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Comparison of coastal tourism destination management against natural disasters of New Zealand and Indonesia

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Abstract
Coastal tourist destinations have vulnerability to the potential for tsunamis. New Zealand and Indonesia as a coastal tourism destination that facing the risk of natural disasters. This study aims to compare coastal tourism destination management policies against natural disasters in New Zealand and Indonesia. Through the literature review method, this paper analyzes proactive disaster management practices and policies in both countries. New Zealand has developed an efficient early warning system and raised public awareness, while Indonesia has financial challenges and vast areas as obstacles to natural disaster management. Research recommendations include the development of a more responsive early warning system, improved safety education for tourism actors, and greater budget allocation for mitigation projects. These measures are directed at strengthening Indonesia's preparedness in the face of potential natural disasters
Keywords: disaster mitigation; early warning; tourism destination; tourism management policies; tourism safety education

1. Introduction

Tourism in Indonesia supports economic growth. According to the data Ministry of Tourism and Creative Economy (2022), foreign exchange revenue from the tourism sector in 2022 reached 4.26 billion US $ or equivalent to 66.8 trillion rupiah. In addition, the tourism sector contributes significantly to creating jobs, as many as 22.89 million workers are absorbed in Indonesia. The tourism sector is the sector most vulnerable to disasters. Natural and cultural resources are usually viewed as key tourist products and experiences, and severe damage incurred after a disaster can affect tourism demand leading to economic downturn (Jiang and Ritchie, 2017)

Indonesia has the longest coastline in the world after Canada, reaching 54,716 km according to data Central Intelligence Agency (2023). The long coastline has potential tourist destination that can attract the attention of world tourists. Survey Kurious Kurious Katadata Insight Center (2022) stated that there are many as 48.6% of the number of Indonesian tourists like beach and sea. However, the coastal tourism sector in Indonesia is very vulnerable to tsunamis and earthquakes (Pahleviannur et al., 2020). Geologically, Indonesia is located between the three main plates of the earth which makes it very vulnerable to the threat of disasters such as floods, landslides, earthquakes, tsunamis (Demartoto, 2019).

New Zealand and Indonesia are two countries that have long coastlines and similar geographical characteristics. New Zealand experienced three of the largest tsunamis in 1868, 1877, and 1960 with heights of 5 to 10 meters, caused by earthquakes on the west coast of South America (Bell et al., 2022). New Zealand has a record tsunami height of 4 meters or more, averaging about 10 times a year the same as Hawaii and Indonesia

(Berryman, 2006). Indonesia has 10 historical tsunami events that caused thousands of casualties. One of the biggest tragedies was the Aceh tsunami in 2004 which caused 227,898 deaths (BMKG, 2019). Indonesia's disaster risk document states that tsunami is one of the disaster threats for coastal areas in Indonesia, caused by vertical movement of the seabed. Various disasters that have occurred in Indonesia have caused damage to destinations and tourist attractions, reduced the number of tourist visits, damaged infrastructure, caused job losses, and reduced community economic growth (Berliandaldo et al., 2023).

Tsunami impact on coastal areas. Many of these areas are visited by tourists who often lack adequate knowledge of the dangers at the region (Fathianpour et al., 2023). The decline of the number of tourists causes by the lack of safety guarantees when visiting the region, this is due to the lack of information about early warning systems, lack of knowledge of tourists in disaster management, and the absence of information about early warning systems (Situmorang, 2021). In addition, the number of people living around the coast and the height of the tsunami are positively correlated with the death rate due to the tsunami (Miyazaki, 2022), so that indirectly the number of tourists has a close relationship for mitigation actions in coastal tourist destinations.

This study aims to compare coastal tourism destination management policies against natural disasters in New Zealand and Indonesia by analyzing similarities and differences in disaster mitigation approaches, emergency response planning, as well as the role of government and community participation in both countries, this study identifies best practices to provide recommendations that can be applied in the context of natural disaster-based coastal tourism destination management.

2. Methods

The research method used in this paper using literature review related to coastal tourism destination management policies against natural disasters in New Zealand and Indonesia. Literature reviews are conducted using Scopus, Google Scholar with the aim of obtaining reputable literature. The literature review was chosen for the reason of providing an overview of the field of research that has been carried out and policy development in the field of disaster mitigation in the tourism sector (Snyder, 2019). The keywords carried out in the search for referenced documents are "disaster mitigation", "tsunami", "Sirombu Beach", "tourist destinations", "beach tourism", "coastal tourism disaster mitigation", and "disaster mitigation regulations". The literature review was carried out starting from October 2023 – January 2024, along with the preparation of the paper. Systematic writing is carried out in the preparation of this paper, including consisting of introduction, literature review, analysis, conclusions, and suggestions for further research.

The criteria for the documents referred to in this study are to have the same keywords and abstract discussions as the research theme, namely disaster mitigation; state documents that discuss disaster mitigation; and statistical documents from relevant agencies and discussing tourism and disasters. The data analyzed are secondary data sourced from books, journals, reports, regulations, and articles from the internet that are appropriate and relevant to research needs. This literature study aims to gain an analysis of the policies that have been implemented in managing coastal tourism destinations against natural disasters in New Zealand and Indonesia. The scope of discussion of the literature used is disaster-based tourism, New Zealand tsunami disaster mitigation policy, and Indonesian tsunami disaster mitigation policy.

2.1. New Zealand

New Zealand is an island nation located in the southwestern part of the Pacific Ocean. The country consists of two main islands, namely the North Island and the South Island, as well as several smaller islands around it. New Zealand's natural beauty is striking, with diverse landscapes, including mountains, lakes, rainforests, and coastlines. New Zealand is also known for its geothermal activity, including spectacular hot springs and geysers. The climate varies, ranging from subtropical in the north to polar climate in the south. The map of New Zealand shown in Figure 1.

Figure 1. Map of New Zealand
Source: Nations Online Project

Figure 1. shows that New Zealand is a country surrounded by sea, so geographically a tsunami disaster is very potential to occur in the country.

2.2 Indonesia

Indonesia is the world's largest archipelagic nation, located between mainland Asia and Australia and between the Indian and Pacific Oceans. The country consists of thousands of islands stretching from Sabang at the western end to Merauke at the eastern end. Indonesia has a rich variety of cultures, ethnicities, and languages. The landscape is also very diverse, including volcanoes, tropical rainforests, beautiful beaches, and coral reefs. Indonesia's climate varies from tropical in most areas to monsoon in certain parts. Map of Indonesia shown in Figure 2.

Figure 2. Map of Indonesia
Source: Nations Online Project

Indonesia is a maritime country with geographical conditions located in the equatorial plane that has thousands of islands, as shown in Figure 2. Indonesia is located between the confluence of three plates, so the potential for a tsunami is quite high in this country.

3. Results and Discussion

The vision of the Indonesian government in disaster management, as set out in Presidential Regulation of the Republic of Indonesia number 87 of 2020 about the 2020-2044 Disaster Management Master Plan is "Realizing a Disaster-Resilient Indonesia for Sustainable Development". Disaster resilience means that Indonesia can contain, absorb, adapt, and recover from the effects of disasters and climate change in a timely, effective, and efficient manner. The sustainability of the coastal tourism industry in Indonesia can be threatened by the risk of tsunami disasters if not managed effectively and efficiently. This can have a negative impact on various aspects of the tourism industry, including the number of tourists, foreign exchange receipts, employment, and other components.

The tsunami disaster in Indonesia became a key factor that influenced the level of achievement of performance targets, both in positive and negative terms. To minimize disaster risk, disaster mitigation can be done (Wicaksono and Pangestuti, 2019). By Permendagri number 33 of 2006 regarding the General Guidelines for Disaster Mitigation, disaster prevention and mitigation activities are carried out with the aim of knowing potential disasters and making efforts to anticipate their handling. Risk reduction through prevention and mitigation is carried out before a disaster occurs, so that the community can minimize the risk of disaster (Pahleviannur et al., 2020). Regulations related to the management of tourism destinations against natural disasters in Indonesia can be seen in Table 1.

Table 1. Laws and regulations related to the management of tourism destinations against natural disasters

No	Regulation	Policy Description
1.	*Undang-Undang Republik Indonesia Nomor 24 Tahun 2007* concerning about Disaster Management	The implementation of disaster management is carried out based on 4 (four) aspects including, social, economic, and cultural community; environmental sustainability; expediency and effectiveness; and the wide scope of the area through 3 (three) stages, namely, pre-disaster, during emergency response, and post-disaster.
2.	*Undang-Undang Republik Indonesia Nomor 10 Tahun 2009* concerning about Tourism	The government is expected to provide information about the condition of tourism destinations that are conducive and safe to visit by providing early warning of a disaster.
3.	*Peraturan Pemerintah 50 Tahun 2011* concerning about the National Tourism Development Master Plan	In realizing the vision of world-class, competitive, sustainable national tourism development is realized by developing tourism destinations that are safe, comfortable, attractive, easy to reach, environmentally friendly, increase national, regional and community income, equipped with facilities such as firefighting, disaster response facilities *(early warning system)* in disaster-prone destinations.
4.	*Peraturan Pemerintah Republik Indonesia nomor 87 tahun 2020* concerning about the 2020-2044 Disaster Management Master Plan	Increase the resilience of the government, local governments, and communities in facing disasters, as well as reduce disaster risk in the long term, through various policy strategies, namely: strengthening effective and efficient laws and regulations; increasing synergy between ministries/institutions and stakeholders; strengthening investment in disaster risk management; and policies to strengthen

No	Regulation	Policy Description
		professional, transparent, and accountable disaster governance.
5.	*Peraturan No. 26 Tahun 2022* concerning about Cross-Sectoral Strategic Coordination of Tourism Implementation	Strategic efforts made by the government related to strategic coordination across sectors of tourism implementation aimed at achieving harmony, harmony, integration, both planning and implementation of tasks and activities at the level of tasks, policies, programs, and tourism implementation activities, especially in disaster management in the national tourism sector.
6.	*Permenparekraf RI No. 9 Tahun 2021* concerning about Sustainable Tourism Destination Guidelines	Destinations have risk reduction, crisis management, and emergency response plans that are in accordance with destination conditions, through planning schemes that have been created and developed so that they can recognize various risks, including natural disasters, terrorism, health threats, resource reduction and other things.

Source: Author's analysis, 2023

In general, there are three stages in disaster management, namely pre-disaster (before a disaster), when a disaster occurs, and post-disaster (after a disaster occurs). The factor that greatly influences each of these stages is adequate resources and can function optimally. Therefore, human resources are what greatly determines the success of technical and operational implementation of disaster management activities (Telaumbanua et al., 2022). Risk mitigation and reduction measures against natural disasters in the tourism sector are realized through various disaster-resilient tourism management and development policies. These policies, if implemented, can have a positive impact on achieving the future performance targets of the tourism sector. Therefore, the implementation of the policy needs to be carried out collaboratively with various parties so that the tourism sector in Indonesia continues to be a driver of maximum socio-economic growth of the community.

3.1. Disaster Management Comparison of New Zealand and Indonesia

Disaster management is an effort or activity carried out before, during, and after a disaster occurs, in the context of prevention and mitigation, preparedness, emergency response and post-disaster stages (Nasution, 2011). *Pusat Pendidikan dan Pelatihan Sumber Daya Air dan Konstruksi* (2017) Provide a definition of prevention and mitigation as a series of activities aimed at eliminating and/or reducing disaster threats. Preparedness is defined as all efforts made to deal with emergency situations and identify various sources of risk. Emergency response includes an activity that are carried out quickly after a disaster by government and non-government agencies. While rehabilitation refers to the improvement and restoration of all aspects of public or community services to reach an adequate level in the post-disaster area, with the main aim of ensuring the normality of all aspects of government and community life in the region. In this case, the authors compare how policy practices for prevention and mitigation, preparedness, emergency response and post-disaster rehabilitation are natural disaster management in New Zealand and Indonesia.

Table 2. Comparison of natural disaster management policies in New Zealand and Indonesia

No	Disaster Management	New Zealand	Indonesian
1.	Prevention and Mitigation	1. 2022 budget allocation National Emergency Management Agency (NEMA) New Zealand	1. The 2023 budget allocation of the Disaster Management Agency of the Republic of Indonesia is Rp. 1.036 trillion (House of Representatives, 2023).

No	Disaster Management	New Zealand	Indonesian
		amounted to Rp. 9.225 trillion (KPMG, 2022). 2. New Zealand involves developing and implementing efficient early warning systems, including community education and periodic disaster simulations (Vinnell et al., 2023).	2. *Permenparekraf RI No. 2 Tahun 2021* about operational guidelines for the management of physical special allocation funds in the tourism sector. Construction and procurement of disaster mitigation facilities (security and safety posts), emergency communication equipment, evacuation routes, disaster gathering points, and evacuation signs. 3. Action plan Minister of Public Works of the Republic of Indonesia No. 11/PRT/M/2012 which states that existing infrastructure must adapt to climate change through adjustments to structure, components, design, and location.
2.	Preparedness	1. The warning center can issue a message within 5 minutes of the detection of a tsunami (National Emergency Management Agency). 2. Each hotel provides information on what to do in the event of a disaster (Fathianpour et al., 2023).	1. BMKG issued information on the potential for a tsunami within 5 minutes after the earthquake occurred (BMKG, 2012). 2. *Permenparekraf RI No. 6 Tahun 2014* concerning about hotel business standards. Provide protection to guests in line with disaster preparedness efforts. 3. Community capacity building through disaster resilient village programs, village forums, and emergency response education at the school level (BNPB, 2021).
3.	Emergency	Formation *Earthquake and War Damage Commission* (EWDC) in 1944 to provide social security and offer state-organized and sponsored protection for losses due to disasters (Vosslamber, 2023).	*Permensos RI No. 10 Tahun 2020* about direct assistance in the form of cash for disaster victims in the form of providing direct assistance to individuals, families, and community groups who experience social impacts and vulnerabilities due to disasters, to help them get better living conditions.
4.	Post-disaster rehabilitation	1. New Zealand is focused on comprehensive rehabilitation, rebuilding infrastructure, and addressing long-term impacts to achieve a	*Peraturan Pemerintah Republik Indonesia Nomor 29/Prt/M/2018* regarding technical standards, minimum service standards for public works and public housing in the form of providing and rehabilitating habitable houses are carried out through new

No	Disaster Management	New Zealand	Indonesian
		sustainable recovery (Ngaire, 2023). 2. New Zealand has a national catastrophe insurance scheme (Fattaruso, 2023).	construction and/or rebuilding of houses for disaster victims.

Source: Author's analysis, 2023

3.1.1. Indonesian

Indonesia has a National Disaster Management Agency (BNPB) which has the function of coordinating disaster management efforts at the national level. Based on Table 2, the Indonesian government has shown proactive steps in planning the management of tourist destinations against natural disasters through policies that have been prepared. However, the challenges related to the allocation of small funds are not proportional to the number of disasters occurring, the vast territory of Indonesia with a high level of disaster becomes a challenge if the budget allocation is very small. Limited allocation of funds can limit optimal policy implementation, thus involving challenges in achieving adequate preparedness and providing a quick and effective response to visiting tourists and surrounding communities. Based on analysis and review of state documents related to disaster mitigation policies in the tourism sector, tsunami disaster mitigation in coastal areas in Indonesia includes social, economic, and cultural aspects of the community; Environment; benefits and effectiveness by providing up-to-date information, accessible accessibility for evacuation purposes, construction of disaster response facilities; synergy and integration between institutions and stakeholders optimally; and the suitability of mitigation programs to the characteristic conditions of tourism areas.

Research conducted by Hall et al. (2019) which discusses tourist awareness of the tsunami in Indonesia, it was found that around 70% of tourists in Indonesia are not aware of the risk of tsunami. This condition poses a significant problem due to the lack of awareness that keeps tourists from knowing how to act during natural disasters. The results of the study show that although there is evacuation information for tourists in Indonesia, most of them tend to ignore or neglect to read the information. This shows that expanded awareness and understanding is needed among tourists regarding actions to be taken in dealing with potential risks of natural disasters.

Currently, Indonesia does not have an infrastructure development policy that is resistant to natural disasters. This greatly causes the risk of disaster impacts in various sectors. The Indonesian government has not provided specific standards on infrastructure, facilities, and infrastructure such as hotels, restaurants, homes, and hospitals around tourism destinations, which can mitigate risks and provide guidelines for safer and more resilient developers against natural disasters.

3.1.2. New Zealand

New Zealand is a popular tourism destination and relies heavily on nature-based tourism (Hussain, 2023). New Zealand has revenues in the tourism sector that reach 56 trillion (New Zealand Tourism Revenue, 2022). The country boasts a vast and diverse landscape (New Zealand Destinations), making it an attractive destination for tourists. After experiencing disasters such as the Indian Ocean tsunami in 2004 and the Great Japan earthquake in 2011, vulnerable countries like New Zealand need to prepare for natural disasters and in the last ten years, the New Zealand government has embarked on major efforts to raise awareness of tsunami risk to achieve increasing results along with government efforts and public education (Dhellemmes et al., 2021). Tsunami awareness and preparedness in New Zealand has grown since a national coastal survey was conducted in 2003. Public education campaigns have been successful in raising awareness of the dangers of tsunamis and supporting public awareness by NEMA *(National Emergency Management Agency).*

Evacuation recommendations in New Zealand emphasize not waiting for official evacuation warnings, instead, tourists are expected to head immediately to high ground or as far inland as possible after feeling an earthquake or potential tsunami disaster (HBEM, 2021).

Research conducted by Fathianpour et al., (2023) explained that the impact of road congestion around beach tourism destinations in New Zealand made it difficult for evacuation functions to reach safe zones. Therefore, every hotel in New Zealand provides information on what to do in the event of a disaster and the information is provided in English to be able to facilitate foreign tourists who visit.

Fattaruso (2023) said that 97 per cent of homeowners in New Zealand protect their property through building insurance. In the event of an emergency, such as damage from a disaster or other unforeseen event, insurance will provide indispensable financial support. This allows homeowners to quickly and efficiently restore or rebuild their homes without having to face a heavy financial burden.

3.2. Recommendations of Disaster Risk Management

Because of vulnerability tsunami, coastal tourist destinations need to be supported by the development and application of disaster mitigation. Disaster mitigation has basically been implemented since the initial planning stage of a destination to maintain the security and welfare of the region (Qatrunada et al., 2023). Mitigation measures undertaken are not only inputs aimed at reducing the impact of natural disasters, but can include reduced feelings of anxiety or increased perceptions of safety; increased recovery time during disasters; cost reduction due to the occurrence of disasters; reduce trauma; reduce environmental damage; better post-disaster health and mental health outcomes; increased community cohesion; improvement of shelter and provision of temporary housing; and better communication among community members thus creating additional benefits in other areas (Kousky et al., 2019). Early warning system preparedness, disaster risk awareness, risk mitigation efforts, and evacuation from disaster-prone areas are necessary countermeasures to protect people and infrastructure from disasters (Dissanayaka et al., 2022). Mitigation strategies that can be applied can be in the form of hazard mitigation aimed at preventing damage from tsunamis and protecting human lives through the application of structural countermeasures and mitigation with the application of land use regulations and evacuation management (Strusińska-Correia, 2017). Disaster mitigation is an important step that coastal tourism must have.

Based on a comparison of natural disaster management policies of New Zealand and Indonesia, policy recommendations that can be applied to support the resilience of tourism destinations from natural disasters include:

First, encourage the development and implementation of more efficient early warning systems to provide fast and accurate information to the public regarding natural disasters. Although New Zealand and Indonesia have the same speed of time in providing disaster information to the public, there are still some areas in Indonesia that still do not implement it optimally. Another effort that can be done is to adopt a Japanese early warning system that can provide warnings within 3 minutes after a natural disaster (Webb, 2005). The sooner warnings are delivered to the community, the greater the chance of taking timely evacuation measures. Tsunami early warning is a messaging mechanism that aims to notify people near the coast who will be affected by the tsunami about the danger of a tsunami, the purpose of this warning is to give local authorities time to take rescue action (Kurniasih et al., 2020).

Second, strengthen education programs to increase awareness and knowledge as well as tourists related to security measures dealing with natural disaster response. New Zealand and Indonesia can make providing disaster information to travelers before entering a destination area the standard in conducting a destination business, with security and safety as a key focus. Especially now that information can spread quickly, so it needs to be accompanied by a high level of literacy, so that people are able to distinguish which information is true and incorrect. Not only to the community, disaster communication and education need to be provided to Regional Disaster Management Agency (BPBD) staff

because the lack of disaster-related training and education to BPBD staff causes the inability of officers to master the field and has an impact on the ability to lead the disaster management effort process (Telaumbanua et al., 2022). Research conducted by Chen et al. (2022) explain that tsunami evacuation drills have three functions: training, assessment, and information. First, the training aims to ensure that trainees can carry out (even improve) evacuation instructions received through brochures, lectures, videos, other media, or previous experience. For example, participants can implement evacuation plans, such as planned destinations and route choices from previous experience or knowledge. They can also acquire or update evacuation knowledge after the exercise. Second, the assessment aims to measure the extent to which evacuation plans and training materials can secure or assist as many people as possible before the arrival of the tsunami. Based on the context of the assessment function, an evacuation exercise can be viewed as a scheduled simulation of an actual evacuation. These simulations are designed to improve evacuation preparedness by identifying weaknesses in response performance. For example, emergency managers can assess the effectiveness of a sign by investigating whether it can help participants to navigate to safety during an evacuation drill. The third piece of information aims to provide scientific evidence, such as human behavior in exercises, to provide information and validate tsunami evacuation research and planning. For example, walking speed data from evacuation drills can be used to inform the speed of movement of individuals in an evacuation simulation model.

Third, budget allocation for disasters needs to be prioritized as a step in natural disaster management. Indonesia needs to increase financial investment in projects that can reduce disaster risks and impacts, such as earthquake-resistant infrastructure. With adequate budget allocation, Indonesia can be better prepared to face potential natural disasters. Economic aspects have an important role in disaster management, because disaster mitigation requires large costs. Financial analysis can control potential losses due to tsunamis and ensure safety when investing in disaster areas (Anggraini et al., 2023).

Handling disasters certainly cannot be completely handed over to relevant organizations or government agencies, but cooperation is also needed involving various parties, ranging from government agencies to the community (Widiandari, 2021). Community empowerment is one of the determining factors in disaster prevention and preparedness to ensure optimal coordination and implementation of mitigation programs (Telaumbanua et al., 2022). The active involvement of the community in disaster resilience programs is not only an effort to improve disaster literacy, but also to understand the concept of disaster. Furthermore, community participation can encourage voluntary action within the community (Koem and Akase, 2022). This gave impetus to optimize local resources and form social volunteer organizations. According to Yoon et al (2016), a cohesive volunteer organization can help strengthen relationships to effectively improve natural disaster response and recovery. Initiation of local organizations/communities can ensure their direct involvement before, during, and after a disaster. This approach not only strengthens the capacity of communities to deal with the tsunami threat, but also builds a sense of ownership and shared responsibility towards the sustainability of mitigation measures. Thus, the active and continuous involvement of local communities in Sirombu Beach is expected to be a solid pillar in building mutual resilience against potential disaster threats.

4. Conclusions

Based on a comparison of tourism destination management policies against the tsunami disaster in New Zealand and Indonesia, there are diverse approaches in disaster management. Both countries have shown their preparedness for natural disasters (including in the tourism sector) through policies that have been prepared. New Zealand has built an efficient early warning system and successfully raised public awareness of tsunami risk. The implementation of the national disaster insurance scheme is also an important element in supporting post-disaster recovery. In addition, financial challenges and the vast territory in Indonesia are critical factors in policy implementation, indicating

an expansion of awareness and greater budget allocation. The lack of understanding of tourists on tsunami risk in Indonesia is also a problem that needs attention through increased education and information. Nevertheless, it should be noted that the optimization of such policies largely depends on the availability of funds for implementation and raising awareness of local communities and tourists. Therefore, further attention is needed regarding budget allocation to ensure the effectiveness and safety of tourism destinations in both countries. Policy recommendations include the development of a more responsive early warning system, increased safety education for tourism actors, and greater budget allocation for disaster mitigation projects. These efforts are directed at strengthening Indonesia's preparedness in the face of threat natural disasters. In this paper, we focused to study about policy in disaster mitigation so further research are needing to social resilience for mitigation actions.

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Conflicts of Interest
The authors declare no conflict of interest.

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