

# Impact of Disaster Mitigation Socialization on Community Readiness for Facing Flood Danger (Case Study on Baureno -Mojokerto -East Java)

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## ABSTRACT

The flood disaster that once hit Jatirejo Sub-district, Mojokerto Regency encouraged universities to participate in efforts to prepare the community to be ready to face the disaster if it struck again at any time. The purpose of this service activity is to provide information and practical knowledge to the community regarding actions that can be taken if at any time a flood disaster occurs. Based on the results of the activity, it is known that the understanding of disaster mitigation in the people of Baurena Village, Jatirejo District, Mojokerto Regency is very good. Then the correlation between gender and test results hurts test results, while the correlation between education level and the results of the understanding of flood mitigation tests has a weak but positive effect disaster occurs

**Keywords:** Socialization, Disaster, Mitigation, Flood

## 1. INTRODUCTION

A disaster is an event or series of events that threaten and disrupt people's lives and livelihoods caused both by natural and/or non-natural factors as well as human factors, resulting in human casualties, environmental damage, property losses, and psychological impacts.

The government places the issue of natural disasters as one of the priorities for handling. In this regard, the legislature in April 2007 passed two laws, the Disaster Management Law no. 24 of 2007 and the Spatial Planning Law (UU No. 26 of 2007) which is a revision of the previous law, namely Number 24 of 1992 which shows that disaster risk management policies are handled comprehensively and are focused on preventive efforts, namely not only in the event of a natural disaster [1]

Law Number 24 of 2007 concerning the National Disaster Management Agency also defines natural disasters, non-natural disasters, and social disasters. The history of the National Disaster Management Agency (BNPB) is inseparable from the development of disaster management during the independence period to natural disasters in the form of a devastating earthquake in the Indian Ocean in the twentieth century. Floods, landslides, fires, and others are events that are difficult to predict when they will occur. Natural disasters or whatever they are called can happen at any time without the public

knowing it. When facing a disaster, people who have not been able to handle it themselves have to wait for help which sometimes does not come immediately due to the distance of the incident location, while the first seconds when a disaster occurs is a very important time in efforts to reduce the impact of a larger disaster. Data from the Meteorology, Climatology and Geophysics Agency (BMKG) shows that in early 2020 the weather cycle is getting more extreme, such as higher rainfall so that every area is often affected by disasters, especially floods. According to the 2010 report on the Flood Management Policy Study at the Deputy for Facilities and Infrastructure, it is stated that throughout Indonesia, there are 5,590 main rivers and 600 of them have the potential to cause flooding [2]

When we are referencing UNISDR the description of floods is one of the widest-reaching and commonly occurring natural hazards in the world, affecting on average about 70 million people each year [3]

Meanwhile, another definition of flood is the event of the sinking of land by water. Flood is a natural phenomenon that often occurs in various countries, including Indonesia. Floods can be caused by river water overflowing into the surrounding environment and excessive surface runoff with high rainfall intensity and long duration [4] In general, floods are caused by rainfall that is high above normal, so that the drainage system and

artificial flood storage canals are unable to accommodate the accumulation of rainwater so that they overflow [5]

In East Java Province- Mojokerto Regency, the flood disaster caused the wheels of the economy to cripple everywhere, the harvest was not encouraging and some even failed to harvest, many houses were washed away, and not a few people died. The flood disaster that occurred in Mojokerto Regency based on its source is distinguished from 2 sources. In low-lying areas, namely in the northern part, the cause of the flooding is mostly by overflowing river water, but in the southern region, which includes mountainous slope areas, if there is a flood due to high rainfall in the upper area then the rainwater flows to the slope area below. This flood on the slopes of the mountains is called a flash flood. Flash flood according to the Flash Flood Mitigation System and Action Instructions, Ministry of Public Works, (2012) is inundation due to runoff out of river channels because the river discharge suddenly increases beyond the capacity of the flow, occurs quickly in areas of low earth's surface, in river valleys and basins and usually carries debris in its flow. Flash floods are distinguished from floods by their rapid duration and usually less than six hours [6]

One area of Mojokerto Regency that was hit by flash floods was Baureno village, Jatirejo sub-district. The astronomical position of Baureno Village-Jatirejo District-Mojokerto Regency is located at 7°40'LS-7°36'LS and 112°24' East Longitude-112°26' East Longitude.

The height of Baureno village above sea level is 250 m ABSL or DPAL. The area is 2204 km<sup>2</sup>, the distance from the district city is 3 km and the distance to the district capital is 15 km. The total population is 3,508 people. The area of rice fields is 112.70 ha and the area of non-rice fields is 68.00 ha. Then Rainy Days and Average Rainfall According to the 2018 Cakarayam Observation Station, namely 57 rainy days, total rainfall of 1,129 mm, and an average rainfall of 18.3 (mm/day). To the east of Baureno Village, there is the Kletek River which springs from the foot of Mount Arjuno.

Taking into account the geographical position of Baureno Village which is located on the slopes of Mount Argopuro and Mount Welirang, then the high rainfall and the village is flanked by rivers, the village is vulnerable to flash floods. According to the information from the Baureno Village Head, in 2020 Baureno Village has experienced a flash flood with the loss of the village bridge being washed away by the flood. However, this incident has become a warning to the community that the village is vulnerable to banjir bandang disasters.

Therefore, the service program that is carried out hopes to provide solutions to the community on how to anticipate and cope in the event of a disaster, especially a flood disaster. This community service program is one way to transfer knowledge to the community through the

involvement of lecturers and students to assist the community in implementing community empowerment programs. In line with that, an independent community development program requires community preparedness in dealing with disasters so that the community can handle and anticipate disasters that can happen to them before the arrival of outside assistance. Based on this, it is necessary to learn from the community in flood disaster mitigation. This learning is carried out through Community Service (PKM) in the form of socialization of flood disaster mitigation, especially flash floods, as the people of Baureno-Jatirejo-Mojokerto Regency have experienced in 2020.

## 2. METHOD

Activities carried out are based on Community Service in the form of socialization activities with flood disaster mitigation materials. The socialization method was carried out by showing an animated flood film, and explanations and questions and answers about flood disaster mitigation materials. Then the targets of this service program include village officials, community leaders, the general public, youth as community members of Baureno Village-Jatirejo District-Mojokerto Regency-East Java Province.

At the end of the activity, an evaluation of the results of the socialization of the understanding of flood disaster mitigation was carried out. The data used as material for evaluating the socialization was obtained from the results of tests carried out after the screening of the film, discussions, and questions and answers at the end of the activity. Then the data collected from the test results were analyzed quantitatively

The mean activities are divided into three stages, namely film screenings, and question and answer discussions, as well as post-test mitigation materials

First Stage: The activity at the first stage PPT Animated film screenings and material explanations via LCD.

Second Stage: Initial activity on the stage is Discussion and question and answer led by resource persons

Third Stage: In the third stage, an understanding test activity on disaster mitigation was carried out for the socialization participants. The form of the test instrument is a written test

The criteria for the results of the flood disaster mitigation socialization test used are as follows.

**Table 1.** Criteria for overall understanding and readiness category of flood disaster mitigations

No	Test Score	Mention	Readiness
1.	>60 - 75	Very good	Very Ready
2.	45- 60	Good	Ready
3.	30-<45	Less	Nor ready
4.	< 30	Very Less	Un-prepare

**Table 2.** Criteria for evaluation of flood disaster in the mitigations phase

Before		During		After	
Test Score	Mention	Test Score	Mention	Test score	Mention
>20-25	Very good	>20-25	Very good	>20-25	Very good
15-20	Good	15-20	Good	15-20	Good
10-15	Less	10-15	Less	10-15	Less
<15	Very less	<15	Very less	<15	Very less

### 3. RESULT AND DISCUSSION

#### A. Result of Socialization of Community Readiness For Flood Disaster

Based on the results of the flood disaster mitigation understanding test, data obtained that the results of disaster mitigation socialization using animated movie media and explanations using "PowerPoint" obtained an average value of 67.85. These results according to the evaluation criteria of the mitigation test results are categorized as very good. The mean, the community is very prepared if a flood occurs.

Then based on data processing about the correlation between gender and test results, the correlation between education level and test results and the average test results of flood disaster mitigation socialization are presented in the following table.

**Table 3.** Data processing results of gender correlation with test, education level with the test, and average mitigation socialization test result

No.	Result of Data Processing	Result Of Statistic
1.	Rate of Result Score Comprehension Mitigation	67.85
2.	Correlation of Gender and Tes Result Mitigation	-0.2138618
3.	Correlation of Education status and Tes Result Mitigation	0.06324406

Based on table 3, it is known that the results of the socialization that have been carried out regarding the understanding of flood disaster mitigation with a score of 67.85 are classified as very good. This means that the

understanding of participants in the socialization of flood disaster mitigation on average starting from the material before the disaster occurs, then when a disaster occurs and in the post-disaster phase, their understanding is very good and very ready if there is a flood.

Then the results of the analysis of the correlation data between gender and the results of the disaster mitigation test obtained the result of -0.2138618. Thus, the meaning obtained is that there is a negative correlation between gender groups when it is correlated with test results. Then, the results of the flood disaster mitigation test when correlated with the education level of the participants obtained the results of 0.06324406. The meaning of the correlation between the flood disaster mitigation understanding test and the level of education is positively correlated, but the correlation is weak.

Furthermore, in detail, the results of socialization of flood disaster mitigation which are sorted from the phase before the flood event, the phase during the flood, and the post-flood phase which is described by gender and level of education are presented in the following table.

**Table 4.** Results of the socialization test for flood disaster mitigation by gender and educational level

Phase Of Mitigation	Gender		Level of Education		
	Male	Female	Junior	Senior	Graduate
Before	20,4	23,4	22,4	21,3	22,3
During	23,3	22,0	23,3	22,2	22,2
After	23,2	23,4	22,1	22,4	23,3
Total	66,9	68,8	67,8	67,9	67,8

Based on table 4, it is known that the understanding of disaster mitigation in the female group is higher than the male group. Then the results of the socialization test for flood disaster mitigation materials based on the level of education, it is known that senior education has the highest understanding, followed by Graduate and junior education levels.

Taking into account the criteria for the results of the disaster mitigation socialization test based on the mitigation phase, it is known that in the pre-flood mitigation phase the male participant group had a relatively low score of 20.4. Then the highest flood mitigation understanding test score of 23.4 was found in the pre-flood phase and the post-flood phase, all of which were found in the female socialization participant group.

#### B. Discussion of Socialization of Community Readiness For Flood Disaster

Referring to Evita Lylyana Dewi that mitigation is the most efficient action to reduce the impact caused by a disaster. Mitigation actions consist of structural

mitigation and non-structural mitigation. Structural mitigation is an action to reduce or avoid the possible physical impact of a disaster. Meanwhile, non-structural mitigation is an action to reduce disaster risk through policies, knowledge development, regulations, and security of dangerous objects [7]

Thus, the socialization of flood disaster mitigation that we do is classified as non-structural mitigation, namely by providing socialization to develop knowledge to prepare the community to face flood disasters if one day the disaster will happen again [8]

Referring to the test results after being given socialization of flood disaster mitigation, the average value of 67.85 with a value range of 0-75 is very good. The results of the mitigation socialization in Baureno Village are better when compared to those carried out by Awaliyah et al in Penoleh Village, Kaligondang District, Kebumen Regency. Then in detail, the division of the mitigation phase is grouped into 3, namely before a flood occurs, during a flood, and after a flood occurs. higher than the people in Penoleh Village, Kaligondang District, Kebumen Regency.

The cause of the difference is thought to be because the people who are the targets of the two villages differ in their level of education. In the Baureno village community, Jatirejo sub-district, Mojokerto district, the lowest education owned by the community is junior high school and the equivalent, while the community in Penoleh Village-Kaligondang District-Kebumen Regency studied by Awaliyah et al.

In detail, if you look at the results of the understanding of the mitigation test before and after the flood disaster, there are similarities between the two Baureno Villages in Mojokerto and Penoleh Village in Kebumen. Relatively, the score or value in the phase when there is a flood is relatively low when compared to the pre-and post-disaster mitigation phases, so these conditions encourage the community to provide training or simulations.

The people of Baureno Village-Jatirejo District-Mojokerto Regency have recognized the signs that the river in their village will flood. According to the results of discussions with residents that the signs of the Kletek river flowing in their village will be flooded if other signs are known: cloudy river water, thunderous sounds are heard from the river. the river. Thus, it can be seen that the people of Baureno village already have "the skill of recognizing nature". Thus, the people of Baureno Village who have recognized their environment are in line with the opinion of Althien John Pesurnay who said that the relationship between human and environment, and the relationships between human communities are essential; what becomes the values of one community influences their relationship with other humans and their relationship with nature [9]

Based on the results of data processing, the correlation between the results of the understanding of disaster mitigation tests and the level of education shows a positive correlation, but the correlation is relatively weak. This condition is hypothesized that the level of variation in education in Baureno village is relatively dominant in Senior High School. The same result shows that there is a correlation between education level and understanding of mitigation also occurs in Hartini's research in Salo Village, Kendari. And from 4 (four) levels of education it is known that; 1) Elementary school graduates/equivalent have less knowledge and understanding, 2) Junior high school graduates/equivalent have sufficient knowledge and understanding, 3) High school graduates/equivalent have good knowledge and understanding, 4) PT/academic graduates have good knowledge and understanding also good. So, it can be analyzed that the higher a person's level of education the higher the knowledge and understanding of disaster mitigation [10]

However, the conditions in Salo-Kendari Village are different from the Baureno Village community. In Salo Kendari Village, the higher a person's education level, the higher his knowledge of disaster mitigation, but in Baureno Village it is known that only Senior high education has the highest understanding of disaster mitigation. Meanwhile, at the undergraduate and junior high school levels, the test scores for understanding flood disaster mitigation are relatively lower when compared to the Senior education levels.

In disaster management, gender is also an interesting hot issue. The international community recognizes the importance of gender in disaster management, and gender is recognized as an essential factor in the mitigation. Highly vulnerable women have specific needs and interests before, during, and after disasters. Gender shapes capacity as well as vulnerability. Women are active and resourceful disaster responders but most often are regarded as helpless victims. Several causes are primarily responsible for the vulnerability of people and social structure as far as the occurrence of a natural disaster is concerned [11]

Noting the results of data analysis that there is a negative correlation in the sense that the people of Baureno Village who are actively organizing are women's groups, then this condition opens our insight that the potential of women in Baureno Village occupies a strategic position to be empowered in flood disaster mitigation. If we refer to the guidelines for disaster management about gender issues, then the women in Baureno Village can be involved in gender responsiveness later in the event of a disaster. Activities that require the role of women, such as women in managing the Command Post, P-3K, soup kitchens, and post-disaster "trauma healing" psychological recovery.

The following evidence of comparative test results between the groups of women and men confirms that gender roles cannot be ignored. In the pre-flood phase, the score or score for the flood mitigation test in the female group was higher than the male group. Likewise, the value of the mitigation understanding test in the post-flood phase in the female group was higher than the male group.

#### 4. CONCLUSION

Socialization of flood disaster mitigation using animated film screenings and explanations using LCD PowerPoint programs resulted in a very good understanding of various mitigation phases starting from the phase before the flood disaster, during the flood disaster, and after the flood disaster. In detail, the understanding of mitigation in the very good category is highest in the pre-flood phase, then the post-flood phase, and the phase during the flood. This means the community at Baureno is very ready if a flood happened. Education level is positively correlated with an understanding of flood disaster mitigation. Education level is positively correlated with an understanding of flood disaster mitigation.

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