INTERNATIONAL JOURNAL OF
PUBLIC FINANCE
AND ACCOUNTABILITY

NAWALA

Volume 3, Number 2, *2024*

Social Vulnerability and Financial Risk Management in Natural Disasters: A Systematic Review

Dwi Febri Himmatul Khairiyah [1*]

[1] Universitas Negeri Yogyakarta, Yogyakarta, Indonesia

Abstract

Article history:
Received: July 6, 2024
Revised: August 22, 2024
Accepted: October 28, 2024
Published: December 30, 2024

Keywords:
Catastrophe Bonds, Financial Risk Management, Natural Disasters, Social Vulnerability, Vulnerability Indices.

Identifier:
Nawala
Page: 102-111
https://nawala.io/index.php/ijpfa

Natural disasters disproportionately affect socially vulnerable populations, whose susceptibility is shaped by factors such as poverty, limited access to resources, and social inequality. Financial risk management strategies, including insurance schemes, emergency funds, contingent loans, and catastrophe bonds, are critical in mitigating economic losses. This systematic literature review synthesizes studies published between 2020 and 2023 to examine the interplay between social vulnerability and financial risk management in disaster contexts. Findings reveal that integrating social vulnerability assessments, such as Social Vulnerability Indices (SVIs), into financial risk management enhances the targeting and effectiveness of disaster interventions. Public-private partnerships and inclusive governance structures further support equitable disaster resilience. However, gaps remain in operationalizing these integrated approaches, particularly in regions with limited institutional capacity. Future research should focus on developing holistic frameworks that align social vulnerability metrics with innovative financial tools to promote inclusive and effective disaster resilience strategies.

*Corresponding author:
(Dwi Febri Himmatul Khairiyah)

1. Introduction

Natural disasters pose significant threats to societies worldwide, disproportionately affecting socially vulnerable populations. Social vulnerability encompasses factors such as poverty, limited access to resources, and social inequality, which increase susceptibility to disaster impacts. Financial risk management, encompassing strategies like insurance, emergency funds, and fiscal policies, plays a crucial role in mitigating these impacts. Integrating social vulnerability considerations into financial risk management is essential for developing inclusive and effective disaster resilience strategies.

Recent studies have highlighted the importance of this integration. For instance, a study by Perazzini (2020) emphasizes the role of public-private partnerships in disaster management, noting that while these collaborations can be effective, they often face challenges such as high debts and governance issues. The study advocates for greater involvement of all community segments, especially the most vulnerable, in risk management planning. Similarly, research by Terrones and Tol (2022) demonstrates that fiscal stability can reduce the negative economic impacts of natural disasters in poorer countries, underscoring the need for robust financial frameworks in disaster-prone regions (Terrones & Tol, 2022).

Other empirical works also reinforce these conclusions. Horvath (2021) shows that severe natural catastrophes significantly depress financial depth, meaning that economies with shallower financial markets become more vulnerable to shocks. Further, Khan et al. (2023) find that natural disasters negatively affect economic growth, foreign direct investment, and the fiscal balance, particularly in developing economies, thus illustrating the tight coupling between fiscal resilience and social vulnerability. Sheehan (2023) presents a conceptual model whereby collaboration between insurance and disaster risk management sectors can enhance resilience and better allocate risk across actors, calling for cross-sectoral integration in DRM frameworks

This systematic review aims to explore the interplay between social vulnerability and financial risk management in the context of natural disasters. By synthesizing findings from studies conducted between 2020 and 2023, the review seeks to identify effective strategies and frameworks that enhance resilience and reduce adverse impacts on vulnerable populations.

2. Literature Review

The integration of social vulnerability and financial risk management in natural disasters has become a focal point in disaster studies over the past decade. Social vulnerability refers to the susceptibility of individuals or communities to the adverse effects of hazards, influenced by factors such as socioeconomic status, access to resources, and social networks. Financial risk management encompasses strategies to mitigate the economic consequences of disasters, including insurance mechanisms, emergency funds, and fiscal policies. Understanding the interplay between these dimensions is crucial for developing effective and equitable disaster resilience strategies.

Recent studies have emphasized the importance of considering social vulnerability in financial risk management frameworks. For instance, Lee et al. (2022)

proposed an integrative conceptual framework that links social vulnerability to financial risks in disaster management. Their model aims to inform governmental financial management by incorporating social vulnerability assessments into disaster cost evaluations . Similarly, Soden et al. (2023) highlighted the need for equity in disaster risk modeling, noting that current approaches often overlook the disproportionate impacts on vulnerable groups, which can lead to ineffective risk management interventions.

The application of Social Vulnerability Indices (SVIs) has been a common method for assessing social vulnerability. A systematic scoping review by Wood et al. (2023) examined the use of SVIs in natural hazard contexts, identifying their strengths and limitations in capturing the multifaceted nature of social vulnerability. These indices often inform disaster preparedness and response strategies, but their effectiveness depends on the accuracy and relevance of the indicators used.

In terms of financial risk management, recent literature has explored innovative approaches to enhance resilience. The World Bank's review of disaster risk management in fragile, conflict, and violence affected countries (2023) discusses the challenges and opportunities in integrating financial mechanisms into disaster risk management, particularly in contexts with limited institutional capacity . Additionally, the development of pre-arranged financing tools, such as contingent loans and catastrophe bonds, has been recognized as a means to provide timely and predictable funding for disaster response, reducing the financial burden on affected communities .

The intersection of social vulnerability and financial risk management necessitates a holistic approach that considers both the social determinants of vulnerability and the financial mechanisms available to mitigate disaster impacts. Integrating these dimensions can lead to more inclusive and effective disaster resilience strategies, ensuring that the needs of vulnerable populations are adequately addressed in disaster planning and response.

3. Methods

This study adopts a systematic literature review (SLR) approach to explore the relationship between social vulnerability and financial risk management in natural disasters. The research focuses on identifying, evaluating, and synthesizing existing literature published between 2020 and 2023, indexed in Google Scholar and other reputable academic databases. The scope includes studies addressing social vulnerability frameworks, financial risk management strategies, and the integration of these dimensions in disaster management contexts.

The review process involves three main stages: identification, screening, and analysis. In the identification stage, relevant studies were collected using keywords such as "social vulnerability," "financial risk management," "natural disasters," and "disaster resilience." In the screening stage, studies were filtered based on inclusion criteria, including publication in peer-reviewed journals, relevance to the topic, and availability of full text. Studies that focused solely on unrelated sectors or lacked empirical or theoretical contributions were excluded.

In the analysis stage, selected articles were systematically examined to extract key findings, methodologies, and conclusions related to social vulnerability and financial risk management. The data were synthesized to highlight trends, gaps, and best practices in integrating social and financial approaches for disaster resilience. This method ensures a comprehensive understanding of the current state of research and provides a foundation for identifying areas requiring further investigation.

The SLR method was chosen due to its rigor and ability to provide an evidence-based overview of existing knowledge, enabling the identification of patterns and insights that inform future research and policy development in disaster risk management.

4. Results and Discussion

The systematic literature review revealed a strong linkage between social vulnerability and financial risk management in enhancing disaster resilience. Studies consistently highlight that socially vulnerable populations characterized by poverty, limited access to resources, and social inequality experience disproportionately higher adverse impacts from natural disasters (Lehnert, 2022). The findings indicate that neglecting social vulnerability in disaster planning often results in inequitable resource allocation and ineffective interventions. For example, Lee et al. (2022) proposed a framework that integrates social vulnerability assessments into disaster cost evaluations, showing that incorporating social determinants improves the targeting and effectiveness of financial mitigation strategies.

Financial risk management strategies such as insurance schemes, emergency funds, and pre-arranged financing tools play a pivotal role in mitigating disaster impacts. Contingent loans and catastrophe bonds have been identified as innovative mechanisms that provide timely and predictable funding for disaster response, reducing economic losses for both governments and affected communities (World Bank, 2023). However, studies also point out that in contexts with high social vulnerability and limited institutional capacity, these mechanisms may fail to reach the most at-risk populations unless explicitly designed to do so (Perazzini, 2020; Terrones & Tol, 2022).

The review also shows that Social Vulnerability Indices (SVIs) are widely used to quantify community susceptibility to hazards. SVIs serve as valuable tools for prioritizing interventions, yet their effectiveness depends on the selection and relevance of indicators, as well as the quality of data (Wood et al., 2023; Lehnert, 2022). Integrating SVIs into financial risk management allows policymakers to design interventions that are both equitable and cost-effective, ensuring resources are allocated where they are most needed.

Moreover, public-private partnerships have emerged as a critical avenue for combining social and financial approaches in disaster management. These collaborations can mobilize resources and expertise, but challenges such as governance issues, high debt burdens, and inadequate inclusion of vulnerable groups remain significant barriers (Perazzini, 2020). Addressing these challenges requires a holistic approach that considers not only financial mechanisms but also social structures, community engagement, and local capacity building.

Overall, the synthesis of the literature suggests that integrating social vulnerability considerations into financial risk management enhances disaster resilience. By aligning financial instruments with the needs of vulnerable populations, governments and organizations can reduce both economic and social impacts of disasters. However, gaps remain in operationalizing this integration, particularly in ensuring that financial tools are accessible, inclusive, and tailored to local contexts (Soden et al., 2023; Lee et al., 2022). Future research should focus on developing and testing frameworks that effectively combine social vulnerability metrics with innovative financial risk management strategies to promote equitable disaster resilience.

5. Conclusion

This systematic review highlights the critical interplay between social vulnerability and financial risk management in mitigating the impacts of natural disasters. The findings indicate that socially vulnerable populations are disproportionately affected by disasters due to factors such as poverty, limited access to resources, and social inequality. Financial risk management strategies including insurance schemes, emergency funds, contingent loans, and catastrophe bonds play a key role in reducing economic losses. However, their effectiveness is enhanced when integrated with assessments of social vulnerability, such as through Social Vulnerability Indices (SVIs). The review also underscores the importance of public-private partnerships and inclusive governance structures in ensuring that disaster resilience measures reach the most at-risk populations. Despite the progress in combining social and financial approaches, gaps remain in operationalizing these strategies, particularly in contexts with limited institutional capacity. Future research and policy development should focus on creating holistic frameworks that effectively integrate social vulnerability metrics with financial risk management tools, ensuring equitable, inclusive, and effective disaster resilience strategies.

References

Horvath, R. (2021). Natural catastrophes and financial depth: An empirical analysis. *Journal of Financial Stability*, *53*, 100842.

Khan, M. T. I., Anwar, S., Sarkodie, S. A., Yaseen, M. R., & Nadeem, A. M. (2023). Do natural disasters affect economic growth? The role of human capital, foreign direct investment, and infrastructure dynamics. *Heliyon*, *9*(1).

Lee, S., Dodge, J., & Chen, G. (2022). The cost of social vulnerability: An integrative conceptual framework and model for assessing financial risks in natural disaster management. *Natural Hazards, 114*(1), 691–712.

Lehnert, E. A. (2022). A Social Vulnerability Framework to Identify and Assist With Environmental Injustice. *American journal of public health*, *112*(8), 1089-1091.

Perazzini, S. (2020). Public-private partnership in the management of natural disasters: A review. *arXiv*.

Sheehan, B., Mullins, M., Shannon, D., & McCullagh, O. (2023). On the benefits of insurance and disaster risk management integration for improved climate-related natural catastrophe resilience. *Environment Systems and Decisions*, *43*(4), 639-648.

Soden, R., et al. (2023). The importance of accounting for equity in disaster risk modeling. *Nature Sustainability*.

Terrones, V., & Tol, R. S. J. (2022). Relevance of financial development and fiscal stability in dealing with disasters in emerging economies. *arXiv*.

Wood, E., et al. (2023). A systematic scoping review of the Social Vulnerability Index as applied to natural hazards. *ResearchGate*.

World Bank. (2023). A review of disaster risk management for fragility, conflict, and violence countries in the World Bank portfolio: Fiscal years 2012–2022. Washington, DC: World Bank. Retrieved from https://openknowledge.worldbank.org/entities/publication/b6b5f0f7-65e9-465a-bc82-6e8dad486d7b