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EFFECTIVENESS OF LOCAL GOVERNANCE IN FLOOD MANAGEMENT IN DISASTER PREPAREDNESS IN BAGUMBONG AREA, NORTH CALOOCAN CITY

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ABSTRACT

Flooding is a recurring hazard in the Bagumbong Area of North Caloocan City, and local government units (LGUs) are mandated under Republic Act No. 10121 to lead flood mitigation, preparedness, response, and recovery. This study examined the effectiveness of local governance in flood management and disaster preparedness in the Bagumbong Area by determining the strategies implemented by the local government and the level of preparedness as perceived by residents who have experienced flooding. It assessed three areas, namely (1) policy implementation and information dissemination, (2) emergency response, and (3) post-disaster rehabilitation; tested whether respondents' demographic profile is related to their assessment; identified the problems encountered in implementation; and proposed a civic and administrative action plan. A quantitative descriptive-evaluative design was used. One hundred (100) residents of Bagumbong, North Caloocan City, selected through purposive sampling on the basis of residency, age (18 years or older), experience with flooding, and willingness to participate, answered a structured questionnaire administered through Google Forms. Data were analyzed using frequency and percentage, weighted mean, and the Chi-Square Test of Independence at the 0.05 level of significance. Respondents were predominantly aged 18–28 years (81%), female (59%), and long-term residents of more than 10 years (52%). Policy implementation and information dissemination were rated Effective (composite mean = 2.52), whereas emergency response (2.45) and post-disaster rehabilitation (2.23) were rated Less Effective. No significant relationship was found between assessment of effectiveness and age ($p = 0.292$), gender ($p = 0.069$), length of residence ($p = 0.215$), or geographic location ($p = 0.210$). The problems encountered in implementation were rated Moderate Problems overall (composite mean = 1.90), with limited budget and resources, inadequate emergency equipment, insufficient personnel, and limited training obtaining the highest mean (1.92). Flood management policies and measures were implemented in the Bagumbong Area, but their effectiveness was not consistent across the stages of the flood management process. Improving access to disaster-related resources, training of personnel, information dissemination, and post-disaster rehabilitation and assistance is recommended to strengthen local governance in flood management and disaster preparedness.

Keywords: *local governance; flood management; disaster preparedness; disaster risk reduction and management; Bagumbong; Caloocan City*

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INTRODUCTION

Background of the Study

Caloocan City is one of the highly urbanized cities in Metro Manila and has experienced continuous development over the past decade. The city has numerous commercial establishments, including shopping malls, public markets, and local businesses, particularly in North Caloocan. These developments contribute to economic growth, employment opportunities, and increased local government revenue (Philippine Statistics Authority [PSA], 2020; Caloocan City Government, 2024). Despite these developments, concerns remain regarding the effectiveness of flood control measures in disaster preparedness in protecting residents from natural hazards.

Flooding has become one of the most pressing environmental and public safety concerns in Caloocan City. Several areas in both North and South Caloocan are vulnerable to flooding, particularly low-lying communities that are frequently affected by heavy rainfall and typhoons. Rapid urbanization, inadequate drainage systems, and the increasing impacts of climate change have further intensified flood risks, causing damage to properties, disrupting livelihoods, and threatening public safety (National Disaster Risk Reduction and Management Council [NDRRMC], 2020; Department of the Interior and Local Government [DILG], 2023).

The Philippine Disaster Risk Reduction and Management Act of 2010 (Republic Act No. 10121) emphasizes local government units' (LGUs) responsibility to implement disaster risk reduction and management programs, including flood mitigation, preparedness, response, and recovery efforts (Republic Act No. 10121, 2010). As the primary government institutions responsible for protecting communities, LGUs play a crucial role in developing policies, implementing flood control projects, promoting disaster preparedness, and strengthening community resilience.

Flooding is one of the most common natural hazards in the Philippines, causing significant impacts on communities, infrastructure, livelihoods, and public safety. Due to the country's geographical location and exposure to tropical cyclones, many areas experience recurrent flooding, particularly during the rainy season. The effects of climate change, rapid urbanization, inadequate drainage systems, and improper waste management have further increased the vulnerability of urban communities to flood-related disasters (Republic Act No. 10121, 2010).

The same law mandates LGUs to take an active role in disaster prevention, mitigation, preparedness, response, and recovery. As the primary government institutions closest to the people, LGUs are responsible for implementing policies and programs that reduce disaster risks and strengthen community resilience (Office of Civil Defense, 2010).

Effective local governance is essential to successful flood management and disaster preparedness. Local governments are expected to develop and maintain flood control infrastructure, conduct regular drainage maintenance, establish early warning systems, implement emergency response plans, and promote community awareness and participation. According to the Department of the Interior and Local Government (DILG, 2024), strong local governance contributes significantly to disaster resilience by enhancing coordination among stakeholders and improving the delivery of disaster-related services.

In North Caloocan City, particularly in Bagumbong Area, flooding remains a recurring concern that affects residents during periods of heavy rainfall and typhoons. Flood incidents often result in property damage, transportation disruptions, health risks, and economic losses for affected households. Although the local government has implemented various flood management and disaster preparedness initiatives, there is a need to assess the effectiveness of these measures in addressing community needs and reducing the impacts of flooding.

Understanding how local governance influences flood control planning and disaster preparedness is essential to ensuring the safety, resilience, and well-being of Caloocan City residents. This study aims to examine the importance of effective local governance in disaster risk reduction and disaster preparedness in North Caloocan City, with

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particular focus on Bagumbong Area. Specifically, the study seeks to assess the role of the local government in addressing flood control issues, evaluate existing disaster preparedness initiatives, and raise awareness among local officials and residents.

Understanding the effectiveness of local governance in flood management and disaster preparedness matters because it reveals the strengths and weaknesses of current programs and policies. Through this assessment, local government officials, community leaders, and policymakers can identify areas for improvement and develop more responsive strategies to protect residents from flood-related risks. Therefore, this study seeks to evaluate the effectiveness of local governance in flood management and disaster preparedness in Bagumbong, North Caloocan City, to improve disaster resilience and sustainable community development.

Review of Related Literature and Studies

This section reviews local and international literature and studies that provide a foundation for the present research. The studies are grouped under flood management and disaster preparedness in general and under the three areas assessed in this study: policy implementation and information dissemination, emergency response, and post-disaster rehabilitation. A synthesis of the reviewed studies follows.

Flood management and disaster preparedness (FMDP)

Abayao (2020) examines disaster risk governance in northern Philippine communities, focusing on how local disaster reduction efforts connect to national climate change action plans. The study finds that local government units often develop plans using incomplete records, leading to estimated rather than verified risk details that weaken response quality. It notes that current practices tend to prioritize formal technical requirements while overlooking valuable local knowledge and traditional coping methods that could improve planning and implementation. The author emphasizes that effective disaster governance requires consistent cooperation among officials, technical experts, and community members at every stage, and suggests building comprehensive hazard databases, integrating local perspectives into official policies, and creating clear channels for ongoing public participation to strengthen long-term resilience (Abayao, 2020).

Kurata et al. (2023) analyzed the determinants of public risk perception during extreme flooding events in the Philippines. The researchers demonstrated that targeted media communication and citizens' past disaster experiences significantly heighten perceived vulnerability and severity, which ultimately drives public readiness to support and comply with municipal disaster mitigation programs.

Modesto et al. (2026) examined the determinants of flood preparedness behavior among young citizens in the Philippines, focusing on individual disaster response self-efficacy. The study revealed that institutional capacity and local government initiatives are most effective when local authorities systematically foster self-efficacy through target-tailored disaster management training and youth-centered civic engagement platforms.

Peixoto Silva (2024) examines disaster governance and community resilience through the April 2022 landslide in Barangay Kantagnos, triggered by Tropical Storm Agaton, which caused casualties and made the area unsafe for settlement. The study analyzes actions taken by the community, local government, academic institutions, and civil society groups across preparedness, response, and recovery phases, and finds gaps such as delayed hazard communication, limited integration of local knowledge into planning, and unclear roles between agencies that slowed timely support and safe relocation. It notes that while formal policies exist under Republic Act 10121, insufficient risk mapping, limited resources, and weak coordination weakened implementation, and it emphasizes that sustained partnership with residents and clearer shared responsibilities are essential to build resilience in high-risk upland areas (Peixoto Silva, 2024).

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Radmehr (2025) proposed an integrated Spatial Decision-Making Support System (SDSS) to enhance urban flood governance and build city resilience. The study explained how combining Geographic Information System (GIS) spatial data with collaborative stakeholder engagement—specifically involving municipal authorities, water agencies, and local communities—creates a more transparent and actionable flood hazard planning model. The findings revealed that flood vulnerability is highest in low-slope, high-density residential zones with restricted drainage. They demonstrated that combining spatial technology with participatory local governance allows administrators to map high-risk zones more accurately and outline optimal runoff collection routes.

Acharya, Koedsin, and Techato (2025) analyzed the operational strategies of disaster management frameworks in Nepal and the specific role that effective governance plays during extreme weather events. The study explained how establishing decentralized administrative structures, building local capacities, and coordinating institutional responses across multiple tiers of government are essential to robust disaster mitigation. The findings revealed that systemic deficiencies in institutional accountability, fragmented policy execution, and underfunded regional frameworks severely restrict overall governance effectiveness and reduce community-level preparedness.

Lefutso (2025) examined flood disaster governance and policy evolution in post-apartheid South Africa, tracing progress from 1994 toward proactive risk reduction anchored by the Disaster Management Act 2002 and national disaster frameworks. The study shows that while South Africa built a comprehensive, globally aligned legal and institutional structure moving away from purely reactive emergency responses, major gaps remain in actual implementation: persistent funding shortages mean current allocations cover less than half the estimated R4.5 billion annually needed just to upgrade stormwater and drainage infrastructure in high-risk municipalities, with most spending still directed toward post-disaster relief rather than prevention. It further identifies unclear assignment of duties, weak coordination, capacity limits at local government level, and unresolved historical inequalities—where marginalized and informal communities remain most exposed—as continuing barriers preventing laws and policies from delivering intended protection and resilience. The author concludes that effective flood management requires strengthened accountability, dedicated and sustained financing streams, clearer roles across all levels of government, robust monitoring systems, and genuine inclusion of vulnerable groups to close the persistent gap between progressive legal standards and on-the-ground results.

Zulkipli et al. (2022) examined flood disaster preparedness for records and documents at a public university in Malaysia, analyzing past incidents to develop better future safeguards. The study shows that planning for vital paper-based records and documents was completely inadequate and largely overlooked. Awareness was identified as the most critical factor for successful records protection. It further reveals that the institution's emergency management focused entirely on protecting human life and costly equipment, with no consideration or preparation for preserving important records and documents during flood events. The researchers concluded that systematic planning and clear provisions are urgently needed to safeguard institutional information and ensure that essential records are recognized and protected alongside other priorities during disasters.

Policy implementation and information dissemination

Amil (2025) qualitatively evaluated flood-control programs in Region XII, Philippines, identifying infrastructure such as dikes and drainage systems as primary long-term strategies that strengthened community resilience through fewer flood-related displacements, better-protected assets, and improved preparedness in low-lying barangays. Successful implementation relied on careful planning, regular monitoring, and coordinated action by agencies including the DPWH, DSWD, NIA, and LGUs, though significant limitations—such as funding shortages, weather-related construction delays, and poor maintenance—were also noted. To address these, the study recommends expanding public-private partnerships and suggests that further quantitative research be undertaken to verify these findings more broadly.

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De Leon and Gonzales (2026) examined the systemic disconnect between formal municipal flood disaster plans and operational risk communication practices during extreme rainfall and flooding events. The authors demonstrated that local governance effectiveness is often undermined not by a lack of policy planning, but by institutional failures to execute risk communication protocols effectively on the ground during weather crises.

Le (2026) conducted a comparative analysis evaluating how differing political regime structures (democratic-decentralized vs. authoritarian-centralized) shape disaster communication governance during typhoon and extreme flooding events in the Philippines and Vietnam. The study revealed that local governance effectiveness in risk communication is fundamentally conditioned by the overarching political regime, which dictates the balance between centralized administrative control and decentralized, localized emergency decision-making.

Aquino and Soliven (2026) assessed the effectiveness of the City Disaster Risk Reduction and Management Office's (CDRRMO) disaster risk reduction information dissemination among residents in Barangay Bantug, Science City of Muñoz, Nueva Ecija. The study shows that the overall level of public awareness regarding typhoon-related information was moderate across all stages—before, during, and after a typhoon—though awareness was noticeably highest after the calamity, particularly regarding updates on recovery services and restoration of utilities. It further reveals that while information was generally clear and easy to understand, print materials such as posters were only moderately accessible to the community. The results also indicate that factors such as the content of information, how well residents understood the messages, and how much they utilized the information had significant positive relationships with their level of awareness; notably, the medium used did not significantly affect awareness levels. Furthermore, the study found a moderate positive correlation showing that higher public awareness is linked to better perceived effectiveness of information dissemination, leading the researchers to conclude that improving the accessibility and variety of information channels at the barangay level is essential to strengthen disaster risk communication.

Ridzuan, Razali, Soon Yew, and Abd Rahman (2022) analyzed Malaysia's public policies for flood disaster risk reduction, benchmarking against international frameworks such as the Hyogo and Sendai agreements. The study shows that the country still lacks a unified, comprehensive legislative framework specifically designed for flood management; current arrangements rely mainly on National Security Council Directive No. 20, which governs all types of disasters rather than focusing on floods alone, and must depend on scattered, unrelated laws and regulations. It further reveals that existing policies tend to be reactive rather than proactive, emphasizing emergency response and relief while giving limited attention to preparedness, prevention, and long-term planning. Additionally, the researchers noted that official documents do not clearly mandate or encourage meaningful public participation, and many local development plans still fail to fully integrate flood-preparedness standards, early warning provisions, or community-centered risk reduction measures. They concluded that to reduce flood impacts effectively, Malaysia needs a dedicated, inclusive flood policy that clarifies roles, engages citizens throughout all stages of management, and shifts toward more holistic, long-term disaster risk reduction aligned with global standards.

Raphela and Ekeke (2025) examined the institutional mechanisms used to disseminate flood disaster early warning messages in vulnerable township settlements. The authors demonstrated that local disaster governance efficiency depends on utilizing diversified, context-appropriate communication channels—combining digital alerts with grassroots community networks—to ensure timely and actionable hazard information reaches high-risk populations before floodwaters escalate.

Lin (2025) investigated the impact of participatory communication engagement on citizen involvement in local flood risk management and environmental sustainability programs. The author revealed that local governance frameworks achieve higher community participation when municipal agencies foster two-way, interactive communication channels that empower citizens to contribute local insights rather than relying solely on top-down administrative broadcasts.

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Buriro and Jatoi (2025) conducted a critical review of Pakistan's flood management strategies by examining the country's disaster preparedness, emergency response, and risk mitigation efforts. The study focused on the devastating floods of 2010 and 2022, which exposed weaknesses in Pakistan's disaster management system. The authors found that ineffective early warning systems, poor coordination among government agencies and humanitarian organizations, inadequate infrastructure, and limited disaster preparedness contributed to the severity of flood impacts. These challenges resulted in significant damage to lives, property, agriculture, and public health.

The study emphasized the importance of strengthening both pre-disaster and post-disaster management. It recommended improving early warning systems, enhancing coordination among government institutions, increasing community education and disaster preparedness programs, and ensuring the availability of water, sanitation, and hygiene (WASH) services after disasters. The authors concluded that effective disaster management requires strong government leadership, active community participation, and continuous investment in disaster risk reduction.

Emergency response

Amriampa et al. (2024) examined the effectiveness of flood disaster management programs in North Kalimantan Province, Indonesia, focusing on collaborative governance across input, process, output, and outcome stages. The study shows that while programs performed quite effectively during emergency response at the output stage, significant weaknesses remained at earlier phases: limited resources at the input level, along with weak coordination, incidental collaboration, and unstructured community participation throughout the process stage. These challenges prevented the programs from achieving their long-term goal of stronger community resilience, revealing that effective immediate response does not automatically lead to sustainable risk reduction. The researchers concluded that improving overall flood management effectiveness requires strengthening institutionalized cooperation, securing adequate resources, and building consistent, structured engagement among all stakeholders beyond crises alone.

Lacasandile et al. (2022) examined the impact of community crowdsourcing on local disaster management operations. The authors revealed that providing citizens with direct digital channels to report local hazard occurrences led to a measurable increase in resolved emergency cases, thereby bolstering overall local government capacity to mitigate localized casualties and property losses.

The findings of Amriampa et al. (2024) align with established frameworks in collaborative governance, such as those proposed by Ansell and Gash (2008) and Emerson et al. (2012), which emphasize that successful cross-sector collaboration requires shared goals, clear roles, and structured engagement beyond crises. Similar challenges have been documented across regions: in flood response, collaboration is often effective during emergencies but lacks continuity in preparedness, mitigation, and recovery planning, while resource scarcity and fragmented authority frequently limit overall impact. For instance, assessments of flood governance in other parts of Southeast Asia and globally also note that informal or event-based cooperation yields faster immediate results but fails to address systemic risks or build lasting institutional capacity, making programs overly dependent on reactive measures rather than proactive risk reduction.

Gundran et al. (2023) assessed the disaster simulation training needs among frontline local responders and public agencies in Metro Manila, Philippines. The study highlighted that local governance effectiveness during extreme hazards depends heavily on moving beyond theoretical policy frameworks toward routine, simulation-based operational training that mimics complex urban flooding scenarios.

Focusing on how communities assess local disaster governance, a study of community perceptions in Loboc, Bohol (University of Bohol Multidisciplinary Research Journal, n.d.) evaluated public perceptions of the performance and effectiveness of the Municipal Disaster Risk Reduction and Management (MDRRM) Office in Loboc, Bohol, using a quantitative descriptive cross-sectional design involving 354 respondents from seven disaster-prone barangays. Using

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frequency and percentage analysis, weighted mean, Chi-square test, and Spearman's rank-order correlation, the research found that the MDRRM Office was rated "quite effective" overall, especially in managing early warning systems, conducting preparedness education, and delivering emergency communications. Among respondent characteristics, only age showed a significant link with perceived effectiveness and satisfaction; gender and length of residency did not yield similar associations. Notably, there was a strong positive correlation between perceived operational effectiveness and public satisfaction, confirming that how well services function directly shapes community trust and confidence in the LGU's disaster efforts. These findings highlight the value of centering community feedback in evaluating DRRM performance, offering relevant insights for strengthening transparency and responsiveness in comparable local units—including those in flood-prone areas such as Caloocan City.

Wen et al. (2024) analyzed the structural shortcomings of existing urban emergency management frameworks, identifying inter-departmental fragmentation and delays in resource deployment as primary obstacles to disaster resilience. The study emphasized that local governance effectiveness relies heavily on establishing a rapid response system characterized by centralized command structures, clear departmental division of labor, and streamlined operational protocols.

Goode et al. (2021) evaluated the implementation of specialized web-based emergency management platforms that facilitate real-time collaboration among remote experts, local administrators, and field responders. The study emphasized that institutional effectiveness in flood response relies heavily on centralized, shared platforms that harmonize risk assessments across public health, environmental protection, and civil defense sectors.

Khatibi and Gafarov (2026) analyzed flood risk management systems globally using a framework based on Responsibility to Protect and duty of care, while also assessing alignment with the Sendai Framework for Disaster Risk Reduction. The study shows that flood risk approaches can be grouped into four modes: proactive learning, reactive, ad hoc, and hybrid forms. It further establishes that systems with high compliance with Sendai standards are consistently proactive. In contrast, medium compliance corresponds to reactive methods, and low compliance belongs mostly to ad hoc arrangements that are poorly planned and inconsistent. The authors also note that no system stays fixed permanently and every type carries risks of falling back into weaker practices. They conclude that flood risk management is not only a technical or administrative task but also a moral and institutional duty to protect communities at risk and that this classification can serve as a helpful diagnostic tool for policymakers to understand strengths and weaknesses in current approaches.

Post-disaster rehabilitation

Tamulto (2021) examined post-disaster rehabilitation and recovery policies implemented in Itogon, Benguet, following catastrophic landslide and flooding events triggered by Typhoon Ompong. The author revealed that top-down, planned relocation schemes often fail to achieve long-term disaster resilience because local governance frameworks prioritize physical resettlement without adequately accounting for displaced communities' socio-economic realities and traditional livelihoods.

Atienza and Quilala (2021) examined the contributions of non-governmental organizations (NGOs) operating alongside state actors in post-disaster humanitarian activities across the Philippines. The authors showed that local governance effectiveness in disaster management improves significantly when municipal authorities partner strategically with NGOs, which provide flexible resource mobilization, localized technical expertise, and rapid relief delivery during climate-induced emergencies.

Atilano-Tang et al. (2025) assessed Zamboanga City's flood management and hazard mitigation strategies to determine their contribution to urban flood resilience, anchoring the analysis on Sustainable Development Goals (SDG) 16.3 on strong institutions and SDG 17 on partnerships. Using a mixed-methods design involving surveys of 200 residents

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from flood-prone barangays and key informant interviews and focus group discussions with 30 officials, planners, engineers, and DRRM personnel, the study found that 59.5% of respondents viewed their communities as insufficiently prepared. In contrast, 57.5% were dissatisfied with existing mitigation measures. The most cited challenges were poor infrastructure (36.5%), limited public awareness (28%), weak inter-agency coordination (21.5%), and insufficient funding (13.5%), with governance gaps such as poor coordination (32.5%) and inadequate resources (27%) also prominently noted. These findings indicate that technical measures alone cannot resolve flood risks; instead, the authors recommend integrated actions including upgrading and maintaining drainage systems, river rehabilitation, and evacuation facilities; formalizing inter-agency collaboration, enforcing policies, and ensuring adequate resource allocation; and launching sustained awareness campaigns, capacity-building activities, and volunteer empowerment to engage communities meaningfully. Similar investigations in other Philippine cities and barangays confirm these patterns: recurring floods persist despite significant investments because of outdated or poorly maintained infrastructure, fragmented planning between national and local agencies, unclear roles, and community participation that remains superficial or ad hoc rather than embedded in planning and decision-making processes. Collectively, these studies underscore that enhancing urban flood resilience requires balancing physical infrastructure improvements with stronger institutional coordination, stable financing, policy enforcement, and genuine, inclusive engagement—factors equally critical for addressing flood risks in high-density areas like Caloocan City.

Fontanilla (2026) evaluated disaster preparedness in the five most flood-prone barangays of San Juan, La Union—Cabaroan, Nadsaag, Bambanay, Catdungan, and Oaquing—using a descriptive-correlational design and structured questionnaires administered to 328 residents. The study recorded an overall "moderate" level of preparedness across the communities, but identified critical shortfalls in emergency transport, reliable communication systems, and consistent access to training opportunities. At the same time, general flood-related awareness was relatively high, and participation and readiness varied notably among households and stakeholder groups. Statistical testing further established that the availability of essential resources and the extent of residents' knowledge and training were significantly and positively linked, showing that preparedness cannot be sustained through information campaigns alone. The author also underscored deeper institutional barriers: weak inter-agency alignment, inconsistent political commitment, and limited meaningful involvement of local stakeholders in planning and implementation. In response, the research proposes a context-specific preparedness model centered on improved resource allocation, stronger governance mechanisms, regular and inclusive capacity-building, and collaborative planning between government units and communities. These findings reinforce observations from other flood-affected LGUs nationwide, highlighting that balanced investments in equipment, education, and institutional cooperation are equally vital—a lesson directly applicable to addressing comparable gaps across Caloocan City's flood-vulnerable barangays.

Sumarsyah (2025) evaluated the scope of local government interventions during municipal recovery operations. The author demonstrated that local governance achieves meaningful long-term effectiveness only when post-disaster policies extend beyond immediate physical infrastructure repair to address the broader social, economic, and psychological rights of affected populations.

Ilmi et al. (2025) examined the execution of municipal disaster management authority delegated to the Regional Disaster Management Agency (BPBD) under local regulatory mandates (Regional Regulation No. 16 of 2011). Utilizing authority and legal protection theories, the authors demonstrated that effective local disaster governance requires balancing preventive legal protection—such as community education, disaster information dissemination, and strict spatial planning enforcement—with repressive legal protection delivered through prompt post-disaster rehabilitation and infrastructure reconstruction.

Jailani (2026) examined flood impacts and the implementation of the Disaster-Safe Education Unit, also called the SPAB policy, across Islamic educational institutions in Aceh Tamiang Regency, Indonesia, using a qualitative

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Participatory Action Research approach. The study shows that recent floods severely damaged nearly 400 educational facilities, suspended learning for almost one month, and caused mental and emotional distress among both students and teachers, even though a national framework already existed to make schools safer. It further finds that putting those rules into practice faced major hurdles such as weak cooperation between agencies, unclear local regulations, aid that did not reach everyone fairly, and very little preparation capacity. The study also reveals that community support and teachers acting together, guided by shared Islamic values such as mutual assistance and responsibility, helped keep learning going through temporary spaces and shared class schedules. The author proposes a recovery roadmap for 2026 to 2030 that includes flood-proof infrastructure, clearer governance systems, mental health support programs, and shared ethical values to help education systems better withstand future disasters.

Synthesis of the reviewed studies

The reviewed literature and studies collectively emphasize that effective flood management in disaster preparedness requires a comprehensive approach that integrates governance, policy implementation, emergency response, and post-disaster rehabilitation. Across different countries and local settings, previous studies consistently indicate that disaster resilience depends not only on physical infrastructure but also on effective institutional coordination, active community participation, adequate resources, and the sustained implementation of disaster risk reduction (DRR) policies.

The reviewed studies further highlight the important role of local governments in translating disaster risk reduction policies into actual programs and services for communities. Effective policy implementation and information dissemination help ensure that residents are aware of flood risks, early warnings, evacuation procedures, and appropriate actions before and during flooding. At the same time, emergency response depends on the availability of trained personnel, rescue equipment, evacuation facilities, and coordination among responsible agencies. These findings demonstrate that preparedness requires both preventive measures and the capacity of local institutions to respond promptly when flooding occurs.

Post-disaster rehabilitation is also identified as an important component of effective flood management. Previous studies emphasize that disaster management does not end after emergency response, as affected communities require continued assistance to restore normal conditions. Activities such as debris clearing, restoration of drainage systems, repair of damaged public facilities, provision of necessities, and livelihood recovery contribute to community recovery and resilience. The literature therefore suggests that weaknesses in rehabilitation efforts may affect the ability of communities to recover effectively from recurring flood events.

Despite the similarities among the reviewed studies, differences can be observed in their geographical settings, populations, and areas of emphasis. Some studies focus primarily on disaster risk governance, infrastructure, community resilience, or preparedness, while others examine specific aspects of emergency response and recovery. Although these studies provide important information on flood and disaster management, there remains a need for localized assessments that examine how residents perceive the effectiveness of local governance across different phases of flood management and disaster preparedness.

The reviewed studies provide a foundation for the present research by identifying governance, policy implementation and information dissemination, emergency response, and post-disaster rehabilitation as important components of effective flood management. However, limited attention has been given specifically to the experiences and perceptions of residents in the Bagumbong Area of North Caloocan City. Thus, the present study addresses this gap by assessing the effectiveness of local governance in flood management and disaster preparedness in terms of policy implementation and information dissemination, emergency response, and post-disaster rehabilitation. It also examines the problems encountered in implementation. It provides a basis for developing a proposed civic or administrative action plan that responds to the needs and conditions of the local community.

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Theoretical Framework

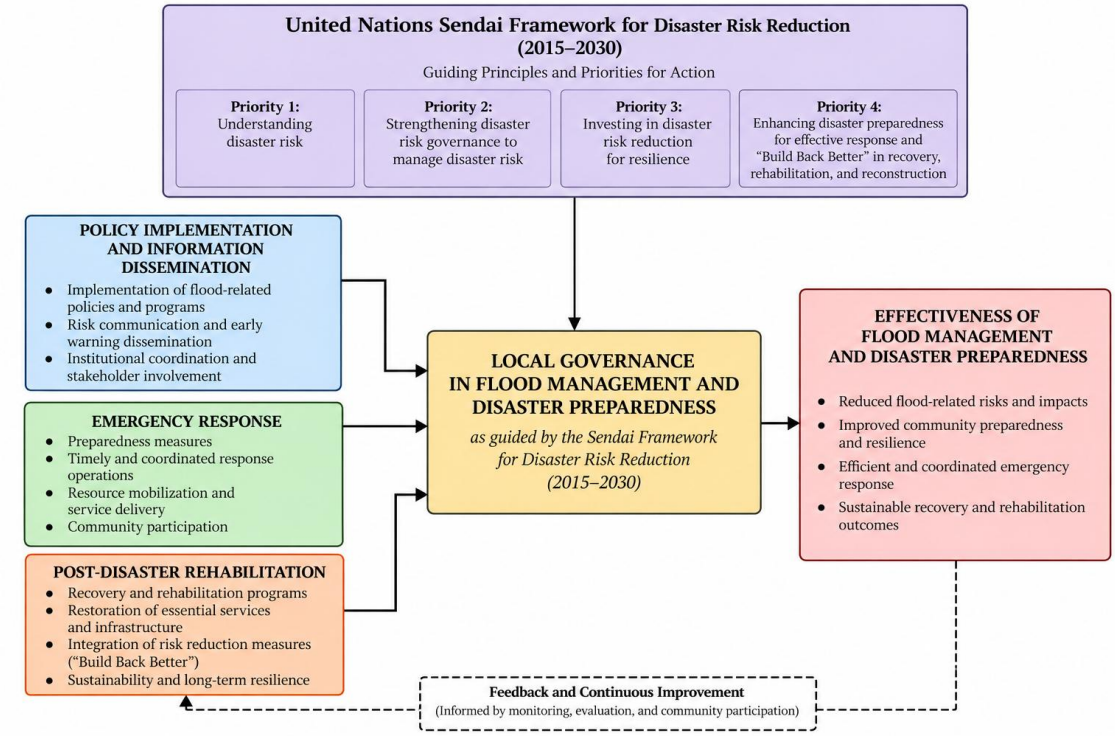
This study is anchored on the United Nations Sendai Framework for Disaster Risk Reduction (2015–2030) (United Nations Office for Disaster Risk Reduction [UNDRR], 2015), which provides an international framework for reducing disaster risks and strengthening resilience through effective governance, prevention, preparedness, response, recovery, and rehabilitation. The Sendai Framework emphasizes that while the State has the primary responsibility for reducing disaster risk, this responsibility is shared with local governments and other relevant stakeholders. The framework is guided by four priorities for action: (1) understanding disaster risk; (2) strengthening disaster risk governance to manage disaster risk; (3) investing in disaster risk reduction for resilience; and (4) enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation, and reconstruction. These priorities emphasize the need to move beyond a purely reactive approach to disasters by strengthening preventive and preparedness measures before hazards occur. In the context of flood management, the framework highlights the importance of effective policies, accessible risk information, institutional coordination, adequate resources, preparedness measures, timely emergency response, and sustainable recovery and rehabilitation. Thus, the Sendai Framework provides a comprehensive foundation for understanding how effective governance contributes to disaster risk reduction and strengthens preparedness for flood-related hazards.

The Sendai Framework is relevant to the present study because its principles and priorities provide a basis for assessing the effectiveness of local governance in flood management and disaster preparedness in Bagumbong Area, North Caloocan City. Specifically, the framework is reflected in the three major areas assessed in the study: policy implementation and information dissemination, emergency response, and post-disaster rehabilitation. The framework's emphasis on strengthening disaster risk governance supports the assessment of how local authorities implement flood-related policies, disseminate warnings and relevant disaster information, coordinate responsibilities, and manage available resources. Similarly, its emphasis on disaster preparedness and effective response provides a basis for examining the capacity of local authorities to respond promptly and appropriately during flood incidents. Furthermore, the principle of "Build Back Better" is associated with post-disaster rehabilitation, as it emphasizes restoring affected areas while reducing existing vulnerabilities and future disaster risks. These principles are consistent with the reviewed literature, which identifies effective policy implementation, risk communication, institutional coordination, resource availability, emergency preparedness and response, and sustainable rehabilitation as important components of effective flood governance. Therefore, the Sendai Framework provides an appropriate theoretical foundation for examining how disaster risk reduction principles are reflected in local governance practices and flood management measures in Bagumbong, North Caloocan City.

Figure 1. Theoretical Paradigm of the Study

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Conceptual Framework

This study is based on the idea that effective local governance is important in improving flood management and disaster preparedness in Bagumbong Area, North Caloocan City. The local government plays a key role in implementing programs and services that help reduce the effects of flooding and prepare the community before, during, and after disasters. By assessing these efforts, the study aims to determine how effective the local government is in managing flood-related concerns and protecting the community.

The study first describes the respondents according to their age, sex, length of residence, and geographic location or topography of residence. These characteristics help provide a better understanding of the respondents' background and how their experiences may influence their views on flood management in disaster preparedness. The study then evaluates the respondents' assessment of the local government's disaster management efforts in terms of policy implementation and information dissemination, emergency response, and post-disaster rehabilitation.

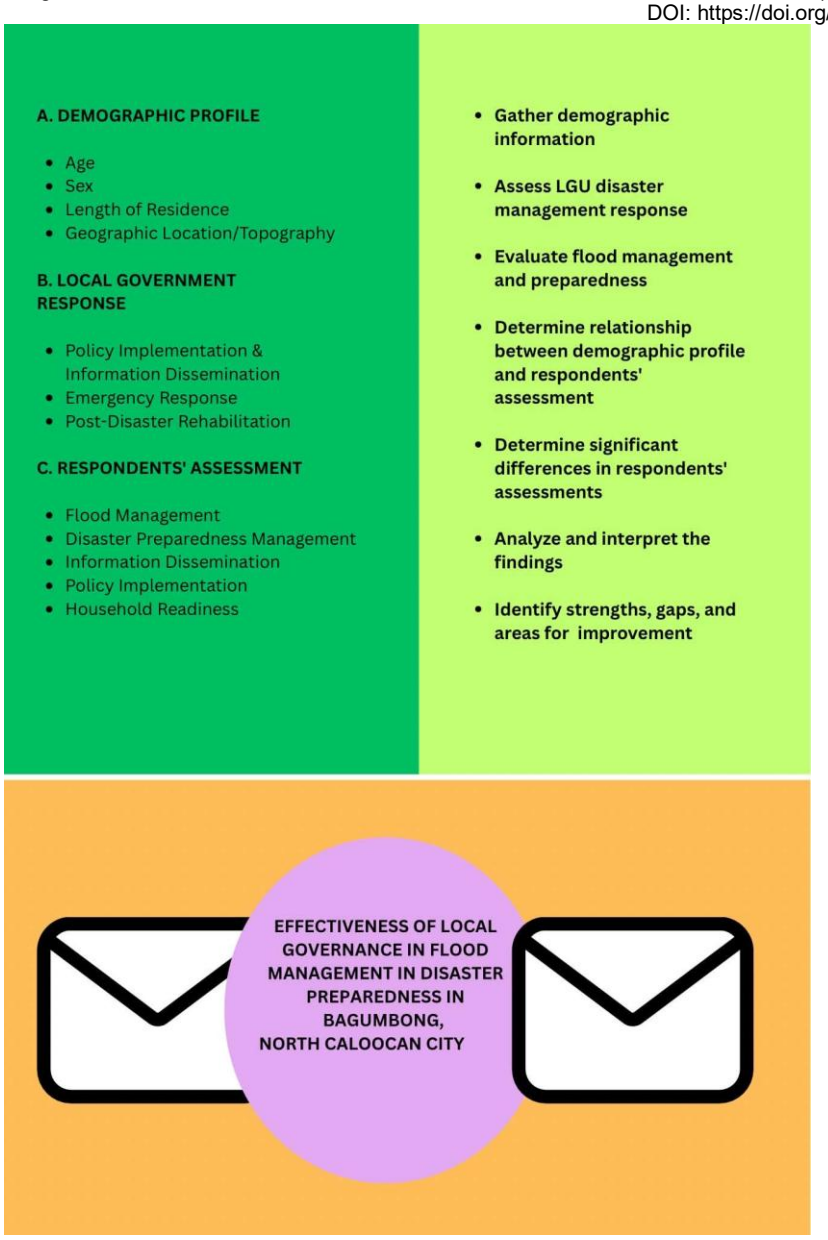
After gathering the necessary data, the study analyzes the respondents' assessments to determine the effectiveness of the local government's disaster management programs. It also examines whether the respondents' demographic profile is related to their assessment and whether the relationship is statistically significant. The findings help identify the strengths and weaknesses of the current flood management and disaster preparedness efforts in Bagumbong Area.

Based on the study results, a Proposed Administrative Plan was developed to improve flood management and disaster preparedness in Bagumbong Area, North Caloocan City. The proposed plan provides practical recommendations to strengthen policy implementation, improve information dissemination, enhance emergency response, and support post-disaster rehabilitation. It is expected to assist the local government in improving its disaster management programs and help the community become more prepared and resilient against future flooding. The conceptual paradigm of the study is presented in Figure 2.

Figure 2. Conceptual Paradigm of the Study

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Statement of the Problem and Objectives

Flooding remains one of the most frequent natural hazards affecting communities in Bagumbong, North Caloocan City. Despite the implementation of Local Government programs and disaster risk reduction initiatives, concerns remain regarding the effectiveness of these measures in minimizing flood impacts and enhancing community preparedness.

This study aimed to determine the role of local governance in the Bagumbong Area (Barangay 171) of North Caloocan City in flood management and disaster preparedness.

Specifically, it sought answers to the following questions:

1. What is the demographic profile of the respondents in terms of:

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1.1 age;

1.2 gender;

1.3 length of residence; and

1.4 geographic location or topography of residence?

2. How do the respondents assess the level of effectiveness of the local government's flood management response in disaster preparedness in the Bagumbong area, North Caloocan City, in terms of:

2.1 policy implementation and information dissemination;

2.2 emergency response; and

2.3 post-disaster rehabilitation?

3. Is there a significant relationship between the respondents' demographic profile and their assessment of the effectiveness of the local government's flood management response in disaster preparedness in the Bagumbong area, North Caloocan City?

4. What problems does the local government encounter in implementing flood management in disaster preparedness?

5. What civic or administrative plan may be proposed based on the findings of the study?

Hypothesis

H_0: There is no significant relationship between the respondents' demographic profile and their assessment of the effectiveness of the local government's flood management response in disaster preparedness in the Bagumbong area, North Caloocan City.

Significance of the Study

The findings of this study are deemed beneficial to the following:

For Local Government Units (LGUs). The findings of this study may help barangay and city officials identify gaps between existing flood management programs and their actual implementation. Insights from residents can guide improvements in drainage maintenance, waste management practices, information dissemination, and emergency response strategies.

Residents of the Bagumbong Area. This study gives voice to residents' lived experiences with flooding and disaster response. It may encourage greater community awareness and participation in disaster preparedness initiatives and foster stronger cooperation between residents and local authorities.

Disaster Risk Reduction and Management Personnel. The study may assist disaster management practitioners in identifying gaps in preparedness, communication, and emergency response that are not easily captured through quantitative assessments.

Researchers/Future Researchers. This quantitative study may serve as a reference for future research on local governance, flooding, and disaster preparedness, particularly in urban and flood-prone communities. It may also provide a foundation for mixed methods or comparative studies in similar settings.

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For Policy and Planning. By documenting how local governance is perceived and experienced, the study may inform the development of more responsive and community-centered disaster preparedness policies.

Scope and Delimitations

This study focused on assessing the effectiveness of local governance in flood management in disaster preparedness in Bagumbong Area, North Caloocan City. It determined the demographic profile of the respondents in terms of age, gender, length of residence, and geographic location or topography of residence, and examined the respondents' assessment of the local government's flood management response in terms of policy implementation and information dissemination, emergency response, and post-disaster rehabilitation. The indicators under these areas cover aspects such as the accessibility of information and facilities, quick response, evacuation practices, and the assistance given before, during, and after flooding. The study also identified the problems encountered in implementing flood management in disaster preparedness and provided the basis for a proposed civic and administrative action plan.

The respondents of the study were selected residents of Bagumbong Area, North Caloocan City, who have experienced or are potentially affected by flooding within the community. Data were gathered through a survey questionnaire designed to collect information regarding their perceptions and experiences related to flood management in disaster preparedness initiatives implemented by the local government.

This study was limited to the responses of the 100 selected residents and does not include the views of local government officials, disaster risk reduction personnel, or residents from other barangays. It is also confined to the variables identified in the Statement of the Problem, namely the respondents' demographic profile, the three areas of flood management response, and the problems encountered in implementation. Other factors that may influence flood management in disaster preparedness, such as budget allocation, infrastructure funding, climate change adaptation policies, and technical flood risk assessments, were beyond the scope of this study. Therefore, the findings are limited to the selected respondents and the specific setting of Bagumbong Area, North Caloocan City.

Definition of Terms

The following terms are defined for a better understanding of the study:

Accessibility. The ease with which people can reach, enter, or use places, services, facilities, information, or resources without unnecessary barriers. In this study, it refers to the ease with which residents of Bagumbong Area, North Caloocan City, can obtain flood management facilities, evacuation centers, and emergency services information provided by the local government.

Bagumbong Area, North Caloocan City. The geographical area where the study was conducted and where the respondents reside.

Community Participation. The active involvement of community members in planning, implementing, and evaluating programs and activities that affect their welfare. In this study, it refers to the involvement of Bagumbong residents in disaster preparedness activities such as drills, meetings, and emergency response initiatives.

Disaster Preparedness. The knowledge, capacities, and actions developed by governments and communities to anticipate, respond to, and recover from disasters effectively.

Disaster Risk Reduction and Management (DRRM). The systematic process of reducing disaster risks through prevention, mitigation, preparedness, response, and recovery. In this study, it refers to the programs and activities carried out by the local government to reduce the impacts of floods and other disasters.

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Drainage System. A network of natural or artificial channels, pipes, culverts, canals, and other structures designed to collect surface and underground water to prevent flooding.

Evacuation Practices. Procedures, actions, and measures carried out by government agencies, organizations, and communities to safely and efficiently move people from areas at risk of disasters to designated safe locations or evacuation centers before, during, and after an emergency.

Flood Management. The planning and implementation of measures to prevent, reduce, and respond to flooding to minimize its effects on people, property, and the environment. In this study, it refers to the strategies and activities undertaken by the local government to prevent flood risks in Bagumbong.

Information Dissemination. The process of distributing or communicating information to the public through various channels to ensure that people receive accurate, timely, and relevant information. In this study, it refers to providing residents with timely, accurate, and accessible information regarding flood management, disaster preparedness, evacuation procedures, and emergency warnings.

Local Government Unit (LGU). A political subdivision of the Philippines authorized by the Local Government Code of 1991 to govern and provide services within its jurisdiction. In this study, it refers to the local government responsible for implementing flood management and disaster preparedness programs in Bagumbong Area, North Caloocan City.

Local Governance. The process by which local government units exercise authority, make decisions, and deliver public services through participation, accountability, transparency, and responsiveness. In this study, it refers to the actions and performance of Barangay 171 in implementing flood management and disaster preparedness programs.

Policy Implementation. The process of putting adopted laws, policies, plans, or programs into action through the coordinated efforts of government agencies and other stakeholders to achieve their intended objectives. In this study, it refers to the carrying out of flood management and disaster preparedness policies, programs, and activities, as perceived by the respondents.

Post-Disaster Rehabilitation. The process of restoring and rebuilding communities, infrastructure, public services, and livelihoods after a disaster to help individuals return to normal living conditions. In this study, it refers to the restoration of public infrastructure, basic services, and community well-being after flooding, including the repair of damaged facilities, provision of assistance, and support for community recovery.

Responsiveness. The ability of an organization or public institution to respond to the needs, concerns, and expectations of the people it serves. In this study, it refers to the provision of timely and appropriate actions, services, and assistance before, during, and after flood-related disasters.

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METHODS

Research Design

This study employed a quantitative descriptive-evaluative research design to examine the effectiveness of the local government's flood management in disaster preparedness efforts in Bagumbong Area, North Caloocan City. This design was considered appropriate because it enabled the researchers to collect measurable data and evaluate the respondents' assessment of the local government's initiatives in addressing flooding within the community.

The descriptive aspect of the study provided a clear picture of how respondents assessed the local government's performance in policy implementation and information dissemination, emergency response, and post-disaster rehabilitation. Meanwhile, the evaluative aspect focused on determining the extent to which these initiatives were perceived as effective. The findings also served as the basis for identifying areas for improvement and for proposing civic and administrative plans that may help strengthen flood management and disaster preparedness in the community.

Study Locale

The study was conducted in the Bagumbong Area, Barangay 171, North Caloocan City, a flood-prone community in a highly urbanized city of Metro Manila. Respondents resided along four locations within the area, namely Sampaguita Drive, Saranay Road (around Petron), Clamor Avenue, and Malapitan Road.

Respondents and Sampling Technique

The respondents of this study were one hundred (100) residents of Bagumbong Area, North Caloocan City. These individuals were selected because they have firsthand experience with flooding in their community, allowing them to provide relevant insights into the effectiveness of the local government's flood management and disaster preparedness efforts. Their experiences and observations served as valuable sources of information in addressing the objectives of the study.

The study employed purposive sampling, a non-probability sampling technique in which participants are selected based on specific characteristics relevant to the research. This method was considered appropriate because the study sought information from individuals who have directly experienced flooding and are familiar with the local government's actions before, during, and after flood incidents. Selecting respondents with relevant experiences allowed the researchers to gather data that directly reflected the realities of flood management and disaster preparedness in the community.

To ensure respondent suitability, the researchers included residents of Bagumbong Area, North Caloocan City, who were at least eighteen (18) years of age, had experienced flooding within the community, and voluntarily agreed to participate. Before the distribution of the questionnaires, the researchers explained the purpose of the study and assured the respondents that their participation was voluntary. They were also informed that all information collected would be kept confidential and used solely for academic purposes.

Research Instrument

Data were gathered using a structured, researcher-prepared questionnaire (Appendix A) consisting of three parts. Part I elicited the respondents' demographic profile in terms of age, gender, length of residence, and geographic location or topography of residence. Part II measured the respondents' assessment of the local government's flood management response in disaster preparedness in terms of policy implementation and information dissemination, emergency response, and post-disaster rehabilitation, with five indicators for each area (15 items in all). Part III listed ten problems

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that may be encountered by the local government in implementing flood management and disaster preparedness, which the respondents rated according to the degree to which each is a problem.

Responses in Parts II and III were recorded on four-point scales. For Part II, the ratings were 4 (Strongly Implemented), 3 (Implemented), 2 (Slightly Implemented), and 1 (Not Implemented), and the mean scores were interpreted using the descriptive levels of effectiveness shown in Table 1. For Part III, the ratings were 4 (Not a Problem), 3 (Slight Problem), 2 (Moderate Problem), and 1 (Serious Problem), interpreted as shown in Table 2. The instrument was validated by Dr. Eva M. Ramirez and Professor Pilar C. Del Carmen, and the statistical treatment was reviewed by the study's statistician, Dr. Joeanly A. Fines (certificates of validation are on file with the researchers).

Table 1. Scale and interpretation used for the assessment of effectiveness (Part II)

Scale	Descriptive value (questionnaire)	Range	Verbal interpretation
4	Strongly Implemented	4.00–3.26	Very Effective
3	Implemented	3.25–2.51	Effective
2	Slightly Implemented	2.50–1.76	Less Effective
1	Not Implemented	1.75–1.00	Not Effective

Table 2. Scale and interpretation used for the assessment of problems (Part III)

Scale	Descriptive value	Range	Interpretation
4	Not a Problem	4.00–3.26	NP
3	Slight Problem	3.25–2.51	SP
2	Moderate Problem	2.50–1.76	MP
1	Serious Problem	1.75–1.00	SeP

Data Gathering Procedure

The data collection process began with securing official approval from the Barangay Chairman or Punong Barangay of Barangay 171, located in the Bagumbong Area, North Caloocan City. A formal letter of request was submitted to the concerned barangay office to seek permission to conduct the study entitled "Effectiveness of Local Governance in Flood Management in Disaster Preparedness in Bagumbong Area, North Caloocan City." Coordination with the concerned barangay officials was then conducted to facilitate the distribution of survey questionnaires to residents within the study area.

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Once approval was obtained, the survey questionnaire was distributed to the selected respondents through Google Forms. The online questionnaire included items concerning the demographic profile of the respondents, the effectiveness of the local government's flood management response in terms of Policy Implementation and Information Dissemination, Emergency Response, and Post-Disaster Rehabilitation, as well as the problems encountered in implementing flood management in disaster preparedness. The respondents were given sufficient time to complete the survey based on their experiences and perceptions regarding flood management and disaster preparedness in the Bagumbong Area.

After the collection period, all completed responses were compiled and organized through Google Forms for statistical analysis. The responses were treated with strict confidentiality, ensuring that the gathered data were used solely for academic and research purposes. The collected information then underwent statistical processing using frequency and percentage, weighted mean, and Chi-Square to determine the effectiveness of local governance in flood management, disaster preparedness, and the problems encountered in its implementation. The findings served as the basis for the conclusions, recommendations, and proposed Civic/Administrative Action Plan of the study.

Ethical Considerations

Before the questionnaires were distributed, the researchers explained the purpose of the study and assured the respondents that their participation was voluntary, that all information collected would be kept confidential, and that the data would be used solely for academic and research purposes. Only residents who voluntarily agreed to participate were included.

Statistical Treatment of Data

The data collected from the completed survey questionnaires were organized, coded, tabulated, and analyzed using appropriate statistical tools to address the study's specific problems. The analysis focused on determining respondents' assessment of the effectiveness of local governance in flood management and disaster preparedness in Bagumbong Area, North Caloocan City, and identifying possible differences in assessment by variable.

Frequency and Percentage. Frequency and percentage distributions were used to describe the demographic profile of the respondents.

Weighted Mean. The weighted mean was applied to measure the respondents' assessment of the effectiveness of local governance in flood management and disaster preparedness in Bagumbong Area, North Caloocan City. It was used to evaluate their perceptions of flood management and disaster preparedness in their barangay. The weighted mean was considered suitable for Likert-scale data because it provided an average level of agreement or preference for each indicator.

Chi-Square Test of Independence. The Chi-Square Test of Independence was used to determine whether there was a significant relationship between the respondents' demographic profile and their assessment of the effectiveness of local governance in flood management and disaster preparedness. The test was applied to demographic variables such as age, sex, length of residence, and geographic location or topography of residence in relation to the respondents' assessment of flood management and disaster preparedness. The level of significance was set at 0.05. If the computed p-value was less than 0.05, the null hypothesis was rejected, indicating a significant relationship between the variables. Conversely, if the computed p-value was greater than 0.05, the null hypothesis was not rejected, indicating that no statistically significant relationship was established between the variables.

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RESULTS

The results are presented according to the specific problems of the study: the demographic profile of the respondents, their assessment of the effectiveness of the local government's flood management response, the relationship between demographic profile and assessment, and the problems encountered in implementation. The proposed action plan derived from these results is presented in Section 4.8.

Demographic Profile of the Respondents

Table 3 summarizes the demographic profile of the 100 respondents.

Table 3. Demographic profile of the respondents (N = 100)

Variable / category	Frequency	Percentage
Age		
18–28	81	81%
29–39	8	8%
40–49	6	6%
50 and above	5	5%
Gender		
Male	36	36%
Female	59	59%
LGBTQ+	5	5%
Length of residence in the Bagumbong Area		
Less than 1 year	5	5%
1–5 years	25	25%
6–10 years	18	18%
More than 10 years	52	52%
Geographic location		
Sampaguita Drive	13	13%

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Variable / category	Frequency	Percentage
Saranay Road (around Petron)	40	40%
Clamor Avenue	23	23%
Malapitan Road	16	16%
Total (all variables)	**100**	**100%**

Age. The results show that most respondents are aged 18–28 years, accounting for 81 respondents (81% of the total). This indicates that the study is largely represented by young adult respondents within this age group. Meanwhile, 8 respondents, or 8%, are aged 29–39 years, followed by 6 respondents, or 6%, aged 40–49 years. The smallest group consists of respondents aged 50 years and above, with 5 respondents, or 5%. Overall, the distribution shows that the respondents are predominantly young adults, while relatively fewer respondents belong to the older age groups. This demographic composition suggests that the findings of the study largely reflect the perceptions and experiences of respondents aged 18–28 years. However, the participation of respondents from the other age categories provides representation across different stages of adulthood.

Gender. Of the 100 respondents, most are female (59, or 59%), indicating that females comprise more than half of the respondents in the study. This is followed by male respondents, at 36% of the total sample. Meanwhile, 5 respondents (5%) identified as LGBTQ+, the smallest group in the distribution. Overall, the results indicate that the respondents are predominantly female, while male and LGBTQ+ respondents are also represented in the study. The distribution demonstrates that the study includes respondents from different gender groups, allowing their respective perspectives and experiences to be considered in assessing the subject under investigation.

Length of residence. The findings show that most respondents (52; 52%) have lived in the Bagumbong Area for more than 10 years, making this the largest group. This is followed by 25 respondents (25%) who have lived in the area for 1–5 years, while 18 respondents (18%) have resided in Bagumbong for 6–10 years. Only 5 respondents (5%) have lived in the area for less than one year, representing the smallest proportion. Overall, the data indicate that the respondents are predominantly long-term residents, with 70% having lived in the Bagumbong Area for six years or more. This suggests that most respondents have had considerable exposure to the community and may have developed sufficient familiarity with its programs, services, facilities, and local conditions. Their longer period of residence may therefore enable them to provide more informed perceptions and experiences regarding the community and the programs being assessed in the study. In contrast, the small proportion of respondents who have resided in the area for less than one year may have had relatively limited exposure to community activities and services. Thus, the distribution shows that respondents generally have substantial residential experience in Bagumbong, which can provide valuable insights for the study's assessment.

Geographic location. The data show that the largest number of respondents, 40 (40%), are located along Saranay Road (around Petron), making it the most represented geographic location in the study. This is followed by Clamor Avenue, which accounts for 23 respondents or 23% of the respondents. Meanwhile, Malapitan Road accounts for 16 respondents (16%), while Sampaguita Drive has the smallest representation, with 13 respondents (13%). The distribution indicates that respondents were drawn from several locations within the study area, providing geographic representation across the identified communities. The relatively high proportion of respondents from Saranay Road may indicate that this area has a larger concentration of the target population or that respondents in this location were

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more accessible during the data-gathering process. In contrast, the lower percentages from Sampaguita Drive and Malapitan Road indicate comparatively fewer respondents from these areas. Overall, the geographic distribution demonstrates that the study included respondents from different parts of Bagumbong, which may help provide a broader perspective of the experiences and perceptions of residents across the study area.

Assessment of the Effectiveness of the Local Government's Flood Management Response

Policy implementation and information dissemination

Table 4. Respondents' assessment of policy implementation and information dissemination

Indicators	Weighted mean (WM)	Verbal interpretation (VI)
1. The local government effectively provides credible and reliable information through bulletin boards and social media (Facebook page).	2.52	E
2. The local government effectively informs residents about flood prevention programs and activities.	2.54	E
3. The barangay effectively uses communication channels (e.g., social media, text messages, and public announcements) to disseminate disaster-related information.	2.52	E
4. The local government effectively provides sufficient information about evacuation procedures and designated evacuation centers.	2.51	E
5. The barangay effectively provides early warnings of potential flooding through megaphones.	2.51	E
Composite mean	**2.52**	**E**

Legend: 4.00–3.26 Very Effective (VE); 3.25–2.51 Effective (E); 2.50–1.76 Less Effective (LE); 1.75–1.00 Not Effective (NE)

Table 4 presents respondents' assessment of the Policy Implementation and information dissemination aspects of the local government's flood management response in disaster preparedness. The results yielded a composite weighted mean of 2.52, verbally interpreted as Effective, indicating that respondents generally perceive the local government's efforts to implement policies and disseminate flood-related information as effective. Among the indicators, the highest weighted mean was 2.54 for the local government's effectiveness in informing residents about flood prevention programs and activities, suggesting that respondents recognize the efforts of the local government in communicating preventive measures to the community. This was followed by the use of bulletin boards and social media to provide credible and reliable information, as well as the use of various communication channels such as social media, text messages, and public announcements, both with a weighted mean of 2.52. Meanwhile, providing sufficient information on evacuation procedures and designated evacuation centers, and giving early flood warnings through megaphones, both obtained a weighted mean of 2.51, which is still within the Effective range. Overall, the findings indicate that the local government has established and utilized different means of communication to inform residents

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and support disaster preparedness; however, the relatively low weighted means within the "Effective" category suggest that there is still room for improvement, particularly in strengthening evacuation information and early-warning systems to ensure that residents receive timely, sufficient, and accessible information before and during flooding incidents.

Emergency response

Table 5. Respondents' assessment of emergency response

Indicators	Weighted mean (WM)	Verbal interpretation (VI)
1. The local government personnel/DRRM respond promptly when flooding occurs in the barangay.	2.57	E
2. The local government personnel/DRRM provide emergency supplies and necessities to residents affected by flooding.	2.51	E
3. The local government personnel/DRRM organize rescue operations effectively during flooding and other emergencies.	2.45	LE
4. The local government personnel/DRRM provide timely and adequate evacuation facilities for residents who need to leave their homes.	2.39	LE
5. The local government personnel/DRRM provide priority assistance to vulnerable individuals, such as children, the elderly, and people with disabilities, during emergencies.	2.32	LE
Composite mean	**2.45**	**LE**

Legend: 4.00–3.26 Very Effective (VE); 3.25–2.51 Effective (E); 2.50–1.76 Less Effective (LE); 1.75–1.00 Not Effective (NE)

Table 5 presents respondents' assessment of the local government's emergency response in relation to flood management and disaster preparedness in the Bagumbong area, North Caloocan City. The results yielded a composite weighted mean of 2.45, interpreted as Less Effective, indicating that respondents generally perceive the local government's emergency response efforts as needing improvement. The highest weighted mean was 2.57 for the prompt response of local government personnel/DRRM when flooding occurs, which falls under the Effective category and suggests that respondents recognize the ability of authorities to respond promptly during flood incidents. The provision of emergency supplies and necessities received a weighted mean of 2.51, also interpreted as Effective, though it falls at the category's lower boundary. However, the remaining indicators were assessed as Less Effective, particularly the organization of rescue operations with a weighted mean of 2.45, the provision of timely and adequate evacuation facilities with 2.39, and the provision of priority assistance to vulnerable individuals, such as children, elderly persons, and people with disabilities, with the lowest weighted mean of 2.32. These findings suggest that while the local government demonstrates some effectiveness in responding promptly to flooding and providing basic emergency necessities, weaknesses remain in rescue operations, evacuation facilities, and assistance to vulnerable groups. Overall, the 2.45 composite mean indicates that the local government and DRRM personnel need to strengthen

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emergency response mechanisms, particularly by improving rescue coordination, ensuring adequate evacuation facilities, and providing more responsive, inclusive assistance to residents most at risk during flooding.

Post-disaster rehabilitation

Table 6. Respondents' assessment of post-disaster rehabilitation

Indicators	Weighted mean (WM)	Verbal interpretation (VI)
1. The local government personnel effectively clear mud, accumulated garbage, and other debris from flood-affected roads and public areas after flooding.	2.25	LE
2. The local government personnel effectively repair or restore drainage canals that are damaged or clogged because of flooding.	2.22	LE
3. The local government personnel effectively repair damaged roads and other public facilities affected by floodwater.	2.23	LE
4. The local government personnel effectively inspect flood-affected areas to identify damage to roads, drainage systems, and public facilities after flooding.	2.22	LE
5. The local government personnel effectively prioritize the repair or improvement of flood-damaged areas based on the results of post-flood assessments.	2.25	LE
Composite mean	**2.23**	**LE**

Legend: 4.00–3.26 Very Effective (VE); 3.25–2.51 Effective (E); 2.50–1.76 Less Effective (LE); 1.75–1.00 Not Effective (NE)

Table 6 presents the respondents' assessment of Post-Disaster Rehabilitation as part of the local government's flood management response in disaster preparedness in the Bagumbong area, North Caloocan City. The results show a composite weighted mean of 2.23, verbally interpreted as Less Effective, indicating that the respondents generally perceive the local government's post-disaster rehabilitation efforts as insufficient and in need of improvement. The highest weighted mean was 2.25 for the local government's effectiveness in clearing mud, accumulated garbage, and other debris from flood-affected roads and public areas, as well as prioritizing the repair or improvement of flood-damaged areas based on post-flood assessments. Both indicators were still assessed as Less Effective. Meanwhile, repairing damaged roads and public facilities obtained a weighted mean of 2.23, while repairing or restoring damaged or clogged drainage canals and inspecting flood-affected areas to identify damage both received 2.22, the lowest ratings in the table. These findings suggest that although the local government undertakes rehabilitation activities after flooding, respondents perceive these efforts as not sufficiently effective in addressing damaged infrastructure, drainage systems, roads, and other public facilities. The consistently low weighted means across all indicators further indicate the need to strengthen post-disaster assessment, debris clearing, drainage rehabilitation, infrastructure repair, and prioritization of affected areas. Overall, the 2.23 composite mean reflects that post-disaster rehabilitation is an

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area requiring significant improvement to ensure that flood-affected communities can recover more quickly and that public facilities and infrastructure are restored effectively after flooding incidents.

Relationship Between Demographic Profile and Assessment of Effectiveness

Table 7. Test of significant relationship between the respondents' demographic profile and their assessment of the effectiveness of the local government's flood management response in disaster preparedness

Variable compared	Computed χ^2	p-value	Decision on H_0	Remarks
Age	10.769	0.292	Accept	Not significant
Gender	11.701	0.069	Accept	Not significant
Length of residence	11.968	0.215	Accept	Not significant
Geographic location	15.596	0.210	Accept	Not significant

Note. Statistical tool: Chi-Square Test of Independence; each demographic variable was compared with the level of effectiveness of the local government's flood management response in disaster preparedness. Level of significance = 0.05.

The results in Table 7 show no significant relationship between the respondents' demographic profile and their assessment of the effectiveness of the local government's flood management response in disaster preparedness in the Bagumbong area, North Caloocan City. Specifically, age had a computed χ^2 value of 10.769 and a p-value of 0.292, which is greater than the 0.05 level of significance; therefore, the null hypothesis is accepted, indicating that respondents' assessments of effectiveness do not significantly differ by age. Similarly, gender yielded a computed χ^2 of 11.701 and a p-value of 0.069, which is also greater than 0.05, showing no significant relationship between gender and the assessment of effectiveness. Length of residence had a χ^2 value of 11.968 and a p-value of 0.215, also indicating no significant relationship; the number of years respondents have lived in the area does not substantially influence their assessment. Finally, geographic location produced a computed χ^2 of 15.596 and a p-value of 0.210, which is above the 0.05 significance level, indicating that respondents' assessments do not significantly vary according to their geographic location. Overall, because all p-values exceed 0.05, the findings indicate that age, gender, length of residence, and geographic location are not significantly associated with respondents' assessments of the effectiveness of the local government's flood management response. This suggests that the respondents generally share similar perceptions of the local government's flood management effectiveness regardless of their demographic characteristics.

Problems Encountered in Implementing Flood Management in Disaster Preparedness

Table 8. Problems encountered in implementing flood management in disaster preparedness

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Indicators	Weighted mean (WM)	Verbal interpretation (VI)
1. Limited budget and resources	1.92	MP
2. Inadequate emergency equipment	1.92	MP
3. Insufficient personnel	1.92	MP
4. Limited training	1.92	MP
5. Poor inter-agency coordination	1.91	MP
6. Inadequate early warning system	1.91	MP
7. Poor evacuation planning	1.88	MP
8. Limited community participation	1.89	MP
9. Inadequate facilities	1.86	MP
10. Communication gaps	1.85	MP
Composite mean	**1.90**	**MP**

Legend: 4.00–3.26 Not a Problem (NP); 3.25–2.51 Slight Problem (SP); 2.50–1.76 Moderate Problem (MP); 1.75–1.00 Serious Problem (SeP)

Table 8 presents the respondents' assessment of the problems encountered in implementing flood management in disaster preparedness. The table obtained a composite mean of 1.90, verbally interpreted as a Moderate Problem (MP) based on the given scale of 1.76–2.50. This indicates that, overall, the identified factors are perceived by the respondents as moderate problems in the implementation of flood management in disaster preparedness. Among the indicators, Limited Budget and Resources, Inadequate Emergency Equipment, Insufficient Personnel, and Limited Training obtained the highest weighted mean of 1.92, all interpreted as Moderate Problems. These findings suggest that resource availability, emergency equipment, staffing, and personnel training remain areas that may affect the effectiveness of disaster preparedness activities. However, respondents do not perceive them as severe concerns. Poor Inter-agency Coordination and Inadequate Early Warning System both obtained a weighted mean of 1.91, also indicating Moderate Problems, suggesting that coordination among concerned agencies and the dissemination of timely flood-related warnings may still require improvement. Limited Community Participation received a weighted mean of 1.89, while Poor Evacuation Planning obtained 1.88, likewise interpreted as Moderate Problems. These results imply that although community involvement and evacuation preparedness are generally present, there may still be opportunities to strengthen residents' participation and improve the organization and implementation of evacuation procedures.

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Meanwhile, Inadequate Facilities received a weighted mean of 1.86, followed by Communication Gaps, which had the lowest weighted mean of 1.85; both remain in the Moderate Problem category. The relatively close weighted means, ranging from 1.85 to 1.92, indicate that no single problem substantially dominates the others, suggesting that the identified challenges are relatively comparable in their perceived level. Overall, the findings indicate that flood management and disaster preparedness in the study area are generally implemented with moderate problems. Nonetheless, improvements in resources, equipment, personnel, training, inter-agency coordination, early warning systems, evacuation planning, community participation, facilities, and communication remain important to further strengthen the community's preparedness and capacity to respond effectively to flooding incidents.

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DISCUSSION

Summary of Principal Findings

This study assessed the effectiveness of local governance in flood management and disaster preparedness in the Bagumbong Area, North Caloocan City, based on data gathered from 100 respondents. The principal findings, according to the Statement of the Problem, are as follows:

1. **Demographic profile.** The findings revealed that most respondents were aged 18–28 years, comprising 81% of the total respondents, followed by those aged 29–39 years (8%), 40–49 years (6%), and 50 years and above (5%). In terms of gender, the majority were female at 59%, followed by male respondents at 36%, while 5% identified as LGBTQ+. Regarding length of residence, more than half of the respondents, or 52%, had lived in the Bagumbong Area for more than 10 years, followed by 25% who had lived in the area for 1–5 years, 18% for 6–10 years, and 5% for less than one year. In terms of geographic location, the largest proportion of respondents came from Saranay Road (around Petron) at 40%, followed by Clamor Avenue at 23%, Malapitan Road at 16%, and Sampaguita Drive at 13%. Overall, the demographic findings show that the respondents were predominantly young adults, female, and long-term residents of the Bagumbong Area, with respondents represented across the identified geographic locations within the study area.

2. **Effectiveness of the local government's flood management response.** The findings revealed that the effectiveness of the local government's flood management response in disaster preparedness varied across the three assessed areas. Policy Implementation and Information Dissemination had the highest composite weighted mean of 2.52, interpreted as Effective, indicating that the local government generally provided flood-related information, communicated prevention programs, and used different communication channels. In contrast, Emergency Response obtained a composite weighted mean of 2.45, interpreted as Less Effective, with areas for improvement particularly in rescue operations, evacuation facilities, and priority assistance for vulnerable individuals. Post-Disaster Rehabilitation received the lowest composite weighted mean of 2.23, also interpreted as Less Effective, indicating weaknesses in drainage restoration, damage assessment, debris clearing, and the repair of flood-affected roads and public facilities. Overall, the findings show that while the local government demonstrates effectiveness in policy implementation and information dissemination, it needs to improve emergency response and post-disaster rehabilitation to strengthen its flood management and disaster preparedness.

3. **Relationship between demographic profile and assessment.** The Chi-Square Test of Independence showed no significant relationship between the respondents' demographic profile and their assessment of the effectiveness of the local government's flood management response in disaster preparedness. Age obtained a p-value of 0.292, gender obtained 0.069, length of residence obtained 0.215, and geographic location obtained 0.210. Since all p-values were greater than the 0.05 level of significance, the null hypothesis was accepted. This indicates that respondents generally had similar assessments of local government flood management effectiveness regardless of their demographic characteristics.

4. **Problems encountered in implementation.** The problems encountered in implementing flood management in disaster preparedness obtained a composite weighted mean of 1.90, interpreted as a Moderate Problem. Limited budget and resources, inadequate emergency equipment, insufficient personnel, and limited training obtained the highest weighted mean of 1.92. Communication gaps obtained the lowest weighted mean of 1.85. Although all identified concerns were assessed as moderate problems, the findings indicate areas that may still affect the implementation of flood management measures, particularly resources, equipment, personnel, training, coordination, early-warning systems, evacuation planning, community participation, facilities, and communication.

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5. **Proposed civic or administrative plan.** Based on the findings, particularly the areas assessed as less effective and the implementation challenges identified, a civic or administrative plan may be proposed to strengthen flood management and disaster preparedness in the Bagumbong Area. The proposed plan should prioritize the improvement of response and post-disaster rehabilitation, particularly rescue operations, evacuation facilities, assistance for vulnerable groups, drainage restoration, damage assessment, debris clearing, and infrastructure repair. It should also address identified implementation concerns involving resources, equipment, personnel, training, coordination, early-warning systems, community participation, and communication.

Policy Implementation and Information Dissemination

The findings of this study align with previous research emphasizing the importance of effective information dissemination in flood management and disaster preparedness. The composite weighted mean of 2.52, interpreted as Effective, indicates that residents generally receive information regarding flood prevention programs, evacuation procedures, early warnings, and other disaster-related measures through various communication channels. This finding aligns with Aquino and Soliven (2026), who emphasized that residents' understanding and use of disaster-related information support effective information dissemination. Similarly, Raphela and Ekeke (2025) highlighted the importance of using diverse communication channels to deliver timely and actionable flood warnings, while Kurata et al. (2023) found that targeted media communication can influence public risk perception and readiness to support disaster mitigation programs. Thus, the findings in Table 4 support the reviewed literature by showing that clear, accessible, and timely communication is an important component of effective local governance for flood management and disaster preparedness.

It should be noted that all five indicators obtained weighted means between 2.51 and 2.54, so the Effective rating rests only marginally above the lower limit of the Effective range (2.51). The result therefore reflects a baseline of adequate rather than strong performance, which is consistent with the respondents' implied need for clearer evacuation information and more reliable early warnings.

Emergency Response

These findings align with Amriampa et al. (2024), who showed that limited resources and weak coordination can reduce the effectiveness of flood disaster response. Similarly, Gundran et al. (2023) emphasized the importance of proper training among disaster responders, while Wen (2024) highlighted the need for better coordination and timely deployment of resources during emergencies. These studies support the findings in Table 5, particularly the Less Effective assessment of rescue operations, evacuation facilities, and priority assistance for vulnerable individuals. This suggests that although the local government can respond promptly and provide basic emergency supplies during flooding, it still needs to improve rescue coordination, evacuation facilities, and assistance for residents most vulnerable during emergencies.

This pattern also reflects the observation of Amriampa et al. (2024) that effective immediate response does not automatically translate into sustainable risk reduction: in Bagumbong, the highest-rated indicators were prompt response and the provision of emergency supplies, while the capacities that depend on prior investment, such as rescue organization, evacuation facilities, and priority assistance for vulnerable groups, were rated lowest.

Post-Disaster Rehabilitation

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The findings of this study align with existing literature on the importance of post-disaster rehabilitation in restoring flood-affected areas. The Less Effective composite weighted mean of 2.23 in Table 6 shows that improvements are needed in clearing mud and debris, restoring clogged or damaged drainage canals, repairing roads and public facilities, inspecting flood-related damage, and prioritizing areas that require immediate repair. This finding supports Ilmi et al. (2025), who emphasized the importance of prompt rehabilitation and infrastructure reconstruction after disasters. Similarly, Atilano-Tang et al. (2025) highlighted the need to improve and maintain drainage systems and other flood-related infrastructure, while Sumarsyah (2025) emphasized the importance of sustained local government intervention during recovery. These studies support the findings of Table 6 by showing that effective post-disaster rehabilitation requires timely assessment, repair, and restoration of damaged infrastructure to help affected areas recover from flooding.

The uniformly low ratings, which ranged only from 2.22 to 2.25, suggest that the weakness is systemic rather than confined to a single activity, and that recovery in Bagumbong depends on the combined performance of inspection, debris clearing, drainage restoration, and infrastructure repair.

Relationship Between Demographic Profile and Assessment

The findings indicate that the respondents' assessments of the local government's flood management response do not significantly vary according to their age, gender, length of residence, or geographic location. This suggests that respondents generally have similar perceptions of the effectiveness of local governance in flood management in disaster preparedness regardless of their demographic characteristics.

This result differs from the assessment of the MDRRM Office in Loboc, Bohol, where age was significantly associated with perceived effectiveness, although gender and length of residency were not. In the present study, gender had the lowest p-value (0.069) but still did not reach the 0.05 level. A plausible explanation, which was not tested here, is that residents of the same area are exposed to the same flooding and receive the same services, so their assessments converge regardless of background. Because the sample was heavily concentrated in the 18–28 age group (81%), however, the absence of an age effect should be interpreted with caution.

Problems Encountered in Implementation

The findings of this study support previous research on the challenges encountered in implementing flood management in disaster preparedness. The composite mean of 1.90, interpreted as a Moderate Problem, indicates that respondents perceive concerns related to budget and resources, emergency equipment, personnel, training, inter-agency coordination, early warning systems, evacuation planning, participation, facilities, and communication as present but not serious. This finding is consistent with Acharya, Koedsin, and Techato (2025), who identified inadequate resources, weak coordination, and limited institutional capacity as barriers to effective disaster management. Similarly, Amriampa et al. (2024) emphasized that limited resources and weak coordination can affect the effectiveness of flood management operations, while Gundran et al. (2023) highlighted the importance of proper training among disaster responders. These studies directly support the concerns identified in Table 8 and suggest that, although Bagumbong perceives these challenges as minor, improvements in resource availability, personnel capacity, training, coordination, and communication may further strengthen flood management implementation in disaster preparedness.

The four problems with the highest means (limited budget and resources, inadequate emergency equipment, insufficient personnel, and limited training) correspond closely to the weaknesses observed in emergency response and post-disaster rehabilitation, which supports the view that resource and capacity constraints underlie the uneven performance across the stages of flood management.

Overall Interpretation

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Taken together, the results show a decline in perceived effectiveness across the stages of the flood management process, from policy implementation and information dissemination (2.52), to emergency response (2.45), and to post-disaster rehabilitation (2.23). This is consistent with the Sendai Framework's emphasis on moving beyond a purely reactive approach, and with the reviewed literature showing that policies and communication are often in place while response capacity, coordination, and recovery lag behind (e.g., Amriampa et al., 2024; Atilano-Tang et al., 2025; Fontanilla, 2026; Khatibi & Gafarov, 2026). The finding that policies and measures related to flood management in disaster preparedness are implemented in the Bagumbong Area, but not with consistent effectiveness, therefore points to specific stages, namely emergency response and post-disaster rehabilitation, where the local government's attention is most needed.

Proposed Civic and Administrative Action Plan

Rationale. The proposed Flood Management and Disaster Preparedness Enhancement Plan responds to the findings of the study on the effectiveness of local governance in flood management and disaster preparedness in Bagumbong, North Caloocan City. The study examines how local government implements policy and information dissemination, emergency response, and post-disaster rehabilitation, while also identifying the problems encountered in implementing flood management and disaster preparedness measures.

The findings of the study provide a basis for identifying specific areas where local governance mechanisms may be strengthened. These include the delivery of timely flood warnings and information, availability of emergency equipment and trained responders, monitoring and improvement of drainage systems, identification of flood-prone areas, proper allocation of preparedness resources, and organized assistance and rehabilitation following flood events.

The proposed plan therefore links the study's assessment of local governance effectiveness to practical measures to improve flood management and disaster preparedness in Bagumbong. It emphasizes coordination among the Barangay Council, Barangay Disaster Risk Reduction and Management Committee (BDRRMC), City Disaster Risk Reduction and Management Office (CDRRMO), and other concerned government agencies. Through these proposed measures, the plan may support more coordinated decision-making, improved preparedness and emergency response, and more organized post-disaster recovery.

Table 9. Proposed Flood Management and Disaster Preparedness Enhancement Plan

Action item	Strategies	Persons involved	Expected output
Policy implementation and information dissemination	1. Instead of relying on megaphones over the whole area, social media platforms and short message service (SMS) via the cellular network will be integrated and prioritized for delivering information. Families should have, or will be given, at least a cellular phone for emergency purposes. 2. Prior evacuation procedures and policies on evacuation will be posted through signage to inform residents.	BDRRMO, Barangay	The local government is expected to coordinate to effectively manage and provide sufficient information about evacuation procedures and designated evacuation centers. Clear instructions will be posted at street corners and are expected to accompany every warning so that residents understand when to evacuate, where to seek assistance, and where to evacuate.

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Emergency response	1. A seminar or webinar on evacuation procedures will be conducted. 2. Residents will participate voluntarily with barangay officials and build stronger linkages with civic groups to help respond to residents who need assistance in times of emergency.	Researchers, BDRRMO, Barangay, Bagumbong Bravo Fire Rescue	The local government personnel/DRRMO are expected to coordinate in conducting the seminar by providing a venue, refreshments, and other resources. The seminar is expected to inform residents about evacuation procedures and to provide insights on whom to give priority assistance, such as vulnerable individuals, children, the elderly, and people with disabilities, during emergencies.
Post-disaster rehabilitation	1. Post-disaster rehabilitation and assistance will be requested from the BDRRMO to be implemented regularly. 2. Information about post-disaster assistance will be disseminated via text message or social media publication so that residents are aware of the assistance available to them. 3. Residents will participate voluntarily in regular drainage inspection, declogging, repair, and rehabilitation, as well as clean-up drives.	MDRRMO/CDRRMO, DILG, MMDA, Barangay police officer	The local government personnel are expected to effectively and immediately help repair or restore damaged houses and drainage canals that are damaged or clogged because of flooding, and to effectively inspect flood-affected areas to identify damage to roads, drainage systems, and public facilities after flooding.

BDRRMO/BDRRMC = Barangay Disaster Risk Reduction and Management Office/Committee; CDRRMO = City Disaster Risk Reduction and Management Office; MDRRMO = Municipal Disaster Risk Reduction and Management Office; DILG = Department of the Interior and Local Government; MMDA = Metropolitan Manila Development Authority.

Limitations of the Study

Several limitations should be considered when interpreting the findings. First, the study relied on the perceptions of 100 purposively selected residents of one area and did not include the views of local government officials or DRRM personnel; the findings therefore cannot be generalized to other barangays. Second, the sample was concentrated among young adults (81% aged 18–28), and the questionnaire was administered online through Google Forms, which

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may have favored respondents who are more digitally connected. Third, some demographic categories were small (for example, five respondents aged 50 and above and five who identified as LGBTQ+), which may limit the sensitivity of the Chi-Square tests. Finally, because the study measured perceived rather than objectively recorded performance, and did not examine budget allocation, infrastructure funding, or technical flood risk assessments, the results should be read as resident-based indicators of effectiveness rather than as a full audit of local flood management.

CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn according to the Statement of the Problem:

1. **Demographic profile of the respondents.** The study concludes that the respondents were predominantly young adults aged 18–28 years, female, and long-term residents who had lived in the Bagumbong Area for more than 10 years. Respondents were also drawn from different geographic locations within the study area, with the largest proportion residing along Saranay Road. The demographic distribution provided perspectives from residents with varying personal and residential backgrounds, although young adults comprised the majority of the sample.

2. **Effectiveness of the local government's flood management response in disaster preparedness.** The study concludes that the effectiveness of local governance in flood management in disaster preparedness varies across the three assessed areas. Policy Implementation and Information Dissemination was assessed as Effective, indicating that the local government has established mechanisms for communicating flood-related information and preventive measures to residents. However, Emergency Response was assessed as Less Effective, indicating the need to strengthen rescue operations, evacuation facilities, and priority assistance for vulnerable residents. Similarly, Post-Disaster Rehabilitation was assessed as Less Effective, indicating the need to improve drainage restoration, damage assessment, debris clearing, and the repair of roads and public facilities. Therefore, while information dissemination demonstrates relative effectiveness, emergency response and post-disaster rehabilitation require further improvement to strengthen the overall flood management response in disaster preparedness.

3. **Significant relationship between demographic profile and assessment of effectiveness.** The study concludes that there is no significant relationship between the respondents' age, gender, length of residence, and geographic location and their assessment of the effectiveness of the local government's flood management response in disaster preparedness. Therefore, the null hypothesis is accepted. This indicates that differences in the respondents' demographic characteristics did not significantly influence their assessment of local government flood management effectiveness.

4. **Problems encountered in implementing flood management in disaster preparedness.** The study concludes that the identified challenges in implementing flood management in disaster preparedness are generally considered Moderate Problems. Nevertheless, limited budget and resources, inadequate emergency equipment, insufficient personnel, and limited training emerged as the most prominent concerns among the identified problems. These areas should still be addressed because they may affect the local government's capacity to improve emergency response, preparedness, and post-disaster rehabilitation.

5. **Proposed civic or administrative plan.** The study concludes that a civic or administrative plan may be developed based on the identified weaknesses and implementation concerns. The plan should primarily address the areas assessed as Less Effective, particularly Emergency Response and Post-Disaster Rehabilitation, while also maintaining and further improving Policy Implementation and Information Dissemination. Strengthening emergency equipment, personnel capacity and training, evacuation preparedness, assistance for vulnerable groups, drainage and infrastructure rehabilitation, early-warning

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systems, inter-agency coordination, and community participation may contribute to a more responsive and comprehensive flood management system in disaster preparedness in the Bagumbong Area, North Caloocan City.

RECOMMENDATIONS

Based on the statistical analysis, summary of findings, and conclusions drawn in this study, the following actionable recommendations are offered to enhance local flood governance in disaster preparedness in Bagumbong Area, North Caloocan City:

Enhance Policy Implementation and Information Dissemination Systems

Although Policy Implementation and Information Dissemination was generally assessed as Effective, indicators on evacuation instructions and the use of megaphone alerts, both with a weighted mean of 2.51, received the lowest ratings in this area. Therefore, the Barangay Disaster Risk Reduction and Management Committee (BDRRMC) may strengthen the dissemination of clear and timely evacuation instructions and maximize the use of megaphone announcements during flood emergencies. Information regarding evacuation procedures, designated evacuation areas, and necessary safety measures should be communicated clearly to residents before and during flooding.

Strengthen Priority Assistance for Vulnerable Individuals During Emergencies

Emergency Response was assessed as Less Effective, with a composite weighted mean of 2.45. The lowest-rated indicator was providing priority assistance to vulnerable individuals, such as children, older persons, and persons with disabilities, during emergencies, which obtained a weighted mean of 2.32 and was interpreted as Less Effective. Based on this finding, the local government and DRRM personnel may strengthen measures for providing timely and appropriate assistance to vulnerable individuals during flood emergencies. Specific personnel may be assigned to assist these individuals during evacuation and emergency response activities. At the same time, priority assistance procedures may be established to ensure that their safety and immediate needs are properly addressed.

Strengthen Post-Disaster Inspection and Drainage Restoration

Post-Disaster Rehabilitation was assessed as Less Effective, with a composite weighted mean of 2.23. The lowest-rated indicators were the repair or restoration of drainage canals damaged or clogged because of flooding and the inspection of flood-affected areas to identify damage to roads, drainage systems, and public facilities, both with a weighted mean of 2.22 and interpreted as Less Effective. Based on these findings, the local government may strengthen its post-flood inspection and drainage restoration procedures by conducting timely assessments of flood-affected areas and prioritizing the clearing, repair, and restoration of damaged or clogged drainage canals. These measures may help address the specific weaknesses identified by the respondents and improve post-disaster rehabilitation in the community.

Strengthen Communication in Flood Management Implementation

The problems encountered in implementing flood management in disaster preparedness were generally assessed as a Moderate Problem, with a composite weighted mean of 1.90. Among the indicators, Communication Gaps obtained the lowest weighted mean of 1.85 and was interpreted as a Moderate Problem. Based on this finding, the local government and barangay may continue strengthening communication during flood management activities by ensuring disaster-related information, instructions, and updates are clearly and consistently communicated to residents and concerned personnel. Strengthening existing communication practices may help support better coordination and information dissemination in flood management and disaster preparedness.

Proposed Civic or Administrative Plan

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Based on the findings, particularly the lowest-rated indicators under Policy Implementation and Information Dissemination, Emergency Response, and Post-Disaster Rehabilitation, as well as the implementation challenges encountered, the researchers recommend adopting the proposed civic or administrative enhancement plan developed in this study. The plan should prioritize the specific areas identified as needing improvement and provide clear activities, responsible offices or persons, expected outcomes, and monitoring measures.

Encourage Future Academic and Policy Research

Future researchers may conduct similar studies in other flood-prone barangays in North Caloocan City to determine whether similar findings are observed in other communities. They may also use qualitative or mixed-method approaches to obtain more detailed information regarding residents' experiences and the perspectives of local officials involved in flood management and disaster preparedness.

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