

Earthquake Management Emergency Response: Literature Review



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Abstract— Indonesia is a country that is prone to natural disasters due to earthquakes. The losses due to the disaster reached more than 150 trillion. The earthquake disaster that occurred in several areas such as Lombok at that time claimed a mass death of more than 500 victims and in Palu 4 times more. Efforts during the emergency response and the delay in helping victims and medical personnel who were victims of damaged and non-functioning health infrastructure added to the severity of disaster management due to earthquakes, tsunamis and even liquefaction. The purpose of this study is to find out a literature review related to how the earthquake disaster emergency response management is based on the process input and output systems that occur. The focus of this analysis includes samples, design, theoretical framework, earthquake emergency response management, validity, Results show, In general the emergency response process includes 1) emergency alert, 2) rapid assessment, 3) determination of emergency status, 4) Search and Rescue, 5) search, rescue and evacuation (PPE), 6) Response and assistance (Response and Relief), and 7) assessment for rehabilitation and reconstruction. Disaster management during an emergency response is a synergy between the fulfillment of human resources, health services, medicines and supplies and the role of the government and related non-government roles regulated in disaster management regulations by the health crisis center. In terms of fulfilling disaster human resources (HR), the government fulfills the needs of emergency medical teams and non-medical teams who are members of the Emergency Medical Team (EMT) concept from the World Health Organization (WHO).

Keywords: Disasters, earthquakes, governance, management

1. Introduction

Disaster governance is a form of collaborative or activity governance that brings together many organizations to solve problems that occur (Tierny,2012). Disaster management is important because according to Natasha Goyal, 2019, disaster is the result of repeated governance failures "Disaster are a result of repeated failure of Governance". Good disaster governance must be supported implementation of Good Corporate Governance and Good Corporate Governance. Disaster is an event or series of events that threatens and disrupt people's lives caused by several natural factors and non-natural factors and human factors that can result in casualties, environmental damage, loss of property and psychological impact (BNPB, 2007). To reduce the adverse effects that occur during a disaster, handling is needed in all phases of disaster management, especially during emergency response disaster. Disaster emergency response includes a series of activities carried out with immediately at the time of the disaster to deal with the adverse effects caused, which includes activities to rescue and evacuate victims, property, fulfillment basic needs, protection, management, evacuation, rescue, as well restoration of infrastructure and facilities (Ministry of Health, 2008). Indonesia is a country that is potentially prone to earthquake natural disasters earth. Earthquake natural disasters that occur are possible because of geographical location Indonesia is located on three active tectonic plates, namely the Eurasian plate, the Pacific plate and the Indo-Australian plate and Indonesia also lie in a row active volcano part of the ring of fire and geographical location of Indonesia that is passed by the equator. According to the National Disaster Management Agency(BNPNB), the threat of earthquakes can occur in almost all islands Indonesia, from the islands of Sumatra, Java, Sulawesi to Papua (Nailufar, 2020).In addition to natural factors that can cause disasters, complexity conditions of Indonesian society interms of demographics, such as population density and economic aspects such as poverty which is still high has added to the height vulnerability to natural disaster events. Currently, Indonesia is ranked first out of 265 countries in the world on the risk of tsunami disasters, ranked first out of 162 countries for disasters landslides, ranked sixth out of 162 countries for the risk of flood disasters as well ranked third out of 153 countries for the risk of earthquake disasters (Husein, 2014). This shows that the risk of earthquakes and disasters is still high tsunamis in Indonesia. An earthquake is a natural event caused by the shaking of the earth by collisions between the earth's plates, fault activity (fault), volcanic activity and rock fall, resulting in infrastructure damage and loss of life. Earthquakes arise because of the sudden release of seismic wave energy caused by the movement of tectonic plates originating from within the crust. The earth so that the vibrations or shocks can be felt on the surface of the earth.

2. Literature Review

2.1 Governance

Governance (Governance) related to the interaction between governments with society. While "governing" means all social, economic, political, and administrative carried out as an effort to direct, controlling, supervising or managing society. According to Cobit

Governance (Governance) ensures that needs, conditions, and stakeholder options are evaluated to determine objectives, balanced enterprise and agreed to achieve; set direction through prioritization and decision making; and monitor performance and compliance agreed direction and goals. This means that the main responsibility of governance management is to evaluate, direct, and monitor ((evaluate, direct and monitoring (EDM)). According to Cobit management, on the other hand serves to plan, establish, run, and monitor activities to align and support governance objectives. Governance is the responsibility of the board, interim management is the responsibility of executive management. Management responsible for planning, development, operation and supervision towards activities that are in line with the directives set by the managing body to achieve company goals. Governance or Governance ensures that all needs and the expectations of the organization's stakeholders have been evaluated when setting goals (objectives) that must be achieved by the organization. Governance provides directions regarding priorities and decisions important decisions that need to be taken so that organizational goals can be achieved, carry out monitoring (monitoring) of the performance and achievement of targets and the instructions that have been set. While management (management) lowers the directives that provided by Governance into actions that need to be carried out by the organization in in order to achieve the set goals. According to the United Nation Development Program (UNDP), Good Governance has 8 (eight) main characteristics including participation, rule of Law, transparency, responsiveness, consensus oriented, equity, effectiveness and efficiency, and accountability. Good Governance was first developed by an international funding agency such as the World Bank, UNDP, and IMF in order to maintain and guarantee continuity of aid funds provided to aid target countries. By Therefore, good governance becomes a central issue in the relationship between institutions multilateral with the target country. Good Governance can also be interpreted as the performance of a good institution government, corporations, and community organizations. Good governance, the image of a state based on law, where the people are self-regulatory society. Thus, the government has been able to reduce its role as coach and supervisor of the implementation of the nation's vision and mission in all aspects state affairs through monitoring of legal issues that arise and follow up on community complaints and act as a good facilitator. With the development of good information, government activities become more transparent, and accountable, because the government can capture feedback and increasing community participation. Good Governance is categorized as good governance, in process standards and as well as the results, all elements of government can move synergistically, do not clash with each other, gain support from the people and be free from anarchist movements that can hinder the development process. Can be categorized good government, if the construction can be done at great expense minimal towards the ideals of well-being and prosperity, showing results indicators of the people's economic capacity are increasing, their spiritualized welfare increases with community indicators of feeling safe, calm, happy and full of peace. Good Governance is good governance in process standards and the results, all elements of order can move synergistically, not mutually lash, gain support from the people and apart from the movements anarchy that can hamper the development process. In the

United Nation Development Program (UNDP) policy documents, the characteristics of good governance include inclusive, transparent and accountable, effective and fair, guarantee the rule of law, ensure that political, social and economic priorities are based on community consensus, Paying attention to the interests of the poorest and weakest indecision-making process regarding the allocation of development resources.

2.2 Disaster Governance

Disaster governance is not yet a general term used in the disaster literature, which tends to focus more on concepts such as disaster management and disaster risk reduction. System governance is a more inclusive concept due to disaster management and risk reduction activities take place within the context of the governance framework special disaster. Disaster students tend to focus on activities governance, such as legislation, regulation and government planning, not on governance. However, the concept of governance itself emerged from recognition that the functions previously carried out by public entities are now frequently played by various actors that not only include government agencies but also private sector and civil society (Tierney K, 2012).

Disaster management can be included in the more general rubric of risk governance, which consists of implementing governance principles manage the risk and risk reduction function (risk reduction). Governance concept risk includes various risks recognized by society, including health or medical, safety and security, and environmental risks, such as hazards and disasters. Recent risk governance formulations differentiate between governance arrangements horizontal (horizontal governance) and vertical (vertical governance), an important differences for disaster management. Horizontal governance relationships involve a network of actors especially in the local geographic context, for example community, flood plain, or water shed, while the vertical relationship is relationships involving ties between local and supra local entities, for example, the state sectional, provincial, regional and national levels as well as international and global actors. So conceptually disaster governance is related with risk, environment, and earth governance. However, this linkage may not be recognized in research practice. Empirically, disaster, risk, environment, and governance systems are interrelated.

Disaster governance is often a form of collaborative governance or activity that brings to gather many organizations to solve a common problem beyond the scope of any organization. To define the term more specifically, disaster management (disaster governance) consists of asset of interrelated norms, organizational actors and institutions then practice (covering pre-disaster, trans-disaster, post-disaster) designed to reduce the impact and associated losses with disasters arising from natural and technological agents and from acts of terrorism that was intended. Norms include laws and regulations at various scales, norms informal, standards and consensus-based frameworks, and other mechanisms. Which encourage collective action, such as the dissemination of best practices through policies and practitioner network. Organizational and institutional actors include entities that form state systems, not-for-profit organizations, and not-

for-profit entities. Including institutions international and global, scientific and professional societies, coalitions and alliances, border organizations connecting scientific bodies and policy makers, as well as new social movements and organizations. According to Tierney K, 2012, the conclusion of Disaster Management (Disaster governance) is described as follows:

1. Governance is a new concept in the study of disasters; research on governance issues related to hazards and disasters is in its infancy which means Governance is a new concept in disaster studies; study on governance issues related to hazards and disasters still in early stages.
2. Disaster governance is conceptually but not always empirically related to meaningful environmental; risk, earth system, and collaborative governance Disaster governance is conceptually but not always empirically related with environmental, risk, earth governance, and collaborative governance.
3. Disaster governance arrangements are shaped by social, economic, and political forces, such as globalization, political and economic trends within the world system, and socio demographic changes, e.g., population migration into hazardous areas which means Disaster management arrangements formed by social, economic, and political forces, such as globalization, and political trends economics in the world system, and socio demographic changes, for example, migration residents to dangerous areas.
4. Efforts at disaster governance face many challenges, including global disparities in income, well-being, and political empowerment, as well as the rapid expansion of disaster vulnerability, particularly in poor nations This means that disaster management efforts face many challenges, including global income disparities, well-being, and empowerment politics, as well as the rapid expansion of disaster vulnerability, especially in poor countries.
5. Disaster governance arrangements exist at different scales and often focus on specific phases of the hazards cycle, e.g., mitigation and response. Governance arrangements tend to be reactive and fragmented; most systems are neither risk based nor comprehensive which means governance arrangements disasters exist on different scales and often focus on a particular phase of the hazard cycle, for example, mitigation and response. Governance settings tends to be reactive and fragmented; most systems are not risk based nor comprehensive.
6. Governance arrangements and capabilities vary considerably across societies as a function of such factors as overall state capacity, state-civil society relationships and economic organization which means governance arrangements. Governance and capabilities vary across societies as a function of factors such as overall country capacity, state civil society relations, and economic organization.

2.3 Earthquake disaster

Earthquakes are vibrations or shocks that occur on the surface of the earth due to the sudden

release of energy from within that creates waves seismic (Yuantari, 2012). An earthquake occurs when two blocks of earth suddenly pass through one each other (Usgs, 2020) The surface on which they slip is called the fault plane or fault. The location below the Earth's surface where an earthquake begins is called the hypocenter, and the location is exactly at above it on the earth's surface is called the epicenter. Sometimes earthquakes have an initialquake.It'sasmallearthquakeoccursinthesameplaceasthenextlargerearthquake.Scientistcan't say that the earthquake is the initial earthquake until the earthquake is bigger happened. The largest main earthquake is called a main shock.

Major earthquake always had after shocks that followed. This is a small earthquake that occurs afterwards at the same place as the main shock. depending on size main shock, aftershocks can continue for weeks, months, and even years after the main shock (Usgs, 2020). Earthquakes occur as a result of the sudden release of elastics train energy stored accumulated by stresses created by plate forcestectonic. Faults, faults in planar rock in the earth's crust, move randomly diametrical and a seismic to the roughness of the rock surface sufficient frictional resistance to stop the cut locally. The elasticity of rock in the lower ductile crust and mantle accumulates strain energy potential up to the slip threshold. Rapid release of energy, spreading from the hypocenter that is deeper (or focused) to the surface epicenter, causing waves seismic, thermal, and faulting of the fragile oceanic and continental crust. This is referred to as the "stick slippage process" and is part of displacement the or elastic (WolfsonN,2016).According to the National Disaster Management Agency (BNPB) management disaster is an effort that includes: establishment of risky development policies disaster occurs; disaster prevention; disaster mitigation; preparedness; responsive emergency; rehabilitation and reconstruction. According to Carter (1991), disaster management is generally grouped into three dimensions: before the disaster, during the disaster, and after the disaster. According to Carter disaster management can be organized through five dimensions: (1)prevention, (2) mitigation, (3)preparedness, (4)response, and (5)recovery. According to the National Disaster Management Agency (BNPB) in the instructions technically stated that a series of disaster management activities consists of 4 things namely pre-disaster during normal conditions (no disaster) included in the phase prevention and mitigation; pre-disaster situation when there is a potential disaster included in the preparedness phase; emergency response situations implemented when they occur disaster; and post-disaster which is carried out after the disaster occurs, namely the phase recovery.

2.4 Dimensios of Disaster Management

Carter explained the five dimensions of disaster management, including:

- a) Prevention or prevention of disasters, namely all actions that aims to delay the occurrence of disasters and/prevent incidents that occur pose a threat to society
- a) Mitigation or mitigation, or taming the natural movement that causes it disaster, namely the dimension that includes actions that aims to reduce the impact of disasters on a country or society, both natural and non-natural disasters. Action in this mitigation

dimension is carried out by the government as regulators in the context of disaster. Mitigation defined as an effort aimed at reducing the impact of disasters both natural disasters, man-made disasters and a combination of both within a country or society. Disaster mitigation is part of disaster management be wrong one task of the central government and regional. Government in the framework providing a sense of security and protection from the threat of disaster it might happen. There are four important things in mitigation disasters, namely:

- 1) Available in formation and maps of disaster-prone areas for each type of disaster,
- 2) outreach to increase understanding and public awareness in dealing with disasters caused live in disaster-prone areas,
- 3) know what is necessary do and avoid and know how to save yourself if disasters occur and

4) Regulation and management of disaster-prone areas to reduce the threat of disaster

c). Preparedness or disaster preparedness, namely all actions that enable governments, organizations, communities, and individuals to be able to respond quickly to emergency situations and effective. Actions in this preparedness dimension include: formulation of disaster plans, provision of infrastructure, and human resource training, and so on. Actions in this preparedness dimension are usually skewed carried out by individuals. Included in preparedness measures are disaster management plans, resource maintenance and personnel training. While in the Risk Reduction Guidelines Disaster issued by BNPB, and refers to Article 1 Number 7 Law Number 24 of 2007 Concerning Disaster Management, preparedness is defined as a series of activities that carried out to anticipate disasters through organizing as well through appropriate and efficient measures.

d) Response or response to a disaster is usually called the emergency response phase. Disasters are the steps taken when they occur disaster, which aims to save human souls. In this dimension, disaster emergency measures a real so carried out. Disaster emergency response is a series of activities carried out immediately upon the occurrence of a disaster to deal with the impact harm caused, which includes rescue activities and evacuation of victims, property, fulfillment of needs basis, protection, management of evacuation, and rescue and search form is sing victims.

e) Recovery or post-disaster recovery, which is a dimension that is also impost-disaster realm. This dimension covers all processes for disaster-affected units, from the state, community, to community level individual, in order to restore its function back after disaster. Rehabilitation planning can be done to housing, residential areas. Physical and psychological health status Victims must also be considered during the post-disaster recovery phase (Sunarti, 2009). In development and recovery planning support from NGOs, Government, and the Indonesian Red Cross (PMI) much needed for the post-disaster recovery phase (PNPM, 2008). Regulations on post-disaster rehabilitation and

reconstruction in Indonesia has been state din the Regulation of the Head of the National Agency Disaster Management Number 17 of 2010 concerning Guidelines General Implementation of Post-Disaster Rehabilitation and Reconstruction. The regulation has stated the target substance of rehabilitation and reconstruction includes humanitarian aspects (social psychological, health services) aspects of housing and settlements, infrastructure building, economic, social and cross-sectoral.

1. Finding

Some literature sources attribute this to “inadequate understanding” of underlying factors of risk. The mainstream planning processes of many governments are beginning to reflect disaster risk reduction concerns. However, such concerns are an “add-on” rather than “hard wired” in the key development sectors. There are very few examples where “economic and productive sectoral policies” have incorporated risk reduction in an explicit manner. This is not to say that there is no risk management practice within the sectors. It is just that such efforts are not focused on disaster risk. At the local level there is an increasing recognition of linkages between natural resource management and disaster risk reduction issues. Disaster risk assessments do not go far enough to analyze the risk of loss of economic output in sectors. Progress has been made on development of building codes and by laws for risk reduction. However, enforcement remains weak. The role of “Spatial Planning and Land Use Control” in shaping risk patterns is recognized but there are other powerful drivers that overshadow risk reduction concerns. Integration of risk reduction in infrastructure projects is one of the most promising areas right now but most of the action has been very one-sided. For example, a highways project would consider the risk that the project itself is exposed to but may not adequately consider how it is likely to reconfigure risk territorially. The last five years have seen a lot of innovation in developing new products for risk transfer at different levels (ranging from weather-indexed insurance for small farmers to catastrophic risk financing for nation states. However, overall, this area of work is still at a pilot stage. The notion of differential vulnerability—recognizing that different social groups are vulnerable in different ways and hence need to be supported in different ways – and the impact of larger global processes on the most vulnerable are not being adequately considered in policies and programs. However, at the academic/ technical level the interest in this area is high.

2. Conclusion

Data on disaster management often comes from a variety of sources and may require multiple database synthesis to produce valid and reliable results. To further the problem, many datasets have a half-life. This means that researchers and practitioners must use caution and judgment when discerning the “best” data. Researchers and practitioners should ensure that a variety of sources are examined when developing metrics and that those sources provide the most up-to-date information. If an excessively far-reaching

effort must be made to create a specific metric, researchers and practitioners should consider creating a new dataset prior to the metric's completion or the metric should be deleted. The results of metrics created from too many sources or from very old and/or bad data will be self-defeating. Consensus among the many participants in disaster management on the best data resources should assist in improving both the consistency and accuracy of data and the production of valid and reliable results. Subjective interpretations and value judgments can arise from countless years of field experience in which the product benefits most from a lack of objectivity. Either way, researcher and practitioner experience and expertise should prove to be the most valuable resource in the development of disaster preparedness metrics. Selecting indicators for a comprehensive disaster management model can also pose problems, particularly when in the process of selecting indicators. Attempting to include all viable indicators can easily become an overwhelming undertaking as innumerable indicators are available, many of which would provide a comprehensive measure. Therefore, maintaining a manageable selection of indicators becomes a crucial component of creating a comprehensive disaster preparedness measure. Grouping the indicators into different types and selecting the best of the groups, as opposed to selecting as many indicators as possible, may provide an equally excellent disaster preparedness measure.

Recommendations resulting from the implementation of disaster management models are virtually non-existent. In fact, making a single recommendation regarding disaster management practice and application is extremely difficult. The problem stems from the inability of the field to decide on a comprehensive disaster management paradigm, or set of metrics, with which disaster management stakeholders can look to for guidance, or implement without alteration. To date, no field-wide disaster management models have been tested and no results can be examined to provide recommendations. Without any successful disaster management models to provide results, the only realistic recommendation for the implementation of a disaster management "template" is to develop one. Providing a venue where stakeholders involved in disaster management can interact, share experiences, and develop a disaster management model together, is perhaps the best method of ensuring a disaster management model of general applicability and broad acceptance.

3. Conflict of Interest

The author states that there is no conflict of interest in this study

4. Funding

The authors declare that current study not financially supported by any institution organization

5. Ethical clearance

Submit to the Ethics Review Board of the Faculty of Public Health, Universitas Indonesia

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