

AN ANALYSIS OF DISASTER MITIGATION READINESS IN COASTAL AREAS OF KUPANG CITY

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ABSTRACT

Coastal area is an area that attracts a lot of attention, both in terms of economics, social and environment, which is also followed by a multiplier effect. On the other hand, the coast is also vulnerable to disasters, when disaster comes, people who live in coastal areas are affected, both material and non-material. Mitigation readiness is the main thing that must be done in coastal areas. The purpose of this study is to know how far the readiness of disaster mitigation in the coastal area of Kupang City and what mitigation priorities can be done in facing disasters in the coastal areas. This research is conducted in six urban villages which located in coastal areas. The method used in this research is interview. The data that obtained then tabulated to know the readiness of mitigation in accordance with Perka BNPB guidelines and to analyze mitigation priorities using AHP with expert choice. The result of analysis on mitigation readiness shows that all urban villages that are sampled are not ready to face disasters, with the total score obtained less than 20 points. As for priority analysis based on the criteria, the structural mitigation has a higher point than the other criteria, that is 37.4%.

Keywords: analysis, disaster, mitigation, coastal, Kupang city, AHP

INTRODUCTION

Coastal areas are ecosystems that are rich in natural resources. The high potential of natural resources in this coastal area makes the economic function contained in it followed by a multiplier effect that is the development of activities that directly or indirectly related to the main economics activity (Marfai, 2011).

Natural disasters can occur suddenly or through a process that takes place slowly. Some types of disasters, such as earthquake, is almost impossible to predict accurately when and where it will happen, and the magnitude of its strength; while the other types of disasters such as flood, landslide, drought, tsunami and weather anomaly can be predicted before.

Kupang City is the capital of East Nusa Tenggara Province which is the center of the implementation of government and economics administration functions. The city of Kupang has the coastal wide of 12,695 Ha and coastal length of 22.7 Km (Baun, 2008). Activities in

the coastal areas of Kupang City are mostly dominated by settlements, trade, services, industry and tourism.

Looking at the geographical, geological, hydro-logical and demographic conditions, Kupang City area has a high level of vulnerability to disasters, whether caused by natural factors, non-natural factors or human factors. The main effect of disasters often cause casualties or victims both human lives, environmental damage, loss of property, and the impact of non-material and psychological damage.

Seeing the situation and condition of the coastal areas of Kupang City, it is estimated that in the coming years by the increasing number of settlements in the coastal areas and the lack of readiness of the government and the community in terms of structural, non-structural mitigation and good mitigation management in coastal urban villages, the threat of disasters in coastal areas can cause greater physical and non-physical losses, as well as can cause more severe environmental damage. This is why the purpose of this research is to look at disaster mitigation readiness in Kupang City and which mitigation priorities should be prepared in facing disasters.

RESEARCH METHODOLOGY

1. Population and Sample

The population of this study is the urban villages in coastal areas of Kupang City, the number of urban villages that selected as a sample is six. The selection of urban villages is based on the level of disaster risk. The six urban villages that were sampled are Lasiana, Oesapa, Pasir Panjang, Fatubesi, Nunbaun Sabu and Namosain. These six urban villages were chosen because according to BPBD of Kupang City, these urban villages are located in the coastal areas, besides they are belong to the urban villages with big population and ever experienced several disasters.

For interviews, the selection of sample was done by using purposive sampling technique. The samples were chosen based on the consideration that they could represent the problem being examined or researched. The samples consist of BPBD of NTT Province, BPBD of Kupang City, mitigation experts, BAPPEDA of Kupang City, BMKG, six headmen of urban villages and a chairperson of hamlet whose areas are directly located in the coastal areas or affected areas.

2. Data Collecting Technique

The ways of data collection are through field observation, questionnaire, interview and documentation or written data both narrative and numerical. In general, the research procedures consist of:

- a. Data retrieval in the field;
- b. Data normalization and validity test of data;
- c. Data analysis by hierarchical process analysis or Analytic Hierarchy Process (AHP);
- d. AHP results as a decision support (Decision Support System).

3. Structure and Variable of Research

The research variables consist of the readiness of urban villages mitigation and supporting factors of natural disaster mitigation, namely the functions of structural mitigation, the functions of non-structural mitigation and mitigation management.

For the analysis of urban village which is strong in facing disasters, the questionnaire and variable that used follow what has been determined in PERKA BPNP No.1 of 2012 concerning urban villages that strong in facing disasters, where there are six aspects which summarized in sixty question indicators. The scale used in questionnaires related to PERKA No.1 of 2012 is an ordinal data with Gutman scale where each question has two options of answer namely if the answer is “Yes,” then the score is 1; and if the answer is “No” then the score is 0.

The data which has been obtained then tabulated and calculated in order to get the total number of all indicators that questioned. The scoring result then compared with the criteria set by PERKA No.1 of 2012.

For the analysis of mitigation priority, it was used a questionnaire in order to obtain the data on the main priorities in preparing for mitigation in the coastal areas. The variables measured in the AHP method are stated in three criteria and nine alternatives that defined as shown in figure 1 below.

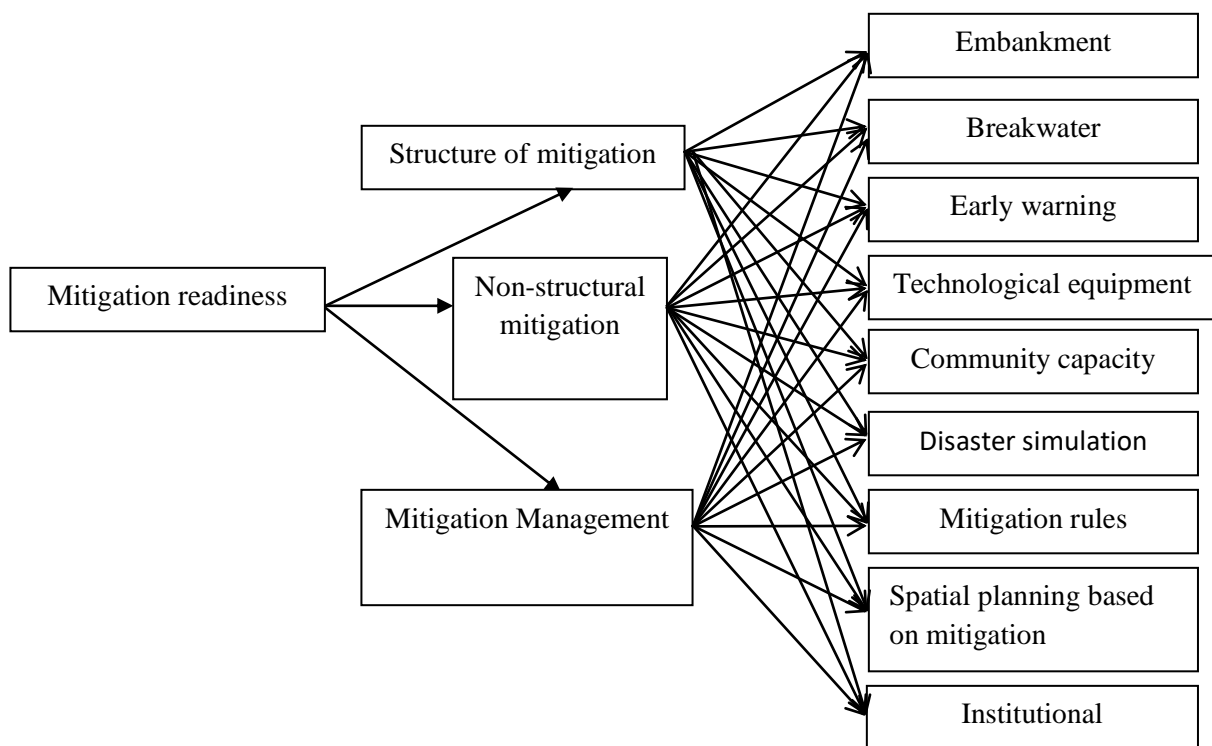


Figure 1. Criteria Hierarchy Structure

4. Data Analysis

For the determination of urban village which is strong in facing disasters, it is conducted by scoring method in accordance with the instructions of PERKA dealing with urban village which is strong in facing disasters, where if the answer is “Yes,” then the score is 1;

and if the answer is “No” then the score is 0, then the total of scoring result is compared with the criteria set by PERKA (Perka BNPB No.1 of 2012).

The variables both criteria and alternative in order to support decision in AHP calculation is calculated using a computer program. The program used to calculate the AHP method is the Express Choice 2000 program.

RESULT AND DISCUSSION

1. The Readiness of Urban Village Which is Strong in Facing Disaster

By the data of questionnaire distributed in six urban villages in the coastal areas, the obtained results shows that all urban villages in the coastal areas of Kupang city are not ready to face the disasters. The tabulation results of interview can be seen on table 1.

Table 1. Results of interview scoring in the Kupang City coastal village

No	Aspects	Urban Villages					
		Lasiana	Oesapa	Pasir Panjang	Fatubesi	Nunbaun Sabu	Namosain
1	Legacy	0	0	1	2	0	1
2	Planning	0	0	2	1	0	0
3	Institutional	3	0	1	4	1	2
4	Funding	0	1	1	1	0	4
5	Capacity development	10	2	2	0	4	6
6	Implementation of Disaster Management	6	7	3	5	4	5
	Total	19	10	10	13	9	18
	Annotation	NMC	NMC	NMC	NMC	NMC	NMC

Note: NMC = It does not meet the criteria

Source: Research Result

From the table above, it shows that all urban villages in the coastal areas of Kupang city are still not ready in facing disasters, especially if we see from all aspects of mitigation assessment set by BNPB. This thing shows how vulnerable of those areas when the disasters are coming.

In terms of funding, all urban villages have not a special funds allocation that prepared for emergency conditions. This is unusual problem that must be paid attention because if disasters happen, the funds that have been prepared can be utilized. This lack of fund

allocation could be due to the majority of the population living in coastal areas are fishermen, whom depend heavily on sea products, so it is impossible to collect funds from them, otherwise they are very dependent on the Government (Sagala, 2014)

Besides funding, in terms of legacy, planning, institutional, capacity development and the implementation of disaster management in each urban village is still very limited. This limitation makes the urban villages which are in coastal areas very vulnerable if the disasters come.

If it is seen from the stages or cycles of disaster mitigation management, the urban villages in coastal areas of Kupang City are not ready, they are still at the stage of readiness to face disasters. This condition can be seen by: (1) the lack of identification of dangers or threats. This stage is needed to identify population and assets that are threatened, (2) the lack of mapping of disaster-prone zones, (3) the lack of dissemination to the public on disaster risk and anticipation steps, (4) the lack of emergency response on the time of disaster by making training or disaster simulation, (5) the lack of public awareness, (6) the lack of strict regulations about spatial planning based on mitigation, (7) the lack of the enforcement of mitigation regulations. The unpreparedness can be seen from the results of questionnaire scoring where there are indicators about the readiness in facing disasters, and here most of urban villages do not have anticipated efforts as mentioned in 60 indicators.

The research results by Wibowo (2015) concerning the value of disaster vulnerability in coastal urban village of Kupang city emphasize that if disaster happens in coastal areas of Kupang city then it will have a big impact.

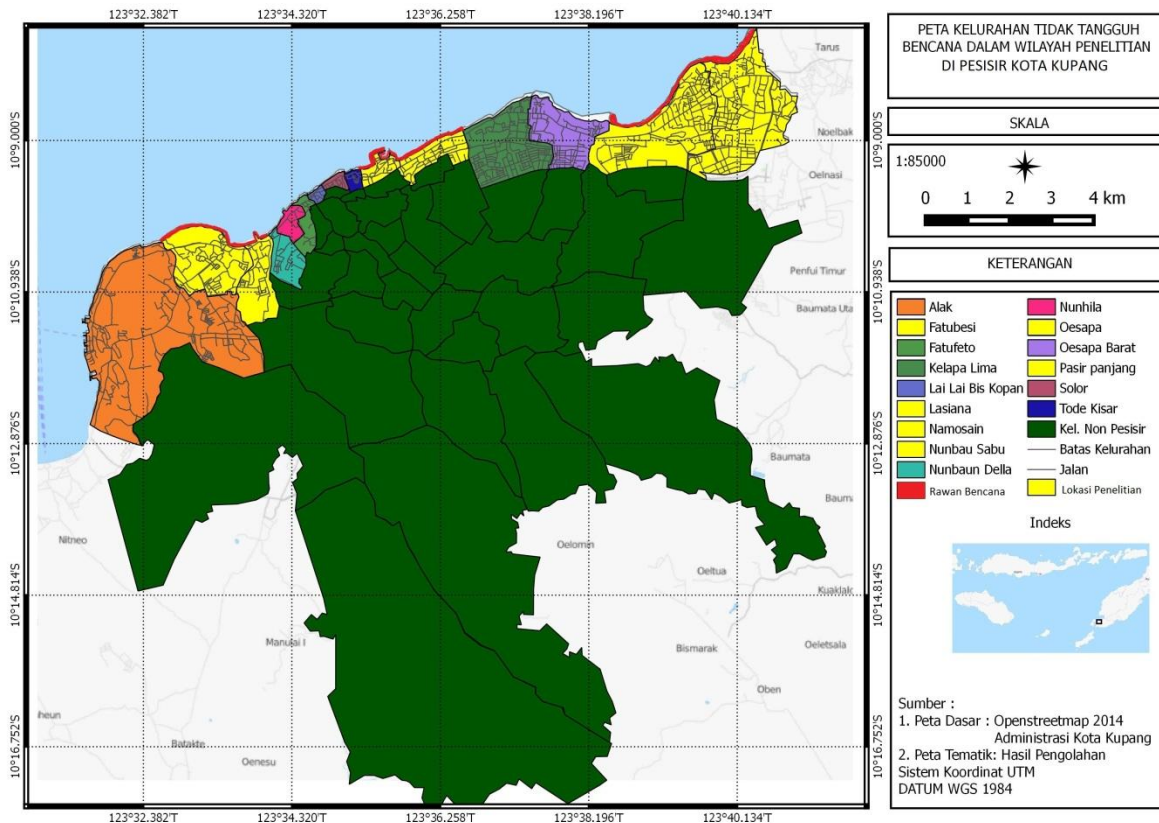


Figure 2. The Map of Urban Villages which are not Strong in Facing Disaster in Research Area, the Coast of Kupang City.

From the map above, it can be seen that the urban villages marked in red are the urban villages that do not meet the criteria as strong urban villages in facing disasters, namely Lasiana, Oesapa, Pasir Panjang, Fatubesi, Nunbaun Sabu and Nomosian. According to Ma'arif (2007) in Rante, et al (2013) one of the causes of victims and damage due to disasters is the lack of household / community preparedness, in addition to the rapid development of city, especially in coastal areas causing the risk of disaster increasingly large because of abrasion, rising water to the mainland tidal wave (Diposaptono, 2003).

2. Mitigation Readiness in Coastal Areas of Kupang City Based on AHP

The analysis was carried out through interview to find out disaster mitigation preparedness in coastal areas of Kupang City. Interview was conducted with respondents who had expertise in the field of mitigation, namely BPBD of NTT Province, BPBD of Kupang City and mitigation expert from Nusa Cendana University. The results of the interview then

analyzed using expert choice 2000. The complete analysis results can be seen in Figure 3 below.

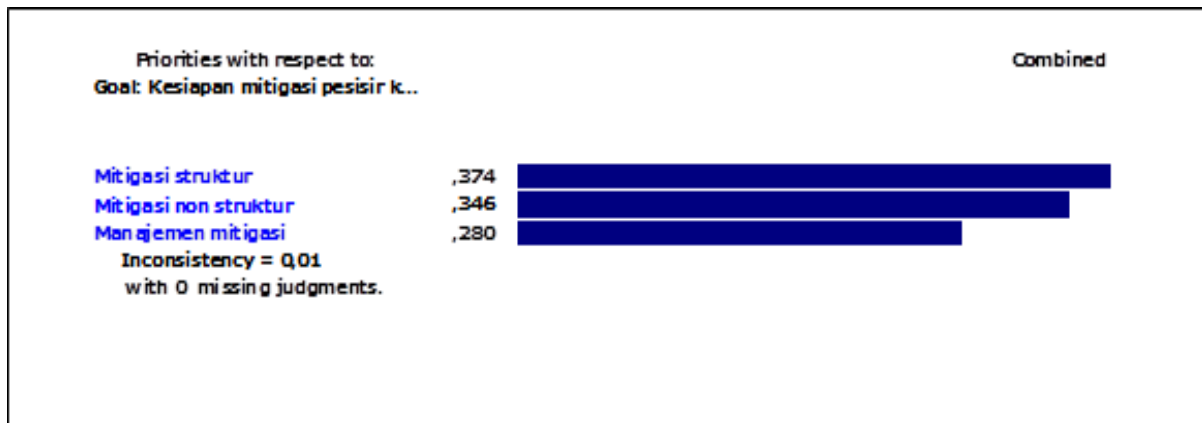


Figure 3. Analysis Results of Criteria Point

From the analysis results, it is known that what is needed to prevent the occurrence of disasters today, firstly, structural mitigation with point result: 0.374 or 37.4%. Secondly, non-structural mitigation with point result: 0.346 or 34.6%. Thirdly, mitigation management with point result: 0.280 or 28% and inconsistency point: 0.01 or 1%. This is in accordance with what Saaty wrote (1984) in Roman (2014) that the calculation results of point value must not have inconsistency value > 0.10 or 10%. If the inconsistency value is greater than 10%, it can be said that the calculation results are not valid enough. The structural mitigation is an important point that must be done in this research because it is consistent with observations in the field. Besides there are dikes that have been damaged so cannot block the coming waves.

An integrated approach to managing flood risk in this case tidal flood caused by wave surges in a coastal area is a combination of flood risk management both structural and non-structural (Brody et al., 2009). The characteristics of structural approach to reduce the risk of flood are technical aspects (engineering), physical approach, and emphasis on the aspect of danger (hazard). Characteristics of non-structural approach to reduce the risk of flood disaster are non-technical aspects (social-cultural), focusing on people, and emphasizing on vulnerability aspects.

CONCLUSION

The result of analysis shows that disaster mitigation preparedness in coastal areas of Kupang City has not been prepared for mitigation, especially in six urban villages. Based on AHP analysis, the priority criteria that must be done in coastal areas of Kupang City in order to minimize the impact of disasters are structural mitigation, in addition to the spatial priority based on mitigation that must be done in all coastal areas of Kupang City.

SUGGESTION

Suggested to:

1. The Government of East Nusa Tenggara Province and the City of Kupang in order to:
 - a. Carry out the mitigation efforts to reduce the risk of disasters, both through physical establishment and enhancing the ability of the community especially in coastal areas.
 - b. Can pay more attention to the condition of people in coastal areas, especially the arrangement of disaster-prone areas by repairing the dykes that damaged in urban villages of Lasiana, Oesapa, Pasir Panjang, Namosain and Nunbaun Sabu and designing spatial planning based on mitigation.
2. To the society:
 - a. Increasing the readiness to face disasters.
 - b. Awareness to recognize the types and characteristics of disaster threats that exist in their areas.

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