SENJOp
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Science and Environmental Journals for Postgraduate
Vol. 4 No. 1 (pp. 1-7) June 2021
p_ISSN 2655-5085
e_ISSN 2655-5239

COMMUNITY CAPACITY BUILDING IN FLOOD DISASTER MITIGATION EFFORTS IN LIMAPULUH KOTA REGENCY

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Received: 01 Des. 2021, Revised: 13 Des. 2021, Accepted: 25 Des. 2021

ABSTRACT

Disaster mitigation is an effort and or action to reduce disaster risk. Community capacity building in dealing with disasters is an effort to reduce disaster risk. Limapuluh Kota Regency is one of the areas that have a high level of vulnerability to flood disasters. The target of this activity is to increase community capacity in dealing with flood disasters. The efforts made can be divided into five forms, namely 1) strengthening disaster management institutions; 2) early warning of disaster risk; 3) disaster education; 4) reducing risk factors; and 4) development of preparedness in all lines. In the first year, there will be institutional formation and a study of disaster-prone zoning. In the second year, prepare a model for disaster education and study efforts to reduce disaster risk factors. In the third year building preparedness on all lines in the face of disasters. This activity has the output of national and international scientific publications in modeling community capacity building in dealing with flood disasters.

Keywords: Disaster Mitigation, Floods, Capacity Building, Disaster Prone Zones, Limapuluh Kota Regency.

INTRODUCTION

UU no. 24/2007 concerning Disaster Management explains that disaster-prone is a geological, biological, hydrological, climatological, geographical, social, cultural, political, economic, and technological condition or characteristic in an area for a certain period that reduces the ability to prevent, reduce, achieve preparedness, and reduced ability to respond to the adverse effects of certain hazards. Efforts that can be made to prevent or minimize the adverse effects of flood disasters are to carry out mitigation. Mitigation is a series of efforts to reduce disaster risk, both through physical development as well as awareness and capacity building to deal with disaster threats. According to Iwan et al (1999); Bechtol & Laurian (2005) mitigation include all actions taken before, during, and after the occurrence of natural events to minimize their impact. Mitigation measures include avoiding the hazard, providing warnings, and evacuating in the period before the hazard.

The BPBD of Limapuluh Kota Regency noted that there was an increase in floods and landslides both in terms of frequency and area affected in the 2010-2017 period. One form of mitigation that can be done to minimize the impact of flood risk is by increasing

community capacity in dealing with flood disasters. Limapuluh Kota Regency based on fictional characteristics has areas that are very prone to floods and landslides, including 1) morphologically, about 25% of the area is prone to floods and landslides; 2) about 70% of the Limapuluh Kota Regency area of primary forest area is converted into a secondary forest area; 3) an increase in the intensity of rainfall in the upper watershed area; and 4) the development of residential areas in flood and landslide-prone zones.

In March 2017 two sub-districts in Limapuluh Kota Regency, namely in Pangkalan and Kapur IX sub-districts experienced landslides and floods which caused great loss of property and life. The above conditions were due to high rainfall and land conversion in watersheds in the two districts. The incidence of floods and landslides over the last 10 years has increased both in frequency and in area. According to the BPBD of Limapuluh Kota Regency, the flood disaster occurred due to the overflow of five rivers in Nagari Pangkalan, namely Batang Mahat, Batang Sanen, Batang Talagiri, Batang Kesok, and Batang Mangilang.

IMPLEMENTATION METHODS

In the implementation of community service activities, socialization of community capacity building in dealing with floods and landslides in Limapuluh Kota Regency uses several approaches or methods. Table 1 presents the method of implementing community service activities.

Table 1. Matrix of methods of implementing community service activities

No	Purpose	Method	Output
1	Strengthening and or establishing disaster institutions	FGD all elements	The formation of disaster institutions starting from the most basic level of government to the district level
2	Assessing zoning prone to flooding and landslides	GIS and FGD	Map of zoning prone to flooding and landslides
3	Conducting socialization of disaster education	Lectures and Q&A	Improved understanding and increased skills in dealing with disasters
4	Reducing disaster risk factors	Lectures and Q&A and FGD	Proposals and directions for conservation policies and regulations as well as environmental improvement
5	Improved preparedness on all fronts	Lectures and Q&A and FGD	Improved understanding and increased skills in dealing with disasters

RESULTS AND DISCUSSION

Region description

This research was conducted in Limapuluh Kota Regency, West Sumatra Province. Geographically, Limapuluh Kota Regency is located at longitude 100°15' east longitude - 100°53'BT and latitude 0°25'N - 0°25'LS. Based on the morphology, the Kampar watershed has a relatively hilly and mountainous area. The morphology of the Kampar watershed is more than 41 % an area with a slope of more than 27 % and this area is relatively steep and steep. The flat area is only about 15 % of the total area. The slope conditions of the research area are presented in Fig 1 below.

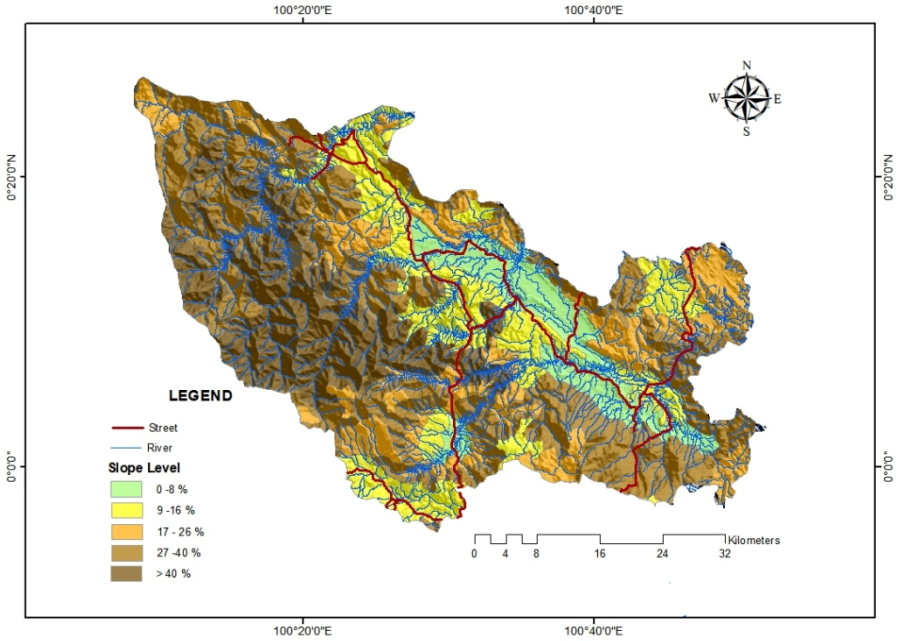

Fig 1. Map of Slope

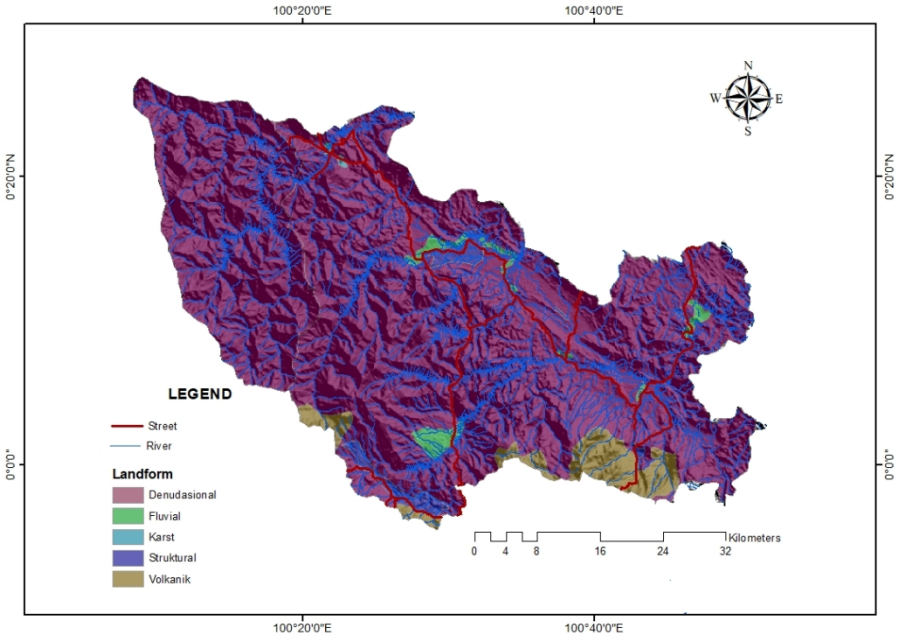

Fig 2. Map of Landform

The research area is an area located in the Bukit Barisan zone. Geomorphologically, this area is mostly formed due to uplift and volcanic origin processes. So that most of the landforms formed are denudational, structural, and volcanic, as well as karst. However, the reshuffle process also occurs by water power which forms the fluvial origin of the landform. The description of the landforms in the research area is presented in Fig 2. Based on the geological type, the research area is mostly Alluvium (Qh) and limestone mixed with silt (Tms). This clearly shows that at a certain period there has been a process of lifting and overhauling hydropower so that a lot of sedimentary material is formed. In addition, the research area also found many metamorphic rocks, namely rocks formed due to high pressure and temperature. The geological type in the research area is presented in Fig 3 below.

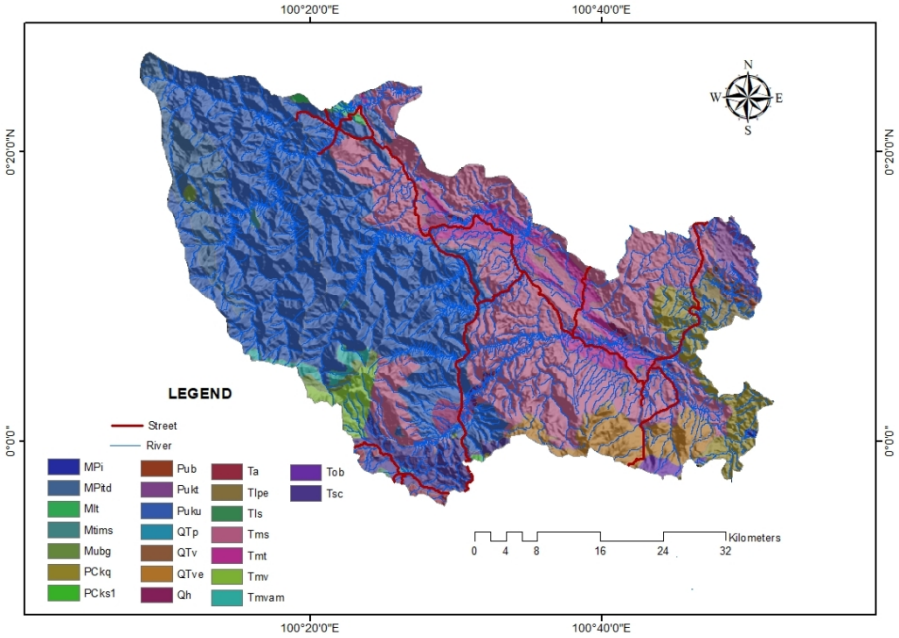

Fig 3. Map of Geology

The research area has variously distributed rainfall intensity. The average annual rainfall is high at 3500-4000 mm/year. The research area has an orographic type of rainfall, namely rainfall that occurs due to topographical factors. The intensity of rainfall is higher upstream of the river and vice versa in lower areas the intensity of rainfall is lower. Fig 4 is the land use of the research area as a result of the interpretation of Landsat OLI 8 imagery in 2021. Based on the land use map, it shows that the research area still has forest areas. About 70 % of the forest area in the research area has turned into secondary forest. Changes in the condition of the primary forest to the secondary forest can disrupt the hydrological cycle. Rainfall can take place more quickly due to an increase in ambient temperature.

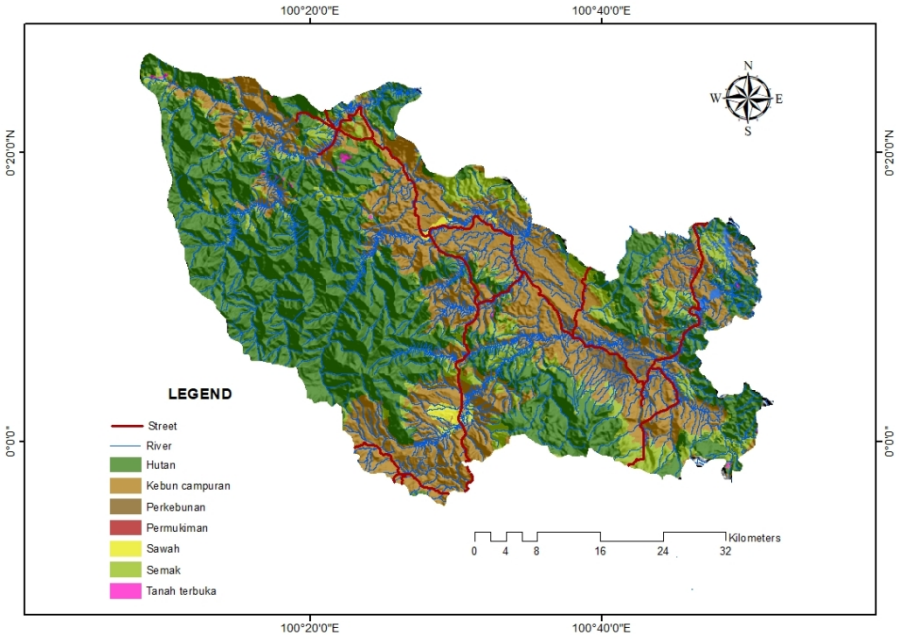

Fig 4. Map of Land Use

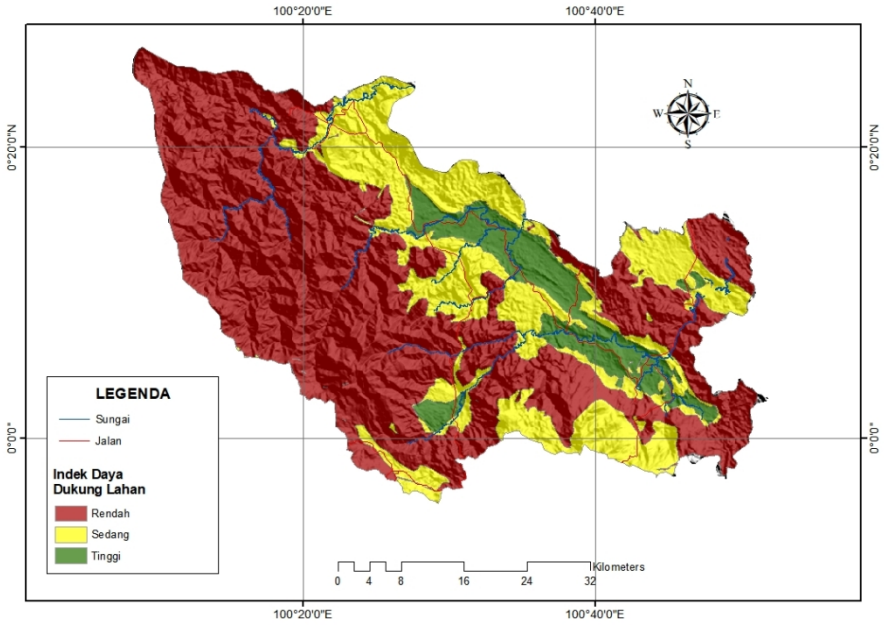

Fig 5. Map of Land Carrying Capacity

Based on the results of the analysis of the land carrying capacity of the research area, most (55 %) have a low category, about 30 % are in the medium category, and the remaining 15 % of the research area has a high category. The %age of areas that have low power in the research area is influenced by regional topography and soil types. Most of the research areas have slopes of more than 17 % and have soil types that are prone to erosion and landslides.

Fig 6. Message of community service activities by Wali Nagari Lubuk Alai

Fig 7. Delivering disaster mitigation materials by Dr. Iswandi U., M.Si

Fig 8. Delivering material on environmental degradation by Dr. Indang Dewata, M.Si

Fig 9. Delivering alternative economic materials

The increasing population causes the cultivated area to tend to be smaller, this situation causes increased population pressure on land, in everyday human life and activities, the land is part of the environment as a natural resource that has a very important role as an interest for humans (Sumarwoto, 2001). Land carrying capacity is a systematic land use and population data. Where all human activities in meeting the needs of life require space so that the availability of land has a major effect on human activities. Likewise, a large number of residents in an area support the population so that it affects a decent standard of living.

The land has become one of the main elements in supporting the continuity of life since humans first occupied the earth. Land serves as a place for humans to move to maintain their existence. The first activity carried out was the use of land for farming. Ress (1990), environmental carrying capacity in an ecological context is the number of populations or communities that can be supported by the resources and services available in the ecosystem. According to Law No. 23/1997 concerning Environmental Management, namely the ability of the environment to support the lives of humans and other living creatures. The Kampar watershed based on the analysis of the land carrying capacity of the research area, most (55 %) are in a low category, about 30 % are in the medium category, and the remaining 15 % of the research area is in the high category. The %age of areas that have low power in the research area is influenced by regional topography and soil types. Most of the research areas have slopes of more than 17 % and have soil types that are prone to erosion and landslides.

CONCLUSION

Flood disasters are influenced by three factors, namely climatology, watershed characteristics, and human behavior. Efforts to mitigate flood disasters can be carried out by increasing community capacity. Increasing public awareness of the environment and seeking alternative economic sources and or increasing added value are mitigation efforts that can be carried out in Limapuluh Kota Regency. For this reason, one form of the tri dharma of higher education, LP2M, Universitas Negeri Padang, is to serve Nagari Lubuk Alai, Kapur IX District, Limapuluh Kota Regency. Based on the discussion above, it can be suggested: 1) To BPBD Limapuluh Kota Regency, it is suggested to increase community capacity to minimize disaster risk; 2) To LP2M Universitas Negeri Padang to continue funding community service activities at Nagari Lubuk Alai, Kapur IX District, Limapuluh Kota Regency; and 3) To all parties, there is a need for synergistic cooperation to overcome the risk of future flood disasters.

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