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**COMMUNITY RESILIENCE AND ADAPTATION STRATEGY OF FLOOD  
DISASTERS IN TRUCUK DISTRICT BOJONEGORO REGENCY**

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**ABSTRACT**

*This study aims to determine (1) the level of community resilience to flooding in Trucuk District, Bojonegoro Regency in 2018; (2) community adaptation strategies to flood disasters in Trucuk District, Bojonegoro Regency in 2018; and (3) efforts to improve resilience and adaptation to flood disasters. The population in this study were all villages in Trucuk District, Bojonegoro Regency. The sample used was flood-affected communities in each village by purposive sampling technique. Data collection techniques using survey methods. Data collection was carried out by questionnaire and interview. Data analysis uses scoring techniques. The results of the study are as follows. (1) Resilience of the Trucuk Subdistrict community against flooding has moderate resilience (52.86 - 62.38) and high resilience (65.89 - 75.13). the distribution of resilience is likely moderate. There are 6 villages provided which is village of Kandangan, Sumbang Timun, Kanten, Pagerwesi, Padang, and Guyangan. For the high resilience ones, There are 6 villages provided which is Sumberjo, Mori, Tulungrejo, Trucuk, Sranak, and Banjarsari villages. (2) Adaptation strategies undertaken by the Trucuk District community in dealing with floods are physical and non-physical adaptations. The physical adaptation carried out by the community and the government in order to improve physical conditions, such as elevating houses, repairing irrigation networks, building dams, and building embankments along rivers. The non-physical adaptation carried out by the community and the government is the existence of an early warning system in purpose of detecting the danger of flooding earlier and also with the help of community in dealing with floods, such as mutual cooperation and mutual assistance in all matters before and after the flood. (3) provide solution to improve resilience and adaptation to flood disasters.*

**Keywords:** flood, community resilience, adaptation

**A. INTRODUCTION**

Disaster is a series of events that threaten and disrupt people's lives, whether caused by natural / non-natural factors or human factors, resulting in casualties, environmental damage, property losses, and psychological impacts (Law Number 24 Year 2007

Concerning Disaster Management) . According to Bakornas PB (2007: 2), there are interactions that cause the disaster to cause many victims and huge losses, namely:

1. Lack of understanding of hazard characteristics (hazards),

2. Attitudes or behaviors that result in a decrease in natural resources (vulnerability),
3. Lack of information / early warning that causes unpreparedness, and
4. Powerlessness in dealing with the threat of danger.
5. In the 2015-2019 National Disaster Management Plan, districts / cities that have a high risk of flooding spread across five major islands of Indonesia. One of them is the island

of Java, especially for the Province of East Java, there are 18 districts / cities that are at high risk of flooding such as Sidoarjo, Lamongan, Jombang and Bojonegoro.

Based on the recapitulation of Bojonegoro Regional Disaster Management Agency (BPBD) in 2016. It can be seen in Table 1:

Table 1 Summary of 2016 Disaster Events in Bojonegoro Regency

No	Type of Disaster	Amount of Incident	Amount of Loss
1	Bengawan Solo Floods	8	49.210.130.000
2	Flash Floods	-	-
3	Inundation Floods	8	1.141.150.000
4	Landslide	16	27.500.000
5	Strong Winds	24	495.100.000
6	Wildfire	48	1.750.100.000
7	Drought	-	-
8	Industrial Failure	2	-
9	Electric Shock	7	-
10	Struck by Lightning	4	-
11	House was Struck by Lightning	1	9.900.000
12	Sink	29	-
<b>Total</b>			52.633.880.000

Source: Regional Disaster Management Agency (BPBD) Bojonegoro 2016

Flood disaster in Bojonegoro caused by the overflow of Bengawan Solo caused the greatest losses compared to other types of disasters, although the intensity of flooding caused by the overflow of the Bengawan Solo River only occurred 7 times but the scale of the flood was wide enough to make losses

large enough. The worst flooding in Bojonegoro occurred at the end of December 2007 which inundated 14 of 27 sub-districts in Bojonegoro Regency. Particularly in the Trucuk District area, almost all villages were affected by the flood, only a few villages whose land was rather high were not affected by

flooding, besides flooding settlements also submerged several residential areas, rice fields, yards, and village road access that could be traversed by boat. After the big flood event, the government was enthusiastic in disaster management to anticipate and minimize the impact of the flood disaster in Bojonegoro by creating an early warning system, the building of embankments, dams, and shafts located on either side of the Bengawan Solo flow. The objectives of this research are: (1) analyzing the level of community resilience to flood disasters in Trucuk District (2) looking for community adaptation strategies to flood disasters in Trucuk District lience of communities against floods in District Trucuk.

## **B. MATERIALS AND METHODS**

This study is a qualitative research field survey methods. The population

in this study are all residents who live in District Trucuk. 7 informant research samples for each perdesa (the total number of informants 84). The data collection technique using observation, interviews and questionnaires.

## **C. RESULTS AND DISCUSSION**

### **1. The level of Community Resilience Against Floods**

Based on assessment of all components showed resilience in general, the District Trucuk community resilience in the face of floods, with an assessment in accordance with the resistance component obtained results are presented in Table:

Table 2 Results of Resilience

No	Village	Component of Resilience					Grade	Resistance Classification
		A	B	C	D	E		
1	Kandangan	14,71	12,97	12,4	5	13,79	58,87	Medium
2	Sumbangtimun	13,71	12,11	14	4,7	15,59	60,11	Medium
3	Kanten	13,43	12,17	12,4	4,9	14,27	57,17	Medium
4	Pagerwesi	13,31	11,33	12,9	5,4	16,11	59,05	Medium
5	Padang	13,27	11,41	12,9	5	14,89	57,47	Medium
6	Sumberejo	14,32	14,7	15,5	7	18,33	69,85	High
7	Mori	15	14,64	16,1	6,1	17,77	69,61	High
8	Tulungrejo	14,86	14,31	16,7	6,4	16,03	68,3	High
9	Trucuk	14,56	14,59	16,5	6,7	17,89	70,24	High
10	Guyangan	14,29	14,11	13,5	6,9	16,03	64,83	Medium
11	Sranak	13,93	14,26	14,9	7	16,17	66,26	High
12	Banjarsari	14,13	14,45	16,6	6,6	16,77	68,55	High

Source: Research Data, 2018

Information:

A = Knowledge and Education

B = Preparedness and Disaster Response

C = Governance

D = Rate Risk

E = Risk Management and Vulnerability Reduction

Based on the table it can be seen that the assessment of each component of resilience in each village showing the shape of medium and high endurance in

District Trucuk. Distribution village has moderate resistance that is five village consists of a village Kandangan, Sumbangtimun, Kanten, Pagerwesi, and Padang. And villages that have high resistance there are seven villages namely Sumberejo, Mori, Tulungrejo, Trucuk, Guyangan, Sranak, and Banjarsari. Following the spread of resistance values in the district of Bojonegoro Trucuk found on Map.

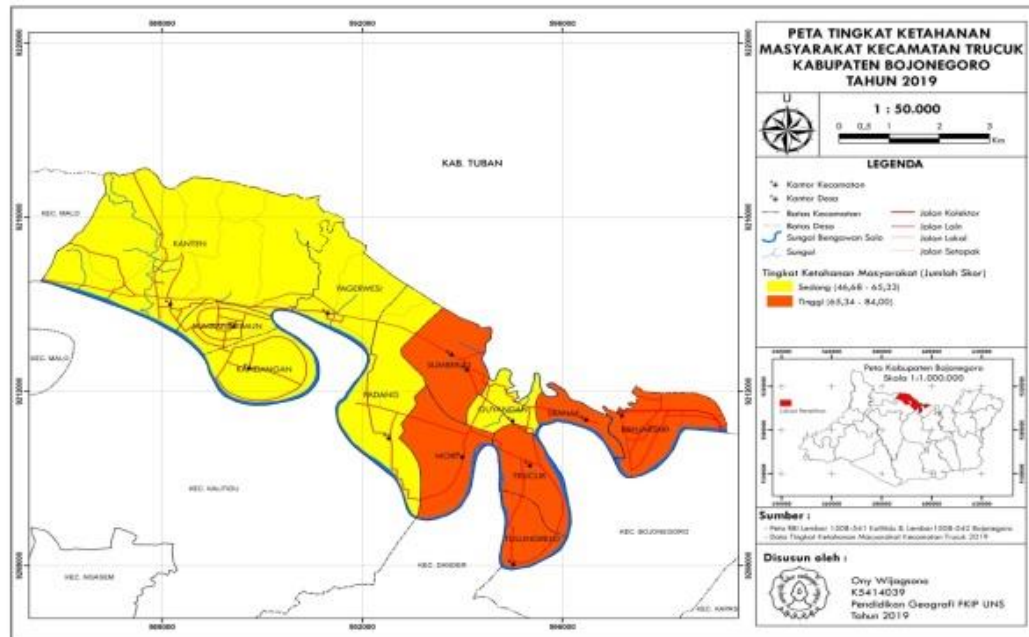


Figure 1. Map of The Resilience Level in Trucuk Sub-District, Bojonegoro Regency 2019

After reviewing community resilience in the face of floods in the district of Bojonegoro Trucuk, obtained two forms of resistance categories, namely community resilience and resistance was high society:

**a. Resilience Medium**

Resilience in the face of the flood bring disaster to people which then achieve understanding and behavior of people who are aware of the danger of flooding and the public are willing to handle it. Increased community capacity to act, people improve their knowledge and skills about the flood and its consequences, people improve and maintain all the infrastructure and all types of resources are available, all of the

increase in capacity is still limited to the management and coordination is still lacking. It is characterized by the management of all aspects of life in the disaster purposes only limited short-term and no long-term management.

**b. High resilience**

High resistance in the face of floods will achieve a good understanding with the behavior of the people, government and disaster agencies which were aware of the danger of flooding. The continuity between the community and the government in improving disaster education and the disaster training has been running at the site. People improve and maintain all the infrastructure and all types of

available resources, community capacity building management and coordination with the government or related agencies. Due to a good disaster response, the need for a good planning of all levels society and the government is really needed. Good risk assessment, risk management and vulnerability reduction should be the people's habits.

The spread of resistance villages have high resistance that there are 6 village consists of Sumberejo, Mori, Tulungrejo, Trucuk, Sranak, and Banjarsari. All

six villages have varying resistance ratings, respectively - each village has a different resistance levels every indicator of resilience.

## **2. Community Adaptation Strategies Against Floods**

### **a. Physical Adaptations**

Physical adaptations that do Trucuk the District community is affected by the level of flooding, the knowledge and the ability to cope with floods. Based on the results of interviews conducted in the field, there are several physical adaptations made is nothing exalted house, making an emergency dike in the cracks of the house, and elevate the road.



Figure 1. Attic Home Residents





Figure 2. Level 2 Home Residents

Elevating the home of choice of citizens to reduce flood risk to property and their souls, at least the water entering their home can be minimized, but the height of the flood waters can not be predicted, such as floods in 2007-2008 that were

sufficiently large. Physical adaptations were made public as elevating roofs and floors is done by some people who have a high economic generally, and settlements are located by the river in particular.



Figure 3. Elevation Floor Home Residents

**b. Non-Physical Adaptations**

According Sagala, et al. (2014: 7) the actions of non-physical cover a wide range of preventive measures or adjustments to reduce the risk of flooding by modifying the vulnerability of development activities resulting in damage in the flood plain. Subdistrict Trucuk now has an awareness of the hazards, preventive measures, preparedness and capability in the face of disaster threats that aim to reduce the risk had started to become a habit for most people. The floods that occur also increases solidarity close relatives, interaction among neighbors and local residents when the flood remain intertwined with the good, the interrelationships

between people affected by the flooding is realized in the form of mutual help.

1) Economic adaptation

In flood event most of the people are trying to make revenue such as fishing, boat building, and do a boat traffic. They take advantage of the flood situation to supplement their income, some good fished to feed themselves or resale. Motorcycle taxi boats are also the most sought after when floods occur, a lot of boat owners who utilize this flood conditions to take the other resident. Other residents also make emergency boat from banana stems as their transport during floods, whether to seek help or to take any other citizen.



Figure 4. The boat Emergency (getekan)  
Source: BPBDs



Economic needs when flooding occurs community must make good at reducing / pressing spending needs daily consumption. Society tried to suppress the daily needs in order to survive during the flood. In fulfilling the daily needs during floods displaced people who do not have to scrimp, when it comes to their needs runs one of the families seeking food assistance in place of refuge.

2) Cultural adaptation

based on previous experience people are ready with this phenomenon. They understand the flood through the lunar planting stating that in 4 have started ready for the planting season because the water has started to recede. In the previous month of the water is still too high and is likely to be flooding. People understand the approximate month frequent flooding. Usually the flood began

to occur between the months of October to January.

3) Social adaptation

Community activities to meet the needs of clothing when the flood disaster assistance obtained from various social institutions and government agencies. Social groups or social organizations engaged to assist people affected by the floods. Social groups and the Agency for Local Government moving to help people affected by the flooding such as Youth, the Village Protection Society (LINMAS), Agency for Local Government, Regional Disaster Management Agency Bojonegoro. Social groups and the Agency for Local Government is working together to help people affected by the floods. Activities undertaken include helping people make tents or post evacuation, distribute donations of various volunteers, inform the ebb and flow of the water, and various other activities.



Figure 5. Post-Flood the Mutual Cooperation  
Source: BPBDs

Thus, it can be said that society has formed a partnership and involvement in solving problems in the face of a flood disaster. Forms of mutual assistance that arises when the flood of helping evacuate, mutual assistance in repairing their homes or public facilities around, mutual help in cleaning the environment, mutual assistance in making the post evacuation, worked together to create a common kitchen, sharing food, drinks, clothing, and others.

#### **D. CONCLUSIONS**

Based on data analysis and discussion it can be seen that community resilience to floods has resistance with medium and high grades. Communities with resistance only understand the

dangers and risks posed flood their region but the capacity of action for preparedness, mitigation, social, cultural, and planning when the disaster comes. Communities which have a high resistance value, they are mostly ready to handle and minimize the impact of the flooding. They do not just let go, and the capacity of action for preparedness, mitigation, social, cultural, and planning always well done before the disaster, during disaster and after disaster.

Trucuk subdistrict community adaptation strategies against floods, namely physical and social adaptation. People who perform physical adaptations such as elevating houses, made of sacks and sand embankments, making the attic for storage of goods, raising bed with

stones, and others. Communities that do social adaptation is to know the early warning of disasters, prepare a place of refuge, a public kitchen, safeguarding livestock and mutual cooperation to help each other when flood and post-flood.

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