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THE CONCEPT OF WATERFRONT MANAGEMENT BASED ON DISASTER MITIGATION

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ABSTRACT

The concept of integrated waterfront management is a development concept that involves all stakeholders such as government, private and public as well as stakeholders in the waterfront city area. So that waterfront management leads to a planned development approach in the coastal area. With the concept of integrated waterfront management, it is hoped that stakeholders in the waterfront city area can manage development that maintains a balance and can be tolerated by the community and the environment.
Keywords: *Waterfront, Disaster, Management*

INTRODUCTION

Waterfront is a development area that is on the edge of water such as sea, river and lake. Waterfront is an urban development that is in direct contact with water and is an effort of developing urban areas that are naturally close to water bodies. The waterfront city design principle is good city and area design by considering the basics of urban planning and various aspects of other urban planning components. The edge of the water body is an area that is directly adjacent to the water, for example a city that is directly opposite a river, lake or sea. The waterfront development will have a positive impact on the communities living on the edge of the water body. Because with the development of the edge of the water body, it can be used as a tourist spot and improve the community's economy. Waterfront development is the process of managing a waterfront area that can accommodate social, economic, tourism and environmental physical activities (Goenmiandari *et al*., 2010).

The development of waterfront areas is a very important facility and container for the community. Waterfront development has a function, namely as a means of transportation, economic, social and trade activities. Judging from the many functions of the waterfront, the development of the waterfront area is an area that is very much needed and becomes the center of activity that is very attractive and strategic. The development of the waterfront was started because of the separation of two or more lands by the sea, lake or river. which in the area uses water transportation and gradually becomes a busy center of activity. To find out the potential and problems in waterfront development, a holistic urban spatial analysis is needed. So that there is no damage or problems in the future at the waterfront (Gilmour *et al*, 2007).

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Waterfront seen from its development process can be divided into 3, namely: (1) development, namely waterfront planning which deliberately creates waterfront areas in accordance with community needs, (2) redevelopment, namely planning that revives the port area that is not functioning and with a different goal from the previous one but still paying attention to the needs of the city community by changing existing facilities, and (3) conservation, namely developing the edge of an old water body, whose condition still has the potential to be maximally developed.

DISASTER BASED WATERFRONT MANAGEMENT

In waterfront development, there are several waterfront characteristics, namely: (1) the waterfront has its own urban architectural design pattern on the planned beach. The compliance pattern uses technology that has one unit, (2) a development pattern that is in accordance with the character of the coast, (3) has a unique character as a whole, and (4) the orientation of the waterfront building is adjusted to the activities on the beach. In addition to the waterfront characteristics, before carrying out the development of the coastal area there are several aspects that must be considered, namely: (1) environmental aspects, which are the development of waterfront areas that affect the improvement of environmental quality, (2) social aspects, which are waterfront cities as places providing facilities for social activities, gathering and having fun, and (3) economic aspects, including the amount of land value and economic potential that can be developed in a city, and preservation aspects, namely the development of waterfront areas that have historical values and have specific characteristics. Such as historical buildings and local specialties and preserved culture (Grant and Meadows, 2008).

The development of waterfront areas is a great potential for an area to develop something that can be profitable, such as shopping centers and restaurants. Thus, there are principles that have been developed in waterfront development, namely: (1) cooperation from various parties to develop the edge of the water body and become an attraction for visitors, (2) development of the concept of waterfront areas through existing potentials, and (3) developing existing activities in the waterfront areas as a potential to provide valuable experiences for visitors (Hall *et al*., 1997).

In waterfront development, each area must pay attention to the potential for disasters that can occur at any time in the coastal area, because coastal areas are the meeting areas between land and sea which are affected by tides. Therefore, waterfront development must be based on disaster mitigation to reduce or anticipate the damage caused by a disaster. Disaster is an event that threatens or disturbs human life caused by natural and non-natural factors, resulting in environmental damage, casualties and psychological impacts. Disaster management is an integrated and continuous process in improving the quality of activities which include prevention, evacuation, preparedness, mitigation, emergency response, rehabilitation and reconstruction.

Disaster mitigation is urgent and important to be implemented effectively and efficiently in the waterfront area (Hermon, 2012; Hermon, 2015; Hermon, 2016; Oktorie, 2017). Disaster mitigation activities are part of disaster management activities that focus on

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reducing the potential impacts and losses caused by disasters (Hermon, 2017; Hermon, 2019; Hermon, 2020). Disaster mitigation is an effort to reduce or anticipate the risk of disasters that occur by increasing the capacity to face disasters and through physical development. Disaster mitigation is a step that needs to be taken as a starting point for disaster management, the goal of which is to reduce losses caused by disasters by means of mitigation. Disaster mitigation is a very important activity in disaster management (Hermon *et al*., 2017; Hermon *et al*., 2018; Hermon *et al*., 2019; Hermon *et al*, 2020; Triyatno *et al*., 2020; Oktorie *et al.,* 2020). Disaster mitigation activities are activities carried out before a disaster occurs so that the impacts that occur can be reduced. Disaster mitigation through the development of the waterfront concept can be carried out structurally and non-structurally. In overcoming the problem of tsunami disasters, comprehensive disaster mitigation is needed, namely, a combination of structural and non-structural and its implementation involves related agencies. The key to success in disaster mitigation is harmony between humans and the natural environment.

People living in coastal cities which are prone to tsunami disasters have a very large role in tsunami disaster mitigation efforts (Oktorie *et al*, 2019). So that it requires a high level of awareness and concern for nature and the environment which is disciplined towards existing regulations. Disaster mitigation, which is a process to minimize the negative impact of a tsunami disaster that will occur in the future in an area. Mitigation must be carried out in all kinds of disasters, both natural disasters and disasters caused by human actions. In general, mitigation is carried out to reduce losses due to disasters, such as casualties, material losses that affect human life (Xiaocheng *et al*., 2017; Oktorie *et al*., 2019; Hermon, 2019).

In tsunami disaster mitigation, accuracy is needed in assessing nature that is in danger of a disaster, applying tsunami hazard warning techniques and preparing threatened areas in order to reduce the negative impact of the disaster. The steps that can be taken in tsunami disaster mitigation are: (1) issuing disaster-prone maps for each region, (2) installing disaster warning signs in disaster warrants areas, (3) increasing human resources, (4)) conduct training for people living in tsunami-prone areas, (5) conduct awareness raising education for communities in tsunami-prone areas, (6) prepare places that can accommodate people in evacuation routes, (7) move people to places which is safer, (8) constructing buildings that can reduce the impact of the tsunami disaster, and (9) establishing disaster alert posts in disaster-prone areas (Yassin *et al*., 2010; Hermon, 2019; Hermon *et al*., 2019).

The steps that can be taken in mitigating tsunami disasters in the waterfront area are: (1) hazard assessment, which is the most important element in tsunami disaster mitigation, namely a hazard assessment, because it is needed to identify the population, level of threats and assets that are threatened. This requires knowledge of the source of sunami and the morphological characteristics of the sea and coast, (2) warning, namely warning of a tsunami that is threatening to the community and government so that they can immediately evacuate. Tsunami warnings are based on when an earthquake occurs and the receding sea water. It is hoped that this warning can be received and understood by the community in the waterfront city area, (3) preparation, the community must know about the areas that will be affected by the tsunami, and must understand the warnings given about when to evacuate and also have to know when to do so. right to come back. In addition, other preparations that can be made

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by the government are planning the layout of the location of important facilities such as police stations, schools, hospitals and fire brigades that are located far from tsunami-prone areas. Institutions play a very important role in tsunami disaster mitigation efforts because institutions can assist communities in disaster mitigation. Communities and institutions that are capable of dealing with disasters can be realized in reducing the risk of a tsunami disaster (Yassin, 2012; Yassin, 2017).

Things that can be done in disaster mitigation by institutions and the community are as follows: (1) establishing a policy not to build in a tsunami-prone location because the risk posed is very dangerous, (2) estimating the impact of the tsunami disaster that occurred, (3) identify areas that are prone to tsunami, (4) carry out activities that are tsunami disaster mitigation in the waterfront city area, (5) so that good work coordination is realized in disaster mitigation, the community can take the initiative to create an institution that handles tsunami disaster mitigation, (6) provide knowledge to the community about the tsunami hazard, and characteristics before the tsunami occurred.

CONCLUSION

The characteristics of a waterfront city must provide greater space for green open space, public and social facilities, which can be used as an evacuation location in the area along the fault line. Then develop or make earthquake-resistant waterfront buildings using lightweight materials.

REFERENCES

Goenmiandari, B., J. Silas dan R. Supriharjo. 2010. Konsep Penataan Pemukiman Bantaran Sungai di Kota Banjarmasin berdasarkan Budaya Setempat. Seminar Nasional Perumahan Pemukiman dan Pembangunan Kota. Jurusan Arsitektur ITS Maret 2010.

Gilmour, D., D. Blackwood, L. Banks and L. Wilson. 2007. A Sustainability Enhancement Framework for The Dundee Central Waterfront Development. International Conference on Whole Life urban Sustainability and its Assessment. Glasgow, 2007

Grant, A. E and J.H. Meadows. 2008. Communication Technology Update and Fundamental. (ed. 06). Boston. Focal Press

Hall, G.B., R.L. Bowerman, and R.D. Feick. 1997. GIS-Based Decision Support Architecture and Aplications for Developing Countries. South African Journal of Geo-Information. 17: 73-80

Hermon, D. 2012. Mitigasi Bencana Hidrometeorlogi: Banjir, Longsor, Degradasi Lahan, Ekologi, Kekeringan, dan Puting Beliung. UNP Press. Padang.

Hermon, D. 2015. Geografi Bencana Alam. Jakarta: PT RajaGrafindo Persada.

Hermon, D. 2016. Mitigasi Perubahan Iklim. Rajawali Pers (Radjagrafindo).

Hermon, D. 2016. The Strategic Model of Tsunami Based in Coastal Ecotourism Development at Mandeh Regions, West Sumatera, Indonesia.Journal of Environment and Earth Science. Volume 6.

Science and Environmental Journals for Postgraduate (SENJOp)
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e_ISSN 2655-5239

Hermon, D., P. Iskarni., O. Oktorie and R. Wilis. 2017. The Model of Land Cover Change into Settlement Area and Tin Mining and its Affecting Factors in Belitung Island, Indonesia. Journal of Environment and Earth Science. Volume 7 No. 6. p: 32-39. IISTE.

Hermon, D. 2017. Climate Change Mitigation. Rajawali Pers (Radjagrafindo).

Hermon, D., Ganefri., A. Putra and O. Oktorie. 2018. The Model of Mangrove Land Cover Change for the Estimation of Blue Carbon Stock Change in Belitung Island-Indonesia. International Journal of Applied Environmental Sciences. Volume 13. Issue 2. p: 191-202. Research India Publication.

Hermon, D., A. Putra and O. Oktorie. 2018. Suitability Evaluation of Space Utilization Based on Enviromental Sustainability at The Coastal Area of Bungus Bay in Padang City, Indonesia. International Journal of GEOMATE. Volume 14. Issue 41. p: 193-202. Geomate International Society.

Hermon, D. 2019. Evaluation of Physical Development of The Coastal Tourism Regions on Tsunami Potentially Zones in Pariaman City-Indonesia. International Journal of GEOMATE. Volume 17. Issue 59. p: 189-196. Geomate International Society.

Hermon, D., Ganefri, Erianjoni, I. Dewata, P. Iskarni and Alexander Syam. 2019. A Policy Model of Adaptation Mitigation and Social Risks The Volcano Eruption Disaster of Sinabung in Karo Regency-Indonesia. International Journal of GEOMATE. Volume 17. Issue 60. p: 190-196. Geomate International Society.

Hermon, D. 2019. Mitigation and Adaptation: Disaster of Climate Change. Sara Book Publication. India.

Hermon, D. 2019. Land Stability Model for Sustainable Spatial Planning in Padang City-Indonesia based on Landslide Disaster. Journal of Geography and Earth Sciences. Vol. 7. Issue 1. Pp 19-26.

Hermon, D., Erianjoni, I. Dewata, A. Putra, and O. Oktorie. 2019. Liquefaction Vulnerability Analysis as a Coastal Spatial Planning Concept in Pariaman City–Indonesia. International Journal of Recent Technology and Engineering (IJRTE). Vol. 8. Issue 2. Pp 4181-4186.

Hermon, D., Ikhwan., A. Putra., O. Oktorie. 2020. Spatial Analysis of Tsunami Vulnerability Zones as a Basic Concept of Coastal Disaster Mitigation in Development Planning of Pariaman City. Journal of Advanced Research in Dynamical and Control Systems – JARDCS. Vol. 12. Special Issue 07 (681-690)

Oktorie, O., D. Hermon, Erianjoni, A. Syarief, and A. Putra. 2019. A Calculation and Compiling Models of Land Cover Quality Index 2019 uses the Geographic Information System in Pariaman City, West Sumatra Province, Indonesia. International Journal of Recent Technology and Engineering (IJRTE). Vol. 8. Issue 3 (6406-6411)

Oktorie, O., D. Hermon, E. Barlian, I. Dewata, and I. Umar. 2020. Policy Model of Disaster Mitigation for Liquefaction Potential in Pagar Alam City-Indonesia. IJISET - International Journal of Innovative Science, Engineering & Technology. Vol. 7. Issue 5 (107-113)

Triyatno., I. Bert., Idris., D. Hermon., and A. Putra. 2020. Hazards and Morphometry to Predict The Population Loss Due of Landslide Disasters in Koto XI Tarusan - Pesisir Selatan. International Journal of GEOMATE. Vol. 19. Issue 76 (98-103).

Xiaocheng, S., J. Liub and Y. Zhao. 2017. Effect of design factors on the thermal environment in the waterfront area. 10th International Symposium on Heating, Ventilation and Air Conditioning, ISHVAC2017, 19- 22 October 2017, Jinan, China

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p_ISSN 2655-5085
e_ISSN 2655-5239

Yassin, A.B., C. Eves and J. Donagh. 2010. An Evolution of Waterfront Development in Malaysia. Proceedings from the Pacific Rim Real Estate Society 16th Annual Conference (PRRES), pp. 1-17

Yassin, A B. 2012. Principles For Sustainable Riverfront Development For Malaysia. Journal of Techno-Social. Vol. 4 No. 1

Yassin, A.M., R. Ramlan, M. Razali, and M. Najib, M. 2017. Assessing Opportunities and Challenges in Waterfront Development in Malaysia. Advanced Science Letters, 23(1): 511-513