International Journal of Social Science and Human Research

ISSN (print): 2644-0679, ISSN (online): 2644-0695

Volume 07 Issue 07 July 2024

DOI: 10.47191/ijsshr/v7-i07-70, Impact factor- 7.876

Page No: 5228- 5235

Analysis of Flood Disaster Resilience in Kroya District Indonesia Year 2024

Agung Nugroho[1], Nurhadi[2], Rita Noviani[3]

[1,2,3] Masters in Geography Education, Faculty of Teaching and Education, Sebelas Maret University. Jalan Ir. Sutami 36A Surakarta 57126, Central Java, Indonesia.

ABSTRACT: This research was conducted to analyze the level of flood disaster resilience in Kroya District, Cilacap Regency in 2024 at the household level. This writing was designed as a qualitative and quantitative research model with case studies to determine how adaptation efforts function to reduce the level of vulnerability. So it is expected that there will be a difference between current vulnerabilities and future vulnerabilities. This difference is called resilience, which in this study will be explained at the household level. This research used a survey approach to obtain data from the people of Bunju Village and Mujur Village in Kroya District, Cilacap Regency. The results of the research show that the average resilience level results of Buntu Village and Mujur Village are categorized as high resilience, Buntu Village with a resilience level value of 0.695 (research value conversion) and Mujur Village with a resilience level value of 0.721 (research value conversion). So it can be concluded that the people of these two areas are ready to face the danger of a flood disaster if it occurs.

1. INTRODUCTION

Indonesia has a high risk of disasters due to its geological and geographical location. Indonesia's geographic condition, which is located in the tropics and where two oceans and two continents meet, makes this region prone to floods, earthquakes, tsunamis, landslides, flash floods, extreme weather, abrasion, drought and forest fires. (BNPB, 2020). According to the National Disaster Management Agency (BNPB) report from 2011 to 2020, the total number of disasters in Indonesia was 25,752. Disasters in Indonesia are recorded to have trends that change every year. From 2016 to 2020, the number of disaster incidents increased quite significantly.

Central Java Province is a region that has a fairly high disaster index. According to the National Disaster Management Agency (BNPB), there are types of natural disasters that occurred in the Central Java region from 2021 to 2020. Disaster events in the Central Java region include floods, earthquakes, tsunamis, landslides, flash floods, extreme weather, abrasion , drought, and forest fires.

Cilacap Regency is a district in Central Java Province that has the highest incidence of disasters. It was recorded that from 2011 to 2020 there were 767 disaster events. Geomorphologically, Cilacap Regency is in the southern zone and central zone of Java. Cilacap Regency is an area that is mostly alluvial plains, which increases the risk of hydrological disasters. Kroya District in Cilacap Regency is an area that is hit by floods almost every year. This is because the area is located in the lowlands with a height of 2-12 meters above sea level and directly borders Banyumas Regency which has a height of more than 25 meters which causes water from upstream with high intensity to flow into Kroya District which causes flood disasters. .The condition of the people of Kroya District who were affected by the flood disaster caused the community to have to make adjustments to the flood disaster. By adjusting conditions, communities are able to maintain and increase resilience to the threat of flooding.

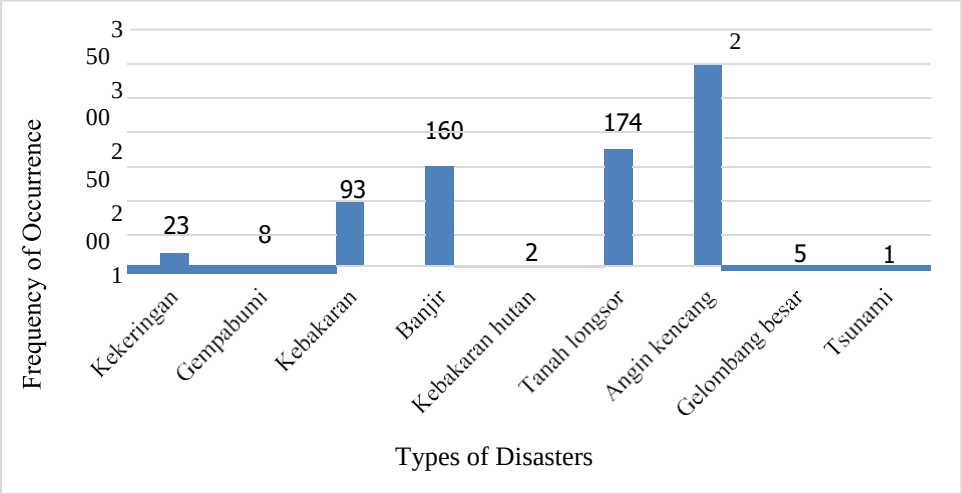

Figure 1. Number of disasters in Cilacap Regency in 2011-2020
(**Source:** National Disaster Management Agency, 2020)

Kroya District is one of the areas in Cilacap Regency that often experiences flood disasters. Of the several villages in Kroya District, Buntu Village and Mujur Village are prone to flooding every year. Every time it rains, the area will be inundated with water. If the intensity of the rainwater is high enough, it is certain that flooding will hit. High risk flood disasters threaten the safety of people's lives and damage some of the existing infrastructure. It's not just material losses that are a problem, but also the psychological impact.You can see Figure 1; Flood disaster risk map in Kroya District.

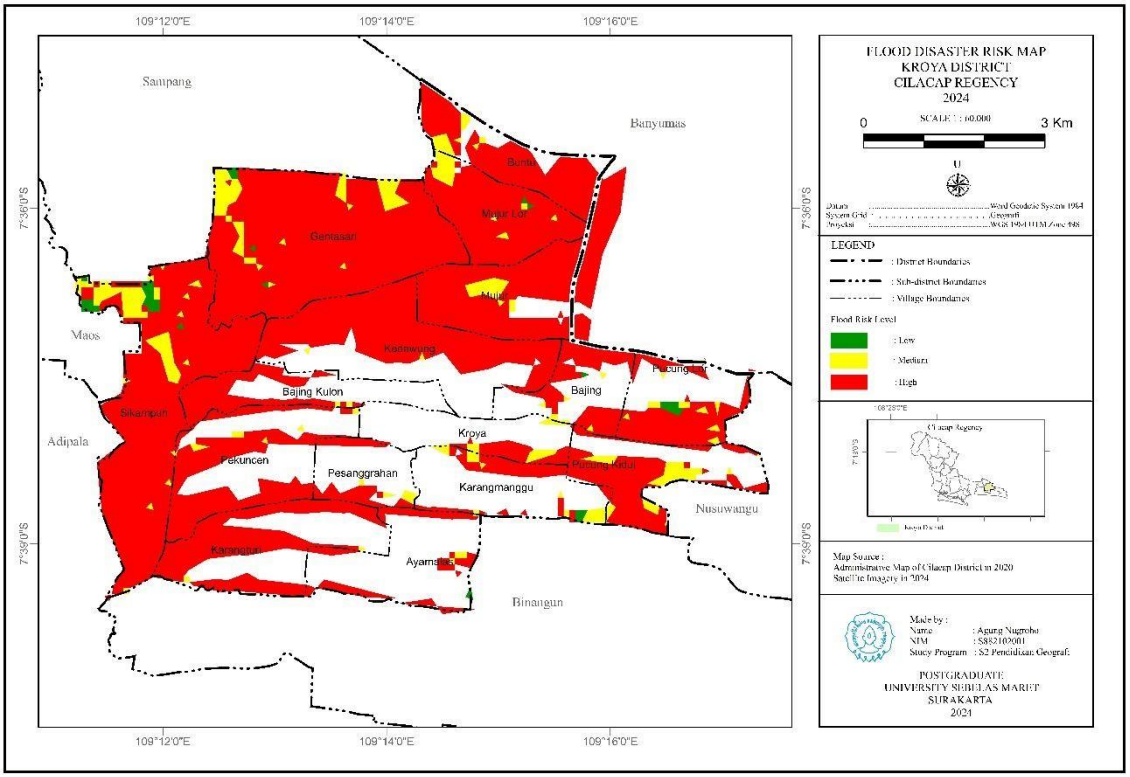

Figure 2. Kroya District Disaster Risk Map
Source: Author's data processing

The Flood Disaster Risk Map shows that the flood disaster risk areas in Kroya District are quite evenly distributed. Especially the two villages taken by researchers as samples, namely Buntu Village and Mujur Village, which have a high risk of flood disasters. Field surveys show that the condition of the home areas of the two villages has a lot of standing water, this is due to the conditions in the lowland areas, the large amount of community agricultural land such as rice fields, andThis area is located in a basin surrounded by hills in the northern part which directly borders Banyumas Regency.

Buntu Village and Mujur Village are villages located in Kroya District. Both villages have a high risk of flood disasters. After researchers conducted a field survey, the two villages had high levels of water in each area. This happens because the area is located

in the lowlands and has high rainfall intensity.Based on the problems described in the background above, the following problems can be identified: 1) Flooding is a disaster threat that cannot be avoided for some communities.Kroya District in Cilacap Regency is an area that is hit by floods almost every year. This is because the area is located in the lowlands with a height of 2-12 meters above sea level and directly borders Banyumas Regency which has a height of more than 25 meters which causes water from upstream with high intensity to flow into Kroya District which causes flood disasters. . 2)The condition of the people of Kroya District who were affected by the flood disaster caused the community to have to make adjustments to the flood disaster. By adjusting conditions, communities are able to maintain and increase resilience to the threat of flooding.

2. MATERIALS AND METHODS

The type of research used is quantitative and qualitative research. Quantitative research is the result of observations (observations) of things expressed in numbers (numerics).(Santoso & Madiistriyatno, 2008). This type of quantitative research is used to assess regional resilience to flood disasters according to the social dimension using resilience radar to determine the level of community resilience. However, the resilience data analysis process also involves qualitative processing. Meanwhile, qualitative research is research whose findings are not obtained through statistical procedures or other forms of calculation(Strauss, Anselm, 2003). This type of qualitative research was used to formulate adaptation strategies and directions to increase regional resilience to flood disasters.

Data analysis techniques are the process of systematically searching and compiling data obtained from interviews, field notes and documentation by organizing data into categories, answering into units, synthesizing, arranging into patterns, choosing what is important and what will be studied, and make conclusions so that they are easily understood by oneself and others (Sugiyono 2014). In this analysis method, the data that has been collected is in the form of primary data and secondary data. Then analyzed based on variables using qualitative descriptiveand quantitative descriptive analysis is also used to analyze the level of community resilience. The steps taken are to summarize the answers to the questionnaire and then calculate the percentage of answers for each question. The questionnaire instrument used consists of questions with nominal, ordinal and interval measurement scales.

Research variable

Table 1. Research variable

No	Variable	Indicator	Data
1	ernment policy	Disaster risk assessment	mentation and interviews
2	Resilience level	Community of Buntu and Mujur Village, Kroya District	The interview results were processed using resilience radar
3	Relevance for High Schools	its' understanding of flood resilience	Geography learning outcomes in high school

Resilience assessment is carried out using quantitative methods to make measurement easier. The respondents' answer choices were given ascriptor values, namely values that function as information providers. Each indicator has a value range between 0.00 to 1.00. A value of 0.00 is given to the answer that is considered the worst in terms of durability and a value of 1.00 is given to the answer that is considered the best. From this analysis it can then be concluded that the level of resilience of the people of Buntu Village and Mujur Village forms a graph in the shape of a spider web. For a clearer explanation of the scores used in the answers to the knowledge and attitude questions, see Figure 2 and Table 2 of the resilience level category values below:

Figure 3. Resilience Categories

Table 2. Resilience Radar Interpretation

Color	Score	pretation for resilience
	0.81 - 1.00	Very high
	0.61 - 0.80	Tall
	0.41 - 0.60	Currently
	0.21 - 0.40	Low
	0.00 - 0.20	Very low

Source: *resilience radar, Banyaneer*

Primary data is data obtained directly from respondents or objects to be studied, or which are related to what is being studied. Primary data was obtained directly in the field in the form of interviews with the people of Kroya District. The primary data in this research is presented in table 3 below:

Table3. Study Primary Data

No	Data	Data source
1	Community understanding of the threat of flood disasters	Data was obtained from interviews with the community

Secondary data is obtained from competent institutions or related agencies in the field. The following secondary data is needed in this research.

Table 4. Secondary Data

No	Data	Data source
1	Areas affected by flooding	Data obtained by BPBD, BPS Kab. Cilacap
2	An area	Kroya District in 2023 figures
3	Geographic conditions	Serasan District in 2023 figures
4	Population data	Serasan District in 2023 figures

The selection of respondents was carried out using a proportional sampling technique. Determining the sample areas for Buntu Village and Mujur Village was based on these areas having a high level of flood disasters and a high risk of flood disasters. Determining respondents used simple random sampling. According to(Singarimbun et al., 1989)A simple random sample is a sample taken in such a way that each research unit or elementary unit of the population has an equal chance of being selected as a sample. Of the number living in Buntu Village and Mujur Village in Kroya District, this research took 60 respondents from two villages in Kroya District, namely Buntu Village and Mujur Village. According to(Effendi & Tukiran, 2014), parametric statistical test requirements with a minimum sample of > 30 respondents, so that 60 respondents meet the statistical test requirements.

The conditions needed to be a sample for this research are that respondents must be residents of Buntu Village and Mujur Village. For this reason, sampling was carried out randomly in each RW and directly visited the homes of residents of Buntu Village with 30 respondents and Mujur Village with 30 respondents. To avoid distrust or doubt about the data in this research, the data validity was tested using triangulation techniques. Sugiyono (2014) stated that by using triangulation techniques in data collection, the data obtained will be more consistent, clear and certain, and will further increase the strength of the data. To obtain correct data in accordance with the objectives of this research, various data collection techniques were combined, including: the results of field observations, interviews and documentation. Then analysis is carried out to obtain results in accordance with the research objectives. Field validation includes several activities as follows: 1). Checking resilience level results using resilience radar. 2). Coordinate measurement using GPS. 3.)

3. RESULTS AND DISCUSSION

Resilience is defined as a person's ability to survive, recover and adapt to conditions after an incident. Community resilience to flood disasters is determined through each component of the resilience assessment, where each component is divided into several. In this research, researchers used the resilience radar method to measure the resilience being developedby Banyaner. Resilience radar uses 10 aspects which are then translated into several indicators. These aspects have values that can form a graph in the form of a spider web or radar. Resilience radar can be used to determine the baseline, midline and endline conditions of resilience (Bolte et al., 2017).

Resilience assessment is carried out using quantitative methods to make measurement easier. The respondents' answer choices were given ascriptor values, namely values that function as information providers. Each indicator has a value range between 0.00 to 1.00. A value of 0.00 is given to the answer that is considered the lowest in terms of resilience and a value of 1.00 is given to the answer that is considered the best.

Table 5. Radar Resilience Index Class

Color	Score	Category
	0.81 – 1.00	Very high
	0.61 – 0.80	Tall
	0.41 – 0.60	Currently
	0.21 – 0.40	Low
	0.00 - 0.020	Very low

Source: Banyaner

In this research, the author adopted the resilience index calculation method to determine the baseline condition of resilience of the Kroya District community by taking two sample villages, namely Buntu Village and Mujur Village. The results of interviews and surveys conducted in Buntu Village and Mujur Village were then analyzed using resilience radar. The level of resilience of the Buntu Village community is based on the results of the analysis carried out to determine the level of resilience of the Buntu Village community. The resilience value for each indicator was obtained. These values are presented in the form of a radar graph which can be seen in the following image:

3. 1 Level of Resilience of the Buntu Village Community

Based on the results of the analysis carried out to determine the level of resilience of the Buntu Village community, the resilience value for each indicator was obtained. These values are presented in the form of a radar graph which can be seen in the following image:

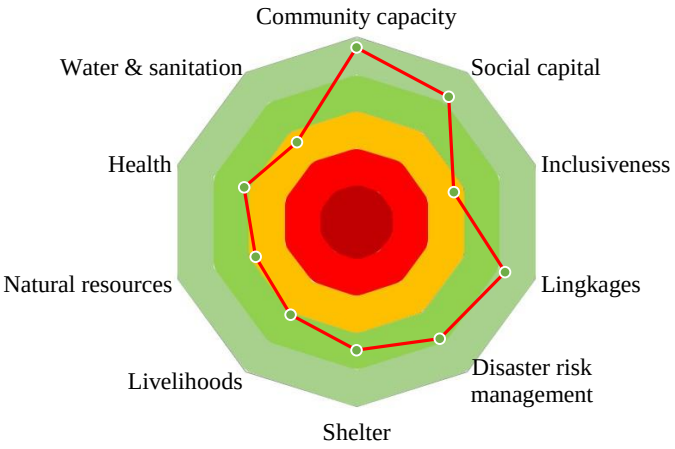

Figure 4. Level of Resilience in Buntu Village

If you look at the overall results of each indicator, it can be seen that the resilience value of the community in Buntu Village is presented in table 4.8 below:

Table 6. Buntu Village Resilience Level

No	Resilience Components	Mark	Category
1	Community Capacity	0.946	Very high
2	Social Capital	0.843	Very high
3	Inclusivity	0.549	Currently
4	Linkages	0.839	Very high
5	Risk Management	0.761	Tall
6	Shelter	0.677	Tall
7	Livelihood	0.601	Tall
8	SDA Manager	0.568	Currently
9	Health	0.633	Tall
10	Water & sanitation	0.541	Currently
	Average	**0.695**	**Tall**

Based on table 6, it can be seen that the level of resilience in Buntu Village for all indicators has different values. The level of resilience in the very high category is found in indicators of community capacity, social capital and interconnectedness. The level of resilience in the high category is found in the risk management, shelter, livelihood and health indicators. The level of resilience in the medium category is found in indicators of inclusiveness, natural resource management, water and sanitation.

The average value for all indicators is the final resilience value. Buntu Village has a final resilience value of 0.695 in the high category. This is because the people of Buntu Village have carried out various activities described in the indicators for dealing with flood disasters. Even though the final resilience score for Mujur Village is categorized as high, it still needs to be increased again, so that the community is physically and psychologically ready to face flood disasters.

3. 2 Levels of Resilience of the Mujur Village Community

Based on the results of the analysis carried out to determine the level of resilience of the Mujur Village community, the resilience value for each indicator was obtained. These values are presented in the form of a radar graph which can be seen in Figure 4 below:

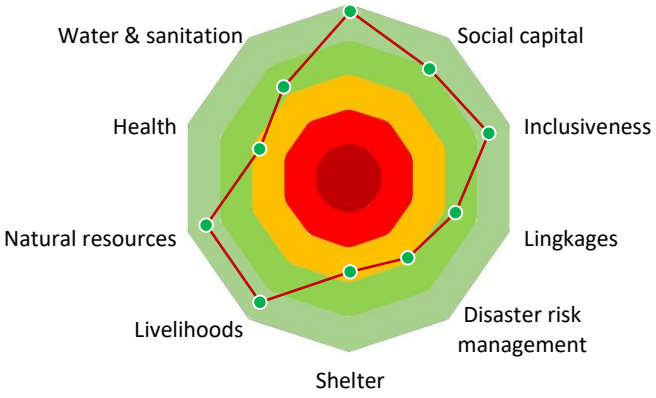

Figure 5. Mujur Village Resilience Level Community capacity

If you look at the overall results of each indicator, it can be seen that the value of community resilience in Mujur Village is presented in table 4.9 below:

Table7. Mujur Village Resilience Level

No	Resilience Components	Mark	Category
1	Community Capacity	0.954	Very high
2	Social Capital	0.772	Tall
3	Inclusivity	0.832	Very high
4	Linkages	0.632	Tall
5	Risk Management	0.561	Currently
6	Shelter	0.534	Currently
7	Livelihood	0.876	Very high
8	SDA Manager	0.864	Very high
9	Health	0.544	Currently
10	Water & sanitation	0.645	Tall
	Average	**0.721**	**Tall**

Source: 2024 data analysis

Based on table 7, it can be seen that the level of resilience in Mujur Village for all indicators has different values. The level of resilience in the very high category is found in indicators of community capacity, inclusiveness, livelihoods and natural resource management. The level of resilience in the high category is found in the indicators of social capital, interconnectedness, water and sanitation. The level of resilience in the medium category is found in the risk management, shelter and health indicators.

The average value for all indicators is the final resilience value. Mujur Village has a final resilience value of 0.721 in the high category. This is because the people of Mujur Village have carried out various activities described in the indicators for dealing with flood disasters. Even though the final resilience score for Mujur Village is categorized as high, it still needs to be increased again, so that the community is physically and psychologically ready to face flood disasters.

4. CONCLUSIONS

Buntu Village and Mujur Village have similar and different values for all resilience indicators. Indicators that have similarities in the very high category for the two villages are indicators of community capacity. Based on the results of research related to parts of the Buntu Village and Mujur Village communities, they have carried out activities that provide education to the community, and the activities that have been carried out so far are in the form of outreach activities to the community, where the outreach discusses information to the community about disaster.

From the results of the average level of resilience, Buntu Village and Mujur Village were categorized as high resilience, Buntu Village with a resilience level value of 0.695 and Mujur Village with a resilience level value of 0.721. So it can be concluded that the people of these two areas are ready to face the danger of a flood disaster if it occurs.

ACKNOWLEDGMENTS

The author realizes that the study process presented could be more optimal and bring more benefits to society if the scope of the study was broader and deeper. The author apologizes if there are imperfections in this work. The author would like to thank his thesis research supervisor, namely MrDr. rer. Nat. Nurhadi, S. Ant. M. Hum and Dr. Rita Noviani, S.Sc., M.Sc. for input, suggestions and attention to the author. I hope that my two mentors will always be blessed with health and ease.

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