

Strategy of Bekangdam Jaya in Logistic Distribution for Flood Disaster Mitigation in Jakarta Region 2020-2025

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Abstract

Flood disaster management in DKI Jakarta demands a rapid, precise, and coordinated logistics distribution strategy. As the center of government and economy, paralysis due to flooding in Jakarta has a systemic impact. Bekangdam Jaya, as a support unit of Kodam Jaya, plays a strategic role in supporting the Regional Government through the provision of infrastructure, personnel mobilization, and aid distribution during emergency response, in accordance with the mandate of Law Number 34 of 2004 concerning the TNI. The problem in this research is how Bekangdam Jaya's strategy in distributing logistics for flood disaster management in the Jakarta area. This study aims to analyze the capability of facilities and infrastructure (Means), the effectiveness of operational distribution (Ways), and to formulate a strategy for optimizing logistics distribution (Ends) using the Arthur F. Lykke Jr. strategy framework. The research method used is qualitative with a case study design. Data was collected through in-depth interviews with informants from Bekangdam Jaya and BPBD DKI Jakarta, field observations, and analysis of related documents. The results show that Bekangdam Jaya has strong logistics capabilities, including a transport fleet, rubber boats, field kitchens, and trained personnel. However, the effectiveness of distribution is still hampered by inter-agency coordination constraints, the accuracy of dynamic logistics needs data, and accessibility challenges in flooded areas. The discussion emphasizes the gap between potential capabilities and their realization in the field due to coordination friction and information systems. Optimization of the logistics distribution strategy requires strengthening civil-military interoperability through the refinement of joint Standard Operating Procedures (SOPs), the implementation of an integrated data system for real-time information management, and the decentralization of logistics by pre-positioning in flood-prone areas. With a strategy that is aligned between Ends, Ways, and Means, the effectiveness of the disaster logistics response can be increased, thereby supporting the acceleration of handling flood victims in Jakarta.

Keywords: Bekangdam Jaya, disaster logistics, Jakarta flood, distribution strategy, Lykke's Ends-Ways-Means Strategy

1. INTRODUCTION

The Special Capital Region of Jakarta (DKI) is one of the urban areas with a high level of vulnerability to hydrometeorological disasters, particularly flooding. As the centre of national government, economy, and services, paralysis due to flooding in Jakarta can have a significant systemic impact. Data from the National Disaster Management Agency (BNPB), shows that Jakarta consistently faces the threat of flooding every year due to a combination of factors, including high rainfall, land subsidence, land use changes, and an inadequate drainage system. (BNPB, 2021). Its geographical condition, which is traversed by 13 major rivers and its position in a low-lying coastal area, makes Jakarta a region that is naturally prone to flooding. The complexity of this problem requires extraordinary preparedness and response capacity from all stakeholders, especially the Provincial Government of DKI Jakarta as the main responsible party. The threat of flooding in Jakarta is not merely a theory, but a recurring reality with increasingly massive impacts. Data from the National Disaster Management Agency (BNPB) shows that in the last five years (2020-2025), Jakarta has experienced several major floods that have caused material losses and casualties.

The major flood in early January 2020 was one of the worst, with 390 neighbourhoods in 151 sub-districts from 35 districts submerged for four days. This disaster caused more than 90,000 people to be displaced and resulted in 66 fatalities in the Greater Jakarta area (BNPB, 2020). Material losses are estimated to have reached trillions of rupiah due to damage to infrastructure, settlements, and the paralysis of economic activity. A similar incident occurred in March 2025, when extreme rainfall once again hit Jakarta and its surrounding areas. This flood caused 9 deaths and forced more than 90,000 people to evacuate. According to data from the Jakarta Provincial Disaster Management Agency (BPBD DKI Jakarta), the floods affected 62 neighbourhoods (RT) spread across 17 sub-districts (BPBD DKI Jakarta, 2025). The high intensity and frequency of these floods underscore the urgency of optimising the emergency response system, particularly in terms of the distribution of humanitarian logistics, which is the backbone of rescue operations and the fulfilment of the basic needs of victims.

Figure 1.1 shows the Administrative Map of DKI Jakarta Province, which consists of five administrative cities and one administrative district, namely Central Jakarta, West Jakarta, East Jakarta, North Jakarta, South Jakarta, and Kepulauan Seribu District. This region It has a land area of approximately 662.33 km² and a sea area of 6,977.5 km², making it one of the most densely populated metropolitan areas in Southeast Asia.



Figure 1. Map of Jakarta

Source: BPK Representative Office of DKI Jakarta Province

The city is crossed by 13 major rivers and surrounded by areas with high rainfall intensity, such as Jakarta and Depok. This makes Jakarta highly vulnerable to flooding from upstream areas, compounded by poor urban drainage and the high rate of conversion of green open spaces into residential and industrial areas. Flooding in Jakarta is also often exacerbated by tidal phenomena or rob, which obstructs the flow of rivers into the northern sea of Jakarta. According to data from the Jakarta Regional Disaster Management Agency (BPBD), in early 2021 there was flooding that flooded more than 200 neighbourhoods in Jakarta and caused more than 1,000 residents to evacuate.

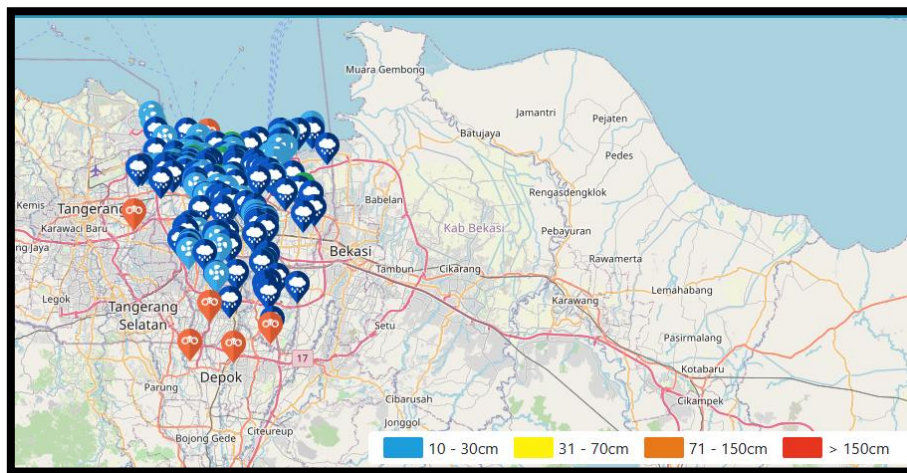


Figure 2. Map of flood-prone areas in DKI Jakarta

Source: DKI Jakarta Regional Development Board
(<https://pantaubanjir.jakarta.go.id/peta-informasi-banjir>)

2. RESEARCH METHOD

Qualitative research methods were the primary choice for this study. This approach was chosen for its ability to explore the meanings, perceptions, and experiences of research subjects in depth within their natural context. As explained by Sugiyono (2017), qualitative research aims to examine an object in its actual conditions, with the researcher acting as the key instrument. The focus on understanding meaning is prioritised over the measurement of quantitative variables alone. In line with Creswell's (2014) view, which emphasises that the purpose of qualitative research is to explore and understand the meaning given by individuals or groups to a social phenomenon or problem, this study will explore the perceptions and experiences of various stakeholders. The parties involved include Bekangdam Jaya personnel as the main distributor, representatives of the local government as coordination partners in the field, and the community as recipients of logistical assistance during the flood disaster.

In the context of optimising Bekangdam Jaya's logistics distribution in flood disaster management in Jakarta, a qualitative approach is highly relevant. This study will

focus on gaining an in-depth understanding of how the logistics distribution mechanism operates, identifying the obstacles encountered during disaster management, and exploring ways to optimise the effectiveness and speed of distribution to support the success of humanitarian operations in handling flood victims.

Research Design, This study employs a qualitative approach with a case study design. This design was chosen based on the consideration that the research aims to analyse in depth complex contemporary phenomena in a real-life context. According to Yin (2018), case studies are an appropriate method when researchers want to answer the questions ‘how’ and ‘why’ regarding an ongoing phenomenon, where researchers have little or no control over the events. the case study design in this research allows researchers to explore holistically and deeply the logistics distribution strategy of Bekangdam Jaya, including the context, processes, and dynamics surrounding it. The research subjects were individuals who served as key informants in this study. Research subjects were selected using purposive sampling based on the following criteria: (1) directly involved in the decision-making process or implementation of flood disaster logistics distribution; (2) have adequate knowledge and experience regarding the research topic; and (3) willing to be interviewed and provide the required information. The research subjects in this study included key personnel from the Jakarta Military Command and the DKI Jakarta Regional Government.

The research object is the phenomenon or subject that is the focus of this study. The research objects in this study include: Logistics Distribution Strategy, Coordination Mechanism: Operational Procedures: Standard Operating Procedures (SOPs), Facilities and Infrastructure Capabilities, Challenges and Obstacles.

3. RESULTS AND DISCUSSION

This discussion aims to analyse the strategies implemented by Bekangdam Jaya in the distribution of flood disaster relief logistics in the Jakarta area for the period 2020-2025, with reference to Arthur F. Lykke Jr.'s (1989) strategic theory framework, which includes Ends (Goals), Ways (Methods), and Means (Resources). This discussion will

integrate the results of the analysis of infrastructure capabilities (Means), operational effectiveness (Ways), and potential for strategic improvement (Ends) with relevant theories and previous research.

Discussion of the Capabilities of Means and Infrastructure for Logistics Distribution in the Jaya Military Command. The analysis shows that Bekangdam Jaya has adequate basic facilities and infrastructure in terms of asset availability to support the distribution of flood disaster relief logistics in Jakarta. These assets include a sufficient number of logistics vehicles, rubber boats, and field kitchens to support emergency response operations. This is in line with the capability theory view that refers to the Resource-Based View (RBV) by Barney (1991), in which physical assets (facilities and infrastructure) are one of the domains of capability that contribute to operational effectiveness. The availability of these assets is the initial foundation for Bekangdam Jaya in carrying out its functions. However, the effectiveness of utilising these facilities and infrastructure is still hampered by technical and structural factors. Technically, it has been found that most logistics vehicles are old (10-15 years). These ageing vehicles are prone to more frequent breakdowns, which leads to increased maintenance costs and potential delays in distribution when needed. The limitations of the age and technical condition of these facilities can disrupt operational smoothness in the context of the Humanitarian Supply Chain (Thomas & Kopczak, 2005), which demands agility (agile supply chain) and supply chain reliability. Structurally, the logistics system, which is still centralised in East Jakarta, poses a significant obstacle. This centralisation creates disparities in response times to other areas, particularly North and West Jakarta, which are often affected by flooding. This contradicts the principle of pre-positioning strategy, which is part of humanitarian supply chain theory, whereby placing logistics stocks in strategic locations can speed up response times. The centralisation of logistics can also hamper the last-mile distribution process, which is crucial in delivering aid to affected victims. In terms of means (facilities), Bekangdam Jaya already has sufficient assets. However, to improve effectiveness, it is necessary to upgrade facilities to overcome technical constraints and decentralise the logistics network to address structural barriers, thereby accelerating and streamlining the distribution process. Hidayat's (2023) research, which

examines the optimisation of the role of supply and transport units (Bekang) in the context of Military Operations Other Than War (OMSP) for natural disaster management, is also relevant in this context, as it highlights the importance of the readiness and modernisation of the facilities owned by Bekang units to deal with natural disaster challenges.

Discussion on the Operational Effectiveness (Ways) of Logistics Distribution between Bekangdam Jaya and Local Government. Operational coordination between Bekangdam Jaya and local government in the distribution of flood disaster relief logistics in Jakarta demonstrates effectiveness at the policy and macro command levels. The command mechanism, which has been implemented in accordance with standard operating procedures (SOPs), ensures synergy between Bekangdam Jaya, the Regional Disaster Management Agency (BPBD), and the Social Services Agency, while minimising potential overlaps in authority. This confirms that Ways (Methods) in the form of sectoral coordination have been structurally established, in accordance with the mandate of Law Number 24 of 2007 concerning Disaster Management, which emphasises the principles of being planned, integrated, coordinated, and comprehensive. However, this effectiveness faces significant obstacles at the operational and tactical levels. One of the main obstacles is the weakness of the information system. Inconsistencies between data on logistical needs in the field and data at headquarters can cause delays in the distribution process. This is particularly crucial in disaster management, where the speed and accuracy of information is critical to the success of operations, in line with the principles of supply chain management that emphasise the importance of visibility and smooth information flow.

In addition, field coordination relies heavily on unintegrated personal communication. Although personal communication can sometimes speed up certain aspects, its unstructured nature has the potential to cause misunderstandings (miscommunication) and a lack of adequate documentation. In the context of disaster management theory, an effective response requires clear and accurate communication at all levels, not just relying on informal communication. The effectiveness of operational coordination between Bekangdam Jaya and local governments has been established at the Ways level structurally. However, there is a need to strengthen the integrated information

system and develop formal communication mechanisms at the tactical level to improve the speed and accuracy of information and minimise operational obstacles in the field.

Santoso's (2021) research, which analyses the cooperation mechanism between Kodam Jaya and the DKI Jakarta Provincial Government in flood disaster management, is highly relevant here, as it can provide insight into the coordination patterns that have been established and the areas that still need improvement in operational implementation in the field.

Discussion on Improving Logistics Distribution Strategies (Ends) for the Jaya Military Command. All stakeholders have demonstrated a shared commitment to transforming logistics distribution strategies. This change is moving away from a reactive approach, where aid is distributed after a disaster has occurred, towards a more anticipatory and adaptive approach. An anticipatory approach involves preparedness efforts before a disaster occurs, while an adaptive approach means the ability to adjust strategies in line with the dynamics of conditions on the ground. This change is in line with Lykke Jr.'s (1989) strategic framework, which emphasises balancing Ends (Goals) with Ways (Methods) and Means (Resources) to achieve policy objectives effectively, while also considering risks. The construction of satellite warehouses in flood-prone areas is a priority in the decentralisation strategy for logistics networks. This measure aims to speed up response times, which are a crucial element in the response phase of the disaster management cycle (Carter, 2008) and also embody the pre-positioning strategy. With logistics stocks closer to the affected areas, the distribution process, especially last-mile distribution, can run more efficiently. The integration of digital information systems is key to creating real-time coordination and minimising errors in distribution. An integrated information system will support an agile supply chain (Thomas & Kopczak, 2005) by providing comprehensive visibility of stock availability, requirements and distribution status. This will minimise the potential for miscommunication that often occurs in informal coordination.

Modernising infrastructure and increasing human resource capacity through technology training are other important components. Personnel need to be equipped with

the ability to utilise modern technologies such as Geographic Information Systems (GIS) and drones. The use of GIS can assist in mapping affected areas, identifying the safest and most effective distribution routes, and estimating logistics requirements more accurately. Meanwhile, drones can be used for rapid surveys in hard-to-reach areas or for logistics delivery in the early stages towards the last mile. This modernisation of facilities and training will simultaneously improve the capabilities of Means and Ways.

The Special Capital Region of Jakarta (DKI), as the centre of Indonesia's government, economy and society, consistently faces the challenge of hydrometeorological disasters, particularly flooding. This phenomenon is caused by a combination of natural factors such as extreme rainfall and land subsidence, as well as anthropogenic factors such as massive urbanisation and suboptimal drainage management (National Disaster Management Agency [BNPB], 2021). The period from 2020 to 2025 is a crucial time frame in which the intensity and impact of flooding show a significant trend, requiring a rapid and coordinated response from various stakeholders. In disaster emergencies, the Indonesian National Armed Forces (TNI) plays a vital role through Non-War Military Operations (OMSP), as mandated by Law No. 3 of 2025 on the TNI.

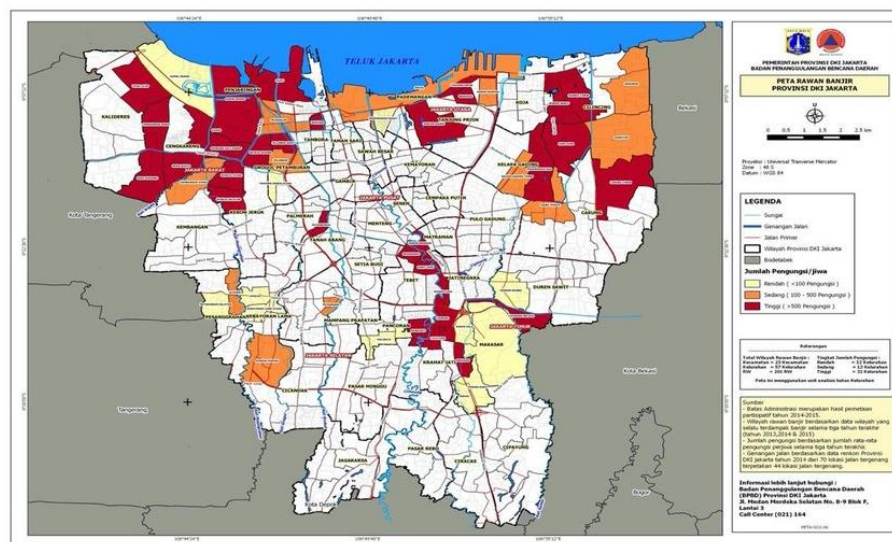


Figure 3. Map of Flood-Prone Areas in DKI Jakarta

Source: BPBD DKI Jakarta

In the Kodam Jaya region, logistics distribution is the primary responsibility of the Kodam Jaya Supply and Transport Unit (Bekangdam). This unit is the backbone in ensuring that humanitarian aid, ranging from food, clean water, medicine, to evacuation equipment, reaches the affected victims in a timely manner, in the right quantities, and to the right targets. The complexity of Jakarta's densely populated urban terrain, accessibility hindered by flooding, and the fluctuating needs of victims create unique logistical challenges. Therefore, an in-depth analysis of Bekangdam Jaya's strategies, capabilities, and operational effectiveness in the humanitarian supply chain is essential to identify strengths, weaknesses, and areas requiring improvement to optimise flood disaster response in the future.

Capabilities of Logistics Facilities and Infrastructure (Means) of the Jaya Military Command Bekangdam Jaya is an administrative unit under Kodam Jaya whose main task is to provide operational logistical support, particularly in the areas of supply and transport. Structurally, Bekangdam Jaya is under the direct supervision of the Army Supply and Transport Centre (Pusbekangad) and acts as the spearhead of logistics distribution in the capital region, which is geographically densely populated and prone to natural disasters such as flooding. In the context of disaster management, military logistics capabilities, including speed, accuracy, and distribution coverage, are greatly influenced by the quality and quantity of logistics means or facilities and infrastructure. These facilities and infrastructure include land and water transport fleets, storage facilities, specialised equipment, and support systems such as communications and logistics processing. The assessment of these capabilities is not only based on the number of assets, but also on operational readiness, operational capabilities in difficult terrain, and the level of integration within the national logistics system. Quantitatively, in early 2020, when severe flooding occurred in Jakarta, Bekangdam Jaya deployed 52 multi-purpose transport trucks, consisting of Liaz 110 and Reo M35 types. This fleet has an average carrying capacity of 5 to 7 tonnes and is designed for high mobility in semi-offroad terrain and urban roads (Pusbekangad, 2020). In addition to land trucks, this unit is equipped with 20 LCR (Landing Craft Rubber) rubber boats capable of carrying up to 15 personnel or 1.5 tonnes of logistics. These boats play a vital role in accessing flood-

isolated areas, particularly in East and North Jakarta regions such as Cipinang and Marunda. In addition to transport vehicles, Bekangdam Jaya also has four field kitchens capable of producing 1,000 servings of ready-to-eat meals per hour. These field kitchens are used intensively during emergency response periods to provide food for affected victims and disaster management personnel (Susilo, 2019). The existence of these units shows that Bekangdam Jaya's logistics capabilities not only include transportation but also the production of basic necessities in the field.

The main infrastructure support is centred at the Kramat Jati Integrated Logistics Warehouse in East Jakarta, which functions as the main logistics hub in the military logistics supply chain in the DKI Jakarta area. This warehouse has a storage capacity of up to 1,200 tonnes of logistical aid, including food, clean water, medicines and hygiene equipment. The facility is equipped with a digital-based inventory management system, enabling rapid tracking and packaging prior to distribution (Kodam Jaya, 2020). However, as identified in Susilo's (2019) research, military logistics capabilities in the context of disasters are not solely determined by the quantity of assets. Operational readiness and adaptability are critical indicators. In the context of Bekangdam Jaya, despite having a significant fleet, there are challenges related to the average age of transport vehicles, particularly Liaz trucks, most of which are over 20 years old. This condition affects the mean time between failures (MTBF), which in turn impacts distribution performance when needed urgently.

Operational Effectiveness (Ways) of Logistics Distribution between Bekangdam Jaya and Local Government. Operational effectiveness in disaster management is highly dependent on synergy and interoperability between military and civilian agencies. In Jakarta, the main working relationship is between Bekangdam Jaya and the DKI Jakarta Regional Disaster Management Agency (BPBD) as the main coordinator at the regional level. The existing working mechanism generally begins with an official request from the DKI Jakarta Provincial Government to Pangdam Jaya, which is then forwarded as an operational order to Bekangdam Jaya. At the tactical level, coordination is carried out through joint command posts (posko) established in strategic locations. These command posts serve as control centres for sharing information, allocating resources, and directing

the movement of distribution teams. Although a coordination framework has been established, its effectiveness in the field faces several challenges. Pranoto (2022) in his study on civil-military synergy highlights that ‘the main challenge is often not the absence of procedures, but rather the integration of real-time data and the simplification of the chain of command at the field level’ (p. 115). For example, data on the number of refugees and specific needs at each point often differs between BPBD records and territorial intelligence reports from Babinsa. These data discrepancies have the potential to cause misallocation of aid, where one location receives excess aid while another location experiences a shortage. In addition, differences in organisational culture and Standard Operating Procedures (SOPs) between hierarchical military environments and civil bureaucracies sometimes slow down the decision-making process. The success of logistics operations is largely determined by the ability of both parties to harmonise their operational methods into a coherent, responsive and flexible system.

3. CONCLUSION

Based on the results of the research and discussion outlined in the previous chapter, the following conclusions can be drawn:

Facilities and Infrastructure Capabilities (Means) Bekangdam Jaya quantitatively demonstrates its solid capabilities in terms of facilities and infrastructure as the main foundation for flood disaster management operations. Its ownership of vital assets such as a large fleet of land transport vehicles, dozens of rubber boats for evacuation in shallow waters, a number of mobile field kitchens, and a massive-capacity central logistics warehouse is proof of its institutional readiness. The availability of these resources theoretically enables Bekangdam Jaya to carry out large-scale mobilisation and respond to surging logistical needs during disaster emergencies, making it one of the main pillars of the flood management support infrastructure in DKI Jakarta. However, qualitative analysis reveals significant limitations that hinder the optimal effectiveness of these facilities and infrastructure. The majority of the land transport fleet, which is between 10 and 15 years old, has two implications: a high risk of operational failure when deployed in difficult terrain and increased routine maintenance costs. In addition, the logistics storage model, which is still centralised at a single point in East Jakarta, creates disparities in response times; flood-prone areas in North and West Jakarta are geographically further away, resulting in longer delivery times for aid. Thus, strong quantitative capabilities have not been fully utilised due to constraints in modernisation and centralisation of infrastructure that are not yet adaptive to the distribution of disaster risks.

Operational Effectiveness (Ways) At the macro level, operational coordination between Bekangdam Jaya and local government institutions, particularly the Jakarta Disaster Management Agency (BPBD) and the Jakarta Social Agency, has been running smoothly within an established framework. A structured command mechanism and clear standard operating procedures (SOPs) ensure that the flow of commands, division of tasks, and reporting take place in a hierarchical and orderly manner. This clarity of roles enables Bekangdam Jaya to immediately deploy its personnel and logistical resources to disaster sites that are difficult for civilian entities to access, demonstrating its superiority in terms of initial mobilisation speed and penetration capabilities in severely affected areas. However, the effectiveness of these operations has declined significantly at the micro or field level due to fundamental weaknesses in information system integration. The absence of an integrated inter-agency data platform has led to information asymmetry, where the logistical needs data held by BPBD, the Social Services Agency, and the Bekangdam Jaya field unit are often out of sync. These data discrepancies have implications for two main problems in the field: the potential for overlapping (redundancy) in the allocation of aid in one location and, conversely, delays in the fulfilment of supplies in other locations where needs have not been validated. This situation indicates that good macro-level coordination is not yet supported by real-time data synchronisation at the micro level, thereby hindering the achievement of precise and efficient aid distribution.

Strategy for Enhancing the Jaya Military Command (Ends). To transform the logistics distribution system into one that is faster, more accurate, and more adaptive, the strategy for improving the capabilities of Bekangdam Jaya must shift from a reactive approach to an anticipatory paradigm. The first pillar of this transformation is the decentralisation of logistics facilities. This is implemented through the establishment of buffer stock warehouses strategically located in several areas with the highest flood risk. The purpose of these facilities is to drastically reduce response times by bringing essential logistics stocks closer to potential disaster locations, so that aid delivery no longer depends entirely on central warehouses and can be carried out in a matter of hours, rather than days.

Furthermore, this strategy needs to be reinforced by two other complementary pillars, namely information system integration and technological modernisation. The integration of digital-based logistics information systems will create an integrated data ecosystem that enables all stakeholders to monitor stock movements, validate field requirements, and coordinate distribution in real time. On the other hand, modernising mobility facilities through fleet renewal and the adoption of supporting technologies such as Geographic Information Systems (GIS) for mapping affected areas and digital disaster monitoring systems will increase the precision and range of operations. Overall, the synergy between infrastructure decentralisation, digital integration, and technological modernisation is expected to strengthen Bekangdam Jaya's role as a proactive and highly adaptive strategic partner in the disaster management architecture in DKI Jakarta.

Based on an in-depth analysis of current operational needs and logistical challenges, there are several strategic recommendations that can be considered. To the Commander of the Jakarta Military Command. The formulation of a comprehensive medium-term plan specifically aimed at modernising the existing logistics fleet. This modernisation is not

only physical in nature, but also includes the establishment of a decentralised logistics warehouse structure spread across strategic points in the Greater Jakarta area. This decentralised approach theoretically aims to significantly shorten distances and speed up emergency response times. Strengthening personnel capabilities through ongoing training programmes focused on mastering digital logistics technologies, such as warehouse management systems (WMS) and real-time tracking platforms, which ultimately supports improved overall operational effectiveness.

To the DKI Jakarta Regional Government, specifically the Regional Disaster Management Agency (BPBD) and the Social Services Agency. Strengthening data integration and logistics information systems with Bekangdam Jaya to create a single, integrated data centre that can be accessed in accordance with protocols. This integration is crucial to ensure precise alignment between emergency needs in the field and the supplies and inventory available in warehouses, thereby avoiding duplication or stock shortages. Regular joint exercises involving all stakeholders. These routine simulations are essential for strengthening interoperability, refining communication procedures, and identifying coordination gaps before an actual emergency occurs.

To researchers and academics, The results of this analysis open up several avenues for further study. Subsequent research is expected to explore aspects of evaluating the implementation of an integrated digital logistics system involving multiple agencies, with a focus on measuring success metrics, technical barriers, and its impact on the speed of aid distribution. In addition, there are opportunities to examine more specific civil-military collaboration models, particularly technology-based models in the context of unique and complex urban disaster management. An in-depth study of these collaboration models could provide a practical and evidence-based framework for policymakers

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