Ianna Journal of Interdisciplinary Studies, Volume 7 Issue 1, January 2025 DOI: https://doi.org/10.5281/zenodo.14523524
EISSN: 2735-9891

The Role of Community and Industry in Disaster Prevention and Management: A Systematic Review

Indra Saktia Octaviana*
ORCID ID: https://orcid.org/0009-0002-7098-1900

Yuki Mahardhito Adhitya Wardhana
ORCID ID: https://orcid.org/0009-0006-0810-0905

Udi Syahnoedi Hamzah
ORCID ID: https://orcid.org/0009-0007-4561-200X

School of Environmental Science, University of Indonesia, Jakarta, 10430, Indonesia
*Corresponding author email: indra.saktia@yahoo.com

Abstract

Background: Natural and technological disasters cause significant societal and economic harm, making effective disaster prevention and management essential. Communities and industries are key actors, each contributing unique resources and knowledge to enhance resilience and mitigate disaster impacts.
Objectives: This study examined the role of community and industry in disaster prevention and management. It analysed how collaboration between these segments advances readiness, reaction, and flexibility and investigated procedures to reinforce future fiasco administration approaches**.**
Methodology: This study is a systematic review conducted using the PICO (Patient, Problem, or Population; Intervention; Comparison, Control, or Comparator; and Outcomes) framework that analyses literature sourced from the SCOPUS database. The investigation centres on assessing the unmistakable and shared parts of communities and industries in the fiasco disaster.
Results: Industries contribute by identifying risks, supplying resources, and managing disruptions, while communities enhance resilience through local knowledge, social networks, and active involvement in response efforts. Effective disaster management is achieved through coordinated efforts supported by government policies, which bridge industrial and community capabilities.
Unique Contribution: The study presents a system where community and industry collaboration is seen as central to building a stronger and more versatile disaster management show. It highlights the virtual stages' role in advancing information trade between partners.
Conclusion: Successful disaster management relies on the cooperation between industries, communities, and governments. This study demonstrates how their combined efforts can strengthen preparedness and reduce disaster impacts.
Key Recommendation: Future research should centre on creating collaborative procedures and leveraging innovation to upgrade disaster management associations between industries and communities, particularly in the face of expanding disaster complexity.
Keywords: Disaster Risk Management, Community Involvement, Industrial Participation, Public-Private Collaboration, Urban Community

Introduction

Common and technological calamities frequently cause noteworthy harm to society and the economy, making calamity avoidance and anticipation endeavours a worldwide need. Neighbourhood communities and industry have an awfully vital part in both of these endeavours, considering that their inclusion can speed up recuperation and diminish the negative impacts of catastrophes (Coppola, 2020). Past thinks about have appeared that compelling collaboration between communities and industry can increment crisis reaction capacity and construct more grounded strength (Tierney, 2014). Hence, understanding the part of each of these substances is exceptionally imperative to reinforce future calamity administration procedures (Alexander, 2015).

Neighbourhood communities are regularly on the front lines when fiascos strike, as they are the primary ones to feel the coordinated effect. Community association in arranging and executing catastrophe moderation can increment community mindfulness and readiness (Aldrich, 2012). For occurrence, building up Virtual Communities of Hone (VCoPs) empowers different partners to trade information and encounters, subsequently improving reaction and recuperation endeavours (Wenger, 1998). Dynamic community interest can moreover offer assistance in recognising neighbourhood needs and actualising more significant and successful arrangements (Norris et al., 2008).

Also, catastrophe administration frequently requires extraordinary thought for at-risk populations in society, such as senior citizens, children, and people with inabilities. Including them in each arranging can guarantee that their needs are met, and they are not ignored (Peek & Stough, 2010). Inquire that wide interest from different bunches in society can essentially increment the usage of danger relief procedures (Stevens et al., 2010). For instance, research by Stevens et al. (2010) identified a strong correlation between the degree of community involvement and the success of disaster mitigation efforts across different locations in the United States.

On the other hand, the industry has the assets and capacity to back large-scale fiasco avoidance and administration endeavours. The part of industry has advanced from being considered a source of hazard to being a key accomplice in hazard administration (Cutter et al., 2003). Companies can oversee dangers autonomously and mobilise the assets required to overcome the impacts of fiascos (Haigh & Amaratunga, 2010). For illustration, Companies locked in within the administration of enormous systems, such as those in vitality and transportation or the fabricating of products and administrations, are presently respected as fundamental accomplices in chance administration (Tierney & Bruneau, 2007).

Collaboration between the open and private segments is basic for compelling fiasco anticipation and management (Xiaoxin et al., 2024). Recognising the significance of this collaboration, governments worldwide have energised public-private associations in fiasco administration (Waugh & Streib, 2006). For example, the Federal Emergency Management Agency (FEMA) in the United States has created a private-sector division to foster and support these partnerships (Kapucu, 2006). The division of small and medium-sized undertakings inside Japan's national organisation for catastrophe anticipation and moderation points to empower industry support in fiasco administration (Shaw & Goda, 2004).

Moreover, communities are fundamental in recording and assessing the societal impacts of catastrophes. In this case, the utilisation of daily neighbourhood papers to record fiasco occasions and community reactions can provide profitable bits of knowledge about the social effect and effectiveness of help endeavours (Rodriguez et al., 2007). The increasing documentation over

time shows that the role of communities in identifying and responding to natural disasters is increasingly crucial (Lindell & Perry, 2004). This helps build an archive of experiences that can be used to improve future disaster management strategies (Tierney et al., 2001).

Inside the system of adjusting and relieving climate change, the association of communities is basic. Community cooperation in natural preservation endeavours, such as improving mangrove timberlands and shield belts in cyclone-prone zones, is exceptionally supportive in lessening catastrophe dangers. This exertion not as it secures the environment but moreover increments community strength to common fiascos. Community inclusion in natural preservation appears to be a social move from simple help to avoidance and readiness (Cutter et al., 2008).

In the interim, the industry is significant in maintaining supply chain coherence both amid and after fiascos. Companies are frequently dependable for reestablishing key administrations such as water supply, power, and fundamental goods. The industry's capacity to reply rapidly to these disturbances is essential to maintaining social and financial solidity (Tierney & Bruneau, 2007). Successfully reestablishing service promptly benefits society and safeguards the interests of suppliers, customers, workers, shareholders, and employees.

In conclusion, community and industry associations in catastrophe anticipation and administration are key to viable calamity administration. These two substances bring distinctive but complementary assets, information and abilities to improve crisis reaction capacity and construct more grounded versatility (Coppola, 2020). Great collaboration between communities and industry, bolstered by government arrangements and systems, can deliver more proficient and successful catastrophe administration methodologies (Kapucu, 2006). Thus, understanding and maximising the role of communities and industry is very important to minimise the impact of future disasters.

Objective of the Study

This study examined the roles of communities and industries in disaster prevention and management. Specifically, it aimed to investigate how these two entities contribute to preventing and mitigating disaster impacts and how their collaboration can improve disaster management strategies.

Methods

Research Questions

This study is a systematic review that utilised the PICO framework developed by the National Institute for Health and Clinical Excellence to help outline the research questions. The acronym PICO stands for P (Patient, Problem, or Population), I (Intervention), C (Comparison, Control, or Comparator), and O (Outcomes) (García-Feijoo et al., 2020; Schardt et al., 2007).

Using the PICO framework, the research questions formulated are: What is the role (intervention) of the community and industry (population) in efforts to prevent and manage disasters (outcome)? This study aims to explore the contributions of communities and industries in disaster prevention and management.

Search Strategy

Studies on community and industrial disasters published in international scientific journals without a publication time constraint were considered for this systematic review. Based on this, as

well as the author's limited funding sources, the database used as a source of analysis was SCOPUS.

The articles to be analysed were searched using several keywords as follows: "Community Based Disaster Management", "Industrial", "Disaster", "Enterprise", "Urban Community", "Technological", "Failure", "Area", "Capacity", and "Capability". To make the search more focused, these terms were concatenated. Publications that align with the search parameters set by the database and meet the criteria based on these terms in the title, keywords, and/or abstract were also included. The search keywords used are listed in **Table 1.**

Table 1. Search Keywords

Search Keywords	SCOPUS
• Community based disaster management AND ○ Industrial AND disaster ○ Enterprise AND urban community ○ Technological AND failure ○ Industrial AND area ○ Industrial AND capacity AND capability	TITLE ABSTRACT KEYWORD

Inclusion and Exclusion Criteria

In this study, we initially focused on search results in articles and papers, excluding books, book chapters, conference reviews, errata, and reviews. Next, we excluded articles unrelated to the role of industry and community. The data extraction and analysis method included documents satisfying each stage's inclusion criteria. Thirteen documents were found to be compliant.

Selection/Trial Flow Process

Based on the search results in the designated database and after removing articles that had repetitive variants of the search terms, 110 articles and papers were found in the first search to be examined. The flow diagram showing the article selection process can be seen in **Figure 1**.

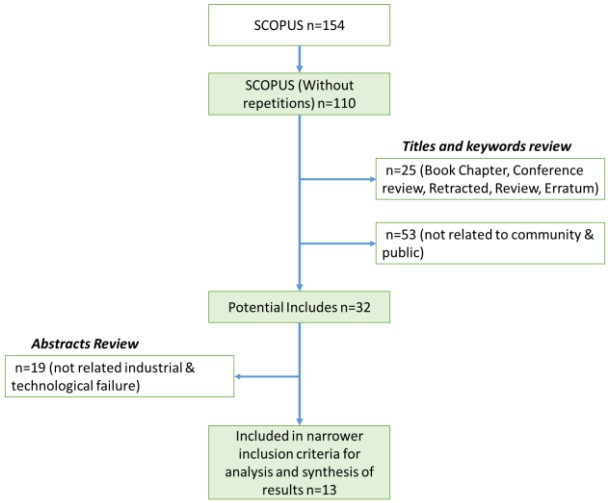

Figure 1. Articles Selection Flow Process

In the initial phase, the titles and keywords of each publication were reviewed to evaluate whether they belonged to the appropriate document category and were relevant to the community's implementation of crisis management. First, the screening findings from the first exclusion criteria led to the elimination of 25 documents; second, the application of the second exclusion criteria resulted in the elimination of 53 documents. This left 32 documents in phase two. At this stage, abstracts from the remaining documents were reviewed to determine whether they had any connection to industry or technological failure. In this phase, 19 documents were eliminated, leaving 13 documents for further analysis and synthesis.

Quality Review

The selected articles were assessed for quality using ten questions put forward by the Joanna Briggs Institute (JBI) for systematic reviews (Lockwood et al., 2015). **Table 2** presents the evaluation results from the 13 articles.

Table 2 Quality of Selected Articles

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Qureshi, Butt, and Khan (2006)	-	-	-	-	-	No	No	-	-	-
Kourakata (2011)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	-	Yes
Howe (2011)	Yes	Yes	Yes	Yes	Yes	No	No	-	-	Yes
Khazai, Merz, Schulz, and Borst (2013)	Yes	Yes	Yes	Yes	Yes	No	No	-	-	Yes
Steyer and Gilbert (2013)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	-	Yes
Gimenez, Hernantes, Labaka, Sarriegi, and Laugé (2014)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	-	Yes
Sansom, Berke, McDonald, Shipp, and Horney (2016)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	-	Yes
McKnight and Linnenluecke (2016)	-	-	-	-	-	No	No	-	-	-
Raska and Dubisar (2017)	Yes	Yes	Yes	Yes	Yes	Yes	No	-	-	Yes
Zhang, Hu, Li, and Pradhan (2018)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	-	Yes
Lee, Park, Lee, and Ham (2020)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	-	Yes
Kong and Sun (2021)	-	-	-	-	-	No	No	-	-	-
Vishwakarma, Godara, Soni, and Lal (2024)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	-	Yes

Q1: Does the research approach align with the philosophical perspective?; **Q2:** Are the research questions or objectives consistent with the chosen research methodology?; **Q3:** Do the techniques employed for data collection and research approach align?; **Q4:** Do data representation, analysis, and research methods align with each other?; **Q5:** Do the methods and interpretation of the research align; **Q6:** Do any of the statements place the researcher within a theoretical or cultural framework?; **Q7:** Is there a discussion about how the researcher influences the study or how the study impacts the researcher?; **Q8:** Does the study adequately represent the participants and their viewpoints?; **Q9:** Does the research comply with current ethical standards, and is there documentation of approval from a relevant ethics committee or authority for recent studies?**; Q10:** Are the conclusions in the research report based on an interpretation of the data or on its analysis?

Results

To facilitate the study analysis, the researcher created an analytical chart to compile essential details from the chosen articles. This chart contains research descriptors (such as origin, author, and year of publication), methodology (including study characteristics and design), type of

intervention (activities associated with community preparedness), and the conclusions of each study (effects on the community and industry, identified issues, challenges, and recommendations).

Study Descriptor

All 13 articles reviewed were written in English. Regarding the date of publication, it was found that there were no documents published in the same year, namely one article each published in 2006, 2011, 2012, 2014, 2016, 2017, 2018, 2020, 2021, and 2024 and no there were articles published in 2007, 2008, 2009, 2010, 2013, 2015, 2019, 2022, and 2023 (**Figure 2**).

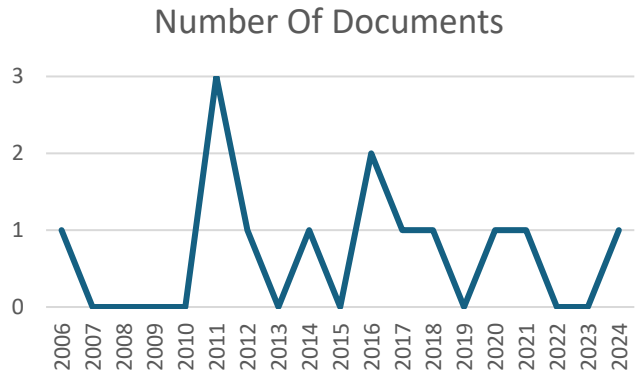

Figure 2. Year of Publication

The authors' affiliations are diverse, as illustrated in Table 3a. One article each was authored by researchers from educational institutions in Japan, China, India, and Spain. Additionally, one study resulted from a collaboration between researchers in Canada and Australia. As for journal publications, the 13 articles were published in 13 different journals, as indicated in **Table 3b**.

Table 3. Authors Affiliation and Journal Publication

Document	Authors Country	Journal
(Qureshi et al., 2006)	Pakistan	Proceeding
(Howe, 2011)	USA	Global Environmental Change Journal
(Kourakata, 2011)	Japan	Studies in Regional Science Journal
(Khazai et al., 2013)	Germany	Natural Hazards Journal
(Steyer & Gilbert, 2013)	France	Sociology of Health & Illness Journal
(Gimenez et al., 2014)	Spain	Proceeding
(Sansom et al., 2016)	USA	Environmental Research and Public Health Journal
(McKnight & Linnenluecke, 2016)	Canada & Australia	Organization & Environment Journal
(Raška & Dubišar, 2017)	Czech Republic	Moravian Geographical Report Journal
(Zhang et al., 2018)	China & Nepal	Land Use Policy Journal
(Lee et al., 2020)	USA & South Korea	Journal of Management in Engineering
(Kong & Sun, 2021)	China	Sustainability (Switzerland) Journal
(Vishwakarma et al., 2024)	India	Community Practitioner Journal
	(a)	(b)

Methodology

Among the 13 studies examined, 3 employed a descriptive, general reflection, or theoretical approach; 8 utilized qualitative and quantitative methods through primary data collection; and 2 adopted a content analysis approach. Details regarding the type of article and the methodologies used are presented in **Table 4**.

Table 4. Article Type and Methodology Used

Authorship	Article Type*			Explanation of the Method
	A	B	C	
Qureshi, Butt, and Khan (2006)	X			This study uses a theoretical approach to relate the role of GIS in relation to Disaster Management
Kourakata (2011)		X		This study employs a case study approach to gather detailed information on the specific actions taken by companies in Ojiya during and after the Chuetsu earthquake to resume normal operations. This method was selected for its ability to capture diverse company actions, including recovery procedures, external assistance received, and the prioritization of facilities or institutions for public sector support.
Howe (2011)		X		The study utilized a survey to collect information on risk perception, beliefs about climate change, firm characteristics, precautionary actions, and demographic details of the respondents. The survey was sent via email to 1,118 individuals, achieving a 22.5% response rate. The survey included 35 questions covering 106 different items.
Khazai, Merz, Schulz, and Borst (2011)	X			The research employs the DEMATEL (Decision Making Trial and Evaluation Laboratory) method to evaluate the structural interdependencies among various sub-indicators within the analysed systems. This approach uncovers complex cause-and-effect relationships using digraphs and depends on expert input to develop a direct influence matrix. This matrix determines the dependence weights of each indicator, which are then combined with importance weights provided by experts to calculate an overall weight for each indicator, representing both its impact and its structural connection with the others
Steyer and Gilbert (2012)		X		The research employed a case study approach to analyse the interaction between public and private actors in planning for a common threat, with a focus on the flu pandemic. Data collection involved interviews, observations, document analysis, and snowball sampling. This combination of methods provided a comprehensive understanding of the discourses, representations, and practices of the actors involved in public-private partnerships for pandemic preparation.
Gimenez, Hernantes, Labaka, Sarriegi, and Lauge (2014)		X		This study uses a multi-stage methodological approach to identify barriers to knowledge sharing in emergency management and to develop solutions to overcome these barriers through the creation of a Virtual Community of Practice (VCoPs)

Authorship	Article Type*			Explanation of the Method
	A	B	C	
Sansom, Berke, McDonald, Shipp, and Horney (2016)		X		The research employed community engagement techniques to integrate local knowledge into the study. This approach included conducting a community survey to capture perceptions regarding the health impacts of environmental risks. Trained teams carried out the survey by walking along every public pathway and visiting each home in the Manchester neighbourhood, excluding properties that were fully fenced, abandoned, or deemed unsafe.

Authorship	Article Type*			Explanation of the Method
	A	B	C	
McKnight and Linnenluecke (2016)	X			Research on community robustness in dealing with natural disasters and effective response efforts adopts a stakeholder-based perspective to explore how different strategies enhance community resilience. A key methodological challenge identified in this research is the difficulty of comparing societal responses to various disasters, given the distinct characteristics and varying severity of each event
Raska and Dubisar (2017)			X	The research method aims to reconstruct the societal effect of multiple natural threats impacting a historical population at research location. Local newspapers were the main data source. The events were assessed according to their relative direct damage and were classified based on their frequency and societal impact, with rainstorms and lightning showing the highest relative direct impacts.
Zhang, Hu, Li, and Pradhan (2018)		X		The research employed both household and key informant interviews to collect data. Household interviews were conducted in the Lujiang Flatland (LJF) from mid to late September 2014 to examine farmers' strategies for managing drought and to assess the strengths and limitations of each approach.
Lee, Park, Lee, and Ham (2020)		X		The research employed a system dynamics approach to create a supply-demand estimation model for the electric power system. This model was designed to address critical research questions about the evolution of electricity demands over time during disaster scenarios and how the power grid's reliability affected by supply and demand responses.
Kong and Sun (2021)			X	The document does not provide specific details about the research methods used in the study. This report focuses more on discussing the importance of company participation in disaster management, the challenges they face, and how the government can support it
Vishwakarma and Soni (2024)		X		The study used a quantitative research design to collect data from individuals residing in industrial areas of Gujarat. The study included participants who were able to

Authorship	Article Type*			Explanation of the Method
	A	B	C	
				understand Gujarati, Hindi, or English, and excluded those who had difficulty communicating due to language barriers.

*Document Type:

A: Description, overall reflection, or theoretical perspective

B: Qualitative or quantitative research (involving primary data collection)

C: Content analysis

Study Focus: Industry & Community Role Comparison

The table below presents the key concepts from the 13 analysed studies, highlighting and comparing the roles of Industry and Community in disaster prevention and management **(Table 5).**

Table 5 Industry & Community Role Comparison

Authorship	Industry's Role in Disaster Prevention and Management	Community's Role in Disaster Prevention and Management
Qureshi, Butt, and Khan (2006)	Industry can engage in developing technologies and systems, such as GIS, that aid in disaster management by improving the availability, management, and presentation of geo-information, which is critical for effective disaster response and planning	By delegating responsibility and financial authority, communities can develop self-reliance and self-help. Involving NGOs and Community-Based Organizations (CBOs) raises awareness and supports relief efforts. Community participation balances long-term environmental needs, such as developing mangrove forests in cyclone-prone areas, and shifts the focus from relief to preparedness. Organized community action ensures each family's involvement in disaster plans, prioritizing their needs. This participation also maintains social support systems, reducing the impact of disasters and mitigating social disruption.
Kourakata (2011)	1. Establishing mutual aid systems through inter-industry and inter-regional relationships coordinated by a disaster countermeasure office. 2. Maintaining internal capabilities with multiskilled workers for equipment maintenance and fabrication. 3. Obtaining rapid external assistance from organizations like industrial machine manufacturers. 4. Using information networks among similar regions to access scarce equipment quickly; and 5. Receiving efficient support from public sector entities to back up private enterprises.	1. Fostering mutual trust and aid, as seen in Ojiya City, were residents, also employees, prioritized company recovery over personal repairs. 2. Confirming the safety of residents, who often work locally, via on-foot or word-of-mouth communication when systems fail. 3. Maintaining communication networks to share resource availability and aid rapid recovery; and 4. Verifying employee safety and company status to meet regulatory requirements and ensure accurate public perception of the disaster's impact.
Howe (2011)	1. make evacuation plans. 2. Have a greater adaptive capacity which will influence the resilience of the communities where the industry operates.	1. Communities adjust in response to climate change. 2. Obtaining information about risks and learning about precautionary measures and their efficacy

Authorship	Industry's Role in Disaster Prevention and Management	Community's Role in Disaster Prevention and Management
	3. Have an appropriate resource to prevent & response. 4. Carry out risk communication efforts regarding potential disasters that may occur.	are vital steps toward successful adaptation, which benefits the entire community.
Khazai, Merz, Schulz, and Borst (2011)	Identifying vulnerabilities, operationalizing dependencies, and understanding the broader socio-economic and socio-political context that can influence disaster impacts	Communities are essential in disaster prevention and response due to their social networks, coping abilities, economic resilience, and awareness of existing vulnerabilities.
Steyer and Gilbert (2012)	The role of industry in disaster prevention and response has shifted from being viewed mainly as a source of risk to becoming crucial participants in risk management. Companies are now recognized for their ability to autonomously manage risks and mobilize essential resources during technological accidents, natural disasters, and public health crises. Particularly, companies in goods production, energy, and transport are indispensable partners in risk management. This shift emphasizes the need for public-private partnerships and strong coordination across both public and private sectors to achieve successful disaster prevention and management	Communities frequently serve as the first responders in emergencies, playing a crucial role during the initial phases of disaster response. Their involvement can enhance the effectiveness of risk management strategies by providing local knowledge and resources that are essential for tailored responses.

Authorship	Industry's Role in Disaster Prevention and Management	Community's Role in Disaster Prevention and Management
Gimenez, Hernantes, Labaka, Sarriegi, dan Lauge (2014)	The private sector contributes significantly to developing a community of practice in emergency management by helping to identify and overcome obstacles that hinder the sharing of lessons learned and best practices among emergency practitioners and managers. Industry participants engage in workshops to identify these barriers and propose requirements for technological platforms, such as the ELITE living document, to overcome them.	The community is essential in disaster prevention and response, especially using Virtual Communities of Practice (VCoPs). These platforms allow individuals to share knowledge and expertise, helping stakeholders learn from past crises and apply best practices. This collaborative approach avoids repeated mistakes and ensures that expertise and knowledge are readily available, improving preparedness for natural disasters like earthquakes, fires, and floods.
Sansom, Berke, McDonald, Shipp, dan Horney (2016)	The industry plays a prominent role in the Houston neighbourhood of Manchester and has been a significant concern for the community. The area is surrounded by industrial buildings and waste facilities, which most residents perceive as problematic. The proximity to these industrial sites contributes to environmental and health concerns, as the neighbourhood is exposed to hazardous substances and poor air quality	Community involvement in disaster prevention and response is crucial, especially in involving at-risk groups in disaster planning and mitigation efforts. Broad community participation improves the implementation of hazard mitigation techniques, as shown by a study linking higher participation levels to better mitigation in 65 high-risk U.S. locations. Enhancing community resilience is crucial, as demonstrated by the Emergency Preparedness Demonstration project with communities impacted by Hurricane Isabel, and the PREP group, both of which found that participatory initiatives improve preparedness in marginalized communities.
McKnight dan Linnenluecke (2016)	Their role in supply chains, governance functions, social dynamics, and managing critical infrastructure:	The community's involvement is essential in creating a coordinated response to natural disasters, which includes the participation of a critical mass of firms and other stakeholders. The community's

Authorship	Industry's Role in Disaster Prevention and Management	Community's Role in Disaster Prevention and Management
	1. Providing goods and services that support citizens and businesses throughout all phases of a disaster: before, during, and after. 2. Proactive disaster response by staying open and providing essential services and supplies during crises.	preparedness and response efforts are intertwined with the actions of private sector firms, which are central to many capacities required for resilient communities, such as supply chains, governance functions, and managing critical infrastructure.
Raska dan Dubisar (2017)	Industry is vital in disaster risk reduction by investing in technology and infrastructure enhancements to help mitigate these risks. Industries can create and enforce safety protocols, emergency response plans, and build resilient infrastructure to lessen the impact of disasters. They can also partner with governments and communities to strengthen preparedness and recovery efforts, thereby decreasing overall vulnerability.	The community is essential in disaster prevention and response, as demonstrated by local newspapers that record the societal effects of natural hazards. Community participation is clear in documenting hazard events, their impacts, and responses. For instance, accounts of disaster relief efforts, such as fundraising and volunteer support following the 1890 flood, highlight active community engagement. The increasing availability of documented social impacts over time highlights the community's growing role in recognizing and responding to natural hazards.
Zhang, Hu, Li, dan Pradhan (2018)	The industry's role in disaster prevention and response involves aiding farmers' adaptation by supplying production materials, agricultural products, and information, as well as offering skills training and insurance coverage.	1. formation of a community organization committee that will coordinate various matters related to disaster prevention and management. 2. Community participation contributes vital local knowledge, enhancing project success 3. Social relations within the community, making community involvement and local knowledge integration essential for effective disaster prevention and response.

Authorship	The Role of Industry in Disaster Prevention & Management	The Role of Community in Disaster Prevention & Management
Lee, Park, Lee, dan Ham (2020)	Industry plays a multifaceted function in disaster mitigation and response by producing and supplying essential disaster relief commodities like food, beverages, and medical services, which leads to increased electricity demand. Industrial facilities adjust by focusing on essential operations or transferring service demands outside affected areas. Despite these adjustments, overall electricity usage typically increases due to their critical role in disaster recovery.	The community is key in disaster prevention and response, particularly in managing electricity demand. Homes and businesses can help control power use, either through required or voluntary efforts, to reduce blackouts and strengthen the power grid. Studies show that community involvement can cut blackouts by up to 6.7% after earthquakes. The government also encourages people to save energy voluntarily, which helps manage electricity during disaster recovery.
Kong dan Sun (2021)	Industry participation plays a vital role in swiftly restoring essential services like water, electricity, and commodities, which helps maintain social and economic stability and safeguard stakeholders' interests. Governments recognize this importance, with agencies like FEMA fostering public-private partnerships and similar initiatives in Japan and China promoting enterprise participation in disaster	Forming part of an inclusive framework that involves the government, private sector, and social organizations. Communities, as direct beneficiaries and victims, significantly contribute to local-level preparedness, response, and recovery, ensuring that disaster management strategies meet specific local needs. Grassroots participation is crucial for effective disaster risk reduction and fostering a

Authorship	The Role of Industry in Disaster Prevention & Management	The Role of Community in Disaster Prevention & Management
Lee, Park, Lee, dan Ham (2020)	Industry plays a multifaceted function in disaster mitigation and response by producing and supplying essential disaster relief commodities like food, beverages, and medical services, which leads to increased electricity demand. Industrial facilities adjust by focusing on essential operations or transferring service demands outside affected areas. Despite these adjustments, overall electricity usage typically increases due to their critical role in disaster recovery.	The community is key in disaster prevention and response, particularly in managing electricity demand. Homes and businesses can help control power use, either through required or voluntary efforts, to reduce blackouts and strengthen the power grid. Studies show that community involvement can cut blackouts by up to 6.7% after earthquakes. The government also encourages people to save energy voluntarily, which helps manage electricity during disaster recovery.
	management. Thus, enterprises are essential for disaster recovery, supported by government policies and frameworks.	safer and more resilient environment in partnership with government and private sector initiatives.
Vishwakarma and Soni (2024)	1. Develop significance safety precautions to prevent industrial disaster occurrence 2. Providing education related to community awareness regarding industrial disasters and emergency contact numbers that can be contacted	1. Participate in education and training activities related to disaster prevention and management to increase disaster preparedness 2. The community shows a prudent attitude towards healthcare costs, with many individuals having health and life insurance

Discussion

The correlation between industry and community involvement in disaster prevention and management is pivotal for effective disaster management strategies. Both entities bring unique resources, knowledge, and skills that, when combined, significantly enhance emergency response capacity and resilience (Kapucu & Van Wart, 2006). Based on existing literature, collaboration between industry and community has an important role in disaster prevention and management efforts, making a significant contribution. Previous studies, such as those reviewed by Alexander (2015) and Tierney (2014), have emphasised the importance of cross-sector collaboration in enhancing emergency response capacity and community resilience. Other research also reveals that the effectiveness of disaster response is highly dependent on integrating local capacity with external resources (Kapucu, 2006; Paton & Johnston, 2001). However, this study expands on these insights by identifying how industry and communities can work together more effectively through collaborative strategies supported by strong government policies. This study also provides a new perspective by showing how collaboration between industry and community sectors can create a more adaptive and sustainable disaster risk management model.

The interdisciplinary approach used in this study also confirms that disasters cannot be effectively managed by only one sector or discipline. This study extends the view of Tierney and Bruneau (2007), who stated that resilience measurement must include social, economic, and institutional dimensions. Industries play a crucial role by identifying vulnerabilities, operationalising dependencies, and understanding the broader socio-economic and socio-political contexts influencing disaster impacts (Coppola, 2020). Their role has evolved from being seen primarily as sources of risk to key players in managing those risks. This demonstrates the dual role of industry, not only as a resource for risk management but also as an active partner in building community capacity through technology development and provision of disaster-resilient infrastructure.

Companies are now recognised for autonomously managing risks and mobilising essential resources during technological accidents, natural disasters, and public health crises. This study identified that industry provides physical resources and can develop and disseminate new technologies, including Geographic Information Systems and various risk monitoring tools, to bolster community resilience (Qureshi et al., 2006). These examples have demonstrated improvements in the speed and effectiveness of disaster response (Khazai et al., 2013; Qureshi et al., 2006), adding a technological dimension to the resilience model that previously focused on social and economic capacities. Mainly, goods production, energy, and transport industries are indispensable partners in risk management (Oloruntoba & Gray, 2006). This shift underscores the importance of public-private collaborations (United Nations International Strategy for Disaster Reduction, 2015) and expands the traditional view that tends to see industry solely as a source of risk (Cutter et al., 2003).

Regarding enhancing local capacity, this study also presents the idea of building local capacity through collaboration that involves technology transfer from industry to the community. For example, knowledge and technology provided by the industrial sector can strengthen the adaptive capacity of communities in facing disasters (Zhang et al., 2018). This aligns with the findings of Cutter et al. (2003), which indicate that lowering social vulnerability to disasters necessitates an approach that involves both enhancing local capacity and minimising risk exposure. Applying Virtual Communities of Practice (VCoPs) in disaster management, as proposed by Wenger (1998), can also accelerate knowledge transfer between communities and industry. This is important considering the increasing frequency of disasters related to climate change, which require rapid and adaptive responses (Coppola, 2020).

In terms of the industry's innovative role in disaster risk management, the industry provides important resources such as skills training, information related to adaptation, and logistical support (Kong & Sun, 2021). This is different from the traditional view which considers industry only as an entity providing funds or physical resources (Haigh & Amaratunga, 2010). This role is increasingly relevant in the context of increasing occurrences of complex technological and climate disasters, where cross-sector collaboration has become essential (Shaw & Goda, 2004). Furthermore, the industry's role in post-disaster recovery reflects a shift from a passive response to active risk management. This can be seen in industry efforts to maintain supply chain continuity during and after disasters, ensuring economic stability and accelerating social recovery (Lee et al., 2020).

On the other hand, this study also shows increased community participation through digital platforms. Digital platforms such as VCoPs can empower local communities to share knowledge and experiences, strengthening collective responses to disasters (Gimenez et al., 2014). This supports the argument that increasing community participation through digital tools can strengthen social resilience by providing access to broader resources and networks (Norris et al., 2008). This approach also reflects an increasing focus on community-based mitigation strategies, where local community involvement is critical in reducing disaster risk and facilitating rapid recovery (Aldrich, 2012; Stevens et al., 2010). The results of literature studies show that higher participation can increase the effectiveness of mitigation and help identify local needs that are often overlooked in top-down disaster management approaches (Peek & Stough, 2010).

Finally, the study results emphasise integrating public policy with industry and community best practices. This study reinforces Kapucu's (2006) findings on the critical role of public-private partnerships in disaster management. A supportive policy framework and suitable regulations can

enhance collaboration between communities and industry. Examples include public-private partnership initiatives in Japan and the United States facilitated by agencies such as FEMA and other organisations (Shaw & Goda, 2004; Waugh & Streib, 2006). In this context, a more flexible and inclusive policy framework is recommended to increase synergy among the public sector, private enterprises, and community organisations in managing increasingly complex and unpredictable disasters.

Limitations

This study has several limitations, including its reliance solely on the SCOPUS database, which may exclude relevant studies from other sources. Only peer-reviewed journal articles were considered, excluding books, conference proceedings, and grey literature. Resource constraints further narrowed the scope of the search, and gaps in publication years may limit the temporal representation of disaster management practices.

Conclusions and Recommendations

This systematic review emphasises the essential role of both industry and communities in disaster prevention and management. The study's findings indicate that effective disaster response and resilience building can significantly improve through collaboration and coordination between the public and private sectors. Industry contributes by identifying vulnerabilities and managing risks, while communities leverage their social networks and coping capacities to increase resilience. The synergy between these entities, supported by strong government policies, is critical to strengthening emergency response capacities and future disaster management strategies.

This study underscores the significance of knowledge sharing, community involvement, and resilience building as essential elements in mitigating the impact of disasters. In addition, it confirms that active participation from all parties, including industry, communities, and government, is key to improving disaster preparedness and response. Therefore, further research is needed to delve deeper into and improve this collaborative approach to strengthen readiness and reaction to disasters in the future.

Future studies should focus on pinpointing specific strategies to strengthen collaboration between industry and communities, particularly concerning climate change adaptation and the rising occurrence and complexity of disasters. Moreover, studies should investigate the application of innovative technologies to enhance community and industry engagement and coordination, to create more adaptive and sustainable disaster risk management models.

References

Aldrich, D. P. (2012). *Building Resilience: Social Capital in Post-Disaster Recovery*. University of Chicago Press.

Alexander, D. (2015). *Principles of Emergency Planning and Management*. Dunedin Academic Press Ltd.

Coppola, D. P. (2020). *Introduction to International Disaster Management*. Butterworth-Heinemann.

Cutter, S.., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E., & Webb, J. (2008). A Place-Based Model for Understanding Community Resilience to Natural Disasters Global Environment Change. *Global Environment Change*, *18 (4)*, 598.

Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. *Social Science Quarterly*, *84(2)*, 242–261.

García-Feijoo, M., Eizaguirre, A., & Rica-Aspiunza, A. (2020). Systematic review of sustainable-development-goal deployment in business schools. *Sustainability (Switzerland)*, *12*(1), 1–19. https://doi.org/10.3390/SU12010440

Gimenez, R., Hernantes, J., Labaka, L., Sarriegi, J. M., & Laugé, A. (2014). Developing a community of practice to learn, share and improve in emergency management. *Proceedings of the European Conference on Knowledge Management, ECKM*, *1*, 395–401.

Haigh, R., & Amaratunga, D. (2010). An integrative review of the built environment discipline's role in the development of society's resilience to disasters. *International Journal of Disaster Resilience in the Built Environment*, *1(1)*, 11–24.

Howe, P. D. (2011). Hurricane preparedness as anticipatory adaptation: A case study of community businesses. *Global Environmental Change*, *21*(2), 711–720. https://doi.org/10.1016/j.gloenvcha.2011.02.001

Kapucu, N. (2006). Public-nonprofit partnerships for collective action in dynamic contexts of emergencies. *Public Administration*, *84(1)*, 205–220.

Kapucu, N., & Van Wart, M. (2006). The evolving role of the public sector in managing catastrophic disasters: Lessons learned. *Administration and Society*, *38*(3), 279–308. https://doi.org/10.1177/0095399706289718

Khazai, B., Merz, M., Schulz, C., & Borst, D. (2013). An integrated indicator framework for spatial assessment of industrial and social vulnerability to indirect disaster losses. *Natural Hazards*, *67*(2), 145–167. https://doi.org/10.1007/s11069-013-0551-z

Kong, F., & Sun, S. (2021). Understanding the government responsibility and role of enterprises' participation in disaster management in china. *Sustainability (Switzerland)*, *13*(4), 1–16. https://doi.org/10.3390/su13041708

Kourakata, I. (2011). Strengthening the regional resiliency of industrialized suburban cities through BCP consolidation: Case study based on the niigataken. *Studies in Regional Science*, *41*(2), 535–551. https://doi.org/10.2457/srs.41.535

Lee, S., Park, M., Lee, H.-S., & Ham, Y. (2020). Impact of Demand-Side Response on Community Resilience: Focusing on a Power Grid after Seismic Hazards. *Journal of Management in Engineering*, *36*(6). https://doi.org/10.1061/(asce)me.1943-5479.0000844

Lindell, M. K., & Perry, R. W. (2004). Communicating Environmental Risk in Multiethnic Communities. *SAGE Publications*.

Lockwood, C., Munn, Z., & Bnurs, K. P. (2015). Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *International Journal of Evidence-Based Healthcare*, 179–187. https://doi.org/10.1097/XEB.0000000000000062

McKnight, B., & Linnenluecke, M. K. (2016). How Firm Responses to Natural Disasters Strengthen Community Resilience: A Stakeholder-Based Perspective. *Organization and Environment*, *29*(3), 290–307. https://doi.org/10.1177/1086026616629794

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology*, *41(1-2)*, 127-150.

Oloruntoba, R., & Gray, R. (2006). Humanitarian aid: An agile supply chain? *Supply Chain Management*, *11*(2), 115–120. https://doi.org/10.1108/13598540610652492

Paton, D., & Johnston, D. (2001). Disasters and communities: Vulnerability, resilience and preparedness. *Disaster Prevention and Management: An International Journal*, *10*(4), 270–277. https://doi.org/10.1108/EUM0000000005930

Peek, L., & Stough, L. M. (2010). Children with disabilities in the context of disaster: A social vulnerability perspective. *Child Development*, *81(4)*, 1260–1270.

Qureshi, A. M., Butt, M., & Khan, O. M. (2006). The role of GIS and public awareness for disaster management. *2006 International Conference on Advances in Space Technologies, ICAST*, 37–42. https://doi.org/10.1109/ICAST.2006.313794

Raška, P., & Dubišar, J. (2017). Impacts of natural hazards on an early industrial community: A case study of North Bohemia and its implications for long-term vulnerability assessment. *Moravian Geographical Reports*, *25*(1), 13–23. https://doi.org/10.1515/mgr-2017-0002

Rodriguez, H., Quarantelli, E. L., & Dynes, R. (2007). *Handbook of Disaster Research*. Springer.

Sansom, G., Berke, P., McDonald, T., Shipp, E., & Horney, J. (2016). Confirming the Environmental Concerns of Community Members Utilizing Participatory-Based Research in the Houston Neighborhood of Manchester. *International Journal of Environmental Research and Public Health*, *13*(9). https://doi.org/10.3390/ijerph13090839

Schardt, C., Adams, M. B., Owens, T., Keitz, S., & Fontelo, P. (2007). Utilization of the PICO framework to improve searching PubMed for clinical questions. *BioMed Central*, *6*, 1–6. https://doi.org/10.1186/1472-6947-7-16

Shaw, R., & Goda, K. (2004). From disaster to sustainable civil society: The Kobe experience. *Disasters*, *28(1)*, 16–40.

Stevens, M. R., Berke, P. R., & Song, Y. (2010). Public participation in local government review of development proposals in hazardous locations: Does it matter, and what do local government planners have to do with it? *Environmental Management*, *45*, 320–335.

Steyer, V., & Gilbert, C. (2013). Exploring the ambiguous consensus on public-private partnerships in collective risk preparation. *Sociology of Health and Illness*, *35*(2), 292–303. https://doi.org/10.1111/j.1467-9566.2012.01538.x

Tierney, K. (2014). *The Social Roots of Risk: Producing Disasters, Promoting Resilience* (Standford University Press (ed.).

Tierney, K., & Bruneau, M. (2007). Conceptualizing and measuring resilience: A key to disaster loss reduction. *TR News*, *250*, 14–17.

Tierney, K. J., Lindell, M. K., & Perry, R. W. (2001). *Facing the Unexpected: Disaster Preparedness*.

United Nations International Strategy for Disaster Reduction. (2015). Sendai Framework for Disaster Risk Reduction 2015-2030. In *Cmaj*.

Vishwakarma, D., Godara, N. R., Soni, S., & Lal, A. K. (2024). Study To Investigate Community Awareness and Readiness for Industrial Disasters Management in India. *Community Practitioner*, *21*(1), 53–62.

Waugh, W. L., & Streib, G. (2006). Collaboration and leadership for effective emergency management. *Public Administration Review*, *66(s1)*, 131–140.

Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity*. Cambridge University Press.

Xiaoxin, Z., Jiahui, Z., Zhimin, W., & Lu, S. (2024). *Emergency Culture: Nurturing Resilience in Times of Crisis*. *7*(3), 19–26. https://doi.org/10.25236/AJHSS.2024.070304

Zhang, L., Hu, J., Li, Y., & Pradhan, N. S. (2018). Public-private partnership in enhancing farmers' adaptation to drought: Insights from the Lujiang Flatland in the Nu River (Upper Salween) valley, China. *Land Use Policy*, *71*(December 2017), 138–145. https://doi.org/10.1016/j.landusepol.2017.11.034