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Local Government Resonance on Disaster Potential Issues

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Abstract

Ring of fire that surround Indonesia from east to the west made this country become potential vulnerable to various types of natural disasters, Morowali is a district located in central sulawesi province that one of a disaster-prone area. It is traversed by the Matano fault which connected to Palu Koro fault which is a fault with approximately 8 mm active movement per year. This study aims to see how far the local government of Morowali responds to the issue of potential disasters, consider that Morowali district is one of the areas designated by the state government as a special economic zone. This study using an exploratory case study that does not see phenomena only from problems but also in the form of social activities, groups, and organization. Niklas Luhmann's concept of resonance is the main reference in describes the interconnection between systems and the environment. Research data obtained using in-depth interviews, focus group discussions, and field observations. The informants in this study were executive and legislative board. The results show that the executive and legislative response to the issue of potential natural disasters shows the resonant capacity of two functional systems politics and economics are weak, which shows that the government's system should encourage the concept of proactive adaptation to strengthen its response to the existing potential disasters and create security for the Morowali community.

Introduction

As a country which has geographical, geological, hydrological, topographical, and morphological conditions that are prone to very high natural disasters(Wardyaningrum, 2014). Indonesian is an archipelago country consist a chain tectonic order is a confluence area of three large plates, the Eurasian Plate (northwestern part), the Australian Indian Ocean Plate (southern part) and the Pacific Ocean Plate (northeast part) which move with each other (Mikhael Tinaiy et al., 2020).

Geographically, the territory of Indonesia is surrounded by the ring of fire, which has an impact on a high level of natural disasters risk that have a very large destructive capacity. Geologically, the ring of fire is a frequent site of strong earthquakes and volcanic eruptions(Masum & Md, 2019). In addition, there is also a volcanic belt that stretches from Sumatra, Java, Nusa Tenggara, and Sulawesi which has the potential to cause volcanic disasters, earthquakes, tsunamis, winds, floods, landslides, and other disasters (Naping et al., 2019).

From a geographical perspective, Morowali Regency has a relatively similar structure with several disaster-prone area in Indonesia, with the Matano Fault passing through in the eastern part of Sulawesi in a Northwest-East direction and, connected to the Palu Koro fault (Patria & Putra, 2020). Matano Fault known as an active status which has the potential to trigger natural

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disasters, especially earthquakes. According to(Bellier et al., 2001) , Morowali Regency is an area that is vulnerable to natural disasters such as earthquakes, floods, and landslides.

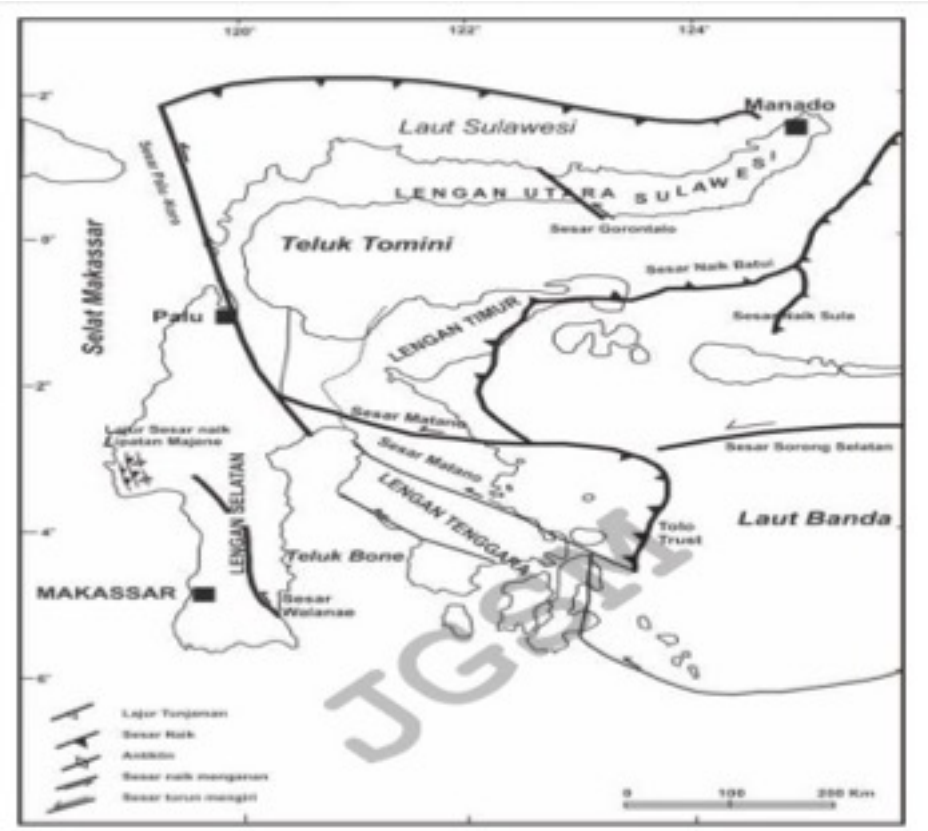

Figure 1. Map of the main subductions and faults of the Sulawesi region (Koesnama, 2014).

In 2016, an international non-government organization conduct research based on disaster potential vulnerability in Morowali district, and the result shows that there is a high vulnerability to natural disasters including tsunamis, earthquakes, floods, and landslides. Tsunami and earthquakes caused by the active stretch of the Matano fault in the west and the Tolo fault in the east, flood and landslides caused by land conversion (forest) due to mining and plantation exploration(Bellier et al., 2001). This research shows that the potential for natural disasters in Morowali included in the high category which threaten people's lives. Thus, structural and non-structural mitigation is required. The results of Ngo's research indicate that Morowali district has a variety of potential natural disasters that seriously threaten the lives of people in the region. The local government's response in handling this problem is very important to be seen as an awareness and readiness of the government regarding disaster issues. Equally important is how the right development communication strategy is in the change process, who is involved, and how to drive the change process. In the context of development communication, the important actors in disaster management in this study consist of the ranks of the government in the executive and legislative institutions. These two institutions are the determinants of the implementation of government policies and programs related to regional development. According to (Nugroho, 2018) Disaster events that have occurred more frequently are due to the government's lack of awareness and understanding of potential disaster vulnerabilities and their mitigation efforts.

Natural disasters are a series of events that threaten and disrupt people's lives, both caused by natural and non-natural factors as well as human factors (Purwoko & Putro, 2015). The environmental change caused by environmental damage is one of the causes of natural

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disasters. Environmental damage is also inseparable from humans in caring for environmental sustainability (Pramono et al., 2396).

Environmental problems are currently a global concern starting from the problem of climate change caused by global warming, the use of plastics, and the greenhouse effect, to the vulnerability of geographical disasters caused by the composition of the earth's surface in the form of cracks and volcanic phenomena which make several areas vulnerable to disaster threats. This phenomenon requires study and analysis based on various aspects, including development communication and ecological communication.

Communication play an important role and acts as a bridge in the process of building and developing public awareness(Wahyuni, 2019). Disaster communication has an effect on making people aware of disasters, including basic knowledge, types of disasters, disaster-prone locations, disaster preparedness and mitigation, emergency response, post-disaster including rehabilitation and reconstruction and sustainable plans to minimize various potential disaster risks in the future(Khumairoh et al., 2021). The intensity of communication conceptually and actually between stakeholders (government, private, and community) needs to be increased and integrated to pay attention to environmental and disaster issues.

Niklas Luhmann's thoughts on the concept of ecological communication provide an alternative explanation of the ecological problems faced by social systems. The concept of ecological communication in general describes the relationship between the system and the environment. The perspective of ecological communication in development communication sees government as a social system that is autopoietic and has the capacity for resonance as a response to the complexities faced by that system. Social system resonance allows the system to have the ability to reduce the complexity of its environment through communication (Luhmann, 1989).

Based on the explanation above, the main problem is that the role of development communication has not been optimally applied to environmental issues and potential disasters. This study aims to see the resonance capacity of the local government of Morowali Regency regarding the issue of potential disasters.

Methods

This research is an exploratory case study by providing a more flexible space to carry out in-depth investigations by understanding the phenomena being research studies from various sources (Creswell & Poth, 2016). Exploratory case study research does not look at phenomena only from problems but can be in the form of social activities, groups, organizations, or institutions (Hollweck, 2016).

Research data were obtained using in-depth interview techniques, focus group discussions, and field observations of phenomena encountered in the field. The informants in this study were regional agencies, namely the Regent (BUPATI), Regional disaster management agency (BPBD), Regional environmental department (DLHD), Regional research and planning agency (BAPPEDA), Public works and public housing services (Dinas PUPR), and Local legislative of Morowali (DPRD).

Analysis of research data was carried out by looking at the extent to which local governments understand the potential for existing disasters and the forms of communication responses undertaken. Then an analysis was carried out using Niklas Luhmann's communication ecology concept, to clarify the response of local government communications related to potential disaster issues.

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Results and Discussion

Executive Agency Response

The understanding related to disaster issues and disaster potential is important to study and analyze through the local government as a determinant of the direction in regional disaster management. The higher the understanding of the disaster, the higher the awareness to avoid the risk. The government's response to potential disasters is closely related to people's livelihood (Adejoke et al., 2014) . This response greatly influenced the government's communication system in reducing the existing complexity. This can be used to create policies that are oriented towards strengthening the social system in Morowali in dealing with potential natural disasters.

Morowali Regent's revealed that the most frequent disasters are floods, earthquakes, and coastal abrasion. Floods often occur as a result of high rainfall. According to BPS data from the Morowali district, as of 2019. Morowali experienced 124 rainy days out of a total of 365 days/per year with a significant increase in rainfall. In addition, the human factor in exploiting natural resources is quite large. There are dozens of mining companies whose operations have not been accompanied by a clear environmental impact analysis.

The Regent of Morowali responded to the results of research and assessments by STIRRRD 2016 related to disaster potential and disaster risk which summarizes the classification of types of potential and risk of disasters in Morowali district which can be seen in Figure 1.2(Stirrrd, 2016).

Figure 2. Morowali disaster risk assessment results (Stirrrd)

The Morowali government's response to the research results did not give a positive response. The presence of foreign non-governmental organizations to carry out this research is due to economic elements. The results of this study seem to frighten the public more with the aim that the government intends to adopt the technology they offer.

The regional Disaster management agency (BPBD) of Morowali Regency is taking strategic steps through outreach and disaster mitigation. In 2018 socialization was carried out to increase public awareness and preparedness for flood disasters in Ipi Village, as one of the prone areas which are suffer from flood (Gunawan, 2021). It was recorded that a quite large flood disaster occurred in 2013 which resulted in quite severe damage to residents' houses and the main connecting bridge between village in the Morowali district(Retia, 2019). As a prevention effort from the government, BPBD carried out disaster socialization in determining and installing evacuation route signs in Dongkelan village, Bungku Selatan District, and Trans Wosu village which located in Bungku Barat District. The Public Works and Public Housing Service (PUPR) and the Regional environmental Department (DLHD) carried out an intensive program by building wave breakwaters and planting Mangroves to reduce disasters caused by land erosion due to the intensity of sea waves.

Disaster Risk Reduction Forum is a collaboration with 13 regional government agencies, which formed by the regional disaster management agency. This step is integrated and comprehensive disaster management coordination between agencies includes aspects related to disaster potential reduction. The field of the coordination start from determining the evacuation point

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done by BPBD, opening of road access (farm road) to the location of the evacuation point done by coordination of PUPR with the Department of Agriculture. The Morowali Regency Environmental Service and Non-Governmental Organizations collaborate with the planting program Mangrove in locations that are considered prone to coastal abrasion disasters. Planting program Mangrove combing several areas that had also previously become planting media. The activity was carried out as a measure to reduce the potential for disaster through abrasion disaster mitigation.

The Public Works and Spatial Planning (PUPR) Office's response to the issue of potential disasters is by mapping potential disasters and disaster-prone areas in Morowali Regency. The PUPR Service's strategic program is to carry out the Design of the Regional Spatial Plan (RSP) through several revisions from 2016 until it received approval in 2019 which became a Regional Regulation related to the RSP.

The formulation of the RSP concept begins with identifying the potential and problems that exist in development. The process of identifying spatial use potentials and problems does not only cover the present but also the potential and problems that will arise in the future. The Spatial Plan for an area does not only contain a land use plan but further discusses all aspects related to the development plan for an area, starting from the economic aspect to the development of human resources in an area.

However, in the implementation of inter-institutional coordination, there are often obstacles and obstacles that have an impact output produced is not optimal. The dynamics that occur are the low level of commitment between institutions, starting from coordination to implementation of existing policies. In addition, another factor is the lack of competence of each agency delegate sent to the forum. This is due to the frequent change of government officials in related agencies.

The development program as a strategic step for the government is very closely related to responding to potential disasters. In tackling disaster issues, local governments still rely heavily on reactive adaptations or adaptations made after a disaster has occurred. This can be seen in the responsiveness of the regional government when a disaster occurs(Rackelhof et al., 2007).

Reactive adaptation is a concept of adaptation that is carried out after a disaster event occurs. The concept of adaptation according to Anthony Giddens in politic of climate change is the need to encourage the concept of proactive adaptation aimed at the role of political institutions including the government in analyzing and making policies related to climate change. Proactive adaptation is not only a government effort in dealing with disasters that have occurred. The concept of proactive adaptation can be applied as an effort to diagnose and respond to potential vulnerabilities or risks that will occur in the future (Giddens, 2009).

Legislative Agency Response

In this study, we look at how the response of the legislature responds to potential disasters. The legislature has a very important role in the development process. Another central role in determining the direction of regional development is through the functions mandated by law. The functions of budget, legislature, and oversight are the main tasks and functions of the legislature.

The legislature or the regional representative council is divided into 3 (three) commissions that act as permanent fittings of the legislative institution. First commission works in the field of law, governance, and people's welfare. Second commission in economics and finance. Third commission works in the development sector(Sekertariat Jendral, 2019). As a complement to regional institutions in the field of development, third commission also has a supervisory

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function over executive government agencies including the issue of disaster potential. The response of the district legislature represented by the third commission chief on the issue of potential disasters is considered quite good in understanding the potential for existing disasters.

However, in responding to the issue of potential disasters, the role of the legislature is still limited in its surveilance function. This can be seen from the absence of regional regulations or the drafting of regional regulations originating from the initiative of the legislature which is directly related to the existing potential disaster issues. The oversight function is carried out spontaneously based on community reports regarding development problems and natural events that occur both natural factors and risk factors for mining exploitation activities.

Related to disaster issues that are responded to by the legislature, the supervisory function is carried out directly in areas affected by disasters based on reports received from the community. The commission 3 (three) legislative surveillance function runs with various dynamics which also have an impact on the less than the optimal role of the local legislature. Space for direct supervision has become difficult due to changes in Constitution No. 23 of 2014 concerning regional governments delegating authority and management functions being transferred to provincial governments. These changes make it difficult for Commission 3 (three) to carry out its main tasks and functions, including disaster issues that impact the community.

In the perspective of systems theory, concepts such as complexity, reduction, self-reference, autopoiesis, and closed reproduction recursively with open environmental disturbances raise theoretical questions that tend to be difficult so that explanations regarding the relationship between system and environment are explained by the concept of resonance. Interconnection between the system and the environment is produced by closing the system's self-reproduction from the environment through internal structural loops (Luhman, 1986) so that the system begins to resonate and be moved. The system limits itself to be different from its environment. System resonance occurs when the system is stimulated by its environment, but the system receives stimulation from its environment to the extent that it is compatible with its capacity to recognize and infer the presence of its environment(Handaka et al., 2017). Similarly, the system registers the effect of its behavior on the environment whenever this behavior triggers a stimulus within its perceptual range. possible system. The environment is the total horizon of information processing that refers to outside the system. It is an internal premise for the operation of the system itself that is established within the system using different self-references and other references (or 'internal' and 'external') to carry out its operations.

The social system is an autopoiesis system that autonomously forms its systemic structure in order to reduce its internal and external complexity, the internal complexity of the system is a series of information that covers the system internally, while the external complexity is a collection of information that is outside the environment of a system(Arifudin et al., 2019). the environment is always more complex than the system, the system interacts with its environment in the concept of "resonance" which then performs a complexity reduction process based on the system's binary code or "programming language" that belongs to the system, such as legal/illegal in the legal system, profit/disadvantage in the system economic, powerful/not powerful in the political system, sinful/innocent in the religious system, impressive/not impressive in the art system, scientific/unscientific in the scientific system where the whole system operates internally and self-referentially or self-referential to the systems the system.

The response of the local government system of Morowali district, which is seen from the response as a form of understanding of the executive and legislative institutions, tends to show a fairly strong resonance of the economic system and political system on the issue of potential

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disasters. the executive branch led by the Regent as the head of the region in response to the results of research related to potential disaster risk as a transactional business strategy and tends to direct the government to adopt the technology offered by the agency which shows an economic system with a binary code of profit/disadvantage from the regent's understanding of the offer from the research institute. But on the other hand, the resonance of the political system which refers to the ruling/not ruling binary code is shown by the rotation of positions so that government policies at both the executive and legislative levels have not shown a response that refers to improving the government system on the issue of potential disasters. in other executive institutions that are included in the technical implementation of regional disaster management at BPBD, which shows a positive response at the level of implementation of regional disaster mitigation activities but lacks resonance to other existing potential disaster issues, and focuses only on flood disaster mitigation, in other agencies the response of the institution the government shows the resonance of the executive branch on the issue of potential disasters which also shows the resonance of the political system in terms of decision-making and structural hierarchies in institutional policy formulation.

The legislature in responding to the issue of potential disasters seems not to be carrying out its main function of carrying out legislation, and budgeting for disaster issues, the function that is running is only a supervisory function, it is even just waiting for direct reports from the community regarding mining activities that can cause disaster. Man-made disasters or disasters are caused by human activities or technological failures. Furthermore, to understand the response of the system, we will see how the functional system resonates with the issue of potential disasters in Morowali district, where two functional systems resonate with the issue of potential disasters, namely the economic function system and the political function system. the resonance of the system to the dangers of its environment must be linked to the rejection of redundancies that exist in the non-replaceable functioning system. This forces the channeling of all interference into one or more of these functional systems. Anything that appears to be environmental pollution can be dealt with effectively only according to one code or another

Economic System Resonance

In society, many functional systems play an important role, but the economic system is a functional system that can influence the existing system, all operations of this system are forms of payment transactions with money, and money is the main marker of this function system, when money plays a role, directly or indirectly the economic system has worked. which is in the definition of a system that works through communication with binary code payment⁄nonpayment.

In the issue of potential disasters in Morowali district, the economic system shows resonance which, although not large, has a significant influence on the government system in terms of responding to the issue, economic transactions which then create a response from the regent as the main institution in the executive branch of regional government which then participates in influencing the response of local government institutional systems to potential disaster issues which are the result of scientific research, but tucking economic value transactions behind it. regional legislatures also show a very poor understanding in responding to potential disaster issues, the statutory/legislation function and the budgeting function not running well, showing a lack of response in seeing potential disaster issues as a priority issue in regional development.

Cases related to the issue of potential disasters in Morowali district seen from the response of the local government did not show further resonance of the economic system, but this seemed to greatly influence how the understanding and response of the local government influence local government programs and policies on disaster-related issues and the results of research

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scientific non-governmental organizations carried out specifically on the issue of potential disasters.

Political System Resonance

The political system claims a fairly special position in society. Society is a system that is formed politically, this has been understood since the time of Plato and Aristotle, as a force whose job it is to regulate everything, the political system works mainly by removing the boundaries of its attractiveness and regenerating hopes and disappointments and then continuing to grow because the theme that occurs can be changed quickly.

The inclusion of ecological studies in the system of political functions strengthens the observation effect in the political system which makes it more apparent how much politics must achieve and how little can be achieved, the political system will constantly try to widen its limits through different governments, different political parties, to a different constitution with rule/no rule code achieves closure of its own mode of operation and openness to environmental and political program changes. Holding or not holding a position in political authority, especially those that regulate who has a major influence in politics and various things, becomes very important. However, this does not mean that politics is powerless against decisions that are considered to originate from the state for all activities that lead to conclusions that are political when trying to influence programs, forms of organization, positions, or decisions in certain fields. The state office structure functions as a political code, even as a unifying code for all politics. This also defines the principle of positions in parliament, government, and administration which can only be held or not held.

In looking at the resonance of the political system on disaster issues in Morowali district. the political system shows the resonance of the executive institution which in the highest position is held through the general election route by a regent, which then shows that there is still a lack of regional decisions or programs that respond to potential disaster issues, this shows the capacity of political resonance through decisions and political programs of the executive branch is still very limited to matters that are beyond the reach of potential disaster issues which also affect regional apparatus organizations that are under the authority of the regional executive agency. The Regional Disaster Management Agency (BPBD) of Morowali district as a technical tool in dealing with disaster issues shows a response related to the issue of potential disasters by forming a disaster risk reduction forum which also coordinates with 12 regional apparatuses within the scope of the Morowali district government but becomes less effective due to the frequent rotation of positions in the scope of local government which is also a sign of a lack of response that is influenced by the resonance of the political system, regional apparatus organizations such as BAPPEDA, the Public Works & Public Housing Office, and the Regional Environment Service show responses related to the issue of potential disasters which tend to work respectively which causes policies related programs that almost touch the issue of disaster potential do not run comprehensively, while in the legislature as a position obtained through a direct general election with the main tasks and main functions that are mandated in the constitution does not at all show the resonance of the political function system related to the issue of potential disasters in the Morowali district, this shows the lack of capacity of the political function system in the Morowali district government system to the existing potential disaster issues.

Conclusion

The response of the government system in Morowali has not shown a positive trend regarding the issue of potential disasters that exist, this is detected through the system of economic functions and political function systems that show resonant capacity for potential disaster

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issues, which is the cause of the function system that is seen to be lacking in influencing policy and local government programs that are not yet oriented towards the exposure of ecological hazards. Niklas Luhmann stated that the social system will be destroyed if it is unable to reduce the complexity of its environment, the environment is always more complex than the system, the reduction of complexity is an internal operation of the system to continue its evolutionary stages. the regional government of Morowali district is required to be able to be more sensitive to the issue of potential disasters and encourage greater resonance capacity of political and economic function systems and even other system functions such as law, education, religion, art, etc. The concept of pro-active adaptation (Giddens, 2009) should be encouraged by the government to be developed within the Morowali district government system to deal with the hazards of its natural disasters. So the government is able to develop a disaster communication model that focuses on existing disaster potential to face in the future.

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Conflict of Interest

The authors declare that there is no conflict or competing interests regarding the publication of this manuscript.

References

Adejoke, O. C., Mji, A., & Mukhola, M. S. (2014). Students' and Teachers' Awareness of and Attitude towards Environmental Pollution: A Multivariate Analysis Using Biographical Variables. *Journal of Human Ecology*, *45*(2), 167–175. https://doi.org/10.1080/09709274.2014.11906690

Arifudin, Wahyuni, H. I., & Haryadi, F. T. (2019). Autopoiesis Sistem Sosial dalam Diskursus Penyelesaian Persoalan Bencana Asap di Indonesia [*Social System Autopoiesis in the Discourse on Solving Haze Disasters in Indonesia]*. *Jurnal Ilmu Komunikasi,* , *17*(1), 28–38. http://sipongi.menlhk.go.id,

Bellier, O., Sébrier, M., Beaudouin, T., Villeneuve, M., Braucher, R., Bourlès, D., Siame, L., Putranto, E., & Pratomo, I. (2001). High slip rate for a low seismicity along the Palu-Koro active fault in Central Sulawesi (Indonesia). *Terra Nova*, *13*, 463–470. https://doi.org/10.1046/j.1365-3121.2001.00382.x

Creswell, J. W., & Poth, C. N. (2016). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches Pengarang* (4th ed., Vol. 4). SAGE Publications.

Giddens, A. (2009). *Politics of Climate Change*.

Gunawan, H. (2021). *Data Bencana BPBD Morowali* [Morowali BPBD Disaster Data].

Handaka, T., Wahyuni, H. I., Sulastri, E., & Wiryono, P. (2017). Interpenetrasi Sistem Komunikasi Pemerintah dalam Pengelolaan Breeding Center Kambing Kaligesing di Purworejo [*Interpenetration of Government Communication Systems in the Management of the Kaligesing Goat Breeding Center in Purworejo*]. *KOMUNIKOLOGI Jurnal Pengembangan Ilmu Komunikasi Dan Sosia*, *I*(2).

ISSN 2721-0960 (Print), ISSN 2721-0847 (online)

Hollweck, T. (2016). Case Study Research Design and Methods (5th ed.). *The Canadian Journal of Program Evaluation*. https://doi.org/10.3138/cjpe.30.1.108

Khumairoh, Z., Widana, I. D. K. K., & Sumantri, S. H. (2021). The role of communication as the disaster risk reduction in Indonesia capital city transference policy. *IOP Conference Series: Earth and Environmental Science*, *708*(1). https://doi.org/10.1088/1755-1315/708/1/012101

Koesnama. (2014). Pensesaran Mendatar Dan Zona Tunjaman Aktif Di Sulawesi: Hubungannya Dengan Kegempaan [*strike-Slip Faults And Active Subduction In The Sulawesi Area: Their Relationships With Seismicity]*. *J.G.S.M*, *15*(02), 75–79.

Luhmann, N. (1989). *Ecological Communication*.

Masum, M., & Md, A. A. (2019). The Pacific Ring of Fire is Working as a Home Country of Geothermal Resources in the World. *IOP Conference Series: Earth and Environmental Science*, *249*(1). https://doi.org/10.1088/1755-1315/249/1/012020

Mikhael Tinaiy, A., Rogi, O. H., & Siregar, F. O. (2020). Pemetaan Kerentanan Terhadap Bahaya Bencana Vulkanik Gunung Soputan Kabupaten Minahasa Tenggara *[Mapping the Vulnerability to the Hazards of the Mount Soputan Volcanic Disaster, Southeast Minahasa Regency]*. *Jurnal Spasial*, *7*(1).

Naping, H., Safriadi, & Musywirah, I. (2019). A strategy of local wisdom-based natural disaster management in coastal communities in Barru District. *IOP Conference Series: Earth and Environmental Science*, *235*(1). https://doi.org/10.1088/1755-1315/235/1/012033

Nugroho, A. (2018). Pengembangan Model Pembelajaran Mitigasi Bencana Gunung Meletus Di Sekolah Dasar Lereng Gunung Slamet [*Development of a Mount Eruption Disaster Mitigation Learning Model in Mount Slamet Slope Elementary School]*. In *Jurnal Pengabdian Masyarakat E-ISSN* (Vol. 1, Issue 2).

Patria, A., & Putra, P. S. (2020). Development of the Palu–Koro Fault in NW Palu Valley, Indonesia. *Geoscience Letters*, *7*(1). https://doi.org/10.1186/s40562-020-0150-2

Pramono, J., Kusumastuti, D., Sekarwangi, M., & Choerudin, A. (2396). The Community Participation in Disaster Mitigation to Managing the Impact of Natural Disasters in Indonesia. *Talent Development & Excellence*, *12*(2s), 2396–2403. http://www.iratde.com

Purwoko, A., & Putro, S. (2015). Pengaruh Pengetahuan Dan Sikap Tentang Resiko Bencana Banjir Terhadap Kesiapsiagaan Remaja Usia 15-18 Tahun Dalam Menghadapi Bencana Banjir Di Kelurahan Pedurungan Kidul Kota Semarang [*The Influence of Knowledge and Attitudes About the Risks of Flood Disasters on the Preparedness of Adolescents Aged 15-18 Years in Facing Flood Disasters in Pedurungan Kidul Village, Semarang]* City. In *Jurnal Geografi* (Vol. 12, Issue 2).

Rackelhof, C., Petersen, D., & Dangel. (2007). *Risk Communication in Action; The Risk Communication Workbook*.

Retia, K. D. (2019). Antisipasi Tsunami, Warga Morowali Mengungsi ke Bukit dan Daerah Tinggi *[Anticipating a Tsunami, Morowali Residents Evacuate to the Hills and Highlands]*. kompas.com

Sekertariat Jendral. (2019). Kapus PUU DPR Jelaskan Tanggung Jawab DPRD dalam Penangulangan Bencana *[The Head of the PUU DPR Headquarters Explains the*

ISSN 2721-0960 (Print), ISSN 2721-0847 (online)

Responsibilities of the DPRD in Disaster Management]. https://www.dpr.go.id/berita/detail/id/23652/t/Kapus+PUU+DPR+Jelaskan+Tanggung+Jawab+DPRD+dalam+Penangulangan+Bencana

Stirrrd. (2016). *Kabupaten Morowali – Profil Kerentanan Bencana alam*.

Wahyuni, H. I. (2019). Ecological Communication in Information Society- Reflections on Niklas Luhmann's Thought in Understanding Ecological and Disaster Issues in Indonesia. *Ikatan Sarjana Komunikasi Indonesia*, *04*(01), 09–17.

Wardyaningrum, D. (2014). Perubahan Komunikasi Masyarakat Dalam Inovasi Mitigasi Bencana Di Wilayah Rawan Bencana Gunung Merapi *[Changes in Community Communication in Disaster Mitigation Innovations in Disaster Prone Areas of Mount Merapi]. ASPIKOM*, *2*(3), 179–197.

ISSN 2721-0960 (Print), ISSN 2721-0847 (online)