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Regulatory Adaptability in Flood Risk Governance: A Legal Analysis in Pandeglang Regency, Indonesia

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Abstract

Flood risk in Pandeglang Regency has continued to evolve, raising questions about whether the existing regulatory framework can respond adequately to changing risks. This study aims to examine the normative consistency and adaptive capacity of Pandeglang Regent Regulation Number 3 of 2023 in relation to Article 36 of Law Number 24 of 2007 and Article 6 of Government Regulation Number 21 of 2008. The study employed normative legal research using a statute approach and conceptual approach. Primary and secondary legal materials were analyzed qualitatively through grammatical and systematic legal interpretation. Empirical data on flood events and flood risk mapping were also examined as contextual material to assess the regulation's responsiveness to changing risks. The findings showed that the three regulations form a coherent hierarchical framework. Article 36 establishes the obligation to plan and review disaster management, Article 6 specifies the planning period and review mechanism, and Article 5 of the Regent Regulation operationalizes monitoring and evaluation at the regional level. However, the regulation's substantive adaptability remains limited because evaluation results are not explicitly connected to an obligation to review or adjust the Regional Flood Risk Management Plan. The novelty of this study lies in distinguishing vertical normative coherence from regulatory adaptability as two dimensions for assessing flood risk governance. This framework provides an original basis for evaluating whether legal consistency is accompanied by effective policy responsiveness. The study contributes theoretically to adaptive disaster governance and practically to the development of responsive regional flood risk regulations.

Keywords: Flood Risk Governance, Regulatory Adaptability, Disaster Management

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INTRODUCTION

Flooding is one of the most prevalent hydrometeorological disasters affecting human life, particularly in terms of loss of life, economic losses, and environmental damage. From the perspective of law and disaster resilience, this issue concerns not only the government's capacity to respond to disasters after they occur, but also the capacity of regulations to anticipate risks, reduce vulnerability, and monitor and adjust policies in response to evolving risks (Sapountzaki, 2022).

As an archipelagic country with high rainfall and increasing pressure from land use conversion, Indonesia ranked third among the countries with the highest disaster risk in the world according to the *World Risk Index* 2025, with a risk score of 39.80 out of 193 countries (IFHV, 2025). This condition demonstrates that disaster management needs to be addressed as a matter of governance and regulation, as legal instruments determine the allocation of responsibilities, planning, and evaluation mechanisms to be undertaken by the government (Setyorini, 2023). The adaptive governance approach to disaster management planning in medium-sized cities in Indonesia also demonstrates that policy flexibility and the learning capacity of local governments are determining factors in the success of risk management, such that rigid regulatory designs may hinder adaptation to changing disaster conditions (Ledoh et al., 2026).

Official data from the National Disaster Management Agency (BNPB) for 2025 recorded 2,009 flood events in Indonesia throughout the year, resulting in 1,353 deaths, 182 missing persons, 6,208 injuries, 10,563,082 affected people, and 1,115,244 displaced persons. In addition, floods caused 64,587 houses to sustain severe damage, 55,560 houses to sustain moderate damage, and 123,627 houses to sustain minor damage (BNPB, 2026). The high frequency and magnitude of these disasters indicate that flooding can no longer be addressed solely through reactive emergency responses. Therefore, a regulatory framework is required that not only governs actions when disasters occur, but also provides mechanisms for planning, monitoring, evaluation, and periodic review as integral components of disaster risk management.

Normatively, Article 5 of Law Number 24 of 2007 concerning Disaster Management stipulates that "the Government and regional governments are responsible for the implementation of disaster management." This provision is reinforced by Article 6, which specifies that the responsibilities of the Government include disaster risk reduction and the integration of disaster risk reduction into development programs.

Furthermore, Article 35 of this Law requires the formulation of disaster management planning as part of disaster management implementation during situations in which no disaster is occurring, while Article 36 paragraph (5) affirms that "the Government and regional governments shall periodically review disaster management planning documents within a specified period," which constitutes the principal normative benchmark in this study.

These provisions are further elaborated through Government Regulation Number 21 of 2008 concerning the Implementation of Disaster Management, which was enacted to implement the mandates of Article 50 paragraph (2), Article 58 paragraph (2), and Article 59 paragraph (2) of Law Number 24 of 2007. Article 6 paragraphs (5) and (6) of this Government Regulation specifically provide that "a disaster management plan ... shall be established by the Government or regional government

according to their respective authorities for a period of 5 (five) years" and that such plan "shall be reviewed periodically every 2 (two) years or at any time if a disaster occurs." These provisions concerning the duration and review cycle directly establish a legal obligation for regional governments in formulating their disaster risk management plans.

Pandeglang Regency in Banten Province is one of the areas that directly experiences the urgency of such regulation. Based on flood risk mapping using a Geographic Information System across Banten Province, Pandeglang Regency is categorized as having a moderate level of risk, with the affected area covering approximately 20.2 percent of its total territory and approximately 340,058 residents potentially exposed to flood risks (Fahira et al., 2024).

Although the percentage of environmental losses and the extent of the affected area are classified as moderate compared with other areas in Banten Province, the large number of exposed residents nevertheless requires particular attention in mitigation efforts. This condition became evident in early November 2025, when the overflow of a tributary of the Ciliman River caused flooding in eight villages across four subdistricts, affecting 885 households or approximately 3,181 people (BNPB, 2025).

In mid-January 2026, flooding recurred due to the simultaneous overflow of the Cilemer, Cikaret, Dayeuh, Cilatak, and Ciliman Rivers, inundating 23 villages across nine subdistricts and affecting 537 households or 2,051 people (BNPB, 2026). These successive events demonstrate that flood risk in Pandeglang Regency is recurrent and widespread, thereby requiring the legal instruments governing flood risk management to be examined not merely in terms of their existence, but also in terms of the capacity of their norms to respond to evolving risks.

On the basis of the normative obligation under Article 6 of Government Regulation Number 21 of 2008, the Government of Pandeglang Regency enacted Regent Regulation of Pandeglang Number 3 of 2023 concerning the Regional Flood Risk Management Plan for 2023–2027. The "Considering" section of this Regent Regulation explicitly states that its enactment was intended to implement the obligation to formulate a disaster management plan for a five-year period as mandated by Government Regulation Number 21 of 2008.

Accordingly, Regent Regulation Number 3 of 2023 constitutes a regional legal instrument for flood risk planning and has established its own monitoring and evaluation mechanisms. In broad terms, Article 5 of this Regent Regulation governs three matters: monitoring is conducted by each institution according to its respective authority; periodic monitoring is conducted by the task force responsible for implementation at least annually or whenever a disaster occurs; and comprehensive evaluation is conducted by the task force periodically, at least once every two years, based on the compilation of monitoring and reporting results from all relevant institutions.

Several studies concerning the performance of regional disaster management institutions have produced varying findings. A study of disaster management policies in Pangandaran Regency found that although the regional resilience index had increased, policy effectiveness remained constrained by strategic documents that were not periodically updated and by limited human resources (Kesuma & Suwaryono, 2024). This finding is relevant to the present study because the problems concerning the updating and consistency of planning documents identified in Pangandaran correspond to the

inconsistency in the period of validity identified in Regent Regulation Number 3 of 2023 of Pandeglang Regency, thereby likewise emphasizing the importance of updating and consistency of planning instruments as part of adaptive capacity in disaster risk management.

A finding that differs from the foregoing is reflected in research on the role of the regional government in Bandung Regency, which found that inter-agency coordination and the institutional capacity of the Regional Disaster Management Agency (BPBD) were relatively effective in addressing flood disaster risks, supported by funding and facilities provided by vertical government institutions (Permana, 2023). This difference indicates that the effectiveness of flood risk management is highly dependent on the institutional context of each region and therefore cannot be generalized without consideration of the respective regional context.

From the perspective of legal responsibility, a normative study on the legal accountability of regional governments in flood disaster management affirms that regional governments bear not only administrative responsibility but also legal, moral, and constitutional responsibilities, which must comply with the general principles of good governance, including the principle of legal certainty (Islamiyah et al., 2025).

A similar argument is advanced in a study of the government's legal responsibility in flood mitigation and disaster management in Medan City, which emphasizes that failures in structural and non-structural mitigation may give rise to legal accountability for regional governments (Ramli et al., 2025). These two studies reinforce the argument that the quality of norms contained in regional regulations, including the clarity and consistency of their provisions, is not merely a matter of administrative technique but also concerns the principle of legal certainty, which constitutes a prerequisite for the legal accountability of regional governments.

Nevertheless, the foregoing studies remain focused on institutional performance, coordination, and legal accountability in general, and have not placed the consistency and adaptability of legal norms within a single regulatory instrument as the primary focus of analysis.

In the context of Pandeglang Regency, this issue is relevant because Regent Regulation Number 3 of 2023 has established a two-year monitoring and evaluation mechanism, while flood events continued to recur in 2025 and 2026, and the region was recorded as having a moderate level of risk with a significant number of residents exposed to such risk (Fahira et al., 2024). This condition raises a legal question as to whether the regulatory design that has been established is capable of providing an adequate mechanism for adjustment in response to developments in flood risk.

Based on this research gap, the novelty of this study lies in the juridical analysis of the adaptability of Regent Regulation of Pandeglang Regency Number 3 of 2023 by examining the relationship between the obligation of periodic review under Article 36 of Law Number 24 of 2007 and Article 6 of Government Regulation Number 21 of 2008 and the monitoring and evaluation mechanism under Article 5 of the Regent Regulation.

This study also examines the consistency of the regulation's period of validity and its relevance to the development of actual flood risks in Pandeglang Regency. Accordingly, this study does not merely

assess the existence of the regulation, but also examines whether the regulatory design governing flood risk management is sufficiently adaptive to support regional resilience.

This study aims to analyze how Regent Regulation of Pandeglang Number 3 of 2023 regulates regional flood risk management, particularly the planning, monitoring, and evaluation mechanisms mandated by Articles 5 and 6 of the Regent Regulation and their conformity with Article 36 of Law Number 24 of 2007 and Article 6 of Government Regulation Number 21 of 2008.

In addition, this study aims to assess the extent to which such regulation is sufficiently adaptive when compared with developments in actual flood risks in Pandeglang Regency and the evolving concept of disaster resilience.

To achieve these objectives, this study employs a normative juridical approach using a *statute approach*. This approach is used to examine the normative structure of Regent Regulation Number 3 of 2023, including its textual consistency, within the framework of the hierarchy of laws and regulations, particularly its conformity with Law Number 24 of 2007 and Government Regulation Number 21 of 2008.

Data on flood events and flood risk mapping in Pandeglang Regency obtained from BNPB context to assess the relevance and adaptive capacity of the regulation in responding to developments in risk. The results of the normative examination are subsequently critically analyzed with reference to contemporary concepts of disaster resilience and adaptive governance to assess the preparedness and adaptability of the Pandeglang Regency regulation in realizing regional resilience to flood risks.

RESEARCH METHODS

This research employs a normative juridical approach, namely legal research that places law as a coherent and prescriptive system of norms, rather than merely as a social phenomenon observed empirically (Marzuki, 2013). The prescriptive nature means that the research is directed at finding answers to the legal issues under examination, in this case, the conformity and interrelationship of norms between Law Number 24 of 2007, Government Regulation Number 21 of 2008, and Pandeglang Regent Regulation Number 3 of 2023, rather than merely describing them.

The research design combines two types of approaches in normative legal research. First, the statutory approach is used to examine the hierarchical consistency among the three regulations, including tracing the identified inconsistency in the wording concerning the period of validity of the Regent Regulation. Second, the conceptual approach is used to measure the adaptability of the norms contained in the Regent Regulation to the concepts of disaster resilience and adaptive governance developed in contemporary literature, as analytical frameworks for assessing the adequacy of the existing regulatory design.

Because this research is normative in nature, it is not conducted at a physical location in the sense of field research, but rather at a library research location, where legal materials are obtained, namely the official database of the Legal Documentation and Information (JDIH), the official portal of the National Disaster Management Agency (BNPB), and the official document of Pandeglang Regent Regulation Number 3 of 2023 obtained from the Government of Pandeglang Regency. The substantive locus of the research, namely the area that constitutes the object of examination of the relevance and

adaptability of the norms, is Pandeglang Regency, Banten Province, which was selected based on the consideration that this area has a flood risk management regulation that has been in effect since 2023 but continued to experience recurrent flood events in 2025 and 2026, making it relevant as an object for examining the conformity between the norms and the development of actual risks.

Data collection was conducted through a documentary study of legal materials. The primary legal materials consist of three laws and regulations, namely Law Number 24 of 2007 on Disaster Management, Government Regulation Number 21 of 2008 on the Implementation of Disaster Management, and Pandeglang Regent Regulation Number 3 of 2023 on the Regional Flood Risk Management Plan for 2023–2027. The secondary legal materials consist of 40 sources, including journal articles and other academic publications relevant to disaster governance.

The collected data were analyzed qualitatively using a descriptive-prescriptive method, through legal interpretation techniques, namely grammatical interpretation to interpret the wording of the provisions literally, and systematic interpretation to place the norms of the Regent Regulation within the framework of the hierarchy of laws and regulations in accordance with the principle of lex superior derogat legi inferiori (Ibrahim, 2013). This technique is used to examine the vertical consistency between the obligation of periodic review under Law Number 24 of 2007 and Government Regulation Number 21 of 2008 and the monitoring and evaluation mechanisms under Pandeglang Regent Regulation Number 3 of 2023.

Furthermore, empirical data concerning flood events and flood risk mapping in Pandeglang Regency were analyzed descriptively as contextual comparison material to assess whether the regulatory design identified through the normative analysis is sufficiently adaptive to developments in actual risks in the field, an approach that is consistent with the perspective of adaptive governance in contemporary disaster literature.

The validity of the legal materials was ensured by re-examining the sources and substance of the legal materials used in the research. Primary legal materials in the form of laws and regulations were cross-checked against official documents to ensure the conformity of their contents and their validity status. Secondary legal materials were examined based on their publication sources and their relevance to the issues under investigation. This examination was conducted before the legal materials were used in the analysis process.

RESULTS AND DISCUSSION

Results

The research findings show that Article 36 of Law Number 24 of 2007 concerning Disaster Management, Article 6 of Government Regulation Number 21 of 2008 concerning the Implementation of Disaster Management, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023 concerning the Regional Flood Risk Management Plan for 2023–2027 have a normative relationship in establishing mechanisms for disaster management planning, monitoring, and evaluation at the national and regional levels. These three provisions do not indicate any vertical conflict. Instead, they establish a hierarchical regulatory relationship in which lower-level norms provide concrete implementation of the principles and obligations established by higher-level norms. This approach is consistent with the principle of lex superior derogat legi inferiori, which requires lower-level norms to conform to and not conflict with higher-level norms (Warjiyati et al., 2024).

The position of a Regent Regulation as an implementing regulation at the regional level within this structure is also consistent with the hierarchical model of delegated legislation in Indonesia. Under this model, implementing regulations derive their validity from authority delegated by higher-level regulations (Al-fatih et al., 2023). This position is also consistent with studies on the status of regional regulations within the hierarchy of Indonesian legislation, which place regional legal instruments as an integral part of the national normative system (Isroji et al., 2024).

Article 36 of Law Number 24 of 2007 places disaster management planning as an important component of disaster management during the pre-disaster stage. The provision requires planning to be based on disaster risk data for a particular area and period and to be set out in a document containing disaster management programs and activities. Normatively, this framework demonstrates that disaster management planning is not merely an administrative instrument. Rather, it serves as an instrument connecting risk identification, the selection of measures, the allocation of authority, and the use of resources in disaster management.

This risk-based planning framework is consistent with developments in flood risk governance, which regard risk assessment, institutional arrangements, and decision-making as integral components of flood risk management. Modern flood risk management is no longer oriented solely toward the construction of flood-control infrastructure. It also requires adequate regulatory systems, integrated strategies, resources, and the involvement of actors engaged in risk management (Matczak & Hegger, 2021).

To clarify this concept, flood risk governance can be understood as a cycle connecting risk assessment, institutional arrangements, planning and decision-making, implementation, monitoring and evaluation, and learning and adaptation. This framework demonstrates that flood risk management does not end with risk identification or infrastructure development. Instead, it depends on the interconnection among these components and coordination among actors across different levels of government. In the context of this research, the framework helps explain the position of Article 36 of Law Number 24 of 2007, Article 6 of Government Regulation Number 21 of 2008, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023 as components of a single flood risk governance cycle. This cycle connects risk information, planning, implementation, evaluation, and policy adjustment (Matczak & Hegger, 2021; Dordi et al., 2022).

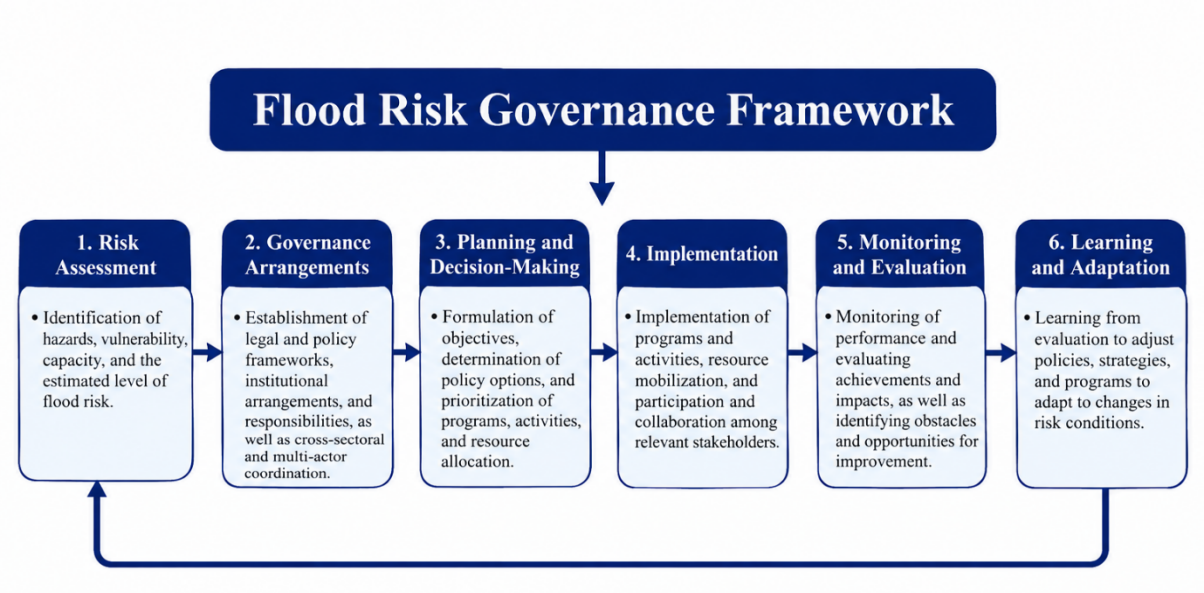


Figure 1. Flood Risk Governance Framework. Source: Matczak & Hegger, 2021 and Dordi et al., 2022

The planning obligation also has a dynamic character because Article 36 requires disaster management planning documents to be reviewed periodically. This provision demonstrates that planning documents are not intended to function as static instruments. Instead, they must adapt to changes in risk conditions and evolving disaster management needs. From a *flood risk governance* perspective, the capacity of a system to adjust policies to changing risk conditions is an essential component of resilience. An effective risk management system requires adaptable strategies, adequate regulatory frameworks, coordination, resources, and institutional capacity to respond to changes in risk conditions (Matczak & Hegger, 2021).

The provision is subsequently given concrete form through Article 6 of Government Regulation Number 21 of 2008. This provision stipulates that disaster management plans are prepared based on disaster risk analysis and disaster management measures, which are elaborated into activity programs and their detailed budgets. The plan is established for a five-year period and reviewed periodically every two years or at any time when a disaster occurs.

Accordingly, Article 6 provides more concrete parameters for the planning and review obligations established at the statutory level. The relationship between risk-based planning and periodic review is also consistent with developments in flood risk management research. These developments indicate a shift from conventional flood management toward approaches that increasingly consider the relationship between risk management and governance, including institutional relationships, actors, and decision-making processes (Dordi et al., 2022).

Based on this legal construction, Article 36 of Law Number 24 of 2007 and Article 6 of Government Regulation Number 21 of 2008 have a relationship of normative concretization. The Law establishes a mandate for planning and document review, while the Government Regulation provides more concrete parameters concerning the planning period and review schedule.

At the local level, this legal construction is implemented through Pandeglang Regent Regulation Number 3 of 2023, which establishes the Regional Flood Risk Management Plan for 2023–2027 (Rencana Pengelolaan Risiko Banjir Daerah or RPRB). The RPRB is a planning instrument specifically

directed at flood risk management in Pandeglang Regency. It therefore constitutes a concrete form of disaster management policy at the local level, with a focus on the characteristics of flood risk in the region. As a product of state administrative law, the formulation of such a Regent Regulation should also comply with the principles governing the formulation of policy regulations, including clarity of purpose and consistency with higher-level legal norms (Taufiqurrahman et al., 2022).

This approach is consistent with developments in flood risk management, which emphasize the importance of regulation and decision-making at the local level. Risk characteristics, institutional capacity, geographical conditions, and vulnerability patterns may differ across regions. This is demonstrated by experiences of flood governance across administrative regions in Indonesia, where decentralized governance faces disparities in institutional capacity among regions (Clegg et al., 2023). It is also consistent with concerns regarding inconsistencies in legislation governing local government administration in Indonesia. Such inconsistencies partly result from weak vertical harmonization across levels of government (Lobubun et al., 2022). Therefore, the RPRB cannot be viewed merely as a technical flood-related document. It forms part of the disaster management planning system that connects national norms with local risk management needs.

Article 5 of Pandeglang Regent Regulation Number 3 of 2023 regulates the monitoring and evaluation of plan implementation. Under this provision, each institution conducts monitoring and evaluation according to its authority and existing mechanisms. In addition, the disaster management plan implementation task force conducts monitoring periodically, at least annually and/or when disaster management is carried out in the region. Evaluation is conducted periodically, at least every two years, based on the compiled evaluation and reporting mechanisms implemented by each institution and the evaluation and reporting mechanisms conducted by the task force. This provision demonstrates that Article 5 establishes a monitoring and evaluation mechanism for plan implementation. Thus, it does not merely regulate the existence of the RPRB as a planning document but also provides a mechanism for assessing its implementation.

Substantively, this provision is connected to Article 6 of Government Regulation Number 21 of 2008. Article 6 requires plans to be reviewed every two years or at any time when a disaster occurs. Meanwhile, Article 5 of the Regent Regulation requires monitoring at least annually and evaluation at least every two years. The identical two-year period indicates a temporal connection between the local evaluation mechanism and the plan review cycle established at the higher level. The relationship between monitoring, evaluation, and review is important in risk governance. Adaptive governance emphasizes learning, collaboration, networks, coordination across levels, flexibility, and adaptive capacity as key characteristics for addressing changing and complex risks (Nikkanen et al., 2024).

In this context, monitoring serves to generate information on plan implementation, whereas evaluation serves to assess that implementation. Review has a broader function because it involves reassessing the continued validity or relevance of a plan. These three mechanisms are interconnected but cannot be conceptually equated. This distinction is important in assessing the adequacy of Article 5. The provision regulates when monitoring and evaluation must be conducted and identifies the responsible actors. However, it does not explicitly require evaluation results to be followed by substantive changes or adjustments to the RPRB.

This finding does not mean that Article 5 conflicts with Article 6 of Government Regulation Number 21 of 2008. On the contrary, Article 5 provides an instrument that can support the review process.

However, from the perspective of normative adequacy, there remains room to strengthen the causal normative relationship between evaluation results and subsequent review or adjustment of the RPRB. This issue is relevant because the existence of plans and regulations does not, by itself, guarantee effective risk governance. Effective risk management also depends on institutional capacity to implement plans, coordinate actions, provide resources, and adjust policies in response to changing risk conditions, as emphasized in global research on the implementation of the Sendai Framework for strengthening disaster risk governance.

In Pandeglang Regency, this finding becomes increasingly relevant when considered alongside developments in actual flood risk. The RPRB applies to the 2023–2027 period, meaning that the document remains temporally valid. However, the continued validity of a document during a specified period does not necessarily indicate that its substance remains consistent with changing risk conditions. Article 6 of Government Regulation Number 21 of 2008 expressly allows review every two years or at any time when a disaster occurs. Changes in risk conditions should therefore provide a basis for the review process. Accordingly, the adaptability issue concerning Regent Regulation Number 3 of 2023 does not concern the existence of an evaluation mechanism. Rather, it concerns whether monitoring and evaluation results are expressly directed toward reviewing or adjusting the RPRB.

Based on Geographic Information System-based flood risk mapping in Banten Province, Pandeglang Regency is classified as having a moderate level of risk, with approximately 340,058 residents potentially exposed to flood risk (Fahira et al., 2024). Although the risk category is classified as moderate in percentage terms, the large number of potentially exposed residents still requires particular attention.

Chronological data indicate that this risk is not merely static. It has materialized repeatedly over relatively short intervals since the RPRB was established. This condition is consistent with research on extreme rainfall patterns in Java Island associated with climate change. The study projects an increase in the frequency of heavy rainfall days in western Java in the coming period. Consequently, hydrometeorological risks, including floods, cannot reasonably be assumed to remain constant throughout the validity period of a five-year planning document (Nurlatifah et al., 2023)

Table 1. Chronology of Flood Events in Pandeglang Regency in 2023–2026 in Relation to the Two-Year Evaluation Cycle.

Time	**Event**	**Impact**
March 2023	River overflow occurred in Baturanjang, Cikaduen, and Kadugadung Districts, Pandeglang Regency.	124 houses were affected, with water levels ranging from 60–120 cm; 60 people were displaced.
December 2024	Flooding caused by four consecutive days of high-intensity rainfall	18 of 35 districts were affected; the status of disaster preparedness for hydrometeorological disasters was extended until January 2025 .
November 2025	Overflow of the Cilimah River tributary	Eight villages and four districts were affected; 885 households, comprising 3,181 people, were affected .

January 2026	Simultaneous overflow of five rivers (Cilemer, Cikeret, Dayeuh, Cilatil, and Ciliman)	23 villages and nine districts were affected; 537 households, comprising 2,051 people, were affected.

Source: (Sari, 2024; Rivaldi, 2025; Darmawan, 2026)

All dimensions of policy implementation, socialization, coordination, communication, implementer compliance, and supervision have been carried out. However, their effectiveness remains affected by weak continuity in cross-sectoral coordination, limited resources, and supervision that has not been able to ensure comprehensive follow-up (Wibowo & Riswanda, 2026). This finding directly reinforces the normative analysis. The monitoring and evaluation mechanism under Article 5 of the Regent Regulation is textually available. However, gaps remain both at the normative level, particularly in the relationship between evaluation results and follow-up review, and at the implementation capacity level, particularly in further coordination and supervision. The evaluation process has not consistently resulted in policy adjustment.

The findings show that Article 36 of Law Number 24 of 2007, Article 6 of Government Regulation Number 21 of 2008, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023 form a hierarchical regulatory framework. Article 36 establishes the obligation to plan and review disaster management. Article 6 then specifies the planning period and review mechanism. Subsequently, Article 5 of the Regent Regulation translates these requirements into monitoring and evaluation mechanisms at the local level.

This legal construction shows that local regulations do not operate independently. Flood risk management requires relationships among regulations at different levels of government and institutional capacity to integrate responsibilities distributed across those levels. Research on flood risk governance shows that flood risk governance involves institutional arrangements that shape relationships between state and community actors in managing risk. Therefore, vertical consistency among the three provisions cannot be assessed solely by the absence of textual conflicts. It must also be assessed through the ability of each norm to perform a distinct function within a single risk management system. Article 36 serves as the basic norm for planning and review. Article 6 specifies the review period and mechanism. Article 5 serves as the operational norm at the local level through monitoring and evaluation.

Article 5 of the Regent Regulation is significant because it establishes mechanisms for monitoring and evaluating plan implementation. Annual monitoring enables the local government to obtain information on implementation progress, while biennial evaluation provides an opportunity to reassess RPRB implementation. From an adaptive governance perspective, these processes form part of institutional learning. Adaptive governance is characterized by institutional capacity to learn from experience, develop networks, coordinate across sectors, and adjust policies when conditions change.

Accordingly, the evaluation mechanism under Article 5 can be understood as an instrument for generating institutional learning. However, to function as a genuinely adaptive mechanism, information generated through monitoring and evaluation must have a clear connection to decisions concerning the continuation or adjustment of the RPRB. This is important because flood risk is not static. Changes in spatial planning, regional development, rainfall patterns, drainage capacity, population density, and social vulnerability may alter the configuration of risk. This is demonstrated by a spatial study of the impact of urbanization dynamics on flood frequency in Java over the past five

decades (Sejati et al., 2024). Flood risk management therefore requires governance capable of responding continuously to uncertainty and changing conditions.

In Pandeglang Regency, the occurrence of floods after the RPRB was established provides an important context for assessing the regulatory framework's adaptive capacity. The disaster data and risk mapping used in this study are not presented as evidence of the empirical effectiveness of regulatory implementation. Rather, they provide an empirical context for assessing the relevance of the regulatory design to evolving risks. Accordingly, this study remains normative juridical in nature, while risk data are used to assess whether the adjustment mechanisms provided by the norms are adequate. Therefore, the existence of an evaluation mechanism under Article 5 is a positive aspect of the RPRB framework. However, evaluation should not be positioned as the endpoint of the planning cycle. It should instead serve as a source of information for reviewing and improving the plan.

The RPRB of Pandeglang Regency was established for the 2023–2027 period. Normatively, this period is consistent with Article 6 of Government Regulation Number 21 of 2008, which establishes disaster management plans for a five-year period. Therefore, there is no inconsistency between the duration prescribed by national regulations and that of the local planning instrument.

However, consistency in the period of validity does not necessarily establish substantive adaptability. A plan may remain valid for a specified period while its substance may require adjustment when risk conditions change significantly. Within the framework of flood risk governance, an adequate regulatory system must be accompanied by the capacity to align strategies and adjust them to evolving risk conditions . Therefore, the five-year period of the RPRB should be understood as its period of validity, rather than as a restriction on substantive review before that period expires. This interpretation is consistent with Article 6 of Government Regulation Number 21 of 2008, which permits periodic review every two years or at any time when a disaster occurs. From this perspective, Article 5 of the Regent Regulation already provides an entry point for adaptation through monitoring and evaluation. The remaining issue is the absence of an explicit provision linking evaluation results to an obligation to adjust the RPRB when changes in risk conditions are identified.

A flood-resilient governance system requires adequate regulations and the capacity to align strategies and integrate various risk management instruments. This need for integration is also consistent with the importance of harmonizing legislation on disaster management across different levels of government to prevent overlapping and conflicting regulations. Accordingly, this study finds no normative disharmony among Article 36 of Law Number 24 of 2007, Article 6 of Government Regulation Number 21 of 2008, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023. The more appropriate finding is a gap in the adequacy and concretization of the norms, particularly concerning the relationship between monitoring and evaluation results and subsequent review or adjustment of the RPRB.

Based on the overall findings, this study concludes that Article 36 of Law Number 24 of 2007, Article 6 of Government Regulation Number 21 of 2008, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023 are substantively consistent and normatively interconnected. Article 36 establishes the basis for planning and review obligations. Article 6 specifies the planning and review periods. Article 5 operationalizes monitoring and evaluation at the local level.

Regarding the adaptability of Pandeglang Regent Regulation Number 3 of 2023, the regulation contains adaptive elements at the procedural level because it provides periodic monitoring and

evaluation mechanisms. Its validity period is also consistent with the five-year requirement under Government Regulation Number 21 of 2008. However, substantive adaptability is not yet fully ensured. This is indicated by recurring floods in November 2025 and January 2026, which occurred within a period substantially shorter than the formal evaluation cycle. It is also supported by independent empirical findings concerning limitations in cross-sectoral coordination in RPRB implementation (Wibowo & Riswanda, 2026).

Therefore, the existence of an evaluation mechanism cannot be equated with the existence of an adaptation mechanism. Evaluation can serve an adaptive function only when its results are normatively connected to corrective action concerning the plan. This is consistent with adaptive governance, which emphasizes learning, flexibility, coordination, and institutional capacity to adjust actions in response to changing conditions (Nikkanen et al., 2024). It also aligns with global disaster risk governance requirements, which identify strengthened institutional capacity as a prerequisite for effective implementation of disaster risk reduction frameworks. The midterm review of the Sendai Framework for Disaster Risk Reduction 2015–2030 further emphasizes that global implementation gaps lie largely in weak connections among risk data, monitoring systems, and governance institutions. These gaps affect preventive action and concrete policy adjustment rather than the absence of legal frameworks or monitoring mechanisms themselves (UNDRR, 2023).

From this perspective, Pandeglang Regent Regulation Number 3 of 2023 can be considered normatively aligned but not yet optimal in ensuring regulatory adaptability. Its alignment is reflected in the connection among risk-based planning, the five-year period, biennial evaluation, and the review mechanism. Its limited adaptability, meanwhile, is reflected in the absence of an explicit mechanism linking monitoring and evaluation results to substantive changes in the RPRB. Therefore, this study does not merely demonstrate that Pandeglang Regency has a flood risk management regulation. It finds that regulatory adaptability depends on a normative link between evaluation information and decisions to review or adjust the plan. Accordingly, strengthening the regulation does not require changing the RPRB's period of validity. Instead, it requires clearer normative follow-up to monitoring and evaluation results. This would enable evolving flood risks to be addressed through timely policy adjustments with greater legal certainty. The balance between legal certainty regarding the validity of a plan and responsive action to evolving risks is consistent with the view that the objectives of law encompass justice, certainty, and utility, which must be proportionately balanced (Firdaus, 2025).

Discussion

Overall, the findings show that the relationship among Article 36 of Law Number 24 of 2007, Article 6 of Government Regulation Number 21 of 2008, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023 is hierarchical and mutually concretizing. However, the main issue concerns the adequacy of the norms in linking monitoring and evaluation results to the obligation to review or adjust the substance of the Regional Flood Risk Management Plan (RPRB). The existence of formal regulations and institutional structures is not necessarily followed by substantive follow-up mechanisms for evaluation results (Peirisal, 2024). The limited clarity of the legal authority of regional implementing bodies in disaster management further reinforces the need for clear follow-up norms at the operational level (Puspita & Sembiring, 2024).

The findings can be interpreted through the framework of adaptive regulation. This framework emphasizes that the capacity of a rule to evolve with changing conditions depends on four interconnected elements. These elements comprise monitoring infrastructure, review triggers, clear

adaptation pathways, and institutional memory that transforms implementation experience into policy learning (Schrepel, 2026). This argument is relevant because Article 5 of Pandeglang Regent Regulation Number 3 of 2023 fulfills the first element through periodic monitoring and evaluation obligations. However, it does not explicitly formulate the triggers and follow-up pathways. Thus, the regulatory adaptation cycle remains normatively incomplete. This gap is consistent with findings that strengthening environmental disaster governance in Indonesia still faces challenges in linking risk monitoring results to concrete policy action (Husein & Iuchi, 2025). Regulatory responsiveness to changing conditions is also a determinant of successful regional institutional adaptation, alongside infrastructure, information, and coordination mechanisms (Hizbaron et al., 2021). The need for such normative linkage is also consistent with studies on climate and multi-hazard risk governance in Indonesian urban areas. These studies emphasize that sustainable adaptation requires policy mechanisms that explicitly translate risk monitoring results into adjustment decisions, rather than merely providing monitoring data. A systematic review of climate change governance for urban resilience in Indonesia likewise shows that the adaptive dimension of a policy depends more on the clarity of institutional follow-up pathways than on the mere existence of regulations.

The finding concerning the gap between evaluation mechanisms and follow-up review is consistent with the policy evaluation of the Regional Disaster Management Agency (BPBD) of Pangandaran Regency. The evaluation showed that strategic disaster management documents were often not updated periodically despite improvements in the regional resilience index. The main issue therefore concerned the continuity of substantive updates to planning documents rather than the absence of policy instruments (Kesuma & Suwaryono, 2024). Similarly, research on the decentralization of disaster management shows that local government failures to respond adaptively to risks are more often caused by weak connections among policy instruments than by the absence of regulations (Fikri et al., 2025). Research on legal disharmony and disaster risk also shows that the absence of explicit normative links between mitigation instruments and recovery mechanisms is one of the underlying causes of recurring disaster risk governance problems across regions (Wasito, 2025). Thus, the clarity and consistency of norms, which remain insufficiently explicit in Article 5 of the Pandeglang Regent Regulation, are not merely technical-administrative issues. They concern the core of effective disaster risk governance itself.

On the other hand, this study's findings contrast with research on the role of the Bandung Regency Government in addressing flood disaster risk. That study concluded that inter-agency coordination and the institutional capacity of the local BPBD had operated effectively, supported by budgets and facilities from vertical government institutions (Permana, 2023). If this finding were applied generally, the monitoring and evaluation mechanism under Article 5 of the Pandeglang Regent Regulation should also be considered adequate. However, this study demonstrates otherwise. Procedurally available coordination and institutional capacity do not necessarily produce regulatory adaptability. Formally established supervision tends to remain reactive and inconsistent in addressing high-risk areas (Afifah et al., 2026). Research on failures in legal governance of environmental supervision during flash floods also shows that governance failures often originate from fragmented supervisory authority among institutions (Noor et al., 2026). This contrast demonstrates that institutional effectiveness cannot be generalized across regions. It also confirms that normative adequacy remains an independent prerequisite that cannot be fully substituted by implementation capacity in practice.

Theoretically, this study demonstrates that vertical normative coherence and the adaptive capacity of a regulation are two distinct dimensions. They do not necessarily correlate positively. A regulatory system may be fully coherent within a hierarchy, as demonstrated by the relationship among Article 36 of Law Number 24 of 2007, Article 6 of Government Regulation Number 21 of 2008, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023. However, such coherence does not automatically provide sufficient adaptive capacity to address evolving risks. This finding provides a further nuance: strengthening institutional capacity alone is insufficient to ensure successful regulatory adaptation. It must be accompanied by a clear normative relationship between evaluation results and corrective action. Accordingly, this study proposes that the adaptability of disaster risk management regulations should be assessed not only by the existence of evaluation mechanisms. It should also be assessed by the strength of the normative link that closes the cycle between evaluation results and policy review decisions.

Practically, these findings provide important lessons for the Pandeglang Regency Government and other local governments with similar regulatory characteristics. The RPRB implementation task force should establish technical procedures that explicitly require the results of the biennial monitoring and evaluation compilation to be followed by a substantive review of the plan. Such results should not function merely as administrative reports. Governance practices should ideally be strengthened through the formulation of trigger indicators that automatically initiate the RPRB review process when certain thresholds are exceeded. These thresholds may include the frequency of flood events within an evaluation period. The responsible party should also be clearly identified and required to follow up on the indicators until they result in concrete policy decisions.

From a policy perspective, this study recommends that the Pandeglang Regency Government consider revising the wording of Article 5 of Pandeglang Regent Regulation Number 3 of 2023 or issuing implementing technical guidelines. These instruments should explicitly provide that the results of the biennial evaluation must serve as the basis for a decision to review or revise the RPRB. The strengthened provisions should also establish a follow-up deadline, identify the authority responsible for making the review decision, and specify the conditions that trigger the process. Thus, the regulation would not merely contain procedural obligations but would also establish a mechanism capable of closing the cycle between evaluation and policy adjustment. Ultimately, such strengthening would help maintain a balance between legal certainty concerning the validity of the plan and the utility of policy responsiveness to continuously changing risks.

This study confirms that the relationship among Article 36 of Law Number 24 of 2007, Article 6 of Government Regulation Number 21 of 2008, and Article 5 of Pandeglang Regent Regulation Number 3 of 2023 is hierarchically coherent. However, such coherence is insufficient to ensure regulatory adaptability to the evolving dynamics of flood risk in Pandeglang Regency. The most fundamental implication of this finding is that strengthening regional flood resilience requires more than hierarchical compliance among regulations. It also requires a normative design that explicitly connects evaluation results with corrective policy action.

CONCLUSION

This study concludes that Pandeglang Regent Regulation Number 3 of 2023 is normatively consistent with Article 36 of Law Number 24 of 2007 and Article 6 of Government Regulation Number 21 of 2008. These three provisions establish a hierarchical normative relationship. The Law provides the basis for

planning and review obligations, the Government Regulation concretizes the review period and mechanism, while the Regent Regulation operationalizes these requirements through monitoring and evaluation at the local level. Thus, the main issue does not concern disharmony among the regulations. Rather, it concerns the adequacy of the norms in ensuring that evaluation results are translated into actions to review or adjust the plan.

From the perspective of adaptability, Pandeglang Regent Regulation Number 3 of 2023 contains procedural adaptive elements through periodic monitoring and evaluation mechanisms. Its five-year planning period is also consistent with Government Regulation Number 21 of 2008. However, its substantive adaptability is not yet fully ensured because Article 5 does not explicitly link monitoring and evaluation results to an obligation to amend or adjust the RPRB. This finding is increasingly relevant in light of recurring floods in Pandeglang Regency in 2025 and 2026. These events demonstrate that the existence of an evaluation mechanism alone cannot be equated with the existence of an adaptation mechanism.

The main contribution of this study lies in positioning normative coherence and regulatory adaptability as two distinct dimensions for assessing the quality of flood risk management regulations. This study demonstrates that regulatory adaptability depends substantially on the clarity of the normative relationship between evaluation results and policy follow-up. In particular, monitoring and evaluation mechanisms should not stop at the administrative stage. They should function as a basis for corrective decision-making. Theoretically, this study therefore reinforces the understanding that regulatory adaptability cannot be measured solely by the existence of monitoring and evaluation mechanisms. It should also be assessed by the capacity of norms to close the cycle between evaluation, learning, and corrective action.

Practically, these findings show that strengthening Pandeglang Regent Regulation Number 3 of 2023 does not merely require changes to the validity period of the RPRB. It requires clearer normative follow-up to monitoring and evaluation results. The study's normative juridical approach and use of risk data as comparative context limit its ability to assess implementation effectiveness empirically. Further research could therefore examine how these review and adjustment mechanisms are actually implemented by local institutions. Ultimately, this study confirms that regulatory resilience to flood risk is determined not only by consistency among regulations. It also depends on the existence of norms capable of transforming evaluation results into a basis for timely policy adjustment with legal certainty.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the preparation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

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