Disaster Management Communication Model

Muhammad Hilmy Aziz
Communication Science, Faculty of Social and Political Sciences, Bhayangkara University Surabaya
*Corresponding author. Email: hilmy@ubhara.ac.id

ABSTRACT

Indonesia is located where the four main plates of the world meet, namely Eurasia, Indo-Australia, the Philippines, and the Pacific, which geologically makes Indonesia prone to earthquakes, tsunamis, and volcanic eruptions. On the other hand, Indonesia is located at the confluence of two oceans and two continents and in the tropics, making the entire region dominantly geographically potential for disaster vulnerability, such as floods, landslides, flash floods, extreme weather, extreme waves and abrasion, and droughts that can also trigger forest and land fires that reinforce the definition of Indonesia being located in a strategic disaster area. This research provides a concrete picture of the latest communication models in disaster management studies that have been carried out still within the risk reduction paradigm. Preparing this communication model is expected to provide strategic potential as an effort and step where Indonesia can make organized disaster management at the communication level. This research uses a qualitative method which can give a concrete picture of how to handle disasters. In addition, FGD (Focus Group Discussion) is a way of collecting data through direct discussion and analysing problems with experts. The research focuses on more than just the communication model as an essential part of disaster management. The development of literacy as a role model can be applied to form a sophisticated handling of disasters that integrates technology with society and media independence in presenting the information. Through these steps, disaster management can be realized in the communication corridor used to provide a new paradigm related to disaster management.

Keywords: *Communication Role Model, Disaster Management, Updating the Disaster Paradigm*

INTRODUCTION

Talking about the unitary state of the Republic of Indonesia cannot be separated from the vulnerability to disasters which, as a whole, the territory of Indonesia has the potential for disaster. The National Disaster Management Agency (BNPB) noted 749 natural disaster events in Indonesia from January 1 to March 31, 2023. Of these, the most catastrophic floods occurred, with 331 events. This number is equivalent to 44.19% of the total national disaster events in 2023. In addition, BNPB also recorded 226 extreme weather events, 130 landslides, 41 forest and land fires (karhutla), ten tidal waves/abrasion, nine earthquakes, and two volcanic eruptions (Annur, 2023). On another note highlighted by Geoportal – the National Disaster Management Agency found an extraordinary number of natural disaster events in Indonesia in the last decade, from 2012 to 2022. The table below shows that Indonesia as a "ring of fire" is true and is the essential thing that must be a common concern in the disaster mitigation process (Geoportal of Indonesia disaster data, 2023).

Table 1. Total of Disasters in Indonesia in 2012-2022

Year	Total of Disasters	Year	Total of Disasters
2012	1.780	2018	3.397
2013	1.666	2019	3.814
2014	1.961	2020	4.650
2015	1.694	2021	5.402
2016	2.306	2022	3.544
2017	2.866		

Source: Geoportal of the National Disaster Management Agency (BNPB) (Infographic on Annual Disasters in Indonesia)

Look at Table 1. As presented above, disaster events in Indonesia increased significantly over the last decade. The summary introduced in the table signals that a disaster event has excellent potential to occur and cannot be predicted in advance even though, technically, many changes and efforts have been made to reduce the occurrence of disaster events. Firman Wahyudi provided important notes through the results of his research related to the communication pattern of BPBD Riau, namely in preventing the Riau BPBD smoke disaster, namely the wheel pattern. The wheel pattern is used by BPBD Riau when coordinating with related parties such as BMKG and BLH. The wheel pattern is also used during emergency response, where leaders give clear orders and directions while delivering their messages (Wahyudi, 2016). The record provides an overview of where agencies that focus on handling or making a response carry out their activities in the context of disaster mitigation, especially haze disaster management, or, in this case, forest and land fires (Karhutla). This fact is counterproductive to the discovery of graphic data highlighting the amount of land and forest burned in the last 7-year period, starting from 2015-2021.

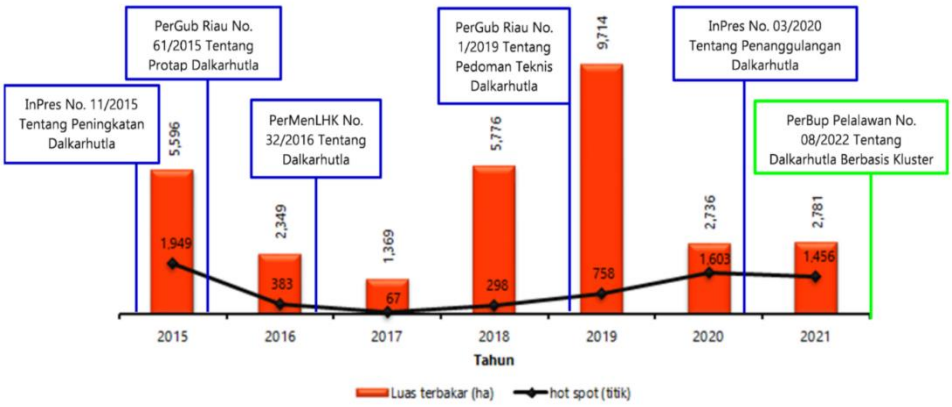

Figure 1. Data on the area of fires and the number of hot spots in Riau Province in 2015 – 2022 and forest and land fire control regulations
Source: Sutrisno & Hardhinasty, 2019

The data shown through bar charts and graphs show the inability to overcome forest fires that cause haze disaster events. The most significant figure occurred in 2019, covering an area of 9,714 ha of forest fire caused by 758 hot spots that triggered forest fires. Furthermore, the research results conducted by Afni et al. highlighted the peatland management protection policy paradigm in Indonesia, which experienced crucial changes after the forest and land fires in 2015. The government carries out various corrective policy measures and corrective actions to protect peatland ecosystems for

forest and land fire control efforts by prioritizing prevention and law enforcement efforts. In addition, if before 2015, peat utilization was more predominantly oriented toward economic growth, then after that, policy orientation was more towards sustainable peat use (Afni. et al., 2022).

Prevention and response are generally centralized and carried out by agencies and related parties complicit in their fields. As a result, mitigation can only be done when the authorities carry out their primary duties and functions in the context of disaster mitigation. Article 1, paragraph 6 of Government Regulation No. 21 of 2008 concerning implementing Disaster Management provides specific information on disaster risk reduction. Furthermore, the government regulation also explains that mitigation is a series of disaster risk reduction efforts through physical development and increased awareness and ability to manage disaster risk. Effective disaster preparedness involves the active role of local communities as a form of disaster communication (Aziz, 2023). Thus, disaster prevention and response are the duties of relevant agencies and agencies in the field of mitigation, but also the community as the main component in implementing helpers who can play their role in maintaining the surrounding environment. This was also highlighted by Yusuf et al. that community activities in cultivating agricultural land/plantations using the slash and burn method are one of the factors that cause forest/land fires in Riau Province. Of course, this is the main focus because of the potential when land clearing is not only done by one person. Based on the distribution of hot spots analysis, a relatively high distribution of hot spots was discovered up to 20 km from dryland farms. The closer the distance from dryland agriculture, the greater the fire risk because land-clearing activities often use fire (Yusuf. et al., 2019).

PROBLEM STATEMENT

In the long history of disaster management carried out by related parties in disaster mitigation, there have been changes in at least four paradigms as a reference in carrying out disaster mitigation, both pre-disaster and post-disaster. First, the Conventional Paradigm (Relief & Emergency) focuses on disaster management efforts more concentrated on relief and emergency. In other words, the Relief Paradigm or Emergency Assistance is oriented toward meeting emergency needs in food, emergency shelter, health, and crisis management, whose primary purpose is to reduce loss and damage and quickly recover the situation.

Second, the Mitigation Paradigm focuses on identifying disaster-prone areas, recognizing patterns that can cause vulnerability, and carrying out various structural mitigation activities such as building construction and non-structural such as spatial planning, building codes, etc. Third, the Development Paradigm focuses more on the efforts made to integrate disaster management efforts with development programs. Such as through economic strength, the application of technology, poverty alleviation, and so on.

Fourth, the Risk Reduction Paradigm combines technical and scientific perspectives to improve the ability of the community to manage and reduce the risk of disasters. The community is seen as a subject, not an object of disaster management. It is expected to actively access formal and non-formal information channels so disaster

risk reduction efforts can directly involve the community. The government prepares facilities, infrastructure, and resources to implement disaster risk reduction activities (Wibowo, 2010).

The paradigm presented above illustrates that disaster mitigation efforts continue to develop, both in thinking and role models (application). This leads to a thought and assumption that a disaster management effort continues to be developed following the needs needed in the field. However, the existing model in this paradigm can still not reduce or overcome disasters optimally or significantly. In the era of information openness (digital age), such as when it has pushed the world towards the industrial revolution 4.0, characterized by a combination of technology that blurs the boundaries between physical, digital, and biological. This is marked by several new technological breakthroughs in several fields, including its use for disaster mitigation, such as robotics and blockchain, and what is not essential is artificial intelligence (AI) for the development of the latest models in disaster management (Sawitri, 2019). A vital note became a highlight where there still needs to be more involvement or the role of communication and information technology used in disaster response, as stated by Kurniawati. Through the results of his research, it was found that out of 200 respondents, as many as 157 respondents stated that both Government and Non-Government Institutions had never conducted socialization about disaster mitigation in any form, such as billboards, or banners about disasters, until coming door to door to residents' homes in providing understanding about disasters was also never obtained by residents around the disaster area. The disaster warning system is also still traditional, namely by looking at the tide or not and what is cloudy in color. They also know the arrival of floods from animals, such as when floods come; cockroaches will climb the walls of their houses (Kurniawati, 2020). Suppose it is related to the concept of disaster mitigation. In that case, all forms of potential and possibility can be used as a breakthrough to reduce and anticipate disaster events. The definition of mitigation suggests a series of efforts to reduce disaster risk through physical development and awareness and improvement of the ability to face disaster threats (BPBD, 2012). This means that disaster mitigation's pre-disaster and post-disaster stages will intersect with communication activities to form awareness and add insight related to disasters. This concept then provides a concrete picture related to the instrumental initiated by William I. Gorden, where the function of communication has a general purpose, such as providing information (to inform), providing teaching or learning (to educate), and can change an attitude or behavior of a person as desired by the person who gives the message (to change behavior) and used to provide entertainment (to entertain) (Rachmaniar &; Susanti, 2022). So that thought arises in disaster mitigation, not only the application of the risk reduction paradigm as the spearhead of efforts that can be done; more than that, there is an urgent approach to be done, one of which is by applying the latest model to penetrate the realm of communication. Thus, the current disaster management or disaster mitigation model refers to a new communication and information technology paradigm in disaster mitigation.

Preparing this communication model is expected to provide strategic potential as an effort and step where Indonesia can carry out organized disaster management at the communication level.

RESEARCH METHODS

This study uses a qualitative method that focuses on examining participants' perspectives with various interactive strategies that have the primary purpose of describing and exploring and describing and explaining (to describe and explain) (Pujileksono, 2015 in Aziz, 2022). The qualitative method has various ways of collecting data to meet the information needed during the research process.

This research uses FGD (Focus Group Discussion) to discuss a specific social reality by focusing on objects. Then it continues with an in-depth analysis of the problems discussed through discussion. Irwanto, 1998 (Pujileksono, 2015) explained that FGD tends to provide variations on how discussion efforts are carried out related to reviewing a problem. This is reinforced by several fundamental reasons that make FGD an alternative in framing social problems to find conclusions and models to realize solutions. First, there is a belief that the problem under study cannot be understood by survey methods or individual interviews (Aziz, 2022). In this case, because making a role model to create a novelty in producing a new model in disaster response communication requires a more in-depth discussion, in this case through a grounded theory design approach as a set of procedures used to compile a theory that explains a process on a substantive topic (Egan, 2002). Qualitative research through a grounded theory approach is suitable for use to explain phenomena and processes or formulate a general theory about a phenomenon that existing theories cannot explain (Budiasih, 2014). Second, to obtain quality qualitative data in a relatively short time. Third, as a method that is considered suitable for comprehensive and specific problems.

RESULTS AND DISCUSSION

A. The Role of Communication at the Disaster Management Level

Talking about communication dynamics will be connected to a thought expressed by Little John (2009), who said that communication is so broad that it cannot be bound or limited in a single paradigm. The relationship between disaster mitigation and communication is the process by which an idea is transferred from the source to one or more recipients to change behaviour (Everett M. Rogers, 1985 in Cangara, 2014). In communication studies, it is known as persuasive communication by providing comfort to someone when carrying out an application of message transfer. This is as explained by Burgon & Huffner in 2002 through Ira Mirawati's research regarding the use of persuasive communication theory in e-commerce research in the digital era. The persuasive communication process explains that it has the purpose of influencing the thoughts and opinions of others to match what the communicator or sender wants (Putri, 2016). Persuasion is not just persuading or seducing; persuasion is a technique of influencing, using, and utilizing psychological data and, facts, sociology from the people we influence (Nida, 2014). This means that persuasiveness wants the recipient to receive precisely what the message's sender wants, both in sickle and meaning.

Furthermore, persuasion or invitation communicated is an invitation to something without coercion. This signals a message exchange activity, both as a process of meaning and data transfer, carried out with a happy feeling, and there is no pressure from any party or more to build self-awareness (Mirawati, 2021). This combination of concepts gave birth to an essential role of communication in shaping and realizing

disaster management. A person is invited to be able to understand disaster messages to be involved in concrete thinking related to disaster mitigation, such as understanding disaster literacy and development planning as an effort to reduce disaster potential.

According to Aziz (2023), Holistic literacy has a broad scope dimension. Literacy is not interpreted partially or overshadows a vital interest and denies existing reality. Literacy can include learning or increasing knowledge that makes it possible to achieve goals in personal and group contexts related to disaster response. In addition, literacy can be used as a superior resource to develop expertise or improve one's skills in their field to elaborate disaster management efforts. No less important as a tangible manifestation of this literacy is the efforts of related parties to participate in disaster management. Second, opinions or views (to change opinions) that have changed so far, disaster communication is still considered a non-emergency or given top priority. In her study of Kompas Daily and online media kompas.com, Asteria (2016) found that disaster reports must contain detailed and precise disaster information. Instead, the news frame focuses on Raung's economic activity and tourism boom. Another more critical aspect of prioritizing is the early warning function, which could be more optimal. This is highly anticipated because the media can help the community's preparedness and capacity to deal with natural disasters (Alfarabi & Adhrianti, 2021) (Aziz, 2023). Thus, it is very appropriate to combine disaster mitigation with a communication model. The communication model in disaster management and response will produce literacy among the community, which impacts the development of people's mindset related to disasters. This is also a solution to the anxiety that has been a phenomenon that people interpret disasters not holistically and politically. Disasters are still considered to be natural thing, especially conservativeness in seeing signs of disaster.

Borrowing the concept of social communication proposed by Brent D. Ruben (1975) gives meaning to the process that underlies a phenomenon or symptom that occurs because of community symbolization and the use of symbols and diffusion. Disaster mitigation is considered a phenomenon that must be interpreted by taking a stance so the community can adopt it. Furthermore, Oteng Sutisna believed that social communication is intended to spread behavior. Social communication is a process of interaction between people or groups of attitudes and aims to influence each other's behavior (individuals) and groups (Sutisna, 1989). In this regard, comprehensively and holistically, the role of communication in realizing disaster management has at least three essential aspects as benchmarks and guidelines (Mashud, 2019).

1. *As an informer,* information needs to be conveyed to community members because reality shows the following.
    a. Man can only progress and develop when he knows the values that need to be achieved. Local wisdom is one of the perspectives that the government can develop regarding disaster mitigation. It can be understood as several ideas, values, and local views that are wise, full of wisdom, and good values, which are embedded and followed by community members. Community empowerment based on local wisdom can be used to reduce the risk of earthquakes (Angin &; Sunimbar, 2016). Thus the government can control and direct the community following the culture in the environment.

b. The main reason information must be conveyed to the public is that only some have the same knowledge about the value that has been achieved, the means that must be used, and the dangers that must be avoided. A concrete example, as proven through research on smartphone digital literacy, is information on landslide disasters in Candi Village, Candisari District, Semarang City. This fact indicates that citizens' digital literacy competence is in the "medium" category of 50%, based on the percentage of citizens who do not use digital media, particularly smartphone electronic media, as a source of additional information (Noviantika, 2020). The results of this study illustrate that there is no guarantee that the public has enough information related to disaster management if there is no action or direct approach by the government. An urban society, which has been considered a collection of educated people, is only sometimes accurate and is a form of the stereotype of the majority of people. Suppose this is assumed as a measurement of community insight. In that case, the community has yet to obtain literacy optimally due to using instruments that cannot be further exposed.
c. The last fact related to information must be immediately conveyed to the public because everyone has the right to get information that is useful for his life. A simple analogy to each individual (someone) is the fulfilment of the needs of life of two kinds: physical and spiritual. The insufficiency of one that will make a person balanced in living his life will impact inequality or lack of insight and can even harm the balance of one's life. Therefore, someone needs to obtain information intended for the community, especially in disaster mitigation which concerns the safety and security of every life.

2. *As a provider of guidance*, either directly or indirectly. The concept of social communication finds in polarization that communication has an essential role in changing attitudes, creating behaviour, and maintaining habits. Regular community training can be done as the government desires through a continuous guidance process. This fact is the result of elaboration that the government and related agencies can play in shaping the spirit of preparedness to overcome disasters. The involvement and active role of the community make disaster management quickly realized. As a supporting component, the media must play an active role in carrying out its functions as in the main task and function of mass media, namely the function of education. An applied study was conducted to measure community escalation in interpreting and understanding the importance of disaster management efforts. The survey proved from the results of research conducted in Ciamis Regency showed an increase in the average knowledge score from 77.07 before training to 89.57 after training, as well as positive attitudes shown by training participants such as health cadres, village government officials, members of community protection (lines), representatives of puskesmas, regional elements such as RT, RW, and Hamlet (Ibrahim, 2020). Thus, as a community manager, the government that collaborates with related parties regularly must provide a development that is realized by physical and non-physical training to create community independence in carrying out disaster management.
3. *As a provider of entertainment*, indirectly social communication has provided alternative solutions in disaster management problems. Speaking of natural

disasters, it will be very closely related to the discussion of how much loss is caused and also how many victims accrue to the occurrence of the disaster event.

Figure 2. Infographic on Indonesian Disaster Events (Period 1 January 2023 – 9 May 2023) Source: Geoportal of the National Disaster Management Agency (BNPB) (Infographic on Annual Disasters in Indonesia)

Based on the picture above, there are several specifications of the impact of natural disasters caused, ranging from meaningful duni, missing, suffering, and evacuating and injured. This is a physical impact that cannot be avoided when a disaster event occurs. Of course, it will have a psychological impact when talking to victims of leaving the world and those who are lost. The family will feel the loss of the disaster that befell him even though, in plain view, not only the family of the deceased felt sad, but all casualties in the disaster circle participated in the grief—this phenomenon cannot be cured through medical channels or anything. However, by applying the solutions offered by social communication, people with one another can play a role in comforting each other. More importantly, related parties and the government as the main person in charge of providing entertainment, as in the concept of social communication.

B. Communication Model as a Disaster Mitigation Solution

Planning disaster communication models in the modern paradigm must always involve the role of technology in it. This is due to the rapid population growth, and it is undeniable that all aspects of social activities in the community have widely used and utilized communication and information technology. Therefore, disaster response in the modern paradigm arises by presenting the critical role of technology to help provide a signal that can help the community realize disaster mitigation management. The following is a communication model that can be used in social life, both by institutions related to disaster management and society in general.

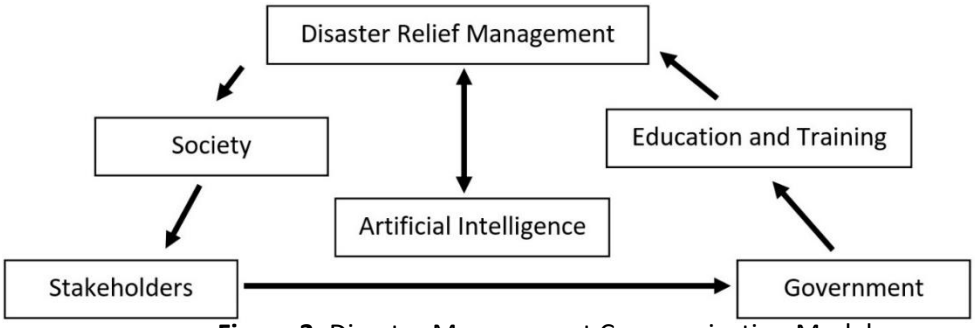

Figure 3. Disaster Management Communication Model
Source: Processed by Researchers and FGD Discussion Results

1. Society

Juridically, Society has the right and even obligation in the context of disaster management. This is stipulated in the Regulation of the Head of the National Disaster Management Agency Number 11 of 2014 concerning Society's Participation in the Implementation of Disaster Management (Perka BNPB No. 11/2014). The obligation of the community to maintain environmental stability to realize disaster management, including

a. Maintaining a harmonious social life in Society, maintaining balance, harmony, harmony, and preservation of environmental functions;
b. Carrying out disaster management activities;
c. We are providing correct information to the public about disaster management. Thus, all components of Society are actively participating in the circle of disaster management communication networks, starting from the RT, RW, Village, and District levels to the city and provincial levels.

2. Stakeholders

It is namely supporting the lives of the community and government, industry, media, etc. The stakeholder component must also be active in disaster management, especially in mass media. The involvement of mass media will have a significant influence on the success of disaster management. Of course, it must be based on honesty and high integrity because it is in the interest of the same and leaves the interests of groups that will impact the independence of the dissemination of information.

3. Government

Become the central figure in society management to produce a responsive and ready community for disaster management. Through the Regulation of the Minister of Social Affairs of the Republic of Indonesia number 29 of 2012, Pemetintah formed a unit called Taruna Siaga Bencana (TAGANA). This Disaster Preparedness cadet represents a social volunteer who is determined and formed, and supervised by the government to assist the government and local governments in carrying out disaster management both during pre-disaster, during emergency response, and post-disaster as well as other social problem-handling tasks related to disaster management (Yuliani, 2020). Of course, this solution is not an optimization of government efforts because it is inevitable that the reality, along with the times and technology, TAGANA can be replaced with the role of technology. Thus, the government certainly must further develop disaster management efforts with technology. For example, they are building a pre-disaster system connected to satellites that can be integrated into all people's homes in potential

disaster areas. So that the term prevention is better than cure can be realized and has positive implications with the impact caused especially casualties.

4. Education and Training

If analogous to a human organ, education, and training are likened to the heart and brain of the structure of human organs. This is because someone will be able to find a solution to the problem if there is knowledge that can provide a solution to the problem. Therefore, through education and training, the community will be guided to know, upgrade insight, and carry out a scientific application which is mainly things that must be taken or done when facing a disaster or when the disaster occurs. Thus, training carried out on an ongoing basis result in the independence of the community, being ready for disasters, and developing of disaster management efforts.

5. Artificial Intelligence

This section integrates four components of the communication model, ranging from society, stakeholders, government, and training education. Currently, all aspects of social life are faced with binding human roles and functions to the use of communication and information technology. Therefore, it is inevitable that disaster management or mitigation development must be integrated with artificial intelligence. Artificial intelligence is considered a 'helper' for humans to be more able to export themselves; in disaster mitigation, artificial intelligence can show the potential for disasters to occur. As in the signal of a tsunami paired in offshore areas that have the potential to experience wind when ocean conditions are high. Artificial intelligence is primarily designed to predict the arrival or imminence of a catastrophic event. Thus, the addition of the role of artificial intelligence in all potential vulnerabilities will result in an optimal reduction of casualties caused by disaster events because it can predict the occurrence of disasters in the few days before the occurrence of disasters. The installation of artificial intelligence tools is very suitable to be placed in opponent areas, landslides, flood-prone, wind-prone, and earthquake-prone by being integrated into communication devices installed in each surrounding resident's house. So that when the device has issued an emergency signal that appears a few days before the occurrence, all surrounding residents must leave the area.

CONCLUSION

Disaster management provides a holistic integration that can be applied to communication models. Based on the discussion above, a conclusion can be drawn that answers the main objectives of this study, including the following.

1. The role of communication at the level of disaster management can be done by applying persuasive concepts in which there are social communication implementers. This social communication becomes a benchmark and guideline in taking a stance in playing the role of communication for disaster mitigation, namely as an informer, a guide, and providing entertainment.
2. The communication model as a Disaster Mitigation Solution provides the fact that the success of disaster management must integrate all social components of society and involve elements of communication technology and information manifested as a form of artificial efficiency. Therefore, all of these components are integrated. Therefore, when going to carry out disaster management development will be

quickly carried out and can also increase the possibility of anticipation of potential disasters integrated with artificial intelligence.

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