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CHALLENGES IN TRAINING AND SIMULATION FOR ENHANCING CIVIL-MILITARY COORDINATION IN MALAYSIAN DISASTER RESPONSE

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Abstract:

Effective disaster management in Malaysia, particularly in the face of frequent natural disasters such as floods and landslides, requires robust coordination between civil agencies and military personnel. This study explores the critical components of civil-military collaboration, with a specific focus on joint training and simulation exercises. Utilizing a qualitative research methodology, data were collected through semi-structured interviews with key personnel from disaster response agencies and analyzed alongside case studies, such as the Shah Alam flood incident of 2021. The findings highlight significant gaps in current training programs, particularly in integrating civil and military efforts and in addressing the unpredictable nature of disasters. The study underscores the importance of advanced simulation tools, such as virtual and augmented reality, in enhancing preparedness. Additionally, the research reveals communication challenges, such as the underutilization of the Government Integrated Radio Network (GIRN), and emphasizes the need for standardized communication protocols across agencies. While existing frameworks provide a solid foundation, the study identifies areas for improvement, including the need for more comprehensive multi-agency simulations and specialized leadership training. The study's conclusions offer valuable insights for policymakers and disaster management professionals, advocating for a culture of continuous improvement and collaboration to build a more resilient disaster management framework in Malaysia.

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Civil-Military, Coordination, Disaster Response, Simulation, Training

Introduction

Efficient disaster management necessitates effective coordination between civil agencies and military personnel, particularly in regions prone to natural disasters. In Malaysia, where floods and landslides frequently threaten lives and infrastructure, collaboration across multiple agencies is crucial for optimizing disaster response outcomes (Ahmad et al., 2023). However, significant barriers exist that impede seamless cooperation and operational execution during emergencies (Ismail et al., 2021). Moreover, Malaysia's diverse topography and climatic variability demand a robust and dynamic disaster management approach (Yusoff et al., 2023; (Abdullah, 2020). Given the frequency and severity of natural disasters in the region, both civil and military entities must be well-prepared and capable of executing coordinated response strategies (Mahmud et al., 2022). The complexity of disaster management is further heightened by the distinct roles and responsibilities assigned to each agency, often resulting in overlapping duties and jurisdictional conflicts (Chong & Tan, 2021). The integration of civil and military efforts is essential to ensure resources are utilized efficiently and response operations are executed seamlessly (Kassim, 2024).

One of the primary challenges in enhancing civil-military coordination is the disparity in training protocols and operational cultures between civilian agencies and military units. Civilian agencies often prioritize community engagement and local knowledge, while military units are trained for rapid, large-scale operations. Bridging this gap through joint training and simulation exercises is essential for fostering mutual understanding and operational coherence. However, current training programs frequently fall short in addressing the unique dynamics of civil-military cooperation, leading to gaps in communication, command, and control during actual disaster scenarios.

Furthermore, the technological and logistical aspects of training and simulation exercises present additional hurdles. Advanced simulation tools and platforms are required to create realistic scenarios that accurately reflect the challenges of real-life disaster situations. The availability and accessibility of such technology, along with the requisite training for personnel to effectively use these tools, are critical factors that influence the success of these exercises. Inadequate funding and resource allocation for these technologies can significantly impede the development of effective training programs.

Another significant issue is the continuous evolution of disaster response strategies and the need for adaptive training programs that can keep pace with emerging threats and new methodologies. The integration of lessons learned from past disasters into training simulations is vital for improving future response efforts. However, the bureaucratic nature of many agencies often delays the implementation of new training protocols, resulting in outdated and ineffective practices being extended.

The article will look at the specific challenges surrounding training and simulation exercises designed to improve civil-military coordination in the context of disaster response in Malaysia. The emphasis is on identifying important challenges in present methods and suggesting ways

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to address these concerns. By evaluating the integration of civil and military operations through training simulations, this study hopes to identify gaps and inefficiencies that, if addressed, might dramatically improve the region's disaster management preparedness and efficacy.

The significance of this research derives from its ability to assist in design more robust and responsive crisis management methods, ensuring that both civil and military personnel are better equipped to act in a coordinated and timely manner. The conclusions of this study are designed to help policymakers, disaster management professionals, and military planners improve training protocols and simulation exercises, resulting in more successful disaster response operations in Malaysia. By fostering a culture of continuous improvement and collaboration, this research aims to contribute to the development of a more resilient disaster management framework capable of safeguarding lives and property in the face of natural disasters.

Problem Statement

Civil-military coordination for disaster response in Malaysia should ideally be characterized by seamless communication, interoperability, and coordinated action. This would involve civil authorities and military personnel conducting regular, extensive training and simulation exercises that realistically simulate real-world disaster scenarios. These efforts should be supported by modern technical tools and a well-defined policy framework that clearly defines roles and duties, resulting in efficient and rapid disaster responses. However, the current training and simulation exercises in Malaysia face several challenges, including insufficient budget, technical gaps between civil and military agencies, and infrequent combined exercises that do not adequately prepare personnel for the complex nature of real crisis scenarios. Additionally, existing policies and frameworks lack the specificity and integration required for efficient interagency collaboration, leading to inconsistencies in command structures and coordination mechanisms during crucial operations.

The implications of inefficient civil-military coordination are significant. Delayed disaster responses, misdirected resources, and unprepared response teams can result in increased injury and loss of life during disasters. For example, during the Batang Kali landslide, the delay in establishing reliable communication significantly hampered initial rescue operations, highlighting the critical need for robust communication systems and proficient use of tools like the Government Integrated Radio Network (GIRN). Furthermore, the lack of realistic training and simulations means that response teams are often unprepared for the chaos and complexity of real-life disasters, exacerbating the disaster's impact on affected communities.

To address these deficiencies, disaster management training programs should incorporate more comprehensive multi-agency simulations that encompass a wider range of disaster scenarios, particularly those that replicate the unpredictable and chaotic nature of actual emergencies. Leadership training should be enhanced to equip leaders with the capabilities to make swift and effective decisions under stress, with scenario-based training exercises that simulate actual disasters to help leaders practice remaining composed and efficiently leading their teams. Additionally, modern technologies such as augmented reality (AR) and virtual reality (VR) should be integrated into training simulations to provide responders with a realistic and secure environment to develop their skills.

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Involving local communities in disaster preparedness and response planning through comprehensive education and training on disaster risks, evacuation procedures, and emergency response strategies is also essential. This approach ensures that residents are well-prepared and capable of effective response actions, enhancing community resilience. Ensuring sufficient funding and resources to support advanced training programs, simulation technologies, and operational tools is crucial. Collaboration between the government and private sector can supplement these resources and ensure the sustainability of disaster management initiatives.

Addressing these challenges through targeted improvements in training, simulations, and interagency coordination will significantly enhance Malaysia's disaster response capabilities. By implementing these recommendations, disaster response efforts can be streamlined, mitigating the impacts on affected communities and fostering more resilient and effective disaster management practices. This research is crucial for establishing more effective methods and procedures to improve the readiness and efficacy of civil and military personnel in managing disasters cooperatively and efficiently.

Literature Review

Civil-military coordination in disaster management is vital around the world because it combines military and civilian capabilities and resources to respond effectively to disasters. Researchers such as Thompson and Yamada (2019) emphasize the value of collaborative training activities in developing mutual understanding and operational synergy. For example, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA, 2018) has issued guidelines emphasizing the significance of pre-disaster training and simulations to improve interoperability.

Training and simulation exercises are critical instruments for preparing military and civilian organizations for joint disaster response. However, challenges such as resource limitations, differing organizational cultures, and technological integration frequently impede their success. Smith and Lee (2020) explain how differences in communication technology can result in considerable operational inefficiencies during collaborative disaster response. In the Malaysian context, cooperation between civil and military forces has been evolving. The Malaysian Armed Forces have typically played a supportive role to civilian authorities during disasters, such as during the 2014 East Coast floods (Mohd, 2015). Despite this supportive role, concerns such as confusing command structures and coordination procedures frequently develop, according to Aziz and Hussein (2017), who argue that Malaysia lacks comprehensive joint training frameworks that address the unique challenges of civil-military operations.

Malaysia's recent initiatives to enhance civil-military cooperation include the establishment of the National Disaster Management Agency (NADMA), which aims to centralize disaster response techniques and integrate military assets into civil-led responses (Nguyen, 2021). Furthermore, simulation-based training programs have been created to address specific inter-agency operability challenges (Kumar & Singh, 2019). Internationally, the importance of efficient civil-military coordination in disaster response is well acknowledged, with training and simulation considered critical for improving interoperability and operational effectiveness. For example, Palttala, Boano, Lund, and Vos (2012) examine the European approach, where simulation exercises are used not only to train staff but also to test and modify disaster response plans in real-time scenarios, emphasizing the significance of adaptability and ongoing development in training programs.

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The integration of civil and military efforts presents unique challenges, including the alignment of disparate organizational cultures and operational frameworks. As Waugh and Streib (2006) point out, cultural differences between civilian agencies and military organizations can create substantial impediments in cooperative operations, emphasizing the importance of specific training programs that address these disparities.

Technological integration is another important aspect of training and simulation. According to Harrell, Higgins, Thompson, and Lee (2013), advanced simulation technologies like virtual reality (VR) and augmented reality (AR) can considerably improve the realism and effectiveness of training activities. However, differences in technological availability and integration between civil and military groups may limit these gains. In Malaysia, studies such as those conducted by Abdul Ghani, Ismail, and Rahman (2018) have found that, while the Malaysian government has made progress in incorporating the military into national disaster response strategies, recurring challenges such as unclear command lines and insufficient collaborative training remain. These gaps can be especially problematic during large-scale disasters where a coordinated multi-agency response is required.

A study by Jose and Dufrene (2014) highlights the effectiveness of simulation as a real-world learning environment, providing an alternative to online learning and lectures. Through simulation, instructors can help students learn how to manage real-world crises and become better prepared for emergencies. Moreover, coordination between all disaster-related authorities is necessary during training and simulations to provide prompt response and an effective network of emergency rescue operations. Effective preparedness requires the coordination and integration of emergency organizations, as noted by Liu, Wang, and Zhang (2022). Emergency rescue readiness and real-world combat capabilities would be greatly increased by pooling training sites, combining emergency simulations, providing rescue operations training, and implementing other strategies.

Power, Bennett, and Adams (2023) conducted a study combining systematic literature reviews and case studies from UK emergency services, highlighting the concept of interoperability as a shared technology and teamwork system built on trust, identity, goals, communication, and adaptability. They found that adopting a decentralized and flexible team structure while maintaining an interoperable framework enhances communication and information exchange. However, for interoperability to be truly effective, it must be deeply embedded within the organizational culture. Power et al. (2023) argue that training focused on developing trust, secure team identity, and cohesive goals is essential for achieving this integration. This can be effectively realized through consistent high-fidelity simulation-based training that addresses these principles within a psychologically safe learning environment.

Countries such as Japan and the United States have developed robust civil-military coordination frameworks based on successful international practices. For example, the United States' National Incident Management System (NIMS) effectively incorporates military support into federal and state emergency management processes, serving as a model for countries like Malaysia.

Theoretical Framework

Understanding the challenges and opportunities in civil-military coordination for disaster management requires exploring relevant theories. The Theory of Interorganizational Relations (IOR) provides valuable insights into the dynamics of collaboration between different

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organizations, such as civil agencies and military units, which must work together during disaster response operations. IOR Theory examines the interactions between organizations, focusing on how they establish, maintain, and manage relationships to achieve common goals (Oliver, 1990). In the context of disaster management, this theory is particularly relevant because it addresses key issues such as power dynamics, resource sharing, coordination mechanisms, and conflict resolution between civil and military entities. The key Aspects of IOR Theory in Civil-Military Coordination include, first is the power dynamics, IOR Theory highlights how power imbalances can influence the collaboration between organizations. In disaster management, military organizations often possess significant resources and logistical capabilities, which may lead to an unequal distribution of influence in decision-making processes. Civil agencies, on the other hand, may have better local knowledge and community engagement skills. Understanding these power dynamics is crucial for establishing equitable partnerships where both civil and military entities can contribute effectively.

Secondly, resource sharing. The efffective disaster response requires pooling resources, including manpower, equipment, and information. IOR Theory emphasizes the importance of resource dependency, where organizations rely on each other's resources to fulfill their objectives (Pfeffer & Salancik, 1978). In the context of civil-military coordination, successful disaster management often hinges on the ability of these organizations to share resources efficiently, overcoming potential reluctance or bureaucratic hurdles. Thirdly, The coordination Mechanisms. IOR Theory also explores the formal and informal mechanisms that organizations use to coordinate their activities. This includes joint training exercises, communication protocols, and shared command structures. In disaster management, the integration of civil and military operations requires well-defined coordination mechanisms to ensure seamless cooperation. IOR Theory can help identify which mechanisms are most effective in facilitating this integration, especially in complex, high-stress environments like disaster zones.

Next is Conflict Resolution. The cconflicts often arise in interorganizational relationships due to differences in organizational cultures, objectives, or operational procedures. IOR Theory provides a framework for understanding and resolving these conflicts, which is essential in civil-military coordination. For instance, military organizations may prioritize rapid, large-scale responses, while civil agencies may focus on community-centered approaches. IOR Theory suggests that successful collaboration depends on the ability of organizations to negotiate these differences and develop mutually acceptable strategies.

Lastly, Mutual Benefits and Reciprocity. IOR Theory posits that organizations engage in relationships when they perceive mutual benefits. In the context of disaster management, both civil and military organizations stand to gain from cooperation—military units can enhance their public image and gain valuable field experience, while civil agencies can leverage military resources for more effective disaster response. Reciprocity, where each organization contributes and benefits from the partnership, is a key element in sustaining these relationships over time.

In summary, the Theory of Interorganizational Relations (IOR) provides a comprehensive framework for analyzing the complex interactions between civil and military organizations in disaster management. By examining power dynamics, resource sharing, coordination mechanisms, conflict resolution, mutual benefits, and institutional pressures, IOR Theory offers valuable insights into how these organizations can work together more effectively.

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Understanding these dynamics is crucial for improving civil-military coordination and ultimately enhancing disaster response outcomes.

Research Methodology

This study applies a qualitative research methodology to explore the challenges involving training and simulation in civil-military collaboration during disaster response in Malaysia. The qualitative technique was chosen to acquire a deeper understanding of the experiences, perceptions, and issues that disaster management practitioners face.

Research Design and Data Collection

The data for this study were collected through primary and secondary sources, including semi-structured interviews, empirical data, and case studies from previous studies. The semi-structured interview approach was chosen because it allows for in-depth exploration of specific topics while providing the flexibility for participants to introduce new ideas and perspectives. Interviews were conducted with participants from several key disaster response agencies in the Klang Valley. These organizations were selected based on their active participation and experience with the major flood disaster in Shah Alam in December 2021. Personnel from both civil and military agencies with direct expertise in disaster response planning and execution were interviewed. While, the secondary data were sourced from documented case studies on disaster management, particularly focusing on civil-military coordination during past disaster events in Malaysia and internationally. These case studies provided a historical context and comparative analysis, allowing the study to build on existing knowledge and identify recurring themes and challenges.

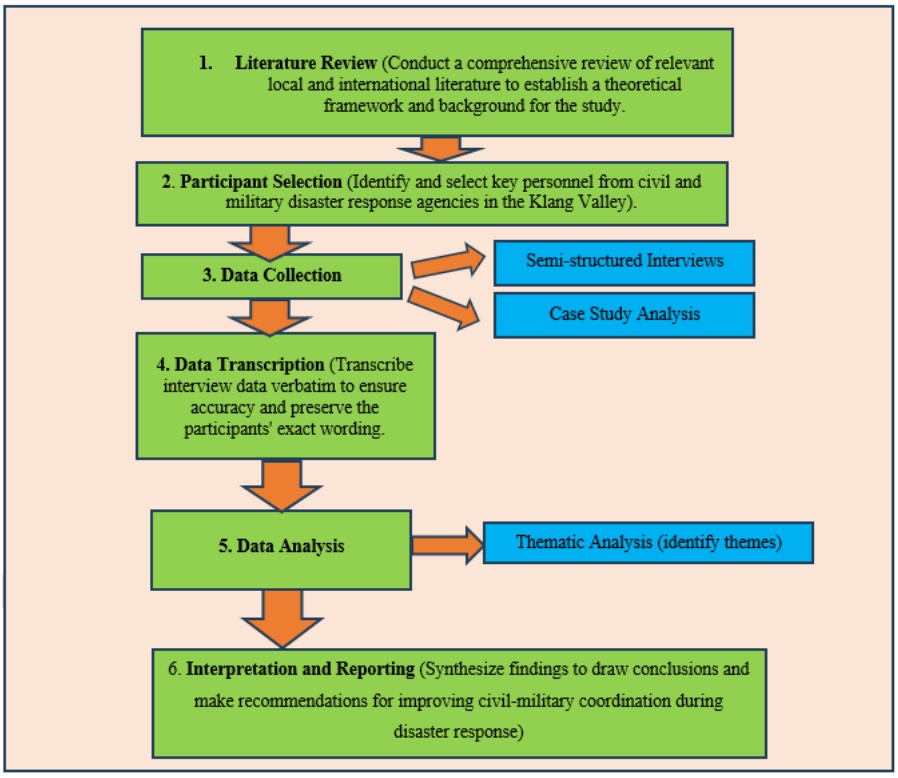

Figure 1. Flowchart of the Research Process

Illustrated by author

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Technique of Analysis

The qualitative data collected through semi-structured interviews and case studies were analyzed using thematic analysis. This technique was chosen for its ability to systematically identify, analyze, and report patterns (themes) within qualitative data, which is particularly useful for exploring complex issues such as civil-military coordination.

The first step involved thoroughly reading and re-reading the interview transcripts and case study notes to become deeply familiar with the content. Initial observations and ideas were noted during this phase. The data were then systematically coded to identify significant features relevant to the research questions. Coding was performed manually to allow for a more nuanced understanding of the data. Each segment of data was labeled with codes that described its content. After generating the initial codes, the next step was to search for patterns and group the codes into potential themes. Themes are broader patterns of meaning that capture important aspects of the data in relation to the research questions.

Next, the identified themes were reviewed to ensure they accurately represented the data. This involved refining the themes by combining, splitting, or discarding them as necessary. The aim was to ensure that each theme was distinctive and relevant to the study's objectives. Once the themes were finalized, they were defined and named. This step involved clearly articulating the essence of each theme and how it related to the research questions. The themes were then organized into a coherent narrative. The final step was to produce a detailed report of the analysis, linking the themes back to the research questions and literature. The report includes examples from the data to illustrate each theme and provides a comprehensive overview of the findings.

Case Studies

The Shah Alam Flood Incident, December 2021

In December 2021, Shah Alam, a large city in Malaysia's Selangor state, experienced one of the most significant floods in its history. This catastrophe was precipitated by an exceptionally intense monsoon season, resulting in continuous rainfall over several days. The relentless downpour overwhelmed the city's drainage systems, leading to extensive flooding in residential areas, business districts, and essential infrastructure. The magnitude of the disaster required a robust response from both civil authorities and military personnel. The Malaysian Civil Defence Force (APM) and local government entities spearheaded the civil response, which included initial assessments, evacuations, and emergency support for affected communities. Concurrently, the Malaysian Armed Forces were mobilized to assist with larger-scale operations such as rescue missions, emergency supply delivery, and flood defense reinforcement.

Lessons and Recommendations

There is a clear need for more regular and comprehensive joint training exercises that simulate urban flooding conditions. These exercises should involve all relevant civil and military authorities to ensure smooth collaboration. According to Perry and Lindell (2003), joint training exercises significantly improve interagency coordination and disaster response efficiency. Incorporating realistic scenarios into these trainings can better prepare responders for the complex dynamics of urban floods.

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Standardizing communication and data-sharing technology across all agencies can significantly enhance disaster response effectiveness. The disparity in technology use, as observed with GIRN and WhatsApp, needs to be addressed. Implementing interoperable communication systems can facilitate better coordination and information flow. A study by Kapucu (2006) highlights the importance of communication interoperability in disaster management, emphasizing that standardized systems reduce confusion and improve response times.

Developing integrated response policies and frameworks that clearly define each agency's roles and responsibilities can help reduce initial confusion and streamline operations post-disaster. Establishing clear command structures and decision-making protocols is essential for efficient disaster management. As noted by Waugh and Streib (2006), well-defined policies and interagency agreements are crucial for effective disaster response coordination.

Engaging local communities in disaster preparedness and response planning can enhance overall resilience. Providing education and training on disaster risks, evacuation procedures, and emergency response strategies ensures that residents are well-prepared to act effectively during emergencies. Research by Dynes (2006) and Shaw and Izumi (2014) supports the idea that community involvement in disaster management planning leads to more adaptive and realistic response strategies.

Result and Discussion

Training and simulation are essential elements in the preparation for disaster response. These activities equip responders not only with the necessary skills but also cultivate a culture of community and mutual support during emergencies. Previous research, including studies by Alharthi et al. (2018) and reports from the Health Crisis Centre (2016), underscore the critical role of training in helping individuals manage panic and respond effectively in crisis situations. Furthermore, simulations, as highlighted by Wahyudi (2018), are pivotal for teaching individuals to manage their reactions and assist others during emergencies.

Training plays a crucial role in disaster response by equipping responders with the necessary knowledge and skills to handle emergencies effectively (Alharthi et al., 2018). Disaster simulation exercises aim to instill the importance of mutual assistance during crises. To effectively response during emergencies, members of rescue agencies must be proficient in using all available equipment, including the Government Integrated Radio Network (GIRN). Interviews revealed that some personnel are less skilled in handling GIRN, as it is an older system that is infrequently used. Instead, WhatsApp has become the primary communication medium due to its speed and ease of information transmission. However, certain agencies rely on GIRN as their main communication tool in the absence of telephone links, using it primarily for internal purposes. The landslide incident in Batang Kali underscored the critical importance of GIRN. For three days, rescue operations were conducted without phone coverage, highlighting the necessity of robust communication systems. According to an agency representative:

"During the disaster management operation in Batang Kali, we waited for three days until the Malaysian Armed Forces installed communication satellites in the area, allowing the line to be reconnected as usual."

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This incident demonstrates the essential role of reliable communication networks like GIRN in ensuring effective coordination and response during emergencies. Therefore, it is imperative that every member of an agency involved in disaster response is proficient in operating all crucial equipment, such as the Government Integrated Radio Network (GIRN). To ensure this proficiency, periodic training sessions should be conducted at least twice a year. These courses will help refresh and reinforce the necessary skills for effectively using such equipment during emergencies, thereby enhancing overall preparedness and response capabilities. Regular training will ensure that all personnel remain adept at utilizing essential tools, enabling more coordinated and efficient disaster management operations.

Apart from that, it is vital for communities to acknowledge this and cooperate in providing support during such events. Panic is a common reaction during disasters (Health Crisis Centre, 2016), and Wahyudi (2018) emphasizes the importance of learning to manage panic through disaster simulations. These exercises help individuals not only to save themselves but also to assist others in a crisis. While disaster simulations do not guarantee survival, they represent a genuine effort to enhance disaster preparedness and resilience.

In this study, the interview sessions highlighted the importance of training and simulation as crucial factors in ensuring agency preparedness for disasters. A representative from an agency experienced in managing disasters in the Klang Valley remarked on the necessity of these measures;

"Based on the case at Taman Seri Muda, in my opinion, training is very important. The leader needs to have knowledge, needs to know the jurisdiction and know the proper flow of command. However, as a result of frequently changing leaders in several area, some of them do not know how to act during a disaster and do not know their respective jurisdictions. For me, training for leaders is also important. This is because the leader must decide accurate results in a short time. So, training is very necessary so that leaders can act wisely and effectively"

"Regular training to enhance knowledge is crucial, such as training focused on managing ship fires. This is because many members lack the expertise to manage ship fires, which are highly risky and prone to explosions"

Despite well-established frameworks, current training procedures exhibit limitations, especially in tailoring training scenarios to the inherently unpredictable nature of disasters. Both literature review and field observations indicate a pressing need for more comprehensive multi-agency simulations that reflect the complexities of real-world situations. To address these deficiencies, disaster management training programs should incorporate more elaborate simulations that encompass a wider range of disaster scenarios, particularly those that replicate the unpredictable and chaotic nature of actual emergencies. Moreover, leadership training should be extended to equip leaders with the capabilities to make effective decisions swiftly and manage their teams under stress.

Apart from that, the necessity to enhance multi-stakeholder collaborative training initiatives was also mentioned by an agency official during the interview. This is because there are agencies that only carry out training at the internal level. The statements made by the agency's representatives are quoted below;

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"In my opinion, given the situation in the Klang Valley, training is absolutely necessary. After managing a significant flood in Shah Alam in 2021, there is much that has to be addressed, particularly in terms of training conducted in conjunction with other organisations. Prior to addressing the actual incident, agency compatibility is required"
"No joint training with other agencies, our training exclusively involves ATM personnel. The National Disaster Management Agency (NADMA) only participates as an observer. For example, our flood management training includes modules on operating boats, installing rafts, and other related skills."

In synthesizing the elements explored in this research on civil-military coordination in Malaysia, it becomes clear that each aspect significantly influences the effectiveness of disaster response. In conclusion, while the existing civil-military frameworks provide a solid base for disaster management in Malaysia, there is substantial room for enhancement across various issues. By addressing the identified gaps in training, and simulations, the disaster management system can be significantly strengthened. Implementing these improvements will not only streamline disaster response efforts but also mitigate the impacts on affected communities, thereby fostering more resilient and effective disaster management practices.

In addition to the findings discussed, a document obtained from the agency provides a comprehensive list of training programs and simulation exercises established by the Disaster Management Committee of Negeri Selangor. This document, titled "Latih Amal dan Latihan Jawatankuasa Pengurusan Bencana Negeri Selangor," outlines the various training initiatives implemented after the major flood that struck Selangor in December 2021. These initiatives reflect the Selangor Government's commitment to enhancing the efficiency of disaster response. The list, shown in Figure 2, demonstrates the proactive steps taken to improve preparedness and coordination among the relevant agencies.

LATIH AMAL DAN LATIHAN JAWATANKUASA PENGURUSAN BENCANA NEGERI SELANGOR

BIL	TARIKH	DAERAH	PROGRAM	TEMPAT	ANJURAN	JUMLAH PESERTA
1	19-20 MAC 2022	HULU LANGAT	BENGKEL PENGURUSAN RISIKO BENCANA BERASASKAN KOMUNITI	DEWAN ORANG RAMAI SG. LUI, BATU 21	JBPD HULU LANGAT	35
2	25-Jun-22	HULU LANGAT	PROGRAM PENGURANGAN RISIKO BENCANA BERASASKAN KOMUNITI	DEWAN SANTIKA KG. JAWA HULU LANGAT	MERCY MALAYSIA	40
3	22 JULAI 2022	SELANGOR	PROGRAM TRAINING OF TRAINERS IN COMMUNITY BASED DISASTER RISK REDUCTION (CBDRR) PERKONGSIAN JICA-SEDAR (LATIHAN PEMIMPIN KOMUNITI DAN LOCAL CHAMPIONS DEMI PENGURANGAN RISIKO BENCANA BERASASKAN KOMUNITI	SUK	UPBN	45
4	27 JULAI 2022	SELANGOR	PROGRAM TRAINING OF TRAINERS IN COMMUNITY BASED DISASTER RISK REDUCTION (CBDRR) PERKONGSIAN JICA-SEDAR (LATIHAN PEMIMPIN KOMUNITI DAN LOCAL CHAMPIONS DEMI PENGURANGAN RISIKO BENCANA BERASASKAN KOMUNITI	SUK	UPBN	45
5	27 JULAI 2022	SELANGOR	TAKLIMAT SUSULAN KEPADA MASTER OF TRAINER PERSIAPAN UNTUK LATIHAN KOMUNITI	UNIVERSITI TEKNOLOGI MALAYSIA KUALA LUMPUR	UPBN	45
6	6 OGOS 2022	KUALA LANGAT	SIMULASI MENYELAMAT MANGSA BANJIR	LOMBONG SG. OLAK LEMPIT	MPKL	30
7	16-17 OGOS 2022	KUALA LANGAT	LATIHAN PEMANDUAN BOT	LOMBONG SG. OLAK LEMPIT	MPKL	30
8	21-26 OGOS 2022	KUALA LANGAT	KURSUS PENGENDALIAN BOT	UTM SPACE, JALAN SEMARAK & MARINA TASIK PUTRAJAYA	MPKL	30
9	24 OGOS 2022	KUALA LANGAT	LATIHAN MENYELAMAT MANGSA LEMAS DI AIR		MPKL	30
10	22-Sep-22	SEPANG	LATIHAN AMAL EX-PERISAI PATHERA KLIA 2022	KLIA	KLIA	145
11	22-23 SEPTEMBER 20202	PETALING	LATIHAN PENGURUSAN BENCANA (MENYELAMAT DI AIR)	TASIK PUCHONG UTAMA, PUCHONG	MBSJ BERSAMA JBPM	85
12	24-25 SEPTEMBER 2022	KLANG	PROGRAM COMMUNITY-BASED DISASTER RISK MANAGEMENT (CBDRM) KAMPUNG PULAU KETAM	DEWAN MAJLIS PENGURUSAN KOMUNITI KAMPUNG (MPKK) PULAU KETAM	APM DAERAH KLANG	42
13	27-28 SEPTEMBER 2022	AIR SELANGOR	PELAKSANAAN BENGKEL DAN TABLETOP EXERCISE PELAN TINDAKAN KECEMASAN (EAP) BAGI EMPANGAN SUNGAI LANGAT DAN ORS SUNGAI LABU 2022	HOTEL ARMADA, PETALING JAYA	AIR SELANGOR	36
14	28-29 SEPTEMBER 2022	SELANGOR	LATIH AMAL DAN SIMULASI BENCANA SELANGOR	SUK	UPBN	200
15	1 OKTOBER 2022	SELANGOR	PROGRAM TRAINING OF TRAINERS IN COMMUNITY BASED DISASTER RISK REDUCTION (CBDRR) PERKONGSIAN JICA-SEDAR (LATIHAN PEMIMPIN KOMUNITI DAN LOCAL CHAMPIONS DEMI PENGURANGAN RISIKO BENCANA BERASASKAN KOMUNITI HULU LANGAT	DEWAN UTAMA DEMESNE, PDT HULU LANGAT	UPBN	55
16	3 OKTOBER 2022	PETALING	KURSUS KOLABORASI DAN SIMULASI SKUAD PANTAS MBPJ BERSAMA PASUKAN SMART		MBPJ	40
17	3-4 OKTOBER 2022	GOMBAK	PROGRAM SIMULASI BENCANA DAERAH GOMBAK 2022		JPBD GOMBAK	350
18	5 OKTOBER 2022	PETALING	BENGKEL PELAN STRATEGIK OPERASI BANTUAN BENCANA	DEWAN SERBAGUNAN USJ 7	MBSJ	150

Figure 2: list of Training Programs Conducted in Selangor

Source: Angkatan Pertahanan Awam Malaysia Negeri Selangor

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The attached document titled "Latih Amal dan Latihan Jawatankuasa Pengurusan Bencana Negeri Selangor" provides a comprehensive list of training programs and simulation exercises initiated by the Selangor Disaster Management Committee. These programs were established following the major flood that hit Selangor in December 2021. The proactive efforts by the Selangor Government reflect their commitment to improving the efficiency and effectiveness of disaster response through systematic training and simulation exercises.

The Selangor Disaster Management Committee has implemented several key training programs to enhance disaster response capabilities. One significant initiative is the Community-Based Disaster Risk Reduction (CBDRR) workshops. These workshops, conducted in multiple sessions in Hulu Langat and Selangor, including a notable workshop on 19-20 March 2022 in Hulu Langat, focus on community engagement and preparedness. The workshops aim to build local capacities in disaster risk reduction by training community leaders and local champions. This approach ensures that communities are better prepared to respond to disasters, thus enhancing overall resilience. The impact of these workshops is evident in the improved community awareness and readiness, which are critical in mitigating the impacts of disasters.

Practical simulation exercises and training sessions form another basis of the disaster response enhancement strategy. These include flood rescue simulations conducted on 6 August 2022 in Kuala Langat. These practical sessions simulate real-world disaster scenarios, providing hands-on experience to responders. For example, the flood rescue simulation helps participants practice rescue operations in a controlled environment, thereby improving their skills and readiness. The impact of these simulations is significant in enhancing the practical skills of responders, ensuring they are better equipped to handle actual disaster situations effectively.

Moreover, coordination training are also vital components of the training programs. These sessions, conducted throughout 2022, include coordination exercises on 03 Oktober 2022 in Selangor. The focus is on improving coordination among “Skuad Pantas MBPJ and SMART Team that also involved in disaster response. The impact of these training sessions is seen in the improved inter-agency collaboration, reducing delays and enhancing the overall effectiveness of disaster response operations.

Lastly, specialized training programs address specific skill gaps identified during past disasters. For instance, a boat operation course was conducted from 17-21 August 2022 in Kuala Langat. These specialized programs provide targeted training to enhance specific skills needed in disaster response, such as operating rescue boats or managing ship fires. The impact of these programs is evident in the improved preparedness of responders for a variety of scenarios, ensuring they are well-equipped to manage complex disaster situations effectively. Other states can enhance their capacity for responding to disasters and ensure a more effective and efficient handling of disasters by implementing these advantages into practice. The initiatives performed by the Selangor State Government provide a useful framework for improving readiness and adaptability to disasters in various areas.

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Table 1: Summary of Main Findings from Training and Simulation in Disaster Response

Category	Key Findings
Importance of Training	- Training equips responders with essential skills and knowledge to manage emergencies effectively (Alharthi et al., 2018). - Leadership training is critical for decision-making and jurisdictional awareness. - Regular training enhances preparedness and ensures proficiency in using critical tools like GIRN.
Simulation Exercises	- Simulations are crucial for teaching responders and communities to manage panic and assist others during emergencies (Wahyudi, 2018). - More comprehensive multi-agency simulations are needed to reflect real-world complexities and the unpredictable nature of disasters.
Communication Challenges	- GIRN, while essential, is outdated and less frequently used, leading to a reliance on tools like WhatsApp for communication. - Effective disaster response requires proficiency in all communication tools, especially in scenarios where modern communication systems fail, as demonstrated during the Batang Kali landslide.
Leadership Training Needs	- Leadership training should focus on rapid decision-making and managing teams under stress, particularly in high-risk scenarios like ship fires.
Multi-Agency Coordination	- Multi-stakeholder training is necessary to improve inter-agency compatibility and collaboration during disasters. - Current training often remains within single agencies, limiting the effectiveness of joint response efforts.
Improvement Areas	- Identified gaps in current training procedures, particularly in tailoring scenarios to the unpredictable nature of disasters. - Need for joint training initiatives to enhance collaborative disaster response across agencies.
Proactive Government Initiatives	- The "Latih Amal dan Latihan Jawatankuasa Pengurusan Bencana Negeri Selangor" document lists various proactive training and simulation exercises initiated after the major flood in Selangor, reflecting the government's commitment to improving disaster response.

Sources: Illustrated by author

Recommendations

Expand Joint Training Programs

Enhance the frequency and breadth of joint training exercises that include all relevant civil and military agencies. These programs should encompass disaster response simulations as well as workshops and seminars on disaster management best practices. Integrating lessons from past disasters into these sessions will improve preparedness and response capabilities (Thompson & Yamada, 2019; OCHA, 2018).

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In order to enhance the efficacy of these training initiatives, it is advisable to incorporate outside specialists and global partners. Interacting with international disaster response organisations and specialists might bring new perspectives and innovative techniques that might not be accessible locally. Through international cooperation, Malaysian authorities may be able to expand their expertise and capacities by taking part in international disaster response exercises.

Furthermore, adding modern technologies like augmented reality (AR) and virtual reality (VR) to training simulations can make learning more dynamic and engaging. Responders may develop their abilities in a realistic and secure setting by using these high-fidelity disaster simulation tools (Harrell et al., 2013; Kumar & Singh, 2019).

Establishing a continual feedback loop in which the results of training activities are methodically assessed and applied to improve subsequent training initiatives is also critical. It should be regular procedure to conduct after-action reviews and discussions to make sure that all lessons learnt are recorded and applied to later training cycles. All participating agencies' preparedness and response capacities are continuously enhanced by this iterative process.

Comprehensive Training Programs for Leaders

Leaders in civil and military entities need to get extensive training programmes specifically designed to improve the efficacy of disaster response operations. Strategic planning, good communication, and making decisions under pressure should all be prioritised in leadership development programmes. Leaders need to be able to quickly evaluate the circumstances and make well-informed decisions that have a big influence on how disaster response operations turn out. Besides that, leaders can gain a lot from incorporating scenario-based training exercises that simulate actual disasters. To assist leaders in practicing remaining composed and efficiently leading their teams under pressure, these simulations must to incorporate high-stress scenarios. Furthermore, seminars on crisis management best practices—which encompass learning from past incidents—can boost leaders' readiness and offer insightful information.

Civil and military institutions should collaborate and understand one another in a collaborative culture that is fostered by leadership training. Leaders can improve their awareness of one another's roles, duties, and operational cultures by taking part in joint training sessions. This understanding is essential for effective coordination in real-world disaster situations.

It's also crucial for professionals to continue learning. It should be possible for leaders to continue their education so they can remain current on the newest approaches and tools for disaster management. Promoting involvement in international conferences and forums for disaster response can expose people to innovative approaches and best practices from around the world.

Develop Community-Based Disaster Management Plans

Involve local communities in disaster preparedness and response planning by providing comprehensive education and training on disaster risks, evacuation procedures, and emergency response strategies. This method significantly enhances community resilience by ensuring that residents are well-prepared and capable of effective response actions. Collaboration with local authorities is essential to develop community-based disaster management plans, which should then be integrated into national disaster response strategies. This collaborative approach not only empowers communities but also aligns local initiatives with broader national objectives,

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ensuring a cohesive and effective disaster response framework (Shaw & Izumi, 2014; Abdul Ghani et al., 2018).

Furthermore, research has shown that involving communities in disaster management planning increases the effectiveness of response efforts. For instance, Palttala et al. (2012) emphasize the importance of community engagement in creating adaptive and realistic response strategies. Similarly, Dynes (2006) highlights that communities with a strong understanding of local risks and response mechanisms are better equipped to handle emergencies, reducing the overall impact of disasters. By adopting these strategies, disaster response frameworks can be significantly strengthened, leading to better-prepared communities and more efficient management of future disasters.

Ensure Adequate Funding and Resources

Secure sufficient funding and resources to support the development and implementation of advanced training programs, simulation technologies, and operational tools. Collaboration between the government and private sector is essential to supplement these resources and ensure the sustainability of disaster management initiatives. Adequate funding enables the acquisition of state-of-the-art simulation technologies such as virtual reality (VR) and augmented reality (AR), which enhance the realism and effectiveness of training exercises. These technologies are critical for preparing responders for complex disaster scenarios, as they provide immersive and interactive environments that closely mimic real-life situations (Harrell et al., 2013; Kumar & Singh, 2019).

Additionally, the development of comprehensive training programs requires investment in skilled trainers, curriculum development, and continuous improvement based on feedback and evolving best practices. Research has shown that well-funded and regularly updated training programs significantly improve the preparedness and response capabilities of disaster management personnel (Waugh & Streib, 2006; Dynes, 2006).

Conclusion

This study aimed to explore the critical components of civil-military coordination in disaster management within Malaysia, with a specific focus on joint training and simulation exercises. The research has successfully met its objectives by identifying key areas where improvements can be made to enhance the effectiveness of disaster response operations in the country. Through a detailed analysis of the Shah Alam flood incident and other case studies, the study has highlighted the necessity of comprehensive and integrated training programs that bridge the gaps between civil and military agencies.

The study underscores the importance of fostering mutual understanding and operational coherence between civilian and military units through joint training exercises. The integration of advanced simulation tools, such as virtual reality (VR) and augmented reality (AR), has been identified as essential in creating realistic disaster scenarios that can significantly enhance the preparedness and response capabilities of all involved agencies. The findings affirm that these objectives have been achieved, providing valuable insights into how Malaysia's disaster management framework can be strengthened.

Limitations of the Study

While this research provides important findings, it is not without its limitations. One of the primary limitations is the reliance on qualitative data from a limited number of interviews and

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case studies. Although these sources provide in-depth insights, the findings may not fully represent the broader spectrum of challenges faced across different regions and types of disasters. Additionally, the study focuses primarily on the Klang Valley region, which may limit the generalizability of the results to other areas of Malaysia with different geographical and socio-political contexts.

Another limitation is the availability of recent secondary data, particularly regarding the effectiveness of newly implemented training programs. The rapidly changing nature of disaster management practices means that some of the data used may not reflect the most current practices or technologies. Lastly, the study does not extensively explore the perspectives of non-governmental organizations (NGOs) and local communities, which are crucial stakeholders in disaster response.

Future Research Directions

Future research could address these limitations by incorporating a more diverse and larger sample of interviews, covering a wider range of regions and types of disasters. Quantitative approaches could also be employed to complement the qualitative findings and provide a more comprehensive understanding of the issues. Additionally, future studies should explore the role of NGOs, local communities, and private sector involvement in disaster management, as these entities play a significant role in on-the-ground response efforts.

Furthermore, research should focus on evaluating the long-term effectiveness of integrated training programs and advanced simulation technologies like VR and AR in real-world disaster scenarios. This could include longitudinal studies that track the progress and impact of these training initiatives over time. Exploring the potential for international collaboration and knowledge exchange in disaster management could also provide valuable insights for enhancing Malaysia's disaster response framework.

In conclusion, the study emphasizes the critical importance of continuous improvement, collaboration, and innovation in Malaysia's disaster management practices. By addressing the identified gaps in training, communication, and policy frameworks, and by implementing the recommendations provided, Malaysia can build a more resilient and effective disaster response system. This research offers valuable guidance for policymakers, disaster management professionals, and military planners, contributing to the development of a robust and responsive crisis management strategy for the country.

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