

Disaster Management Learning: Systematic Literature Review of Path Dependence of Disaster Management in Indonesia

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ABSTRACT

A dynamic environment is always present in the world. Unexpected natural disasters are a common occurrence for the government, particularly the public sector. Indonesia is one of three countries that frequently experience natural disasters. The learning process conducted by government actors and institutions (co-evolution) has led to a paradigm shift in Indonesia's governance development. This research aims to explore changes in governance in the face of disasters. This research uses qualitative methods with systematic literature review analysis techniques. The understanding of how knowledge influences power in changing perspectives about disasters in government institutions is facilitated by evolutionary governance theory. From 1914-2023 there were 580 natural disasters. The research results show that there is a learning process within government actors where disaster management cannot be carried out by the government itself. Learning carried out by the government is obtained through reflections on the past and present. This is because path dependence is a path that shows inheritance from the past that influences current reproduction and shapes future choices. This has the effect of changing the configuration of disaster management by involving the public and private sectors.

Keywords: Disaster, Disaster Management, Path Dependence

1. Introduction

The frequency of natural disasters has increased in the past few decades (Chen et al., 2023; Timperio et al., 2020). Communities around the world experience significant losses as a result of natural disasters (Kourtit et al., 2023). The impact of natural disasters on human activities can be disruptive (Di Tommaso et al., 2023) which includes: (1) Natural disasters cause people to die and result in loss of human resources; (2) Damage to physical capital can be caused by natural disasters, such as damage to houses, vehicles, and infrastructure; (3) As migration flows out of disaster areas, people are searching for safer places to restart their lives. This results in the disruption of economic activity and the need to establish a new equilibrium. Natural disasters are characterized by a combination of natural hazards and vulnerabilities that affect vulnerable communities who are unable to withstand the resulting hardships (Yu et al., 2018). Natural disasters are classified into 4 categories (Below et al., 2009): (1) Geophysical disasters are natural disasters that occur due to energy factors from within the earth. Types of disasters include earthquakes, volcanoes,

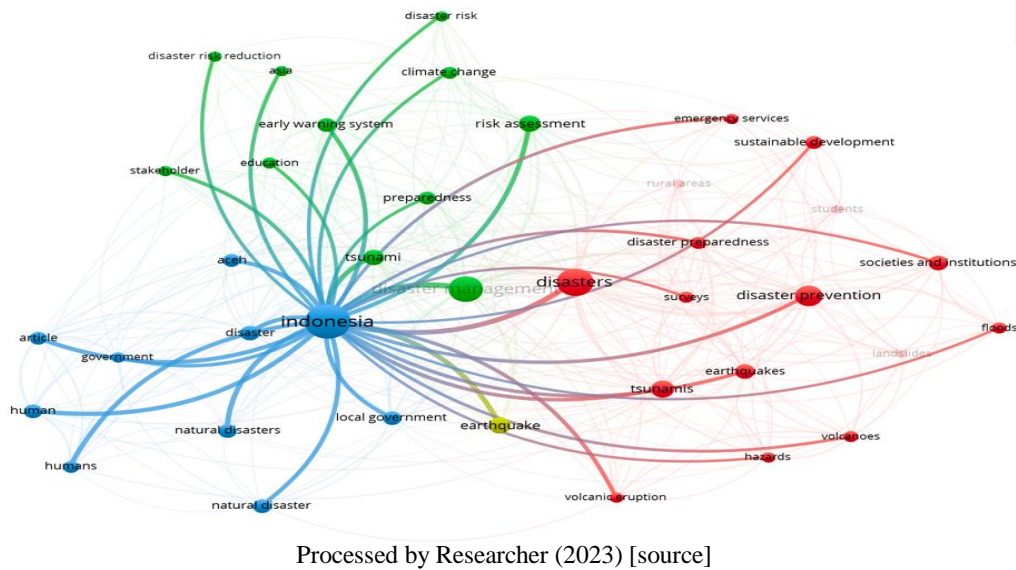
Meteorology is a phenomenon that is caused by short or small to meso-lived atmospheric processes (ranging from minutes to days). Types of disasters include hurricanes; (3) Hydrological is a tragedy caused by weather activities such as the hydrological cycle, rainfall, temperature, wind and humidity. Types of disasters include floods and mass movements; (4) Climatology is events caused by long-term processes/meso to macro scales (in the spectrum of intra-seasonal to multi-decadal climate variability). Types of disasters include extreme temperatures, drought, and forest fires.

The Emergency Event Database shows that Indonesia experienced 580 natural disasters from 1914-2023. The natural disasters that occur include earthquakes, tsunamis, landslides, volcanic activity, storms, floods, fires, and droughts. The most common types of natural disasters that occurred in Indonesia were flooding with 268 incidents, earthquakes with 146 incidents, and landslides with 67 incidents. The history of natural disasters in Indonesia offers an insight into the various changes in governance in Indonesia (Craig et al., 2019; Julius & Daryono, 2021; Latos et al., 2023). Governance changes over time and has unique forms in each community (Beunen et al, 2015). Changes in various actors, developing multi-party cooperation capacity for natural disaster management systems (Spahn et al., 2010). Knowledge is a discourse production that develops, competes, and transforms (Van Assche et al., 2022). Actors construct their own identities and the identities of others through discourse. The relationship between knowledge and power is mutual (Van Assche et al., 2022). A co-evolutionary approach is used in governance to explain that learning cannot be understood as a simple transfer of knowledge from one place to another. Learning is an exchange of tools, models, and practices that is contingent, relational, and co-evolving across scales, networks, and dimensions (Van Assche et al., 2014). In acquiring knowledge, the government experiences path dependence. Path dependence is a path that is inherited from the past and has an impact on current reproduction and future choices (Van Assche et al., 2022).

2. Research Method

The research has a novelty value which was analyzed using VOSviewer with bibliographical data mapping. Data were extracted from Scopus using keywords and summaries on "Indonesia" AND "Institution" AND "Disaster Management" obtained 194 data. VOSviewer was utilized to analyze the relevance of disaster management institution, keywords to other topics after processing the data.

Figure 1. Institutional Management Disaster Data Mapping



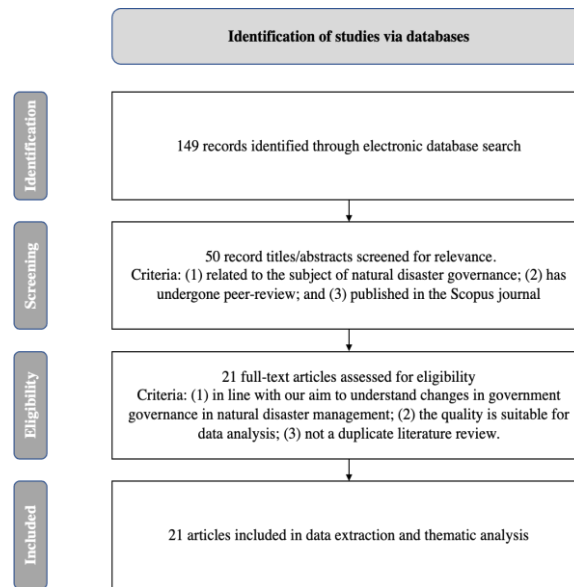
Data mapping has revealed disasters linked to government, local government, humans, and stakeholders. Analysis indicates that disaster management is a focus of current research, but no research leads to governance in natural disaster management (Figure 1). Mapping this reference helps prepare a systematic method for document analysis.

This research uses a literature review approach to investigate the relationship between natural disasters and changes in government governance. We searched the literature using the systematic literature search method developed by (Munn et al., 2018). First, we created information search terms from an initial selection of documents. To guarantee the relevance of results, search terms were used in titles, keywords, and abstracts in the database. We use a combination of terms (“Indonesia”) AND (“Disaster” OR “Natural Disaster”) AND (“Governance” OR “Changes in Governance”). Our research was limited to academic journals published in English.

Because this field of study is still understudied and interdisciplinary in nature, it is necessary to disseminate a common database widely. We used and searched for titles and abstracts using the Scopus website. Database searches provided articles in a variety of fields (n = 149) (Figure 2 PRISMA diagram). The researchers then independently screened the remaining abstracts (n=50) using the following criteria: (1) related to ethical issues of changing natural disaster governance; (2) peer reviewed; and (3) published in the Scopus journal. Third, a more in-depth analysis of the remaining articles was carried out.

These filtering criteria resulted in n =21 articles being screened. The overall relevance of the reviewed articles was examined based on three criteria: (1) alignment with our aim to understand changes in governmental governance of natural disaster management; (2) suitability of quality for data analysis; and (3) avoidance of duplicate literature reviews.

Figure 2. PRISMA for systematic literature review



Page et al. (2021) [source]

3. Results and Discussion

The systematic analysis of the literature review has revealed changes in governance for managing natural disasters. The Tsunami Aceh disaster in 2004 was the starting point for changes in natural disaster management in Indonesia. From the tsunami experience, various parties gained knowledge and awareness that natural disasters cannot be addressed solely by regional governments, as regional governments have limitations in handling natural disasters. This was the beginning point for the formation of the National Disaster Management Agency (*Badan Nasional Penanggulangan Bencana*) in Indonesia (Danugroho et al., 2020).

This has given rise to changes in governance with a change in the paradigm of Disaster Risk Reduction (DRR) and the formation of clear institutional arrangements and capacity at the national and local levels that support the development of community and institutional response capabilities at the local stage in managing natural disasters (Spahn et al., 2010). The effectiveness and responsiveness of disaster risk governance can be increased by understanding the decentralization of the disaster management sector. The development of government knowledge has led to an understanding that disaster management is not only carried out by the central government through the National Disaster Management Agency. Decentralization has a positive impact on the implementation of disaster management in terms of regulations, institutional formation, budgeting, and planning, but decentralization of natural disasters can lead to new problems with regulatory inconsistencies between central and regional governments, as well as limited regional government capacity (Putra & Matsuyuki, 2019). Local governments in Indonesia are responsible for issuing evacuation orders at both regional and city level. The mayor has the official authority.

responsibility to announce evacuation orders (Sakalasuriya et al., 2020).

The entry of international organizations into Indonesia has caused changes in governance due to the existence of natural disasters in Indonesia. The Government prohibited foreign aid during the earthquake and land movement in Palu in 2018 until coordination and approval were clear, ensuring that its objectives, roles, and functions were clear. In the field, foreign aid volunteers expressed concerns about delays in obtaining import approvals (Beech & Suhartono, 2018). The decentralized disaster management system, the potential involvement of international organizations in response, has led to an increasing diversity of organizations involved in responding to disasters (Bisri, 2017). Various stakeholders value inter- and intra-regional cooperation at different levels as a means to offer a basic scenario for developing a capacity building roadmap for cooperation that can be developed through knowledge databases, data and resource sharing, and educational exchange programs (Borg et al., 2020). Indonesia's policies to regulate international institutions in managing natural disasters in Indonesia were based on this knowledge.

Changes in governance are also based on increasing public knowledge in managing natural disasters. The existence of community resilience during natural disaster emergencies means that the community is able to remain alert and able to carry out evacuations, organize logistics, record damage and victims, and coordinate with outside parties independently (A. Y. Pratama & Sariffuddin, 2018). Local governments' vulnerability risk studies suggest that the community should take steps to reduce risks and handle natural disasters independently. One important aspect in managing natural disasters is social capital. Communities are being strengthened by social capital to prepare for natural disasters, enabling them to respond effectively and potentially rebuild during recovery (Hidayati, 2018). To enhance community capacity, disaster preparedness training based on local wisdom can be provided to increase the knowledge, abilities, and skills of communities in disaster-prone areas (Subandi et al., 2019). The management of natural disasters requires social capital entities such as participation in networks, trust, reciprocity, solidarity, togetherness, and mutual cooperation (Wibowo et al., 2021). A synchronous relationship between the government and society is necessary for managing natural disasters (P. Y. Pratama & Nurmandi, 2020).

The government established the Disaster Preparedness Area Program (*Program Kawasan Siaga Bencana/KwSB*). The purpose of this program is to promote early synergy in community-based disaster management with an integrated approach that involves various stakeholders in areas with high risk of natural disasters. Local institutions and knowledge in dealing with natural disasters have historically been present in areas prone to natural disasters, as demonstrated by social reality (Suradi et al., 2022). In order to enhance natural disaster mitigation, it is crucial to align programs with society's social realities.

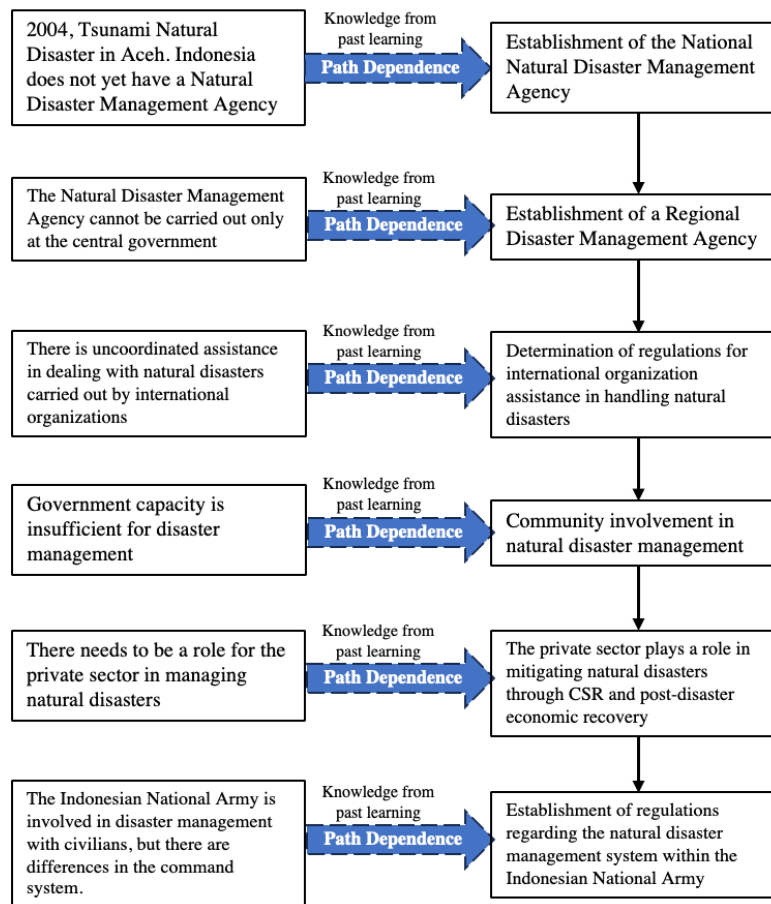
Changes in the management of natural disasters in Indonesia are also influenced by the private sector. Economic recovery in post-disaster communities is facilitated by entrepreneurs. The role of community members in local entrepreneurial associations, as well as the power of social capital, community organizing, and community-centered development, are effective in restoring the socio-economic conditions of the community after severe damage due to natural disasters (Alifa & Nugroho, 2019). Apart from that, companies are also involved in providing CSR to mitigate natural disasters

The Indonesian National Armed Forces (*Tentara Nasional Indonesia/TNI*) must be at the forefront when dealing with natural disasters in accordance with Law Number 34 of 2004, which aims to protect the entire nation and all of Indonesia's citizens from threats. The TNI requires disaster response SOPs within the TNI organizational structure and determines contingency budget allocations for disaster management (Dermawan & Ananda Ramadhan, 2019). In its evolution, the TNI currently has regulations for managing natural disasters which are stated in the Regulation of the Minister of Defense of the Republic of Indonesia Number 31 of 2019 concerning Health Assistance in Disaster Management within the Ministry of Defense and the Indonesian National Army. Apart from that, there is synergy between the TNI and the National Disaster Management Agency through collaboration in personnel training, this can strengthen each other in disaster management (Djuyandi et al., 2019). The TNI collaborates with civil society to deal with natural disasters, but coordination needs to be improved due to differences in command systems (Subagia et al., 2021). Disaster management requires collaboration between civil and military agencies, which must involve relevant agencies in making regulations to enhance disaster management regulations (Tjahjono et al., 2023).

The legislative process is still limited in the role of non-governmental actors (plantation companies, environmental NGOs, scientists, and journalists) in influencing natural disaster management policies because government institutions do not offer any opportunities for participation (Alamsyah et al., 2020). Community protection (*Satuan Perlindungan Masyarakat/Linmas*) organizations in society have not been involved with the government in managing natural disasters (Indrayani & Wasistiono, 2021). The empowerment of community protection units (*Linmas*) through regional work units or stakeholders is necessary for conducting and facilitating training, as well as increasing skills in managing natural disasters.

The research shows that there are changes in governance in managing natural disasters due to increased knowledge gained through learning from the past. Past and present learning are learning through reflexivity, which can be understood as a continuous reflection on what is happening and continuous evaluation of processes and results (Van Assche et al., 2022). Changes with knowledge influence change in power which cause changes in actors and institutions (Van Assche et al., 2014). The path of governance change dependencies is affected by this. Path dependence is a path that is inherited from the past and has an impact on current reproduction and future choices (Van Assche et al., 2022). More clearly can be seen in the figure below.

Figure 3. Indonesia's Natural Disaster Management Path Dependency



Processed by Researcher (2023) [source]

3. Conclusions

Indonesia is experiencing changes in governance through changes in knowledge from past experiences. Change occurs with path dependence. Changes occurred with the formation of the National Disaster Management Agency, then there was decentralized to the regions. Apart from that, there is awareness that the TNI, community, private sector and international institutions are involved in managing natural disasters in stages. Natural disaster management strategies are dynamic because natural disaster learning is carried out all the time, so that governance will always experience changes in the future. In making natural disaster management policies, the role of non-government actors (plantation companies, environmental NGOs, scientists and journalists) in influencing the legislative process is still limited because government institutions do not open windows for participation, so that in the future governance changes are needed by involving various actors in policy changes so that natural disaster management can run effectively.

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