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# FLOOD MANAGEMENT OF THE LOCAL ADMINISTRATIVE ORGANIZATIONS IN PHETCHABURI, THAILAND

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## Abstract

This study sought to investigate the processes of flood management and the practices of flood management of the local administrative organizations in Phetchaburi, Thailand. It was carried out through qualitative research, specifically a case study approach. Forty-three informants from the local administrative organizations, namely Phetchaburi Municipality and Ton Mamuang Sub-district Administrative Organization, were involved. The data was collected through in-depth interviews and was analyzed through content analysis. The results showed that the pre-flood management process of this local administrative organizations included formulating disaster prevention and mitigation plans to develop risk prevention strategies, preparing disaster resources, personnel, evacuation plans, early warning systems, establishing temporary shelters, conducting pre-flood disaster drills and mitigation, and promoting risk reduction. Additionally, the during-flood management process involved establishing the Disaster Prevention and Mitigation Division within local administrative organizations to assess the situations, supporting the Division, as well as monitoring, analyzing and reporting on the situation. Meanwhile, the post-flood management process encompassed restoration, reconstruction, rehabilitation of public utilities, and assessment and restoration of the living conditions of affected communities to normal. From this study, the practices of flood management comprised seven steps as follows: understanding the current situation, the need for risk assessment, and drawing upon historical data; assessing flood disasters; assessing exposure to flood disasters; analyzing vulnerability and capacity for flood management; analyzing impacts and risk levels of flood disasters; developing risk data and guidelines for management and reduction of flood risks; and formulating or improving strategies and action plans for mitigation of flood risks.

**Keywords:** Management, Flood Disaster, Local Administrative Organizations

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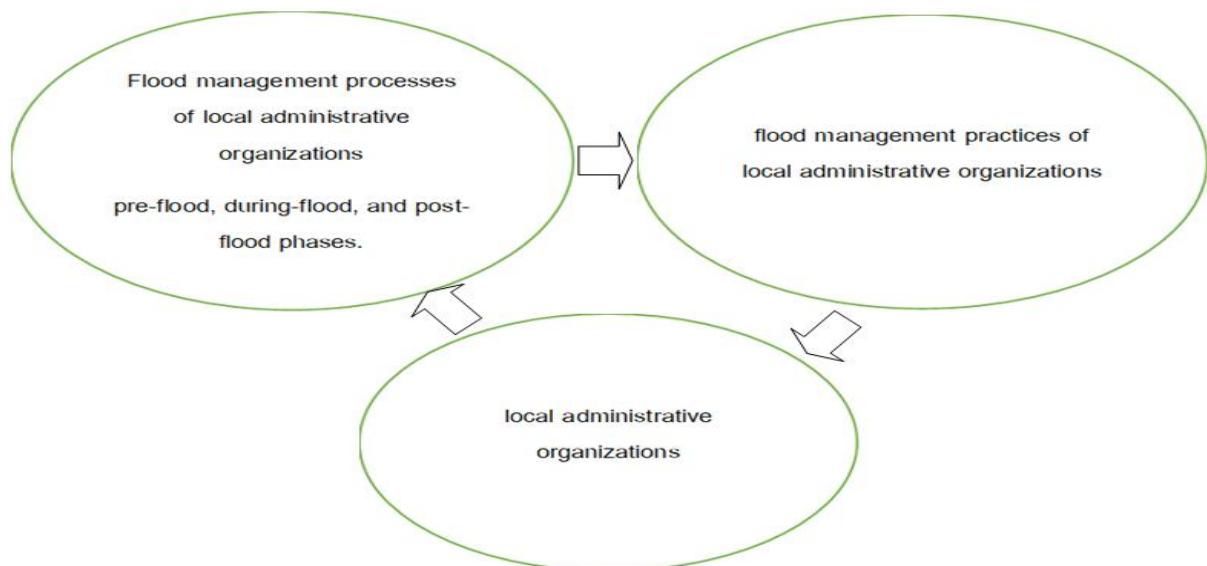
## Introduction

Thailand is among the countries which face severe disasters compared to many others. Historically, the country experienced seasonal disasters, such as floods, storms, and droughts. Nevertheless, in the last decade, it has frequently encountered intense disasters, causing extensive damage to the country. Hence, this poses the need to prioritize disaster issues. In fact, the 2011 flood crisis led to widespread devastation across Thailand, impacting a staggering 12.8 million people. The World Bank estimated the damage at 1.44 trillion baht, ranking it as the world's fourth most destructive disaster (Department of Disaster Prevention and Mitigation, 2024).

In accordance with the Determining Plan and Process of Decentralization to Local Government Organization Act 1999, Section 2 on the determination of powers and duties in public service systems, Articles 16 and 17 under the provision of Article 16, Sub-district Administrative Organizations and Provincial Administrative Organizations have the authority and responsibility to provide public services for the benefit of local people. Among many responsibilities is disaster prevention and mitigation, such as providing initial assistance to disaster victims. These organizations serve as the primary agencies for provision of public services, are involved in decision-making to tackle local issues, have the autonomy to determine administrative policies, manage public services, personnel, and finance, as well as having specific powers and duties (Phetchaburi Provincial Office, 2024b). Thus, the law grants the authority to local administrative organizations in Thailand to manage disasters in their respective areas directly and indirectly through the provision of various public services, such as Phetchaburi Municipality and Ton Mamuang Sub-district Administrative Organization, involved in providing flood disaster relief services to flood victims (Phetchaburi Provincial Office, 2024a). The present study investigated the flood management of local administrative organizations in Thailand, with a specific focus on the local administrative organizations in Phetchaburi, situated in western Thailand. Specifically, it examined Phetchaburi Municipality and Ton Mamuang Sub-district Administrative Organization since these areas are prone to frequent floods (Phetchaburi Provincial Office, 2024a) Based on disaster statistics from the Phetchaburi Provincial Disaster Prevention and Mitigation Office between 2016 and 2021, Phetchaburi Province in Thailand continuously experienced flood disasters. In fact, 39,868 households and six districts were affected, resulting in significant damage reaching 44,481,450 million baht, particularly in Mueang Phetchaburi District, which is an important economic hub (Phetchaburi Provincial Disaster Prevention and Mitigation Office, 2024). Considering this, the issue at hand is how local administrative organizations in Phetchaburi manage flood disasters during these disasters. Hence, the present study aims to investigate the flood management processes of local administrative organizations in Phetchaburi, Thailand and examine the flood management practices of local administrative organizations in Phetchaburi, Thailand.

## Literature Review

This research article uses the concept of disaster management of local administrative organizations. Disaster management refers to the process of taking action to reduce the loss of life and property of the people. the concept of disaster management, encompassing the pre-flood, during-flood, and post-flood phases. Disaster risk management concepts According to the Act, the plan and procedures for decentralizing power to local administrative organizations in Thailand are established (Department of Disaster Prevention and Mitigation, 2024).



**Figure 1** Conceptual Framework

## Research Methodology

The present study adopted a qualitative research approach, specifically a case study design. The research site was Phetchaburi Province, located in western Thailand. This study focused on local administrative organizations in the province, namely Phetchaburi Municipality and Ton Mamuang Sub-district Administrative Organization. These organizations were chosen due to their experience with flooding over a five-year period (Phetchaburi Provincial Office, 2024a).

This study involved key informants from different organizations. Initially, it included 26 key informants from Phetchaburi Municipality: 1) The Mayor of Phetchaburi Municipality, responsible for establishing policies and operational guidelines for disaster management; 2) The Deputy Mayor of Phetchaburi Municipality, responsible for overseeing policies and operational guidelines for disaster management; 3) The Municipal clerk of Phetchaburi Municipality, responsible for overseeing policies and operational guidelines for disaster management; 4) The Director of the Strategy Division, responsible for overseeing policies and operational guidelines for disaster management; 5) Six disaster prevention and mitigation officers, responsible for carrying out operational tasks in disaster management; and 6) Sixteen community leaders.

Additionally, it involved two key informants from the Phetchaburi Provincial Disaster Prevention and Mitigation Office as follows: 1) The Head of the Phetchaburi Provincial Disaster Prevention and Mitigation Office, responsible for setting policies and operational guidelines for disaster management in conjunction with Phetchaburi Municipality; and 2) The Chief of the Provincial Disaster Prevention and Mitigation Operations Division of Phetchaburi, responsible for overseeing policies and operational guidelines for disaster management in coordination with Phetchaburi Municipality.

There was one key informant from the Phetchaburi Irrigation Project: The Director of the Phetchaburi Irrigation Project, overseeing policies and operational guidelines for disaster, drought, and flood management in coordination with Phetchaburi Municipality.

Finally, there were 14 key informants from Ton Mamuang Sub-district Administrative Organization: 1) The Chief Executive of Ton Mamuang Sub-district Administrative Organization, in charge of establishing policies and operational guidelines for disaster management; 2) The Deputy Chief Executive of Ton Mamuang Sub-district Administrative Organization, responsible for overseeing policies and operational guidelines for disaster

management; 3) Six disaster prevention and mitigation officers, responsible for carrying out operational tasks in disaster management; and 4) One village headman and five community committee members, totaling 6.

Taking them altogether, this study involved 43 key informants. The data obtained from interviews was validated for accuracy and completeness through triangulation methods. This involved cross-checking across informants, presenting hypothetical scenarios, and tailoring interview questions to the informants' specific contexts.

The data was derived from in-depth interviews guided by an interview guideline, consisting of two parts of 15 questions each. These interviews were conducted with the key informants, focusing on the main issues specified in the interview guidelines, including the flood management processes and practices in local administrative organizations in Phetchaburi, Thailand.

To ensure the reliability of the collected data and to obtain clear and comprehensive data aligned with the research objectives, the data was rigorously verified after each session of the interviews, which allowed for accurate, comprehensive, and truthful data. Specifically, after each session, the data was systematically organized and recorded. If any ambiguity arose, it was cross-checked with different sources to achieve accuracy and reliability of the data. Subsequently, the data was classified for analysis. Additionally, throughout data collection, the data was constantly verified for accuracy. In doing so, all of the collected data was analyzed, categorized, and assessed to determine its sufficiency in explaining the phenomenon. If additional data was needed, the researchers revisited the research site to obtain the necessary data, thereby ensuring completeness of the data for accurate interpretation based on the research objectives. Finally, the obtained data was analyzed and compared with the results of prior analyses to address the research questions.

In conducting data analysis, the data collected from in-depth interviews was categorized and compared to identify similarities, differences, and relationships. Specifically, theoretical frameworks were drawn upon to address the research objectives. Qualitative content analysis through inductive analysis was employed to identify patterns and derive inductive conclusions, which were presented through analytical descriptions. Research Ethics Certification ECPB\_R 40/2566 No.05/2567.

## **Research Findings**

### **Flood management processes of local administrative organizations in Phetchaburi, Thailand**

Pre-Flood Phase: The results demonstrated that during the pre-flood phase, Phetchaburi Municipality and Ton Mamuang Sub-district Administrative Organization implemented disaster management through direction, control, command, and coordination at the national level. The Disaster Prevention and Mitigation Division facilitated this by implementing policies and operational plans. In addition, it coordinated with district and provincial administrative agencies, including the National Disaster Prevention and Mitigation Committee, the National Disaster Prevention Committee, and the Provincial Disaster Prevention and Mitigation Planning Committee. These bodies were responsible for developing and submitting provincial disaster prevention and mitigation plans to the Governor for enactment in accordance with the structure, powers, and duties provided in Section 17 of the Disaster Prevention and Mitigation Act 2007.

In response to the recurrent flood events in the municipal area of Phetchaburi during the periods 2016-2020, Phetchaburi Municipality and Mamuang Sub-district Administrative Organization worked in concert with the Provincial Disaster Prevention and Mitigation Planning Committee to formulate disaster prevention and mitigation plans to develop risk prevention strategies and enhance disaster preparedness, including mobilization of disaster

resources and personnel, evacuation planning, early warning systems, establishment of temporary shelters, conducting pre-flood disaster drills and mitigation, and promoting multi-sectoral engagement to reduce flood risks.

**During-Flood Phase:** It was found that during flood events, Phetchaburi Municipality and Mamuang Sub-district Administrative Organization established the Disaster Prevention and Mitigation Division under local administrative organizations to evaluate the situation and provided support for the Division. In addition, they monitored, analyzed, and reported on the situation, issued warnings, and provided recommendations to the National Disaster Prevention and Mitigation Commander for decision-making on enhancing disaster management.

In the case of the consecutive three years of flooding in the municipal area of Phetchaburi from 2016 to 2020, Phetchaburi Municipality and Mamuang Sub-district Administrative Organization assessed the severity of the flood disaster, classified into four levels: minor, moderate, major, and severe. If the disaster assessment surpassed the capacity of the local administrative organization's resources and could not be managed, they would report to the District Chief and request assistance from the Disaster Prevention and Mitigation Division of the neighboring local administrative organization or the District Disaster Prevention and Mitigation Division. Additionally, during the floods from 2016 to 2020, the municipality and the sub-district administrative organization requested support, such as water pumps and personnel, from other sub-district administrative organizations to mitigate the flood event.

**Post-Flood Phase:** The results showed that after flood disasters, Phetchaburi Municipality and Mamuang Sub-district Administrative Organization implemented post-flood management through recovery efforts, including restoration, reconstruction, rehabilitation of public utilities, and assessments and restoration of the living conditions of the affected communities to normal. During the consecutive three years of floods in the municipal area of Phetchaburi between 2016 and 2020, the municipality and the sub-district administrative organization assisted in restoring damaged roads, water supply systems, and repairing houses affected by the floods. The findings are summarized in Table 1.

**Table 1** Flood management processes of local administrative organizations in Phetchaburi, Thailand.

<b>Period</b>	<b>Flood management of local administrative organizations in Phetchaburi</b>
Pre-flood phase	<ul style="list-style-type: none"><li>■ Formulating disaster prevention and mitigation plans to develop risk prevention strategies</li><li>■ Preparing mobilization of disaster resources, personnel, evacuation plans, and early warning systems</li><li>■ Establishing temporary shelters</li><li>■ Conducting pre-flood disaster drills and mitigation</li><li>■ Urging all sectors to reduce flood risks</li></ul>
During-flood phase	<ul style="list-style-type: none"><li>■ Establishing the Disaster Prevention and Mitigation Division under local administrative organizations to assess the situation and supporting the Division</li><li>■ Monitoring, analyzing, and reporting on the situation</li></ul>
Post-flood phase	<ul style="list-style-type: none"><li>■ Restoration, reconstruction, and rehabilitation of public utilities</li><li>■ Assessments and restoration of the living conditions of the affected communities to normal</li></ul>

### **The flood management practices of local administrative organizations in Phetchaburi, Thailand**

The results found that the flood management practices of local administrative organizations in Phetchaburi, Thailand, comprised seven steps as follows: 1) Understanding the current situation, the need for risk assessment, and drawing upon historical data; 2) Assessing flood disasters; 3) Assessing exposure to flood disasters; 4) Analyzing vulnerability and capacity for flood disaster management; 5) Analyzing impacts and risk levels of flood disasters; 6) Developing risk data and guidelines for management and reduction of flood risks; and 7) Developing or improving strategies and action plans for mitigation of flood risks.

Additionally, local administrative organizations conducted risk assessment. It refers to the process of identifying the nature, magnitude, or extent of risks by analyzing the occurring hazards and evaluating the community's exposure, vulnerability, and capacity to respond to threats which could endanger lives, property, livelihoods, and the environment. It entails analyzing the probability of hazard impacts within the community to facilitate systematic risk management planning. Specifically, it focuses on the following aspects.

Flood disasters refer to events resulting from natural or human activities which can lead to a loss of life and property, as well as economic, social, and environmental impacts.

Exposure to flood disasters means that people, buildings, properties, systems, or any components are situated in high-risk areas and susceptible to the damaging effects of floods. Meanwhile, vulnerability refers to factors or conditions which render a community or society incapable of protecting itself, managing disasters, or rapidly recovering from the destructive effects. These factors have existed in the community or society long before a disaster occurs and may exacerbate the impact of the disaster.

The capacity of local administrative organizations can be defined as the ability to take action or the potential to further develop for the greater benefit of the community.

## **Conclusion and Discussion**

### **The flood management processes of local administrative organizations in Phetchaburi, Thailand**

The present study examined the flood management of Phetchaburi Municipality and Ton Mamuang Sub-district Administrative Organization. It was shown that flood management included three phases, namely pre-flood, during-flood, and post-flood.

Pre-flood management aligns with the Disaster Prevention and Mitigation Act 2007, spanning direction, control, command, and coordination at a national level through the Disaster Prevention and Mitigation Division, along with coordination with district and provincial administrative agencies. This reflects structured management and bureaucratic management in accordance with the provincial disaster prevention and mitigation plan and risk management practices in terms of disaster resources, personnel, evacuation preparation, early warnings, establishment of temporary shelters, and pre-flood disaster drills and mitigation (National Disaster Prevention and Mitigation Committee, 2024). Conversely, there is a lack of focus at the policy level and a gap in translating policies into practical mechanisms for sustainable disaster management as in the case of flood disasters in Bangkok, Thailand (Supajakwattana & Supajakwattana, 2017). Therefore, the results of this research show the model of the flood disaster management process of local administrative organizations in Phetchaburi, Thailand, which is characterized by a local government system.

During flood disasters, the response involves establishing the Disaster Prevention and Mitigation Division, providing support for the Division, monitoring, analyzing and reporting on the situation, and issuing warnings. These operational activities must adhere to the structural authority and bureaucratic systems for responding to flood events base on characteristic process of local government system (Laohawichean & Sangmahachai, 2017).

At the post-flood phase, local administrative organizations provide recovery efforts, including restoration and reconstruction. These involve restoring public utilities, livelihoods, and the living conditions of the communities to their normal state. However, the adherence to the structural authority and bureaucratic systems can result in delayed assistance. Additionally, there is community involvement in developing disaster management policies of local administrative organizations, that is a weak point of the flood disaster management process of local government organizations in Phetchaburi, Thailand (Ubalee, 2008; Un-ob *et al.*, 2022; Suttipun & Arwae, 2020).

### **The flood management practices of local administrative organizations in Phetchaburi, Thailand**

From our research find that the flood management practices of local administrative organizations in Phetchaburi, Thailand, comprises seven steps: 1) understanding the current situation, the need for risk assessment, and drawing upon historical data; 2) assessing flood disasters; 3) assessing exposure to flood disasters; 4) analyzing vulnerability and capacity for flood management; 5) analyzing impacts and risk levels of flood disasters; 6) developing risk data and guidelines for management and reduction of flood risks; and 7) developing or improving strategies and action plans for mitigation of flood risks. This is in line with the powers and duties of local administrative organizations outlined in the Determining Plan and Process of Decentralization to Local Government Organization Act 1999, Section 2 on the determination of powers and duties in public service systems, Articles 16 and 17 under the provision of Article 16. It is stipulated that Sub-district and Provincial Administrative Organizations shall have the authority and responsibility to provide public services for the benefit of local people. One aspect of these responsibilities is disaster prevention and mitigation, such as in the case of a flood disaster in Bangkok, the flood disaster management model is providing basic assistance to victims. Disaster management concept consists of 3 period managements including pre-flood, during-flood, and post-flood phases (Bangkok Metropolitan Administration, 2024). Outstanding, the 7-step model have used, the King Rama IX's Wisdom and Royal Initiative Project have been applied as well to sustainable flood disaster management of local administrative organizations in Phetchaburi, Thailand (Solgoosom & Pothisan, 2018; Phetchaburi Provincial Office, 2024a). Finally, This Phetchaburi Thailand model is a well-organized way to manage flood inundation for emergency planning and degree of risk concern to local community including solving quality of post-flood life's problems because of collaborative networks between local administrative organizations and communities.

### **Recommendations**

This study investigated the flood management of local administrative organizations in Phetchaburi. Based on the findings, further studies are needed on the capacity of local administrative organizations in managing flood disasters and community involvement in sustainable flood management.

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