

Disharmonization of Logistic Management and Regulation of Natural Disaster in Indonesia: A Collaborative Governance Perspective

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**DISHARMONIZATION OF LOGISTIC MANAGEMENT AND REGULATION
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GOVERNANCE PERSPECTIVE**

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印度尼西亚自然灾害的物流管理和监管不协调：协作治理视角

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Abstract

This research is at the ontological level of implementing logistic disaster management that is very significant in reducing the risk of natural disaster in Indonesia. The problem is very interesting to examine by conducting descriptive qualitative research. Sharpening the research was using the theory of public policy, collaborative governance, and supply chain management for logistics improvement. Data were collected using in-depth interviews with several key informants, direct observation, and related documentation. Data were analyzed using interactive models in data reduction, data display, and data verification supported by triangulation employed to obtain validity and reliability. The results were based on ontology, epistemology, and sociology research by empowering the logistic and equipment distribution for natural disaster and disaster management in Indonesia. Vision and mission of public policies related to natural disasters are needed to complete the facilities of prevention, equipment management, and logistics supervision, provide information to stakeholders regarding regulations and sanctions in natural disaster management that were carried out deliberately, and balance the provision of disaster management. Therefore, it will produce revised and detailed relevant regulations and state agencies as public officials in making natural disaster and disaster management regulations in Indonesia. The researchers suggested that relevant state institutions as public officials in making regulations on natural disaster management in Indonesia should form regulations and institutions to cover the collaborative governance of natural disaster reduction.

Keywords: Public Policy, Collaborative Governance, Disaster Management, Supply Chain Management

摘要 这项研究是在实施物流灾害管理的本体层面，这对于降低印度尼西亚的自然灾害风险非常重要。通过进行描述性定性研究来检查这个问题非常有趣。加强研究的是使用公共政策、协作治理和供应链管理理论来改善物流。数据是通过与几位关键知情人的深入访谈、直接观察和相关文件收集的。在数据缩减、数据显示和数据验证中使用交互式模型对数据进行分析，并采用三角测量支持，以获得有效性和可靠性。结果基于本体论、认识论和社会学研究，通过为印度尼西亚自然灾害和灾害管理的后勤和设备分配提供支持。需要自然灾害相关公共政策的愿景和使命，以完善预防、设备管理和后勤监管设施，向利益相关者提供有意实施的自然灾害管理法规和制裁信息，并平衡灾害供给管理。因此，它将制定修订和详细的相关法规，并作为公职人员在印度尼西亚制定自然灾害和灾害管理法规。研究人员建议，印尼相关国家机构作为公职人员在制定自然灾害管理法规时应形成法规和机构，以涵盖减少自然灾害的协同治理。

关键词: 公共政策、协作治理、灾害管理、供应链管理

I. INTRODUCTION

A. Background

Public management focuses on the substance of collaboration to solve problems and achieve goals. Participation will contribute to public management [1]. The development of public management drives the behavior of stakeholders in policymaking, and the distribution of powers is tied to policy practice [2]. A good policy will be increased in a new era of government, but there has not been much implementation and practice in the field [3]. Uncertainty reveals limitations and challenges in the stakeholder's complexity in decision-making [4].

Public and private stakeholders should make consensus-oriented decisions to solve the crucial factors and develop collaborative forums [5]. Collaborative must be carried out jointly and designed to achieve better results and goals in managing disaster [6]. Integration of collaborative partners is required and can be applied to manage the degree of complexity in a dynamic interaction between stakeholders [7].

Interaction between social actors in managing disaster drives disputes and needs to be resolved to obtain effective conflict resolution and decision making [8]. Collaboration needs conditions that support the goals to succeed and involving communities, mechanisms, power, and resources [9].

At the ontological level, the problem revealed that there is no statutory regulation as a legal umbrella for distributing disaster management equipment into disaster locations that are not effective in receiving aids. The National and Regional Disaster Management Agency needs an

updated and detailed regulation for implementing a new model from a collaborative governance perspective.

Performance implementation in disaster management also has the basics of a fundamental approach, namely governance approach, which emphasizes several important aspects such as levels of government activity, relations between sectors, distribution of authority in government systems, and possible reforms in the management sector and the people especially those affecting disaster management [10].

A disaster is a natural or man-made event, sudden and progressive, which has a great impact so that the affected community must respond to the extraordinary actions [11]. We can do something to avoid disasters and reduce the potential for the loss of many lives and properties or damages to the environment where humans survive [12].

Disaster management strategies are developing flexible technology solutions that will increase responsiveness by creating material visibility and increasing the effectiveness of people and processes. Furthermore, the information system will create the infrastructure for knowledge management, performance measurement, and learning [13].

Disaster management activities consist of pre-disaster, emergency response when a disaster occurs, and post-disaster. The activities carried out prior to a disaster can be in the form of disaster preparedness and disaster mitigation for reducing the impact of a disaster [11]. Disaster management requires support from government agencies, human resources, communities, and the availability of disaster management equipment.

Logistics and equipment management have an important role in determining whether disaster management operations will succeed or fail. However, logistics is also the most expensive activity of any disaster relief.

The main component of disaster management that is often neglected that requires special attention and commitment of resources is a group of citizens with limited mobility, such as hospital population and others with logistical challenges [12]. Supplies and transportation are the main components of logistics in disaster management [11]. Logistics in disaster management requires a great amount of funds, reaching 80% of the total available disaster funds [14].

Disaster logistics is crucial regarding the effectiveness and speed of response of disaster relief programs, for example, health, food, location for refugees, water, and sanitation. Provision and transportation of aid for disaster victims are some of the most expensive aspects to provide any assistance. Good data stored on disaster logistics is very useful as the material for post-disaster studies [13], [15]

Problems regarding logistics and equipment in disaster management consist of damage caused by disasters, the flexibility of the transportation system to divert resources from areas that are not affected by the disaster to areas affected by disasters, ability to obtain transportation resources, difficulty in accessing transportation due to lost communication, limitations transportation, land transportation is not available except air transportation. Some parts are not well served by logistics and transportation capabilities [11].

Disaster management and logistics and equipment management should be influenced by the involvement of various sectors with a system that focuses on priority and non-discrimination. However, the current system is not equipped to assist response and recovery from major disasters; therefore, some areas are deficient, and proposals have emerged for logistics reform and disaster equipment [16].

The focus on the humanitarian supply chain involves logistics and equipment for disaster management regarding the stages are preparation, response, and reconstruction. Disaster mitigation is linked to government responsibilities and involves the direct participation of equipment [17].

The preparation stage refers to the various operations that take place during the period before a disaster occurs. This stage combines various strategies that enable the implementation of a successful operational response to disaster

management. This stage is very important because it aims to avoid possible catastrophic consequences. This stage also includes the efforts and experiences in adapting to past disaster events to meet new challenges. The response stage refers to the various operations that are implemented immediately after a disaster occurs. At the response stage, coordination and collaboration between all parties involved in a humanitarian aid emergency need to be done. The reconstruction phase refers to the different operations after a disaster occurs. This stage involves rehabilitation and aims to address the impact of the disaster from a long-term perspective. The effects of a disaster can continue for a long time and have severe consequences on the affected population [17].

There were 3.398 disaster events in Indonesia in 2018. Based on the National Disaster Management Agency (BNPB) data in 2018, it showed that 5.395 people died, 19.610 were injured, and 603.873 were displaced and affected. The data showed there were 117.655 housing units severely damaged, 70.303 units slightly damaged, 182.195 units moderately damaged, and 313.653 units submerged. There are natural factors as the key factors causing the threat of disaster. Apart from threat factors from natural conditions, disasters are also determined by the community's vulnerability to disasters.

Logistics and Equipment Warehouses as a form of strengthening in disaster management were located in many provinces. The logistics building and equipment were used as a joint effort to increase preparedness and reduce the disaster risk index. The Logistics and Equipment Warehouse functions by increasing the capacity of resources that act as a logistics and equipment buffer stock, providing disaster management services quickly and precisely in all areas to ensure the quality and quantity of logistics and equipment.

The government initially carried out disaster management. Still, along with the community's increasing needs for disaster management information, such as pre-disaster, during a disaster, and after a disaster, the involvement of the private sector and the community in providing disaster management services is a necessity. Such conditions make it possible to view disaster management problems from a governance perspective [18]–[23].

The application of governance in disaster management, considering the many incidents and impacts of disasters, requires the government to provide disaster management services quickly, accurately, and reliably. One form of disaster

management in the first phase of a disaster event is the provision of emergency response equipment to reduce the burden on the affected victims. The irregularity in the number, timing and location of requests for disaster equipment assistance makes this an interesting phenomenon that must be addressed by existing disaster management systems [11].

Based on the previous research explained above and natural disaster phenomena in Indonesia as described, it still needs to be explored deeper about the governance of logistics and equipment for disaster management. There is some research question revealed. Why is the equipment management for disaster needed, and how is the current equipment governance in Indonesia?

Based on the description of the multi-regulatory policies in natural disaster management in Indonesia, which were made and established by the legislative and executives as public officials, at the ontological level, the implementation of logistics and equipment management has a very significant problem related to the natural disaster management in Indonesia. Therefore, this issue is very interesting to be studied.

B. Research Objectives

This research is useful for academicians and practitioners by adding knowledge related to public policy concepts and collaborative governance in terms of natural disaster management. The legislative and executive public official, they should develop revised and detailed regulations on natural disaster management.

C. Original Research

Sahay, Vinod Chandra Menon, & Gupta examined the key roles of various stakeholder groups in effective disaster management in the post-disaster phase [24]. In the context of the need to develop a mature and robust humanitarian logistics system and to present a framework for humanitarian action, it summarizes the key lines of their role in humanitarian logistics management. This research used a literature study from several literature sources on humanitarian logistics, disaster management, and stakeholders' role. This research produced action plans for different stakeholders by playing different roles in managing disaster rights at the stages of preparation, response, technology, coordination, and procurement. These stakeholders must work

together to ensure an effective response to disasters [24].

Garrido and Aguirre revealed that the logistical perspective has major difficulties in post-earthquake disasters, including uncertainty, a sudden increase in demand for logistics and personnel supplies [25]. This sudden increase in uncertainty and demand forces the decision-makers to improvise into plans, which are sometimes hampered by a lack of information and readiness. As a result, a study was conducted that presented a modeling framework for emergency logistics with the objectives of timely delivery of emergency supplies to the affected areas and maintaining control of spending on logistics financing within a certain budget limit. This research uses a quantitative method with a stochastic mixed-integer programming model approach to the space and time of logistics supply, inventory, distribution and relocation costs, and unexpected demand characteristics. The results reveal an increase in logistics inventory in the affected areas to meet local supply needs. Although at the same time, the size of the budget limits the feasibility of preventing an increase in unexpected needs. Other findings reveal that decision-makers must consider the possibility of an earthquake disaster to the lowest possible scale of need [25].

Disaster preparedness, disaster management, and disaster response are important to minimize damage caused by disasters. Improvements in early warning systems for disasters occurred by developing technology. There is a change in perspective regarding disasters that it is possible to cope with disasters with minimum losses through accurate preventive measures and planning. This relates to the role of logistics in disaster management and disaster logistics issues. This study used a qualitative research method with a literature review approach. Real-time disaster management information, news declarations, and aid organization activity reports were used as references. This study confirms that the implementation of efficient disaster logistics is very important to disaster areas; the preparedness stage is the most important part of disaster logistics. Investments in the preparation phase can reduce the likelihood of complications in the response phase. This investment can also provide cost and time saving. The response stage, which uses disaster logistics very much, occurs according to the type of disaster and current conditions. During the response phase, there are priorities, and these must be met. The safety of disaster victims and aid personnel is a top priority. After that, quick delivery of relief

materials such as clean water, food, medicine, and shelter should arrive. For successful disaster management, successful planning and implementation of operational logistics are required. Relief and personal material transportation, storage, and distribution are also needed, so relief materials have a very important role in logistical operations. Problems and shortcomings in logistics reduce the success of the relief operation. Hence, the suffering in disasters keeps on increasing [26].

Fallucchi, Targuini, and De Luca present a system that can assist early warning and provide decision support for disaster response and recovery management by integrating heterogeneous data sources to form different organizations [27]. The method used is a method for correlation of multi-source information to determine which pairs of records have to be considered for comparison. The research has created the Geo-Political Map of Geo-Political and Economic Italy as a knowledge base for future mapping and understanding of other HADR-related domains. It then describes how to use the framework to collect and integrate information sources of different public and private organizations to support decision-makers, integrate our systems with ontology-driven systems that automate the processes of data collection, knowledge extraction, and representation from the web to reconcile information, disaster with web resources and to increase knowledge base [27].

A disaster preparedness system was introduced based on a combination of multi-purpose optimization and geographic information systems to aid multi-organizational decision-making. The cartographic model is used to avoid the selection of floodable facilities, informing the two objectives of the optimization model used to determine the location of emergency facilities, stock preparation, allocation of resources, and distribution of aid, along with the number of the actors required. The results of this study make it clear that the number of government organizations deployed to deal with the situation is excessive, leading to high costs without achieving the best level of satisfaction. The proposed system shows the potential to achieve better performance in terms of costs and service levels than the approaches currently used by the authorities [28].

The barriers and benefits of building relationships between humanitarian organizations and logistics service providers were explored to improve humanitarian disaster relief operations [29]. The research method used mixed analysis.

This study reveals that disaster relief operations are influenced by the perceptions of collaborative actors who also play an important role in determining the formation of partnerships. Other results show that while logistics service providers focus more on profitable processes on the business side, humanitarian relations between organizations are perceived as outdated and have less skilled capacities. Operations can be more efficient and effective with service provider collaboration to support disaster humanitarian organization relations and increased transparency and allocation of logistical resources [29].

The difference from the previous research on natural disaster and disaster management regulation above is that the government and its agencies should manage natural disasters and environmental problems by enforcing rules and standards set up in laws and treaties. This study analyzed a multi-policy approach regarding natural disaster management in Indonesia.

II. RESEARCH METHODS

The scientific research method is based on the relationships between ontology, epistemology, and methodology. Ontology describes a reality produced of the consciousness of various individuals and viewed from various points of view. Epistemology explains how to obtain knowledge and the relationship between the researcher and the object under study. The methodology describes collecting data and analyzing data to prove existing concepts for a deductive approach or to obtain the deep meaning of a natural activity for an inductive approach [30].

A qualitative research strategy can be applied if research problems still need to be explored deeper. Qualitative research can also be applied to follow up on previous quantitative research. Even qualitative research can also be applied when a pre-existing theory or concept is still considered unable to capture the complexity of the problem under study [31]. The qualitative research approach produces descriptive data in the form of words or writings and behaviors that can be observed from the subject and object of the study itself. The qualitative approach was chosen because it complies with the research aims to describe and understand the phenomena, events, social activities, attitudes, beliefs, perceptions of people.

Data collection in this research were interviews, observation, and documentation. In-depth interviews were conducted with ten informants as key members of the National Disaster Management Agency. The author and

team conducted participant observation to obtain records in the field of study. Related documentation was gathered from many sources, such as from the Internet and library documents.

In this research, data analysis used three data reduction steps, data display, and data verification, referring to the interactive model [32]. Data reduction is for sorting out the primary data, data display for presenting the data, and data verification is for concluding the main themes of the results.

The validity in this study used the triangulation method based on the observation record, in-depth interview transcript, and documentation analysis to obtain valid and reliable data. Credibility related to the truth aspect was performed through triangulation to compare the interview results with the results of interviews with colleagues. Transferability shows the applicability of research to other studies that readers can understand the results of qualitative research. The report was made in a detailed, clear, and systematic manner. Auditability means that it can be tested by examining the entire research process. Since the researchers designed the case studies, determined data sources, collected data, and conducted data analysis to make conclusions, it must show the stages, processes, and results. Confirmability is related to the objectivity that the research results are agreed upon and accepted [31].

III. LITERATURE REVIEW

A. Review of Public Policy Theory

The emergence of the New Public Management (NPM) paradigm in the early 1990s can be considered an important momentum, questioning government domination and adopting public management approaches and techniques in the private sector, and giving space to the private sector to participate in public services. The main characteristic of NPM is the change in the bureaucratic environment based on standardized and hierarchical rules towards a flexible public management system that is oriented more towards the public interest [33].

There are seven doctrines in NPM, namely: 1) the use of professional management in the public sector, 2) the use of standards and performance measurement, 3) a greater emphasis on output control, 4) a shift in smaller unit public sector, 5) a shift to tighter competition, 6) an emphasis on applying private management models to public sector management practices, 7) an emphasis on discipline and resource saving [33].

Public management focuses on the substance of collaboration to solve problems and achieve goals. The collaboration has a broad scope and focuses on substance and process in solving problems effectively. Nonhierarchical mechanisms and participation will provide a better contribution to collaborative public management with practices in the future [1].

The development of public management is described as a paradigm shift and a shift in governance. This development studies the behavior of stakeholders and networks who collaborate in policymaking. The core principle of the collaboration model is related to the size and size of the area managed and involving the government with stakeholders. The distribution of powers is tied to administrative law and policy practice. Collaboration should convey the aspirations of stakeholders and a restructuring of the country's political and economic role. Ineffective governance and public service reform measures will pose governance challenges around social, political, and economic issues [2].

Good policy direction and reporting will include collaborative governance. Increased collaboration is a new era of government, but there has not been much implemented and practiced in the field. The concept of collaborative governance can be institutionalized based on policy considerations and new paradigms. Social change affects collaboration effectively and will be increasingly important in collaborative governance [3].

Based on the epistemological and sociological description of several definitions of public policy theory for refining the research, it can be stated that the making of multi-policies on natural disaster management occurs in Indonesia is a part of public policy theory.

B. Review of Collaborative Governance Theory

The concept of governance has a long history. Most countries have developed this concept according to their own needs through interactions between rulers and those controlled by historical backgrounds, legal customs, and the communities in which this concept was developed. The origin of governance is rooted in the German tradition of the 17th and 18th centuries. In the 19th century, the formation of associations such as unions was needed to encourage people to participate in political government activities [34].

The concept of governance has developed further due to changes in the role of government [35]. Governance differs from the government because governance involves complex

interactions among various stakeholders in the public arena [36]. In contrast, the government only knits on the role of government as a single actor. Some scholars define governance as a new governing process in which various actors manage the public arena through mutual interactions [35]. Several definitions of governance are essentially a governance system involving the government, private sector, and society [34].

The decision-making process in collaborative adaptive management of stakeholders used a decision-making model. The qualitative method was carried out by analyzing transcripts of meetings, stakeholder communication, and physical monitoring data to ask what facilitates and challenges decision-makers and how challenges affect stakeholders. The study results found that the reduction of uncertainty, knowledge production and social learning revealed the limitations of ideal cycles and challenges adaptive management. Time lag, trade-offs, path dependency, and stakeholder tension in decision-making complicate this [4].

Collaborative governance brings public and private stakeholders together in collective forums with public agencies to engage in consensus-oriented decision-making. This research was conducted on collaborative governance to elaborate on a model of collaborative governance. The crucial factors are face-to-face dialogue, trust-building, and commitment and understanding. A virtuous cycle of collaboration needs development when collaborative forums depend on trust, commitment, and understanding [5].

Collaborative processes are carried out to prepare for disasters. Preparedness and actions must be carried out jointly. There should be guidance needed to design activities in collaboration, and the results supported can lead to the final goal. The results showed that there was better interaction and relations between parties. Enhanced capacity to assess disaster risk and understanding of processes and practices that enhance disaster preparedness. The effectiveness in achieving objectives is supported by a collaborative process that encourages preparation for natural disasters. More generally, it can contribute to and be oriented towards disaster risk reduction systems and actions produced together with many stakeholders [6].

The collaborative framework provides a comprehensive map for locating and exploring a joint system between policy-based and site-based parties with non-governmental stakeholders to public-private partnerships. Integration of

knowledge about barriers to collaborative social learning action and conflict resolution is required. The general framework can be applied to analyzes the different scales of policy and the varying degrees of complexity. There is a dynamic interaction between stakeholders [7].

The interaction between social, economic, and environmental is often viewed from different perspectives by stakeholders. There are disputes over the interpretation of sustainability. Sustainability requires a plurality of actions. Effective conflict resolution and decision-making about sustainability require collaboration. A variety of collaborative governance arrangements define sustainability that can help understand the drivers of conflict resolution better and improve sustainability [8].

Collaborative governance emerged in response to ethical concerns about centralized governance. Collaborative governance needs to be done to identify the conditions that support the goals to succeed. Collaborative governance works by involving communities, formal mechanisms, sharing of power, ownership of resources, accountability, building trust, and adaptive approaches to performance. Collaborative governance demonstrates the potential for a democratic system based on consensus. Collaborative governance is carried out to support sustainability [9].

Based on the epistemological and sociological description of several definitions of collaborative governance theory for refining the research, it can be stated that the concept of collaborative governance can analyze the making of multi-policies of natural disaster management that occurred in Indonesia.

C. Review of Supply Chain Management Theory

The supply chain is a functional collection activity such as transportation, inventory, control, etc., repeated many times across channels where raw materials are converted into finished products, and consumer value is added. Logistics is an integral part of channel activity. The general task of logistics management is to balance costs and income to achieve a certain profit [37].

Logistics Management is part of the Supply chain process that functions to plan, implement, and control the efficient and effective flow and storage of goods, services, and related information from the point of origin to the point of consumption to meet customers' needs. Logistics management has other tasks: to determine the type of logistics system to be used, choose private logistics or agent logistics, choose

the type of public transportation, design the logistics organization, determine the logistics mix, and determine warehouse operations.

Logistics management is unique because it is the oldest but also the youngest company activity. Logistical activities such as facilities, transportation, inventory, communication, and management and storage have been carried out by people since the beginning of commercial specialization. Logistics is a collection of functional activities which are repeated many times throughout the channel through which raw materials are converted into finished products, and consumer value added. Logistics is a term borrowed from the military; it describes a strategic process of managing the efficient flow and storage of some raw materials, in-process inventory, and finished goods inventory from the point of origin to the point of consumption [38].

Logistics is a strategic management process for moving and storing goods, spare parts, and finished goods from suppliers between company facilities and customers. Physical distribution or logistics involves planning, implementing, and controlling the physical flow of raw materials and finished goods from the point of origin to consumers' point to meet customer needs.

Based on the epistemological and sociological description of several definitions of supply chain management and logistics theory for refining the research, it can be stated that the making of multi-policies of natural disaster management that occurs in Indonesia can be analyzed with the concept of supply chain management and logistics.

IV. DISCUSSION AND ANALYSIS

Based on data collection and data analysis, it resulted as follows. There is a governance system in managing disasters in The National and Regional Disaster Management Agency and several provinces. However, the problem is that its application is limited and has not been integrated with other stakeholders involved.

The equipment governance road map exists in The National and Regional Disaster Management Agency, and related sub-organizations created it. Yet, the particular part of the organization sometimes holds it. There is no updated road map. It seems that the updated roadmap of equipment for disaster management in The National and Regional Disaster Management Agency does not yet exist and refers to the old equipment governance reform roadmap. It becomes an obstacle that it has not yet completed the Road Map.

There are no specific changes until 2020 that improve equipment for disaster management in The National and Regional Disaster Management Agency. However, specifically, it did not mention equipment management because there were only a few. The regulations have not been updated, nothing has changed, and maybe the changes are more in the system only. The governance system of equipment for disaster management in The National and Regional Disaster Management Agency has existed, but the problem is the equipment management.

There is a governance system in equipment management for disaster, but the problem is related to the application and integration of stakeholders. Various stakeholders in effective disaster management produce action plans by playing roles in managing disasters from all stages. Stakeholders must work together to ensure an effective response to disasters.

The governance road maps of equipment management exist in the National and Regional Disaster Management Agency, but the particular part of the organization holds it. Uncertainty suddenly increased in demand for logistics and personnel supplies, then force the decision-makers. Timely delivery of emergency supplies to the affected areas and maintaining control of spending on logistics financing within a certain budget limit are necessary. There is an increase in logistics inventory in the affected areas to meet local supply needs. Decision-makers must consider the lowest possible scale of need.

The updated roadmap of equipment for disaster management in The National and Regional Disaster Management Agency does not yet exist and refers to the old equipment governance reform roadmap. There are important actions to minimize the damage caused by disasters and logistics issues. The implementation of efficient disaster logistics is very important in disaster areas. The preparedness stage is the most important part of disaster logistics. Investment in the preparation phase can reduce the likelihood of complications in the response phase. This investment can also provide cost and time saving.

There were not many changes and improvements on equipment for disaster management in The National and Regional Disaster Management Agency. The regulations have not been updated yet. The system can assist with early warning and provide the decision supporting disaster response. Recovery management through the integration of heterogeneous data sources to form different organizations. By combining all aspects related to

changes and improvements to collect and integrate sources support the decision-makers.

The governance system of equipment for disaster management in The National and Regional Disaster Management Agency has existed. Still, the problem is the equipment management has not been integrated with the stakeholders involved. The preparedness of a disaster system should be based on the combination of multi-purpose aspects such as optimization and geographic information to aid multi-organizational decision-making. Government organizations and other stakeholders were deployed to cope with the situation that minimizes costs and achieves the best level of satisfaction.

V. CONCLUSION

In conclusion, it is necessary to have an updated and detailed regulation on collaboration with the stakeholders, that is, between the legislative, executive, academia, community, and corporation, for logistics distribution to the disaster location. It can be concluded that equipment management for disaster is needed to produce successful disaster management. The current equipment related to disaster still needs to be improved. It needs a better road map in the governance of its equipment and still needs to be improved.

It is recommended for legislative and executive as public officials to make a multi-policies regulation regarding the distribution of disaster equipment management. State institutions will be involved in making effective disaster management in Indonesia. It is suggested to revise the Related Disaster Regulation and revise the regulations of the National Disaster Management Agency Law

Based on the analysis of the research results above, it can be concluded that the legislative and executive as public officials should make multi-policies regarding natural disaster management. State institutions that involved were implied that it is ineffective for natural disaster management in Indonesia and inefficient.

The researchers suggested that related state institutions as the public officials in making regulations on disaster management in Indonesia should establish a better regulation and cover the holistic governance of disaster management.

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