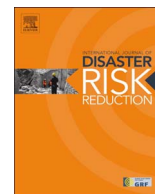




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Flood risk management activities in Vietnam: A study of local practice in Quang Nam province

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ABSTRACT

Vietnam has been extensively impacted by flooding over the years, sustaining heavy losses in human life and damages to housing, agriculture, and transportation. Flood risk in Vietnam is not widely understood beyond a very hazard-focused conceptualization, which often neglects to consider human vulnerability. The objective of this paper is to understand flood risk management (FRM) activities at local levels in Quang Nam province in Vietnam, along with legal and institutional frameworks that are intended to focus, but often restrict, policy and practice. Vietnam's legal and institutional frameworks are analyzed to provide an overview of the scope of existing FRM activities in Vietnam. We then examine the extent to which FRM in Vietnam follows recognized theoretical frameworks, and pinpoint where practice might be strengthened. Based on this positioning, we conduct 27 individual interviews with decision-makers in FRM at provincial, district, and commune levels in Quang Nam province. We argue that FRM activities at local levels in Vietnam are implemented according to the hierarchical structure of the political system and the responsibilities of various paramount government agencies, and that there is a lack of participation of experts, researchers, and scientists in steering committees. There is an urgent need for greater public participation in FRM at local levels. Since communes have a better understanding of their local conditions, empowering them with planning and decision-making power is necessary to improve the effectiveness of FRM activities. Our detailed analysis of FRM activities at local levels has implications for future efforts to mitigate flooding in Vietnam.

1. Introduction

A flood is a very complex phenomenon that involves links between the natural environment, people and social systems [1]. Flood risk can be determined as the combination of the likelihood of a particular flood event and its impacts [2,3]. Flood exposure and flood frequency are projected to increase globally, especially in low latitudes in Asia and Africa [4,5].

Flood risk is a common threat to many densely populated, low-lying riverine and coastal areas around the world [6]. Flood risk management (FRM) has gradually undergone a shift from a traditional approach based on design standards to a risk-based decision-making perspective [2,7]. A standards-based approach focuses on structural flood prevention measures. A risk-based approach provides informed choices and focuses on non-structural measures alongside structural measures, and aims to mitigate the vulnerability and susceptibility of people and their properties in the flood-prone areas [8].

Vietnam is highly vulnerable to flood and storm impacts, ranking eighth in the ten countries most affected by extreme weather events

between 1996 and 2015 [9]. The high flood risk in Vietnam is due to its tropical monsoon climate, dense river systems, long coastline, and dense populations along rivers and coastal areas [10,11]. Besides natural factors such as weather and topography, human interference such as deforestation [12,13] and land-use management [14] contribute to the high flood risk in Vietnam. Also, a significant proportion of Vietnam's population is concentrated in areas prone to flooding, increasing their disaster risk [15–17].

Developing countries suffer more severe consequences from natural hazards than developed ones in terms of fatalities [18–20]. The scale of the problem in Vietnam can be illustrated by the flood damage data in Fig. 1. The flood damage data suggest that floods have had severe impacts on communities in Vietnam with at least 14,927 deaths and economic damage equivalent to 1% of GDP between 1989 and 2015. Rapid population growth, industrial development, and agricultural expansion have increased flood vulnerability, especially in riverine and coastal areas in Vietnam [21]. Floods tend to affect low-income communities when the communities in rural and coastal areas have all sources of income dependent on the natural environment [22]. Socio-

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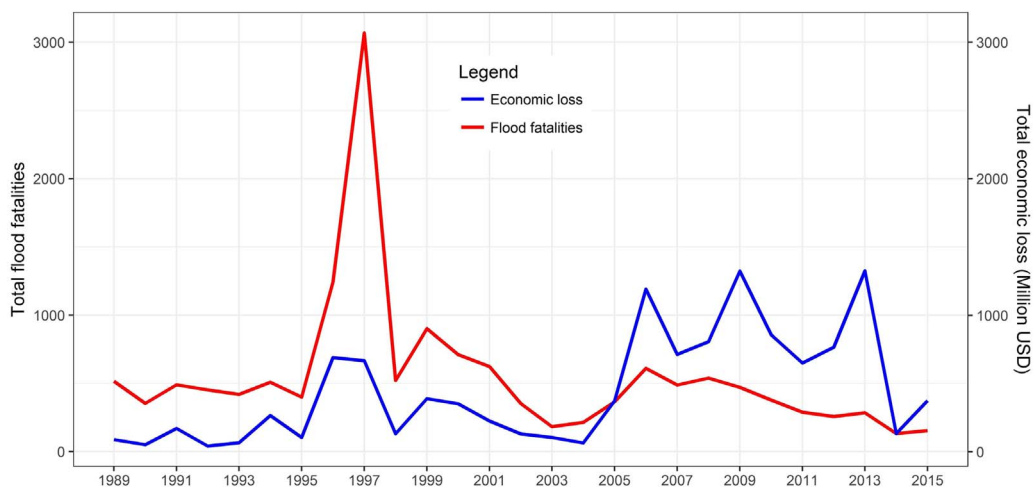


Fig. 1. Death toll and total economic loss caused by flood and storm events between 1989 and 2015 in Vietnam (compiled from Damage Assessment and Needs Analysis (DANA) database of Vietnam).

economically marginalized groups face grave difficulties in disaster resilience when they lack public hazard protection such as emergency relief and insurance [23].

An effective FRM approach can help to reduce adverse impacts of floods and improve flood risk adaptation measures [24]. FRM activities include mitigation, preparedness, response, and recovery [25,26]. FRM decision-making processes in Vietnam use a top-down approach, which often has insufficient involvement of stakeholders [27]. Vietnam's top-down approach to FRM is based on centralized government roles at national and provincial levels [10].

There has been an increasing number of case studies on FRM in Vietnam. Tran et al. [21] explored the coping mechanisms to flood risk by rural communities in Thua Thien Hue province. Bubeck et al. [28] studied flood risk perceptions in a case study in Thua Thien Hue province. Chau et al. [10] undertook an evaluation of the current centralized institutional framework in Vietnam and found that local governments are not proactive about flood management planning. Chinh et al. [29] investigated FRM in terms of preparedness, response, and recovery of private small businesses and households in Can Tho city. Several international cooperation projects in Vietnam have yielded practical case studies such as the WISDOM project in the Mekong Delta [30–33] and the LUCGi project in the Vu Gia-Thu Bon river basin [34]. However, there is still a lack of studies on the practice of FRM activities under the legal and institutional frameworks in Vietnam, and how the legal framework of FRM delivers effective flood risk reduction and mitigation.

Although all levels of the political system are involved in disaster management, the role and activities of local administrations are of particular importance [35]. Therefore, this study aims to understand FRM activities at local levels in Quang Nam province, along with the legal and institutional frameworks that are intended to focus, but often restrict, policy and practice. First, Vietnam's legal and institutional frameworks are analyzed to provide an overview of the operation of FRM activities and a proposed conceptual FRM framework for Vietnam. Second, we introduce a case study in Quang Nam province, in which we investigate FRM activities at local levels. The study includes 27 individual interviews with decision-makers in FRM at provincial, district and commune levels. Finally, following the empirical evidence, we discuss gaps in policy and practice in FRM activities at local levels.

2. Legal and institutional frameworks for FRM in Vietnam

2.1. Legal framework

Vietnam's legal documents pertaining to disaster management are

diverse, are issued by many government agencies, and are frequently modified and updated. The Law on Natural Disaster Prevention and Control (the Law), which came into effect in May 2014, is the first law on disasters in Vietnam and provides the core elements of the country's disaster management system. As stipulated in the Law, disaster management activities consist of prevention, response, and remediation of consequences. Detailed activities of prevention, response and remediation are specified in the Law.

The Law regulates disaster management activities including prevention, response, and remediation of consequences; however, it lacks a focus on mitigation. Where mitigation would help to reduce the consequences of hazards before they occur, the current approach is reactive: preparedness, response, and recovery react to current disasters or anticipate future events [36]. A proactive approach would allow mitigation, preparedness and early warning for disasters before they occur [26], and would help vulnerable communes to become safer and to respond better to natural hazards. It is suggested that all four disaster management activities should be established in Vietnam: mitigation, preparedness, response, and recovery.

2.2. Institutional framework

The Vietnamese constitution has four administrative levels: national, provincial, district, and commune. At the provincial level, Vietnam has 58 provinces and 5 municipalities (effectively 63 provinces). A province includes many districts, and each district consists of many communes. The hierarchical institutional structure in FRM also includes these four levels (Fig. 2); governmental units in a hierarchical order have national, provincial, district, and commune levels. The National Steering Committee for Natural Disaster Prevention and Control has national-level responsibility, and local governments, which include provincial, district and commune levels, are the decision-makers in FRM activities.

The overview of the institutional framework for FRM in Vietnam (Fig. 2) shows the involvement of the entire political system in FRM steering committees. The hierarchical structure of the administrative system in Fig. 2 is a top-down approach that highlights the responsibilities of various government agencies. This approach leads to inequitable and unsustainable outcomes in disaster risk management [37]. There is a transition underway to more resilient approaches such as bottom-up initiatives [38] and community-based systems [37,39]. The ideal approach is a combination of top-down and bottom-up approaches [27], which enables the involvement of all stakeholders and ensures equity [40]. Stakeholders include local people, government agencies, emergency management agencies, local authorities,

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