

# From Challenges to Solutions: Stakeholder Roles in Disaster Relief Operations

Regina Lambin<sup>1\*</sup>, Raja Zuraidah Rasi<sup>1</sup>, Umol Syamsyul Rakiman<sup>2</sup>, MP Roslin MD Sharif<sup>3</sup>

<sup>1</sup>Universiti Tun Hussein Onn Malaysia, Batu Pahat, Malaysia

<sup>2</sup>Universiti Teknologi MARA, Tapah, Malaysia

<sup>3</sup>Padu Citra Resources, Tanjung Malim, Malaysia

\*Corresponding Author

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## ABSTRACT

Disaster relief operations (DROs) in Malaysia require the coordinated efforts of various stakeholders to mitigate impacts and enhance community resilience. However, communication barriers, lack of coordination, and shortage of resources often present challenges that can hinder the efficiency and effectiveness of relief efforts. Thus, this study aimed to gain an in-depth understanding of how key stakeholders in Malaysia navigate inter-organizational difficulties during DROs. Specifically, the objective was to identify the key challenges faced and explore initiatives implemented by stakeholders to navigate these challenges to strengthen relief operations. To address these objectives, in-depth interviews were conducted with seven experienced DRO stakeholders across three disaster-prone states in Malaysia: Pahang, Selangor, and Kelantan. Data collection involved using notebooks, video recorders, and voice recorders, and the transcribed data was analyzed using Atlas.ti software for thematic analysis. The analysis revealed four main themes: communication, coordination, manpower, and equipment. The stakeholders proactively strengthened relief operations by creating training programs for disaster response teams, providing comprehensive disaster-related information to the community, developing a sensor-based early warning system, and launching a community engagement program called *Kampung Siaga 221* to raise disaster awareness. These initiatives reflect a strategic approach aimed at building more resilient communities, ultimately reducing challenges faced during DROs. The findings of this study contribute to the existing literature on stakeholder involvement in disaster management and offer valuable insights that can inform the development of more coordinated and holistic strategies for DROs in Malaysia. Future research could examine the long-term impact and scalability of these initiatives to other regions, as well as investigate the perspectives of disaster-affected communities to further improve DROs.

**Keywords:** Disaster Relief Operations, Disaster, Stakeholders, *Kampung Siaga 221*

## INTRODUCTION

Disasters, whether natural or man-made, inevitably impact communities and nations worldwide. These sudden-onset events (National Security Council (NSC), 2016) often exceed governmental response capabilities (ten Have, 2018) and the community's capability to cope using its resources (Zakaria et al., 2022). Even well-prepared countries like Malaysia face significant challenges from these unforeseen emergencies. Malaysia, located in Southeast Asia, is no exception, experiencing heavy rainfall annually,

especially from October to February. This season is due to heavy rain during these months (Majid et al., 2020), leading Malaysia to suffer from earthquakes, landslides, floods, and droughts across the country (Hawa et al., 2023). Among these disasters, floods are the most catastrophic natural calamity, regardless of their severity (Abdullah et al., 2022). When floods exceed the community's coping capacity, they destroy life and property (Zakaria et al., 2022). As these events result in massive destruction and a considerable loss of life (Krichen et al., 2024), there is an urgent need for effective DROs.

These operations are crucial to addressing immediate needs and restoring normalcy after natural disasters. However, Malaysia's DROs face numerous challenges (Sharifi-Sedeh et al., 2020) that necessitate effective stakeholder collaboration. A study by Elkady et al. (2023) emphasizes that embracing holistic strategies and promoting stakeholder cooperation is essential to mitigate risks and foster the development of adaptive, resilient communities. By working together, stakeholders can pool resources, expertise, and manpower, enabling them to address challenges in DROs more effectively. Understanding the roles of various stakeholders in these operations is essential for ensuring a coordinated and efficient response. This study explores how stakeholders address the challenges encountered by DROs in Malaysia and answers the following research questions: How do stakeholders deal with the challenges of DROs in Malaysia?

## LITERATURE REVIEW

### Disaster Management in Malaysia

Disaster management strategies have been developed and implemented to mitigate catastrophic events' devastating impacts and prevent further harm to the economy and infrastructure (Illias et al., 2021), which requires effective management strategies to mitigate impacts. Effective management means providing a tool for emergency response units to reach a disaster area at the right time, supported by appropriate information (Baharin et al., 2009). This process encompasses emergency planning, response coordination, and recovery support. While public perception and aid organizations primarily focus on post-disaster response activities such as search, rescue, and relief operations (Bush, 2015; Croco, 2014), disaster management is a crucial governmental responsibility with various challenges to fulfil (Lee, 2019)

The disaster management structure in Malaysia is outlined in the National Security Council Directive No. 20, enacted in 1997. This directive outlines the policies, roles, and responsibilities of various stakeholders involved in disaster management (Chong & Kamarudin, 2018) based on the Disaster Management Cycle (DMC) established by the Federal Emergency Management Agency (FEMA) in 2010. The directive is a Standard Operational Procedure (SOP) or policy framework (Rahman, 2018; 2012) for responsible parties, including government and non-government bodies (Norizan et al., 2021), thereby ensuring clear guidelines on their responsibilities and response capabilities in the face of disasters (Ridzuan et al., 2022).

The National Disaster Management Agency (NADMA) was established to execute this directive (Abdullah et al., 2022), managing all aspects of disaster risk management in Malaysia (CFE-DM, 2022). These include preparedness initiatives, SAR operations, and relief efforts (Rahman, 2018). According to Khairilmizal et al. (2016), the NSC Directive No. 20 was developed to prepare the Malaysian community for disasters. It supervises the country's disaster management system and ensures adequate relief equipment is available during a flood disaster (Khalid & Shafiai, 2015). In addition, the directive establishes a framework for disaster management measures, encompassing all forms of natural disasters ((National Security Council, 2011). Additionally, the government formed the Natural Disaster Management and Relief Committee (DMRC) (Table 1) to develop an integrated national disaster management system (CFE-DM, 2022). This multi-tiered structure enhances coordination and information sharing among all disaster management stakeholders (Martin, 2019).

Table 1: The Responsibility of Disaster Management and Relief Committee (*Stakeholders*)

COMMITTEE	MEMBERS	RESPONSIBILITY
National Disaster Management and Relief Committee	<p>Minister of Finance</p> <ol style="list-style-type: none"> <li>1) Minister of National Unity and Community Development</li> <li>2) Chief Secretary of State</li> <li>3) Commander of the Armed Forces</li> <li>4) General Director of Police Department</li> <li>5) General Director of Health</li> <li>6) General Director of the National Security Division</li> <li>7) General Director of Fire Brigade and Rescue Malaysia</li> <li>8) General Director of Atomic Energy Licensing Board</li> <li>9) General Director of Broadcasting</li> <li>10) General Director of Information</li> <li>11) General Director of Transportation Department</li> <li>12) General Director of Public Work Department</li> <li>13) General Director of the Environmental Department</li> <li>14) General Director of the Social Welfare Department</li> <li>15) General Director of Working and Health Security Department</li> </ol>	<ol style="list-style-type: none"> <li>1) To formulate policy and frame the national disaster management strategy.</li> <li>2) The policy and directives for managing a disaster are determined following the decided procedures and active plans.</li> <li>3) Ask all agencies to present reports on the preventive steps to reduce the impact of the disaster.</li> <li>4) Coordinate the Disaster Management and Relief requirements, such as deciding on logistic assistance and requisitioning tools and machinery temporarily owned by government agencies or private sectors.</li> <li>5) To get expert assistance from the local authorities or foreign countries to help in managing a disaster.</li> <li>6) To form an investigator committee, if necessary.</li> <li>7) To ensure that search and rescue exercises are carried out from time to time by the relevant agencies.</li> <li>8) The Operation Commander must succeed in the search and rescue function on the scene to offer all assistance.</li> <li>9) To form a National Disaster Operation Centre concerning Disaster Level III.</li> <li>10) To determine comprehensive relief, such as welfare, health, shelter, and security for the victims and rescuers, including rehabilitation.</li> <li>11) To form working committees, such as committees of welfare, transport, finance, etc., where applicable so that the disaster management process runs smoothly.</li> </ol>

	<p>16) General Director of Meteorology Service Department</p> <p>17) General Director of the Civil Aviation Department</p> <p>18) General Director of the Geology Research Department</p> <p>19) General Director of Irrigation and Drainage</p> <p>a. Representative of General Solicitor</p> <p>b. Budget Director for the Ministry of Finance</p> <p>c. General Director of RELA</p> <p>Also, Present Other Concerning Officer.</p> <p>Secretary: Director of Crisis and Disaster Management Unit, National Security Division (BKN) Prime Minister Department.</p>	<p>12) To form a data bank on tools, equipment, and a list of expertise or skills needed at the national level in disaster management.</p> <p>13) To set and carry out a ‘post-mortem after a disaster and bring out recommendations or proposals to overcome the weaknesses identified from the post-mortem.</p> <p>14) To arrange a coordinated training programme for the rescuers with a full spirit of consolidation and unity to attain the skill level needed in a disaster.</p> <p>15) To formulate an educational and early preventive programme for the public to avoid facing a disaster.</p> <p>16) To ensure relevant agencies take steps to prevent, control, and smoothly and effectively implement training or education programmes.</p> <p>17) Review the existing policy, directive, strategy, and procedure occasionally to strengthen the National Disaster Management.</p> <p>18) To prepare a report on disaster management and control from the past disaster covering all aspects of search and rescue operations and emergency relief and rehabilitation offered to the victims.</p>
<p>State Disaster Management and Relief Committee</p>	<p>State Police Officer Chief</p> <p>1) Brigade Commander (ATM)</p> <p>2) Director of State Fire and Rescue Department.</p> <p>3) Director of State Health Department.</p> <p>4) Director of State Public Works Department.</p> <p>5) Director of State Social Welfare Department.</p>	<p>1) To implement the policy and strategy of National Disaster Management in handling any disaster at the state level.</p> <p>2) Coordinate all disaster management and relief needs, such as deciding on logistical assistance and requisitioning tools and machinery temporarily owned by government agencies and private sectors.</p> <p>3) To provide facilities and necessities to victims and rescuers, including food, medical treatment, evacuating, and other emergency assistance.</p>

<p>6) Director of State Information Department.</p> <p>7) Director of State Broadcasting Department.</p> <p>8) Director of State Civil Defense Department.</p> <p>9) Director of State Environment Department.</p> <p>10) Director of State Workers Security and Health Department.</p> <p>11) Director of State Meteorology Department.</p> <p>12) Director of Civil Aviation Department.</p> <p>13) Director of State Irrigation and Drainage Department.</p> <p>14) Director of State Geological Survey Department.</p> <p>15) Director of Transport Department.</p> <p>16) Director of Malaysian People Voluntary Alliance (RELA).</p> <p>17) Manager of State STMB (Malaysia National Telecommunication Agency).</p> <p>18) Manager of State TNB (Malaysia Electrical Power Agency).</p> <p>Also Present: Other relevant officers.</p> <p>Secretary: Director of National Security State Division (BKN).</p> <p>(For the Federal Territory of Kuala Lumpur, the Mayor is appointed as Chairman, while for the Federal Territory of Labuan, the Director of Labuan Administration is the Chairman).</p>	<p>4) To activate the State Disaster Operation Controlling Centre (PKOB) if there is any level II disaster.</p> <p>5) To form a working committee, if necessary, so that the work of handling the disaster by the Welfare Committee, Transportation Committee etc., could be done smoothly.</p> <p>6) To form a data bank on tolls, equipment and a list of skills at the State Level needed in disaster management.</p> <p>7) To form a system of announcements and warnings for public information.</p> <p>8) To prepare exercises involving the state and district-level agencies from time to time.</p> <p>9) To organize research and collect information on the potentiality and risk of a disaster in the state or district.</p> <p>10) To formulate and operate a ‘post-mortem after every disaster covering all aspects, such as the incident’s origin and effect, conclusion and recommendation to overcome any weaknesses identified.</p> <p>11) To ask those relevant agencies to bring forward their reports on the preventive steps taken to avoid or minimize the impact of the disaster.</p> <p>12) To ensure that actions taken by the relevant agencies at the state level regarding preventing, controlling, and providing education and exercise programmes run smoothly and effectively.</p> <p>13) To prepare reports on disaster management and control, including all aspects of search and rescue operations, emergency assistance and rehabilitation given to the victims.</p>
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<p>District Disaster Management and Relief Committee</p>	<p>Chief of District Police Officer</p> <ol style="list-style-type: none"> <li>1) District Fire and Rescue Officer</li> <li>2) District Health Officer</li> <li>3) District Engineer, Public Works Department.</li> <li>4) Representative from Malaysian Armed Forces (ATM).</li> <li>5) District Council Secretary.</li> <li>6) District Social Welfare Officer.</li> <li>7) Officer of District Civil Defense Corporation.</li> <li>8) District Information Officer.</li> <li>9) District Engineer, Irrigation and Drainage Department.</li> <li>10) District RELA Officer.</li> <li>11) District TNB Officer.</li> <li>12) District STMB Officer.</li> </ol> <p>Also present: Other related officers.</p> <p>Secretary: Assistant Director, National Security Division (BKN), District.</p> <p>Note: Any district without a National Security Division Assistant Director or assistant District Officer (Security) will take over the place.</p>	<ol style="list-style-type: none"> <li>1) To coordinate Disaster Management and Relief Necessities, such as arranging the logistic support and requisition of equipment and machinery needed temporarily from government agencies or private sectors</li> <li>2) To activate the District Disaster Operation Controlling Centre (PKOB) whenever a level I disaster occur</li> <li>3) To fix the distribution of works for relevant agencies at the Disaster Operation Controlling Centre (PKOB).</li> <li>4) To identify and form evacuation centres and front posts.</li> <li>5) To provide necessities and facilities, including shelters, food, clothes and medical treatment to the victims and rescuers.</li> <li>6) To ensure that search and rescue operation is done smoothly and effectively.</li> <li>7) To simplify all communications in disaster management, a communication system will be created between PKTK and PKOB and with State PKOB.</li> <li>8) To form working committees wherever necessary to help with the disaster management operation, such as a Welfare Committee, Transportation Committee, Financial Committee, etc</li> <li>9) To form a sub-committee, if necessary, at <i>Mukim</i>, village, residents' association or Rukun Tetangga (neighbourhood) level to assist with the work of disaster management on the scene</li> <li>10) To create a data bank on tools, equipment and a list of skills in disaster management at the District Level.</li> <li>11) To decide and carry on a 'post-mortem' after any disaster and to bring forward recommendations in overcoming any weaknesses identified.</li> </ol>
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		<p>12) Conduct research and collect information on any disaster potentiality and risk in the district.</p> <p>13) To ask those relevant agencies to submit their reports on preventive steps to avoid or minimize disaster impacts.</p> <p>14) To prepare disaster management and control reports covering all aspects of search and rescue and emergency assistance and rehabilitation offered to the victims.</p>
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Source. National Security Council (NSC) (1998)

At the core of this system is the National Disaster Control Center (NDCC), which plays a crucial role in managing the flow of information from various stakeholders during disaster strikes. The NDCC receives information and inputs from technical agencies, including the Department of Irrigation and Drainage (JPS), the Department of Environment (JAS), the Public Works Department (JKR), and the Malaysian Meteorological Department (MMD). This information is distributed to the NADMA and other relevant stakeholders, including SMART or Responder Agencies, NGOs, and volunteers (Che Hamid et al., 2019). This coordinated information sharing enables a comprehensive and efficient disaster response. The coordinated involvement of these key stakeholders is crucial for effective disaster management in Malaysia. Through continued collaboration and refinement of roles, the country can build a resilient disaster management framework that minimizes suffering and speeds the restoration of normalcy following catastrophic events.

### The Challenges of Disaster Relief Operations

Disaster Relief Operations (DROs) are crucial coordinated efforts to provide immediate and long-term support to disaster survivors and affected communities (Lambin et al., 2024; Tomasini & Van Wassenhove, 2009). These operations encompass a broad spectrum of activities, including the cost-effective mobilization of relief aid and lifesaving services for victims (Anjomshoe, 2019). Effective planning and scheduling of these operations are critical to saving lives and minimizing disaster damage. As Zheng et al. (2015) highlight, DROs involve many tasks, such as establishing emergency facilities, searching for and rescuing survivors, providing health and medical assistance, distributing relief supplies, transferring injuries, scheduling rescue forces, and coordinating these activities across organizations. Likewise, Owusu-Kwateng et al. (2017) emphasize the importance of coordination and efficient inventory management during disasters. They argue that ensuring prompt and effective delivery of relied-on items can be life and death for those trapped in a disastrous situation. A well-defined recovery plan, an efficient management system, and a competent team are imperative to achieve the desired results. However, despite the importance of these elements, it is worth noting that in Malaysia, current DROs have yet to be fully planned and implemented.

Malaysia's DROs face numerous challenges (Sharifi-Sedeh et al., 2020), highlighting weaknesses within its disaster management system. One of the major issues is the lack of multidisciplinary approaches in disaster management (Gillani et al. (2021), leading to a disproportionate proportion of top-down and bottom-up approaches (Chong & Kamaruddin, 2018). Furthermore, flood management authorities lack mutually agreeable cooperation (Zakaria et al., 2022), leading to a bias in flood disaster management (Tahir et al., 2021). This lack of coordination in executing disaster management (Muzamil et al., 2022) is further executed by the absence of a particular mechanism or tools to coordinate all non-governmental

organizations (NGOs) and their capacities (Mohd et al., 2018),

This lack of coordination confuses organisations due to overlapping roles in disaster management and hampers identifying areas of need and allocating resources (Wong et al., 2020). Additionally, ineffective communication tools to distribute disaster information can lead to repeated false information and impair emergency response (Ab Malik et al., 2020). Moreover, relief operations often face challenges due to insufficient rescue personnel and equipment (Wong et al., 2020), resulting in unavoidable challenges such as route accessibility and delays in humanitarian aid delivery (Zain et al., 2021). The lack of assets like boats and helicopters further exacerbates these challenges, consequently insufficient food supplies (Yazid et al., 2017) and a lack of immediate supplies of essential needs for the victims (Khuzzan et al., 2017).

Therefore, effective disaster relief strategies are critical to ensuring disaster management’s preparedness and mitigation potential. Tomasini and Van Wassenhove (2009) state that disaster management is a critical factor that drives relief operations’ success. Long-range planning, policies, and mechanisms are required to integrate flood management in Malaysia (Zawawi et al., 2018) and ensure that DROs are coordinated and managed efficiently to save lives. Ultimately, appropriate and adequate DROS is required to respond to and tackle catastrophes, as it is a critical factor in saving lives and mitigating the effects of disasters.

## RESEARCH METHODOLOGY

The study focused on the roles of stakeholders in the flood-prone states (Figure 1) of Pahang, Johor, and Kelantan. It employed a qualitative methodology to gain a deeper understanding of the complexity of DROs. In-depth interviews were conducted with seven informants, all aged 30 or above, who knew disaster management and had experience in DROs. The informants (Table 2) represented the stakeholders in non-government organizations (NGOs), academia, medical teams, relief agencies, and volunteers and were selected to provide a comprehensive overview of response performance.

Figure 1: Map of the research areas

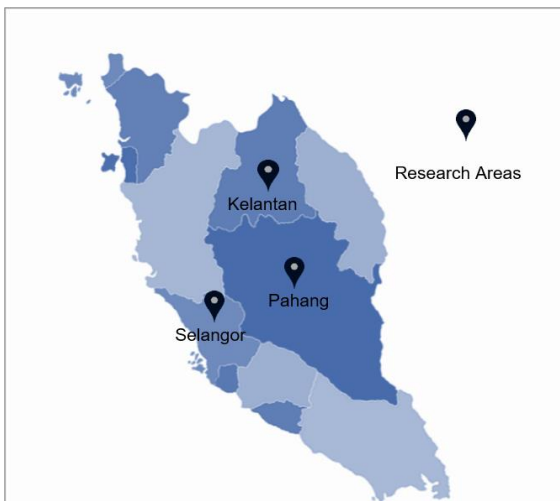


Table 2: Characteristics of informants

Informants	Stakeholder	Gender	Year of Experiences	Age group	Highest level of education
Informant 1	Volunteer	Male	>10	30-39	Degree
Informant 2	NGO	Male	>9	30-39	Degree
Informant 3	Volunteer	Male	>10	50-59	Degree
Informant 4	Academia	Female	>6	30-39	PhD



Informant 5	Academia	Male	>20	50-59	PhD
Informant 6	Medical	Male	>5	30-39	Degree
Informant 7	Relief agency	Male	>11	50-59	Degree

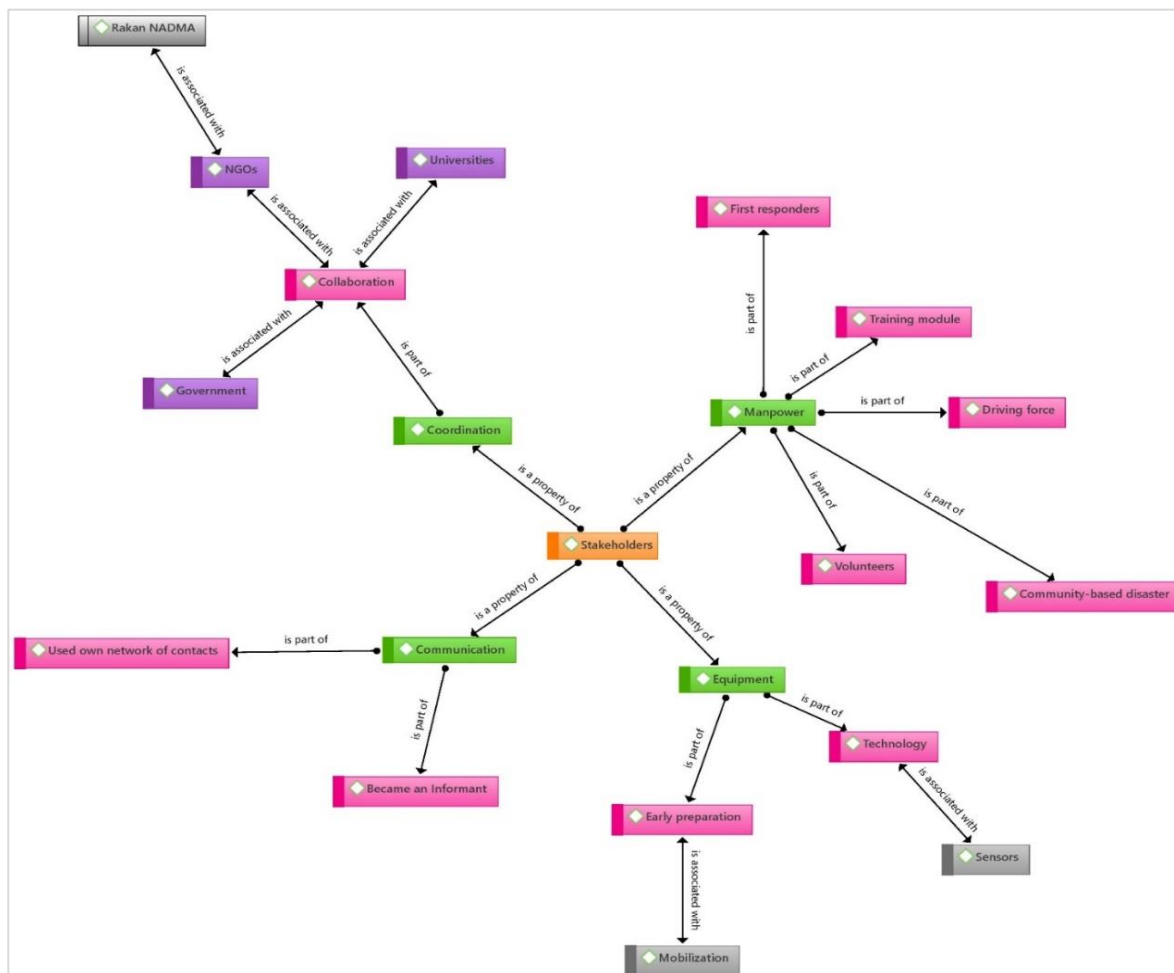
The interviewee selection process used the snowballing technique, where each subsequent informant was known to the previous informant (Cooper & Schindler, 1998). To build trust with the informants, the research team provided an introductory briefing explaining the study’s purpose, the importance of their participation, and the confidentiality of the information they provided (Lambin et al., 2018). The team also reassured the informants that their participation was voluntary and would not be used against them.

Data from the interview were recorded in a notebook, video, or voice recording device as field notes and transcribed later for analysis. The transcribed data were then analyzed and interpreted using thematic analysis (Boyatzis, 1998) and computer-assisted qualitative data analysis (CAQDAS) software, such as Atlas.ti. This software facilitates data, sorting, organizing, interpreting, identifying concepts, and categorizing, making the analysis process more accessible (Lewins (2015).

## RESULTS AND DISCUSSIONS

The research aimed to understand how the stakeholders used strategies to deal with the challenges faced during DROs. This research has identified the critical roles of stakeholders in DROs based on themes derived from interview sessions. The findings indicate that stakeholders have taken significant measures to reduce disaster impact of disasters, as shown in Figure 2.

Figure 2: Themes map of the stakeholders ‘s role in dealing with the challenges of DROs



## The roles of Stakeholders in DROs

### Overcoming Communication Barriers

Effective communication is critical in disaster management, particularly during DROs. When disaster strikes, it is crucial to maintain clear and effective communication with those affected, relief organizations, emergency responders, and other stakeholders. Any lapse in communication can hinder disaster response efforts and potentially lead to disastrous consequences. This research underscores the significant roles that different stakeholders play in addressing communication challenges in DROs. For instance, informant 1 and his team serve as vital links for the stakeholders involved, providing timely and accurate information that facilitates coordination and effective communication between them. They are associated with the Malaysia Relief Agency (MRA), a leading agency registered to prevent misunderstandings and misinformation about DROs, thereby keeping all stakeholders informed and updated. As informant 1 explains:

*“We will use the boat to reach the isolated places... Once there, we will inform other NGOs about the places that need help, for instance, where areas need help and how many are there... I serve as an informant at the Malaysia Relief Agency (MRA)... so when other NGOs want to enter, they will inform me...”* [Informant 1: S5/L63-65]

Similarly, informant 3 leverages his communication skills to work with government officials, community organizations, and other humanitarian organizations during DROs. His goal is to ensure that victims receive the most effective assistance possible. By utilizing his network of contacts, he can circumvent potential constraints, ensuring prompt delivery of necessary aid. He stated:

*“I communicate with many people, so it is not an issue...Even during the flood, I sought help from the Maghfirah Foundation, an NGO...”* [Informant 3: S2/L462-464]

Effective DROs rely on the ability to address communication barriers. This involves exchanging high-quality knowledge (Diem Le et al., 2021), which aids partners in planning, problem-solving, and decision-making (Kankam et al., 2023). The fostering of robust communication skills and information-sharing among stakeholders is critical to enhancing the efficiency and coordination of DROs. This, in turn, makes them more responsive to the needs of communities affected by disasters. Kapur et al. (2016) highlight that effective communication forms a vital link connecting first responders, support systems, and family members with the communities and individuals amid the disaster. Therefore, continuous improvement and adaptation of communication strategies are essential to ensure the most effective disaster response.

### Navigating Shortage of Manpower

Manpower is a crucial element in DROs. A lack of manpower can delay rescue operations and aid distribution to disaster victims. Moreover, a skilled workforce is critical for conducting efficient DROs. Despite the inevitable challenges in any DRO, each stakeholder has a unique approach to dealing with these challenges. This research interviewed stakeholders about their strategies for addressing these challenges. Informant 7, for instance, revealed that their agency has implemented several initiatives to deal with disasters, especially in DROs. They have customized a training module in their academy to produce skilled members. This ensures that the teams have the necessary skills and knowledge to respond effectively and swiftly to disasters. The module was tailored to ensure that the teams understood the roles and responsibilities of each member, as well as how to handle different emergencies. The teams also underwent physical training, such as strength and endurance drills, to ensure they were physically prepared to respond to any disaster. As informant 7 explains:

*“We costumed a module...which means everything is in there...2 hours of medic training, 2 hours of rescue training, and 2 hours of underwater training... Usually, if it’s professional level or above, he will take the 2-hour course... For the executor, they are a bit specific; they don’t need the 2-hour course; maybe they only spend a week with medic training as such...Those who are chief supervisors only want to know the basics because they only want to supervise, not do the work...” [Informant 7: S5/L283-289]*

Aside from training the team members, informant 7 also conducts community-based disaster training for the local community. This training enhances response and minimizes the risk or prevents the occurrence of challenges during DROs. The training was conducted in every village and involved all village headmen, including the chieftain. Informant 7 stated that the community-based disaster focused on the local community in disaster areas. The identified areas were classified as *Kampung Siaga 221*. In *Kampung Siaga 221*, the local community receives comprehensive information on preparing for and coping with disasters. This information includes guidance on how to build more resilient communities, as well as practical advice on disaster risk reduction strategies. As Informant 7 explains:

*“We called this Community-Based Disaster Risk Management (CBDRM) a kampung Siaga 221...we started last year... we wanted to tackle each state... one area of each parliament was made into a kampung Siaga 221. like last year we went to...Papar in Sabah... that village is indeed an area that always floods... so we implemented CBRM... where the villager has to prepare themselves to face the disaster...” [Informant 7: S5/L220-228]*

The research findings also found that other stakeholders, such as Informant 2 and Informant 1, had their own approaches to dealing with inadequate manpower. This ensured that limited personnel were utilized effectively during DROs. Informant 2 represented the artist’s friends on set then. While the drama was being filmed, they tried to set a time when everyone was free and unoccupied. They volunteered to help with the relief operations. This approach enabled the NGO to take advantage of the fact that the crew was already present and available and that no additional personnel had to be hired. It also allowed the artist’s friends to contribute to disaster relief, which was essential to them.

Similarly, Informant 1 was a driving force for Southern volunteers through training and volunteering. He trained both volunteers and disaster victims on basic rescue or disaster knowledge. The training aimed to educate volunteers and victims about emergencies and become first responders to provide valuable assistance to the needy until disaster relief teams arrived on the scene. They did a lot of Training of Trainers (TOT) and provided essential rescue services for affected victims. The TOT program was designed to help volunteers gain skills and knowledge in disaster response. By doing so, volunteers gained knowledge and skills to respond to disasters effectively. As Informant 1 explains:

*“We are the driving force of the Southern Volunteers...through training and volunteering... we did a lot of Training of Trainers (TOT) and provided basic rescue to certain victims...we gave training to volunteerism. Now, they were aware (of disaster) ...” [Informant 1: S5/L348-351]*

On the other hand, this research found that the community often plays a crucial role in DROs. They are frequently the first to arrive at an emergency or disaster scene and deliver essential aid. Moreover, they are trained to save themselves in a disaster, which helps resolve the challenges of insufficient manpower in those areas and develops the capacity and competence of local rescuers during DROs. According to informant 4, local leaders play a significant role in preparing their communities for disasters. For instance, the village head conducted a drill on how to rescue people in the village. This drill allowed the villagers to become familiar with the necessary equipment and techniques, gave them the confidence to respond quickly

and effectively in a disaster, and allowed them to practice their skills in a simulated setting before an emergency, making them better prepared to handle the situation. As Informant 4 explains:

*“In the village I went to, the head of the village did a drill on how to rescue people... if someone fell into the river, he called the firefighters...”* [Informant 4: S3/L255-258]

In summary, having well-trained and skilled manpower, either volunteers or victims, can alleviate manpower shortages during DROs (DROs). Therefore, it is essential to understand the level of knowledge, attitudes, and preparedness of the people who experience disasters (Hariyanto et al., 2022). Furthermore, local communities must have first-hand knowledge of the hazards and vulnerabilities they face while waiting for the arrival of rescue teams. According to Purba et al. (2022), communities need to be involved in disaster mitigation either before a disaster, during a disaster, or after a disaster occurs because they are the ones who experience it and suffer from the impact of the disaster. This way, inadequate manpower can be resolved while emergency response efforts are strengthened.

### **Resolving Coordination Inefficiencies**

When multiple stakeholders are involved in a DRO, coordinating their efforts and working together effectively can be challenging. This can lead to delays in the response, confusion, and inefficiency. DROs can be hindered without proper coordination, resulting in an ineffective response and difficulty achieving desired outcomes. This research identified that stakeholders, especially NGOs and federal parties, coordinate with government agencies to tackle the challenges encountered during DROs in coordinating and supplying aid to affected victims. Informant 6, for instance, explained that they usually help the community during disasters and established a group called Rakan National Disaster Management Agency (NADMA). This group refers to the collaborative partnership program with the NADMA. According to Informant 6:

*“Since 2016, NADMA has called all the NGOs that usually help the community during disasters, and they created a group called Rakan NADMA...There are 72 registered NGOs, so they all have their strengths...They are all registered, and each of them shares their experiences...In terms of knowledge, there are strengths: what instruments they have, what vehicles they have, and so on... Their involvement is based on their respective advantages and strengths...We work together to help disaster victims...making it easier for all parties, especially the victims...We can help the victims quickly...”* [Informant 6: S4/L359-379]

Informant 4 added that the involvement of NGOs is based on their respective advantages and strengths. By working together, NGOs can ensure that their efforts are maximized and that the needs of the most vulnerable are met. Additionally, Informant 4 stressed that NADMA, in particular, has taken several measures to cope with coordination challenges. She stated that NADMA maintained a database of all NGOs in Malaysia to request help from NGOs when needed. She stated:

*“...if there are no federal recourses, they will utilize all the states. In that case, the federal government could coordinate with Pahang and Terengganu, or Terengganu with Kelantan, etc. In the aftermath of a disaster, numerous organizations will be involved. Some will provide aid, some will deliver food, some will provide health care, and some offer logistics to evacuating the victims that must be coordinated...”* [Informant 4: S3/25-29]

In DROs, the federal government and non-governmental organizations (NGOs) in Malaysia have recognized the importance of coordination. When resources are insufficient, the federal government will cooperate with state governments, demonstrating proactive steps to ensure effective coordination. Informant 3 highlighted the collaborative efforts among different agencies to assist disaster victims. They partnered with numerous agencies to ensure victims received support and assistance. This collaboration allowed them to pool their resources and coordinate their efforts more efficiently, enhancing their ability to provide better assistance to

those in need. As Informant 3 explains:

*“So, like us at the MRA, we love collaborating with synergy partners...”* [Informant 3: S5/L635-636]

Moreover, coordination demands timely information sharing. Failure to do so would deprive the relief chain of knowledge of the disaster setting, available resources, NGO characteristics, and so forth (Wankmüller & Reiner, 2020). Therefore, coordination or collaboration among stakeholders during DROs is paramount. All efforts must be coordinated to support all affected victims. The effectiveness of any DRO depends on how well all stakeholders work together. Poor coordination can lead to wasted resources and delayed rescue of victims. Furthermore, coordination allows stakeholders to avoid duplication of effort and ensures that resources are distributed equitably.

### **Insufficient Equipment**

Lack of equipment in DROs is a serious challenge that affects victims. Without the right equipment, relief teams cannot correctly assess disaster areas and coordinate resources, leading to delays and inadequate responses. However, this research found that stakeholders managed to deal with these challenges. As equipment was limited during DROs, stakeholders benefited from digitalization to overcome the challenges. They utilized technology comprehensively by installing sensors in disaster-prone areas to detect, prevent, and respond to disasters. Informant 5 clarified that satellites, instruments, and sensors can be used to predict hot spots on highways and in residential areas:

*“...with technology, satellites, instruments, and sensors, we can predict hot spots on highways and residential areas. By placing sensors, we can make predictions. Wind flow results from an event occurring; we have placed a sensor near it to detect it. So, for example, if water rises along the stream, there is a point where we have installed a sensor...”* [ Informant 5: S3/L177-182]

In addition, some stakeholders have taken early steps to avoid equipment and machinery constraints during DROs. This is based on their experience with a lack of equipment or machinery during DROs. They used this method to overcome equipment or machinery shortages so that resources could be mobilized faster, saving lives and preventing more damage. Informant 1 explained that firefighters, police, and the Ministry of Health are on standby:

*“Such as firefighters, police, and the Ministry of Health are on standby... it means that, before the flood, they mobilized their transportation... it means they have moved to ensure traffic.... if there is an emergency...they can arrive faster...”* [Informant 1: S5/L17-20]

Dealing with DROs' lack of equipment or machinery is critical to ensuring that victims are evacuated within a reasonable timeframe. Delays in evacuating victims can lead to more casualties and suffering, so all stakeholders must have access to the necessary equipment during DROs. As such, proper planning and logistics are essential to ensuring that the necessary equipment and machinery are always available when needed.

### **CONCLUSION**

The findings of this study underscore the significant challenges faced by stakeholders in disaster relief operations (DROs) in Malaysia, particularly regarding communication, coordination, manpower, and equipment. As the research highlights, these challenges have worsened over the past six years, hindering the overall effectiveness of DRO efforts in the country (Lambin et al., 2024). Without effective alignment and collaboration among stakeholders, even well-planned and resourced operations can become chaotic, wasteful, and unproductive. Nonetheless, this study has also revealed the proactive measures taken by

Malaysian stakeholders to overcome these obstacles. For instance, the National Disaster Management Agency (NADMA) formed the Rakan NADMA initiative in 2017 to better coordinate various stakeholders and strengthen disaster management policies and practices. The Civil Defence Force (APM) also launched the community-based *Kampung Siaga 221* program to provide the public with emergency preparedness training and knowledge.

These strategic initiatives implemented by stakeholders reflect a concerted effort to build more resilient communities and mitigate the challenges faced during DROs. The insights gained from this study can serve as a valuable resource for governments, non-governmental organizations, and other stakeholders, both in Malaysia and globally, to better understand the complexities of disaster response and inform the development of more effective DRO strategies. Furthermore, this research lays the groundwork for stakeholders to develop and suggest improvements that align with the advancements of the Fifth Industrial Revolution (IR5.0). By leveraging emerging technologies and innovative approaches, stakeholders can work towards addressing the persistent obstacles in DROs and enhancing the overall efficiency and effectiveness of disaster relief efforts.

In conclusion, this study provides essential insights into the current state of DROs in Malaysia. These insights can inform the creation of new strategies, policies, and technologies to better meet communities' needs in times of crisis. The findings also offer a valuable framework for evaluating the effectiveness of existing disaster risk reduction efforts and identifying potential areas for improvement, both in Malaysia and beyond.

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