

# ANALYSIS OF PUBLIC PERCEPTIONS OF ACCOUNTABILITY AND THE NEED FOR IT-BASED FLOOD MITIGATION SYSTEMS AND URBAN INFRASTRUCTURE IN BANDUNG CITY, INDONESIA

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## Abstract

Climate change and rapid urbanization have greatly contributed to the increase in the frequency of flooding, including in the city of Bandung, Indonesia. To date, flooding remains a major challenge for the local government. Therefore, this study aims to examine the integration between public governance and technological innovation. Specifically, this study focuses on the community's perception of the accountability of current flood management and their views on the need to integrate information technology (IT) into urban infrastructure to improve mitigation efforts.

This study uses a quantitative method with a descriptive survey method. Data were collected through a structured questionnaire distributed to residents in flood-prone areas in the city of Bandung, focusing on key variables such as perceived transparency, government responsiveness, and the urgency of digital transformation in disaster mitigation.

The results show a significant difference between public expectations regarding flood management accountability and the government's current performance. The majority of respondents feel that accountability is still low due to the lack of real-time information. In addition, the data shows a high level of public urgency for the development of IT-based mitigation systems, particularly the need for predictive analytics and real-time early warning dashboards. The public views these technological tools as essential elements for building public trust and ensuring sustainable urban development. This study concludes that the Bandung City government must prioritize digital integration in its infrastructure planning. By responding to public demand for IT-based transparency, the relevant authorities can improve flood mitigation outcomes while strengthening public trust in urban governance.

**Keywords:** Flood Mitigation, Public Accountability, IT-Based Systems, Urban Infrastructure, Bandung City, Sustainable Development.

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## 1. INTRODUCTION

The world is currently experiencing an unprecedented climatic change, which has led to increased instances of urban flooding (Handayani et al., 2020). Bandung City in Indonesia is an exemplary urban center in Indonesia that is being adversely affected by flooding (Setiadi et al., 2023). Bandung City is located in a basin; therefore, it is naturally susceptible to flooding (Afriyanie et al., 2022). However, the increased rate of land usage change coupled with the failure of the natural drainage system have worsened the flooding in Bandung City (Handayani et al., 2020; Pradoto et al., 2025). Despite all the efforts by the government, flooding still remains a threat in Bandung City (Rahmasary et al., 2021; Setiadi et al., 2023).

The other challenge facing modern flood management is the infrastructure aspect and the governance framework, especially with regards to public accountability

(Rahmasary et al., 2021; Rulinawaty et al., 2022). In many developing urban centers, there is often a "trust gap" that exists between the government's mitigation strategies and the public's perception of these strategies (Rosmadi et al., 2023). In this case, accountability entails the level of transparency with regards to the allocation of funds, progress towards mitigating the effects of flooding, and the effectiveness of the infrastructure in mitigating flooding (Rulinawaty et al., 2022). The perception of this gap thus affects the resilience of the public (Rosmadi et al., 2023).

In addition, the development of Industry 4.0 has thus created an opportunity that could be leveraged to bridge this gap with regards to public accountability (Permanasari et al., 2025). Although conventional infrastructure is very important in mitigating the effects of flooding, this infrastructure is insufficient without the support of Information Technology (IT) solutions (Setiadi et al., 2023). The use and development of IT solutions are thus seen as an integral part of urban infrastructure (Gunawan et al., 2025). However, this must be done in consideration of the needs and expectations of the public (Rulinawaty et al., 2022).

This paper tackles these questions by examining public views on the accountability of flood management in Bandung City. It will assess how much the public demands and trusts IT-based flood mitigation systems (Permanasari et al., 2025; Rosmadi et al., 2023). Through the use of a quantitative survey approach, this paper hopes to offer empirical proof on the need for digital transformation in urban infrastructure. The results of this paper are hoped to provide strategic advice for the Bandung City Government on how to enhance its technical flood mitigation capacity and its governance transparency, ultimately creating a more flood-resilient and tech-savvy community (Afriyanie et al., 2022; Permanasari et al., 2025).

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## 2 METHODOLOGY

This research adopts a quantitative design that employs the descriptive survey method to investigate public perceptions in Bandung City. The approach is also designed to offer empirical support for the link between government accountability and IT-enabled flood mitigation systems demand.

### 2.1 Population and Sampling

The subjects in this study were residents who lived in the city of Bandung. The sampling was done by purposive sampling (the selection of the respondents are people who live or work in flood-prone areas were to gain more representative data). These regions were Bandung Kidul, Pasteur, and river area, which had access to digital devices. Fifty Respondents and Data Collection: A total of 50 respondents were involved in the present study.

### 2.2 Data Collection Technique

Information collection in this study used an online survey tool with a structured questionnaire to collect primary data regularly. This tool consisted of 12 questions that were divided into three major categories or indicators. The three categories are: (1) Accountability and Transparency with 4 statements, (2) Government Responsiveness

with 3 statements, and (3) Urgency of Information Technology Integration with 5 statements.

The researcher used a five-point Likert scale with the range of 1 (Strongly Disagree) to 5 (Strongly Agree) for all the statements in the tool. The five-point Likert scale was used for all the statements in the tool, and it measured the perception of the respondent and converted it into numerical data that could be statistically analyzed.

Information collection for the study used an online tool called Google Forms, which was used to reach the respondents in the flood-prone areas in the city of Bandung. The researcher used the online tool to disseminate the questionnaire links to the local community communication groups and social media platforms, especially in the flood-prone areas in the city of Bandung, including Bandung Kidul and Pasteur.

To validate the result, the researcher used a filter system at the beginning of the questionnaire to ensure that all the respondents were residents who had direct experience with flooding in the study location and had been accessed by digital devices.

### **2.3 Data Analysis Technique**

The data collected through Google Forms first underwent a data cleaning process to ensure that the 50 responses obtained were complete and consistent. To analyze the data, descriptive statistics were used by calculating the percentage of frequency distribution and the average value of each indicator. The average calculation process was carried out by summing up all the response scores for each indicator, then dividing them by the number of statements and the number of respondents.

For the data to be interpreted objectively, the average values achieved were grouped into three categories based on the scale range:

1.00 - 2.33 (Low): Indicates a weak perception of accountability or little urgency regarding technology.

2.34 - 3.66 (Moderate): Indicates a neutral or sufficient perception or urgency.

3.67 - 5.00 (High): Indicates a good perception of accountability or a high sense of urgency regarding the need for technology.

The results of this analysis were then visualized in the form of tables and bar charts, making it easier to compare the current state of accountability with the level of community need for an information technology-based flood mitigation system.

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## **3 FINDINGS AND DISCUSSION**

Data obtained from 50 respondents in flood-prone areas in Bandung City shows a striking difference between residents' views on the current performance of the bureaucracy and their expectations for the use of more modern technology. Overall, the results of the study show that while the physical infrastructure is in place, the lack of public trust due to the lack of access to information and transparency is still an issue. The results of the study are divided into three main pillars: the level of accountability, the government's response to emergencies, and the significance of digital transformation in the disaster management systems. The analysis of these three parameters offers deep insight into the flood mitigation policies desired by the people of Bandung today.

### 3.1 Analysis of Public Accountability and Government Responsiveness

Based on the results of the study, citizens' assessments of the government's accountability and transparency are at an alarming level. Respondents tended to give low scores to statements related to the clarity of budget information and access to public evaluation reports.

**Table 1 Distribution of Accountability and Responsiveness Scores**

Indicator	Average Score	interpretation
Accountability	2.15	Low
Responsiveness	2.45	Moderate

The low accountability score (2.15) reflects communication barriers between policymakers and affected communities. Residents in areas such as Bandung Kidul and Pasteur feel excluded from the mitigation project oversight process. On the other hand, the responsiveness score, which falls into the "Moderate" category (2.45), indicates that although emergency measures were taken when flooding occurred, these efforts were considered merely reactive, without measurable preventive solutions that could be monitored by the public.

### 3.2 The Urgency of Digital Transformation in Flood Mitigation

Contrary to views on bureaucracy, the public has high expectations for the role of information technology as a solution for the future. Respondents view technology not only as a tool, but as a means of achieving real transparency.

**Table 2 Information Technology Integration Needs Score**

Technology Instruments	Average Score	interpretation
Real-time Water Sensor System	4.65	High
Early Warning System	4.75	High
Data-Based Predictive Analytics	4.40	High

The data in Table 2 shows that the digital early warning feature received the highest score of 4.75. This shows that the urgent need of people today is to get quick and accurate information directly to their personal devices. This high figure signals that conventional methods of disaster information dissemination are no longer considered sufficient for the mobility needs of the people of Bandung City.

#### 4 CONCLUSION

This research highlights a major mismatch between how floods are managed in Bandung City and what the public wants in terms of new and clear ways to handle flood problems. The results show a significant gap in trust, revealing that the public feels accountability is quite low (2.15) and that the government is only seen as somewhat responsive (2.45). These findings indicate that old methods of communication and disaster response are not enough for the needs of people living in areas at risk of flooding.

On the other hand, there is a strong need for digital changes, with an average score of 4.60 for integrating technology. The public specifically wants real-time water monitoring systems and digital alerts (4.75), seeing these as key tools for clear and unbiased information. This strong interest shows that technology is viewed not just as a technical fix but also as a way to enhance accountability without bureaucratic hold-ups.

In summary, the Bandung City Government needs to shift from conventional infrastructure to a "smart" approach to managing floods. Focusing on technology-based transparency through public dashboards and predictive tools will not only strengthen disaster preparedness but also significantly help rebuild public confidence and support sustainable growth in cities.

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#### REFERENCES

- Afriyanie, D., Julian, M. M., & Nugraha, H. A. (2022). Urban Flood Resilience through Spatial Plan in Bandung City, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 986(1). <https://doi.org/10.1088/1755-1315/986/1/012052>
- Gunawan, W. C., Javas, J., Yosa, I. M., Suwarman, R., Farid, M., & Adityawan, M. B. (2025). Spatial Modeling of High Flood Risk Region in the Cikapundung River Basin using HEC-RAS 2D Model: Enhancing Regional Mitigation Planning. *IOP Conference Series: Earth and Environmental Science*, 1472(1). <https://doi.org/10.1088/1755-1315/1472/1/012038>
- Handayani, W., Chigbu, U. E., Rudiarto, I., & Surya Putri, I. H. (2020). Urbanization and increasing flood risk in the Northern Coast of Central Java-Indonesia: An assessment towards better land use policy and flood management. *Land*, 9(10). <https://doi.org/10.3390/LAND9100343>
- Permanasari, E., Wijaya, M., Feliren, V., Khikmah, F., Lechner, A., Virani, A., & Saputra, R. (2025). Enhancing urban resilience through integrated flood policy and planning: a mixed-methods evaluation of retention ponds for flood mitigation in South Bandung. *Aqua Water Infrastructure, Ecosystems and Society*, 74(2), 267–282. <https://doi.org/10.2166/aqua.2025.292>
- Pradoto, R. G. K., Nugroho, E. O., Syakira, H., Wicaksono, A. B., Nurkhaerani, F., Yuherdha, A. T., Enfila, C. T., Oriandra, R. D., & Wahyudi, D. P. (2025). Urban Flood Risk Management Based on Asset Life Cycle Method for Drainage System: Case Study Gedebage Area, Bandung, Indonesia. *Journal of Environmental and Earth Sciences*, 7(6), 91–110. <https://doi.org/10.30564/jees.v7i6.9154>

- Rahmasary, A. N., Koop, S. H. A., & van Leeuwen, C. J. (2021). Assessing Bandung's Governance Challenges of Water, Waste, and Climate Change: Lessons from Urban Indonesia. *Integrated Environmental Assessment and Management*, 17(2), 434–444. <https://doi.org/10.1002/ieam.4334>
- Rosmadi, H. S., Ahmed, M. F., Mokhtar, M. Bin, & Lim, C. K. (2023). Reviewing Challenges of Flood Risk Management in Malaysia. In *Water (Switzerland)* (Vol. 15, Number 13). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/w15132390>
- Rulinawaty, R., Samboteng, L., Aripin, S., Kasmad, M. R., & Basit, M. (2022). Implementation of Collaborative Governance in Flood Management in the Greater Bandung Area. *Journal of Governance*, 7(1). <https://doi.org/10.31506/jog.v7i1.14710>
- Setiadi, S., Sumaryana, A., Bekti, H., & Sukarno, D. (2023). The flood management policy in Bandung city: Challenges and potential strategies. *Cogent Social Sciences*, 9(2). <https://doi.org/10.1080/23311886.2023.2282434>