

Literature studies on natural disasters and communication in Indonesia

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Abstract. Disaster communication is important in improving community preparedness because it can help convey information and instructions for the community to face and respond to disasters effectively. This study aims to analyse the role of communication in disaster management in Indonesia based on a review of various related literature sources. The research uses literature study approach, analysing the publication of communication science journals discussing communication and natural disasters in Indonesia. The data sources include various relevant scientific publications, since the year 2000. The results showed that: 1) The types of natural disasters that are the main concern in the publication of communication journals in Indonesia are disasters on a national and regional scale such as floods, earthquakes, tsunamis, and volcanic eruptions. 2) Various communication topics include disaster communication for community mitigation and preparedness, public communication and social media in disasters, crisis communication and disaster communication management, communication and community participation in disasters, as well as disaster communication and vulnerability issues of vulnerable groups. 3) Efforts to bridge the gap between research and disaster management practice are challenges that must be faced so that communication science can make a greater contribution to improving the effectiveness of disaster management and mitigation in Indonesia.

1 Introduction

Indonesia is an archipelagic country that is known to have geological and climatological characteristics that are vulnerable to various kinds of natural disasters [1-3]. Natural disasters can occur suddenly and have a bad impact in the form of property damage and threatening human life [1, 2]. To overcome these challenges, the Indonesian government has issued various policies and plans, such as Law Number 24 of 2007 concerning Disaster Management and Presidential Regulation Number 8 of 2008 concerning the Establishment of the National Disaster Management Agency [1].

On the other hand, the challenges faced in the future are much greater [3, 4]. Increasingly extreme climate change, increasingly dynamic geological phenomena, and increasing environmental degradation require serious efforts to develop effective and efficient disaster emergency planning. One of the important aspects of disaster management is communication [2]. Appropriate communication strategies can contribute significantly to disaster mitigation and response. One of them is coordination between various parties in the emergency response to the pandemic by utilizing the use of communication platforms [5, 6]. This study raises the following questions:

1. What are the disaster events that are of great concern to communication science?
2. How are the uses of communication research findings in strengthening disaster management in Indonesia?

This study, in general, aims to analyse the role of communication in disaster management in Indonesia, specifically, it aims to:

1. Analyse the disaster events that are of great concern to communication research, and
2. Analyse the aspects of natural disasters in Indonesia which of concern to communication science.
3. Analyse the use of communication research results for strengthening disaster management in Indonesia.

2 Method

This study uses a literature study approach to analyse the publication of communication science that discusses communication-related to natural disasters in Indonesia. The study uses various data sources such as; journal articles, research reports, and other documents that discuss communication issues in natural disaster management in Indonesia. More specifically, it explores Journal articles using various online media such as Google Scholar, Garuda, Crossref, Sinta, and other sources using the keywords "communication," and "disaster," without distinguishing the journal's ranking. The study is based on a systematic literature review (SLR), the search covers publications from the year 2000 onward.

Data were analysed using qualitative analysis by creating a typology of communication studies about disasters and identifying patterns and trends in communication studies on disasters in Indonesia.

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3 Results and discussion

3.1 Types of disasters studied

Based on Law Number 24 of 2007 concerning Disaster Management, we review of communication journals related to the types of natural disasters. The results of the study show that natural disasters of main concern to communication publications in Indonesia are floods, earthquakes, tsunamis, and volcanic eruptions. This is not surprising considering that Indonesia is a country that is prone to these natural disasters. Some of the articles reported communication in the context of flood disasters in several regions of Indonesia, such as the Jakarta flood and the Bandung flood. Meanwhile, some journals discuss earthquake-related communications, such as the 2004 Aceh earthquake and the 2018 Lombok earthquake. In addition, communication in the context of the tsunami disaster is also a concern, such as the study of the 2004 Aceh tsunami and the 2018 Sunda Strait tsunami. Some journal articles report the role of communication in the disaster cycle, such as in mitigation, preparedness, emergency response, and recovery after the several eruptions of Mount Merapi in Central Java. In general, the results of this study show that in the last 20 years, the journal publications present communication in the context of natural disasters contributed to enriching the understanding and practice of disaster management in Indonesia.

3.1.1 Year of disaster event

The year of disaster events that are widely studied by communication science in Indonesia is the period 2004 to 2018. This is not surprising considering that during that period there were several major natural disasters in Indonesia, such as the Aceh earthquake and tsunami (2004), the eruption of Mount Merapi (2010), the Jakarta flood (2013), the Lombok earthquake (2018), and the Sunda Strait tsunami (2018). For example, the Aceh earthquake and tsunami in 2004 [7] became a topic that was widely studied in communication science journals in Indonesia. These studies generally discuss how communication and social media play a role in information dissemination, coordination of disaster handling, and mitigation. In addition, the eruption of Mount Merapi in 2010 is also the focus of attention, especially related to crisis communication and the use of social media.

In the following years, the flood disaster in Jakarta, the earthquake in Lombok, and the tsunami in the Sunda Strait also became a topic that was widely studied in the publication of communication science-related journals. This shows that communication science in Indonesia is quite responsive to natural disaster events that occur and tries to study the use of communication science to support disaster risk reduction efforts in Indonesia. Furthermore, the earthquake disaster in Lombok in 2018 became a topic that was studied quite a lot in communication journals, as disseminating information related to evacuation procedures, training, and simulations.

These studies generally discuss the use of social media for the dissemination of disaster information and coordination of handling.

3.1.2 Scale of the disaster

Based on the results of the analysis, the scale of disasters that are most studied in communication journal publications in Indonesia are those on a national and regional scale. Natural disasters with national impacts, such as the 2004 Aceh earthquake and tsunami, the 2010 eruption of Mount Merapi, and the 2018 Sunda Strait tsunami have become topics that have been widely studied. These studies generally discuss how communication, both through conventional media and social media, plays a role in information dissemination, coordination of handling, and disaster mitigation efforts on a national scale.

In addition, natural disasters with regional impacts, such as floods in Jakarta and Bandung, are also the focus of attention in the publication of communication journals in Indonesia. Few journals address communication in the context of natural disasters on a local or community scale. This shows that communication science in Indonesia tends to be more interested in studying communication in the context of natural disasters that have a greater and more widespread impact, both on a national and regional scale. Overall, the results of this literature review show that in the last 20 years, communication science in Indonesia has made a significant contribution to studying the role of communication in natural disaster management in Indonesia, especially in major natural disasters that occurred in the period 2004-2018

3.2 Communication topics studied

With the key search words of communication and disasters, 22 journal publications were found in the period 2000 – 2020. From the analysis of 22 journal publications, it was found that several main topics were the focus of the study, including disaster communication for community mitigation and preparedness, public communication, and social media in disasters, crisis communication and disaster communication management, communication, and community participation in disasters, as well as disaster communication and vulnerability issues of vulnerable groups. And coordination between stakeholders in disaster communication. [7-10]

3.2.1 Disaster communication for community mitigation and preparedness

Studies have shown that disaster communication has an important role in improving community preparedness in dealing with disasters. Effective communication can increase public understanding and knowledge about disasters, thereby reducing risks and losses. Communication plays a role in education, socialization, and community mobilization to prepare for disasters, such

Various studies examine how disaster communication can be used to build community preparedness, both

through socialization, dissemination of information about disasters, and disaster mitigation training. So that the community can understand the disaster risk in their area, know the evacuation procedures, and take disaster risk reduction actions [4, 11].

3.2.2 Research on government communication to improve community preparedness in dealing with flood disasters

Other researchers found the important role of community-based communication networks in building preparedness for natural disasters [7, 8, 10, 12]. Research related to government communication to improve community preparedness provided an overview of the use of communication media by local governments in an effort to improve community preparedness to face flood disasters. Meanwhile, community-based communication research shows how communication networks and collaboration between residents in the community can help build citizens' preparedness in dealing with natural disasters. Communication networks and collaboration between residents in the community can be interconnected and coordinated to build citizens' preparedness in dealing with natural disasters. Steps to build this communication and collaboration network are through the establishment of community-based disaster preparedness groups, the preparation of community emergency response plans, preparedness training, and others.

Effective communication can improve community preparedness, coordination between stakeholders, and the dissemination of accurate information during the emergency response phase [2]. Research shows that a good communication strategy helps reduce the impact of disasters and accelerate recovery efforts [3, 4]. Considering various natural disasters that frequently occur in Indonesia, community preparedness must be constantly increased to deal with disasters. However, the preparedness of the Indonesian people is still limited due to limited knowledge and understanding of disaster mitigation [11].

3.2.3 Public communication and social media in disaster

Several journals examine other important issues related to disaster communication, such as the handling of hoax and rumor issues, communication between the government and the community, and the involvement of vulnerable groups in disaster management. Aim to provide practical guidance for the use of new media in the context of crisis communication [13, 14]. These studies provide evidence that the use of social media and public communication has an important role in disseminating information, coordinating, and mobilizing people during disasters [1, 3]. In addition, during crises, social media is a channel for the dissemination of inaccurate information or hoaxes, which can interfere with people's emergency response

efforts [2]. Therefore, a good communication strategy is needed to manage information and public communication in times of disaster.

Furthermore, several journals also examine how social media such as Twitter, Facebook, and WhatsApp are used to disseminate information and conduct emergency response communication during a disaster [7]. The article also reports the examination of the influence of social media platforms on the dissemination of disaster information. Implementation of conceptual framework in designing tools to identify disaster location and disaster safety in the disaster process with the help of social media [15]. The results of his research show that social media facilitates individual communication during disasters and allows people to spread information quickly [10].

Subsequent research shows the role of social media in natural disaster situations, such as information dissemination, evacuation coordination, and relief. However, there are also challenges related to the spread of hoaxes and false information on social media, so it requires the right communication strategy to overcome them. To overcome challenges related to the spread of false information or hoaxes on social media, effective communication strategies are needed, such as verifying and clarifying information, strengthening media literacy, as well as the active role of the government and related institutions in disseminating accurate and timely information.

In addition, communication through traditional media such as radio and television also still plays an important role, especially to reach people who are less exposed to digital media. Effective public communication can encourage active community participation in disaster management efforts, ranging from mitigation, preparedness, and emergency response to post-disaster recovery and rehabilitation. Overall, this literature study shows that communication plays a key role in the entire disaster management cycle in Indonesia, from the pre-disaster stage, during emergency response, to the post-disaster recovery stage.

3.2.4 Crisis and disaster communication management

The research focuses on the role of crisis communication and communication management efforts in natural disaster emergency response. The research examines the management of communication by government agencies and organizations in conveying information, avoiding information chaos, and facilitating coordination among stakeholders. Coordinated communication strategies between various parties in the pandemic emergency response [5]. Effective crisis communication can help coordinate emergency response actions, use various communication channels to disseminate the right information and conduct two-way communication with the community. Make this happen through leadership support, communication planning, and strengthening the capacity of communication human resources.

Two-way communication between the government, relevant institutions, and the community can also increase public trust and encourage community participation in disaster management. Research related to the management of emergency response communication for natural disasters such as earthquakes, tsunamis, floods, and others examines the coordination, communication strategies, and channels used. The stages of communication management are careful and comprehensive communication planning, data collection and analysis to identify current needs and situations, delivery of targeted messages and selection of appropriate communication media, as well as monitoring and evaluation of the implementation of communication.

3.2.5 Communication and community participation in disasters

The research examines the role of communication in encouraging community participation and empowerment in disaster management, starting from the mitigation, preparedness, and emergency response to the rehabilitation and reconstruction stages. Describe and critique how community-based disaster management in Indonesia [16] Two-way communication involving active community participation will increase the effectiveness of disaster management, as communities can convey their aspirations and needs and contribute to disaster risk reduction efforts. The research how the communication strategies for disaster management panning such us the use of communication platform [6]. In addition, discussion forums, citizen discussions, and empowerment of vulnerable community groups can support the creation of participatory communication in disaster management. This step is important to build community awareness and capacity in dealing with disasters. The role of communication in encouraging participation can be done by increasing community involvement in emergency response planning, strengthening organizations and

community groups that play a role in disaster management, and facilitating dialogue between stakeholders and the community.

3.2.6 Disaster communication and vulnerability issues of vulnerable groups

The research examines communication strategies that take into account the needs and challenges of vulnerable groups such as women, children, the elderly, and people with disabilities in disaster situations. This vulnerable group requires special treatment and delivery of information, such as adaptive communication with easily accessible languages and channels. In addition, the study also shows the need for an active role of vulnerable groups in planning and decision-making to ensure their needs are accommodated. The issue of vulnerable groups is important to pay attention to so that disaster emergency mitigation and response efforts can be more equitable and inclusive.

Several studies related to vulnerable groups say that effective communication with vulnerable groups such as women, children, the elderly, and people with disabilities requires specific approaches and channels, such as using simple language, visual media, activating their social networks, and facilitating their participation in decision-making. [1, 2, 4, 10] Effective communication with vulnerable groups can encourage their active involvement and contribution in every stage of disaster management, from mitigation, preparedness, and emergency response to post-disaster recovery.

Research shows that in disaster situations, vulnerable groups such as women and children face a higher risk compared to other groups. Therefore, communication strategies need to pay attention to the specific needs and challenges faced by these vulnerable groups so that information delivery and disaster management can run more fairly and inclusively [4, 10, 11]. Table 1 summarizes the relevant journal articles reviewed.

Table 1. Summary of typology, patterns, and trends of communication and natural disaster studies in Indonesia.

Communication Aspects	Reference	Research Findings	Research opportunities	Recommendations
Patterns of information dissemination	[7, 10, 18, 19, 20]	- Disaster information spreads through various media, including social media, and the factors that influence it	Information dissemination patterns are based on individuals, organizations, and policies for more effective disaster management.	The importance of increasing the capacity of the government and related institutions to utilize social media as a communication channel in disaster management.

Coordination between stakeholders	[1, 3, 16, 17, 22]	<ul style="list-style-type: none"> - In terms of coordination, these journals examine how communication and coordination between governments, communities, and other stakeholders take place in disaster management. - The results of the research are valuable input to develop a better collaboration mechanism in disaster management. 	Build more effective coordination between the government, the private sector, and the public in communication during disaster emergency response.	<ul style="list-style-type: none"> - The importance of increasing the capacity of the government and related institutions to utilize social media as a communication channel in disaster management. - Scientific studies on disaster communication can make a practical contribution to improving Indonesia's capacity to deal with natural disasters.
Utilization of social media	[7, 8, 10, 12, 13, 14, 15, 17]	The role of social media in disaster management is still limited in reviewing the use of social media for information dissemination and coordination of disaster management.	The contribution of social media in the process of verifying information to avoid the spread of false information or hoaxes that can cause public panic.	Further research is still needed to explore the potential of social media as a means of education and increasing public awareness of disaster risk.
Effective communication	[5, 6, 7, 8, 21]	<ul style="list-style-type: none"> - The publication of communication journals in Indonesia has made an important contribution to understanding the role and strategy of communication in dealing with natural disasters. - The results of the study show that communication plays an important role in every stage of disaster management, from pre-disaster, and emergency response, to post-disaster. - These studies highlight the need for effective, coordinated, and targeted communication so that the disaster management process can run well. 	<ul style="list-style-type: none"> - Few journals explicitly discuss how the results of the communication study can be used in disaster management practices. - Research should be able to provide valuable input for the development of more effective disaster management strategies and policies. 	<ul style="list-style-type: none"> - Not only analyze communication phenomena in the context of disasters, but also provide recommendations that can be implemented in disaster management practices. - Opportunities to expand the scope of the study, for example, disaster communication in the context of transnational and global issues. - Encourage stronger collaboration among various stakeholders, such as government, private and community, in designing and implementing effective disaster communication strategies. - Further studies can be directed to not only analyses the phenomenon of communication in the context of disasters, but also explore its implications for improving the effectiveness of disaster management.

3.3 Utilization of the results of communication studies in disaster management

The findings from these journal studies can make an important contribution to strengthening disaster management in Indonesia. For example, a study on the use of social media and crisis communication can help governments and related institutions in designing effective communication strategies in disaster emergencies. Similarly, the results of research on coordination between stakeholders can be a valuable input to develop better collaboration mechanisms in disaster management. Thus, scientific studies on disaster communication can make a practical contribution to improving Indonesia's capacity to deal with natural disasters [17, 18]. There is still a need for further efforts to optimize the use of communication research results in disaster management practices. [1, 2]. In general, the publication of communication journals in Indonesia has made an important contribution in understanding the role and strategy of communication in dealing with natural disasters. Various studies have provided practical recommendations for disaster risk reduction efforts and more effective disaster communication management. However, there is still an opportunity to expand the scope of the study, for example, disaster communication in the context of transnational and other global issues [7]. In addition, deepening case studies and comparative analysis between regions are also needed to enrich the understanding of communication practices in disaster management in Indonesia.

The results of the review show that most of the communication journal publications in Indonesia that discuss communication topics in the context of natural disasters focus more on analysing and understanding communication phenomena that occur, such as information dissemination patterns, coordination between stakeholders, and the use of social media. However, several journals have also tried to provide recommendations or inputs related to how communication can be optimized to support disaster management efforts in Indonesia. For example, a journal that examines the use of social media in disaster communication [17] recommends the importance of increasing the capacity of the government and related institutions to utilize social media as a communication channel in disaster management.

Several journals suggest the need to increase disaster communication capacity, both at the individual, organizational, and policy levels for more effective disaster management. [10, 18, 19, 20] Thus, the results of the study of communication in the context of disasters in Indonesia still need to be further translated into more effective disaster management practices [7, 10].

There are several challenges in utilizing the results of communication studies to strengthen disaster management practices in Indonesia. Previous research identified that there is still a gap between the results of academic studies and implementation in the field [1]. In addition, coordination between the government, the

private sector, and the community in disaster communication is also still a challenge [1, 21]. To address these challenges, more intensive efforts are needed to bridge the gap between academic study results and disaster management practices on the ground, by encouraging stronger collaboration among various stakeholders, such as government, the private sector, and the community, in designing and implementing effective disaster communication strategies.

4 Conclusion

Based on the results of this literature review, it can be concluded that:

First, communication science in Indonesia has been quite responsive to natural disaster events that occur, with a focus on major disasters, such as floods, earthquakes, and volcanic eruptions. Communication science in Indonesia tends to focus on studying communication in the context of major natural disasters that occurred in the period 2004 to 2018. The scale of disasters that are most studied in communication journal publications in Indonesia are disasters with national and regional impacts, such as earthquakes, tsunamis, volcanic eruptions, and flash floods.

Second, the main topics studied in communication journals in Indonesia related to disaster management include information dissemination patterns, coordination between stakeholders, and the use of social media. In general, the results of the study show that communication plays an important role in every stage of disaster management, from pre-disaster, and emergency response, to post-disaster. These studies highlight the need for effective, coordinated, and targeted communication so that the disaster management process can run well. However, few journals explicitly discuss how the results of the communication study can be used in disaster management practices. A deep understanding of communication in the context of disasters should be able to provide valuable input for the development of more effective disaster management strategies and policies. Therefore, in the future, it is hoped that there will be more communication journals in Indonesia that not only analyses communication phenomena in the context of disasters but also provide recommendations that can be implemented in disaster management practices.

So far, journals related to the role of social media in disaster management are still limited in examining the use of social media for information dissemination and coordination of handling. Further research is still needed to explore the potential of social media as a means of education and increasing public awareness of disaster risk. For this reason, in the future, it is hoped that communication science can make a greater contribution to strengthening disaster management practices in Indonesia, not only through studies that produce a comprehensive understanding but also by providing recommendations that can be adopted by stakeholders in the field. Close collaboration between the academic

community, the government, and civil society is the key to making this happen.

This shows that there is still room to strengthen the linkage between communication research and disaster management practices in Indonesia. Further studies can be directed to not only analyse communication phenomena, but also explore their implications for improving the effectiveness of disaster management. In general, although the publication of communication journals in Indonesia has been quite responsive to the phenomenon of natural disasters that occur, efforts to integrate the results of such research into disaster management practices in Indonesia still need to be improved. Communication science in Indonesia still needs to be more intensive to study and formulate practical recommendations for improving communication effectiveness.

In addition, other research results emphasize the need to build more effective coordination between the government, the private sector, and the community in communication during disaster emergency response. Quite challenging research related to how to optimize the use of communication study results in disaster management practices in Indonesia. In terms of information dissemination patterns [7], several journals analyse how disaster information spreads through various media, including social media, and the factors that influence it. Meanwhile, in the aspect of coordination, the journals examine how communication and coordination between the government, the community, and other stakeholders take place in disaster management. Research that is still needed regarding the role of social media in the pattern of spreading disaster information is in the form of social media contributions in the process of verifying information to avoid the spread of false information or hoaxes that can cause public panic.

Third, although the results of research on communication in the context of disasters are adequate, efforts to integrate them into disaster management practices in Indonesia still need to be improved. Most of the communication journal publications in Indonesia that discuss communication topics in the context of natural disasters focus more on analyzing and understanding communication phenomena that occur, such as information dissemination patterns, coordination between stakeholders, and the use of social media. However, there are still few journals that explicitly examine how the results of the communication study can be used in disaster management practices.

Based on the results of this literature review, here some recommendations:

First, subsequent studies can be directed to not only analyze communication phenomena in the context of disasters, but also explore their implications for improving the effectiveness of disaster management. Second, there needs to be an effort to strengthen the linkage between communication research and disaster management practices in Indonesia, so that the results of communication studies can be translated into strategic and

operational recommendations that can be implemented by stakeholders to improve the effectiveness of disaster management and mitigation in Indonesia.

Third, further studies can be directed to examine the role of social media not only in information dissemination and coordination of handling but also in education and increasing public awareness of disaster risk. The need to increase disaster communication capacity, both at the individual, organizational, and policy levels for more effective disaster management. The above literature review has provided an overview of how communication science in Indonesia has contributed to research related to disaster management, although the integration of research results into practice in the field still needs to be improved. Efforts to bridge the gap between research and disaster management practice are challenges that must be faced so that communication science can make a greater contribution to improving the effectiveness of disaster management and mitigation in Indonesia.

References

1. I. Mauluddin, H. Bekti and R. Pancasilawan, Preflood management collaboration in bandung district. *Journal of Public Service Management*, **5**, 154-168, (2022)
2. M. M. Wijoyono and A. Raditya, Designing educational media games as learning how to protect themselves in the face of natural disasters for children aged 7-12 years. *Adiwarma Visual Communication Design Journal*, **1**, (2014)
3. T. M. Milyane, Komunikasi kelompok dalam training material failure analysis. *Dialektika*, **7**, (2020)
4. M. J. Nur, P. R. Andhita and B. V. Safitri, Communication noise in handling teh covid-19 outbreak (descriptive-qualitative study of handling covid-19 in NTB). *JCommsci (Journal of Media and Communication Science)*, **3**, (2020)
5. E. Nilawati, Collaborative governance covid-19 pandemic disaster emergency response management in gunungkidul regency. *Journal of Administrative Sciences*, **19**, (2022). <https://doi.org/10.31113/jia.v19i1.845>
6. M. S. Anshori, H. Hatima and A. Lestari, Communication strategy of the regional agency for disaster management of Sumbawa regency in disaster mitigation. *Journal of Communication Management*, **7**, (2022)
7. T. Suliyati, Saving archives from disaster: between idealism and reality. *Lentera Pustaka*, **3**, (2017). <https://doi.org/10.14710/lenpust.v3i2.16738>
8. I. Pitaloka, S. Sari and I. Indria, Crisis communication strategy of pt. pelabuhan indonesia II (PERSERO) branch of bengkulu during the covid-19 pandemic (study on land dispute cases). *Journal of ISO*, **3**, (2023)
9. R. Widyastuti, Using new media and social media in disaster communication. *Communicator*, **13**, (2021)

10. Y. Rusfiana and H. Nurseta, Synergy of the TNI and local governments through military campaign strategies in flood disaster management in Bandung district. *Indonesian Governance Journal*, **4**, (2021)
11. Y. S. Hijri, K. Hadi, A. Roziqin and A. M. Hidayah, Assistance in the preparation of a COVID-19 disaster contingency plan in Bandulan Village, Sukun, Malang City. *Journal of Community Service*, **4**, (2023)
12. M. A. Fu'ady, R. Munadi and M. A. Fu'ady, Disaster mitigation in Indonesia: between plans and reality. *IOP Conf. Ser.: Mater. Sci. Eng.*, **1087**, 012011 (2021). <https://doi.org/10.1088/1757-899X/1087/1/012011>
13. F. S. Mubarak, The use of new media for communication effectiveness in the pandemic era. *Scientific Journal of Meaning Communication* **10**, (2022)
14. V. Widjaja and N. M. Widodo, The influence of internet technology on the knowledge of the people of Jakarta regarding COVID-19 vaccination information. *Tematik*, **8**, (2021)
15. A. Sutedi, Design and build a social media-base disaster identification and disaster-safe location application. *Algoritma*, **16**, (2019)
16. C. Muryani, Community-based disaster management in Indonesia, *SHes: Conference Series 3*, **3**, (2020)
17. D. Tamitiadini, W. W. A. Dewi and I. Adila, Innovation of non-structural disaster mitigation model based on communication, information, coordination and cooperation. *Journal of Communication*, **13**, (2019)
18. E. Dulwahab, Y. Huriyani and A. S. Muhtadi, Therapeutic communication strategies in the treatment of victims of sexual violence. *Journal of Communication Studies*, **8**, (2020)
19. D. Kurniawati, Disaster mitigation communication as community awareness to face disasters. *Symbolic Journal*, **6**, (2020)
20. M. B. F. Bisri, Inter-organizational network in Indonesia during disasters: Examples and research agenda on disaster management. *IOP Conf. Ser.: Earth Environ. Sci.* **56**, 012023 (2017). <https://doi.org/10.1088/1755-1315/56/1/012023>
21. R. N. S. Amriza and K. N. M. Ngafidin, Analysis of the influence of social media platforms on the dissemination of disaster information. *JSiI (Journal of Information Systems)*, **8**, (2021)
22. R. H. Sayuti, O. P. Inderasari, and A. Evendi, The influence of education and local culture on community preparedness in facing disasters. *Journal of Research and Assessment of e-Science Eduaction*, **5**, (2021)