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An Analysis of Malaysian Public Policy in Disaster Risk Reduction: An Endeavour of Mitigating the Impacts of Flood in Malaysia

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Abstract

In light of climate change and sustainable development issues, holistic flood risk reduction strategies must be integrated into policy initiatives to reduce flood threats. Numerous countries have been devastated by recent floods, which have claimed many lives and wrecked the economy in the affected areas. In most nations, there are public policies in place to mitigate the impact of flooding on citizens. Policies adopted are mostly based on international frameworks, including the Yokohama Strategy, the Hyogo Framework for Action 2005-2015, and the Sendai Framework for Disaster Risk Reduction. With the help of international frameworks, Malaysia has also developed several disaster guidelines and public policies. Some people died as a result of their failure to escape from the floodwaters, but many more were injured. Since Malaysia is plagued by floods, this study aims to examine the effectiveness of Malaysian public policy related to flood management. This qualitative research examines and evaluates publications from a variety of sources, especially published journal articles. The findings revealed that Malaysia lacks an effective legislative framework to integrate policies and mechanisms for flood management. Directive No. 20 of the National Security Council provides precise standards, but it must also rely on a range of regulations not specifically adopted for flood control. Besides that, the Directive is formulated to cater to general disasters and is not specifically focused on the flood. The Directive also did not highlight the need to engage citizens in flood management. Besides that, some local plans are less concerned with the criteria that help to inculcate preparedness in the face of flood risk. Policymakers in Malaysia should be able to use the findings of this research to craft a public policy that specifically addresses the country's flood concerns. Scholars are encouraged to conduct an additional study to obtain a better understanding of public policy issues in Malaysia, particularly floods.

Keywords: Disaster Risk Reduction, Flood, Hyogo Framework for Action, Malaysian Public Policy, Sendai Framework for Disaster Risk Reduction

Introduction

Natural disasters, such as floods, can have a devastating impact on people's daily lives and elevate their level of vulnerability (Chan et al., 2022). Malaysia is one of the countries that experience monsoon floods on an annual basis, causing the most damage (Chan, 2012), with over 5 million people living in flood-prone areas (Maznieda et al., 2022). People around the country are frequently affected by floods. All parties must be prepared for the possibility of flooding in areas that have hitherto been spared from the wrath of floods. Every stakeholder, from the government to Non-governmental Organizations (NGOs), businesses to the general public, should work together to ensure a community is well-prepared to deal with any disaster that may arise, including floods. In Malaysia, the government has implemented numerous flood prevention and mitigation measures (Salleh et al., 2013) to minimize and limit property destruction and loss, death, and the spread of infectious diseases (Hussain et al., 2014).

Structural and non-structural measures are used to safeguard places at risk of flooding. Structural flood prevention measures include dams, seawalls, revets, levees, and embankments, as well as the use of engineering tools to manage and protect human settlements from flooding (Mohit & Sellu, 2013). Mitigating natural disasters, as well as environmental deterioration and technological dangers, can be accomplished through flood prevention measures (Othman et al., 2014). Meanwhile, non-structural measures refer to pre-disaster planning, which involves the regulation of human activities and communities to reduce property damage. They enforced laws including planning policies and the restriction of industrial activity near flood-prone zones (Elias et al., 2013; Mohit & Sellu, 2013; Khalid & Shafiai, 2015). Furthermore, non-structural measures include efficiently notifying flood victims of early warnings (Mohit & Sellu, 2013; Othman et al., 2014). Both measures are regarded as critical in preparing the government and the citizens for floods. While the flood disaster is inevitable, the impacts on people can be mitigated if the government and the people prepare for it. Furthermore, a government with strong measures may ensure that people get up and start living soon after a calamity.

Although Malaysia has various policies in place to mitigate the effects of flooding, many citizens suffer damage and require government aid to remain resilient. Therefore, this study is carried out to assess the effectiveness of Malaysian public policy in mitigating the impacts of the flood disaster in Malaysia. This paper is embarked to help in disaster preparedness and response decision-making. Exploring the adequacy of Malaysian flood policy may give some information, particularly on pertinent concerns that need to be addressed before, during, and after a flood disaster. This study begins with an introduction to global disaster management strategy, with an emphasis on three significant frameworks: the Yokohama Strategy, the Hyogo Framework, and the Sendai Framework for Disaster Risk Reduction. It will then attempt to describe the actors in Malaysian disaster management. This section is critical for readers to understand how Malaysian flood management works. The adequacy of Malaysian public policy related to flood control is presented and discussed, and numerous recommendations have been made to enlighten policymakers for future policy reformation.

Global Policy on Disaster Management

International conventions have made constant activities in developing frameworks that advocate for the inclusion of holistic Disaster Risk Reduction (DRR) measures in development agendas to create and increase resilience in the aftermath of climate-induced

hazards (Desouza & Flanery, 2013; Saavedraa & Budd, 2009). This includes structural preventive and protective measures, as well as more inclusive adaptive non-structural DRR initiatives, which can improve disaster resilience (Wenger, 2017). There are several worldwide guidelines for engaging the community in DRR. The Yokohama Strategy was the first multinational disaster-management framework. The Hyogo Framework for Action 2005-2015 (HFA) and the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) are the two most important publications relating to public participation in DRR (Sobian, 2016).

The Yokohama Strategy

The Yokohama Strategy and Plan of Action for a Safer World was adopted in 1994 following the United Nations World Conference on Natural Disaster Reduction, held in Yokohama, Japan. It is the first worldwide publication to provide guidelines for catastrophe planning, prevention, and mitigation (Poterie & Baudoin, 2015). The Yokohama Strategy focused specifically on enhancing coping mechanisms to better cope with and recover from the effects of disasters. This method emphasized the expertise and experience in managing emergencies that exist at the local level among at-risk populations to support a smooth and quick recovery process. The following decade (the 2000s) reflects a transition in how DRR is regarded, shifting from a strong emphasis on coping capacities and relief interventions to a greater emphasis on risk preparedness and prevention (Baudoin & Wolde-Georgis, 2015).

The Hyogo Framework for Action 2005-2015 (HFA)

The changing conditions in demography, technology, and socio-economics, as well as modernization processes, have made the world, particularly the poor, increasingly vulnerable and susceptible to hydro-meteorological disasters such as floods. Disaster preparedness is one of the things that citizens may do to help mitigate the effects of natural catastrophes. According to Poterie & Baudoin (2015), the HFA concept of DRR indicates a larger emphasis on risk preparedness and prevention, as opposed to the preceding decades' concentration on response and recovery.

The HFA is the world's first global strategy to give a clear work plan for various sectors and actors working on DRR (Zhoua et al., 2014). HFA was adopted in January 2005 at the World Conference on Disaster Reduction in Kobe, Hyogo, Japan. The Hyogo Framework's core objective is to guarantee that member countries develop a strong institutional foundation, prioritizing catastrophe risk reduction at all levels of society (Hamin et al., 2013). HFA aims to significantly minimize disaster losses of lives and social, economic, and environmental assets by 2015 by strengthening nations' and communities' disaster resilience (Poterie & Baudoin, 2015; UNISDR, 2015).

The HFA was recognized by over 162 nations. It establishes a comprehensive strategy for DRR. It aims to reduce risk exposure, boost resilience, and improve catastrophe preparedness and management (McBean & Rodgers, 2010). The framework focuses on DRR to reduce social and physical vulnerability to disasters while increasing adaptive capability and resilience. It lays the groundwork for encouraging, developing, and improving community participation in DRR and highlights the proactive approach to informing, motivating, and involving communities in DRR.

In this framework, many tools and platforms were created to aid in the implementation of DRR at the regional, national, and local levels. Among the tools and platforms is a global platform for the United Nations Office for Disaster Risk Reduction (UNISDR) parties to share DRR experience, national platforms for tracking efforts in the

implementation of DRR strategies made in each country, and a reporting process established through the voluntary submission of national reports on progress toward HFA implementation (Olowu, 2010). The HFA highlighted state governments, regional organizations and institutions, and international organizations such as the United Nations System and International Financial Institutions as major actors. Since the adoption of the HFA in 2005, many nations have used this framework at the national or local level to construct DRR action plans (Zhoua et al., 2014).

HFA outlines five action priorities: (i) ensuring that DRR is a national and local priority with a strong institutional foundation for implementation, (ii) identifying, assessing, and monitoring disaster risks and improving early warning, (iii) using knowledge, innovation, and education to build a culture of safety and resilience at all levels, (iv) reducing the underlying risk factors, and (v) strengthening disaster preparedness for effective response at all levels. Various activities can be carried out with the active participation of local communities based on the five priorities (Sobian, 2016).

In general, HFA not only considers society's involvement in DRR but also focuses on establishing various foundations for society to actively participate in any DRR activities. The framework emphasizes at least four key points: (i) community engagement, (ii) information management and exchange, (iii) education and training, and (iv) public awareness. In terms of community participation, HFA argues that the adoption of specific policies, networking promotion, strategic management of volunteer resources, role and responsibility attribution, and delegation and provision of essential authority and resources should be prioritized (Sobian, 2016).

The framework's major goal, according to Prabhakar et al (2009), is to promote and empower developing countries to build their local capacity to mitigate climate-related disasters. Due to a lack of clear domestic policy and research, the government has turned to the Hyogo Framework for guidance on climate and catastrophe issues, as well as to increase coordination and implementation of government initiatives at the national and local levels (Sternberg & Batbuyan, 2013). Although this framework was useful, the emphasis on tracking progress in DRR implementation was limited to regional and national levels. The reporting tool was not designed to evaluate HFA implementation at a local level. The international community has given little thought to how to track the community-level impacts of various DRR methods (Poterie & Baudoin, 2015).

Sendai Framework for Disaster Risk Reduction (SFDRR) 2015–2030

The SFDRR is a revised and improved version of the HFA implementation throughout the last decade. It aims to represent the emerging issues that characterize today's world, such as climate change, growing globalization, and the emergence of new technologies and expertise in risk prediction and early warning systems (Zia & Wagner, 2015). The United Nations SFDRR was accepted in 2015 by 187 nations to protect lives, livelihoods, ecosystems, and key infrastructure against natural and human-caused disasters until 2030 (UN, 2015; UNISDR 2015; Wahlstrom, 2015).

To achieve the SFDRR goal, the international community identified and agreed on seven global targets, thirteen guiding principles, and four action priorities, signaling a paradigm shift from disaster management to disaster risk management by understanding risk, reducing existing risk, preventing new risk, and strengthening societal and environmental resilience (UNISDR, 2015; Walz et al., 2020; Zaidi & Fordham, 2021).

The framework was adopted at the Third United Nations World Conference on Disaster Risk Reduction, which took place from 14 to 18 March 2015 in Sendai, Miyagi, Japan. The framework is a continuation of the HFA, which ended in 2015. In comparison to HFA, SFDRR goes into great detail about DRR requirements. The document includes more precise objectives for DRR activities as well as well-defined targets (Sobian, 2016). The progress of the SFDRR's seven Global Targets is tracked by 38 indicators developed by the Open-ended Intergovernmental Expert Working Group on DRR Indicators and Terminology (OIEWG-DRR) (UN, 2016). Countries must measure indicators at the national level and report annually through the Sendai Framework Monitor, an online tool launched in March 2018 by the United Nations Office for Disaster Risk Reduction (UNDRR, 2021), to quantify their progress toward the Global Targets and contribute to the SFDRR's implementation.

The framework highlights that structural factors of vulnerability alone do not effectively represent a community's potential to withstand or adapt and transform in response to disaster events. It also identifies four action priorities to prevent new disasters and reduce existing disaster risks: (i) understanding disaster risk; (ii) strengthening disaster risk governance to manage disaster risk; (iii) investing in disaster reduction for resilience; and (iv) enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation, and reconstruction. Adopting this approach represents a critical transition from reacting to the effects of disasters to managing and lowering the risks that contribute to disasters, or, in other words, disaster prevention.

The framework emphasizes shared responsibility as a guiding principle for its four action priorities (UNISDR, 2015). According to the framework, lowering the frequency and impact of disasters necessitates a better understanding of disaster risk and an improvement in risk governance (Monteil et al., 2022). SFDRR has also defined the need for mainstreaming disaster resilience by integrating DRR into local development planning. Promoting catastrophe resilience at the local level would be more feasible and reliable (Poterie & Baudoin, 2015; UNISDR, 2015). Every section of society has a role to play in disaster management. This indicates that stakeholders must collaborate to plan, coordinate, and conduct a specific activity to accomplish a certain result. According to Nollkaemper (2018), shared obligations do not imply the accumulation of individual responsibilities, but rather that each responsibility is based on numerous actors contributing to each other's acts and the end outcome.

Scholars have highlighted how poorly planned shared tasks can result in negative consequences or side effects (Nolkaemper, 2018). In terms of flood-related DRR, responsibility-sharing between public and private actors can include a variety of activities, such as setting goals and selecting tactics (Sayers, 2013; Mees et al., 2014). Aside from that, the framework emphasizes the significance of women and girls in understanding disaster consequences. One of the main messages to emerge from the Sendai debates is their inclusion and leadership in risk-reduction decision-making (Zaidi & Fordham, 2021). The SFDRR and its associated publications, as the premier policy tool on disaster risk, encourage knowledge of gender-specific risks and possibilities created in the context of catastrophes.

The more complete elaboration of key stakeholders is one area of possible advancement in SFDRR. SFDRR includes a section on the role of stakeholders that is missing from the other frameworks. This section emphasizes the importance of involving women, children and youth, people with disabilities, the elderly, indigenous peoples, and migrants, among other civil society actors (Poterie & Baudoin, 2015). The preamble to the SFDRR affirms the need for more significant and meaningful participation by stakeholders such as women,

people with disabilities, and other marginalized groups in the disaster planning and implementation process, building on lessons learned from its predecessor, the HFA, which contained no actionable policies on gender and drawing on recommendations proposed by the Women's Major Group (Zaidi & Fordham, 2021). In addition, SFDRR highlights the role of the young in DRR. Youth, along with women, children, people with disabilities, elderly people, indigenous peoples, migrants, academia, and the media, are listed as crucial "stakeholders" in the DRR process, whose participation must be ensured throughout framework implementation (Zaidi & Fordham, 2021).

Actors Involved in Malaysian Disaster Management

Flood control necessitates collaboration between responsible authorities and the community for flood management phases to be addressed fairly (Elias et al., 2013; Khalid & Shafiai, 2015). The National Security Council (NSC), Royal Malaysian Police (PDRM), Fire and Rescue Department (JBPM), the Malaysia Civil Defense Force (JPAM), the Department of Social Welfare (JKM), the Malaysian Meteorological Department (METMalaysia), Department of Irrigation and Drainage (DID) and other ministries and government agencies are all involved and responsible for flood management in Malaysia (Billa et al., 2004; Katuk et al., 2009; Ismail et al., 2012; Elias et al., 2013; Khalid & Shafiai, 2015). The Malaysian government is now taking a proactive approach, and the major floods that hit the country in 2014 on the East Coast prompted the government to establish the National Disaster Management Agency (NADMA) under the Prime Minister's Department, taking over disaster management from the National Security Council.

Each agency has distinct tasks and approaches to various situations. Typically, during the prevention/mitigation phase, the Department of Irrigation and Drainage is the most important agency in charge, and this agency has implemented a comprehensive flood control and mitigation program (Billa et al., 2004; Ismail et al., 2012). However, according to Othman et al (2014), most agencies are frequently focused on disaster-related operations such as warning, immediate relief, and rehabilitation.

Malaysia has been hit by several natural disasters in recent decades. As a result, an urgent decision was made to evaluate disaster mitigation concerns and ensure that disaster rescue mechanisms were implemented successfully and efficiently (Leman et al., 2016; Mohit & Sellu, 2013). The goal was to reduce fear among the citizens of the country while also avoiding the excessive loss of life and damage to individual and national property (Inglesby, 2011; Roosli et al., 2013). As a result, the Prime Minister's Department, which reports to the National Security Division (NSD), is responsible for organizing all disaster-related measures. The National Security Council (NSC) Directive 20 was created to provide a plan of action for disaster administration and management that included the tasks and functions of the many agencies involved (Badruddin, 2012; Chan, 2012).

The Directive's objectives are (1) to outline policy on disaster and relief management based on the level of complexity of the disaster, and (2) to identify the roles and responsibilities of various agencies in establishing management mechanisms (Majlis Keselamatan Negara, 2021), for example, the Public Works Department, Welfare Department, Statistics Department, Drainage and Irrigation Department, and Malaysian Medical Relief Society. It is vital to remember that multiple committees exist at various levels, including federal, state, district, and village (which are managed by district committees). However, Obeta (2014) noted that the top-down strategy has flaws, such as insufficient

sustainable flood management measures, limited funding for endangered communities, and so on.

When responding to emergencies, the operations rely greatly on the responding agencies' awareness and comprehension of their respective or individual duties and responsibilities. Furthermore, due to the dynamic nature of catastrophes, collaboration across the many agencies and parties involved may be critical in mitigating bad effects and minimizing additional damages and losses from the disaster. However, several flaws have been revealed in studies conducted in the aftermath of previous flood disasters. These include, among other things, a lack of information sharing across organizations, confusion about inter-organizational dynamics, overlapping duties, a shortage of rescue personnel and equipment, resource mismanagement, and an inefficient flood warning system (Karki, 2016; Comfort & Kapucu, 2006). It is impossible to deny government agencies' competency and contribution to flood management although some studies have previously noted various difficulties. Many stories appeared in the local media about government agencies' involvement and support for flood relief, despite their flood-related challenges. It is also reported that several government officials were affected by the flood and were required to rescue other flood victims. Coordination in flood control can improve the effectiveness of rescue efforts and reduce the number of flood victims.

National Policy on Disaster Management and Its Adequacy in Mitigating the Impact of Flood.

The National Security Council (NSC) Directive No.20 governs the Malaysian disaster management apparatus (Said & Ahmadun, 2017). It establishes rules and orders for responsible parties, including government and non-governmental organizations, to follow the disaster management cycle of prevention, mitigation, readiness, response, and recovery. To increase coordination and efficacy, the Directive is applied to the three-tier government system, namely the federal, state, and district levels.

The Prime Minister will release the Directive from the Prime Minister's Department, with the assistance of extensive legislation, to coordinate numerous federal, state, and district agencies. This Directive arose from the necessity for a strategy and a framework in Malaysia to integrate and coordinate catastrophes on land in a systematic manner. The Directive covers calamities such as the collapse of high-rise structures, the release of dangerous gas in public places, the transport of hazardous materials, and the bursting of hydro dams or reservoirs. Other disasters include train collisions or derailments, air accidents in populated areas, haze, which causes environmental disasters, industrial disasters, fire, explosion, emission of hazardous materials, channeling and transferring of hazardous materials, nuclear and radiological mishaps, and nuclear and radiological mishaps. Finally, a large-scale fire outbreak, such as forest fires and open burning, as well as natural disasters caused by floods, storms, droughts, beach erosion, landslides, or storm-related calamities, are included (Hamin et al., 2013).

When flooding occurs, the relief and recovery process is heavily reliant on Directive No. 20, which can only be activated by the National Security Council, which is part of the Prime Minister's Department. Many statutes, including the Land Conservation Act of 1960, the Town and Country Planning Act of 1976, the Environment Quality Act of 1974, the Local Government Act of 1976, the Irrigation Areas Act of 1953, the Drainage Works Act of 1954, the National Forestry Act of 1984, and the Uniform Building By-Laws of 1984, will have to be invoked. Furthermore, Malaysia has launched the National Climate Change Policy, which calls

for increased measures to mitigate the negative effects of climate change (Jamaludin & Sulaiman, 2018).

In 1997, the Directive established a policy framework for disaster management. It outlines the roles and responsibilities of numerous disaster management agencies at the district, state, and national levels. However, the Directive makes no mention of the public's participation in disaster management (Badrudin, 2012). According to Sobian (2016), Malaysia relies on the Directive as a DRR strategy and requires national disaster management legislation, which is expected to emphasize DRR considerably. However, public participation in DRR is relatively minimal, and it has solely relied on volunteer efforts (Sobian, 2016). As a result, it is time for Malaysia to adopt a comprehensive DRR policy that addresses all areas of DRR, including education, information distribution, and post-disaster development (Sobian, 2016). Besides that, the type of house that will be obtained by the victims for resettlement following the disaster is not specified in the Directive. This is because building or household assistance following disasters will be discussed by higher authorities for further action (Shafiaia & Khalid, 2016).

More than merely responding to an emergency is required for flood risk management (Elias et al., 2013). According to Elias et al. (2013), Malaysia lacks an appropriate legal system to combine flood management policies and mechanisms. The Directive gives detailed rules, but it must then rely on a variety of regulations not particularly adopted for flood management. It is just a catastrophe management policy administered by the Prime Minister's Department. This Directive is not a comprehensive tool for implementing flood management measures. It merely activates government machinery under several other laws that were not especially established to deal with floods.

Malaysia would confront issues where solutions are meant to adapt to the demands of local communities if there is no common legal framework dealing with flood risk management. When flooding occurs, policies and priorities must be consistent to facilitate flood control. Clear-cut responsibilities amongst flood risk management parties may be difficult to discern due to overlapping laws. Nonetheless, because they are different pieces of legislation, they cannot include or exclude any rights or duties. There may be provisions from other Acts that complement one another, but when a crisis occurs, there is not enough time to look for them (Hamin et al., 2013).

Parts of the provisions of the Land Conservation Act of 1960, the Town and Country Planning Act of 1976, the Environment Quality Act of 1974, the Local Government Act of 1976, the Irrigation Areas Act of 1953, the Drainage Works Act of 1954, the National Forestry Act of 1984, and the Uniform Building By-Laws of 1984 are required to regulate flood prevention and preparation measures. However, none of these Acts specifically address the problem (Hamin et al., 2013). Considering the full flood management cycle, the Directive would be unable to address all challenges, combining flood risk management prevention, preparation, response, and recovery.

The recovery phase following a disaster to rebuild and repair in flood risk management is equally valuable. To supplement the recovery and rehabilitation process, legislation relating to welfare, housing, education, and other public amenities must be provided. Again, the Directive will play almost no part. As a result, to keep up with socioeconomic and technical improvements, a more flexible legal system is required in a modern community. As policy evolves, climate change and new threats emerge; a single piece of legislation is required to keep up with flood risk management regulations (Hamin et al., 2013).

The Eleventh Malaysia Plan (2011-2020) addresses the need for Malaysia to increase its resilience to the effects of climate change to ensure good living conditions in the face of natural disasters (Jamaludin & Sulaiman, 2018). More policies, guidelines, and programs have been prepared to address and respond to disaster risks, ideas, and strategies that would increase resiliency, reflect and deliver Malaysian commitment to global agendas in DRR, and build resilience, with the Sendai Framework now serving as the most recent reference. However, the policies and initiatives stated above are typically sectoral, with broad references to physical, spatial development, and administrative levels. Furthermore, they are simply accessible as a guide and are optional but not mandatory, with no legal sanctity to enforce them (Norizan et al., 2021).

Previous studies have critiqued Malaysian officials' flood relief policies developed over the years. Unfortunately, Malaysian governments implement food assistance preparations only after a crisis has occurred, rather than putting precautions in place beforehand (Aldrich et al., 2015). In Malaysia, Disaster Risk Management is based on a top-down or government-centered strategy (Chan, 2012). This explains why Malaysia's preparedness plan is reactive rather than proactive (Shariff & Hamidi, 2016). The Malaysian government's flood relief program is reactive since the government would only act after the disaster has occurred and does not see the policy as long-term planning (Chan & Parker, 1996; Chan, 2012). In most significant catastrophes, people's disaster-response mechanisms fail, forcing them to rely largely on the assistance of central emergency management (Maznieda et al., 2022).

In a study connected to flooding in Malaysia policies, Roosli & O'Brien (2011) said that the policies developed in Malaysia for flood disaster management are based on the top-down approach and have failed to meet the expectations of the victims. In studies on flood risk management, Chan (2012) argued that using the top-down approach, which developed and implemented the policy, does not become effective because the government will only act after a disaster occurs without preparing in advance to take the perception of the community-related policy that is truly necessary. The policy designed based on a top-down approach is ineffective and needs to be modified to a bottom-up approach to obtain the victim's impression of policy execution and the consequences of the disaster to them.

Malaysia has already signed the Hyogo Framework for Action (HFA) 2005-2015, as well as the succeeding SFDRR (Jamaludin & Sulaiman, 2018). More requests have already been made for holistic DRR measures to be incorporated into Malaysian development planning practice. Flood issues and measures to reduce flood disasters have previously been considered and proposed at the national level in the current Third National Physical Plan (RFN-3) in keeping with its goal of building a resilient nation.

Besides that, the statutory development plan at the local level, commonly known as the local plan is perceived to be the suitable means to mainstream DRR measures to promote disaster resilience at the local level (Perera & Khailani, 2017; Poterie & Baudoin, 2015). Norizan et al (2021) carried out a content analysis study in Kelantan and Terengganu to examine the extent to which flood risk reduction measures are being integrated into local plans in Malaysia for flood resiliency. They found that some local authorities have instilled the elements of DRR in their local plans. In Kuala Krai District Local Plan, greater attention has been given to provisioning flood-mitigation infrastructure projects. For instance, it is stated in their local plan that the development of ban and water gates are also needed in all flood-prone areas to prevent river floods from entering low-lying areas. Besides that, the Kuala Terengganu District Local Plan provided a well-versed flood risk map as a guide to monitor and control development from being held in risky areas. For instance, it is stated in their local

plan that housing developments are prohibited in active paddy fields and in agricultural areas that function as flood reservoir areas.

However, they also discovered that all local plans in Kelantan and Terengganu are less concerned with the criteria that serve preparation in the face of flood danger. Unfortunately, all reviewed local plans do not include provisions for an early warning system. An early warning system is a significant step toward minimizing fatalities and injuries while also enhancing reaction capacity among emergency responders (Norizan et al., 2021). The local plan is regarded as the most appropriate method of delivering catastrophe risk reduction planning methods. It is a legal-binding statutory development plan that envisions long-term strategies and is accompanied by a detailed land use map and policy statements that promote and manage development. Local strategies had been developed before Malaysia signed the Melaka Declaration in 2011 to become a member of HFA to build a resilient nation. As a result, no concrete indications or allusions to catastrophe resilience based on the aforementioned framework or any other global resilience agenda are assigned in the local plans. However, because local plans have undergone technical analyses of various considerations, including the local environmental condition and local issues, it is argued that they should have been more sensitive to the long-standing local flood issues and, as a result, should have integrated comprehensive flood risk reduction measures with land use planning strategies to reduce flood risk at the local level (Norizan et al., 2021).

Conclusion

Floods have plagued Malaysia frequently causing many families to lose their houses. Aside from that, the floods have made many residents fearful and phobic whenever it rains excessively in their living areas. Natural disasters, such as floods, are inevitable. However, the impacts of floods can be lessened if the government introduces and implements a flood public policy. So far, there is no specific governmental policy in place to address the flood problem in Malaysia. As discussed earlier, flood disasters are categorized as one of the types of disasters found in the country. In Malaysia, disaster management is more geared towards Directive No.20. This Directive outlines the tasks that need to be carried out by government agencies to manage disasters. However, this Directive does not specify specific DRR methods related to flood disasters.

Furthermore, this Directive does not explicitly explain the role and participation of the people in flood management, particularly the people's preparedness to face floods. Although the Sendai Framework is a purely global guideline, however, the inclusion of stakeholders such as youth and women in flood disaster management especially flood preparedness activities should be highlighted in the Directive. Besides that, the government must develop a specific flood-related policy that details the duties of stakeholders such as the government, NGOs, and the people before, during, and after the floods. All stakeholders, including the people, must be involved in the policy formation process so that the policy implemented is comprehensive and easily understood by the people, particularly those living in rural areas. Sayers (2013); Mees et al (2014) contend that setting goals and selecting methods are two examples of how public and private actors can share responsibility.

At the moment, the government is formulating the National Risk Reduction Policy through NADMA to strengthen management and intensify national catastrophe risk preparedness. It demonstrates that the government is constantly working to enhance public policies to lessen the impact of floods as much as feasible. It is proposed that policymakers heavily consider the views and opinions of the grassroots, particularly youth, women, and

persons with disabilities, to guarantee that the policy produced can cater to the requirements of all sectors of society in flood control.

When a specific policy related to floods is formulated, the government together with NGOs needs to collaborate to explain the content of the policy to the public. Training on flood management should also be emphasized so that the people know what they should do before, during, and after a flood. People are less concerned about flooding dangers if they have not recently suffered a significant flood. The "crisis effect" can explain this, which suggests that disaster awareness rises soon following occurrences but quickly fades (Stefanovic, 2003; Atreya et al., 2013; Gallagher, 2014). The previous findings emphasize the importance of policymakers developing policies that can persuade people, particularly those with little experience, to implement flood protection measures. For any policy to be effective, the public must be involved (Shao et al., 2017). A flood preparedness awareness campaign is important to guarantee that people know what to do before the event of a flood disaster. Hence, it is recommended that all stakeholders, including academics and universities, participate in university social responsibility by developing inventive or/and innovative products to raise public awareness of flood preparedness.

In addition, the results of this study also found that the Malaysian government's flood relief program is reactive since the government would only act after the disaster has occurred and does not see the policy as long-term planning. In other words, flood management in Malaysia is more focused on assistance provided during and after floods. Therefore, emphasis should be given to the process before the flood such as flood preparedness activities. The government can also make Japan a benchmark for formulating flood-related policies. According to Kundzewicz & Takeuchi (1999), Japan, a developed country that has made a deliberate effort to decrease flood risk through solid laws, sensitive planning, well-thought-out building, and flood preparation, has benefited from its mitigation planning and policies.

Catastrophe preparedness should receive more focus to develop a more resilient environment (Restemeyer et al., 2015). Adaptive strategies, particularly when local knowledge is taken into account, are more valuable than just avoiding hazards (Restemeyer et al., 2015; Wenger, 2017). Adaptation in the form of preparation to face disaster and respond to any disaster repercussions is therefore regarded as critical. Local planning authorities should have been more attentive to flood risk by incorporating flood risk mitigation measures into their local plans. Planners should have been more mindful of local needs and knowledgeable enough to discuss and implement flood-prevention measures. Thorough environmental and vulnerability evaluations of the jurisdiction areas are required while drafting the local plans, and local planners should have strong engagement with the public to trade and gain ideas that can strengthen local resiliency. Collaboration with other governmental sectors and non-governmental organizations is critical for gaining a better understanding of successful DRR approaches to address global climate concerns (Norizan et al., 2021).

Local plans should address local issues to reduce disaster risk and allow for appropriate development through a development control mechanism that takes into account existing environmental risk and vulnerability. Tan Sri Lee Lam Thye, Chairman of the Ikatan Komuniti Selamat (Ikatan), stated that the state government and local authorities (PBT) must support the government's policy of implementing planned and sustainable development to deal with floods. The Five Year Malaysia Plan, National Environmental Policy, National Physical Plan Policy, and National Urbanization Policy are among them (Yunus, 2022). Floods, according to Kundzewicz & Takeuchi (1999), cannot be avoided because they are natural events. In

locations where floods occur regularly, the community can be prepared to some extent, yet the tragedies may be unanticipated in some areas. Adapting to what is already present is smart risk management, as demonstrated by the residents of old Nagoya, Japan, who not only built dikes around their villages in the event of a particular flood but also prepared for the floods by storing boats under their roofs. Mitigating such natural disasters necessitates pre-disaster preparation and appropriate policy-making to protect the affected people. Plans and policies must take into account the need for cooperation among government agencies, non-governmental groups, and the community.

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