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Multi-Hazard Preparedness and Response Plan for Barangay Longos, Catmon, Tonsuya, and Tañong in Malabon City: Flood Mitigation, Leptospirosis, Prevention, and Associated Public Health and Environmental Risks

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Abstract:

This study developed a Multi-Hazard Preparedness and Response Plan for Malabon City, focusing on flooding and leptospirosis outbreaks caused by typhoons and monsoon rains. Using disaster risk assessments, flood susceptibility maps, and health data, the study identified the barangays of Longos, Catmon, Tonsuya, and Tañong as highly vulnerable to recurrent flooding and increased leptospirosis cases. Guided by the Disaster Risk Reduction and Management (DRRM) framework, the plan proposes integrated strategies including flood-control improvements, strengthened healthcare preparedness, sanitation enhancement, and community-based interventions. The study emphasizes the importance of coordinated action among government agencies and communities in reducing disaster risks and improving public health resilience in flood-prone urban areas.

Keywords — **Leptospirosis, flood, flood control, public health, Malabon City, waterborne disease.**

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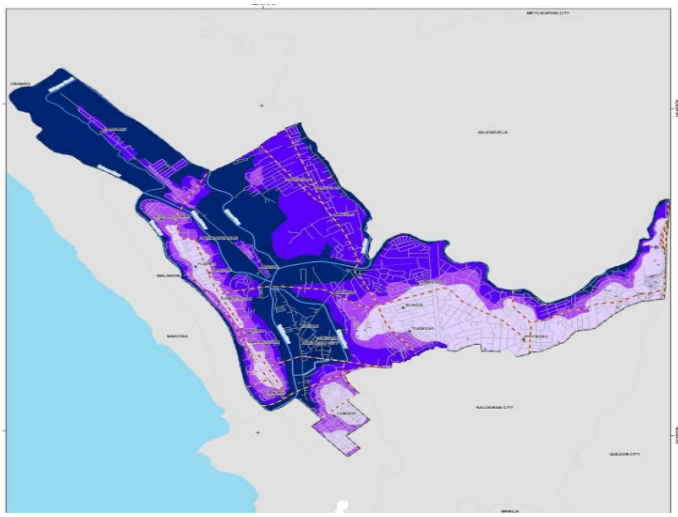
I. INTRODUCTION

The Philippines is highly vulnerable to natural disasters due to its location along tectonic plate boundaries and within the Western Pacific typhoon belt. Malabon City, a densely populated and low-lying area in Metro Manila, experiences recurrent flooding caused by heavy rainfall, high tides, poor drainage, and overflowing waterways such as the Tullahan River. These conditions increase the risk of leptospirosis outbreaks, particularly in overcrowded communities exposed to contaminated floodwaters. In 2024, severe flooding linked to Typhoon Carina and the southwest monsoon resulted in rising leptospirosis cases and fatalities. Addressing these challenges requires integrated, community-based approaches focused on sanitation, flood management, and public health preparedness.



II. SCOPE AND LIMITATION

This action plan aims to address flooding and leptospirosis in Malabon City caused by typhoons and monsoon rains. It focuses on reducing health impacts by improving flood risk assessment, upgrading drainage systems, and installing climate-resilient barriers, with Barangay Maysilo prioritized. The plan also strengthens disease prevention through policy enforcement, community engagement, and improved healthcare capacity, including supplies and treatment facilities. Public awareness, waste management, and hygiene initiatives promote shared responsibility. Implementation will be led by MCDRRMO with local and national partners. Challenges include limited funding, insufficient real-time data, low community participation, and bureaucratic delays affecting timely and effective execution overall.

III. SIGNIFICANCE OF THE PLAN

This action plan is vital for strengthening Malabon City's capacity to manage flooding and leptospirosis while improving public health and resilience. It promotes community participation, awareness, and proactive measures to reduce risks, especially for vulnerable groups. The plan supports local and national governments by providing clear strategies for disaster risk management, efficient resource use, and coordinated emergency response. It also guides stakeholders, including healthcare providers and NGOs, in prioritizing investments and collaborative actions. Additionally, it offers businesses opportunities to support infrastructure and health initiatives, ensuring economic stability. Overall, the plan provides a unified framework for sustainable flood and health risk management

IV. ASSUMPTION OF THE PLAN

The strategy assumes stable political support, sufficient funding, and consistent climate patterns despite uncertainties from climate change. It expects community participation, operational healthcare systems, and reliable services. However, risks include economic challenges, extreme weather, and limited resources, which may affect implementation and the capacity to manage increased flooding and health-related demands.

V. RESEARCH DESIGN

This study assesses Malabon City's preparedness for flooding and leptospirosis through interviews, site visits, observations, and surveys. It identifies gaps in disaster management, disease prevention, infrastructure, and waste systems while measuring residents' awareness and perceptions. The findings support an evidence-based, community-cantered action plan to improve flood management, public health, and disaster readiness

VI. RESULTS OF THE SURVEY

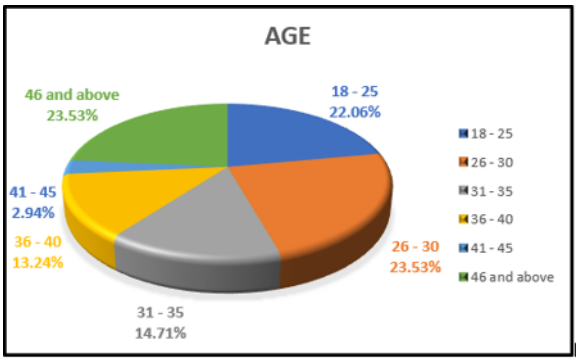


Figure 1. Age Distribution of the Respondents

The survey included diverse age groups, with 26–30 and 46+ each at 23.53%, and 18–25 at 22.06%, forming most respondents. Ages 31–35 (14.71%) and 36–40 (13.24%) showed moderate participation, while 41–45 had the lowest at 2.94%. This distribution highlights strong representation from both younger and older individuals, with slightly lower engagement among middle-aged groups. Overall, the data reflects a relatively balanced sample across age ranges, ensuring varied perspectives. This inclusivity supports a comprehensive understanding of community preparedness, flood mitigation, and public health risks.

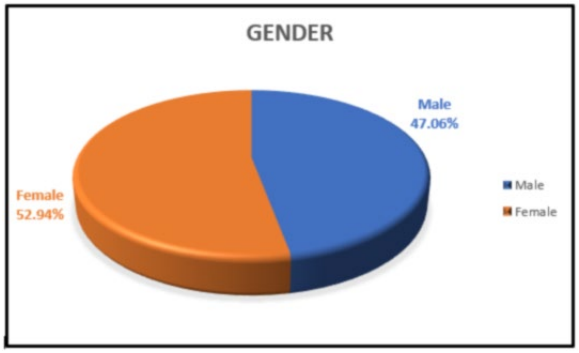


Figure 2: Gender Distribution

The data shows a balanced gender distribution, with females at 52.94% and males at 47.06%. The slight female majority is minimal, indicating strong representation from both genders. This balance ensures diverse perspectives and reduces gender bias, resulting in reliable, inclusive insights into community responses to flood mitigation, leptospirosis prevention, and public health risks in Malabon City

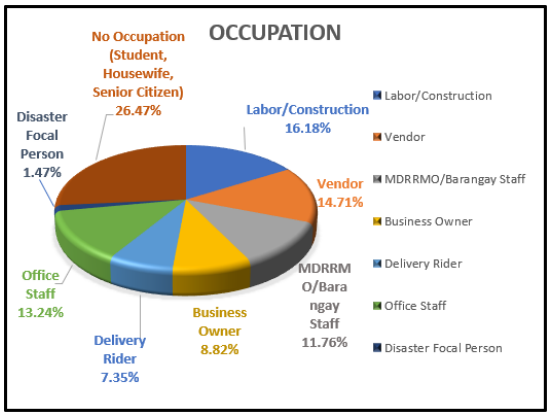


Figure 3: Occupation of the Respondents

The study included 68 respondents from various occupations, reflecting a diverse sample. The largest group was non-working individuals (students, housewives, senior citizens) with 18 respondents (26.47%). Among employed participants, labor/construction workers accounted for 11 (16.18%), vendors 10 (14.71%), office staff 9 (13.24%), and MDRRMO/barangay staff 8 (11.76%). Business owners comprised 6 respondents (8.82%), while delivery riders totaled 5 (7.35%). The least represented group was Disaster Focal Person with only 1 respondent (1.47%). Overall, the distribution shows variability but highlights stronger representation from non-working individuals and informal or labor-based sectors within the surveyed community.

Table 9. Knowledge and Awareness of Respondents

Questions	Frequency				Weighted Mean	Interpretation	Rank
	1	2	3	4			
1. I have sufficient knowledge of whether my residence is located in a flood-prone area.	0	4	16	48	3.6	Strongly Agree	1
2. My barangay is prepared for sudden flooding caused by typhoons or heavy rains	1	5	20	42	3.47	Strongly Agree	4
3. I am knowledgeable about the evacuation procedures and plans in case our area gets flooded.	0	6	18	44	3.51	Strongly Agree	3
4. I have sufficient knowledge and understanding about flood preparedness.	0	5	17	46	3.56	Strongly Agree	2
5. I have sufficient knowledge and understanding about leptospirosis, such as its source and effects.	1	6	19	42	3.46	Strongly Agree	5

Legend: Strongly Disagree (SD) - 1.00 – 1.75; Disagree (D) - 1.76 - 2.50; Agree (A) - 2.51 - 3.25; Strongly Agree (SA) - 3.26 - 4.00

Table 9 shows respondents' knowledge of flooding and leptospirosis in Malabon City, with all items rated "Strongly Agree" (3.26–4.00), indicating very high awareness. The highest weighted mean is 3.60 for awareness of living in flood-prone areas. This is followed by flood preparedness (3.56) and evacuation knowledge (3.51). Barangay preparedness for sudden flooding (3.47) and understanding of leptospirosis causes and effects (3.46) also scored strongly. Overall, the consistently high weighted means demonstrate that respondents are well-informed about flood risks, preparedness, evacuation, and health concerns, reflecting the effectiveness of local information campaigns and disaster preparedness programs in the community

Table 10
Preparedness, Early Warning Systems, Flood Management and Response

Questions	Frequency				Weighted Mean	Interpretation	Rank
	1	2	3	4			
6. There is a proper and reliable early warning system for heavy rainfall and flooding.	3	10	25	30	3.21	Agree	1
7. The canals and drainage system are effective, sufficient, and functional.	6	14	28	20	2.91	Agree	7
8. The barangay's response team has a sufficient number of personnel to respond to disasters	4	11	27	26	3.09	Agree	4
9. The local government regularly conducts risk assessments regarding flooding and diseases.	5	13	26	24	3.00	Agree	5
10. There is sufficient information and awareness campaigns about flood preparedness.	3	12	25	28	3.12	Agree	3
11. There are adequate flood control measures such as flood barriers and a proper drainage system	6	13	29	20	2.94	Agree	6
12. The evacuation plan and processes are effective during flooding	3	9	26	30	3.15	Agree	2

Table 10 presents respondents' assessment of flooding preparedness, early warning, management, and response in Malabon City, with all indicators rated "Agree" (2.51–3.25) and weighted means ranging from 2.91 to 3.21. The highest-rated aspect is early warning systems (3.21), followed by evacuation plans (3.15) and awareness campaigns (3.12). Barangay response teams (3.09) and risk assessments (3.00) were also positively rated. However, drainage effectiveness (2.91) and flood control measures (2.94) received lower scores. Overall, systems are functional, though improvements in drainage and infrastructure are still needed to enhance flood mitigation and;

Table 11
Leptospirosis Response, Prevention and Control Measures

Questions	Frequency				Weighted Mean	Interpretation	Rank
	1	2	3	4			
13. There are sufficient information and campaigning about leptospirosis prevention	2	8	25	33	3.31	Strongly Agree	1
14. The barangay health office has programs that help prevent leptospirosis.	3	10	27	28	3.24	Strongly Agree	3
15. The campaigns about the effects of flooding and leptospirosis are well understood.	2	9	26	31	3.26	Strongly Agree	2
16. Regular clean-up drives are conducted to reduce the rat population.	3	11	26	28	3.21	Strongly Agree	5
17. There are sufficient healthcare facilities for those affected by leptospirosis.	4	12	25	27	3.16	Agree	6
18. There are enough free medicines for those affected by leptospirosis	5	13	24	26	3.12	Agree	7
19. The community actively participates in programs against leptospirosis.	3	9	27	29	3.22	Strongly Agree	4

Table 11 assesses leptospirosis response, prevention, and control measures in Malabon City based on 68 respondents. Weighted means range from 3.12 to 3.31, mostly within "Strongly Agree" (3.26–4.00) and "Agree" (2.51–3.25). Information campaigns ranked highest (3.31), followed by campaign understanding (3.26), barangay health programs (3.24), community participation (3.22), and clean-up drives (3.21). Healthcare adequacy (3.16) and free medicines (3.12) ranked lower but remained under "Agree." Overall, measures are effective in awareness and sanitation, but gaps in healthcare resources, training, funding, and manpower remain.

Table 12
Coordination and Community Involvement – Post Flood Recovery and Monitoring

Questions	Frequency				Weighted Mean	Interpretation	Rank
	1	2	3	4			
20. There is proper coordination among the LGU, DOH, DPWH, and other agencies	5	20	28	15	2.88	Strongly Agree	1
21. There are sufficient training and volunteer programs for disaster response.	6	22	27	13	2.79	Strongly Agree	3
22. The ordinance on cleanliness and sanitation is strictly enforced	4	19	29	16	2.97	Strongly Agree	2
23. Schools and private establishments participate in prevention campaigns.	5	21	26	16	2.91	Strongly Agree	4
24. The LGU has sufficient funding and personnel for a continuous program.	7	24	25	12	2.72	Agree	5
25. Post-flood clean-up activities are effective in preventing an increase in rats.	6	22	26	14	2.82	Agree	6

Table 12 examines coordination, community involvement, and post-flood recovery in Malabon City, with all indicators rated "Agree" (2.51–3.25) and weighted means ranging from 2.72 to 2.97. The highest-rated is sanitation enforcement (2.97), followed by participation of schools and private establishments (2.91) and inter-agency coordination (2.88). Post-flood clean-up efforts scored 2.82, while training and volunteer programs received 2.79. The lowest rating is sufficiency of LGU funds and personnel (2.72). Overall, coordination and participation are effective. However, limitations in funding, manpower, and training highlight areas needing improvement to strengthen sustainability and overall disaster and health response efforts.

VII. SWOC ANALYSIS

STRENGTH	WEAKNESS
Strong community awareness and participation in disaster preparedness and health programs.	Inefficient waste management system leading to clogged drainage and worsening flood
Effective programs such as Project SHIELD, Health Services on Wheels, and Kalinisan Program	Outdated flood control infrastructure (drainage systems and floodgates) unable to handle extreme weather
Centralized coordination through MCDRRMO, EOC, and Incident Command System (ICS)	Limited healthcare capacity, including shortage of hospitals and medical personnel

Reliable early warning systems and use of modern technologies like flood monitoring and DSS	Inadequate risk communication, resulting in some residents missing timely information
Strong collaboration with national agencies (e.g., DPWH)	Insufficient funding and limited resources for disaster response and recovery
High readiness level (80% manpower and equipment deployment capability)	Need to strengthen ICS coordination across sectors
Community-driven initiatives (e.g., Bayanihan sa Malabon) enhancing resilience	Lack of comprehensive Occupational Safety and Health (OSH) policy and insufficient staff support infrastructure
OPPORTUNITIES	**CHALLENGES**
Investment in climate-resilient infrastructure such as improved drainage, pumping stations, and storm surge barriers	Climate change impacts, including rising sea levels and stronger typhoons, worsening flooding and disease spread
Use of technology like real-time flood monitoring, early warning systems, and Decision Support Systems (DSS)	Rapid urbanization and expansion of informal settlements in flood-prone areas
Stronger collaboration with national and international organizations for technical and financial support	Limited healthcare capacity with insufficient personnel and facilities during outbreaks
Enhancement of healthcare systems through additional staff, medical supplies, and temporary treatment facilities	Financial constraints and limited DRRM budget affecting long-term planning
Implementation of stricter land-use and waste management policies	Weak disaster communication systems and slow information dissemination
Strengthening Occupational Safety and Health (OSH) programs for disaster workers	Need for improved resource management and coordination across sectors
Adoption of advanced technologies to improve disaster preparedness and resilience	Insufficient funding allocation for sustainable disaster preparedness and response efforts

VIII. EXAMINATION OF LGU CONTINGENCY PLAN

The Malabon DRRM Plan (2022–2026) provides a comprehensive framework for disaster preparedness and response, focusing on floods, typhoons, storm surges, and flash floods. It outlines clear response actions and promotes coordination among local and national agencies through the Emergency Operations Center. While response capacity is strong, challenges remain in coordination, role clarity, and resource mobilization. The Health Plan further strengthens disaster resilience through water safety, sanitation, disease control, and medical assistance programs.

IX. PESTEL ANALYSIS

Political

Malabon City benefits from strong governance through partnerships with agencies like DILG, MMDA, and DPWH. Programs such as the Malabon Flood Control Project help reduce flooding and improve safety. Public safety, disaster preparedness, employment, and housing initiatives support community resilience and welfare. Overall, these political structures strengthen urban planning, disaster management, and living conditions for residents.

Economic

Malabon City has a diverse economy supported by food processing industries, fisheries, and small businesses, providing jobs and driving economic activity. Key sectors include seafood distribution, retail, handicrafts, and food enterprises. Infrastructure improvements, such as better roads and drainage systems, support business operations and reduce flood-related disruptions. Together, these factors promote productivity, commerce, and economic growth.

Social

Malabon City's social structure is strengthened by its education, healthcare, and community engagement systems. Schools, universities, hospitals, and health centers promote disaster preparedness and public health awareness. Community initiatives and programs like Project

SHIELD encourage cooperation, disease prevention, and resilience. Together, these efforts enhance public participation, awareness, and the community's ability to respond effectively to environmental and health challenges.

Technological

Malabon is advancing through digital technologies that improve governance, education, industry, disaster management, and healthcare. Online services streamline government transactions, while e-learning tools support education. Modern technologies enhance industrial efficiency, and real-time monitoring strengthens disaster preparedness. Healthcare innovations, such as telemedicine and disease surveillance systems, improve service delivery and public health response.

Environmental

Malabon faces environmental challenges from climate change, flooding, and land subsidence. Programs like "Basura Mo, Responsibilidad Mo" and "Adopt-an-Estero" improve waste management and waterways. Initiatives such as "Green Malabon" and "Green Green Green" enhance green spaces and flood mitigation. Community efforts like Eco-Warriors and Barangay Linis promote sanitation and reduce disease risks. Overall, these strategies strengthen sustainability, reduce flooding, and protect public health through active community participation.

Legal

Malabon's legal framework promotes sustainable development, public safety, and economic growth through zoning, labor, and environmental laws. Anti-littering policies and Ordinance No. 03-2019 help reduce flooding, while Executive Order No. 12-2020 created a Flood Control Task Force. Streamlined business regulations support commerce. Overall, these measures integrate urban planning, disaster management, and worker protection, ensuring balanced governance and improved quality of life.

X. ACTION PLAN

A. Disaster Prevention and Mitigation

Table 13
Action Plan for Goal 1 Objective 1.1

Goal 1	Minimize the potential risks of natural disasters, particularly flooding, by improving infrastructure, promoting sustainable land use, and enhancing disaster- resilient policies and practices.
Objective 1.1	Implement flood control measures within 2 years such as installing climate-resilient flood barriers in high-risk barangays (Tañong, Catmon, Tonsuya, and Longos), aiming to reduce flood depth by at least 30% during the rainy season
Outcome	The installation of climate-resilient flood barriers in Tañong, Catmon, Tonsuya, and Longos reduced flood depth by at least 30% within two years, enhancing community resilience and awareness.
Programs, Projects, and Activities (PPA)	1.1.1. Assessment and Planning 1.1.2. Design, Upgrade, and installation of floodgates

The project allocates ₱8,000,000 for design and engineering, including ₱6,000,000 for consultations and ₱2,000,000 for regulatory compliance. Materials and equipment cost ₱80,000,000, with ₱60,000,000 for construction supplies and ₱20,000,000 for machinery. Labor expenses total ₱10,000,000. Inspection and quality assurance are budgeted at ₱2,000,000 (₱1,000,000 each for third-party inspection and testing). A ₱2,000,000 contingency fund is included. Additionally, ₱70,000 supports assessment and planning (₱20,000 data gathering, ₱30,000 consultants, ₱20,000 miscellaneous). This ensures improved flood control infrastructure despite funding constraints.

Table 14
Action Plan for Goal 1 Objective 1.2

Goal 1	Minimize the potential risks of natural disasters, particularly flooding, by improving infrastructure, promoting sustainable land use, and enhancing disaster- resilient policies and practices.
Objective 1.2	To complete a citywide drainage and waterway clearing by the end of the year to 1st quarter of 2027 in Malabon specially those high-risk barangays, aiming to help reduce flooding incidents in flood-prone areas by 25%, based on flood data reports from the MCDRRMO and the City Engineering Office
Outcome	25% reduction in flooding incidents in high-risk barangays of Malabon by the

	first quarter of 2027, following the completion of the citywide drainage and waterway clearing project.
Programs, Projects, and Activities (PPA)	1.2.1 Assessment and Surveys for drainage rehabilitation 1.2.2 Conduct of a city-wide drainage system rehabilitation program mainly focused on desilting, and drainage system upgrades prioritizing the most vulnerable areas in Malabon City

Malabon's drainage system contributes to flooding due to blockages from waste, debris, and silt, as seen during Typhoon Ondoy (2009) and Typhoon Ulysses (2020). Poor maintenance has been identified as a key issue.

To address this, the city plans to upgrade, desilt, and declog drainage systems, targeting 80% of major infrastructure by 2028 to improve water flow, reduce flood duration, and minimize health risks like dengue. The project has a total budget of ₱5,780,000, including ₱150,000 for assessment, ₱1,230,000 for labor, ₱1,200,000 for equipment, ₱1,000,000 for waste disposal, ₱1,500,000 for materials, ₱500,000 for monitoring, and ₱350,000 for management, ensuring improved flood control and public health outcomes.

Table 15
Action Plan for Goal 1 Objective 1.3

Goal 1	Minimize the potential risks of natural disasters, particularly flooding, by improving infrastructure, promoting sustainable land use, and enhancing disaster- resilient policies and practices.
Objective 1.3	Promote and implement nature-based solutions to enhance rainwater retention, lessen urban heat spots, and improve the overall resilience of vulnerable urban spaces by 2027-2028 and to improve rainwater absorption and management and to improve overall resilience of vulnerable urban spaces by 2027-2028
Outcome	Reduce the flood risks and increased green space for sustainable water management
Programs, Projects, and Activities (PPA)	1.3.1 The best implementer of Urban Green projects

Table 15 presents an initiative promoting nature-based solutions to reduce flood risks by developing urban gardens, green spaces, rain gardens, permeable pavements, and water-harvesting systems in flood-prone areas until 2028. It integrates leptospirosis prevention through rodent control, proper waste disposal, Material Recovery Facilities (MRFs), clean-up drives, drainage clearing, and information campaigns. The program covers 21 barangays and includes incentives: ₱50,000 for first place (cleaning and pest control materials), ₱30,000 for second place (cleaning materials), and ₱20,000 for third place (planting materials). Managed by CENRO and Barangay Captains, with funding from the LGU Environment Fund and partners, the initiative aims to expand green spaces, reduce flooding, and decrease leptospirosis cases

Table 16
Action Plan for Goal 2 Objective 2.1

Goal 2	Reduce rodent population through proactive and targeted environmental interventions
Objective 2.1	Intensify the regular clean-up drive campaigns combining pest control procedures for rodents and other water-borne diseases causing pests, environmental clean-up, biological control for water-borne diseases prone barangays by 90% to significantly reduce the cases by the end of 2027
Outcome	Reduce the flood risks and increased green space for sustainable water management
Programs, Projects, and Activities (PPA)	2.1.1 Quarterly organized campaigns such as "Impeksyon Aksyonan! Peste Labanan is a combination of clean-up drive, pest control and information drive

Table 16 outlines Goal 2, Objective 2.1, which targets reducing water-borne diseases like leptospirosis through proactive environmental measures. It strengthens quarterly "Impeksyon Aksyonan, Peste Labanan" campaigns, aiming to cover at least 90% of high-risk barangays. Activities include rodent and pest control, larvicide application, environmental cleanups, and biological controls such as Trap Barrier Systems (TBS), Wolbachia mosquitoes, and larvivorous fish. Key outputs involve campaign implementation,

monitoring reports, and community engagement metrics. Managed by the City Health Office, Barangay Health Units, and Environmental and Sanitation Office, the program has a ₱234,000 budget: ₱24,000 for snacks/incentives, ₱30,000 cleaning materials, ₱30,000 TBS/larvicide, ₱65,000 biological controls, ₱35,000 campaigns, and ₱20,000 protective materials distribution.

B. Disaster Preparedness

Table 17
Action Plan for Goal 1 Objective 1.1

Goal 1	Build informed, prepared, and resilient communities through inclusive capacity-building, public awareness, and intersectoral engagement in the risk prevention
Objective 1.1	To conduct bi-annual multi-hazard drills by 2027 in 5 schools, 5 hospitals, 5 businesses, and 5 vulnerable barangays, with 70% participation from vulnerable groups (elderly, children, persons with disabilities). The drills will focus on evacuation during flooding and other hazards such as earthquake and fire, with 80% of participants demonstrating a 90% understanding of both procedures
Outcome	By 2027, bi-annual multi-hazard drills will be conducted in 5 schools, 5 hospitals, 5 businesses, and 5 vulnerable barangays. These drills will focus on evacuation procedures for flooding, earthquakes, and fire hazards. It is expected that 70% of participants from vulnerable groups (elderly, children, people with disabilities) will be involved. Furthermore, 80% of participants will demonstrate a 90% understanding of the evacuation procedures.
Programs, Projects, and Activities (PPA)	1.1.1 Execute bi-annual Integrated Flood and waterborne diseases Preparedness Drill for Schools and Vulnerable Communities

Malabon faces recurring flooding and waterborne disease outbreaks, requiring strong community preparedness. This initiative aims to equip all sectors, including vulnerable groups, with the capacity to respond effectively. It introduces bi-annual multi-hazard drills simulating floods, dengue, leptospirosis, and other emergencies to test evacuation, resource distribution, and communication systems. Schools, hospitals, businesses, and community groups are actively involved to ensure coordinated responses. The drills help identify gaps in existing disaster plans, enabling continuous improvement. Regular implementation enhances awareness, reduces confusion, and improves response times during real emergencies. Overall, this approach strengthens resilience, promotes inclusive participation, and ensures that Malabon City is better prepared to manage disasters and public health emergencies efficiently.

Table 18
Action Plan for Goal 1 Objective 1.2

Goal 1	Build informed, prepared, and resilient communities through inclusive capacity-building, public awareness, and intersectoral engagement in the risk prevention
Objective 1.2	launch an integrated IEC campaign to raise awareness about flood and waterborne diseases such as dengue and leptospirosis risks, leveraging digital, print, and community-based channels by Q1 2027.
Outcome	Awareness of flood and waterborne diseases risks was raised through the launch of IEC campaigns by Q1 2027
Programs, Projects, and Activities (PPA)	1.2.1 Implement an integrated media campaign (social media, radio) reaching 10,000 Households

Table 18 outlines Goal 3's IEC campaign to build informed and resilient communities by raising awareness on flood and dengue risks. The campaign will use digital, print, and community channels to reach 10,000 households, with 30% via social media. Key outputs include posters, flyers, digital content, and media reach tracking. Scheduled for Q1 2027, it will be led by the Public Information Office.

The total budget is ₱100,000, allocated as follows: ₱35,000 for campaign materials, ₱40,000 for media outreach, ₱10,000 for community-based activities, and ₱5,000 for miscellaneous expenses, funded by the LGU IEC Fund. The initiative aims to increase awareness, participation, and preparedness, ultimately strengthening community resilience against floods and dengue.

Table 19
Action Plan for Goal 1 Objective 1.3

Goal 1	Build informed, prepared, and resilient communities through inclusive capacity-building, public awareness, and intersectoral engagement in the risk prevention
Objective 1.3	To launch a social media contest on platforms such as Instagram, Facebook, and TikTok to engage young people in disaster preparedness activities, encouraging them to share creative preparedness tips and disaster response actions by Q1 2027.
Outcome	By Q1 2027, a social media contest launched on Instagram, Facebook, and TikTok that engaged youth in sharing creative disaster preparedness and response actions.
Programs, Projects, and Activities (PPA)	1.3.1 Social Media contest on Disaster Preparedness for Youth and Young Adult

This initiative engages Malabon City's youth in disaster preparedness through a social media contest on Instagram, Facebook, and TikTok. It promotes awareness of floods, leptospirosis, typhoid, dengue, and other hazards, aiming to reach all 21 barangays with full youth participation. Participants create videos and digital content using hashtags like #SafeMalabon. Scheduled for Q1 2027, it is led by the CDRRMO with Barangay Youth Councils as partners. A total budget of ₱65,200 is allocated for gift certificates and rewards, funded by partner donations. The program fosters creativity, awareness, and active youth involvement, strengthening community resilience and preparedness efforts

C. Disaster Response

Table 20
Action Plan for Goal 1 Objective 1.1

Goal 1	Ensure a prompt and efficient response to flood and other natural hazards emergencies and health related emergencies such as leptospirosis through coordinated efforts and effective resource allocation
Objective 1.1	To upgrade the Tañong, Catmon, Tonsuya, and Longos health centers to include the capacity to provide diagnostic testing for leptospirosis and other waterborne diseases by 2028 to 2029
Outcome	By 2028 to 2029, the Tañong, Catmon, Tonsuya, and Longos health centers are enhanced with diagnostic testing capabilities for leptospirosis and other waterborne diseases, improving early detection and timely treatment in the community.
Programs, Projects, and Activities (PPA)	1.1.1 Utilization of health centers includin diagnostic and testing of health-related cases and waterborne diseases

The project targets upgrading Tañong, Catmon, Tonsuya, and Longos Health Centers to enhance diagnostic testing for waterborne diseases from 2028 to 2029. It aims to improve early detection and management of outbreaks in Malabon through installation of diagnostic units with rapid test kits, microscopes, and centrifuges, alongside a strengthened referral system. Implemented by the City Health Office with the Department of Health, the initiative has an estimated cost of ₱11,800,000 funded by DOH and the LGU Health Fund. Expected outcomes include improved diagnostic capacity, faster response to leptospirosis and dengue, reduced hospital travel, and better healthcare access.

Table 21
Action Plan for Goal 1 Objective 1.2

Goal 1	Ensure a prompt and efficient response to flood and other natural hazards emergencies and health related emergencies such as leptospirosis through coordinated efforts and effective resource allocation
Objective 1.2	To make 100% of evacuation centers stocked with flood response materials, and hygiene kits by 2027
Outcome	By 2027, all evacuation centers will be fully stocked with essential flood response materials and hygiene kits, ensuring preparedness and improved safety for affected communities during flood and other natural hazard events
Programs, Projects, and Activities (PPA)	1.2.1 Distribution of response materials and hygiene kits

Table 21 outlines equipping all Malabon evacuation centers with essential response kits by 2027 to improve disaster preparedness. The project aims to distribute hygiene kits to at least 5,000 evacuees, including mosquito repellents, treated bed nets, PPE, and sanitation supplies to prevent disease transmission. With a budget of ₱5,000,000 funded by the LGU and donors, the initiative strengthens

health and safety during floods, enhances evacuation readiness, and helps reduce the spread of waterborne diseases.

Table 22
Action Plan for Goal 1 Objective 1.3

Goal 1	Ensure a prompt and efficient response to flood and other natural hazards emergencies and health related emergencies such as leptospirosis through coordinated efforts and effective resource allocation
Objective 1.3	To provide additional 21 communication handsets among emergency responders, health services, and waterborne diseases control units during and after flooding and health emergencies
Outcome	Ensured effective coordination during and after flooding and health emergencies by providing 21 additional handsets to emergency responders, health services, and waterborne disease control units
Programs, Projects, and Activities (PPA)	1.3.1 Utilization of 21 additional Communication handheld radios to augment communication capacity of the LGU

The deployment of 10 handheld dual-band VHF/UHF radios enhanced communication among Malabon City's emergency and health teams during disasters. It ensured real-time coordination, reduced communication gaps, and improved response efficiency in floods and earthquakes. The radios supported faster decision-making, better evacuation management, and seamless information sharing across agencies. Assessed through usage monitoring and feedback, the initiative strengthened disaster preparedness, improved operational effectiveness, and boosted public trust while contributing to a more resilient and responsive urban emergency system.

D. Disaster Rehabilitation and Recovery

Table 23
Action Plan for Goal 1 Objective 1.1

Goal 1	Promote the recovery of communities that are safer, healthier, and more resilient by integrating rebuilding efforts, ensuring the continuity of sustainable health services, and implementing data-driven recovery systems.
Objective 1.1	To restore and rehabilitate damaged water, drainage, and health infrastructure within 12 months following major flood events, ensuring swift recovery and long-term resilience
Outcome	Comprehensive post flood assessment report damaged water, drainage, and health infrastructure within 12 months following major flood events, ensuring swift recovery and long-term resilience.
Programs, Projects, and Activities (PPA)	1.1.1 Study of the status of drainage system and flood control infrastructure

The Drone Survey for Infrastructure Damage Assessment in Malabon City enables rapid post-flood evaluation using LGU-owned drones, completing surveys within two weeks. It captures high-resolution images of water systems, drainage, and health facilities to guide repair priorities. The total budget is ₱90,000: ₱50,000 for personnel, ₱20,000 for data processing, ₱10,000 for reporting, and ₱10,000 for miscellaneous costs. This cost-effective approach delivers timely data, accelerates recovery, and supports efficient restoration of essential services.

Table 24
Action Plan for Goal 1 Objective 1.2

Goal 1	Promote the recovery of communities that are safer, healthier, and more resilient by integrating rebuilding efforts, ensuring the continuity of sustainable health services, and implementing data-driven recovery systems.
Objective 1.2	To guarantee the uninterrupted delivery of health services after disasters by establishing reserve health worker pools and integrating tele consult solutions by 2027.
Outcome	Guaranteed the uninterrupted delivery of health services after disasters by establishing reserve health worker pools and integrating medical mission integrating online services solutions by 2027.
Programs, Projects, and Activities (PPA)	1.2.1 Conduct of Health Consultation Mission through TeleConsult

The Health Consultation Mission through teleconsult aims to ensure continuous healthcare for at least 10,000 Malabon residents after floods using platforms like Facebook Messenger for 24/7 access. It trains 30 reserve health workers for remote consultations and allocates a total budget of ₱510,000: ₱100,000 for platform setup, ₱100,000 for training, ₱300,000 for medicines, and ₱10,000 for data

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