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Beyond Bureaucratic Rigidity: A Dynamic Capability Framework for Public Sector Disaster Response

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Abstract

This study investigates how public institutions apply dynamic capabilities in disaster management to strengthen adaptability and resilience. The research focuses on institutions such as BNPB and BPBD, collecting data through in-depth interviews, field observations, and document analysis using a qualitative case study approach. Grounded theory elements guide the inductive development of a conceptual framework based on three key components: sensing, seizing, and transforming. The study finds that traditional bureaucratic structures often rigid and hierarchical are poorly suited to handle the fast-paced and complex nature of disasters. Institutions that can detect early signals, coordinate strategic actions, and adapt organizational routines in real time show greater responsiveness. Key enablers of this capacity include technological integration, inter-agency collaboration, and continuous learning processes. The research contributes theoretically by contextualizing the dynamic capabilities framework within public governance, moving beyond its original business-oriented formulation. It offers insights for institutional reform by identifying adaptive patterns in disaster response that can inform more flexible, data-driven, and sustainable emergency governance models. These findings provide a foundation for improving the agility of public institutions in navigating future uncertainties and crisis environments.

Keywords: Dynamic Capabilities, Disaster Management, Adaptive Bureaucracy, Public Technology, Emergency Governance.

INTRODUCTION

Natural disasters such as floods, earthquakes, and pandemics are not merely emergency events that demand state intervention, but also serve as tests of how adaptive and responsive our governance systems are under pressure. In such situations, the speed and accuracy of

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response are critical factors that determine whether the impact is mitigated or the crisis escalates (Rosenbäck & Eriksson, 2024; Wei et al., 2025; Zavattaro & McCue, 2025). Many government bureaucracies remain trapped in slow, hierarchical, and procedure-heavy work patterns, which hinder timely and flexible decision-making (Kristian, 2022). A report from Indonesia's National Disaster Management Agency (BNPB) noted that in 2023 alone, the country experienced more than 4,900 disaster events, with the majority being floods and landslides. Most of these disasters recur annually, indicating a risk cycle that could be better anticipated through early warning systems and rapid response mechanisms. Institutional responses are often hampered by reliance on bureaucratic mechanisms that are misaligned with the dynamic needs on the ground (Liu & Fan, 2023; Valantiejienė et al., 2022).

A similar pattern was observed during the onset of the COVID-19 pandemic. The lack of preparedness in logistics, aid distribution, and coordination between central and regional governments highlighted how rigid bureaucratic systems were ill-equipped to manage rapidly evolving emergency situations. According to a study by the World Bank (2021, as cited in Sørensen & Torfing, 2024), more than 40% of developing countries faced delays in distributing social and medical aid, highlighting the critical impact of administrative inefficiencies and limited organizational adaptability.

It has become increasingly clear that traditional bureaucratic approaches are no longer sufficient. A more agile, adaptive framework is needed—one that is grounded in an organization's ability to learn and change rapidly. This shift is not solely about restructuring, but also about transforming institutional mindsets and cultures, and this is why the concept of dynamic capabilities is highly relevant for disaster management in the public sector, by integrating the abilities to detect change (sensing), respond effectively (seizing), and continuously transform processes (transforming), this framework creates new opportunities for bureaucracies to adapt to the complexity and uncertainty inherent in every disaster (Jiang et al., 2023; Polater, 2021b).

The main weaknesses of traditional bureaucratic disaster response lie in overly long hierarchical structures, slow decision-making mechanisms, and limited capacity to adapt swiftly to changing circumstances. In rigid governmental structures, critical decisions often must pass through multiple layers of authorization—from local to national levels—which ultimately delays concrete action on the ground. When time becomes a critical factor in saving

lives and sustaining affected communities, bureaucracy becomes trapped by rigid administrative procedures (Kristinawati, 2024; Son et al., 2025).

Research by Sanford et al. (2020) on the Hurricane Katrina response in the United States revealed that coordination failures among government agencies were largely due to fragmented authority and a lack of institutional flexibility. The study highlighted how public agencies often operate in policy silos, making them incapable of responding collectively and adaptively. A similar observation was made in the Indonesian context by Syahruddin & Widodo (2019), who found that the government's slow response to Jakarta's floods was closely tied to poor data integration across agencies and cumbersome accountability procedures, and they concluded that the current bureaucratic system is still designed for stable conditions, not for emergencies that require improvisation and rapid action.

According to a report by the OECD (2020, as cited in Monteiro & Adler, 2022), further emphasized that many public sector institutions still lack systems to monitor risks in real time and make flexible, data-driven decisions. This issue stems not from a lack of resources, but from institutional structures that are ill-prepared to handle uncertainty. It is increasingly evident that without a reformulation of institutional approaches—from procedure-focused bureaucracy to a system oriented toward dynamic capabilities—disaster response efforts will continue to lag behind the rapid escalation of crises on the ground.

Disaster environments are often unpredictable and rapidly evolving, demanding responses that are more agile and adaptive than conventional procedural compliance allows. Disasters strike without warning and frequently cause profound disruptions across multiple aspects of community life and social systems. In such contexts, the speed and accuracy of decision-making are critical to reducing negative impacts and saving lives. When public sector organizations are constrained by static, bureaucratic structures, they fail to respond effectively to dynamic and uncertain situations.

This finding is supported by recent research *(Kleinknecht et al., 2015).* who developed the theory of dynamic capabilities, emphasizes that organizations operating in rapidly changing environments must possess the ability to seize opportunities, optimize resources, and continuously adjust to evolving conditions. This means that public organizations need capabilities not only to respond quickly but also to adapt in real time to emerging information and shifting circumstances. For example, during the COVID-19 pandemic, many countries

struggled to adjust their policies swiftly due to layers of bureaucracy that slowed decision-making. In contrast, countries like Taiwan—with more flexible organizational structures based on dynamic capabilities—responded quickly and effectively, implementing appropriate control measures grounded in continuously updated data (Turyahikayo, 2018).

A report published by the United Nations Office for Disaster Risk Reduction UNDRR (2019) also noted that traditional disaster management approaches relying on hierarchical structures and rigid procedures have proven ineffective in the face of large-scale disasters, such as earthquakes or tsunamis. Organizations that can identify and respond to early signals of crises—and that possess the capacity to shift strategies as situations evolve—have a greater chance of mitigating the losses incurred. More agile approaches that accelerate decision-making, enhance inter-agency collaboration, and leverage technology effectively are essential to confront unpredictable disasters (Bertrand et al., 2016; Mazar et al., 2024).

In highly dynamic and uncertain disaster situations, rapid and adaptive responses from public organizations are crucial. Traditional bureaucratic approaches, which are often rigid and hierarchical, frequently hinder the effectiveness of disaster response. A case in point occurred in March 2023 during a landslide disaster in Natuna Regency, Riau Islands. Minister of Social Affairs Tri Rismaharini acknowledged delays in delivering aid to Serasan Island, which took 27 hours via sea route due to access constraints. Normally, aid delivery could be completed in under 24 hours. This example highlights that despite maximum efforts, the existing bureaucratic structure remains insufficiently agile to effectively respond to emergencies in remote areas. Please refer to the following data in figure 1:

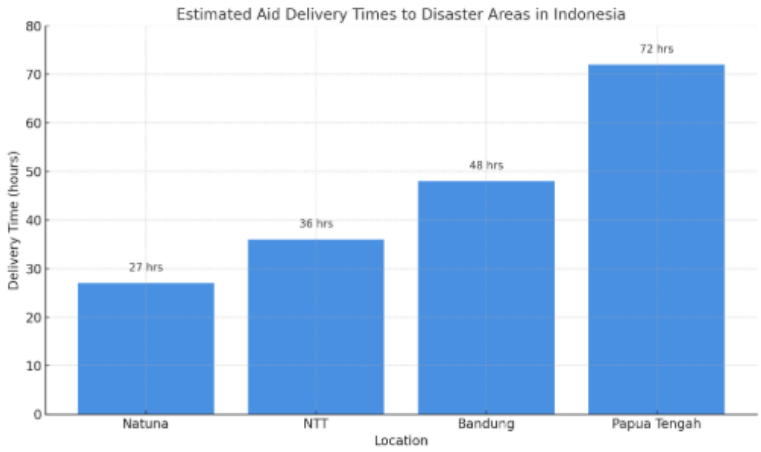

Figure 1. Estimated Aid Delivery Times to Disaster Areas in Indonesia
Source: data proceed

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The visualization above illustrates that the delivery of aid to various disaster-affected regions in Indonesia can take considerable time, especially in remote areas such as Central Papua. This fact highlights the need for a more agile and adaptive approach within public organizational structures to ensure quick and effective responses in emergency situations. Amid the increasing frequency and complexity of both natural and non-natural disasters, the public sector faces significant challenges in ensuring rapid, effective, and adaptive responses. The main issue addressed in this research is how the dynamic capabilities framework can be applied to enhance the ability of public organizations to respond to disasters in a more agile and responsive manner. Rigid bureaucratic structures, with lengthy procedures and hierarchies, often pose barriers to swift and accurate decision-making during emergencies.

Another important issue explored in this study relates to the various factors that can act as both obstacles and enablers in the process of transforming public organizations from a static bureaucratic approach to a more dynamic and adaptive approach, this transformation is not merely a technical issue, but encompasses structural and cultural changes. Within this transformation, challenges include organizational cultures that tend to maintain the status quo, hierarchical leadership models, and institutional structures that lack flexibility. Enabling factors such as visionary leadership, governance reform initiatives, and the use of digital systems capable of processing real-time information are crucial elements in driving public organizations to be more responsive to complex and emergency situations, such as disasters.

This article adapts the dynamic capabilities framework, originally developed in the business context, to analyze disaster response in the public sector. While private firms focus on gaining competitive advantage, public institutions operate under hierarchical structures, legal mandates, and political accountability. In this setting, dynamic capabilities refer not to profit-making but to adaptive governance, institutional responsiveness, and the ability to maintain public legitimacy during crises.

Sensing means more than scanning the environment in public institutions. It involves recognizing early signs of risk across fragmented jurisdictions and diverse community inputs, often without clear incentives or streamlined information flows. Seizing is not only about mobilizing resources but also about navigating administrative procedures and coordinating across agencies under time pressure. Transforming requires adjusting rigid bureaucratic

routines into more flexible, collaborative structures while still adhering to principles of accountability and transparency.

This article moves beyond a simple transfer of business concepts by grounding the framework in the realities of public administration, it reinterprets dynamic capabilities as a set of governance tools that support learning, flexibility, and inter-organizational collaboration—key elements for managing uncertainty in disaster situations.

This study aims to: first, develop a relevant dynamic capabilities framework for disaster response in the public sector, offering an alternative to traditional bureaucratic models. Second, the study will critically analyze the limitations of bureaucracy in disaster management practices, including the structural, cultural, and procedural barriers that frequently arise on the ground. Third, this research aims to identify implementable strategies for applying dynamic capabilities in government systems, considering the socio-political context, technological readiness, and human resource capacity involved.

LITERATURE REVIEW

Bureaucratic Framework in Disaster Management

In assessing the role of bureaucracy in disaster management, we cannot ignore the classical theory of bureaucracy first introduced by Max Weber. According to Weber, bureaucracy is an organizational system based on clear rules and procedures, along with a rigid and formal hierarchical structure. This system is designed to create efficiency, stability, and control within the organization. The main characteristics of bureaucracy, such as a clear hierarchy, strict regulations, and standardized procedures, provide advantages in managing routine and structured tasks. However, when applied in the context of disasters, which require rapid responses and flexibility, the bureaucratic system often reveals significant weaknesses.

Several studies have highlighted the inflexibility of the bureaucratic system in facing crisis situations. For example, research by Prayag et al. (2024) shows that rigid bureaucratic systems become barriers in disaster response, as every step must follow predetermined procedures, which can be highly ineffective in emergency situations. Vanderhorst et al. (2021) argue that while bureaucracy has many advantages in normal situations, in crises requiring rapid and flexible decision-making, bureaucracy is often too slow and unable to accommodate urgent

changes. They note that in disaster management, elements such as fast communication, inter-agency coordination, and flexibility in decision-making are crucial—qualities that rigid bureaucratic structures often fail to provide.

A real-world example of this was seen in the response to Hurricane Katrina in the United States. Various studies, such as those highlighted by Cvetković et al. (2021), describe how the existing bureaucracy exacerbated the situation, with communication barriers between agencies hampered by overly rigid hierarchical structures. Bureaucracy, while effective in routine resource management, is not designed for the flexibility required to respond to large-scale disasters.

Some studies also suggest that bureaucracy is not entirely detrimental in disaster management. Abdullahi et al (2024) argues that bureaucracy, when accompanied by improvements in inter-agency coordination and the development of adaptive capacity, can help in responding to disasters more effectively. Although bureaucracy has weaknesses in rapid response, with proper training and modifications to standard procedures, it can become more efficient in handling crises, the debate on the role of bureaucracy in disaster management reflects the need for a more flexible and adaptive model. The concept of dynamic capabilities, which emphasizes an organization's ability to rapidly adapt to change, emerges as an alternative to overcome the weaknesses of static bureaucracy in crisis situations (Jiang et al., 2022a; Mishra et al., 2022). Previous research clearly illustrates the need for changes in bureaucratic structures to enhance the effectiveness of disaster response.

Dynamic Capability Concept

The dynamic capabilities theory was first developed by Teece, Pisano, and Shuen (1997) to explain how organizations can maintain their competitive advantage in environments full of uncertainty and rapid change. This theory focuses on an organization's ability to adapt to external changes and update its internal resources and skills. Dynamic capabilities differ from operational capabilities, which are static, because they emphasize flexibility, speed, and the ability to innovate in response to changes occurring outside the organization.

Teece and colleagues proposed that to build effective dynamic capabilities, an organization must develop three key components: sensing, seizing, and transforming.

1. Sensing (Opportunity Recognition)

The first component refers to an organization's ability to detect changes or opportunities arising in the external environment, this involves continuously monitoring the evolving situation and emerging needs. In disaster management, for example, the ability to recognize signs of natural disasters or urgent community needs is crucial. (Parsons et al., 2016) stated that this capability allows organizations to capitalize on opportunities that might be missed by more bureaucratic and rigid systems.

2. Seizing (Decision-Making and Exploiting Opportunities)

After identifying opportunities or threats, an organization must be able to take appropriate actions to exploit or address the situation. Rapid decision-making and efficient implementation are key in this regard. In the context of disaster response, this means the ability to quickly coordinate resources and respond effectively to community needs. (Polater, 2021a) argue that the ability to seize opportunities rapidly and make the right decisions is critical for maintaining an organization's competitiveness.

3. Transforming (Organizational and Resource Transformation)

The final component focuses on an organization's ability to transform itself—whether in structure, culture, or internal processes—to ensure that it remains relevant and effective in the long term. In disaster management, this could mean changing procedures or developing new systems to address more complex post-disaster challenges. (Jiang et al., 2022b) emphasized the importance of an organization's capacity to transform in order to maintain its performance amidst a constantly changing environment.

The application of dynamic capabilities theory in the public sector is highly relevant, especially in the context of disaster management. Many studies have shown that the public sector is often hindered by rigid bureaucracy in responding to disasters quickly and effectively. (Polater, 2021b) demonstrated that tightly structured bureaucracies often slow disaster response because existing systems are not flexible enough to handle dynamic situations. In this regard, dynamic capabilities theory offers an alternative approach by emphasizing the importance of flexibility, rapid decision-making, and internal transformation within public organizations to improve disaster response.

A real-world example is found in studies on the response to the 2004 Tsunami. (Wei et al., 2025) observed that countries with better dynamic capabilities, such as Indonesia after the

implementation of a more adaptive disaster risk management system, were able to respond more quickly and effectively compared to more bureaucratic nations. The effective application of the sensing and seizing components enabled public organizations to detect changing needs and coordinate aid efforts more rapidly, and the implementation of dynamic capabilities in disaster management provides a more adaptive and responsive perspective to urgent needs (Fu & Chang, 2019). This is crucial in the public sector, where rapid changes often demand flexibility that rigid bureaucratic structures cannot always provide, public organizations can be better prepared to face the complex and ever-evolving challenges presented by disasters by applying this theory.

Integration of Dynamic Capabilities into the Public Sector

The integration of dynamic capabilities into the public sector has become a topic of interest in recent years, driven by the growing need for organizations to be more flexible, responsive, and innovative in the face of rapid changes and crises. Originally developed for the corporate world, this concept is now being applied to improve efficiency and effectiveness in public sector management, particularly in terms of agility and innovation in public services.

Several studies have explored how agility and innovation can be applied in the public sector to improve responses to the evolving needs of society. (Battisti & Deakins, 2017) in their study on agility in public organizations, emphasized that public sector organizations need to develop the ability to respond to challenges quickly and flexibly, especially in uncertain situations. They identified that the public sector must adopt best practices from the private sector, which focuses on quick responses to external changes, while maintaining the integrity and goals of the organization. (Rosenbäck & Eriksson, 2024) demonstrated that innovation in public services, through the application of dynamic capabilities, can enable organizations to respond more effectively to community needs, especially in emergency situations such as disasters.

One of the greatest challenges in integrating dynamic capabilities into the public sector is changing the rigid bureaucratic culture. Traditional bureaucracy tends to have a highly hierarchical structure, with long and strict processes, which often hinder the agility and innovation needed to deal with crises or rapid changes. (Kaltenbrunner & Reichel, 2018) noted that while bureaucracy excels in creating order and certainty, its structure often slows down

decision-making and the ability to respond to urgent needs. This factor becomes a significant barrier when the public sector faces situations that require flexibility and quick adaptation. Further research by Zavattaro and McCue (2025) indicated that a more adaptive bureaucratic culture is crucial for integrating dynamic capabilities, they suggested that the public sector needs to improve communication and cooperation between agencies, as well as reduce reliance on overly rigid procedures, in order to develop a more flexible response to crises. Jiang et al (2023) argued that while changing the bureaucratic culture is not easy, it is achievable if the public sector begins to recognize the benefits of a more dynamic and innovative approach, particularly in more responsive public services.

The concept of a hybrid model of adaptive bureaucracy emerged, which combines the positive elements of bureaucratic structure with the more flexible dynamic capabilities. Martinelli et al. (2018) proposed this hybrid model for the public sector, which allows organizations to maintain the stability and order offered by bureaucracy, while providing space for faster decision-making and better adaptation to environmental changes. This model integrates flexibility, innovation, and quick response practices within a looser and more collaborative bureaucratic structure.

This hybrid theory is also supported by Loureiro et al. (2021), who argued that in the face of crises or unexpected situations, the public sector needs to combine the strengths of bureaucracy in managing large resources and ensuring tight oversight, with a more open and collaborative approach that allows the organization to adapt quickly to changes. In the context of disasters, for example, this model could enable government agencies to coordinate more effectively, reduce bureaucratic barriers, and quickly respond to urgent community needs.

The integration of dynamic capabilities into the public sector and the implementation of the hybrid adaptive bureaucracy model presents opportunities to enhance flexibility and responsiveness in addressing increasingly complex challenges. While changing the bureaucratic culture requires time and significant effort, previous research shows that with awareness and efforts to improve organizational structures and procedures, the public sector can become more agile and innovative in delivering services to the public, especially in emergency situations and disasters that demand rapid and accurate responses (Loureiro et al., 2021; Valantiejienė et al., 2022; Zavattaro & McCue, 2025).

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RESEARCH METHODS

This study uses a qualitative approach with a case study as its research type, focusing on a deep understanding of the dynamics of public institutions in responding to disasters. This approach allows the researcher to comprehensively explore how the structure, culture, and dynamic capabilities of public organizations adapt in disaster situations. The study also adopts elements of grounded theory, where theory is inductively built from the data collected in the field, allowing space for new insights that emerge from direct interaction with relevant actors (Liu & Fan, 2023). See figure 2.

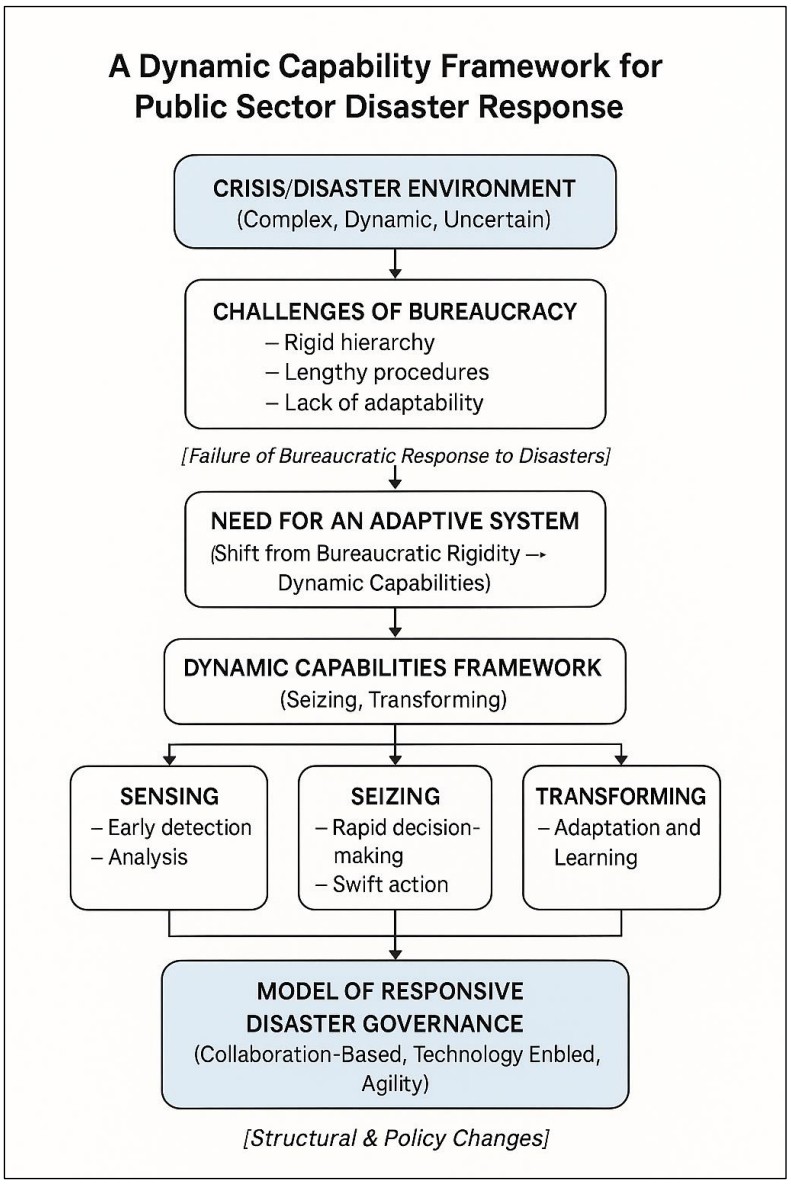

Figure 2. Conceptual Research Framework

The research will focus on institutions directly involved in disaster management, such as BNPB (National Disaster Management Agency) and BPBD (Regional Disaster Management Agency) in certain provinces, or other government agencies with significant roles in disaster response. Data will be collected through in-depth interviews with government officials, volunteers, and other stakeholders involved in disaster response, as well as field observations and the collection of relevant documents. Data analysis will be conducted using thematic analysis or content analysis to form a dynamic framework that illustrates how dynamic capabilities play a role in disaster response, focusing on identifying patterns, challenges, and adaptations in the policies and actions of the organizations. Below is the framework for this research:

RESULTS AND DISCUSSION

Empirical Findings on Bureaucratic Rigidity

One of the key findings in this study is how the rigidity of bureaucracy remains a serious challenge in providing rapid responses to disasters. In the case study conducted in one of the provinces, it was revealed that the overly hierarchical organizational structure and convoluted procedures hindered cross-agency coordination during a flash flood disaster at the beginning of the year.

An interview with an official from BPBD revealed the delays in decision-making during emergencies. They stated, "*We can't immediately distribute logistics because we have to wait for orders from the leadership. That's how the procedure works. Meanwhile, the community has been waiting for help since the night before*." (Interview, 2024). This situation highlighted how the centralization of decision-making was a major obstacle to delivering fast and accurate responses.

This finding is also supported by the testimony of a volunteer involved in the evacuation. They mentioned that information from the command center often arrived late, while on the ground, the situation changed rapidly. "*We had to improvise because there were no clear instructions. Coordination between agencies was also chaotic, everyone was acting on their own*," said one local volunteer (Interview, 2024).

Internal documentation from BPBD analyzed in this study revealed that there were more than eight procedural steps that had to be completed before logistics aid could be officially

distributed, and speed was critical. This finding suggests that, although the bureaucratic system is designed to ensure accountability, in practice, it creates significant operational barriers in emergency situations, this aligns with Weber's critique of the classic bureaucracy model, where the dominance of hierarchy and rigid regulations are often incompatible with the need for a fast-changing and unpredictable environment. The inflexible structure caused fragmented coordination and failures to address on-the-ground urgencies efficiently. This finding emphasizes that while the bureaucratic system aims to maintain order and accountability, without room for adaptation and quick response, bureaucracy can actually slow down the rescue and recovery processes during a crisis. This finding forms a crucial foundation for advocating the integration of dynamic capabilities into the public bureaucracy structure.

Based on field observations and in-depth interviews, this study successfully identified several bureaucratic processes that were unresponsive to urgent needs during disasters. These processes not only slowed actions on the ground but also created confusion and fragmentation among technical implementers. The process of approving logistics aid emerged as a major obstacle. In several BPBD offices, logistics delivery required multi-level approvals from the head of the department to the regional secretary. According to one logistics officer, this procedure could take 4 to 6 hours, or even longer if it occurred outside working hours. In disaster situations, where food, medicine, and emergency shelter are urgently needed, these delays have fatal consequences.

Furthermore, cross-agency coordination systems often failed to operate effectively due to discrepancies in standard operating procedures (SOPs) and sectoral egos between institutions. In one instance, the health team from the regional health department could not immediately join the evacuation team because they were waiting for an official assignment letter signed by the department head. An official mentioned, "*There is a fear of making quick decisions because they are worried about breaking the rules. In the end, everyone waits for instructions, and no one really moves.*" (Interview, 2024).

The last factor analyzed is the use of information technology and reporting systems, which also became a weak point. Reporting of the field situation to the command center is still done manually through written reports or informal text messages, this factor was a key cause of delayed data transmission, and sometimes the data sent was inconsistent between

agencies, making it difficult for the command center to determine priority affected areas and the types of aid needed.

The recruitment of volunteers and distribution of roles was also considered slow. Although the community showed high enthusiasm to help, there was no rapid system to organize and map their skills. Many volunteers complained about the lack of clear directions and the absence of an effective coordination point, these findings suggest that bureaucracy in disaster management still relies heavily on administrative procedures that are not adaptive to the urgency and complexity on the ground. These processes need to be re-examined to align better with the principles of flexibility and dynamic capabilities, especially in dealing with unpredictable crisis conditions, and the integration of technology, delegation of more authority at the operational level, and the establishment of rapid response protocols are urgent measures that need to be implemented.

Identifying Dynamic Capabilities in Disaster Response Practices

To understand how public institutions begin to move beyond bureaucratic rigidity in responding to disasters, this study examines the extent to which elements of dynamic capabilities have been implemented in the field. Based on Son et al.'s (2025) approach, dynamic capabilities consist of three main elements: sensing, seizing, and transforming. The three serve as a framework for measuring institutional adaptability in the context of a crisis. The following table presents field findings that show how each of these elements emerge in the context of disaster management bureaucracy at the research location in table 1:

Table 1. Identifying Dynamic Capabilities in Disaster Response Practices

Dynamic Capability Component	Observations from the Field	Challenges Identified
Sensing (Risk Detection)	- Early warning systems (EWS) installed in several regions. - Community-based disaster risk mapping initiatives.	- Limited coverage of EWS in remote areas. - Data not always integrated between agencies.
Seizing (Decision-Making & Resource Allocation)	- Some BPBDs empowered to make rapid decisions at operational level. - Flexible use of local volunteers and partnerships with NGOs.	- Decision-making still centralized in many cases. - Resource allocation often delayed due to bureaucratic approval layers.

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Transforming (Organizational Learning)	- After-action reviews (AAR) conducted after major disaster events. - Adjustment of SOPs based on past experience (e.g., COVID-19 protocols integrated).	- Lessons learned not consistently documented or institutionalized. - High turnover of staff limits long-term knowledge retention.

Source: data proceed

It can be observed that the element of sensing has begun to develop through the use of early warning systems and community involvement in risk mapping. However, the biggest challenge remains the fragmentation of data and the lack of infrastructure in remote areas. In terms of seizing, some regions have shown good initiatives in making quick decisions and being flexible in resource usage. Cooperation with local NGOs allowed for faster responses in the early stages of the disaster, the centralization of authority and administrative procedures remain the main barriers to accelerating action.

The transforming aspect shows great potential in building long-term capacity. Post-disaster evaluations are conducted, but the results have not been fully integrated into new policies and procedures. The high turnover of officials leads to the loss of institutional knowledge, which should be an essential asset in building an adaptive organization. We need to take a closer look at two very different approaches: the traditional bureaucratic system and the dynamic capabilities approach, as they represent contrasting views on the role of public institutions in responding to crises. The bureaucratic approach typically relies on hierarchical structures, strict rules, and uniform procedures, while the dynamic capabilities approach encourages organizations to be more responsive to change, act quickly on emerging opportunities, and continuously learn and adapt from experiences. To clarify the differences between the two, a systematic comparison table is presented in table 2:

Table 2. Comparison: Bureaucratic System vs. Dynamic Capabilities Approach

Aspect	**Bureaucratic System**	**Dynamic Capabilitie Approach**
Structure	Rigid, hierarchical	Flexible, adaptive network
Decision-Making	Centralized, procedural	Decentralized, responsive
Resource Allocation	Fixed and pre-defined	Fluid, based on real-time needs
Innovation	Low; changes require formal approval	High; encourages experimentation and improvisation
Response Speed	Slow due to approvals and SOP layers	Fast due to empowerment at operational level

Learning Process	Limited, often not institutionalized	Continuous learning through feedback and iteration
Risk Management	Reactive; follows predefined guidelines	Proactive; anticipates risks through sensing capabilities
Technology Use	Often outdated, fragmented	Integrated, real-time data utilization
Cultural Orientation	Compliance-driven	Outcome-driven

Source: data proceed by Author

Field data indicates that the bureaucratic approach still dominates disaster management systems across various government agencies. Rigid organizational structures, reliance on written regulations, and complex reporting procedures often delay and misalign response efforts. However, elements of dynamic capabilities are beginning to emerge in certain contexts, such as community-based emergency response initiatives or cross-sector collaboration with NGOs and the private sector. Examples include rapid volunteer allocation, real-time field data usage for decision-making, and flexibility in emergency logistics deployment.

The dynamic capabilities approach remains sporadic and has not yet become an integrated institutional framework. Its success largely depends on progressive leadership or ad hoc initiatives from local actors. There is a need for institutional design that enables public bureaucracy to transform into a more agile, innovative, and learning-based system, without sacrificing its accountability as a state institution. This comparison serves as an important foundation for developing a hybrid governance model that combines the formal structure of bureaucracy with the flexibility of adaptive systems, aimed at creating resilient disaster response capacity (Jiang et al., 2022b; Polater, 2021a).

Proposed Dynamic Capability Framework for Disaster Response

The proposed Dynamic Capability framework for disaster response is based on the urgent need for more adaptive, responsive, and learning-based public organizational structures. In the context of disaster management, the framework integrates three key components of dynamic capabilities—sensing, seizing, and transforming—into the working systems of public institutions, both at the central and regional levels. See figure 3.

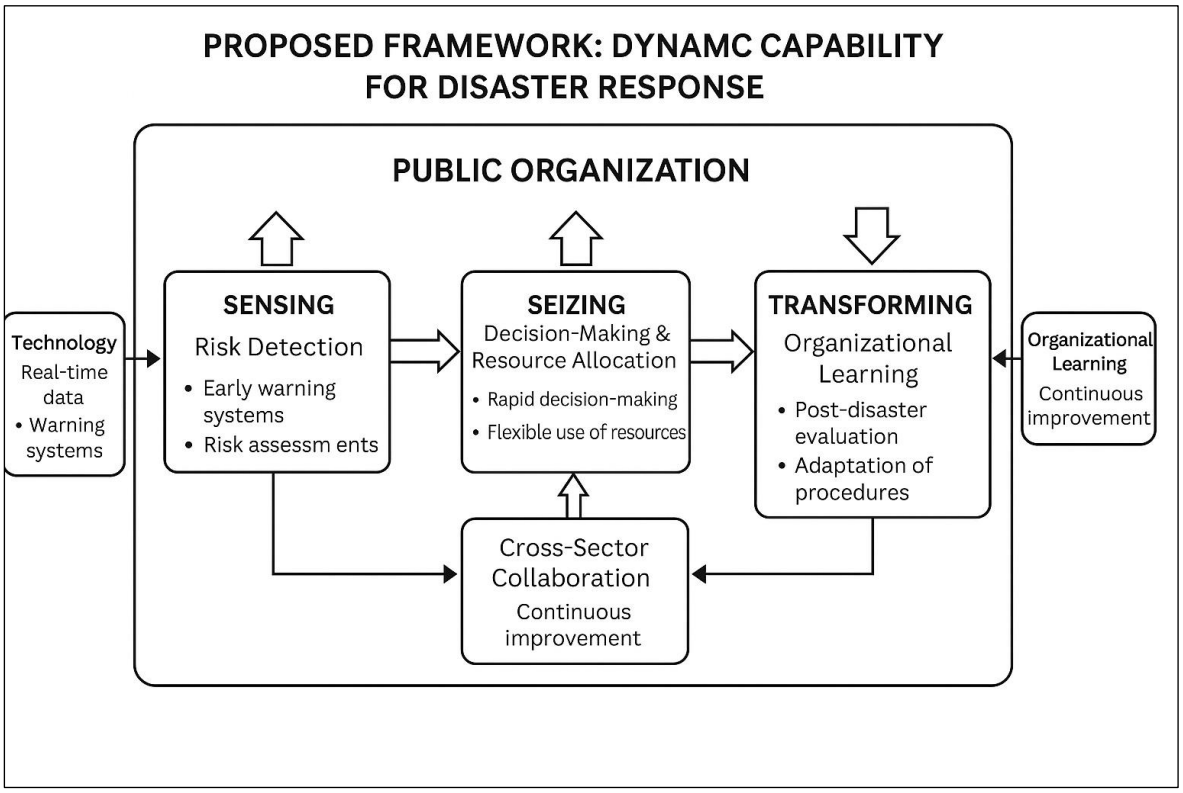

Figure 3. Proposed Dynamic Capability Framework for Disaster Response

The dynamic capability approach offers a more adaptive and responsive framework compared to the traditional bureaucratic model. This model consists of three main stages—sensing, seizing, and transforming—which are interrelated and form a continuous organizational learning cycle.

The first stage, sensing, involves the ability to detect risks early. This is a crucial foundation, as only by understanding threats early can public organizations avoid delays in their response. Detection relies not only on technology-based early warning systems such as the Internet of Things (IoT), GIS, or artificial intelligence (AI), but also on robust networks with local communities. Information from these various channels must be processed in real time to produce a comprehensive and swift understanding of potential crises. As (Jiang et al., 2022a) emphasize, the use of digital technologies can accelerate the flow of information and support more accurate decision-making in emergency situations.

The next stage, seizing, is the process of capturing opportunities and mobilizing resources strategically once a risk is detected. This phase underscores the importance of flexibility. Rigid bureaucracy must be replaced with fast, contextual decision-making

mechanisms, while still maintaining accountability, this process demands the empowerment of operational units in the field, granting them certain autonomy to act based on the conditions they face. It also requires cross-sector collaboration, including with NGOs, the private sector, academia, and civil society. Vanderhorst et al. (2021) show that collaborative networks can enhance coordination effectiveness in disaster responses, especially in complex, multi-actor situations. Technology also plays a role in this stage by supporting logistics management, aid distribution tracking, and efficient resource allocation through digital platforms.

The final stage, transforming, is a pivotal moment for organizational reflection and learning. Every disaster should not only result in administrative reports but should serve as the basis for concrete changes in policy, operational procedures, and even organizational culture. This process is at the heart of organizational learning. Referring to Argyris and Schön's (1978) concept of double-loop learning in (Kleinknecht et al., 2015), organizations need to have the courage to challenge their core values and assumptions when they are no longer relevant. Kristinawati (2024) also emphasizes that post-crisis strategy and organizational structure updates are crucial for improving institutional resilience, this dynamic capability framework is not just a theoretical construct, but is also supported by various studies. (Martinelli et al., 2018) highlight that dynamic capabilities play a significant role in driving innovation and effectiveness in the public sector. Research by Sanford et al. (2020) shows that public organizations that adopt these principles are better prepared to face uncertainty and engage in adaptive reforms. Handelman (1981) stress that the ability to continuously transform is key to maintaining sustainability and competitiveness.

The dynamic capability model requires governments to reframe disaster management policy frameworks that are not only procedural but also adaptive and contextual, this process demands a shift from rigid command systems to more flexible, responsive, and locally capacity-based management systems (Kristian, 2022). Both central and regional governments need to design regulations that promote the establishment of rapid response units at the local level with clear operational autonomy, as well as emergency response procedures that are modular and adaptable to various types of disasters. Policy reforms must also allow for dynamic post-crisis evaluation and learning mechanisms that go beyond mere administrative formalities.

Future public policies must incorporate the principles of flexible and adaptive emergency governance, supported by a reliable data ecosystem. The government needs to build a national disaster information system that integrates multi-sector data in real-time—covering weather, infrastructure, logistics, socio-economic factors, and data from digital community platforms. With this approach, decision-making can be faster and more accurate, avoiding misinformation and overlapping coordination. Flexible governance also means creating spaces for collaboration with non-governmental sectors without bureaucratic barriers that hinder field effectiveness, as demonstrated in various crisis collaboration studies.

Technology cross-sector collaboration, and organizational learning serve as critical enablers that operationalize the three dimensions of dynamic capabilities in disaster management. In the sensing phase, real-time data systems, early warning technologies, and digital platforms enhance the ability of public institutions to detect emerging risks. During the seizing phase, collaboration with NGOs, private actors, and local communities enables faster mobilization and allocation of resources beyond bureaucratic constraints. In the transforming phase, continuous learning—through after-action reviews, simulations, and embedded feedback loops—supports the restructuring of routines and the institutionalization of adaptive practices.

The implementation of these enablers often faces significant barriers. Institutional resistance to change, especially in rigid bureaucracies, limits the integration of new technologies and cross-sector initiatives. Data fragmentation, limited digital infrastructure, and the absence of interoperable platforms hinder the use of real-time information for decision-making. Moreover, hierarchical culture and siloed governance structures restrict knowledge sharing and slow down organizational learning. Addressing these challenges requires not only technical solutions but also cultural and structural shifts within public organizations, reforms that promote openness, interoperability, and collaborative governance are essential to unlocking the full potential of dynamic capabilities in disaster contexts.

Good policy should also support social innovation and the active involvement of civil society at every stage of disaster management—ranging from planning, mitigation, and response, to recovery. Strengthening public engagement can be achieved through the integration of citizen reporting apps, crowdsourced data, and community-based participation models in the creation of local risk maps. The government must adopt a participatory

approach that not only listens to community aspirations but actively involves them in the formulation and implementation of policies, this approach broadens the concept of governance, shifting it from being state-centered to encompassing various actors in the crisis response ecosystem.

CONCLUSION

This study concludes that strengthening disaster management in the public sector requires the adoption of a dynamic capability framework that incorporates sensing, seizing, and transforming capacities. Unlike traditional bureaucratic approaches, this framework supports more adaptive, responsive, and learning-oriented institutions capable of navigating uncertainty. This model contributes to the extension of dynamic capabilities beyond the business context by contextualizing it within public governance, particularly under crisis conditions. The integration of technology, cross-sector collaboration, and organizational learning has been shown to enhance institutional responsiveness at each stage of crisis management. To translate this model into action, policy reforms are needed that promote real-time data systems, flexible inter-agency protocols, and learning mechanisms embedded within public institutions. Bureaucracies must evolve from rigid, rule-bound structures into agile organizations capable of proactive risk detection, rapid resource mobilization, and continuous transformation. Such transformation demands more than structural changes, it requires shifts in institutional culture, leadership orientation, and performance incentives. This study offers a foundation for building a more adaptive, accountable, and sustainable emergency governance system that aligns with the complex realities of disaster response by bridging theory and practice.

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