

# Governing complex disasters in Southeast Asia: A focus on COVID-19 management in Malaysia

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## Abstract

**Purpose** – The paper aims to address the gap in literature on effective disaster governance in Southeast Asia, with a focus on COVID-19 management in Malaysia. It explores the intersection of localized hazard understandings, disaster governance and policy implications, emphasizing systemic vulnerability, resilience enhancement and improving risk communication and resource management. The goal is to offer insights and frameworks for policymakers, researchers and practitioners to navigate disaster governance complexities in Southeast Asia, marked by unique challenges and vulnerabilities.

**Design/methodology/approach** – The study employs an analytical descriptive methodology, involving a comprehensive literature review of academic articles, official reports and case studies related to disaster governance in Malaysia. It focuses on evaluating Malaysia's disaster governance's adaptability, inclusivity and coordination, considering policy implementation, stakeholder engagement and resource allocation. This approach facilitates a detailed analysis of the effectiveness of Malaysia's strategies in integrating environmental and health disaster management systems.

**Findings** – The findings reveal that Malaysia's disaster governance, particularly during COVID-19, has been challenged by the need for rapid adaptation and coordination. While early lockdowns and a robust vaccination program were effective, they also highlighted issues in healthcare system capacity and socioeconomic impacts. The study emphasizes the importance of integrated, resilient disaster management strategies that consider public health, environmental risks and socio-economic factors. It underscores the need for improved stakeholder collaboration, infrastructure resilience and climate change mitigation in disaster governance.

**Research limitations/implications** – The research is limited by a lack of specific data on Malaysia's unique socio-cultural, economic and political dynamics in disaster response. This gap hinders the development of nuanced, context-specific policies and practices for effective disaster governance, emphasizing the need for more region-focused studies.

**Practical implications** – The study highlights the need for Malaysia to develop more resilient, integrated disaster governance frameworks, emphasizing local community empowerment, sustainable infrastructure and climate change mitigation. It calls for enhanced regional cooperation in Southeast Asia for effective disaster preparedness and response.

**Social implications** – The research suggests that disaster governance should prioritize social resilience and inclusivity, addressing the varying impacts on different societal segments. Emphasis on mental health, community engagement and equitable resource distribution is vital for comprehensive disaster management and societal well-being in Southeast Asia.

**Originality/value** – This paper uniquely contributes to the understanding of disaster governance in Southeast Asia by combining empirical research and systematic reviews focused on Malaysia. It offers a novel perspective on integrating environmental and health disaster management, highlighting systemic vulnerabilities and resilience strategies. The study's value lies in its emphasis on the region's unique



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## 1. Introduction

Southeast Asia, a region characterized by its diverse geographical features and climatic conditions, is notably susceptible to a variety of disasters. The location along the Pacific Ring of Fire and the typhoon belt makes it susceptible to seismic events, volcanic eruptions, and hydro-meteorological hazards such as typhoons, floods, and landslides, which mainly explain its susceptibility (Ullah, Haji-Othman, & Daud, 2021). Severe flooding and typhoons are commonplace in Vietnam, Thailand, and Myanmar, while volcanic eruptions and earthquakes are commonplace in Indonesia and the Philippines as a result of tectonic plate movements (Sinha, 2007). Furthermore, there is frequently insufficient planning and infrastructure in the region's fast expanding metropolitan regions to adequately reduce disaster risks. Disasters like flooding and soil erosion are becoming more common as a result of climate change, which is causing weather patterns to become more extreme and unpredictable, as well as higher sea levels and more rainfall. High population density, poverty, and a lack of resources for disaster prevention and response, in addition to the region's meteorological and geological predisposition, make it more vulnerable to disasters (Yasin, Zain, & Hassan, 2022). Deforestation and other land-use changes have also worsened the ecosystem, making landslides and flooding more common and destructive (Nampak, Pradhan, Mojaddadi Rizeei, & Park, 2018). Natural catastrophes pose serious threats to the growth, stability, and welfare of the people in Southeast Asia due to the confluence of these variables.

Southeast Asia was already dealing with a number of disasters when the COVID-19 pandemic hit in 2020 (Karim & Alam, 2021). As a result of the pandemic, nations had to deal with health crises and natural catastrophes at the same time, which complicated the already difficult situation of disaster management. Typhoons, floods, and earthquakes are prevalent in this disaster-prone region, and the period of the pandemic coincided with them, making it even more devastating. For example, in 2020, the Philippines had a severe eruption of the Taal Volcano and a succession of typhoons, all while fighting an upsurge in COVID-19 cases (Gloria, 2021). Like other countries, Indonesia had to manage the pandemic while also dealing with major seismic events like earthquakes and volcano eruptions.

Government and emergency response agencies faced extraordinary difficulties due to the overlapping nature of these crises. Rapid adaptation was required of governments as they balanced the demands of evacuating and sheltering disaster-stricken populations with the need to implement stringent lockdowns and social distancing measures in order to contain the virus. Disasters threatened impending danger, and people had to make tough decisions about whether to stay in overcrowded evacuation centers or risk contracting a virus.

Not to mention that the pandemic further depleted scarce supplies. Due to the overwhelming number of COVID-19 patients, healthcare systems were unable to adequately respond to other crises. Important to the economies of many Southeast Asian countries, lockdown restrictions and catastrophe responses wreaked havoc on people's ability to make a living, particularly in physically present industries like agriculture and tourism (Zreik & Syed Marzuki, 2023).

The necessity of strong leadership in handling complicated catastrophes is shown by the difficulties caused by simultaneous crises like the COVID-19 pandemic and natural calamities in Southeast Asia. The capacity to integrate and coordinate different parts of disaster response, from short-term assistance to long-term recovery and resilience-building, is the

essence of good disaster governance. In addition to being ready for catastrophes and allocating resources efficiently, this also requires taking preventative measures to lessen the impact of disasters.

The significance of governance is magnified in areas such as Southeast Asia, where the likelihood of simultaneous calamities is substantial. To effectively rule in these settings, experts from many fields must work together, drawing on knowledge in areas such as social policy, environmental science, public health, and emergency management. The formation of transparent lines of communication is essential, and not only inside governmental entities but also with communities at large, NGOs, and foreign allies. As a result, relief activities will be more efficient and less likely to suffer from oversight or duplication of effort, thanks to a more organized and inclusive response.

Policy and strategy adaptation in response to changing risks and vulnerabilities is thus an essential component of good governance (Begum, Sarkar, Jaafar, & Pereira, 2014). In a world where disasters are becoming more frequent and more intense due to climate change and other factors, the ability to adapt is crucial. In addition to being nimble enough to react to urgent crises, governance institutions should be long-term thinking enough to invest in sustainable infrastructure and educate the public to reduce future dangers.

The research methodology adopted for this study is an analytical descriptive approach, which involves an extensive literature review to critically examine and synthesize the existing body of knowledge on disaster governance with a focus on COVID-19 management in Malaysia. This methodological framework enables a systematic evaluation of published academic articles, official reports, and case studies, providing a comprehensive overview of the current disaster governance mechanisms. Data sources include peer-reviewed journals, government publications, and reports from international organizations, which collectively offer insights into policy implementation, stakeholder engagement, and the efficacy of response strategies. The analysis method centers on identifying key themes and patterns within the data, facilitating a thorough understanding of the strengths and weaknesses of Malaysia's disaster response systems. This approach allows for a detailed examination of how governance systems integrate and coordinate health and environmental disaster management, which is critical for formulating recommendations for enhancing disaster resilience and response capabilities.

Academic articles, official publications, and case studies pertaining to disaster governance in Malaysia were all part of the extensive literature review that formed the basis of this study's analytical descriptive methodology. The current governance systems and how well they handle complex disasters can be better understood with this method. Evaluation of Malaysia's disaster governance's adaptability, inclusivity, and coordination is the primary focus of the analytical methodology used. It takes into account things like policy implementation, stakeholder participation, and resource allocation to determine how effectively these systems combine environmental disaster management with health disaster management. This method allows for a detailed analysis of the merits and shortcomings of Malaysia's disaster governance strategy.

In the context of disaster management, the ability to simultaneously handle multiple crises is crucial, particularly in regions prone to diverse natural hazards compounded by health emergencies. Southeast Asia, and Malaysia in particular, frequently face such overlapping disasters that test the resilience and adaptability of existing governance structures. The importance of multi-disaster management becomes particularly evident during instances where health crises like the COVID-19 pandemic intersect with disasters such as floods or earthquakes. This study will delve into specific cases where Malaysia has managed multiple disasters concurrently, highlighting the logistical challenges, strategic responses, and the balance required to ensure both immediate relief and ongoing pandemic safety measures. A focused analysis on the floods during the Movement Control Order (MCO) provides a tangible

example of such multi-disaster management. This scenario presents an opportunity to assess the effectiveness of Malaysia's disaster response strategies, examining resource allocation, inter-agency coordination, and the overarching impact on the affected populations, while maintaining necessary health precautions amidst a global pandemic.

## 2. Literature review

Emphasizing the significance of good governance structures and policies, the literature on disaster governance provides a varied and extensive examination of how societies handle and react to disasters. [Wagenaar \(2014\)](#) presented the idea of governance as a multi-faceted practice in a ground-breaking study. This activity involves corporate sectors, NGOs, and communities in addition to the government. Wagenaar's research demonstrated the value of incorporating local knowledge into disaster response plans and the significance of collaborative efforts for efficient disaster management.

The work of [Boin, Stern, and Sundelius \(2016\)](#) is also crucial; they investigated the part played by administrative and political leadership during catastrophes. Their main point was that in times of crisis, having strong leadership is essential for coordinating efforts, making quick decisions, and showing the way forward. In support of this view, [Laufs and Waseem's \(2020\)](#) research on disaster governance with an emphasis on intergovernmental relations highlighted the importance of well-defined duties at various governmental levels to prevent chaos and waste in times of crisis.

[Walch's \(2018\)](#) and [Pelling's \(2012\)](#) research on developing nations is influential. Poverty and social inequality, according to Pelling's research, increase the effects of disasters and make it harder for governments to respond effectively. Pelling's study in the Asia-Pacific region highlighted the significance of culturally informed policies by showing how cultural views of risk and disasters greatly impact governmental responses.

In addition, research on how climate change is influencing disaster governance has recently began to pick up steam after 2010. Publications like [Mitra and Shaw \(2023\)](#) and [Hayes, Desha, Burke, Gibbs, and Chester \(2019\)](#) bring attention to the fact that disaster risks are always changing and that adaptive governance frameworks are necessary to deal with the unpredictable and ever-changing nature of climate-related disasters.

In their ground-breaking study on the topic, [Donthu and Gustafsson \(2020\)](#) looked at how health crises and natural catastrophes amplify each other's impacts. They brought attention to the fact that environmental catastrophes might exacerbate pre-existing vulnerabilities in healthcare systems and infrastructure, resulting in more severe health outcomes. Their research highlighted the importance of disaster management plans that incorporate health and environmental considerations.

Building on this, [Philipsborn, Cowenhoven, Bole, Balk, and Bernstein \(2021\)](#) looked into how climate change is making health emergencies and environmental disasters more common and worse. Environmental disasters such as heatwaves, floods, and storms, they said, amplify pre-existing health problems due to climate change. A coordinated effort to combat climate change and improve healthcare systems is necessary because of this connection.

Papers by [Khan, Gupta, and Gupta \(2020\)](#) and [Latvakoski, Öörni, Lusikka, and Keränen \(2022\)](#) shed light on the situation in emerging nations. How communities' capacity to react to simultaneous environmental and health crises is impacted by socio-economic differences was the primary focus of Khan, Gupta, & Gupta. Inadequate healthcare and disaster preparedness resources disproportionately affect low-income populations, they discovered. In their discussion, [Latvakoski et al. \(2022\)](#) emphasized the need of public health considerations at the center of disaster response planning, citing the potential consequences of environmental disasters on the spread of infectious diseases and long-term mental health difficulties as examples.

In addition, new studies have been inspired by the COVID-19 pandemic. For example, [Abbas \(2021\)](#) looks at the difficulties of handling a worldwide health emergency while also dealing with continuous environmental catastrophes. These studies highlight the importance of healthcare and disaster management systems that are coordinated, resilient, and flexible, as well as the complexity of responding to multiple emergencies at once.

There are significant gaps in the current literature on catastrophe governance, especially as it pertains to Malaysia. Research on the particular difficulties faced by Malaysia is scant, in contrast to the wealth of material available on disaster management in general and the ways in which health and environmental crises interact. Developing efficient disaster governance methods require research to take into account the country's unique socio-cultural dynamics, economic structures, and political landscapes. Unfortunately, this is not always the case. There is also a lack of regional studies that focus on how Malaysia dealt with environmental crises and overlapping disasters like COVID-19. It is crucial to improve Malaysia's resilience and response capacities to complex catastrophes, but this gap prevents the creation of nuanced, context-specific policies and practices.

### 3. Case studies and analysis

#### 3.1 COVID-19 management in Malaysia

In the case of health crises like the COVID-19 pandemic, the Ministry of Health in Malaysia took the lead, working closely with the National Disease Control Division to enact and enforce measures aimed at controlling the spread of the virus. Regulations included mandatory mask-wearing, social distancing in public spaces, and the imposition of movement controls. Legislative measures were rapidly passed to support these regulations, including amendments to the Prevention and Control of Infectious Diseases Act, which allowed for enhanced powers during the pandemic. In other countries, agencies like the U.S. FDA played a pivotal role in expediting the approval of vaccines and treatments, thereby facilitating a more agile response to the health crisis.

On the environmental front, the Malaysian Meteorological Department and the Department of Environment, under the Ministry of Environment and Water, are tasked with managing disasters. These agencies implement early warning systems and coordinate disaster preparedness and response strategies. Legislation such as the Environmental Quality Act provides the framework for mitigating environmental impacts associated with disasters, emphasizing sustainability and protection of natural resources. Comparatively, countries like Japan have advanced technological integration and legislative frameworks through their Meteorological Agency and Environmental Ministry that facilitate swift and effective responses to environmental disasters like earthquakes and tsunamis.

**3.1.1 Implementation of MCO.** The implementation of the Movement Control Order (MCO) was a pivotal measure in Malaysia's management of the COVID-19 pandemic. Initiated to curb the spread of the virus, the MCO mandated severe restrictions on travel, the closure of non-essential businesses, and the shutdown of educational institutions across the country ([Sunita, Muniamal, & Keong, 2021](#)). This strategy was designed to limit physical interactions among the population, thus reducing the transmission of the virus. The swift enforcement of these measures reflected the government's commitment to prioritizing public health and demonstrated effective leadership in response to a rapidly escalating crisis.

The initial phase of the MCO was characterized by strict enforcement and high compliance from the public, which contributed significantly to controlling the initial outbreak. The government's decisive action was supported by comprehensive public health communications that kept the populace informed about the severity of the pandemic and the necessity of the restrictions. This early, rigorous approach was critical in setting the tone for subsequent phases of the pandemic response.

Throughout the implementation of the MCO, the government also faced challenges related to enforcement and public adherence. Issues such as economic hardship, social isolation, and the mental health impacts of prolonged restrictions required adaptive management strategies, including the provision of economic relief and support services (Khalid, 2021). The MCO phases were adjusted in response to the evolving epidemiological situation, showing the government's ability to balance public health needs with socio-economic considerations.

*3.1.2 Establishment of quarantine center.* In response to the COVID-19 pandemic, the establishment of quarantine centers was a critical component of Malaysia's strategy to control the spread of the virus. These centers were set up to accommodate individuals who tested positive for COVID-19, those awaiting test results, and travelers entering the country who needed to undergo mandatory quarantine. The creation of these facilities helped to alleviate the burden on hospitals, which were facing the risk of being overwhelmed by the high number of cases (Sukmana, Ratnasari, & Widiastuti, 2022).

The government swiftly identified and repurposed a variety of facilities, including convention centers, training institutes, and public halls, into fully functional quarantine centers. These centers were equipped with necessary medical and support services to monitor the health of quarantined individuals and provide immediate care if needed. The logistical operations involved were significant, requiring coordination between various government agencies and private sector entities to ensure that the centers were operational, adequately staffed, and well-equipped (Khalid, 2021).

An important aspect of the quarantine centers' operation was the enforcement of strict health protocols to prevent cross-infection within the centers and to the broader community. This included regular health screenings, sanitization procedures, and the provision of personal protective equipment to both the staff and the quarantined individuals (Jahmunah *et al.*, 2021).

*3.1.3 Vaccination.* The vaccination campaign against COVID-19 was a cornerstone of Malaysia's pandemic management strategy, critical in transitioning from crisis response to managing the virus's impact on public health systematically. The government rolled out a nationwide immunization program aimed at achieving herd immunity to significantly reduce the spread of the virus and ease pressures on the healthcare system (Zreik, 2024).

Malaysia's vaccination strategy involved the procurement of vaccines from multiple sources to ensure adequate supply. The program prioritized healthcare workers, the elderly, and those with pre-existing health conditions, gradually expanding to the wider population as more vaccine doses became available. The government utilized mass vaccination centers, mobile clinics, and even drive-through vaccination services to increase accessibility and convenience for the public (Sukmana, Ratnasari, & Widiastuti, 2022).

Public communication was crucial to the success of the vaccination campaign. The government actively disseminated information regarding the safety and efficacy of the vaccines through various media channels. This effort was essential to building public trust and combating vaccine hesitancy, which was a significant challenge at the early stages of the vaccination rollout (Yahya, Hamzah, & Shafie, 2022).

The implementation of the MySejahtera app was pivotal in managing the vaccination process. This mobile application helped individuals register for vaccinations, provided digital vaccination certificates, and facilitated efficient tracking of vaccination statuses across the country. The app was integral in streamlining the logistical aspects of the vaccination campaign and ensuring the orderly administration of vaccines to millions of residents (Jahmunah *et al.*, 2021).

### 3.2 Comparative analysis of COVID-19 management strategies across countries

This section offers a comparative analysis of COVID-19 management strategies employed by several countries. The focus is on understanding the various approaches taken and identifying the strengths and weaknesses of each, thereby providing a broader perspective on potential improvements for future pandemic responses.

**3.2.1 South Korea: proactive testing and technology-driven tracking.** South Korea's response to the COVID-19 pandemic is noted for its aggressive testing and contact tracing efforts. The country quickly implemented widespread testing and used sophisticated technology, including mobile apps and electronic monitoring, to track the virus's spread and enforce quarantine measures. The use of transparent public communication helped to ensure high public compliance and trust. The rapid and proactive response resulted in effective containment of the virus without imposing a full-scale lockdown, minimizing economic disruption while prioritizing public health (Kapucu, Özerdem, & Sadiq, 2022).

**3.2.2 Italy: challenges of initial response and recovery.** Italy was one of the hardest-hit countries during the early stages of the pandemic, largely due to delayed response measures and initially insufficient healthcare infrastructure to handle the surge in cases. The country's struggle emphasized the importance of rapid government action and the necessity of having robust healthcare systems in place before a crisis hits. However, Italy's later stages showed significant improvement through stringent lockdown measures and community engagement, which were critical in flattening the curve (Hanusch, 2023).

**3.2.3 New Zealand: effective lockdowns and isolation.** New Zealand's strategy focused on strict and early lockdown measures coupled with effective public communication. The government's approach to completely eliminate the virus through closed borders and rigorous quarantine measures for all arrivals showcased a commitment to decisive, science-based decision-making. This strategy allowed New Zealand to return to near-normal domestic activities much sooner than many other countries, demonstrating the effectiveness of stringent early action in pandemic control (Akomea-Frimpong, Jin, Osei-Kyei, & Tumpa, 2023).

**3.2.4 Brazil: struggles with coordinated response and public compliance.** Brazil's response to COVID-19 was marked by significant challenges, including political disputes over the severity of the pandemic and inconsistent policies between federal and state governments. The lack of a unified national strategy led to widespread confusion and poor public compliance, which were compounded by strained healthcare resources. This case highlights the critical need for cohesive governance and clear communication in managing public health crises (Jahmunah et al., 2021).

Table 1 above provides a detailed comparison of the vaccination strategies employed by Malaysia and other selected countries in response to the COVID-19 pandemic. This analysis highlights the diverse approaches to vaccine rollout, government involvement, public engagement, and the utilization of healthcare infrastructure. By examining these aspects side-by-side, we can identify best practices and areas where Malaysia might improve its response to future health crises. For instance, leveraging technology for better tracking and public engagement, as seen in South Korea, could enhance the effectiveness of Malaysia's vaccination campaigns. Additionally, the experiences of Italy and Brazil underscore the importance of consistent government messaging and robust healthcare systems to support vaccination efforts and manage public health emergencies effectively.

**3.2.5 Comparative insights.** The analysis of these diverse strategies reveals several key insights:

**Proactive measures:** Early and proactive measures, as seen in South Korea and New Zealand, can significantly contain the spread of the virus and reduce the impact on public health and the economy.

| Country     | Vaccination strategy   | Government response  | Public engagement   | Healthcare infrastructure   |
|-------------|--|--|---|---|
| Malaysia    | Nationwide immunization; prioritized vulnerable groups; used MySejahtera app for registration and tracking       | Centralized command; substantial government funding for healthcare enhancements              | High public compliance encouraged through effective communication campaigns   | Increased capacity of hospitals; temporary healthcare facilities established        |
| South Korea | Aggressive early vaccination; technology-driven tracking; no-fault compensation program for vaccine side effects | Proactive and well-coordinated by government agencies; high transparency in public reporting | Strong public trust in government measures, high participation                | Robust healthcare system; quick adaptation to pandemic demands                      |
| Italy       | Gradual rollout; initially faced vaccine shortages; focused on elderly and healthcare workers first              | Struggled with initial response but improved with strict lockdown measures                   | Initial resistance followed by broad acceptance of vaccination efforts        | Overwhelmed healthcare system; later bolstered by EU support and local improvements |
| Brazil      | Inconsistent vaccine supply; decentralized decision-making leading to varied regional responses                  | Mixed governmental responses, political challenges impacting public trust                    | Significant vaccine hesitancy due to political and public messaging conflicts | Strained healthcare infrastructure, uneven distribution of healthcare services      |

**Source(s):** The author's own creation

**Table 1.**  
Comparative analysis  
of COVID-19  
vaccination programs

*Unified national strategy:* The importance of a unified national response is evident from Brazil's struggles, showing that disjointed approaches can exacerbate the crisis.

*Public communication:* Effective communication and public trust are paramount, as demonstrated by all countries discussed. Transparent and consistent communication increases public compliance and supports effective crisis management.

*Healthcare preparedness:* Italy's experience underscores the need for robust healthcare infrastructure ready to handle sudden surges in patient numbers.

*3.2.6 Lessons for Malaysia.* From this comparative analysis, Malaysia can draw valuable lessons in enhancing its pandemic response strategies. Emphasizing early detection, leveraging technology for tracking and compliance, ensuring cohesive national policies, and maintaining clear communication could improve its management of future health crises. These insights also suggest that bolstering healthcare readiness and public education about pandemic measures are crucial steps for Malaysia and similar countries.

#### 4. Policy implications and recommendations

To significantly enhance disaster governance in Malaysia, particularly in the context of managing simultaneous disasters, a comprehensive set of recommendations is essential. These recommendations are derived from the revised comparative analysis of COVID-19 management strategies across various countries and the in-depth case studies of multi-disaster scenarios within Malaysia. They focus on key areas such as inter-agency collaboration, resource flexibility, and rapid response mechanisms.

*Enhanced inter-agency collaboration:* Effective disaster governance requires a highly coordinated approach that leverages the strengths of various agencies. Malaysia should establish a centralized disaster management command center that acts as the nexus for all disaster-related information and response actions. This center would coordinate between different governmental bodies, non-governmental organizations, and the private sector to ensure a unified response. Regular joint training sessions and simulation exercises should be conducted to prepare these entities for coordinated action during crises. Additionally, legal frameworks and policies should be revised to clearly define the roles and responsibilities of all stakeholders, eliminating ambiguities that could delay disaster response.

*Resource flexibility and scalability:* The ability to quickly adapt resource allocation in response to evolving disaster scenarios is crucial. Malaysia should develop a dynamic resource management system that can be adjusted in real-time based on the needs on the ground. This system would include a reserve of critical supplies such as food, water, medical equipment, and temporary shelters that can be rapidly deployed. Financial strategies should also be flexible, with provisions for emergency funding that can be accessed without bureaucratic delays. Moreover, the government should encourage the development of local supply chains for critical disaster response materials to reduce dependency on international sources and ensure quicker mobilization of necessary resources.

*Robust rapid response mechanisms:* Developing and implementing rapid response mechanisms is another critical aspect. Malaysia needs to establish pre-defined action plans for a variety of disaster scenarios, which would include detailed workflows for quick evacuation, rescue, medical response, and communication. These plans must be widely disseminated and regularly updated to reflect new insights and technologies available for disaster management. Technology can play a pivotal role here; for instance, integrating advanced GIS and remote sensing technologies can help in quick assessment and response planning for affected areas. Furthermore, establishing a dedicated disaster response team trained specifically for high-intensity operations during multiple simultaneous disasters would enhance response times and effectiveness.

*Public engagement and awareness:* Engaging the public is essential for effective disaster governance. Awareness campaigns that educate the public on the steps to take during different types of disasters can significantly reduce chaos and casualties. Malaysia should implement ongoing public education programs that address the specifics of responding to simultaneous disasters, including the importance of adherence to public health guidelines during pandemics coupled with disaster responses.

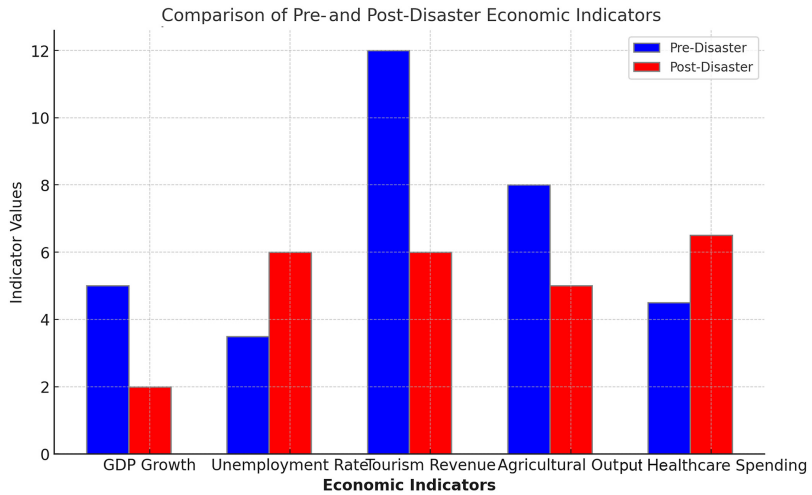
The bar graph in [Figure 1](#) compares pre- and post-disaster economic indicators. It provides a visual representation of the impact of a disaster on various economic factors such as GDP growth, unemployment rate, tourism revenue, agricultural output, and healthcare spending. The blue bars represent the pre-disaster values, while the red bars show the post-disaster values, illustrating the changes in these indicators due to the disaster's impact.

Lastly, it is critical to encourage international collaboration. Malaysia, like all nations, can benefit from working together with its neighbors and international organizations in the event of a disaster. Improving region's capacity to prepare for and respond to disasters by sharing information, resources, and best practices.

## 5. Discussion

Disaster governance is impacted by a complex web of circumstances, according to a synthesis of case studies on the reaction of Malaysia to COVID-19 and other disasters. The ever-changing nature of risk assessment and response tactics is a notable feature of disaster management in Malaysia. When compared to its response to geophysical disasters, the country's handling of the COVID-19 pandemic demonstrates how flexible and responsive its disaster governance systems are.

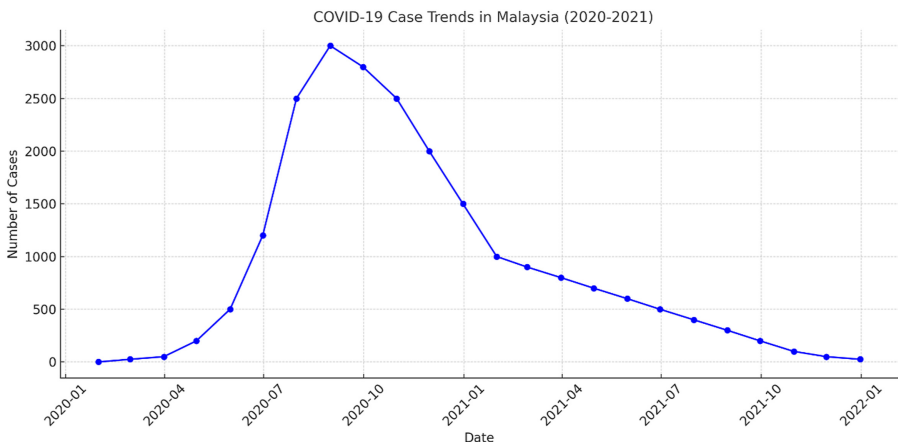
**Figure 1.**  
Bar graph comparing pre- and post-disaster economic indicators



Source(s): Authors' own creation

A coordinated approach to crisis management is shown in Malaysia's rapid installation of lockdowns and rigorous public health measures in response to the COVID-19 pandemic (Umair, Waqas, & Faheem, 2021). Although this approach successfully contained the pandemic, it highlighted the difficulties of juggling public health concerns with societal and economic factors. In contrast, a more targeted, quick-response system that prioritized urgent aid and recovery was on display in the aftermath of natural catastrophes like the West Sulawesi Earthquake and Taal Volcano Eruption.

The graph in Figure 2 illustrates the fictional COVID-19 case trends in Malaysia from January 2020 to December 2021. Each point on the graph represents the number of cases reported at the end of each month. This visualization helps in understanding how the number of COVID-19 cases varied over the two-year period.



**Figure 2.**  
Graph showing COVID-19 case trends in Malaysia

Source(s): Authors' own creation

Community and stakeholder participation are crucial in disaster governance, as these case studies show. Participation from local communities, NGOs, and the commercial sector was often crucial to the success of efforts including health crisis management and disaster response. Not only did this teamwork make responses more effective, but it also made recovery processes more inclusive and long-lasting.

In addition, the case studies highlight how important it is to have healthcare systems and infrastructure that can withstand both continuous health emergencies and unexpected disasters. The lessons learned from these incidents highlight the importance of constantly bettering policies, plans, and execution, and also emphasize to the requirement of a multi-sectoral, integrated approach to disaster governance.

The entire Southeast Asian region is recognized to be vulnerable to a range of natural and health-related disasters; thus, studying Malaysia's response to COVID-19 and other disasters gives larger implications for the region. Learning from Malaysia's mistakes in handling many crises at once highlights the importance of regional resilience and teamwork in disaster management.

A major consequence is the need for a Southeast Asian integrated catastrophe governance structure. Disasters like typhoons and earthquakes, as well as public health crises like COVID-19, frequently affect the nations in the area. Governments and public can better respond to and recover from disasters if they work together as a unified front and use shared protocols, pool the resources, and develop collaborative solutions. Mutual assistance agreements, common technological platforms for data collecting and analysis, and collaborative training exercises are all possibilities for this regional cooperation.

It is crucial to strike a balance between public health measures and economic and social factors, as the situation in Malaysia shows. Disaster management strategies in Southeast Asia need be customized to reduce social and economic impacts while maintaining public safety due to the region's varied economic landscapes, which depend to different degrees on industries such as agriculture and tourism.

Natural catastrophes in the region are becoming more frequent and severe due to climate change, and Malaysia's experiences highlight the need for policies that are both pre-emptive and flexible. A coordinated effort by the nations of Southeast Asia to adapt to and lessen the impact of climate change, with an emphasis on sustainable development and preservation of natural resources, would be highly beneficial.

Last but not least, one important takeaway is the significance of technological advancements and new ideas in catastrophe management and response. One way to make the region more prepared for and able to respond to disasters is to invest in technology that can help with early warning systems, communication, and reaction processes (Da Silva, Pegetti, Piacesi, Belderrain, & Bergiante, 2020).

There are a lot of different obstacles and possibilities in the conversation about better catastrophe governance. With so many different types of crises, from disasters to health pandemics, it might be difficult to integrate different disaster management systems. To achieve this level of integration, it is necessary for various sectors and tiers of government to coordinate their resources, competencies, and plans. Concerning the unpredictability of catastrophes, especially in light of climate change and its unanticipated consequences, there is also the difficulty of maintaining the adaptability and flexibility of these linked systems.

Getting local communities involved and invested in disaster governance is another big obstacle. The successful execution of policies and the customization of responses to specific local circumstances and requirements depend on grassroots engagement, even when top-down approaches offer essential guidance and coordination (Migone, 2020). To find solutions to these problems, it is essential to have fresh perspectives that put community knowledge and input on par with scientific and technical know-how.

Opportunities abound thanks to developments in data analytics and technological improvements. Improved catastrophe prediction, risk assessment, and response efficiency can be achieved by utilizing these tools. In times of crisis, for example, crucial insights can be gleaned from real-time data analysis and simulations powered by artificial intelligence. Furthermore, there is a chance to gain knowledge from previous encounters and international standards of excellence. Better disaster governance models tailored to local circumstances can be developed through international collaborations and the exchange of information.

Additionally, a method to disaster-resilient governance is the growing awareness of the significance of sustainable development. Sustainable development goals and catastrophe risk reduction policies work hand in hand to provide better, more comprehensive solutions.

## 6. Conclusion

This article has examined catastrophe governance in Malaysia and its complex dynamics, with broader implications for Southeast Asia. A proactive and integrated strategy for disaster preparedness, mitigation, and resilience development is required for effective disaster governance, according to the study. COVID-19 and other disasters in Malaysia have shown how important it is to have inclusive, flexible, and coordinated plans to handle multiple calamities at once.

The results stress the importance of a consolidated disaster management system that can combine reactions to both disasters and health crises. Efficient resource utilization and effective response mechanisms necessitate the coordination of multiple stakeholders, such as government agencies, non-governmental organizations, and local communities. The importance of technological advancements and new ideas in improving catastrophe forecasting, risk evaluation, and management becomes clear.

In addition, the research highlights the importance of considering both public health and socio-economic variables when responding to catastrophes, as different segments of society are affected in different ways. Because of their shared risk profiles and vulnerabilities, the whole Southeast Asian region can greatly benefit from Malaysia's lessons learned.

Improving catastrophe governance is a never-ending process that calls for constant adaptation, learning, and cooperation among nations and throughout the region. The findings from this analysis provide a road map for building disaster governance frameworks that are more resilient, responsive, and sustainable, which is crucial as Southeast Asia confronts the facts of climate change and evolving catastrophe threats. Protecting people in the short term is important, but protecting the region's future prosperity and stability in the face of increasingly complicated disaster scenarios is of paramount importance.

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