing methods developed here. Third, the study's cross-sectional nature did not allow for observing changes over time or for attributing causality.

The concerns were addressed with the use of the questionnaire by pretesting it with five government officers to make certain that the questionnaire was clear and neutral with the wording. An emphasis was made on anonymity and confidentiality in order to encourage honest responses. Moreover, ethical clearance for the host university ethics committee was obtained. Respondents were informed of participation being voluntary, and no personal identifiers were collected.

Data were password-protected databases that the research team would have access to only. It had no access to any data, and no findings were shared with outside parties—instead, all findings were reported in aggregate. To maintain the integrity of the research and so that the institutions participating trust in the research, these steps were taken.

Strategies To Mitigate Risks

A business must put in place a set of strategies to mitigate risk and ensure it successfully navigates the challenges of disasters. Robust strategies are necessary to ensure continuity in the face of disasters, given the increasing unpredictability in the business environment. However, there are some ways in which risk can be mitigated and business continuity can be ensured.

This is the first strategy, which is to do a thorough risk assessment of the business to identify its possible points of risks and vulnerabilities to the business. It is stated by Grace Lowe (2019), risk assessment gathers information about possible threats and what such threats can do to the business. Everything that exists about the queries can be summed up from surveys, historical data analysis, interviews and other research methods. By taking this process, the risks involved, both external, such as those which could disrupt business operations, and those which are within the operational environment, will be comprehensively understood. In case of risk assessment, it is important to develop a disaster preparedness plan. The plans should include strategies for rapid control and containment of hazardous conditions and minimising the risk and impact on other persons and the property. Updating and reviewing the plan to adapt to changing risks and maintain preparedness are essential. In general, this is how a proactive approach to disaster management is formed, allowing organisations to react appropriately and protect their operations in the event of a crisis.

The second strategy is to create a business continuity plan (BCP) that outlines procedures for keeping the critical business functions running when a disaster strikes and when the disaster has been resolved. Business Continuity Planning (BCP) is a process of strategic nature that involves developing a comprehensive plan for the continuity of critical business functions in and after a disaster. Categorised as planned, this means that this plan, as well as specific procedures and instructions the organisation has to use to minimise downtime and activate essential operations, will apply for the organisation in which this plan is effective. Tracy Rock (2024) states that key components of a BCP include identifying key personnel responsible for implementing the plan, allocation of resources also known as essential resources, and alternative facilities to maintain operations in case of interruptions. Furthermore, the BCP should include various areas of the organisation, such as assets, human resources, business processes, and business partners (Khaeruman et al., 2024). The BCP is aimed at assisting organisations to minimise disruption's effects, protect his organisation's reputation, and prioritise the safety of employees and clients through providing detail about precise steps and roles to execute while a crisis occurs. The plan requires regular review and updating to take the changes in risks and operational resilience in unconventional conditions into account.

The third strategy is using robust data backup systems to back up critical business data, and they regularly perform tests on these data backup systems to ensure that data is contained and available. Although a robust data backup and recovery system is a must to guarantee that vital business information is protected and within reach in case the need arises. An effective backup and recovery strategy has a few key elements that include setting up a complete data backup system. It is the act of creating multiple replicas of some crucial information, files, and systems and keeping them secured in an external place. The purpose is to have multiple redundant copies of data in order to prevent loss due to hardware failures, human errors and disaster. Not simply having backup systems in place is not enough. Organisations must test the integrity of backups of the data and its recoverability to make sure that data can be restored back and working as usual when that is needed. This procedure includes working the test restores, ensuring that those recoveries are completely backed up, and that the recovery process is valid. Through regular testing it is possible to detect and resolve any changes we might make before they turn into a real disaster. This robust data backup and recovery will ensure that the important information assets of a business are protected and the business will continue to operate during unexpected disasters.

The fourth strategy is to diversify the suppliers and have alternative routes to supply chains to lessen the effect of these disruptions and maintain the connection with the supply chain suppliers so that any potential problems can be anticipated and tackled. It is a vital strategy in disrupting the prevention and assuaging business continuity during disruptions. Redundancy may be achieved through obtaining products, and thus materials, from different suppliers in locations far from one another, thus reducing the businesses' dependence on a single point of failure. This is further enhanced by having alternative supply chain routes, such as using different modes of transportation or logistics providers. Typically, it gives businesses the leeway to easily change or reroute the shipment in case a particular pathway was interrupted by natural disasters or unexpected events. We maintain open communication and collaboration with suppliers. Organisations can anticipate challenges and collaborate with their suppliers by reacting proactively and sharing information that will help

them all develop contingency plans and implement preventive measures. It could include strategies such as increasing the inventory levels, identifying the alternative suppliers, exploring the alternative sourcing options, etc. An effective way of mitigating the effects of disruption, sustaining operations under the stress, and more rapidly responding to dynamic market conditions involves diversifying the supply chain through a strong direct link with suppliers.

The fifth strategy is to set up the remote work policies and infrastructure. It is for supporting employees who need to effectively get things done from home or other locations at the time of a disaster. Additionally, it provides employees with access to necessary tools and communication platforms. To accommodate for a disaster, Joseph, (2024) states that remote work policies and infrastructure must be put in place to allow employees to work remotely (or alternatively) as well. It consists of creating clear rules for remote work and supplying necessary tools and technologies for seamless communication and cooperation, as well as ensuring access to important resources. The organisations that introduce strong remote working capabilities will be able to maintain operational continuity as well as give their employees the means to work at high productivity and quickly adjust to unexpected disruptions. With this, the protection of business operations and of the work-related well-being of the staff can be secured.

The mitigation strategies to mitigate risk and to facilitate continuity of business include comprehensive employee training and preparedness. Regular disaster response procedure and safety protocol training also helps employees to be equipped with a certain level of knowledge and skills to respond appropriately in a disaster. Features of this training should include routes to evacuate, use of emergency equipment, communication in emergencies, how to use shelter-in-place procedures, etc. However, very important in this is to initiate clear communication platforms for distributing emergency information. It means that before we need to send critical updates, instructions and status reports to employees during a crisis, we should have pre-identified methods and platforms to use to communicate them. Empowering employees with essential knowledge and effective communication increases the business's overall preparedness and increases chances for being able to respond to disruptive events.

The second approach is to keep its financial reserves adequate. Businesses need to keep sufficient financial reserves to pay for such unpredictable expenses and the loss of revenue in times of emergencies. It involves placing money in place for meeting the immediate needs like repairs and maintenance, relocation expenses and operational disruption. Also, the disaster presents an opportunity to review insurance policies to have proper coverage of property damage and business interruption. Disaster insurance ensures that they have enough coverage so as to minimise exposure to the financial risks associated with the disasters, all for the purpose that small businesses may continue to function without any interruptions and easily recover so as to resume business.

Creating and maintaining reserves and being insured enable businesses to improve their resilience and minimise the disruption of disaster to a company's financial stability.

Testing and evaluation of the disaster recovery and business continuity plans is an important method for maintaining readiness of organisations and operational continuity. Businesses can test and simulate multiple disaster scenarios by assessing their plans, leading to the effectiveness of their response. However, these exercises enable a company to identify gaps, minimise error, and ensure that it can return the most critical systems and carry on operations within the recovery time objectives applied. Businesses continue to gain tremendous insights into the business needs and customer needs, both internal and external, through feedback from employees, stakeholders, and partners. Apart from being crucial for maintaining a state of readiness and business continuity in the case of disaster, the following process of testing, evaluation and update of plans is instrumental for planning purposes.

Finally, the strategy that can help mitigate risk and maintain business continuity consists of continuous improvement of monitoring risks, adaptive reaction to changed risks, and incorporation of the lessons learnt from past incidents to enhance business continuity. So businesses can be continually assessing risks and can

be actively finding out the new threats to proactively be adjusting response strategies during that time. The refinement of existing plans based on insights from past incidents helps to make the plans more effective to the extent possible to reduce the occurrence of future disasters and disruptions. The learning, adapting, and improving response mechanisms through meeting challenges only make the business more resilient to challenges and get a culture of preparedness and adaptability to keep operations going.

Benefits of a Disaster Resilience

This also highlights that it remains essential for the company to have in place the disaster resilience plan to facilitate the minimisation of risks so that business operations continue normally in case of a disaster. Implementation of such initiatives not only implicates individual companies but also affects the economy and the whole of the nation in a broader perspective. Following this, businesses have the capacity to make themselves more obstinate by including stress decrease procedures in business readiness for disaster. Community resilience provides a robust strategy for disaster readiness, according to Norris et al. (2007). Economic development, social capital, information and communication, and community competency are involved in the concepts of community resilience. Additionally, earthquake forecasting, earthquake early warning, and rapid reaction systems can play a significant role in reducing catastrophe risk and the planning of business continuity for organisations which carry the duty of vital infrastructure (Jones et al., 2022).

Micro, Small, and Medium Enterprises (MSMEs) are coming up with a Business Continuity Plan (BCP) that is well-structured to handle vulnerabilities and making them ready for catastrophic occurrences (Lehan, 2023). To guarantee that medical personnel provide hospitals with the appropriate capabilities to effectively respond in the event of a disaster, it is necessary to train them on disaster medical assistance plans (Georgieva et al., 2022). According to the research conducted by Yabe et al. in 2020, there is a strong correlation between the ability of a business to recover after a disaster and the economic recovery of the community. In addition, the rebuilding and the extent of resilience that will be gained after a disaster can depend on rules being created to support resilience and sustainability following a disaster (Ellery, 2023).

The incorporation of catastrophe resilience methods into institutional frameworks of urban planning and governance is the key to an organisation's power to guarantee business continuity, growth, and sustainability, as stated by Sarkar et al.'s research in 2020. In this paper, Rani et al. (2018) observe that indices like the Climate Disaster Resilience Index (CDRI) can be used to measure the extent of urban resilience and provide great insight that can be used to perform disaster risk management and planning. In Zhong et al. (2014), tertiary institutions, as part of the health systems, are important components to be included at all phases of disaster planning. Disaster resilience plan is one that makes businesses robust and, in the end, helps in making communities, countries and economies as a whole more robust. Finally, a disaster resilience plan is a way to protect the enterprises. If they include impact preparedness, create an RRC and business continuity policy, deal with business vulnerabilities, address how to improve readiness, and incorporate stress relief, jobs, and revenue, these companies will have an enhanced ability to survive the disaster and stay in business. This also paves the way for economic stability and growth.

Policy Implications and Future Research

This study offers useful knowledge for policymakers. For starters, the results can help develop systematic guidelines for the public sector to add resilience to their property decisions, largely by offering training programmes and joining risk assessments. Also, since there is much overlap and struggle due to government fragmentation and a lack of skilled workers, it is clear that problems can be better tackled when agencies cooperate and use digital governance tools. In addition, studies should focus on continuous evaluations of CREM and determine how AI, blockchain and digital twins might benefit disaster planning. Moreover, studying SMEs in the context of overall resilience would improve knowledge about working together in crisis situations.

ISSN No. 2454-6186 | DOI: 10.47772/IJRISS | Volume IX Issue V May 2025

CONCLUSION

Never before has there been such an imperative for Malaysian businesses to adopt comprehensive and multi-dimensional disaster resilience planning for them to survive. In a country that tends to be confronted with natural disasters such as floods, landslides, and even haze, survival would not suffice for businesses, but economic sustainability would need to be triggered in a context of disruption. With the floods in the Klang Valley in December 2021 refreshing the minds on how quick and widespread these can be. Damage to premises, loss of inventories, and inaccessibility severely affected thousands of businesses in particular, especially the small and medium enterprises (SMEs). This unfortunate incident has proven to contain the gap in the risk assessments, preparedness plans, and continuity strategies; hence, businesses need to embrace crisis management strategies with more traditional approaches. Companies can learn from these real-life events and strengthen their internal frameworks, bolster resilience and support the economic ecosystem as that wider whole in times of crisis.

To have an effective resilience plan, your risk assessment must be able to identify both internal and external vulnerabilities. This means that Malaysian businesses need to evaluate not only operational and financial risks but also environmental and infrastructural risks targeted in their geographical location. Companies in such areas as Kelantan, Pahang, and parts of Selangor must consider flood risk modelling when making decisions. Consequently, this risk assessment should also be dynamic, considering new threats such as cyber attacks or health issues like COVID, which permanently changed the operating conditions across all industries. By taking such a proactive step, businesses will be able to focus on their most crucial risks efficiently, allocate resources effectively and find valid ways to mitigate them, such as insurance coverage, early warning systems or even developing strategic relationships with emergency services.

Well, as disaster preparedness planning, it is equally important and should be proper to devise detailed protocols, should have staff training and should have the resource mobilisation strategies. The 2021 Klang Valley floods highlight the need to have well-defined evacuations, safety protocols for employees, and effective channels of communication. A large number of businesses were unprepared: they could not contact staff, access records or let customers know of service disruptions. The backbone of being a resilient business is being able to establish robust disaster response teams, conduct regular drills and use digital infrastructure, such as cloud-based data storage. For instance, companies which previously had put cloud-based systems in place could continue to function remotely even if their physical offices are inaccessible. In addition to strengthening internal preparedness, it also establishes the confidence from stakeholders and investors in a company’s ability to weather disruptions responsibly.

However, the need for business continuity and recovery strategies is equally vital. Risk assessments and preparedness are concerned with readiness, while business continuity plans (BCPs) direct the operational recovery during and then after a disaster. Malaysia's trading businesses must create the mature and comprehensive BCP that both defines the roles and responsibilities of various personnel to conduct business and outlines the steps to restore operations within the acceptable timeframes. A relevant case study of the December 2021 floods is that some companies that had diversified their supply chains and had backups outside the premises were able to get back in business within days, while others required weeks or closed down permanently. In addition, companies with flexible work arrangements from home handled the crisis better. The lessons from these examples demonstrate that one or more of these three aspects (operational agility, data resilience, supply chain redundancy) are paramount in continuity planning.

Businesses should also consider their contribution to community and national resilience and how to increase their performance in internal operations. For prepared individual firms do not add as much pressure on the public emergency systems and help to speed up the economic recovery. It is, however, particularly crucial for the major sectors of which logistics, healthcare and food supply are integral parts. Likewise, Malaysia’s online e-commerce platforms and logistics, such as Lazada and Pos Malaysia, are vital to allow goods and services to be accessed during the pandemic. As equally important nodes of the local support network during the 2021 floods, community-based businesses include mini-markets and pharmacies. As the preceding examples

demonstrate, there is much that can be gained from promoting private sector resilience for society at large. The business case for DRR is not only to protect business interests but also to promote community well-being, national security and sustainable development.

This paper offers benefits beyond its immediate practical implications. It has the structure of a structured, evidence-based approach to resilience planning in the disaster area which can be utilised in policy, academic, and industry contexts. The findings provide a starting point for future work on feasibility, cost-benefit analysis and types of technology impacts on adaptive planning and planning of preparedness investments or roles in adaptive planning by sector. Policy implications of this work can be understood in their public sector and what could be used by them to design and implement DRR policy in the national sphere or to provide incentives for business to comply with them. The strategies here are actionable advice for the practitioners, especially the SMEs with limited resources, on how to prepare and recover from lost time. It could also be improved in this direction by conducting more longitudinal work in assessing the efficacy of resilience interventions or exploring the latest digital innovations (e.g., AI-driven risk modelling or blockchain in supply chain resilience) to raise the standard of disaster planning.

Secondly, it can be concluded that Malaysian businesses need to be disaster resilient as a strategic necessity. Hence, businesses must take a strong and multi-layered approach to risk management to ensure both business integrity and societal stability in light of the recent national events. It is possible for businesses to survive the disruptions and rebound better with a strategy of any sort along the line of risk assessment, preparedness planning, continuity system, workforce training, and a consensus with the community. Yet, if such practices are adopted proactively, uncertainty is reduced, and businesses can operate with certainty, lower the economic loss, and thereby promote long-term competitiveness. In a world of changing climate, rapid change, pandemics, and technological risk, the future is not about avoiding disaster but anticipating disaster, planning for them with real capacity and real capability to come and adapt to them as one of them free of charge. This paper makes a timely and relevant contribution towards building that resilience for Malaysian businesses as well as serving to be a model for other nations which are contending with a similar challenge.

ACKNOWLEDGEMENT

In standard spoken words, our lifetime gratitude extends far beyond. We would like to thank members of the UTM Mass Appraisal Housing and Planning Research Group for their generous explanations when developing our project. We thank the respected reviewers for reviewing the paper, but the remaining mistakes are ours and not theirs.

REFERENCES

1. Amponsah, M., Maryani, E., & Nandi, N. (2024). Systematic literature review on enhancing disaster resilience through spatial planning strategies. Int J Multidiscip Res, 6(2).
2. Antonelli, M., Aldrich, R., Tanner, R., & Ho, A. (2025). The Storm is Here: Public Libraries' Role in Disaster Preparedness and Community Recovery. Electronic Green Journal, 1(51).
3. Auzzir, Z., Haigh, R., & Amaratunga, D. (2018). Impacts of disaster to SMEs in Malaysia. Procedia engineering, 212, 1131-1138.
4. Azadegan, A., Mellat Parast, M., Lucianetti, L., Nishant, R., & Blackhurst, J. (2020). Supply chain disruptions and business continuity: An empirical assessment. Decision Sciences, 51(1), 38-73.
5. Ellery, M., Javernick-Will, A., Liel, A., & Dickinson, K. (2023). Jurisdictional decision-making about building codes for resiliency and sustainability post-fire. Environmental Research: Infrastructure and Sustainability, 3(4), 045004.
6. Georgieva, M., Kostadinov, R., & Semerdjieva, M. (2022). Disaster medical support plan as an element of the hospital disaster resilience. Folia Medica, 64(3), 507-512.
7. Huck, A., Monstadt, J., Driessen, P. P., & Rudolph-Cleff, A. (2021). Towards Resilient Rotterdam? Key conditions for a networked approach to managing urban infrastructure risks. Journal of contingencies and crisis management, 29(1), 12-22.

8. International Organization for Standardization. (2017). ISO 22316:2017 Security and resilience – Organizational resilience – Principles and attributes. https://www.iso.org/standard/50053.htmlWikipedia
9. Jones, K. G., Mulder, F., Morga, M., & Wanigarathna, N. (2022, November). Facilities management and earthquake risk reduction: The TURNkey project. In IOP Conference Series: Earth and Environmental Science (Vol. 1101, No. 6, p. 062008). IOP Publishing.
10. Joseph, E. (2024). Resilient infrastructure and inclusive culture in the era of remote work. In Infrastructure Development Strategies for Empowerment and Inclusion (pp. 276-299). IGI Global.
11. Karaman, B., Basturk, I., Taskin, S., Zeydan, E., Kara, F., Beyazit, E. A., ... & Yanikomeroglu, H. (2024). Solutions for Sustainable and Resilient Communication Infrastructure in Disaster Relief and Management Scenarios. arXiv preprint arXiv:2410.13977.
12. Khaeruman, K., Dewi, I. N., & Noor, N. A. M. (2024). Global Human Resource Management Strategy In Facing Multicultural Challenges In The Digital Era. International Journal of Economy, Education and Entrepreneurship (IJE3), 4(2), 548-557.
13. Lehan, N. F., & Kamarudin, K. H. (2023, November). Geospatial Approach for MSMEs Business Continuity Plan in Post Pandemic Era in Malaysia. In IOP Conference Series: Earth and Environmental Science (Vol. 1264, No. 1, p. 012001). IOP Publishing.
14. Margherita, A., & Heikkilä, M. (2021). Business continuity in the COVID-19 emergency: A framework of actions undertaken by world-leading companies. Business horizons, 64(5), 683-695.
15. Martínez-Reyes, A., Quintero-Araújo, C. L., & Solano-Charris, E. L. (2021). Supplying personal protective equipment to intensive care units during the COVID-19 outbreak in Colombia. A Simheuristic approach based on the location-routing problem. Sustainability, 13(14), 7822.
16. Mhd Noor, M. T., Kadir Shahar, H., Baharudin, M. R., Syed Ismail, S. N., Abdul Manaf, R., Md Said, S., ... & Muthiah, S. G. (2022). Facing flood disaster: A cluster randomized trial assessing communities' knowledge, skills and preparedness utilizing a health model intervention. PLoS one, 17(11), e0271258.
17. Nair, V. (2023).Crisis Management Case Study: The 2021-2022 Malaysian Flood. Linkedin. https://www.linkedin.com/pulse/crisis-management-case-study-2021-2022-malaysian-flood-nair-phd-1gpwc
18. Namdar, J., Torabi, S. A., Sahebjamnia, N., & Nilkanth Pradhan, N. (2021). Business continuity-inspired resilient supply chain network design. International Journal of Production Research, 59(5), 1331-1367.
19. Noor, N. A. M. (2025). Integrating Islamic Principles in Sustainable Real Estate Development: A Path to Harmonious Community Living. Indonesian Journal of Islamization Studies, 2(2).
20. Noor, N. A. M., Eshamuddin, M. N. E., Yusoff, N. S. M., Deris, F. D., Ishak, M. H. Z., & Mohktar, A. (2024). Exploring the Issues and Scenarios among Malaysia's Real Estate Valuers Community Related to Smart City Concepts. International Journal of Research and Innovation in Social Science, 8(5), 1806-1813.
21. Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. American journal of community psychology, 41, 127-150.
22. Ostadtaghizadeh, A., Ardalan, A., Paton, D., Jabbari, H., & Khankeh, H. R. (2015). Community disaster resilience: A systematic review on assessment models and tools. PLoS currents, 7, ecurrents-dis.
23. Rock, T. (2024). 9 Business Continuity Plan Goals + Objectives Every Business Should Use. invenioiT. https://invenioit.com/business-continuity-plan-objectives/
24. Sandifer, P. A., & Walker, A. H. (2018). Enhancing disaster resilience by reducing stress-associated health impacts. Frontiers in public health, 6, 373.
25. Sarkar, A., Wingreen, S., & Ascroft, J. (2020). Towards a practice-based view of information systems resilience using the lens of critical realism.
26. Schätter, F., Hansen, O., Wiens, M., & Schultmann, F. (2019). A decision support methodology for a disaster-caused business continuity management. Decision Support Systems, 118, 10-20.
27. Wan Mohd Rani, W. N. M., Kamarudin, K. H., Razak, K. A., Hasan, R. C., & Mohamad, Z. (2018). Measuring urban resilience using climate disaster resilience index (CDRI). The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 42, 237-242.