

## INTERCONNECTION BETWEEN FLOOD DISASTER MANAGEMENT AND PUBLIC SATISFACTION : A CASE STUDY IN BANYUWANGI VILLAGE, MANYAR DISTRICT GRESIK REGENCY

Fildzah Inarah<sup>1</sup>, Mohammad F.N Aulady<sup>2</sup>

<sup>1</sup> Taiwan Steel University of Science and Technology, Taiwan

<sup>2</sup> Adhi Tama Institute Technology, Indonesia

[\\*Fildzahinarah02@gmail.com](mailto:Fildzahinarah02@gmail.com)

### Abstract

Gresik Regency, which is a flood-prone area, has experienced 66 floods in the last 2 years. This situation is caused by tertiary and secondary channels whose dimensions are too small, and bozems that no longer function due to silting and backfilling into residential areas. This is reinforced by river drainage flow data at 5 points where the upstream channel has a river width of 159m and the downstream river is only 18.4m wide. This causes impacts that are often felt by the local community. BPBD as a response agency has an important role in flood disaster prevention efforts that can reduce the impact. Existing efforts in the flood disaster management process start from predisaster, during disaster, post-disaster. The criteria for assessing public satisfaction are competence, tools and facilities, implementing behavior, and implementing time. Therefore, this study aims to determine the relationship between flood disaster management and public satisfaction in Banyuwangi. This research was conducted by distributing questionnaires to obtain objective results about flood disaster management in the perception of communities affected by floods. In this study using the spearman rank correlation test with the results obtained the correlation coefficients value of 0.623, meaning a strong relationship and sig- value  $< 0.001$  with a positive correlation, meaning that the higher the flood disaster mitigation efforts carried out, the higher the level of public satisfaction achieved by the BPBD of Gresik Regency.

**Keywords:** *Flood, Disaster Management, Public Satisfaction*

### INTRODUCTION

The East Java Provincial Disaster Management Agency (BPBD) has designated 10 regions along the Brantas River as flood-risk areas, one of which is Gresik Regency. According to (Miko, 2023), the districts of Gresik, Manyar, and Kebomas already have a complete drainage system; however, flooding still occurs in several locations. This is caused by tertiary and secondary channels with small dimensions and retention ponds (bozems) that no longer function due to sedimentation and land reclamation for residential areas. This is evidenced by

drainage flow data at five points, showing that the river channel width upstream is 159 meters, while downstream it narrows to only 18.4 meters.

One of the flood-prone areas, Manyar District, has experienced floods 66 times over the past two years, inundating 110 houses, 2 prayer rooms (musholla), and 2 schools, with water levels reaching 70–80 cm. The flooding also disrupted arterial road networks connecting Gresik, Lamongan, Mojokerto, and Surabaya City (Yenny, 2018).

Specifically, the Gresik Regency BPBD implements regional disaster management through a systematic and comprehensive approach, forming flood management strategies that cover pre-disaster, during-disaster, and post-disaster phases. Based on interviews conducted by the researcher with Mr. Heri, Head of the Emergency Division at BPBD Gresik Regency, the agency has carried out educational outreach and disaster response simulations, as well as rapid and accurate field assessments during flood events. This aligns with BPBD's role as a public service institution in the field of regional disaster management.

In this regard, BPBD has a public satisfaction index as one of the indicators for measuring performance, achieving a score of 97.29, which is categorized as "very satisfactory." Therefore, this study aims to determine the relationship between flood disaster management and public satisfaction in Banyuwangi Village, Manyar District, Gresik Regency.

## **LITERATURE REVIEW**

### **Disaster Concept**

#### **1. Disaster Management**

Disaster management is a field of study that encompasses all aspects related to disasters. It involves a deep understanding of disasters, with its main focus on disaster risks and actions aimed at reducing the negative impacts of disasters (Nurjanah, 2013).

#### **2. Causes of Flooding**

Basically, floods are influenced by natural factors. According to (Sudarsono, 2020), the natural factors that cause flooding include rainfall, physiography, erosion, sedimentation, river capacity, drainage capacity, and tidal water. In addition, human activities also play a significant role in influencing flood events, such as unorganized and waste-filled residential areas, changes in the watershed (DAS), infrastructure development along river channels, damage to water control structures, and improper planning of flood control systems that utilize water catchment areas without adequate consideration. These factors lead to an imbalance between groundwater absorption and human needs (Tambunan, 2021).

#### **3. Impacts of Flooding**

Floods always result in consequences, whether on the survival of humans, plants, and animals, or on the overall balance of the environment (Zuchriadi, 2020). The impacts on human life include the disruption of daily activities and economic losses suffered by both communities and the government. Buildings such as places of worship, office buildings, and residential houses are often damaged, while public infrastructure such as bridges, roads, and other facilities are also affected. Many lives are lost as a result of these flood disasters. The environmental impacts of floods include the submergence of other lands such as plantations, rice fields, and other productive areas. Land becomes more critical, groundwater reserves are

depleted, soil-covering vegetation disappears, ecosystem balance is disturbed, and land degradation occurs (Sadisun, 2004).

#### 4. Public Satisfaction

Public service is an essential component of government institutions, aiming to improve the welfare of the people (Ibrahim, 2008). The quality of public service is a dynamic condition related to products, services, human resources, processes, and the environment, where the assessment of quality is determined at the time the public service is delivered. Meanwhile, according to (Riskika, 2023).

#### 5. Quality of Public Services

Service, in this context, refers to the assistance or service provided by a service provider, which involves convenience, speed, interpersonal relationships, competence, and friendliness. This is conveyed through the attitude and behavior of the service provider, with the main focus on creating customer satisfaction (Aulia, 2018). According to (Tjiptono, 2012), service quality is measured by assessing the desired level of service so that comparisons can be made using the attributes of services provided by an institution. Thus, service quality becomes a benchmark for determining the extent to which the level of service can meet the expectations of service users (Riono, 2020).

### **RESEARCH METHOD**

The research method used in this study is a survey with both qualitative and quantitative approaches to obtain an objective overview of the relationship between flood disaster management carried out by BPBD Gresik Regency and public satisfaction, based on respondents' perceptions and qualitative information from informants. In the quantitative part of the study, the researcher uses a correlation test with statistical formulas to analyze the collected data and facts. This study aims to examine the relationship between two or more variables.

#### **Population and Sample**

##### 1. Population

The population used in this study consists of residents of Dusun Banyutami, Banyuwangi Village, Manyar District, Gresik Regency, totaling 1,100 people, comprising 602 males and 498 females.

##### 2. Sample

The sampling technique used is quota sampling. Quota sampling is a sampling technique in which the number and specific characteristics of respondents are determined in advance as targets to be fulfilled (Sugiyono, 2017). The characteristics of the sample selected for this study are residents affected by floods who live in Banyuwangi Village, Manyar District, Gresik Regency. A total of 91 respondents were selected, consisting of 55% male respondents and 45% female respondents, based on characteristics such as gender and age, including youth, adults, and the elderly. The consideration for using quota sampling lies in the presence of varied perspectives on satisfaction with flood disaster management services, which depend on individual experiences, the impacts experienced, and the perceived effectiveness of the response received during the flood event.

## Frame of Mind

Figure 3.1 Frame of Mind



From the framework of thinking in Figure 3.1, it shows that in serving, assisting, and evacuating people who are victims of natural disasters, floods carried out by the BPBD in natural disaster management from pre-disaster, during the disaster, to post-disaster as an effort and process, are closely related to the process of public satisfaction of the community. The existence of disaster management efforts elicits a response from the affected community in assessing aspects of public satisfaction with the competence, tools and facilities, behavior of implementers, and time carried out by the Gresik Regency BPBD apparatus. So in this case, disaster management efforts influence the results of public satisfaction obtained by the Gresik Regency BPBD.

### Data Processing

#### - Validity Test

The validity test is carried out in knowing whether the measuring instrument is valid or invalid (Lumi, 2023). The measuring instrument in this context refers to the questions contained in the questionnaire. Before the research instrument is used, it is necessary to know the level of validity on the instrument by conducting experiments and analyzing the results.

#### - Reliability Test

The reliability test uses a list to show the level of reliable and trustworthy measuring devices (Notoatmodjo, 2005). Therefore, the reliability test can provide information about the consistency of a measuring instrument, namely the extent to which the measuring instrument remains stable when measurements are repeated. If the measuring instrument is considered reliable, the results will be consistent even when the measurement is repeated several times.

#### - Normality Test

The normality test is used to determine whether the sample comes from a normal distribution or has characteristics comparable to the population (Marina, 2020).

#### - Correlation Test

After the normality test requirements are met, the sample data can be analyzed using the correlation test. The correlation test is carried out with the aim of determining whether there is a relationship between the independent variable and the dependent variable. This is done to see how changes in one variable correlate with other changes (Rosandina, 2023)

## RESULT AND DISCUSSION

### 1. Data Processing Results

This chapter discusses the analysis based on the results of the data that has been obtained and collected according to the discussion in the previous chapter. Data collection was carried out by distributing questionnaires with a total sample size of 91 respondents in the Banyuwangi Village community, Manyar District, Gresik Regency. The following describes the identification of respondents with details according to the characteristics of the respondents as below:

- Characteristics of respondents based on age Of the 91 respondents who have filled out the questionnaire given, it can be analyzed to find the age distribution of respondents in percentage form.

Table 1. Percentage of Respondent Age

Class	Interval	Frekuensi	Percentage (%)
1	20-25	14	15
2	26-30	8	9
3	31-35	19	21
4	36-40	13	14
5	41-45	13	14
6	46-50	12	13
7	51-55	12	13
Total		91	100

From table 1, it can be seen that the highest percentage of respondents' age is 31-35 years old at 21%. While the lowest age percentage is at the age of 26-30 years by 9%. At the ages of 46-50 and 51-55 years also have the same large percentage of 13%. In the age interval 36-40 and 41-45 years have a total percentage of 14%, and age 20-25 is 15%.

- Characteristics of Respondents Based on Gender Of the 91 respondents who have filled out the questionnaire given, the percentage of gender of respondents can be seen in table 2:

Table 2. Percentage of Respondent Gender

No.	Gender	Total	Percentage (%)
1	Men	50	55
2	Women	41	45
Total		91	100

Based on table 2, the percentage of gender of respondents in Banyuwangi Village, Manyar Subdistrict, Gresik Regency who have been distributed can be seen in the male type as many as 55 respondents with a percentage of 55 %, while in the female type as many as 41 respondents with a percentage of 45%.

- Characteristics of Respondents by Type of Work Of the 91 respondents who have been distributed questionnaires, the percentage of the types of work of the respondents of Banyuwangi Village, Manyar District, Gresik Regency can be seen in table 4.3:

Table 3. Percentage of Respondent by Type of Work

No.	Type of Work	Total	Percentage (%)
1.	Housewife	26	28
2.	Fisherman	19	21
3.	Employee	16	17
4.	Self-employed	11	12
5.	Student	9	10
6.	Trader	5	6
7.	Farmer	5	6
JTotal		91	100

Based on table 4.3, it can be seen that the type of work with the largest percentage is housewives with 26 respondents at 28% and the number of respondents with the smallest percentage is in 2 jobs, namely traders and farmers with a total of 5 respondents in each job getting a percentage of 6%. Meanwhile, in the type of work of fishermen with a total of 19 respondents got a percentage of 21%, in employees with a total of 16 respondents got a percentage of 17% and selfemployed with a total of 11 respondents at 12%. Students with 9 respondents got a percentage of 10%.

## 2. Data Collection Questionnaires

### a. Validity Test

In this validity test, it is carried out to measure the validity of each question item using product moment correlation. In assessing how the values are said to be valid, the data is measured if the significant correlation level of 5% for 91 respondents is 0.2039 and compared with the results of the r count value.

Table 4. Validity Test Variabel X

Indicator	R Results	R Count Value (5%)	Description
X1.1	0,660	0,2039	Valid
X1.2	0,626	0,2039	Valid
X2.1	0,577	0,2039	Valid
X2.2	0,536	0,2039	Valid
X3.1	0,514	0,2039	Valid
X3.2	0,571	0,2039	Valid

Based on table 4 the results of testing the validity test of the questionnaire of the level of flood disaster management. Of the 6 questionnaire questions given to respondents, the validity test was declared valid all because the requirements of the calculated r value > r table value have all been met. For example the calculation is  $X1.1 = 0.660 > 0.2039$ , then the data is declared valid. All questions use the same calculation as a test tool on the instrument to provide significant results.

Table 5. Validity Test Variabel Y

Indicator	R Results	R Count Value (5%)	Description
Y1	0,577	0,2039	Valid
Y2	0,54	0,2039	Valid
Y3	0,602	0,2039	Valid
Y4	0,657	0,2039	Valid
Y5	0,721	0,2039	Valid
Y6	0,669	0,2039	Valid

From table 5 above is a summary of the results of testing the validity test of the questionnaire from the level of public satisfaction. Of the 6 questions submitted to respondents, all questions were declared valid because they met the requirements for the value of  $r \text{ count} > r \text{ table}$ . For example the calculation is  $Y1.1 = 0.577 > 0.2039$ , then the data is declared valid.

#### b. Reliability Test

After the validity test is carried out, the reliability test is then carried out. This aims to measure the consistency (reliability) of a questionnaire data. The results of the reliability test use the Cronbach's Alpha method with a reliable statement if the Cronbach's Alpha coefficient value is  $> 0.60$ , the following presents the results of the reliability test of the data that has been filled in by the respondents.

Table. 6 Reliability Test Variabel X and Y

Cronbach's Alpha	Alpha	Kriteria
0,604	0,60-0,80	Reliabel
0,693	0,60-0,80	Reliabel

From table 6 the results of the flood disaster management reliability test obtained 0.604 and can be declared reliable because  $0.604 > 0.60$ , it can be concluded that the instrument in the study is reliable. Due to the results of the reliability test above, it shows high reliability, which means that it shows minimal error in variance, so that the answers of the respondents to the questions asked on the questionnaire to measure each variable are declared consistent and reliable.

#### c. Normality Test

After the validity and reliability tests are carried out, the results of the questionnaire data that have been obtained from distributing to the people of Banyuwangi Village, Manyar Subdistrict, Gresik Regency are tested for normality to ensure that the data collected is normally distributed or not.

Table 7. Normality Test Variabel X and Y

Variabel	Kolmogorov-Smirnov	
	Df	Sig
Disaster Management	41	.004
Public Satisfaction	41	<.001



It is found that the df (degree of freedom) value for disaster management is 41 and public satisfaction is 41. So it is known that the number of data samples in each group is more than 30. So that using the Kolmogorov-smirnov technique to detect normal distribution in this research data can be said to be correct. Then from the above results, the sig. value for disaster management is 0.004 and the sig. value for public satisfaction is 0.001. Because the sig. value in the two groups is

#### d. Linearity Test

Calculation with Spearman rank aims to determine whether variable x has a correlation relationship with variable y. The decision on this test is taken based on the significance value  $> \alpha 0.05$ . So that in this sub chapter the results of the linearity test processing are displayed.

Table 8. Linear Test Variabel X and Y

			Sum of Squares	.df	Mean Square	F	Sig.
y*x	Between Groups	(Combined)	260.926	13	20.071	4.251	<.001
		Linearity	196.317	1	196.317	41.582	<.001
		Deviation From Linearity	64.610	12	5.384	1.140	.341
	Within Groups		363.535	77	4.721		
	Total		624.462	90			

The results of the linearity test can be seen that the significance value (P Value Sig.) on the Deviation from Linearity line is 0.341. Because the significance value is greater than 0.05, it can be concluded that between the disaster management variable (X1) and public satisfaction (Y) there is a linear relationship.

#### e. Correlation Test

Calculation with Spearman rank aims to determine whether variable x has a correlation relationship with variable y. The decision on this test is taken based on the significance value  $< 0.05$ . So that in this sub chapter the results of the correlation test processing are displayed.

Table 9. Correlation Test Variabel X and Y

Variabel	Rank Spearman	
	Correlation Coefficients	Sig.
Disaster Management	0.623	<.001
Public Satisfaction	0.623	<.001

From table 9, the sig. for disaster management is  $<.001$  and the sig. Value for public satisfaction is  $<.001$ . Because the sig. Value in the two groups is  $<.001$ , according to the basis, it can be concluded that the data is positively correlated, which means that if post-disaster management increases, public satisfaction also increases. Then on the correlation coef disaster management



get the results 0.623 and public satisfaction 0.623. so that in the criteria for the level of correlation strength has a strong relationship.

## CONCLUSION

Based on the results of research by distributing questionnaires to communities affected by flood disasters in Banyuwangi Village, Manyar Subdistrict, Gresik Regency to determine the relationship between flood disaster management with 3 independent variables, namely pre-disaster (X1), during disasters (X2), and postdisaster (X3) to public satisfaction, the results show that the strongest correlation relationship with a correlation coefficient of 0.507 is in variable (X1) pre-disaster with indicators of flood disaster risk reduction including efforts to increase knowledge by providing material and technical guidance through technological simulations of signs and signals when a flood disaster will occur. This has received a positive response from flood-affected communities as evidenced by the questionnaire which shows the largest average percentage result in variable X1 3.21%, namely pre-disaster. This is evidenced by the DESTANA (Disaster Resilient Village) program carried out by BPBD with local youth organizations as a form of disaster prevention and mitigation efforts. Based on the journal from (Krisbowo, 2023) that based on the efforts to form the DESTANA program owned by BPBD, it has benefits for the affected community. and produce positive results for the community so that they all have an even understanding and can channel their understanding and knowledge to other residents. Until now, DESTANA in Banyuwangi Village, Manyar Subdistrict, Gresik Regency is still running in accordance with the strategic planning that has been made at the beginning of each year and periodic evaluations are carried out on each strategy that has been implemented at the end of the year. Currently, the DESTANA program that has been created by BPBD has contributed a lot to the local village, giving rise to a new regeneration of young people who want to participate in helping in each program in order to maximize existing efforts.

In variable X2, emergency handling during a disaster shows the results that the smallest correlation relationship to public satisfaction with a correlation coefficient of 0.341 with indicators including first aid efforts, evacuation, and fulfillment of basic needs. This is supported by the results of the smallest percentage in the questionnaire of 3.10%. According to the journal (Runi, 2021) that the obstacles during a disaster are the lack of support from the community for preventive measures in the form of evacuation to a safe place carried out by BPBD because they feel that they have lived in the area since they were born, besides that residents feel that relocated assistance always comes late or unevenly so that flood-affected communities make emergency efforts with the ability of the community itself because the disaster location is far from the city center so that it does not run optimally. Currently, efforts in emergency response during floods are carried out starting from collecting data on each victim from the worst hit areas by BPBD assisted by the local RT, then the process of distributing assistance ranging from basic basic necessities to forced pick-ups in the community by paying attention to priority scales such as the elderly, pregnant women, and children to temporary refugee tents.

Post-disaster recovery in variable X3 has a correlation relationship with variable y public satisfaction with a result of 0.397 on indicators of environmental improvement and social psychological recovery. The results of the questionnaire percentage show 3.16%. the form of efforts made by BPBD towards short-term early recovery in the function of vital infrastructure facilities at flood disaster sites and environmental improvements by providing sandbags for levee repairs in collaboration with related institutions, namely by the Public Works Office in accordance with applicable authorities and regulations.

Answering the formulation of the problem made by researchers, namely how the relationship between flood disaster management and public satisfaction in Banyuwangi Village, Manyar Subdistrict, Gresik Regency, this study proves that disaster management efforts include factors that influence and have a direct positive relationship with public satisfaction. Disaster management is a factor of efforts made to reduce all risks in flood disasters so that it will affect the results of public satisfaction with the performance of BPBD. BPBD's efforts in carrying out disaster management efforts need to be evaluated, improved, and made concrete strategies to encourage increased public satisfaction starting from pre-disaster, during disaster, and post-disaster by looking at aspects of executor competence, tools, facilities, executor behavior, and service time so that the level of risk that will arise from flood disasters will decrease.

## REFERENCES

- Aulia, D. (2018). Mengukur Kepuasan Pasien RSI Siti Rahmah Padang Atas Kualitas Pelayanan Instalasi Farmasi Dengan Metode IPA . *Journal of Multidisciplinary Research and Development* , 18-27.
- Ibrahim, A. (2008). Teori dan Konsep Pelayanan Publik Serta Implementasinya. *Bandung; Mandar Maju* .
- K., T. E. (2021). Dampak Ekologis Akibat Peningkatan Urbanisasi di Sepanjang Daerah Aliran Sungai Cikapundung Kota Bandung . *Temu Ilmiah Peneliti Lingkungan Binaan Indonesia* , 7-14.
- Krisbowo, F. (2023). Penerapan Community Based Mitigation Dalam Pengurangan Resiko Bencana Banjir Di Desa Lundo Kecamatan Benjeng Kabupaten Gresik . *Jurnal Pendidikan Geografi* , 25.
- Lumi, J. (2023). Perbandingan Penerapan Model Pembelajaran Probing Prompting dan Model Pembelajaran Discovery Learning Terhadap Hasil Belajar Siswa Pada Materi Barisan dan Deret Aritmatika. *Journal of Comprehensive Science (JCS)*, 2 (1) 99-108.
- Marina, D. H. (2020). Analisis Faktor-Faktor Yang Mempengaruhi Dividen Payout Ratio Pada Saham-Saham Indeks LQ45 Di Bursa Efek Indonesia Tahun 2011-2017. *Jurnal Manajemen Dan Keuangan* 9(2), 206-222.
- Miko. (2023). Perbandingan Indeks NDVI Tanaman Mangrove di Muara Sungai Kalimireng, Gresik Menggunakan Kamera Multispektral dan Citra Sentinel-2 . *Teknik ITS* , 12, 3.
- Notoatmodjo. (2005). Metodologi Penelitian Kesehatan . *Jakarta Rineka Cipta* .
- Nurjanah. (2013). Alfabeta.

- Riono, S. B. (2020). Analisis Pelayanan Publik dan Relationship Marketing Terhadap Loyalitas Nasabah di Bank Perkreditan Rakyat Muhadi Setia Budi (BPR MSB), Kabupaten Brebes. *Jurnal Investasi* 6(2), 143-154.
- Riskika, A. Y. (2023). Strategi Meningkatkan Kualitas Pelayanan Publik Melalui Layanan Simpatik Di Kabupaten Kediri ; Studi Kasus Izin Mendirikan Bangunan. 8(4).
- Rosandina, S. N. (2023). Hubungan Pengetahuan Orangtua Tentang Child Grooming Dengan Pengawasan Penggunaan Gadget Pada Anak Usia 10-15 Tahun. *Promotion and Prevention in Mental Health Journal* 3(2), 49-54.
- Runi. (2021). Analisa Erosi di DAS Kali Lamong Menggunakan Pendekatan ArcSWAT . *Jurnal Teknologi dan Rekayasa Sumber Daya Air Vol. 1 No. 2*, 876-889.
- Sadisun, I. A. (2004). Textural and Minealogical Properties of Argillaceous Rocks in Relation to Their Propensity To Slaking. *In Proceedings 4th Asian Symposium on Engineering Geology and The Environment : Engineering Geological Society of Hongkong* , 167-172.
- Sudarsono. (2020). Analisis Penanggulangan Banjir Sungai Kanci. *Jurnal Konstruksi dan Infrastruktur* , 73.
- Sugiyono. (2017). Metode Penelitian Kuantitatif, Kualitatif dan R & D . *Bandung Alfabeta, CV*
- Tjiptono, F. (2012). Service, Quality, and Satisfaction . *Yogyakarta CV Andi* .
- Yenny. (2018). Strategi Badan Penanggulangan Bencana Daerah Dalam Membangun Partisipasi Masyarakat Tanggap Bencana Banjir Di Kabupaten Gresik. *Kajian Moral Kewarganegaraan* , 671-685.
- Zuchriadi, A. (2020). Sistem Kendali Daya Listrik Berbasis PZEM-004T dan BLYNK. 1023-1028.