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Central Government Responsibility in Mitigating the Impact of Cieunteung Retention Pond Development in Bandung Regency: Causative and Collaborative Analysis

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Abstract

Cieunteung Retention Pond, constructed by Central Government through Citarum River Basin Authority (BBWS Citarum) from 2015 to 2018, was intended to mitigate flood in Dayeuhkolot and surrounding areas of Bandung Regency. Despite the completion of the infrastructure, flood persisted sporadically between 2020 and 2021. Therefore, this study aims to analyze Central Government responsibility, particularly BBWS Citarum, through J. Spiro's theory of Responsibility, focusing on the aspect of responsibility as the cause. The study procedures were conducted using a qualitative approach, and data were presented descriptively. The results showed that while BBWS Citarum successfully met construction targets, it had not adequately addressed new problems emerging post-construction. Persistent flood, which continued after the infrastructure was fully built, indicated the presence of unresolved causal factors. In addition, this study identified potential issues with collaboration between the government and other stakeholders, which hindered effective management and response to the emerging challenges. The analysis suggested that Central Government responsibility for managing the impact of infrastructure remained insufficiently addressed, particularly in resolving the ongoing causes of flood and improving coordination among stakeholders. This indicated that a more collaborative and holistic approach was necessary to resolve the persistent flood issues and ensure the long-term effectiveness of the infrastructure.

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Keywords: *Cieunteung Retention Pond; BBWS Citarum; Flood Control Infrastructure; Spiro; Responsibility as a Cause*

Abstrak

Kolam Retensi Cieunteung, yang dibangun oleh pemerintah pusat melalui BBWS Citarum dari tahun 2015 hingga 2018, bertujuan untuk mengurangi banjir di Dayeuhkolot dan sekitarnya di Kabupaten Bandung. Meskipun infrastruktur tersebut telah selesai dibangun, banjir masih terjadi dengan angka yang fluktuatif pada 2020 hingga 2021. Penelitian ini bertujuan untuk menganalisis tanggung jawab pemerintah pusat, khususnya BBWS Citarum, melalui teori Responsibilitas J. Spiro, dengan fokus pada aspek tanggung jawab sebagai penyebab (causative). Menggunakan pendekatan kualitatif, penelitian ini menyajikan data secara deskriptif. Temuan menunjukkan bahwa meskipun BBWS Citarum berhasil memenuhi target pembangunan, namun masalah yang muncul setelah pembangunan belum sepenuhnya ditangani. Banjir yang terus terjadi setelah infrastruktur selesai dibangun menunjukkan adanya faktor penyebab yang belum terselesaikan. Selain itu, penelitian ini juga mengidentifikasi potensi masalah dalam kolaborasi antara pemerintah dan stakeholder terkait, yang menghambat respons yang efektif terhadap tantangan yang muncul. Analisis ini menunjukkan bahwa tanggung jawab pemerintah pusat dalam mengelola dampak infrastruktur masih belum memadai, terutama dalam hal menangani penyebab banjir yang berkelanjutan dan meningkatkan koordinasi antar pemangku kepentingan. Penelitian ini menyimpulkan bahwa pendekatan yang lebih kolaboratif dan holistik diperlukan untuk menyelesaikan masalah banjir yang terus-menerus dan memastikan efektivitas infrastruktur dalam jangka panjang.

Kata kunci: *Kolam Retensi Cieunteung; BBWS Citarum; Infrastruktur Pengendali Banjir; Spiro; Responsibility as a Cause*

INTRODUCTION

The government is ultimately responsible for ensuring access to infrastructure for its citizens (Wentworth & Makokera, 2015). However, many governments, specifically in emerging market countries, face significant challenges in delivering the necessary infrastructure due to financial and governance constraints (Levitt et al., 2019). When the government struggles to deliver its objectives of public infrastructure development, citizens may face significant challenges in accessing essential services and amenities (Monk et al., 2019). Citizens rely on their leaders to build and maintain essential transportation networks, utility systems, and social services that underpin the quality of life and enable economic advancement (Soomro & Zhang, 2015). Therefore, assessing the government responsibility is crucial, as it can shed light on the obstacles encountered in fulfilling duties and identify potential remedies to address the infrastructure development backlog

This current study was carried out to analyze and describe the government responsibility as causative in the development of flood control

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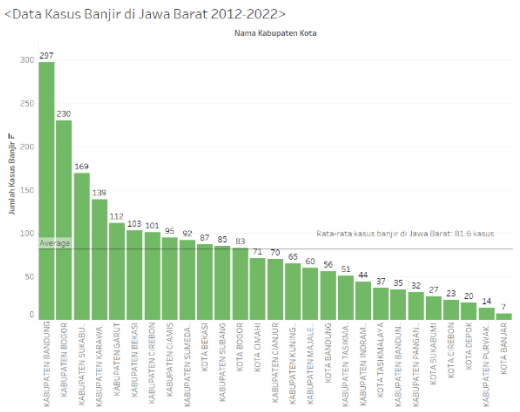
infrastructure in Bandung Regency. According to previous studies, Bandung Regency is one of the areas included in the Bandung Basin region and has the highest percentage of developed land in West Java (Noviyanti et al., 2020). The massive development in this area has undoubtedly boosted the economy of the regency, which is dominated by the secondary economic sector (manufacturing that processes raw materials into finished products). However, development has also decreased water infiltration regions and increased the risk of flood. This is supported by data from West Java BPBD (Regional Disaster Management Agency) (2023), showing that Bandung Regency is the most vulnerable area to flood risk from 2012 to 2022.

Figure 1. Flood Case Data in West Java, 2012–2022



Source: Adapted by the researcher from West Java BPBD 2023
(Accessed on September 20, 2023)

According to data from West Java BPBD (2022), flood cases in Bandung Regency primarily occur in Dayeuhkolot and Baleendah Districts, with a total of 30 cases between 2020 and 2021. These two regions are geographically lowlands with densely populated settlements and are traversed by Citarum River Basin, leading to a high risk of flood. Consequently, Central Government, through the Ministry of Public Works and Housing (PUPR), built 3 flood control infrastructures, including Cieunteung Retention Pond, Andir Retention Pond, and the Cisangkuy Floodway (Teguh, 2023). Cieunteung Retention Pond was the first to be built in 2015 (completed in 2018) and is the largest in terms of land area and water storage capacity. Despite the infrastructure, the community continues to face the impact of flood in Dayeuhkolot, such as traffic disruptions and the closure of major roadways (Lukihardianti & Ridwan, 2024). The government efforts to address flood issues through infrastructure development have had limited success, as the problem persists in some areas. This suggests that the government approach to mitigation may require a more comprehensive and integrated strategy that takes into account the complex interplay of factors contributing to flood, such as land subsidence, urban development patterns, and the management of water resources (Dwi, 2019).

Figure 2. Flood Case Data in Bandung Regency, 2012–2022

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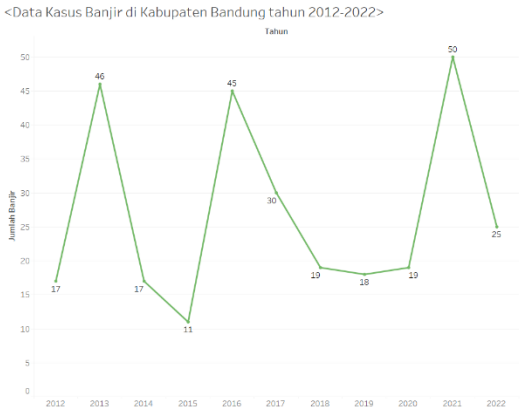

Source: Adapted by the researcher from West Java BPBD 2023
(Accessed on September 20, 2023)

Despite the completion of Cieunteung Retention Pond Development, flood in Dayeuhkolot and Baleendah continues to inundate dozens of homes and hinder daily activities and mobility (Mainaki, 2024). This indicates a gap between construction achievements and the fulfillment of the scope of responsibility as outlined in Spiro's theory. Responsibility in this theory is divided into 3 aspects, namely responsibility as accountability, obligation, and causativeness (Ndraha, 2011). The concept of responsibility as causativeness refers to the causal link between policy actions and outcomes, with the government being accountable for any resulting impact. Therefore, the fact that flood persists despite the completion of Cieunteung Retention Pond presents an intriguing subject of study.

In constructing Cieunteung Retention Pond, Central Government bears responsibility not only for planning and executing the project but also for ensuring its long-term effectiveness through regular maintenance, monitoring, and evaluation (Raflus et al., 2018). In this case, the impact refers to the ongoing flood incidents that have occurred post-construction. As previously mentioned, flood has continued sporadically despite the completion of the project, affecting daily life. Theoretically, the government is expected to resolve such issues to benefit the public at large. However, the community has not yet fully reaped the benefits of this infrastructure. This raises the question of which aspects are influencing the government ability to meet its causative responsibilities and whether other parties are potentially obstructing the realization of the full benefits.

While substantial structural interventions, such as Cieunteung Retention Pond, have been implemented to mitigate flood, the persistence of periodic flood suggests systemic challenges that extend beyond infrastructural solutions alone. The continued impact of flooding in areas such as Dayeuhkolot and Baleendah points to potential gaps in multi-stakeholder collaboration, where management requires not only physical infrastructure but also coordinated efforts among government agencies, local communities, non-governmental organizations (NGOs), and private actors. Effective urban flood disaster management necessitates greater engagement from governments, NGOs, and the private sector, which helps minimize damage to lives and property (Tingsanchali, 2012). Addressing

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fundamental issues, such as waste management, urban development, and environmental degradation, requires collaborative, non-structural interventions. This study suggests that the management challenges in Bandung could be effectively addressed through a collaborative governance framework, which shows shared accountability, resource pooling, and inclusive decision-making among stakeholders. By exploring the impact of collaboration, this study aims to identify opportunities for enhancing management strategies through multi-stakeholder participation.

Spiro's theory of responsibility emphasizes that a responsible party must fulfill both their internal responsibility, which relates to their ability to achieve the intended goals, and external responsibility. This external responsibility considers the impact on the wider community and environment (Indahsari & Raharja, 2022; Izzah, 2022; Rahmat & Tagajajawani, 2020; Wigati et al., 2020). Spiro's concept of responsibility as causativeness is fulfilled when the government successfully manages the consequences of its policies to achieve the intended outcomes. Moreover, the behavior of coal power enterprises in fulfilling social responsibility is cost-driven, influenced by regulatory policies and the subjective factors of decision-makers (Guo et al., 2024). As the governing authority, the government is expected to deliver benefits to the public from the policies it enacts. Therefore, the fulfillment of responsibility as causativeness can also be evaluated by the tangible benefits experienced by the public.

METHODS

This study used a qualitative method with a descriptive approach, applying a case study design. The case study was selected to enable an in-depth and focused analysis (Quanzhou & Nanning, 2019) of Central Government responsibility and subsequent actions in managing the effects of flood control infrastructure development, specifically Cieunteung Retention Pond in Bandung Regency. A qualitative approach enabled the study teams to explore and comprehensively describe the processes of construction and management that had been implemented.

Data used in this study were collected through interviews with several key informants and secondary sources, such as documents and existing literature. Initially, representatives from Citarum River Basin Authority (BBWS Citarum), the entity responsible for the project's execution, and a representative of the Ministry of PUPR were interviewed to obtain data on the planning and targets of the construction, the implementation process, the reporting of construction outcomes, and the management of Cieunteung Retention Pond. In addition, interviews were conducted with residents directly impacted by the project and NGOs who had been vocal on issues related to the project. These 2 groups were expected to provide clear insights regarding the perceived

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benefits of Cieunteung Retention Pond and its influence on their daily lives.

The study was conducted from 2015 to 2018, covering the commencement of the construction process to several years post-completion. This timeframe was selected to enable a more comprehensive understanding of the construction process and the subsequent management of the retention pond, as well as to evaluate its impacts on the local community.

Data from the interviews were analyzed descriptively to provide a comprehensive overview of the successes and challenges encountered during the construction and management of the pond. The analysis also comprised evaluating the roles and responses of various stakeholders in supporting or overseeing the project. Consequently, the study not only detailed the construction process but also uncovered the social, political, and environmental dynamics that influenced flood control project.

Although this qualitative methodology effectively captured stakeholder perspectives and evaluated institutional roles, it had certain limitations. Biases in interview responses could influence the accuracy of the results, specifically when assessing project outcomes subjectively. In addition, relying solely on qualitative data restricted the ability to measure quantitative aspects of infrastructure performance, such as exact reductions in flood levels or inundation areas. To mitigate these issues, the study used triangulation by incorporating secondary quantitative data, including hydrological metrics from both pre-and post-construction phases, to validate and complement the qualitative insights. This mixed-methods approach enhanced the reliability and depth of the analysis.

RESULT AND DISCUSSION

Cieunteung Retention Pond Development as Flood Control Infrastructure

Retention ponds were generally used as temporary water storage areas during periods of heavy rainfall when river channels could not accommodate the volume of water. Subsequently, the water stored in these ponds was gradually released back into the river using pumps or sluice gates (Al'amin & Muliati, 2023). Cieunteung Retention Pond was constructed in 2015 and completed in 2018, alongside other flood control infrastructures, including the Andir Retention Pond and the Cisangkuy Floodway, located in different areas of Bandung Regency. Cieunteung Retention Pond had a capacity of 190,000 m^3 and spanned an inundation area of 47 hectares (Fadli & Alexander, 2022). This could reduce flood-affected areas by up to 91 hectares, thereby minimizing flood risk along the Banjaran–Bandung main route (Maharani & Alexander, 2023).

Cieunteung Retention Pond was located in Cieunteung Village, Baleendah Subdistrict, Bandung Regency, and its operations relied on 4 hydraulic pumps, each with a total capacity of 12.5 m^3/s, maintaining a

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water elevation of 654.7 meters above sea level (m.a.s.l.) (Maulani & Syusetyaningsih, 2022). This figure was based on the lowest elevation in the surrounding area of 654.68 m.a.s.l. and the average height of minor floods at 1.30 m, resulting in a floodwater elevation of 655.98 m.a.s.l.

The construction of Cieunteung Retention Pond was initiated by BBWS Citarum, an implementing body under the Ministry of PUPR. BBWS Citarum responded to the persistent flood in Dayeuhkolot and Baleendah, which frequently disrupted the major Banjaran–Bandung access road, inundated residential areas, and hindered daily activities. Based on a feasibility study and follow-up actions in the 1988 Upper Citarum Master Plan, BBWS Citarum proposed the construction of Cieunteung Retention Pond, which was implemented in 2015. According to Presidential Regulation No. 12 of 2021 on the Amendment of Presidential Regulation No. 16 of 2018 on the Procurement of Government Goods/Services, the project was funded by the State Budget (APBN) and conducted by a joint venture of contractors, PT Nindya Karya (Persero) and PT Barata, under a Cooperative Operations (KSO) scheme, with a contract value of IDR 203 billion (Bahfein & Alexander, 2023). The construction was completed in 2018 (Reza, 2020), with 2 other flood control infrastructures in Bandung Regency, Cieunteung Retention Pond was officially inaugurated by President Joko Widodo in 2023 (Ni'am & Maullana, 2023).

Following the completion of the construction, BBWS Citarum assumed responsibility for the operational management of Cieunteung Retention Pond. The operational activities included maintaining the pond area, conducting routine cleaning, and ensuring the maintenance of the hydraulic pumps.

The Fulfillment of Responsibility as Causativeness by Central Government in the Development of Cieunteung Retention Pond

This study analyzed and described the government fulfillment of its responsibility, particularly through the Ministry of PUPR, as represented by BBWS Citarum, in implementing flood control infrastructure development, with an emphasis on the relationships among institutions, stakeholders, and the community. Using Spiro's theory of Responsibility as causation as the analytical framework, it was found that BBWS Citarum had succeeded in achieving the objectives of flood control infrastructure project through the construction of Cieunteung Retention Pond. According to testimonies from residents and NGOs, the magnitude of flood has significantly decreased since the construction, as evidenced by the following key indicators.

1. Reduction in Flooded Areas

Both residents and NGOs, who observed the area on a broader scale, confirmed that the area affected by flood had

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shrunk significantly following the construction of Cieunteung Retention Pond. This was corroborated by data from BBWS Citarum, showing that flood management in Dayeuhkolot had improved, with flood coverage reduced by 81%, from 371 hectares to 72 hectares in 2022 (Nugraha, 2024).

2. Reduction in Floodwater Levels

In certain areas that still experienced flood, residents reported that the water levels had significantly dropped since the completion of Cieunteung Retention Pond. In locations where floodwaters previously reached up to 1.2 m, post-construction floodwater levels decreased to around 20 cm (Maulani et al., 2022).

3. Reduction in Flood Duration

Before the construction of the infrastructure, residents had to contend with floodwaters that inundated hundreds of homes for days or weeks. According to several informants, floods in Dayeuhkolot and its surrounding areas could last up to a month. However, after the construction of Cieunteung Retention Pond, flood duration was reduced significantly, with floodwaters typically receding in just a few hours. In most cases, floodwaters would recede in a day.

Based on these results, BBWS Citarum had successfully fulfilled its internal responsibility as defined in Spiro's theory of causativeness. The construction of Cieunteung Retention Pond has achieved the designated objectives, demonstrating BBWS Citarum competence in executing the project, managing resources, and achieving the intended results in the stipulated period.

While BBWS Citarum had achieved significant progress, it was important to note that the benefits of Cieunteung Retention Pond were not immediately felt by the community. In the months following the completion of the project, residents still faced high-intensity flood with considerable floodwater levels. In response, BBWS Citarum initiated the construction of riverbank protection walls and further continued river normalization efforts. As a result, the frequency and intensity of flood was effectively managed in recent years.

In Spiro's theory, the aspect of cause suggested that the fulfillment of responsibility was not limited to achieving internal objectives but also extended. This was to ensure that broader benefits were realized by the public (Li et al., 2018; Sun & Su, 2018; B. Wang, 2013; Y. Wang et al., 2015). Despite the significant progress in meeting construction targets, flood management was not considered fully successful. Flood and waterlogging occurred periodically in the Dayeuhkolot area and its surroundings, even causing traffic congestion several times on the main Banjaran–Bandung route. Based on data gathered by the study teams, flood management efforts were effective only in areas adjacent to flood control infrastructure. However, several residential areas located farther from the infrastructure still experienced periodic flood. One of the primary goals

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of flood control infrastructure included ensuring that access to the main Banjaran–Bandung route was not disrupted and had not been fully achieved, although this critical point was close to the location of Cieunteung Retention Pond.

Several factors contributed to the limitations in the use of Cieunteung Retention Pond as an effective flood control infrastructure. The explanations were as follows.

1. Weak Commitment to Collaborative Problem-Solving

One of the factors identified in this analysis was the relatively passive collaboration among stakeholders. A large-scale program, such as flood mitigation, required a holistic approach and the active involvement of various parties. In its efforts to mitigate flood in West Java, particularly in Bandung Regency, BBWS Citarum had collaborated with various stakeholders, including the Citarum Task Force, to maintain Citarum River Basin. In the operational management of Cieunteung Retention Pond and other flood control infrastructures, BBWS Citarum also partnered with the Environmental Agency of Bandung Regency to manage waste accumulation in the retention pond area. However, this collaboration did not produce optimal results. BBWS Citarum's role was limited to removing waste from the retention pond area, but it lacked the authority to manage waste comprehensively, which posed a significant challenge to the project's overall success. In addition, the limited availability of waste disposal areas had emerged as a critical issue in the process.

A previous study revealed that the majority of waste contributing to floods in Bandung consisted of floating debris, primarily macro plastics. This could clog urban drainage systems, obstruct water flow, and elevate upstream water levels (Bertoncelj et al., 2020). Most of this waste originated from households, with results indicating that domestic wastewater significantly polluted the Citarum River. Notably, only 10.54% of waste was managed safely, while a staggering 89.46% was handled improperly (Rakhmadi et al., 2022). Despite decades of government efforts to regulate municipal solid waste management (MSWM), over 97% of respondents expressed dissatisfaction with current MSWM practices, and more than 83% considered the services inadequate (Marešová et al., 2022). Poor waste and drainage management remained significant barriers to the effective implementation of flood control policies in Bandung (Setiadi et al., 2023). In addition, collaboration and clear division of roles among stakeholders in waste management were still lacking, with processes remaining complex and inefficient (Rini et al., 2021).

The cause-effect relationship in large-scale programs was highly dependent on the ability of the institution to establish partnerships and collaboration, including public involvement. This passive engagement among the parties involved made it

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more difficult to achieve widespread benefits for the public. As previously explained in Lucas's theory (1993), the government responsibility could be fulfilled when it was accountable for its performance and responsible for the stakeholders involved, which fostered a sense of public participation in the policy. In this study, the responsibility shared among the parties was not reflected adequately. Consequently, it was expected that other stakeholders could take a more active role and be more committed to addressing these issues collaboratively.

2. Limited Public Engagement

Another key factor limiting the retention pond broader impact was the inadequate involvement of the community in waste management. The lack of public participation in addressing the issue of waste had been a major contributor to the underperformance of Cieunteung Retention Pond and other flood control infrastructures. While some community members have expressed a desire to manage waste more effectively, a lot of constraints were encountered due to a lack of appropriate land and equipment for waste management. According to one of the informants, the local community had submitted a request to the Regional Representatives Council for land and equipment to manage waste, intending to turn waste into valuable materials or products, thereby reducing the risk of flood. These efforts have not yet been achieved in this study. Meanwhile, certain groups in the community still exhibit a lack of awareness, with some individuals observed disposing of waste into rivers and even into the retention pond area itself.

The cause-effect relationship at this point was quite clear, as the government had not yet succeeded in providing adequate facilities to enable the public to actively participate in solving flood-related issues. As a result, the full benefits of Cieunteung Retention Pond were not realized. The numerous blockages in the drainage systems in areas still affected by flood, caused by waste accumulation, served as an indicator that the community had not yet developed a sense of responsibility to collectively address flood problem.

3. Government Public Relation

Responsibility as a Cause, as previously explained, had a close relationship with Government Public Relations. Government institutions must demonstrate their ability to shape, manage, and influence public perceptions of their responsibilities, including infrastructure projects that directly impact society. This could be achieved through effective Government Public Relations. Maintaining commitment between stakeholders and the public was crucial to ensuring that the full and optimal benefits of Cieunteung Retention Pond were realized. Therefore, Public Relations must focus on maintaining relationships between stakeholders, the public, and the institution itself (Jufry, 2023). In this case, to maximize the benefits of

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Cieunteung Retention Pond, particularly BBWS Citarum, the government needed to communicate effectively with the public and other stakeholders regarding issues that could be resolved collaboratively, such as waste management. One of the steps that could be taken was to provide transparent information about the current situation, the actions that have been taken, the challenges faced, and the specific forms of public involvement that were needed. This final point was supported by the government providing the necessary facilities and infrastructure to encourage public participation.

Responsibility as a Cause, according to Spiro, focused on the responsibility of an institution to generate positive outcomes for the broader public through policies that were causally related to previous policies. BBWS Citarum had achieved the general objectives initially intended but had not yet succeeded in delivering the full and widespread benefits from the construction of Cieunteung Retention Pond, as previously outlined. The limited impact and benefits for the wider community must prompt both the government and the public to work together to achieve mutual prosperity. However, no further actions have been taken to address this issue to date.

CONCLUSION

In conclusion, Central Government, through BBWS Citarum, had generally succeeded in achieving the construction targets for Cieunteung Retention Pond. According to Spiro's theory of Responsibility as a Cause, it had not yet succeeded in delivering the maximum or widespread benefits necessary to address flood issues in Bandung Regency. Several factors contributed to this, one of which was waste management, which stemmed from a lack of collective commitment and collaboration.

Based on the data and analysis conducted, the construction of Cieunteung Retention Pond reduced flood-affected area by 81%, lowered floodwater levels, and shortened the duration of floodwater stagnation. While these figures indicated progress, flood problem revealed had not been fully resolved. This was due to several factors, the most significant of which is poor waste management. Waste management must not be the responsibility of a party alone, rather, it must be a shared duty among all stakeholders. The government must also fulfill several roles, including strengthening relationships and commitment to collaboration, providing facilities and infrastructure to encourage public participation, and improving Government Public Relations.

The success of a policy program could not be measured solely by internal achievement indicators, but also by the large-scale positive impact it had on the public, especially considering that the program was funded by the state budget (APBN). An analysis using Spiro's theory of Responsibility as a Cause revealed the need for the government to focus on maximizing the impact and

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benefits for a broader community through collaboration, transparency, and public engagement. Moreover, the government must recognize that achieving these goals required more efficient management, fostering stronger connections with the public, and working collaboratively with various stakeholders to create shared prosperity.

Several recommendations were proposed to enhance future flood management projects. First, infrastructure planning must integrate both gray (engineered) and green (nature-based) solutions. This included improving the capacity of existing infrastructure, such as retention ponds and drainage systems while promoting nature rehabilitation to restore ecosystems that naturally regulated water flow. Second, the government must adopt adaptive management principles, which included continuously monitoring and adjusting flood management strategies based on real-time data and community feedback. Implementing community-based monitoring systems could ensure that local knowledge was leveraged and accountability was maintained.

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