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The Strategy Of The Regional Disaster Management Agency (BPBD) Of Dki Jakarta In Enhancing Flood Disaster Risk Reduction Efforts To Support National Security

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Abstract

Indonesia, as an archipelagic nation, is highly vulnerable to hydrometeorological disasters, particularly flooding, which poses significant social, economic, physical, and environmental risks. Jakarta, with its low-lying topography and traversed by 13 river estuaries, is categorized as a medium-level disaster risk area with a risk index of 61.31 in 2023. The coastal region of North Jakarta, affected by land subsidence, reclamation, and mangrove degradation, is especially prone to tidal flooding, with severe impacts on local communities. This study aims to analyze the role of the Jakarta Regional Disaster Management Agency in enhancing flood disaster risk reduction as part of efforts to support national security. Using a literature review and descriptive research approach, the study examines Jakarta Regional Distaster Management Agency's disaster management strategies based on the disaster management cycle, including prevention through diversion channels, dams, and water pumps; preparedness with early warning systems, evacuation facilities, and public education; response involving rescue operations, humanitarian aid, and community mobilization; and rehabilitation and reconstruction focusing on restoring infrastructure, public services, and socio-economic recovery. The findings indicate that BPBD plays a crucial role in strengthening community resilience, minimizing disaster impacts, and integrating disaster risk reduction into long-term development planning. These efforts not only mitigate flood risks but also contribute significantly to maintaining national security in the capital region.

Keywords: Tidal Flood, Disaster Risk Reduction, BPBD DKI Jakarta, National Security

INTRODUCTION

Indonesia, as an archipelagic nation, is inherently vulnerable to hydrometeorological disasters, one of which is flooding. According to the Indonesian Disaster Risk Book 2023, the country faces significant flood risk exposure, including social exposure affecting approximately 113,829,496 people, physical exposure valued at IDR 526,654,209 million, economic exposure amounting to IDR 480,264,971 million, and environmental degradation affecting an estimated 4,225,236 hectares of land. (Jati, Udrekh, & Purba, 2023).

The Special Capital Region of Jakarta is situated in a relatively low-lying topographical area, rendering it particularly vulnerable to the impacts of climate change (Dinas Lingkungan Hidup DKI Jakarta, 2023). The Special Capital Region of Jakarta is traversed by at least 13 river estuaries, including the Ciliwung River, Angke River, and Pesanggrahan River. The condition and management of these rivers play a critical role in influencing the region's flood disaster potential. In 2023, the National Disaster Management Agency (BNPB) recorded a minimum of seven flood events occurring within Jakarta. In the same year, Jakarta's disaster risk index was reported at 61.31, categorizing it as a medium-level disaster risk area.

Figure 1. Disaster Risk Index DKI Jakarta 2015 – 2023

NO	KABUPATEN/KOTA	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	JAKARTA TIMUR	127.20	97.46	93.18	84.36	75.57	75.08	71.79	74.14	73.46
2	JAKARTA UTARA	122.40	93.78	89.66	81.17	72.72	72.25	69.08	71.34	70.69
3	JAKARTA BARAT	120.40	92.25	88.19	79.85	71.53	71.07	67.95	70.18	69.53
4	JAKARTA PUSAT	96.40	73.86	70.61	63.93	57.27	56.90	54.41	56.19	55.67
5	JAKARTA SELATAN	88.40	67.73	64.75	58.62	52.52	52.18	49.89	51.53	51.05
6	KEPULAUAN SERIBU	64.80	64.80	64.80	64.80	64.80	56.66	49.46	52.13	47.47

Based on a report released by Detik.com on March 18, 2025, the Ciliwung River overflowed due to intense rainfall, leading to the inundation of several residential zones. The flooding affected 34 neighborhood units (RT) across South Jakarta, West Jakarta, and East Jakarta. In specific locations, including Cawang and Cililitan in East Jakarta, water depths reached up to 2.2 meters, indicating a severe level of inundation (Fawdi & Syarifudin, 2025).

Law Number 24 of 2007 defines a disaster as an event or a series of events that pose threats and disruptions to community life and livelihoods, triggered by natural, non-natural, and/or anthropogenic factors, which result in casualties, environmental degradation, property losses, and psychological impacts. Disasters are characterized by their unpredictability, detrimental consequences, association with loss and destruction, and the necessity for specific, coordinated, and targeted response measures. (Rijanta, 2018).

Flooding is defined as the submergence of ordinarily dry land resulting from an abnormal increase in water volume within a particular water body. Such events may occur due to excessive surface water overflow, which can be triggered by factors including intense precipitation, riverbank or dam failure, accelerated ice melting, or sea-level rise (Razikin, Kumalawati, & Arisanty, 2017). The escalating trend of flood disasters is evident not only in their spatial distribution but also in the magnitude of the resulting damages. As a natural phenomenon, floods generate both tangible (material) and intangible (immaterial) losses within affected communities. This upward tendency in both frequency and severity of flood events has been extensively documented in various studies and disaster records (Joko, 2008). The Regional Disaster Management Agency (BPBD) has a crucial responsibility in disaster mitigation, preparedness, and response, but it is currently unable to optimally reach all affected areas, particularly those with difficult road and communication access. This highlights the need to strengthen institutional capacity, develop early warning technology, and actively engage the community to improve disaster preparedness and response (Viranti, Aprillia, & Septiansyah, 2025).

Flood management requires strengthening human resource capacity through ongoing training, improving infrastructure and emergency communication systems, increasing community participation, and institutional reform with decentralization of authority and cross-sectoral coordination, so that flood management can be faster, more precise, and more sustainable (Viranti, Aprillia, & Septiansyah, 2025)The Provincial Government of DKI Jakarta bears the mandate to mitigate the risks of flood disasters within its jurisdiction in order to minimize potential adverse impacts. Strengthening flood risk reduction measures is expected to contribute not only to local resilience but also to the broader objective of safeguarding national security, particularly within the capital region. In line with this background, the present study is entitled "The Role of the Jakarta Regional Disaster Management Agency (BPBD DKI Jakarta) in Enhancing Flood Disaster Risk Reduction Efforts to Support National Security." The central research question guiding this study is: What strategies are employed by the Jakarta Regional Disaster Management Agency in reducing flood disaster risks to support national security? The objective of this research is to examine and analyze the institutional roles and strategic interventions undertaken by BPBD DKI Jakarta in flood disaster risk reduction, with the overarching aim of reinforcing national security.

RESEARCH METHODS

This study employs a literature review research method, wherein the researcher conducts a comprehensive analysis of relevant sources including books, academic journals, and official government websites. Research design refers to a structured framework used to guide the research process in a systematic manner, ensuring that it remains aligned with the intended objectives (Sarwono, 2006). The objective of this descriptive research is to provide a thorough

depiction of the social setting and to explore and clarify a social phenomenon or reality that is currently occurring in society.

RESULTS AND DISCUSSION

The coastal region of Jakarta, geographically situated at 5°10'37" South Latitude and 106°49'35" East Longitude, covers an area of approximately 130 km² and comprises the subdistricts of Penjaringan, Pademangan, Tanjung Priok, Koja, and Cilincing. According to the Public Works and Spatial Planning Agency (PUPR) of the Jakarta Provincial Government, this coastal zone functions as the outlet for 13 rivers, including the Mokervart, Angke, Pesanggrahan, Ciliwung, Cideng, Krukut, Grogol, Sekretaris, Cipinang, Sunter, Buaran, and Cakung rivers, which collectively constitute the Ciliwung sub-watershed (Sub-DAS Ciliwung) spanning approximately 150 km². The recurrent phenomenon of tidal flooding (banjir rob) and its adverse impacts underscore the limited preparedness and awareness of North Jakarta in addressing flood-related hazards. With an elevation ranging from 0 to 3 meters above sea level, this area is particularly vulnerable to tidal flooding, where water levels may reach up to 100 cm. Accordingly, the development of a comprehensive risk assessment framework is imperative as a mitigation strategy, enabling the classification of communities and areas based on their respective levels of vulnerability. The drivers of flooding in North Jakarta are multifaceted, with land subsidence representing the most critical factor—occurring at an estimated rate of 20 to 28 cm per year. This condition is further exacerbated by coastal reclamation projects for residential expansion, which have accelerated the degradation of mangrove ecosystems that traditionally function as natural buffers against tidal intrusion (Candra, 2014). The low-lying topography of the region substantially heightens its susceptibility to tidal flooding. Coastal zones characterized by gentle slope gradients are particularly prone to inundation, especially in lowland areas situated below the mean sea level. In contrast, regions with relatively higher elevations exhibit a lower degree of exposure to tidal flood risks (Salsabillah, Setiawan, A'rachman, & Oktarina, 2024). In addition, the greater the rate of land subsidence, the higher the likelihood of tidal flooding occurring in the affected areas (Ramdhany, Wiranegara, & Luru, 2021).

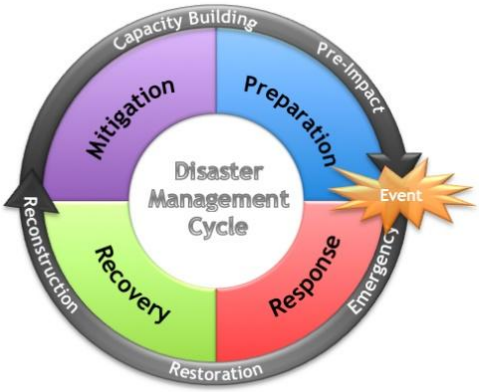

Figure 1. Disaster Management Cycle
Source : (Sambodo, 2012)

In the field of disaster management, there exists a concept known as the disaster management cycle, in which the government plays a pivotal role at each stage. According to Candra (2014), citing Carter in Disaster Management: A Disaster Manager's Handbook, the disaster management system requires a cyclical framework applicable to all nations. This cycle includes the following phases: Prevention, Mitigation, Preparedness, Response, Recovery, and Development.

The disaster management cycle consists of several interrelated phases, each of which plays a critical role in reducing risk and strengthening resilience. First, prevention encompasses efforts to identify, measure, and forecast potential disaster events. While the precise location and timing of disasters remain inherently unpredictable, preventive measures may be implemented to reduce exposure to risk. Examples include the construction of earthquake-resistant buildings, restrictions on residential development in high-risk zones such as coastal areas, riverbanks, and volcanic slopes, as well as the enforcement of building codes and environmental regulations.

Second, mitigation involves strategic interventions aimed at minimizing the adverse impacts of disasters. These efforts include the implementation of targeted programs designed to reduce casualties and physical damage while simultaneously strengthening community resilience and institutional capacity.

Third, preparedness refers to activities undertaken to ensure that both communities and authorities are equipped to respond effectively when disasters occur. Preparedness measures include the formulation of disaster response standards by government institutions, the dissemination of these standards to the public, and the provision of training programs for communities and emergency response units. Preparedness is generally categorized into three components: early warning systems, threat assessment, and precautionary actions.

Finally, response pertains to immediate actions carried out during and in the aftermath of a disaster to safeguard lives and protect property. Effective response depends on the availability of trained personnel within the affected communities who are capable of early intervention prior to the arrival of external assistance. The ultimate objective of this phase is to save human lives while preserving existing assets (Candra, 2014).

In addressing flood disasters in North Jakarta, the Jakarta Regional Disaster Management Agency (BPBD DKI Jakarta) has initiated measures aligned with the first stage of the disaster management cycle, namely prevention. A central component of these preventive efforts is the construction of flood diversion channels (sodetan), which are designed to mitigate flood risks by redirecting excess water discharge during peak flood events. Among the notable projects is the Ciliwung Diversion Tunnel, extending 1,268 meters in length with a discharge capacity of 60 m^3 per second, which channels water into the East Flood Canal. This infrastructure development represents a strategic intervention aimed at reducing hydrological pressure on critical flood-prone zones in the northern part of Jakarta (Ministry of Public Works, 2025). nother diversion channel project has been implemented at the Muara Angke Reservoir in Penjaringan District, designed to direct water flow toward Inlet 3 of the reservoir. Complementary dredging activities have also been undertaken at this site to increase the reservoir's storage capacity, thereby enhancing the operational effectiveness of the diversion channel in accommodating redirected water discharges. This integrated approach underscores the importance of combining structural measures with hydraulic optimization to strengthen Jakarta's flood prevention framework (Nasution, 2024). Additionally, the construction of dams aims to regulate and control water flow, preventing direct and uncontrolled discharge toward coastal areas. Moreover, Jakarta Regional Disaster Management Agency has also installed water pumps in various locations across North Jakarta. These pumps serve the dual purpose of flood control and maintenance of water quality within urban waterways. The primary purpose of dams is to regulate water discharge, thereby mitigating the impact of flooding in flood-prone areas. However, dam construction is typically feasible only in upstream regions and is closely linked to integrated water resource management. Flood control through dam utilization serves to delay the arrival time of floodwaters, reduce the peak discharge released downstream, and manage the allocation ratio of reservoir volume designated for flood control purposes.

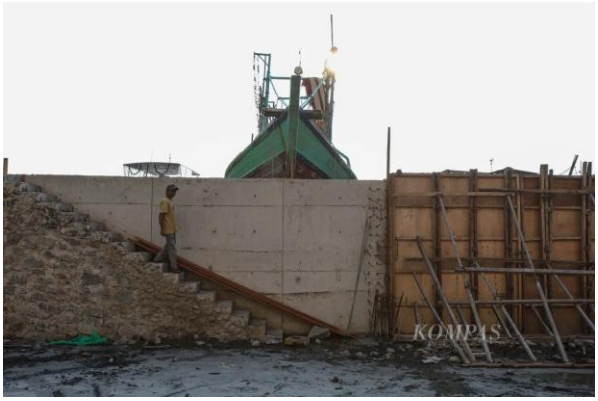

Figure 2. The Construction of a 3.6-Meter Coastal Embankment in Pluit.
Source: (Fadlurrohman, 2025)

The second phase in the disaster management cycle is preparedness. According to Carter (1991), as cited in LIPI-UNESCO/ISDR (2006), preparedness refers to actions that enable governments, organizations, families, and individuals to respond quickly and effectively to disaster situations in order to minimize casualties and losses. Preparedness measures include the formulation of disaster response plans, maintenance of essential resources, and personnel training. The concept of preparedness emphasizes the capacity to take timely and appropriate preparatory actions in the face of disaster emergencies (LIPI-UNESCO/ISDR, 2006). The objectives of preparedness are to reduce hazards, decrease household vulnerabilities, mitigate disaster impacts, and strengthen cross-sectoral coordination. In this regard, the Jakarta Regional Disaster Management Agency has undertaken several preparedness initiatives to anticipate flood disasters. These include the dissemination of early warnings regarding wave conditions through WhatsApp and Telegram groups; the deployment of disaster management personnel in flood-prone sub-districts; the provision of evacuation sites and supporting infrastructure, including rubber boats, ring buoys, life jackets, and other necessary equipment. The government has ensured the readiness of evacuation shelters and emergency facilities in coastal urban villages vulnerable to tidal floods. Furthermore, Jakarta Regional Disaster Management Agency provides 24-hour emergency services and has organized public education programs such as disaster-related talk shows (particularly on flooding), public awareness campaigns, flood disaster simulations, command post drills (gladi posko), and field exercises (gladi lapang). Preparedness aims to enhance the capacity of communities to cope with flood disasters. By strengthening community capacity, it is expected that residents will be better equipped to respond to flood events, thereby minimizing the potential risks and adverse impacts on the population.

Figure 3. The Regional Disaster Management Agency of DKI Jakarta (BPBD DKI Jakarta) Conducts Public Outreach and Awareness Campaigns
Source: (Bidang Pencegahan dan Kesiapsiagaan BPBD DKI Jakarta, 2024)

The third phase of the disaster management cycle is the response phase. In accordance with the Regulation of the Head of the National Disaster Management Agency (BNPB) Number 10 of 2008, response is defined as a series of immediate actions undertaken at the onset of a disaster to mitigate its adverse impacts. These actions encompass the rescue and evacuation of victims and property, the provision of basic necessities, the protection and management of displaced persons, as well as the restoration of essential infrastructure and facilities. The organizational framework for disaster emergency response is embodied in the Disaster Emergency Response Command, which operates under a standardized structure characterized by a unified command system, a clear chain of command, and coordinated mobilization of resources from multiple agencies, institutions, and organizations. Within this framework, the Jakarta Regional Disaster Management Agency (BPBD DKI Jakarta) has implemented a range of initiatives, including the receipt of flood response assistance from the Chandra Asri Group on March 11, 2025; community clean-up operations conducted on March 7, 2025 to support flood-affected residents; and continuous aid distribution to communities impacted by flooding. The overarching objective of the response phase is to safeguard affected populations, mitigate health-related risks, ensure public safety, and fulfill the essential needs of disaster victims, thereby contributing to the preservation of life and the promotion of community resilience

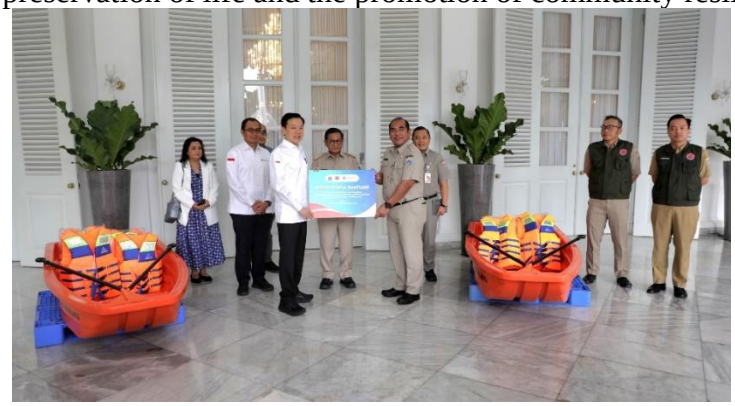

Figure 4. Delivery of Humanitarian Assistance to Flood-Affected Populations
Soruce: (UPT PDIK, 2025)

The fourth phase of the disaster management cycle is rehabilitation and reconstruction. In the aftermath of flood events in North Jakarta, the Jakarta Regional Disaster Management Agency (BPBD DKI Jakarta) has implemented a range of initiatives aimed at facilitating recovery. These include the deployment of personnel and equipment to support post-flood community clean-up operations, as well as collaborative efforts with local residents through mutual cooperation (gotong royong) to restore environmental conditions. The principal objective of the rehabilitation phase is to re-establish the essential conditions required for the proper functioning of disaster-affected areas. This encompasses the restoration of public services, critical infrastructure, and the promotion of socio-economic recovery within impacted communities. In contrast, the reconstruction phase emphasizes long-term efforts, such as the rebuilding and improvement of physical infrastructure, the enhancement of living standards for affected populations, and the systematic incorporation of disaster risk reduction strategies into development planning. Collectively, these measures are intended to strengthen resilience and reduce vulnerability to future flood hazards.

CONCLUSION

The coastal region of North Jakarta is highly vulnerable to tidal flooding due to its low elevation, rapid land subsidence, and environmental degradation caused by reclamation and mangrove loss. Recognizing these risks, the Jakarta Regional Disaster Management Agency

(BPBD DKI Jakarta) has implemented disaster management efforts in line with the disaster management cycle. These efforts include prevention measures such as flood diversion channels, dams, and water pumps; preparedness initiatives like early warning systems, evacuation facilities, and public education; response actions involving rescue operations, humanitarian aid, and community mobilization; as well as rehabilitation and reconstruction to restore public services, rebuild infrastructure, and integrate disaster risk reduction into future development. Collectively, these measures highlight the importance of comprehensive and continuous disaster management to strengthen community resilience and reduce the adverse impacts of tidal flooding in North Jakarta.

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