

Understanding disaster mitigation in the Philippines: A review

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Abstract: The Philippines is highly vulnerable to various natural hazards due to its geographical location, highlighting the need for robust disaster mitigation strategies. This scoping review aimed to map the existing literature on disaster mitigation in the Philippines, to gain a deeper understanding of the current state of knowledge. It sought to address key research questions regarding the main themes and approaches, as well as the strengths, weaknesses, and outcomes of existing strategies. Additionally, it aimed to identify research gaps. Following a predetermined protocol and adhering to PRISMA-ScR guidelines, the review systematically searched major databases, including Scopus, Web of Science, Philippine E-Journals, and Google Scholar, ultimately synthesizing 15 studies published in English between 2015 and 2025. The findings revealed prominent themes, including Disaster Risk Reduction and Management (DRRM) practices, community preparedness, and a critical understanding of geographical vulnerability. Emerging themes included social entrepreneurship in disaster recovery, the impact of disasters on poverty, and the preservation of cultural heritage. Analysis of the mitigation strategies showed strengths in robust policy frameworks and community-based approaches. However, it also highlighted weaknesses, such as understaffed local Disaster Risk Reduction and Management (DRRM) councils, challenges in supervision, and a lack of operational testing for preparedness plans. Key research gaps identified include the need for a deeper understanding of community resilience, socio-ecological systems, and barriers to information sharing. Furthermore, the review underscored the critical need for rigorous evaluations of local government preparedness, a broader examination of institutional challenges, and studies on the long-term impacts of climate change on vulnerability. This scoping review emphasizes the necessity for sustained, evidence-based efforts to build a more resilient Philippines. It recommends increased investment in local capacity, strengthened policy implementation and evaluation, prioritized research, and comprehensive governance reforms.

Keywords: Disaster mitigation, Philippines, Scoping Review, Resilience

Date Submitted: May 16, 2025
Date Accepted: May 28, 2025
Date Published: June 6, 2025

INTRODUCTION

The Philippines, an archipelago situated within the Pacific Ring of Fire and the typhoon belt, faces numerous natural hazards, making disaster mitigation a paramount concern (Lo, 2009). The nation's geographical context significantly contributes to its vulnerability, with frequent typhoons triggering landslides and widespread flooding (Mascariñas et al., 2013). Furthermore, the Philippines is seismically active, experiencing numerous earthquakes daily, increasing the risk of high-magnitude events (Calumba et al., 2021). The convergence of the Eurasian and Pacific tectonic plates heightens susceptibility to seismic activities (Calumba et al., 2021). The archipelago's location makes it vulnerable to natural hazards such as earthquakes and soil liquefaction (Concha, 2020). These geological realities underscore the urgency for effective disaster mitigation strategies to protect lives, infrastructure, and socioeconomic stability.

Disaster mitigation encompasses a wide array of measures aimed at reducing the impact of natural hazards, including structural interventions, land-use planning, community-based preparedness programs, and policy frameworks (Vicario-Merino et al., 2019). These efforts are crucial for minimizing the devastating consequences of disasters, particularly in a developing nation like the Philippines, where resources are often constrained and vulnerable populations are disproportionately affected (Mörchen et al., 2020). A comprehensive approach to disaster mitigation necessitates a thorough understanding of local contexts, vulnerabilities, and capacities, as well as the integration of scientific knowledge, traditional practices, and community engagement. Effective coordination and information sharing are essential for responding to disasters (Ado, 2015). Such preparation can reduce future damages, but can also lack testing to assess their effectiveness in operation (Dariagan et al., 2020). Ultimately, investments in disaster mitigation are crucial for building resilience and promoting sustainable development in the face of growing environmental risks.

Problem Statement

This scoping review aims to map the existing literature on disaster mitigation in the Philippines to gain a deeper understanding of the current state of knowledge. Specifically, the review seeks to answer the following research questions:

1. What are the main themes and approaches in the literature on disaster mitigation in the Philippines?
2. What are these mitigation strategies' reported strengths, weaknesses, and outcomes?
3. What are the key gaps in the research on disaster mitigation in the Philippines?

METHODOLOGY

The scoping review on disaster mitigation in the Philippines was conducted following a predetermined research protocol to ensure systematic rigor and transparency, as outlined by Tricco et al. (2018). This protocol guided every phase of the review — from formulating the research questions to interpreting findings — and any significant deviations from the original plan were carefully documented. To reinforce the reliability and validity of its conclusions, the review adhered to the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-

Analyses extension for Scoping Reviews) guidelines (Lee & Gambiza, 2022), ensuring a structured and comprehensive reporting standard.

Using a PCC (population, concept, context) framework (Munn et al., 2018), the review focused on studies published in English between 2015 and 2025, drawing from both peer-reviewed and gray literature, including government and NGO reports. The population targeted included any group in the Philippines involved in or affected by disaster mitigation, explicitly excluding studies that did not address human populations or were conducted outside the Philippines. The concept centered on disaster mitigation — encompassing prevention, preparedness, risk reduction, early warning systems, land-use planning, and climate change adaptation integrated with disaster risk reduction (DRR) — while studies focusing solely on disaster response or recovery were excluded. The context was strictly limited to the Philippines, excluding global studies without direct Philippine relevance.

The search strategy involved a comprehensive and systematic search across multiple electronic databases such as Scopus, Web of Science, Philippine E-Journals, and Google Scholar, complemented by consultations with government and organizational websites (Moradpour et al., 2025). Keywords and search terms were carefully selected to cover hazards, mitigation actions, and the Philippine context, using combinations like: (“disaster*” OR “hazard*” OR “typhoon*” OR “climate change impacts”) AND (“mitigate*” OR “resilience*” OR “DRRM” OR “early warning system*” OR “land-use planning”) AND (“Philippines” OR “Philippine”). The review prioritized the most recent and significant studies, limiting inclusion to English-language publications and supplementing the search with reference list checks and citation tracking to enhance coverage.

The data extraction process was guided by the review’s research questions and the key thematic areas emerging from the literature. Preliminary searches helped define a structured extraction approach focusing on three main areas: (1) specific disaster mitigation strategies or interventions, including community-based initiatives, policy frameworks, and technological solutions; (2) reported strengths, weaknesses, outcomes, and effectiveness of these strategies, as well as the barriers and facilitators identified; and (3) future research directions, emerging trends, and gaps in the existing literature. Extracted data were meticulously double-checked for accuracy and consistency, then organized into thematic clusters detailed in the results section, ensuring a thorough and coherent synthesis of the diverse sources included in the review.

DISCUSSION OF FINDINGS

This scoping review mapped the existing literature on disaster mitigation in the Philippines, providing a deeper understanding of the current state of knowledge. It identified key themes and approaches, evaluated the reported strengths and weaknesses of mitigation strategies, and highlighted research gaps. The findings from the synthesized literature offer critical insights into the multifaceted challenges and opportunities in disaster risk reduction within one of the world's most hazard-prone archipelagos.

The review revealed that literature on disaster mitigation in the Philippines prominently featured Disaster Risk Reduction and Management (DRRM) practices as a central theme, highlighting ongoing efforts to enhance preparedness, response, and recovery (Orenia & Cabonero, 2023; Sumbillo, Jr. & Madrigal, 2020). This focus extended to Community Preparedness and Awareness, with research often emphasizing the continuous need for improvement in local readiness despite positive engagement through information dissemination via channels such as television (Geronimo & Gonzaga, 2016).

The Philippines' inherent Vulnerability and Geographical Context consistently emerged as a fundamental aspect, underscoring the necessity of understanding the nation's unique risk profile for effective mitigation efforts (Maminta, 2019; Chua, 2015). Additionally, emerging themes such as the role of Social Entrepreneurship in Disaster Recovery (Chandra & Paras, 2021) and the complex relationship between Disasters and Poverty (Lee & Tang, 2019), along with Cultural Heritage Preservation (Florentin et al., 2021), indicated an expanding scope of inquiry in the field. These diverse themes collectively emphasized the dynamic and evolving understanding of disaster mitigation strategies being explored within the Philippine context, directly addressing Research Question 1.

A nuanced understanding emerged in evaluating the strengths, weaknesses, and outcomes of the mitigation strategies (Research Question 2). One significant strength was the comprehensive policy framework established by the Philippine Disaster Risk Reduction and Management Act of 2010, which supported robust policies and enabled multilevel prevention efforts (Alcayna, Bollettino, Dy, & Vinck, 2016; Merino et al., 2019). However, this strong policy foundation was often undermined by critical challenges in implementation, such as understaffed or unprofessional local Disaster Risk Reduction and Management (DRRM) councils and difficulties in national oversight (Alcayna, Bollettino, Dy, & Vinck, 2016). Although preparedness plans aimed to reduce future damages, their effectiveness was frequently compromised by a lack of testing in real operational settings (Dariagan, Atando, & Asis, 2021). The significant benefits of Community-Based Disaster Risk Management (CBDRM) were consistently highlighted, as it empowered local communities and enhanced their capacity for resilience (Shaw & Rouhban, 2020). Despite the increasing autonomy granted to Local Government Units (LGUs) through the Local Government Code, which improved funding and responsiveness for local projects, the Philippines remained highly vulnerable to various hazards. This indicates a persistent gap between policy intentions and actual outcomes (Dariagan, Atando, & Asis, 2021).

The identified research gaps (Research Question 3) underscore important areas for future academic and practical investigation. There is a clear and urgent need for further research to understand better community resilience (Alcayna, Bollettino, Dy, & Vinck, 2016). Additionally, existing literature emphasizes the need for more socio-ecological systems studies, specifically examining how climate change affects environmental and social dynamics, particularly for vulnerable groups such as informal settlers (Alcayna, Bollettino, Dy, & Vinck, 2016). Another significant challenge that requires dedicated research is addressing the organizational and technical barriers that hinder effective information sharing and coordination during disaster response (Ado, Escobar, & Masbate, 2015). Moreover, a critical gap exists in comprehensively evaluating local government preparedness and mitigation strategies. Current research often overlooks broader institutional and governance issues, such as resource management and accountability, that can complicate effective disaster mitigation (Domingo & Manejar, 2018). Ultimately, future studies should focus specifically on investigating the long-term impacts of climate change on vulnerability and resilience, particularly given the increasing frequency and intensity of natural disasters (Lee & Tang, 2023).

CONCLUSION

This scoping review successfully mapped the existing literature on disaster mitigation in the Philippines, thus providing a deeper understanding of the current state of knowledge in this critical field. The review offered comprehensive answers to its three guiding research questions by systematically synthesizing a diverse body of studies.

Firstly, the review clarified the main themes and approaches prevalent in the disaster mitigation literature of the Philippines. It highlighted the predominant focus on comprehensive Disaster Risk Reduction and Management (DRRM) practices, the crucial role of community preparedness and awareness, and the essential understanding of the country's unique geographical vulnerabilities. Additionally, emerging themes such as social entrepreneurship in recovery, the impact of disasters on poverty, and the preservation of cultural heritage indicated a broadening scope of inquiry.

Secondly, the review systematically identified the reported strengths, weaknesses, and outcomes of various mitigation strategies. It recognized the importance of a robust national policy framework (RA 10121) and the empowering nature of community-based approaches. However, it also exposed significant implementation weaknesses, particularly regarding local councils' understaffing, supervision challenges, and a pervasive lack of testing for preparedness plans. This dual understanding of policy ambition versus implementation reality highlighted the complexities involved in effective disaster mitigation.

Finally, the review effectively outlined the key gaps in existing research on disaster mitigation in the Philippines. Significant gaps included the need for deeper investigations into community resilience, comprehensive studies on socio-ecological systems and their impacts from climate change, and empirical research addressing organizational and technical obstacles to information sharing. Notably, the review emphasized the urgent need for rigorous evaluations of local government preparedness, a broader examination of institutional and governance challenges, and the long-term impacts of climate change on vulnerability and resilience.

In fulfilling its objectives, this scoping review provided a structured overview of the disaster mitigation landscape in the Philippines. It synthesized past and current efforts while illuminating pathways for future research and strategic public administration interventions. The insights gained underscore the necessity for continued, evidence-based efforts to build a more resilient Philippines in the face of escalating natural hazards.

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