



Analyzing the Challenges of Flood Management Policies in Bekasi City through Target Mapping Techniques

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Abstract

Purpose : This study aims to analyze the challenges in implementing flood management policies in Bekasi City through the application of target mapping techniques as a spatial-based planning and policy decision-making tool.

Design/methodology/approach : This research employs a qualitative approach using a case study method focusing on flood management policies in Bekasi City. Data were collected through in-depth interviews, field observations, and document analysis of policy frameworks, flood-prone area maps, and regional planning documents. Target mapping techniques were applied to identify priority areas and key stakeholders in flood mitigation efforts.

Findings : The findings indicate that flood management policy implementation in Bekasi City faces several challenges, including limited inter-agency coordination, inconsistencies in spatial planning, and suboptimal use of spatial data. The application of target mapping has proven useful in identifying flood-prone areas and prioritizing policy interventions; however, its integration into the decision-making process remains limited.

Practical Implications : This study provides practical recommendations for local governments to strengthen the integration of spatial data into flood management planning, enhance cross-sectoral coordination, and optimize the use of target mapping as an evidence-based policy formulation tool.

Originality/Value : This study introduces an analytical approach by utilizing target mapping techniques in the analysis of local flood management policies. The approach contributes to the development of spatial data-driven policymaking and enriches the literature on public administration and urban environmental governance.

Keywords : Flood Management Policy; Bekasi City; Target Mapping; Policy Failure

Paper type : Research Paper

Analisis Tantangan Kebijakan Penanganan Banjir di Kota Bekasi melalui Teknik Pemetaan Sasaran

Abstrak

Tujuan : Penelitian ini bertujuan untuk menganalisis tantangan dalam implementasi kebijakan penanggulangan banjir di Kota Bekasi melalui penerapan teknik *target mapping* sebagai instrumen pendukung perencanaan dan pengambilan kebijakan berbasis spasial.

Desain/metodologi/pendekatan : Penelitian ini menggunakan pendekatan kualitatif dengan metode studi kasus. Data dikumpulkan melalui wawancara mendalam dengan pemangku kepentingan terkait, observasi lapangan, serta telaah dokumentasi kebijakan dan perencanaan daerah. Teknik *target mapping* digunakan untuk mengidentifikasi wilayah rawan banjir, aktor kunci, serta prioritas kebijakan dalam penanganan banjir.

Temuan : Hasil penelitian menunjukkan bahwa implementasi kebijakan penanggulangan banjir di Kota Bekasi masih menghadapi sejumlah kendala, antara lain lemahnya koordinasi antarinstitusi, ketidaksinkronan kebijakan tata ruang, serta keterbatasan pemanfaatan data spasial secara optimal. Penerapan *target mapping* mampu memberikan gambaran yang lebih sistematis mengenai wilayah prioritas dan kebutuhan intervensi kebijakan, meskipun integrasinya dalam proses pengambilan keputusan belum berjalan secara maksimal.

Implikasi Praktis : Penelitian ini merekomendasikan penguatan integrasi data spasial dalam perumusan kebijakan, peningkatan koordinasi lintas sektor, serta optimalisasi *target mapping* sebagai dasar perencanaan penanggulangan banjir yang lebih efektif dan berkelanjutan.

Originalitas/Nilai : Studi ini menawarkan pendekatan analitis berbasis *target mapping* dalam kajian kebijakan penanggulangan banjir di tingkat daerah, yang memberikan kontribusi pada pengembangan kebijakan publik berbasis bukti dan tata kelola lingkungan perkotaan.

Kata Kunci : Kebijakan Pengelolaan Banjir; Kota Bekasi; Pemetaan Target; Kegagalan Kebijakan.

Jenis Penelitian : Artikel Penelitian

INTRODUCTION

Flooding is a recurring problem in Bekasi City, posing a major challenge for spatial planning and environmental management. Every year, floods cause significant economic losses and disrupt community activities (Santoso, 2020). Although the government has implemented various flood management policies, their effectiveness remains questionable, particularly in terms of field-level implementation. As part of the Greater Jakarta metropolitan area, Bekasi City is experiencing rapid urbanisation. Changes in land use from water catchment areas into residential and commercial zones have increased the risk of flooding (Rahmawati & Hidayat, 2019). This condition is further exacerbated by inadequate drainage infrastructure and poor waste management in river basins. Studies indicate that other cities facing similar conditions have managed floods more effectively through integrated urban planning (Silver, 2021).

Government policies addressing flooding are often reactive and lack long-term planning. The construction of embankments and water pumps as short-term measures cannot comprehensively solve the problem (Putra et al., 2021). Mitigation-based approaches, such as the reorganisation of green spaces and improvement of drainage systems, are still rarely implemented. Weak inter-agency coordination has been identified as a major factor contributing to policy failure. Local governments, the Regional Disaster Management Agency (BPBD), and related institutions often experience overlapping authority and poor coordination in implementation (Suharto, 2020). Similar institutional fragmentation in flood governance has also been observed in other Indonesian cities (Sazly & Permana, 2020).

In addition to coordination problems, limited budget allocation has become a major obstacle to effective flood management. The available funds are often insufficient to support comprehensive programmes (Wijayanti et al., 2022). Flood management efforts are therefore frequently constrained, resulting in suboptimal outcomes. Community participation also plays a key role in the success of flood management. However, in Bekasi City, participation remains relatively low due to limited education and socialisation related to flood mitigation. Public awareness of environmental protection, such as avoiding littering in rivers, is still weak, worsening the condition of waterways. Strengthening community engagement has been shown to enhance resilience to floods in many regions (Haque, 2000).

Most flood management policies focus mainly on structural measures, such as the construction of embankments and water pumps, while neglecting non-structural aspects like spatial planning and catchment area management (Nugroho, 2018). A combination of both structural and non-structural approaches is crucial for long-term sustainability. This situation highlights a research gap: previous studies have tended to emphasise engineering and technical aspects rather than governance and

policy alignment. Consequently, there is a need for studies that examine flood management through a governance-oriented lens.

Target mapping is an analytical technique that can be used to evaluate the effectiveness of a policy. It identifies the gap between policy objectives and actual outcomes (Prasetyo et al., 2021). This method allows a better understanding of policy shortcomings and helps develop more targeted recommendations. However, few studies in Indonesia have applied target mapping to analyse flood policy effectiveness. Most focus on infrastructure or technical solutions rather than governance mechanisms and inter-agency dynamics. This gap underscores the importance of adopting a governance-based analytical framework.

Internationally, policy mapping has been recognised as an effective approach to identify institutional weaknesses and cross-sectoral gaps. Clarke (2019) used policy mapping to analyse flood governance in the United Kingdom, revealing misalignments between local and national strategies. Similarly, Müller & Reiter (2020) applied target mapping in the European flood directive context to strengthen inter-organisational coordination. These approaches have rarely been implemented in Indonesia, making this study a valuable contribution to bridging that gap and enhancing the originality of policy analysis in flood governance.

In Bekasi City, one notable example of policy failure is the river normalisation programme, which has not been implemented effectively. Although planned several years ago, it has faced obstacles such as land conflicts and a lack of community support (Fauziah et al., 2020). Poor watershed management and deforestation in upstream areas have further reduced the land's ability to absorb rainwater. Several global cities have adopted Nature-Based Solutions (NBS) to manage flooding sustainably, integrating green infrastructure and adaptive water systems such as infiltration gardens and bioretention areas. Bekasi City could learn from such approaches. In Asia, studies also emphasise the role of flood prediction and monitoring systems as vital components of effective flood management (Yusof et al., 2021).

Beyond structural measures, strengthening community capacity is essential to improve disaster preparedness. Emergency response training and disaster simulations can reduce casualties and losses (Sari & Nugroho, 2020). Transparent budget management and community monitoring can also reduce corruption and improve policy effectiveness (Setiawan & Pramono, 2022). In the long term, flood management policy reforms in Bekasi City must align with sustainable development goals, adaptive climate policies, and strengthened environmental regulations (Sari & Yulianto, 2021; Hidayat & Susanto, 2020).

Other Indonesian cities such as Jakarta and Semarang have begun adopting technology-based water management systems (Fadilah et al., 2021). The use of

Internet of Things (IoT)-based early warning systems could enhance Bekasi's flood mitigation efforts. Integrated Flood Management (IFM) encourages multi-level coordination among local, regional, and national institutions to create a unified policy direction (Ahern, 2011). Decentralisation must also be supported by capacity-building programmes for local institutions (Sulastri & Hartono, 2022). Moreover, digital transformation through Geographic Information Systems (GIS), big data, and remote sensing enables real-time flood risk identification and evidence-based policymaking (Rahardjo, 2021). Smart governance has been effective in several Asian megacities, improving institutional responsiveness to emerging risks (Chen et al., 2020).

Building upon these perspectives, this study recognises that many aspects of existing policies require improvement. Therefore, it applies the Target Mapping Technique to evaluate the factors contributing to the failure of flood management policies in Bekasi City. Through this approach, it is expected that the main factors causing policy ineffectiveness can be identified and that more targeted recommendations can be proposed. By understanding these underlying challenges, the Bekasi City government can design more comprehensive and sustainable flood management strategies.

Based on the above background and identified research gap, this study seeks to answer the following research question: How do governance factors such as inter-agency coordination, budget allocation, and community participation influence the effectiveness of flood management policies in Bekasi City as analyzed through the Target Mapping Technique?

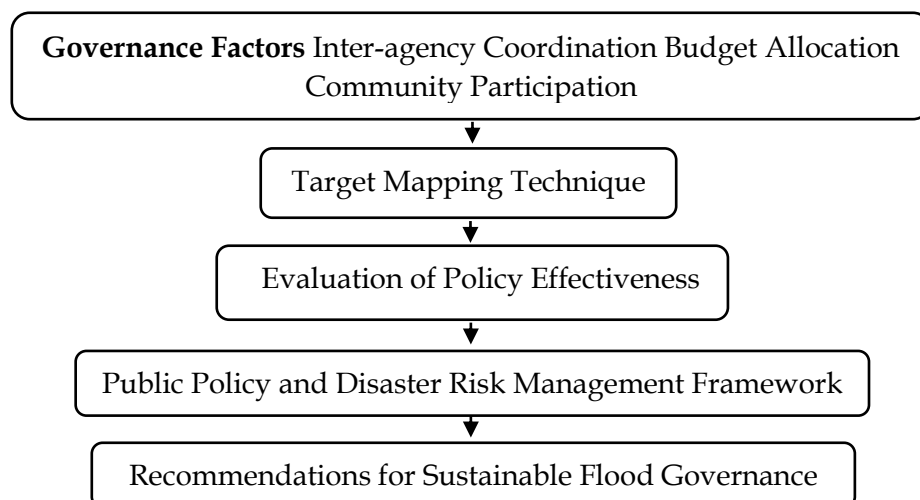
This study contributes to the existing body of knowledge in public policy and disaster risk management by integrating governance analysis with the Target Mapping Technique as a diagnostic tool for evaluating policy effectiveness. Unlike previous studies that primarily emphasize engineering or infrastructural solutions to flooding, this research highlights the role of governance factors such as coordination among agencies, budget transparency, and community participation in determining the success or failure of flood management policies. By framing flood mitigation as a governance issue rather than a purely technical one, this study strengthens the academic discourse on policy implementation and provides a new analytical lens for understanding disaster risk governance in developing urban contexts. The findings are expected to enrich theoretical discussions in public policy evaluation and support the development of more adaptive, participatory, and evidence-based flood management frameworks.

This research aligns with Indonesia's national policies on flood risk management and urban spatial planning. It supports the implementation of the National Medium-Term Development Plan (RPJMN) 2020–2024, which prioritizes

climate resilience, disaster mitigation, and sustainable urban governance. Furthermore, the study reflects the principles outlined in Law No. 24 of 2007 on Disaster Management and Law No. 26 of 2007 on Spatial Planning, both of which emphasize the integration of disaster risk reduction into spatial and environmental management. By analyzing Bekasi City as part of the Greater Jakarta Region, this study provides policy-relevant insights that can guide the National Disaster Management Agency (BNPB) and the Ministry of Public Works and Housing (PUPR) in enhancing coordination between national and local governments. The findings are therefore expected to contribute to strengthening the alignment between national disaster management policies and local implementation strategies.

To support this objective, the study adopts a governance-oriented analytical framework to examine the effectiveness of flood management policies in Bekasi City. The framework integrates five key dimensions of public policy: content, process, maker, impact, and environment, as proposed by Dye (2013). These dimensions interact dynamically in shaping the success or failure of flood governance. Within this structure, the Target Mapping Technique functions as an analytical bridge that connects policy objectives with actual field outcomes, helping to identify implementation gaps. The framework emphasizes that inter-agency coordination, budget allocation, and community participation are the main governance factors influencing policy effectiveness.

Figure 1. Conceptual Framework of Flood Management Policy Evaluation



Source: Author's conceptualization (2025), adapted from Dye's Public Policy Model.

RESEARCH METHODS

This research employs a qualitative case study design to explore the limitations of flood management policies in Bekasi City through the application of target mapping techniques. The investigation was conducted between January and visualized the areas of success, partial fulfilment field observations, and document analysis as primary methods of data collection.

A total of fifteen key participants were involved in the study, consisting of government representatives, academic specialists, community leaders, and members of non-governmental organisations. The participants were chosen through purposive sampling, targeting individuals with direct involvement or expertise in flood management, while the snowball technique was used to identify additional relevant stakeholders. This dual sampling strategy was adopted to ensure the inclusion of both formal institutional actors and informal community representatives, thus reflecting the multi-level governance of flood management in Bekasi City.

Field observations were undertaken across five flood-prone areas in Bekasi City, namely Jatiasih, Pondok Gede, Bekasi Timur, Rawalumbu, and Bantar Gebang. Each site was visited multiple times during the dry and rainy seasons to capture differences in environmental conditions and the implementation of flood management initiatives. Each observation session lasted approximately two to three hours, enabling close examination of drainage systems, infrastructure conditions, and community participation in mitigation activities. The fieldwork was conducted between January and April 2024, covering both dry and rainy periods to capture seasonal variations.

The target mapping procedure comprised three essential phases. The first stage involved identifying policy objectives based on official documents and local regulations, including the Bekasi City Flood Mitigation Plan. The second stage entailed compiling field data drawn from interviews, reports, and direct observations to portray actual outcomes. The final stage compared these datasets to determine the degree of alignment or discrepancy between policy objectives and the results achieved in practice. This mapping process enabled the researcher to visualise the areas of success, partial fulfilment, and policy failure.

Figure 2. Target Mapping Framework of Flood Management Policy



Source: Author's analysis (2025)

To support a deeper interpretation of findings, Dye's framework of public policy dimensions served as an analytical reference. The Policy Content dimension was explored through an analysis of programmes and regulatory frameworks, whereas the Policy Process dimension focused on how policy formulation, implementation, and evaluation were carried out, particularly with regard to coordination among agencies and stakeholder engagement. The Policy Maker dimension examined the involvement of local authorities, implementing bodies, NGOs, and academic contributors. The Impact of Public Policy dimension assessed the intended and unintended outcomes, including infrastructure performance, flood frequency reduction, and improvements in community resilience. Finally, the Policy Environment dimension analysed external influences such as urban growth, climate variability, financial constraints, and socio-political dynamics.

To enhance the validity and reliability of findings, this study applied data triangulation, integrating evidence from interviews, observations, and document analysis. In addition, member checking was performed by presenting preliminary interpretations to selected informants for verification and feedback. Thematic analysis was used to identify recurring patterns of policy weaknesses and implementation challenges.

**Table 1. Relationship Between Policy Objectives and Actual Outcomes
(Target Mapping Summary)**

Policy Objective	Expected Outcome	Actual Outcome	Gap Identified	Interpretation
Strengthen inter-agency coordination	Coordinated planning between BPBD, Public Works, and Environmental Agency	Overlapping duties and weak communication	Moderate	Institutional fragmentation
Enhance community participation	Active community engagement in flood mitigation	Low participation and limited awareness	High	Insufficient community empowerment
Improve budget transparency	Efficient and timely fund allocation	Delays and unclear reporting	High	Weak financial accountability
Maintain drainage and flood infrastructure	Regular cleaning and maintenance	Irregular maintenance and poor supervision	Moderate	Limited technical monitoring
Integrate climate resilience into planning	Inclusion of adaptation in spatial plans	Not yet implemented	Major	Lack of long-term environmental planning

Source: Author's analysis (2025)

RESULTS AND DISCUSSION

Content of Policy

Flood management policies in Bekasi City primarily rely on the development of physical infrastructure such as drainage systems, floodgates, embankments, and water pumps. These initiatives are designed as structural mitigation measures to reduce water accumulation during periods of intense rainfall. However, both literature and field evidence show that this infrastructure-oriented approach is not supported by equally strong non-structural measures, such as public education, environmental monitoring, and enforcement of spatial planning regulations (Junaidi & Sari, 2022; Susanto & Lestari, 2024).

During field observations in Jatiasih and Bekasi Timur, several drainage channels were found filled with sediment and domestic waste, significantly reducing their water flow capacity. One municipal engineer stated, "Every year we build new drainage lines, but maintenance budgets are often postponed or reallocated for other projects" (Interview, March 2024). This evidence reinforces the argument by Wulandari & Fauziah (2020) that the problem is not the absence of infrastructure, but the lack of sustained maintenance and long-term policy commitment. This

finding implies that Bekasi's flood policy is structurally ambitious but operationally fragile, prioritising visible construction over long-term resilience.

From a legal standpoint, existing local regulations such as the Bekasi Flood Control Framework outline clear objectives; however, their technical execution remains weak. For instance, observations in Rawalumbu revealed ongoing residential construction on land that is officially zoned as a water retention area. When asked, a local urban planner explained, "Permits are often granted before coordination with flood control authorities is completed". This suggests that Bekasi's flood policy lacks horizontal coordination between land-use and water management institutions, resulting in spatial inconsistencies and uncontrolled development.

Moreover, the policy framework inadequately integrates flood management with urban spatial planning. Bekasi's rapid urbanisation, which serves as a metropolitan buffer zone for Jakarta, has led to the conversion of wetlands and paddy fields into housing and industrial zones. However, these developments are rarely accompanied by parallel drainage or retention upgrades, thereby exacerbating flood risks in low-lying neighbourhoods. This indicates that flood policies operate in isolation and are detached from broader urban planning processes.

Community participation is another critical weakness. Flood mitigation activities are designed and executed in a top-down manner, with little engagement from residents. During an observation in Bantar Gebang, community leaders noted that "clean-up drives only happen when officials visit, and there is no consistent local initiative." This aligns with level Rahmawati & Hidayat (2025) observation that the absence of participatory mechanisms leads to low ownership and weak behavioural change at the community level. Without genuine collaboration, even well-intended structural projects struggle to achieve sustainable outcomes.

In addition, coordination among implementing agencies remains fragmented. The overlapping responsibilities between the City Government, the Public Works Department, and the Ciliwung-Cisadane River Basin Agency (BBWS) often result in redundant or misaligned projects. For example, during the March 2024 site inspection, two separate dredging operations were conducted in the same area by different agencies within a two-week span, without shared data or unified planning. This suggests that Bekasi's flood management suffers from institutional fragmentation and weak inter-agency synergy.

Overall, the content of flood management policies in Bekasi reveals a pattern of technical adequacy but strategic deficiency. The city demonstrates strong commitment to infrastructure development but lacks the supporting legal, institutional, and community systems required to sustain it. The novelty of this study lies in integrating empirical field data, including target mapping and on-site verification, into the analysis of policy content, which reveals how administrative

fragmentation and short-term political priorities undermine the structural intent of flood control policies.

Unlike previous studies that focus solely on infrastructural performance, this research provides an evidence-based interpretation of the policy gap between design and practice, showing that effective flood governance requires synergy between spatial planning, public participation, and institutional accountability. Thus, the contribution of this study lies in its diagnostic approach, which links real-world field observations to conceptual weaknesses in flood policy formulation and offers a framework that can be replicated in other Indonesian cities facing similar governance challenges.

Goals or Purpose

The principal objective of Bekasi City's flood management policy is to reduce flood risks and mitigate their social, economic, and environmental impacts. Officially, this includes protecting residents' safety, public facilities, and the ecological balance of the city (JICA, 2020; Susanto & Lestari, 2024). However, both document reviews and field findings reveal that these goals remain largely aspirational rather than operational. In practice, the strategies implemented tend to be reactive and politically driven rather than grounded in scientific evidence, a pattern also identified by Hidayat & Susanto (2020).

Field observations and interviews with officials from the Public Works Department indicate that flood response measures are often executed only after major incidents occur. One officer admitted, "We mobilize heavy equipment and distribute pumps once inundation happens, but we rarely act preventively unless it's in the city center." (Interview, February 2024). This empirical insight underscores that the city's flood policy prioritizes short-term visibility over long-term resilience, suggesting that the objective of sustainable protection remains underachieved.

The failure to realize these objectives is clearly observable in recurring flood damage. In Pondok Gede and Rawalumbu, residents reported that their houses were inundated three to four times during the 2023–2024 rainy season despite the completion of new drainage projects. During one observation, floodwaters reached nearly 60 cm in residential lanes after two hours of rainfall, disabling road access and small businesses. As one shop owner stated, "Every time it rains heavily, I lose two days of income. The new drainage didn't make any difference." This finding implies that the policy objective of protecting economic assets and livelihoods is not being met, demonstrating a disconnect between planned targets and actual field outcomes.

Health-related objectives are also insufficiently addressed. Interviews with a local health worker in Bekasi Timur revealed that post-flood periods often bring

spikes in waterborne diseases such as diarrhea and leptospirosis. “We get twice as many cases after the floods,” the nurse explained. Yet preventive health education and sanitation programs remain limited. This indicates that the flood control policy fails to integrate public health protection within its broader disaster management agenda, leading to repetitive post-flood emergencies rather than prevention.

Social protection for vulnerable groups is another neglected dimension. While policy documents mention the safeguarding of children, the elderly, and persons with disabilities, on-site inspections at temporary evacuation centers in Bantar Gebang found that evacuation facilities lacked accessibility ramps, proper sanitation, and designated areas for women and children. This suggests that Bekasi’s flood policy lacks inclusivity and equity in its design, reflecting a technical rather than social understanding of “safety.”

Long-term objectives, such as strengthening community adaptation and enhancing climate resilience, remain underdeveloped. Despite repeated flood events, there are no structured community training programs or local contingency planning mechanisms. When asked about flood drills, a neighborhood leader replied, “We only get socialization when there is a flood, not before it.” This highlights a policy gap in anticipatory capacity-building, showing that the city’s objectives are short-term and reactive rather than preventive and adaptive.

Reflectively, these findings imply that the formal goals of flood management policy in Bekasi have not translated into measurable performance indicators. The gap between normative objectives and actual outcomes reflects a deeper issue of policy misalignment, in which ambition exists at the regulatory level but implementation lacks continuity, coordination, and monitoring.

In terms of scholarly contribution, this study offers a novel analytical approach by integrating field-based target mapping with evaluative policy analysis. Previous studies on flood management in Indonesia have largely focused on infrastructure effectiveness or policy content in isolation. In contrast, this research provides a goal and outcome diagnosis that visually maps how far policy intentions deviate from field realities. This approach contributes to Indonesia’s flood policy studies by demonstrating how local governance dynamics, institutional fragmentation, and weak adaptive planning interact to undermine policy effectiveness.

Ultimately, the novelty of this study lies in linking empirical evidence derived from observations and stakeholder testimonies to the conceptual dimensions of policy success, offering a replicable evaluative model for assessing local flood policies across other urban regions.

Policy Process

The process of flood control policy in Bekasi City can be analyzed through three main stages of the policy cycle: formulation, implementation, and evaluation. Ideally, each stage should be evidence-based, participatory, and guided by inter-agency coordination. However, field data and document reviews reveal that the process is still dominated by bureaucratic and political considerations rather than scientific evidence (Prasetyo et al., 2021).

At the formulation stage, the involvement of academics, technical experts, and community representatives remains limited. Interviews with one city official from the Public Works Department confirmed that “policy discussions are usually internal; external experts are only consulted when a major project is proposed.” (Interview, February 2024). This suggests that policy formulation in Bekasi relies more on administrative logic than on empirical diagnosis of flood risk, which weakens the relevance of the resulting programs. Field observation of public meetings in Rawalumbu District also showed that flood-prone communities were not invited to planning sessions, despite being the most affected. This lack of transparency and inclusivity implies that the formulation process prioritizes procedural compliance over participatory problem-solving, resulting in policies detached from local realities.

During the implementation stage, overlapping authority among city, provincial, and central agencies creates inefficiencies and duplication. For example, drainage rehabilitation on Kali Bekasi was simultaneously carried out by both the BBWS Ciliwung–Cisadane and the Bekasi City Government, with differing technical designs. A local project coordinator explained, “Sometimes we start dredging, then another agency comes with a different plan, so part of the work is repeated.” (Field note, January 2024). This finding implies that Bekasi’s flood control process lacks institutional coordination and a unified operational framework, which reduces cost efficiency and project effectiveness.

Budget allocation also reflects structural imbalance. Based on the 2024 Bekasi City APBD document, more than 70% of the flood control budget is directed toward physical infrastructure such as drainage and pumps, while non-physical measures, including environmental education, infrastructure maintenance, and community preparedness, receive less than 10%. These data reinforce interview findings from the Environmental Agency, where a staff member noted, “People think flood management means concrete and machines, but not behavior or planning.” Such budgeting patterns demonstrate that the policy process is still construction oriented rather than resilience oriented, neglecting social and adaptive dimensions.

Another critical weakness appears at the evaluation stage. Instead of assessing policy outcomes, such as flood reduction, community resilience, or

environmental improvement, evaluation reports mostly measure administrative outputs such as budget realization and project completion rates. A member of the Regional Development Planning Agency (Bappeda) admitted, “We report completion percentages, not impact on flood frequency.” (Interview, March 2024). This suggests that evaluation in Bekasi’s flood policy remains procedural and symbolic, preventing meaningful learning or reform. As a result, ineffective policies are continuously recycled, while successful community-based initiatives remain undocumented and unscaled.

Reflectively, these findings indicate that Bekasi’s flood policy process lacks epistemic integrity, participatory inclusion, and performance accountability. The process appears linear and hierarchical, whereas effective flood governance requires iterative feedback between data, actors, and adaptive action. This gap implies that flood policy in Bekasi is not merely a technical issue but a manifestation of deeper governance challenges, where policy cycles are completed formally but fail substantively.

In terms of novelty, this study contributes to the broader field of flood governance research in Indonesia by combining policy process analysis with empirical observation and institutional mapping. Unlike previous studies that examine policy outcomes or infrastructure performance in isolation, this research introduces a multi-layered policy cycle diagnostic framework, connecting observed implementation behaviors such as overlapping authority and symbolic evaluation to structural causes such as political centralization and weak inter-agency integration. By linking field-based data with policy process theory, this study offers a contextualized understanding of why local flood policies fail to evolve adaptively in rapidly urbanizing regions like Bekasi.

Ultimately, the novelty of this research lies in its integration of empirical governance analysis with the theoretical framework of policy learning, providing an actionable model for diagnosing and reforming local flood management systems across Indonesia.

Policy Maker

Flood control governance in Bekasi City involves multiple actors, ranging from the central and local governments, technical agencies such as BBWS Ciliwung and Cisadane, the Regional House of Representatives (DPRD), private developers, and the local community. In theory, this multi-actor configuration should encourage collaboration and shared responsibility (Sazly & Permana, 2020). However, field findings and interviews indicate that institutional coordination remains weak and often politically fragmented, leading to policies that are reactive rather than strategic.

At the local level, the Bekasi City Government dominates the policy arena but tends to emphasize visible, short-term interventions such as drainage construction and dredging projects. One official from the Public Works Office admitted, “We often prioritize projects that show quick physical results because they’re easier to report and justify to the council.” (Interview, February 2024). This reflects a bureaucratic mindset that equates policy success with infrastructure output, neglecting preventive and social dimensions like community preparedness and land-use regulation. This finding implies that Bekasi’s flood policy still operates under a performance logic driven by visibility and political cycles rather than long-term resilience.

Coordination with technical agencies, particularly BBWS Ciliwung–Cisadane, is inconsistent. Field observations in Jatiasih and Bekasi Timur revealed overlapping dredging projects conducted by different agencies using separate contractors. A project engineer noted, “We sometimes don’t get updates from the city, so our scope overlaps. It’s inefficient, but the hierarchy makes coordination slow.” (Field note, March 2024). This situation demonstrates a lack of vertical synchronization between local and national authorities, suggesting that fragmented governance structures hinder integrated flood management.

The DPRD (local council), which should play a supervisory role, also tends to politicize flood programs. Several informants from NGOs pointed out that project selection often follows electoral visibility rather than technical urgency. One activist said, “Some flood projects appear before elections, not during planning reviews.” (Interview, February 2024). This suggests that political instrumentalization of flood programs undermines the credibility and continuity of flood governance in Bekasi.

Private sector involvement, particularly from housing and industrial developers, adds another layer of complexity. Field observation in Pondok Gede and Bantar Gebang showed large residential complexes built over former rice fields and drainage paths. Despite existing environmental regulations, enforcement remains weak. An officer from the Environmental Agency remarked, “Developers submit drainage plans on paper, but implementation is rarely monitored.” (Interview, January 2024). This finding implies that regulatory capture and weak enforcement enable profit-driven urban expansion at the expense of flood resilience, reinforcing the argument that economic incentives outweigh ecological responsibility.

Community participation, which could have served as a bottom-up corrective mechanism, remains minimal. During observations in Rawalumbu, many residents expressed resignation toward recurring floods, stating that “drainage cleaning only happens when we organize it ourselves.” This reflects a low sense of ownership and trust toward local authorities. It also indicates that flood policies in

Bekasi have failed to institutionalize participatory mechanisms and local empowerment, focusing more on state-led solutions than collective adaptation.

Non-governmental organizations (NGOs) and civil society groups are present but limited in their influence. Most are involved in emergency response rather than policy advocacy. Nevertheless, there is growing potential for collaboration—several CSOs have begun documenting local drainage failures and proposing citizen monitoring initiatives. These emerging efforts suggest that a shift toward multi-actor governance is possible if formal institutions provide participatory entry points and data transparency.

Reflectively, the fragmented interaction among policy actors in Bekasi illustrates how institutional silos, political interference, and regulatory weakness collectively shape the failure of flood governance. The findings highlight that policy-making power is concentrated in bureaucratic and political elites, while scientific evidence, private accountability, and community voices remain peripheral. This suggests that Bekasi's flood management suffers from governance asymmetry, in which authority is centralized while responsibility for outcomes is dispersed and weakly enforced.

From a theoretical perspective, this study provides a novel contribution to Indonesian flood policy research by empirically demonstrating how multi-level governance fragmentation translates into everyday policy failure. While prior studies mostly examine either technical capacity or infrastructure inadequacy, this research integrates field-level observations, stakeholder interviews, and institutional mapping to reveal the relational dynamics among actors. The novelty lies in connecting governance theory with empirical diagnosis, offering a grounded model of actor-network dysfunction in local flood management systems.

Ultimately, this study expands the understanding of urban flood governance in Indonesia by showing that effective policy requires not only technical infrastructure but also collaborative accountability across institutional boundaries. This framework can inform reform agendas in other rapidly urbanizing cities facing similar coordination and participation challenges.

Impact of Public Policy

The impact of flood management policies in Bekasi City manifests clearly across social, economic, health, and infrastructural dimensions. Although the primary objective of these policies is to reduce the frequency and severity of flooding, recurrent inundations continue to displace thousands of residents each year, revealing a persistent implementation gap (Susanto & Lestari, 2024). Field observations in Rawalumbu and Bekasi Timur during the 2024 rainy season showed that evacuation shelters were overcrowded, with limited sanitation facilities and

minimal privacy for women and children. One displaced resident stated, “We had to share one toilet with dozens of people; my children got sick because of the dirty water.” (Interview, March 2024). This suggests that Bekasi’s flood policy lacks an integrated social protection mechanism capable of safeguarding vulnerable populations during emergencies.

Beyond displacement, the education sector also suffers chronic disruption. Several schools in Jatiasih and Pondok Gede were temporarily closed for weeks after heavy rainfall. Teachers interviewed reported that classes were relocated to nearby mosques or community halls. One school principal commented, “Every year we lose about two to three weeks of teaching time. Students get left behind compared to other areas.” (Interview, February 2024). This finding implies that flood management in Bekasi fails to integrate continuity-of-learning strategies into disaster response planning, further entrenching inequality between flood-prone and non-flood-prone communities.

The economic repercussions are equally severe, especially among small traders and informal workers. Local market vendors in Bantar Gebang reported losing both merchandise and income during major floods. An SME owner shared, “When the flood comes, I can’t open my shop for days, and the goods are damaged. No one helps us recover.” (Interview, February 2024). Such testimonies underscore that existing policies prioritize physical infrastructure over economic resilience, leaving small enterprises without post-disaster support mechanisms. This lack of adaptive economic planning reveals a narrow understanding of “mitigation,” which is confined to engineering solutions rather than livelihood protection.

From a public health perspective, interviews with healthcare workers at Puskesmas Jatiasih confirmed an increase in post-flood cases of diarrhea and skin infections, consistent with the findings of Fadilah et al., (2021). Observations at temporary shelters also revealed poor waste management and standing water, creating ideal conditions for vector-borne diseases. However, there was no coordinated health response or psychological assistance for evacuees. One nurse noted, “We treat physical illness, but no one checks mental health. Some children still cry whenever it rains.” (Interview, March 2024). This finding implies that Bekasi’s flood policy remains reactive and biomedical, lacking preventive and psychosocial interventions crucial for long-term recovery.

Infrastructural damage further illustrates the reactive nature of current flood governance. Roads, drainage channels, and bridges in Bekasi Timur were repeatedly repaired within the same fiscal year, consuming budgets that could have funded preventive maintenance. A public works engineer explained, “We fix the same road every rainy season because the design doesn’t match the water flow.” (Interview, April 2024). This reveals a cycle of inefficiency, characterized by a “repair culture”

rather than a resilience framework, where funds are absorbed by repetitive reconstruction instead of proactive mitigation.

Overall, these findings indicate that Bekasi's flood policy outcomes remain misaligned with its stated goals of reducing risk and protecting community welfare. The emphasis on physical infrastructure without parallel investment in social, economic, and health systems produces uneven and short-lived results. This suggests that the city's flood management framework lacks systemic integration, resulting in fragmented outcomes across different sectors.

Reflectively, this study highlights that the true impact of public policy cannot be captured solely through infrastructure metrics, but must also be assessed through its human and institutional consequences. The findings imply that policy evaluation in Bekasi has focused too narrowly on quantitative outputs such as the number of drainage kilometers built, while neglecting qualitative indicators like well-being, equity, and adaptive capacity.

From a broader academic perspective, this research contributes a novel analytical lens to Indonesian flood policy studies by integrating field-based social impact analysis with policy evaluation. Unlike prior research that centers on hydrological or engineering aspects, this study uncovers the multidimensional consequences of governance failures, showing how inadequate coordination and narrow policy framing directly affect human security. By connecting policy intent, implementation gaps, and lived experiences, the study introduces a more holistic approach to assessing the effectiveness of urban flood management policies in Indonesia.

This novel integration of empirical field evidence with public policy theory offers a framework that future researchers and policymakers can adopt to design socially responsive flood governance, one that measures success not only through reduced water levels but also through enhanced community resilience and institutional accountability.

Policy Environment

The policy environment shaping flood management in Bekasi City is heavily influenced by rapid urbanization, which has transformed once-absorbent landscapes into impermeable built-up areas. Interviews with local planning officials from the Bekasi City Spatial Planning Office revealed that over the last decade, residential and industrial expansion has reduced more than 30% of the city's green spaces. One official noted, "Almost every open area is being converted into housing clusters; even retention ponds are being filled." (Interview, March 2024). This finding supports earlier studies by Rahmawati & Hidayat (2019) showing that uncontrolled land-use change has drastically weakened the city's ecological carrying capacity.

This implies that Bekasi's flood policy lacks integration between spatial regulation and hydrological management, resulting in a structural mismatch between development priorities and environmental resilience.

Empirical observations in Jatiasih and Rawalumbu further confirm that urban expansion has encroached on water catchment zones, reducing infiltration capacity. During field visits in February 2024, researchers documented several housing complexes built adjacent to drainage channels that were clogged with construction waste and household garbage. Residents explained that waste management services were inconsistent, causing them to dispose of trash directly into canals. One resident stated, "If the drainage was cleaned regularly, the floodwater wouldn't rise this high." (Interview, February 2024). These observations suggest that community-level environmental awareness remains low, a factor exacerbating urban flooding yet inadequately addressed in existing policy frameworks.

Beyond land-use challenges, climate variability intensifies the vulnerability of Bekasi's flood system. Meteorological data from 2023–2024 indicate that rainfall intensity during the monsoon season has increased by nearly 25% compared to the previous decade (Fadilah et al., 2021). Local disaster management officers reported that several drainage systems in Pondok Gede and Bekasi Timur overflowed within hours of heavy rain. According to one BPBD staff member, "The infrastructure was designed for old rainfall patterns, but now even moderate rain causes flooding." (Interview, March 2024). This finding implies that Bekasi's flood control policies are not adaptive to climate change, relying on outdated engineering standards that fail under current climatic conditions.

Financial and political constraints further limit policy effectiveness. Budget reports from the Bekasi City Government (2023) indicate that only about 12% of the annual regional budget (APBD) is allocated for flood mitigation, with the majority dedicated to administrative expenses. A local official admitted, "Every year, flood funds are proposed, but they're always cut during budget revisions." (Interview, April 2024). Moreover, interviews with council members revealed that project prioritization is often influenced by political visibility rather than technical necessity. One NGO representative observed, "Flood control is sometimes treated as a photo opportunity, not a governance responsibility." (Interview, February 2024). This suggests that Bekasi's flood governance is deeply embedded in a politicized environment, where short-term electoral incentives override long-term sustainability objectives.

Coordination across institutions remains another major weakness. Officials from the Ciliwung–Cisadane River Basin Agency (BBWS) and the Bekasi Public Works Department acknowledged overlapping jurisdictions. For example, both

agencies reported conducting dredging operations in the same river section without shared data. This duplication not only wastes resources but also undermines program consistency. This finding implies that the policy environment in Bekasi suffers from institutional fragmentation, where unclear mandates and limited inter-agency communication reduce overall policy coherence.

The socio-cultural context also plays a significant role in shaping policy outcomes. Field interviews with community leaders in Bantar Gebang highlighted that many residents still regard flooding as a “natural fate” rather than a governance issue. Such fatalistic perceptions discourage participation in preventive initiatives like waste segregation or neighborhood drainage cleaning. As one leader expressed, “People here think the government should handle everything, and community effort is rare unless the flood has already happened” (Interview, March 2024). This indicates that flood policy in Bekasi has not effectively nurtured a culture of shared responsibility, an essential component of sustainable urban resilience.

Overall, the policy environment of Bekasi City demonstrates a complex interplay of ecological, political, economic, and socio-cultural factors that collectively undermine the city’s flood management performance. The empirical findings show that while the technical causes of flooding are well understood, the surrounding governance environment, characterized by weak coordination, political interference, inadequate budgets, and low civic engagement, remains the real obstacle to effective implementation. This suggests that addressing environmental degradation alone will not suffice; systemic governance reform is equally necessary.

Reflectively, this study provides a novel contribution to Indonesian flood policy research by contextualizing environmental policy failures within the broader landscape of political economy and social behavior. Unlike previous studies that focus primarily on hydrological or infrastructural inadequacies, this research integrates field evidence from multiple stakeholders including government, NGOs, and local communities to reveal how external policy environments shape implementation outcomes. By combining empirical field data with policy theory, this study advances a multidimensional model of flood governance that emphasizes cross-sector coordination, social engagement, and climate adaptation as core determinants of policy success.

This approach not only enriches the theoretical understanding of urban environmental governance but also provides a replicable framework for evaluating flood policy environments in other rapidly urbanizing Indonesian cities, such as Tangerang and Depok, where similar structural and political dynamics prevail.

CONCLUSION

The core finding of this study reveals that the persistent failure of flood management in Bekasi City stems not merely from technical shortcomings but from a deeper governance deficit, characterized by fragmented institutional coordination, politically driven decision-making, and limited community engagement. These weaknesses demonstrate that policy implementation in Bekasi has been dominated by short-term, reactive measures rather than a preventive and integrated approach. The evidence suggests that despite extensive investments in physical infrastructure, the absence of sustained maintenance, participatory planning, and cross-sectoral integration continues to undermine the overall effectiveness of flood control efforts.

From a policy perspective, these findings imply that strengthening governance quality is far more crucial than expanding physical capacity. Effective flood management requires a shift toward evidence-based and participatory policymaking, where planning decisions are informed by data, supported by long-term environmental projections, and aligned with spatial development policies. Institutional reform is also essential to clarify inter-agency mandates and minimize political interference in project prioritization. At the same time, empowering communities to participate in monitoring and maintenance can help bridge the gap between policy design and implementation.

Building on these implications, the study recommends several strategic reforms. First, establish a coordinated flood governance framework that links local, provincial, and national institutions under a unified planning mechanism. Second, develop a community-based flood management model to enhance public ownership and behavioral change regarding environmental practices. Third, adopt a climate-adaptive planning approach that integrates hydrological data and urban growth trends into local policy design. Finally, evaluation mechanisms should move beyond financial accountability toward assessing long-term policy outcomes and social resilience.

In a broader scholarly context, this research contributes to the application of Dye's public policy theory in Indonesia by demonstrating how his six-dimensional framework can be operationalized to evaluate local governance failures within an urban environmental setting. The study refines Dye's model by emphasizing the interdependence between policy content and policy environment, offering a nuanced understanding of how contextual political and social factors mediate policy outcomes in developing cities. This integrative approach provides a valuable reference for future public policy studies seeking to bridge theory with empirical governance analysis in the Indonesian context.

PRACTICAL AND THEORETICAL IMPLICATION

Practical Implications

The results of this study provide several important implications for improving flood policy governance in Bekasi City. First, it is necessary to strengthen inter-agency coordination through the establishment of an integrated flood governance framework that connects municipal, provincial, and national institutions under a unified planning and data-sharing system. Second, the direction of policy should shift from a focus on physical infrastructure development toward enhancing social resilience through active community involvement in maintenance, preparedness, and environmental monitoring. Third, the integration between spatial planning and flood control policies must be reinforced by implementing strict zoning regulations in water catchment areas and conducting environmental audits for developers. Fourth, the low level of community participation requires the development of a community-based flood management model that fosters a sense of ownership and behavioral change toward environmental responsibility. Finally, the policy evaluation system needs reform so that it not only measures budget realization but also assesses tangible impacts on social resilience, institutional effectiveness, and environmental sustainability.

Theoretical Implications

Theoretically, this study extends the application of Dye's policy theory by operationalizing its six dimensions within the context of urban flood governance in Indonesia. The findings reveal that the relationship between policy content and policy environment is mutually dependent and dynamic, enriching the understanding of Dye's theoretical framework in developing countries with decentralized bureaucratic structures. Moreover, this study contributes to the literature on flood governance by integrating policy analysis, implementation processes, and social behavior into a single adaptive evaluative framework. This approach emphasizes the importance of shifting from a purely technical paradigm to a social paradigm in public policy studies, where success is measured not only through infrastructure performance but also through community participation and resilience. Conceptually, the study also introduces the dimension of adaptive learning within policy evaluation theory, highlighting the need for a continuous learning cycle between planning, implementation, and evaluation to make policies more responsive to social dynamics and climate change.

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