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# RISK COMMUNICATION MODEL IN FACING TSUNAMI DISASTER THROUGH STAKEHOLDER ENGAGEMENT

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## ABSTRACT

Umang Beach Club Private Island Resort is located in Sumur village, Pandeglang district, Banten. It has a very unique location, located at two sources of potential tsunamis. The first is Seismic, which is at the center of the megathrust of the Sunda Strait. The second, namely Unsesmic, is located at a distance of about 70km from Mount Anak Krakatu. This study aims to find a risk communication model in dealing with tsunami natural disasters through stakeholder engagement. This research uses descriptive qualitative method and data collection by interview, documentation and observation. Interviews were conducted with Umang Beach Club Private Island Resort, local government and disaster-related institutions, Sumur village communities, disaster communities as well as tsunami and risk management experts. The results of the study found a risk communication model in dealing with tsunami natural disasters through stakeholder engagement. Risk communication needs to be carried out in a systematic and planned manner and integrated with all stakeholders involved with disasters to reduce disaster risk.

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## INTRODUCTION

Indonesia is geographically located at the confluence of three major tectonic plates, namely the Indo-Australian plate, the Eurasian plate and the Pacific plate. The three plates collide with each other at any time and can cause earthquakes and their derivative disasters, namely the tsunami disaster (Fuady et al., 2021). Geographically, Indonesia is vulnerable to natural disasters such as earthquakes, tsunamis, volcanic eruptions, and other geological disasters (Cummins, 2017).

Studies related to risk communication discuss more about risks in the health sector, especially after the emergence of the COVID-19 pandemic in March 2020 (Hidayat et al., 2021). Researcher searches until early 2022, discussions about tsunami risk communication are still very minimal. Seeing Indonesia's geographical location which is prone to tsunami natural disasters which have caused the highest death toll based on 2018 BNPB (National Agency for Disaster Management) data, the researchers assess the importance of conducting research related to risk communication related to tsunami natural disasters (Lemona et al., 2020).

On December 22, 2018, at 22:00 western Indonesia time (UTC+7), a tsunami struck the Sunda Strait. It surprised the locals because there were no warning signs, such as earthquakes (Widiyanto et al., 2020). The tsunami was caused by the Anak Krakatau volcano, a seamount in the middle of the Sunda Strait. A tsunami is a wave that occurs after an earthquake, sea quake, volcanic eruption, or meteor strike at sea (Sarapang et al., 2019). There was something unusual about the 2018 Sunda Strait tsunami. The tsunami event was not marked by tectonic activity like when tsunamis occur in general. Due to this unusual thing, the community did not have time to save themselves. Immediately there was a rise in sea waves which resulted in 437 fatalities, 16 people were declared missing, 14,059 people were injured and 33,721 people had to evacuate due to this incident (Lestari & Syarif, 2020).

Understanding risk communication is defined as communication activities about something that is not desired or expected. Risk communication comes in many different forms (Kimura, 2016). One approach to risk communication is the NRC (National Research Council) approach which states that risk communication can be defined as "an interactive process of exchanging information and opinions among individuals, groups, and institutions regarding risks or potential risks to human health or the environment." The implication of this approach is that any successful form of risk communication must include the exchange of information and opinions and participation of all Stakeholders from the outset (McMakin & Lundgren, 2018).

Umang Beach Club Private Island Resort is located on Umang Island, Sumur village, Pandeglang Ujung Kulon – Banten. The location of Umang Island is in the location of the Sunda Strait megathrust which has the potential for a seismic tsunami or a tsunami caused by tectonic earthquakes, and adjacent to Mount Anak Krakatau, about 70 km away, which causes an unseismic tsunami or a tsunami that is not caused by a tectonic earthquake.

The 2018 Sunda Strait tsunami had a profound impact on Umang Island and the people living in Pandeglang, Banten and its surroundings on the coast (Pakoksung et al., 2020). The risk communication carried out by Umang Beach Club Private Island Resort so far is to make a press release to inform the state or condition of Umang Island after the tsunami that occurred (Rafliana et al., 2022). Press releases are informed via email, website and social media to all Stakeholders. Risk communication activities are carried out by simulating disaster response with all employees.

In reducing disaster risk, there are demands for an integrated collaboration and synergy of all stakeholders. The risk communication activities that have been carried out by Umang Beach Club Private Island Resort have not referred to the NRC approach which involved all Stakeholders from the beginning and Stakeholder mapping in conducting tsunami risk communication, therefore it is necessary to formulate a risk communication model related to preparedness in dealing with tsunamis through Stakeholder engagement so that can minimize the risk (Robertson et al., 2019). This tsunami risk communication model can be used for local governments and businesses on the Indonesian coast.

Zhang et al. (2020) created a risk communication management model involving stakeholders based on an experience in handling the Covid-19 pandemic in Wuhan, China. The city of Wuhan, where the Covid-19 virus was first considered successful in dealing with this outbreak. Wuhan first announced the existence of this virus in December 2019. The city with 11 million inhabitants was also closed by the government (lockdown) on January 23, 2020. Around 42,000 medical workers throughout China were sent to Wuhan. The apparatus was also deployed to strictly regulate the border. After almost 4 months of quarantine, the lockdown in the city was lifted on April 8, 2020. The model created by Zhang and his colleagues from the School of Public Administration, Jilin University is based on Wuhan's experience in dealing with the Covid-19 virus.

The model developed by Zhang and his colleagues is also known as the government - expert - public interactive risk communication model. The essence of this model is to focus on the interaction between the three main parties or stakeholders in risk communication (public, government, and experts). All three parties are equally important, and each party must be open and share information with each other. The essence of this model is that there is a two-way interaction between the parties in risk communication.

First, the government, in this model, the government is responsible for risk management because the government has the resources (hospitals, budgets, personnel, etc.) to resolve the risks. The government conducts two-way interaction and communication with experts and the public.

Second, expert. In risk communication, the expert becomes the party with the authority. This is because risks are generally associated with specific information that requires certain expertise. Information about the causes of risks to actions taken to deal with risks must be based on scientific research. The experts involved are adjusted according to the type of risk.

Third, the community/ public. Similar to the government/regulators and experts, the community in this model is also described as having interactive communication with other parties (government and experts). Interactive communication relies on not only two-way communication, but also a willingness to give and receive information.

According to Zhang et al. (2020) the challenge of this government and public communication lies in deciding what to serve and what not to serve. Should all information owned by the government be presented or should the government withhold certain information, for example with reasons so as not to cause panic in the community.

Government interactive communication with experts is a key element of risk assessment and decision making, which can be seen as internal communication. Risks associated with professional knowledge and technology. The essence of risk management is rational action, where decisions are based on strong scientific evidence and are morally justified (Aristyavani, 2022).

## METHOD

This study uses a qualitative research approach with a focus on case study research to construct a risk communication model in dealing with the tsunami natural disaster. Sources of data through primary and secondary data. Primary data collection techniques were carried out by in-depth interviews (Sugiyono, 2019). In-depth interviews were conducted with internal and external stakeholders of Umang Beach Club Private Island Resort. Secondary data collection through internal and external document analysis studies of Umang Beach Club Private Island Resort and stakeholders related to risk communication activities through websites, social media and literature studies.

Researchers conducted participatory observations starting from the coastal locations of Anyer, Labuan, Panimbang to the main location, namely Umang Beach Club Private Island Resort. This study uses triangulation with sources, namely informants consisting of hotel stakeholders both from internal and external who are considered to have experience or insight and also knowledge related to the occurrence of the tsunami natural disaster, especially the Sunda Strait tsunami on December 22, 2018.

Data analysis using the Miles and Huberman model. Data analysis is used when data collection is in progress and when it is finished collecting data at a certain time. During the interview, the researcher had analyzed the answers of the interviewees.

## RESULTS AND DISCUSSION

Based on the research, in principle, each Stakeholder has understood their respective roles but is still not integrated and collaborated with each other, so that a tsunami risk communication mechanism and process is needed that can describe the involvement of all stakeholders so that each understands its function.

Based on the results of the analysis carried out, the researchers developed an interactive government - expert - public risk communication model (Zhang et al., 2020). The model is based on the experience of handling the Covid-19 pandemic in Wuhan, China. According to Zhang, there are three important principles in risk communication, namely First is accessibility and openness, Second, communicating early and continuously about risk, and Third, strategic methods for communicating uncertainty. In the first principle, Zhang also highlighted that the main problem is the perception of the community towards risk. In the second principle, risk communication should begin as soon as a risk is identified and continue as new information becomes available. And third, communicating uncertainty effectively requires assessing different levels of perception among different audiences, and using a scientifically based approach to conveying uncertainty. In the Wuhan model, it only involves 3 stakeholders, namely the public, government and experts.

Risk communication is in the element of Adaptive Capacity, namely the ability to respond to a hazard. Adaptive capacity and risk are inverse, the higher the capacity, the lower the risk. This requires risk communication with various strategies. The government - expert - public interactive risk communication model involves only three main stakeholders, while in disaster management, especially the tsunami, many stakeholders are involved both before, during and after the tsunami disaster (Zhang et al., 2020). Therefore, the researchers reworked the interactive government - expert - public risk communication model by completing the Stakeholders adapted to the conditions facing the tsunami natural disaster. Thus, a novelty was found in this study, namely the TRICOSTE (Tsunami Risk Communication Through Stakeholder Engagement) model which focuses on the risk of tsunami natural disasters. In this model reprocessing the Stakeholder element from the government - expert - public interactive risk communication model Zhang et al. (2020) which only uses 3 Stakeholders and in TRICOTSE researchers use 8 Stakeholders. In addition, researchers also developed this model equipped with elements of integrated stakeholder communication collaboration, Building Messages, Communication Media, Communication Activities, Stakeholders, Behavior Change and Disaster Risk Reduction.

The TRICOTSE model has six elements in its process. First is to place Stakeholders or Stakeholders as important actors in the risk communication process starting from upstream to downstream and vice versa so that it will be like a rotating current. Integrated stakeholder communication collaboration consists of 8 Stakeholders involved are First, namely the Government consisting of BMKG (Meteorological, Climatological, and Geophysical Agency) which is upstream in the initial information data to be forwarded, PVMBG (Center for Volcanology and Geological Hazard Mitigation) which is also a provider of information data related to the status of volcanology and this is only to be considered for inclusion in Stakeholders to see the experience of the Sunda Strait tsunami incident 2018 which was caused by the landslide of Mount Anak Krakatau, BNPB (National Agency for Disaster Management) which was downstream at the time of the disaster but remained part of the Stakeholders because it played an important role in carrying out disaster risk communication activities, BPBD (Department of the National Disaster Management Agency) Regional Disaster Management) as the implementer

in each region, Basarnas (National Search and Rescue Agency) plays a role in evacuation during disaster events but is also involved in carrying out disaster risk communication activities, Local Government (Local Government) as leader and decision maker in the region to determine condition status an area and also "push the button" when the community must evacuate, the Indonesian Army/ Police are tasked with maintaining the stability of the security of Indonesian citizens and in disasters their role is in disaster prevention and management, the Health Service plays a role when a disaster strikes and the Social Service is related to the program. Social granary as part of disaster prevention and mitigation. Second, namely radio as a means of communication in disaster conditions and the most likely means of communication to reach remote villages such as RRI Banten for example. Third, cellular network providers such as Telkom play an important role in communicating. Fourth, are hotels and PHRI (Indonesian Hotel and Restaurant Association), especially those located on the coast to be part of the spread of risk communication in protecting tourists and their employees. Fifth, is the industry, in this case, which is located close to the coast, as in Cilegon, many factories are very close to the beach. Sixth, is a university whose role is to assist the government in developing research and also assisting the community. Seventh, is that NGOs/ Communities take part in risk communication by spreading positive energy to local residents to build awareness regarding the risk of a tsunami disaster. Eighth, is the risk community that plays a role from upstream to downstream where its role is also needed in building messages, conveying and implementing risk communication and then providing feedback on the message.

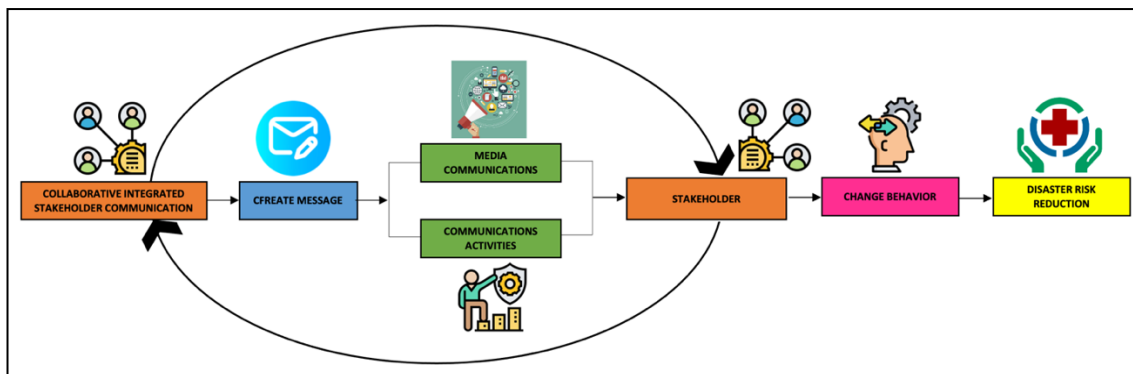
The second element, namely Building Messages or Create Messages, is a communication strategy in conveying a risk, how to create a message related to disaster risk that can be easily accepted by stakeholders. Previously, it was necessary to have a common perspective related to the risk of the tsunami disaster itself, starting from upstream to downstream, which meant starting from local leaders, institutions as well as local community leaders, to be able to equalize the tsunami risk perspective. After that, in the message content, it is necessary to pay attention to the function of the risk communication that will be made. Starting from being informative, educating, entertaining and also influencing, of course, according to the intended audience for that it is necessary to understand the audience starting from segmentation to the audience's experience in disasters so that the messages created can be conveyed properly. Still on the second element, it is also necessary to pay attention to data sources to avoid misunderstandings, even the worst are hoaxes. Therefore, there is a need for regulations related to data sources that are used as references in disasters. and lastly on the Create Message element is the Key Message, how to determine the key facts or communication issues to be conveyed, then the most important benefits to be conveyed, and key message points that must be included and or conveyed into all messages in tsunami risk communication activities.

The third element is Media Communications and Communications Activities. Media Communication is determining what media will be used in conveying risk communication messages. Determine starting from the type of media that will be used, whether conventional media or new media, then the characteristics of the media whether one way communications or two way communications, and finally the target audience of the media is general or specific. Mapping media usage is important so that all Stakeholders are reached to get the message. Communication Activities are risk communication activities, such as simulations consisting of socialization, evacuation exercises, Table Top Exercises, Functional Exercises and Tsunami drills. In addition, there is also a program launched by BMKG as a risk communication activity, namely the Tsunami Field School which is the initial stage to achieve the Tsunami Ready recognition program initiated by UNESCO.

The fourth element is the target audience in this tsunami risk communication, which is to return to Stakeholders which includes Victim or victims who experienced the tsunami disaster, Handling the risk is the actor who handles the risk of a tsunami disaster if it occurs, and Prepare the mitigation is the one who plays a role in making mitigation strategies tsunami disaster. Stakeholders will engage from upstream to downstream and continue to form a risk communication circle.

The fifth element is Change Behavior. This is the purpose of risk communication delivered in the event of a tsunami disaster. How can messages conveyed both through communication media and communication activities be conveyed properly to Stakeholders and then raise awareness of the risk of a tsunami disaster and then want to change behavior to become a community that is resilient to tsunami risk and is quick to respond in the event of a tsunami disaster and has a Sense of a high crisis will be a disaster not only a tsunami.

Moreover, the last is the element of Disaster Risk Reduction which is the final goal of the entire process from beginning to end to be able to reduce disaster risk and this can be assessed when a disaster occurs how many victims in an area, and what is expected is Zero Victim. This is the hope of all stakeholders, but in order to achieve it, synergies with all stakeholders need to be carried out in carrying out a series of tsunami risk communication activities with a full sense of responsibility and consistency in implementing them. The following is an overview of the TRICOTSE Model:



**Figure 1. TRICOTSE (Tsunami Risk Communication Through Stakeholder Engagement) Model**

## CONCLUSION

The substance of this research resulted in the TRICOTSE (Tsunami Risk Communication Through Stakeholder Engagement) model, namely tsunami risk communication through communication strategies and Stakeholder engagement by processing the government - expert - public interactive risk communication model and also the NRC (National Research Council) risk communication approach which was developed in 1996. In the interactive government - expert - public risk communication model, only three main stakeholders are involved, while in disaster management, especially the tsunami, many stakeholders are involved both before, during and after the tsunami disaster. Therefore, the researchers reworked the Wuhan risk communication model by completing the Stakeholders adapted to the conditions facing the tsunami natural disaster. So that a novelty was found in this study, namely the TRICOSTE (Tsunami Risk Communication Through Stakeholder Engagement) model which focuses on the risk of tsunami natural disasters using 8 stakeholders. In addition, researchers also developed this model equipped with elements of integrated stakeholder communication collaboration, Building

Messages, Communication Media, Communication Activities, Stakeholders, Change Behavior and Disaster Risk Reduction.

## REFERENCES

- Aristyavani, I. (2022). *Komunikasi Risiko, Konsep Teori dan Strategi*.
- Cummins, P. R. (2017). Geohazards in Indonesia: Earth science for disaster risk reduction—introduction. *Geological Society, London, Special Publications*, 441(1), 1–7. [Google Scholar](#)
- Fuady, M., Munadi, R., & Fuady, M. A. K. (2021). Disaster mitigation in Indonesia: between plans and reality. *IOP Conference Series: Materials Science and Engineering*, 1087(1), 12011. [Google Scholar](#)
- Hidayat, M., Muljono, P., Maarif, S., & Saleh, A. (2021). Manajemen komunikasi risiko dalam penanganan covid-19 berbasis masyarakat. *JPPPI (Jurnal Penelitian Pendidikan Indonesia)*, 7(4). [Google Scholar](#)
- Kimura, A. H. (2016). Risk communication under post-feminism: Analysis of risk communication programmes after the Fukushima nuclear accident. *Science, Technology and Society*, 21(1), 24–41. [Google Scholar](#)
- Lemona, M., Yunia, A., & Pinariya, J. M. (2020). Komunikasi Mitigasi sebagai Langkah Strategis Pengurangan Risiko Bencana di Provinsi Banten. *Warta Ikatan Sarjana Komunikasi Indonesia*, 3(02), 168–177. [Google Scholar](#)
- Lestari, A., & Syarif, A. D. (2020). *The Effect of Liquidity, Leverage, Profitability, and Firm Size on the Bond Rating of Banking Sub Sector in Indonesia Stock Exchange 2014–2018*. [Google Scholar](#)
- McMakin, A. H., & Lundgren, R. E. (2018). *Risk communication: A handbook for communicating environmental, safety, and health risks*. John Wiley & Sons. [Google Scholar](#)
- Pakoksung, K., Suppasri, A., Muhari, A., & Imamura, F. (2020). Global optimization of a numerical two-layer model using observed data: a case study of the 2018 Sunda Strait tsunami. *Geoscience Letters*, 7(1), 1–20. [Google Scholar](#)
- Rafliana, I., Jalayer, F., Cerase, A., Cugliari, L., Baiguera, M., Salmanidou, D., Necmioğlu, Ö., Ayerbe, I. A., Lorito, S., & Fraser, S. (2022). Tsunami risk communication and management: Contemporary gaps and challenges. *International Journal of Disaster Risk Reduction*, 102771. [Elsevier](#)
- Robertson, B. W., Johnson, M., Murthy, D., Smith, W. R., & Stephens, K. K. (2019). Using a combination of human insights and 'deep learning' for real-time disaster communication. *Progress in Disaster Science*, 2, 100030. [Elsevier](#)
- Sarapang, H. T., Rogi, O. H. A., & Hanny, P. (2019). Analisis Kerentanan Bencana Tsunami Di Kota Palu. *Spasial*, 6(2), 432–439. [Google Scholar](#)
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif R&D*. Bandung: Alfabeta. [Google Scholar](#)
- Widiyanto, W., Hsiao, S.-C., Chen, W.-B., Santoso, P. B., Imananta, R. T., & Lian, W.-C. (2020). Run-up, inundation, and sediment characteristics of the 22 December 2018 Sunda Strait



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tsunami, Indonesia. *Natural Hazards and Earth System Sciences*, 20(4), 933–946. [Google Scholar](#)

Zhang, L., Li, H., & Chen, K. (2020). Effective risk communication for public health emergency: reflection on the COVID-19 (2019-nCoV) outbreak in Wuhan, China. *Healthcare*, 8(1), 64. [Google Scholar](#)

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