

Comprehensive Action Plan on Flooding, Landslides, and Dengue Preparedness and Response to Tropical-Induced Rainfall in the City of Sto. Tomas, Batangas

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Abstract:

This study focuses on the effects of a multi-hazard scenario in the city of Sto Tomas, Batangas. The City of Sto. Tomas is experiencing heightened risks from flooding due to tropical storms and recurring outbreaks of dengue, particularly during the wet season. This research investigated the connection between flooding and the incidence of dengue and aimed to devise a coordinated and sustainable action plan to tackle both challenges. A mixed-methods approach was utilized, analyzing quantitative data on flooding alongside dengue case statistics, complemented by qualitative insights from community evaluations and input from local stakeholders. The findings highlighted a significant correlation between flood occurrences, stagnant water, and increased mosquito breeding, leading to a surge in dengue cases, particularly from 2024 to late 2025. A Comprehensive Integrated Action Plan is proposed for the three years of 2025 to 2027 was developed following the four thematic areas of Disaster Risk Reduction and Management: Prevention and Mitigation, Preparedness, Response, and Rehabilitation and Recovery.

Keywords — Multi-hazard Action Plan, Typhoon-related Hazards, Flooding, Dengue Fever, City of Sto Tomas, Disaster Risk Reduction Management

I. INTRODUCTION

The Republic of the Philippines (RP) is located in Southeast Asia, bordered by the Pacific Ocean to the east, the West Philippine Sea to the west, and the Celebes Sea to the south. Sto. Tomas, one of the oldest Cities of Batangas, is located at the foot of the legendary and picturesque Mt. Makiling. It is sixty (60) kilometres south of Manila and known as the birthplace of Gen. Miguel Malvar, the last Filipino General to surrender to the Americans. Research has indicated that intense rainfall during the wet season from June to December is significantly linked to higher rates of dengue fever incidence. To address these vulnerabilities, A Comprehensive Action Plan on Flooding, Landslides, and Dengue Preparedness and Response to Tropical-Induced Rainfall. This comprehensive action plan includes objectives, targets, programs, projects, and activities to preserve lives and property, applying the four thematic areas: disaster prevention and mitigation, preparedness, response, and recovery & rehabilitation efforts.

II. SCOPE AND LIMITATION

The Comprehensive Action Plan outlines strategies for preparedness, mitigation, and response to flooding, landslides, and dengue outbreaks caused by rainfall from tropical storms within all barangays of Santo Tomas City, Batangas. Although the plan follows a city-wide framework, it focuses on barangays that are frequently impacted by rain-induced flooding, including Poblacion 1, 2, 3, and 4, San Roque, Sta. Anastacia, Sta. Maria, San Antonio, and San Bartolome. The action plan also addresses secondary public health issues, particularly the increased risk of dengue transmission due to post-flood situations that encourage mosquito breeding in stagnant water. The scope of this action plan is also limited by uncertainties linked to climate change, which increase the frequency and intensity of tropical storms and worsen cascading hazards like flooding, landslides, and outbreaks of vector-borne diseases.

III. SITUATIONAL ANALYSIS

A. Global Situation

Flooding, landslides, and dengue fever are growing global threats intensified by climate change, rapid urbanization, and weak infrastructure. Warmer temperatures and heavier rainfall increase

the frequency of floods and slope failures, especially in vulnerable areas with poor drainage, deforestation, and unregulated land use. Climate-driven rainfall and flooding create ideal breeding conditions for dengue-carrying mosquitoes, contributing to a sharp global rise in dengue cases over the past two decades. Southeast Asia bears a significant share of this burden due to monsoon rains, urban overcrowding, and limited health systems. Research emphasizes integrated solutions, including land-use planning, climate-resilient infrastructure, improved sanitation, strong health surveillance, and community-based preparedness to reduce disaster and public health risks.

B. Local Situation

The City of Sto. Tomas, Batangas is highly vulnerable to hydrometeorological hazards such as flooding, windstorms, and landslides due to its geographic location and climatic exposure. Its proximity to typhoon-prone areas results in frequent impacts from monsoon rains and major typhoons, causing disruptions to livelihoods, infrastructure, and agriculture. Flooding is most severe in low-lying barangays, where rivers and creeks overflow during heavy rainfall, hindering mobility and economic activities. Risk assessments have also identified landslide-prone zones, particularly during prolonged rains. Alongside these hazards, dengue poses a serious public health threat, especially in the rainy season. In 2024, Batangas recorded a sharp increase in dengue cases, with Sto. Tomas ranking among the highest in the province. These combined risks highlight the urgent need for integrated disaster risk reduction and public health measures.

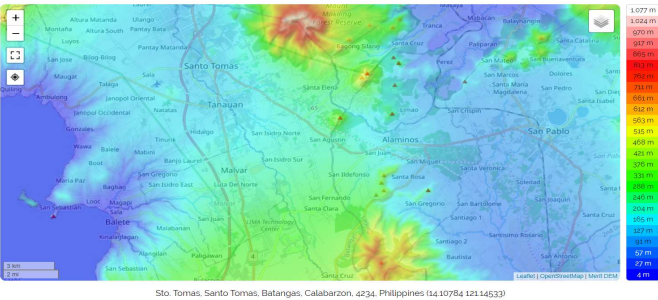


Figure 1: Topographic Map of the City of Sto. Tomas

IV.METHODOLOGIES OF THE PLAN

The research design utilized a descriptive research design using a mixed-methods approach. This study employed a random sampling method, involving 68 respondents from four barangays. The selection of these barangays was based on their high level of exposure to hazards, which makes them critical communities for understanding disaster impacts and resilience.

The questionnaire underwent a pre-approval process by local officials and academic advisors before its distribution. A focus group interview is a significant process by which the study gathers the actual knowledge and improvements the community needs. A thorough interview with the leader of government officials and a document review covering the CDRRM Plan, BDRRM Plan, and DRRM-H_PLAN 2023–2025. With this, the researcher proved the study’s conclusion develop, programs, projects, and activities.

V. RESULTS OF THE SURVEY

According to the data in Table 1, the pattern of responses indicates that while institutional frameworks and government efforts receive favourable evaluations, personal and household preparedness is only moderately regarded, revealing a gap between community readiness and municipal interventions. The overall weighted mean of 3.655, interpreted as Agree, reflects a positive perception of the city government’s capacity to manage floods—particularly in terms of coordination with barangays (WM = 4.69, Strongly Agree) and timely warnings from the CDRRMO (WM = 4.26, Strongly Agree). However, the neutral responses in individual-level indicators, such as knowledge of safety steps (WM = 3.21), participation in preparedness activities (WM = 2.83), and household protection (WM = 2.75), highlight the need for greater emphasis on community empowerment and household-based risk reduction practices.

TABLE I
PREPAREDNESS & RESPONSE DURING FLOODING

Questions	Weighted Mean – Verbal Interpretation	Rank
1. I have enough knowledge of the steps to take before, during, and after a flood.	3.21 (Neutral)	7
2. I participate in disaster preparedness activities of the barangay or local government.	2.83 (Neutral)	9
3. Our house and belongings are adequately protected from flooding.	2.75 (Neutral)	10
4. Government projects and programs are sufficient in preventing or reducing flooding.	3.26 (Neutral)	6
5. Our community is ready to help and cooperate during flooding.	4.18 (Agree)	3
6. The city government has a clear plan for flood and disaster response.	3.94 (Agree)	4
7. The city government, through CDRRMO, provides timely warnings before flooding occurs.	4.26 (Strongly Agree)	2
8. The city has enough equipment (rescue boats, vehicles, medical kits) for flood response.	3.98 (Agree)	5
9. The city regularly conducts drills and training for flood preparedness.	3.45 (Agree)	7.5
10. The city coordinates well with barangays to improve flood response.	4.69 (Strongly Agree)	1
Composite Mean	3.655 – Agree	

TABLE II
PREPAREDNESS & RESPONSE DURING A LANDSLIDE

Questions	Weighted Mean – Verbal Interpretation	Rank
1. I have enough knowledge about the warning signs of a possible landslide.	2.9 (Neutral)	8
2. My family is prepared to evacuate in case of a landslide threat.	3.3 (Neutral)	6.5

3. My family knows the safe route out of our area in case of a landslide.	3.5 (Agree)	3
4. We participate in activities or seminars about landslide preparedness.	2.5 (Disagree)	10
5. We have adequate communication with our barangay regarding landslide risks.	3.3 (Neutral)	6.5
6. The city government has a clear plan against landslides.	3.6	1
7. The CDRMO provides timely warnings when there is a landslide threat.	3.1 (Neutral)	9
8. The city has adequate equipment for rescue and relief operations during landslides.	2.8 (Neutral)	4
9. The city conducts training or drills related to landslide preparedness.	2.7 (Neutral)	5
10. The city has a clear system for the quick evacuation of residents during landslide threats.	3.4 (Agree)	2
Composite Mean	3.11 – Agree	

Table II results reflect predominance of neutral responses and the overall rating of 3.11 indicate that both households and the local government have elements of preparedness but require stronger communication, training, and engagement to achieve a more functional landslide readiness system capable of reducing risks.

TABLE III
Prevention and control measures for dengue

Questions	Weighted Mean – Verbal Interpretation	Rank
1. We regularly clean our surroundings to prevent stagnant water.	3.31 (Neutral)	10
2. Our family practices the “5S strategy” against dengue (Search and destroy, Self-protection, Seek early consultation, Support fogging).	3.42 (Agree)	8
3. We cover water containers to prevent mosquito breeding.	3.51 (Agree)	7
4. We immediately consult the health center or doctor if dengue symptoms appear.	3.88 (Agree)	5
5. My family understands the importance of community participation in dengue prevention.	3.23	9

6. The City Health Office provides sufficient information about dengue prevention.	4.13 (Agree)	4
7. The city regularly conducts fogging or misting in dengue-prone areas.	3.87 (Agree)	6
8. The city has adequate campaigns to educate the public about the 5S strategy against dengue.	4.21 (Strongly Agree)	3
9. Barangays coordinate with the City Health Office to prevent dengue outbreaks.	3.69 (Agree)	2
10. The city provides sufficient support to families affected by dengue.	4.45 (Strongly Agree)	1
Composite Mean	3.77 – Agree	

The findings in Table III indicates that while households generally agree with and practice dengue prevention measures, basic environmental practices and community participation remain only moderately observed. In contrast, health-seeking behaviors and city-led operational efforts such as fogging, information dissemination, and barangay coordination are viewed positively. Overall, strong approval of educational campaigns and city support to dengue-affected families highlights confidence in local dengue prevention and control programs.

VI.SWOC ANALYSIS

TABLE IV
DISASTER PREVENTION AND MITIGATION

STRENGTHS	The presence of generally effective government projects and programs aimed at reducing the risks of flooding, landslides, and dengue.
WEAKNESSES	A key weakness in this area is the limited confidence among residents regarding the effectiveness and visibility of government flood mitigation projects, and for the landslide, the community's low participation in seminars and activities related to landslide preparedness, which indicates insufficient engagement with educational and preventive programs
OPPORTUNITIES	There is a significant opportunity to strengthen prevention and mitigation by improving infrastructure, enhancing drainage systems, and expanding community-level flood-reduction projects. Barangay-based orientations, conducting more accessible community drills, and strengthening partnerships with schools, youth groups, and civic organizations.
CHALLENGES	The major challenge lies in the persistent environmental and social conditions that increase flood risk, such as rapid urbanization, poor waste disposal practices, and drainage obstructions.

TABLE V
DISASTER PREPAREDNESS

STRENGTHS	The consistent delivery of timely warnings through the city government and CDRMO. The community's high level of confidence in these early-warning mechanisms demonstrates that communication channels are functioning effectively. This reliability creates a solid foundation for preparedness, as residents are more likely
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	to take precautionary actions when they trust official advisories.
WEAKNESSES	Despite these strengths, a major weakness is the low level of resident participation in barangay-led preparedness activities and many households are not fully prepared to evacuate quickly, highlighting inconsistency in household-level readiness.
OPPORTUNITIES	Preparedness can be significantly enhanced through increased training, drills, and community education programs. There is also potential to reinforce school-based and community-based DRRM initiatives to develop a more resilient and informed population.
CHALLENGES	Preparedness faces challenges such as information fatigue, lack of time or interest among residents, and limited manpower in some barangays to sustain continuous preparedness activities. Misconceptions about disasters or a tendency to rely solely on government efforts may also prevent residents from fully engaging in preparedness programs. , the increasing unpredictability of dengue outbreaks due to climate factors places pressure on the city to maintain adequate resources, maintain efficient fogging operations, and strengthen coordination with barangays to prevent outbreaks.

TABLE VI
DISASTER RESPONSE

STRENGTHS	A clear strength in disaster response is the strong coordination between the city government and various barangays, enabling efficient dissemination of information and mobilization of resources during flooding.
WEAKNESSES	The potential for response systems to become overwhelmed during large-scale or simultaneous flood events. The perceived inadequacy of rescue and relief equipment available in the city. Limited drills and training further weaken response readiness, as both responders and residents lack sufficient practice in handling real emergencies. The weaknesses of the City of Sto. Tomas, concerning the dengue prevention and responses, several household and community practices remain weak.
OPPORTUNITIES	Disaster response can be significantly improved through strengthened inter-agency collaboration among the police, health units, fire services, and volunteer organizations. Investments in modern rescue technologies, equipment upgrades, and the establishment of mobile or cluster-based response teams can help reduce response times. Concerning the dengue prevention and responses, is a significant opportunity to strengthen community-based vector control through improved waste management practices, regular barangay cleanup drives, and increased participation in dengue awareness activities
CHALLENGES	Climate change also contributes to more intense and frequent flooding events, which can exceed the capacity of existing response systems. Limited resources and funding further complicate efforts to expand rescue units and improve operational efficiency.the challenges of the City of Sto. Tomas, concerning the dengue prevention and responses, is ensuring sustained behavioral change among households, particularly in maintaining clean surroundings and consistently applying the 5S strategy

TABLE VII
DISASTER REHABILITATION AND RECOVERY

STRENGTHS	A significant strength in rehabilitation and recovery is the high level of community cooperation observed during and after flooding events. This collective spirit greatly accelerates the normalization of daily life, as communities become active partners in clearing debris, assisting displaced families, and restoring essential services. The presence of this social cohesion helps reduce recovery time and enhances the community's resilience.
WEAKNESSES	A major weakness is that many households are unprepared and lack adequate home protection, which prolongs recovery. Weaknesses in rehabilitation and recovery stem from limited community involvement in disaster education activities, which may result in a lack of understanding of long-term recovery processes
OPPORTUNITIES	By involving residents in recovery planning, the city can also foster a more sustainable and community-driven approach. There are significant opportunities for strengthening recovery by integrating community participation into rebuilding efforts and enhancing communication systems to support post-disaster coordination
CHALLENGES	Challenges in rehabilitation and recovery include budget limitations, slow reconstruction for low-income households, and the recurring nature of flooding that can undermine rehabilitation gains.

VII. PESTLE ANALYSIS

Political: The political landscape of the City of Sto. Tomas is shaped by a long tradition of local governance rooted in its rich history dating back to 1666 and strengthened by its recent transition into cityhood in 2019 under RA 11086. This transition has provided the city with greater fiscal autonomy, expanded administrative structures, and stronger authority to enforce localized policies on health, disaster risk reduction, and environmental management. Guided by a vision of a responsive, technocratic, and service-oriented government, Sto. Tomas aligns closely with national mandates such as the DOH's W.I.L.D. monitoring system, the "5S" strategy for dengue control, and the provisions of RA 11332 for disease surveillance. Likewise, disaster governance is anchored on RA 10121, empowering the City Disaster Risk Reduction and Management Office (CDRRMO) to implement inclusive, multi-sectoral action plans consistent with the city's vision of forming God-fearing, empowered, and resilient Tomasinos.

Economic: Sto. Tomas has evolved from a 3rd-class municipality into a rapidly growing component city in CALABARZON, boasting major manufacturing zones, logistics, farmlands, and a booming commercial sector that drives investments, jobs, and revenue, enabling investments in public health, resilient infrastructure, and DRRM programs. Yet, this economic dynamism heightens risks from floods, landslides, and dengue due to rising population density, land conversion, industrial growth, and resource strain, particularly vulnerability in informal settlements and low-income areas that could exacerbate socio-economic divides. By promoting stable agriculture, investment-led employment, and industry partnerships including CSR for preparedness, health, environment, and disaster logistics the city can channel its momentum toward climate-smart,

inclusive growth, DRRM-integrated land-use planning, and sustainable practices to protect livelihoods and sustain its competitive edge as a resilient industrial hub.

Social: Sto. Tomas's social fabric is rooted in its rich heritage, religious identity, and tight-knit community spirit evident in saint-named barangays and its legacy as Gen. Miguel Malvar's birthplace fueling a mission for inclusive health services, robust education, and youth empowerment to build compassionate citizens, bolstered by skilled responders, coordinated health teams, and proactive barangay leaders who drive community clean-ups, health education, and disaster drills. Despite this, challenges persist in household compliance with waste disposal, vector control, and readiness, compounded by socio-economic disparities that limit participation and skew risk perceptions among vulnerable groups. To realize its vision of empowered Tomasinos, the city must expand awareness campaigns, integrate disaster education in schools, and institutionalize barangay training and drills, cultivating an engaged citizenry that embraces preventive behaviors, shares responsibility, and lessens dependence on government aid to boost collective resilience against health and environmental threats.

Technological: Technological progress is central to Sto. Tomas's goals of efficient governance, investment appeal, and modern public services, offering tools like GIS-based hazard mapping, digital disease surveillance, automated early warnings, and ICT-boosted emergency operations to enable swift decisions and real-time coordination against floods, landslides, and dengue. Challenges include securing ongoing funding, building capacities, harmonizing agencies, bridging uneven barangay access to digital tools, and training frontline workers, which the city can overcome through partnerships with universities, tech firms, and its sophisticated manufacturing base. By integrating these digital systems into DRRM, health, infrastructure, and governance, Sto. Tomas can boost transparency, response speeds, and evidence-based policies, cementing its status as a competitive, business-friendly, future-proof city that protects residents and attracts investors.

Legal: Sto. Tomas's legal framework underpins its responsive governance, social protection, and sustainable development through national laws like RA 10121 (DRRM Act), RA 11332 (Public Health Reporting Act), RA 11086 (Cityhood Law), and DOH directives, alongside local ordinances on land-use, environmental protection, zoning, construction, and health that outline responsibilities and shape growth. Enforcement gaps linger in hazard-zone land-use regulation, industry compliance, waste management, and informal settlements, with legal tools needing updates to address climate hazards, health crises, and industrial boom as the city expands. Strategically, bolstering enforcement, revising zoning and land-use codes for climate adaptation, and crafting ordinances for sustainable, inclusive urban development will fortify this foundation, safeguarding the city's agro-industrial vitality.

Environment: Sto. Tomas's environmental profile features Mount Makiling proximity, fertile agricultural lands, forests, and watersheds that underpin its sustainable, productive identity, yet climate change and urbanization amplify risks like intense rainfall, flooding, landslides, and dengue surges, especially in high-risk barangays such as San Rafael, Sta. Maria, and San Pablo due to terrain, poor drainage, and settlements. To advance its resilience and protection mission, the city prioritizes slope stabilization, enhanced drainage and flood controls, watershed management, reforestation, and strict ecological enforcement, while weaving green infrastructure—like eco-parks, permeable pavements, sustainable drainage, and low-impact development—into urban planning to curb heat islands and runoff. This multisectoral push, blending agricultural vitality, eco-tourism, and industry through evidence-based policies, community involvement, and financing via climate funds and PPPs, will foster long-term adaptive capacity for a livable, climate-resilient future.

VIII. ACTION PLAN

C. Disaster Prevention and Mitigation

TABLE VIII action plan for GOAL 1, OBJECTIVE 1.1	
GOAL 1	To mitigate flooding and landslides through Infrastructure Development and Environmental Management.
OBJECTIVE 1.1	Establish structural mitigation strategies by building or enhancing drainage systems, flood-control channels, and slope-protection structures in all recognized high-risk barangays, aiming for a minimum 30% decrease in yearly flooding occurrences within three years.
OUTCOME	A quantifiable decrease in the effects of disasters has been realized, demonstrated by at least a 30% reduction in yearly flooding occurrences in all designated high-risk barangays over three years, along with enhanced drainage efficiency, stabilized slopes, and a reduction in flood-related interruptions to communities and essential services.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	1.1.1 Upgrade and maintain the city and barangay drainage flood control improvement program. 1.1.2 Conduct quarterly community clean-up drives to remove debris blocking waterways.

The initiative focuses on the implementation plans for Goal 1, focusing on flood and landslide mitigation in the City of Santo Tomas through infrastructure upgrades, community engagement, and stricter land-use enforcement. Under Objective 1.1, the city aims to reduce annual flooding by 30% within three years by executing two main Programs, Projects, and Activities (PPAs): a PHP 10 million structural drainage upgrade and maintenance program led by the City Engineering Office for 2027, and a PHP 600,000 quarterly community clean-up drive throughout 2026 to keep waterways clear. Complementing these efforts, Table 10 details Objective 1.2, which focuses on strengthening policy compliance and urban planning practices, notably through the Safe Housing Relocation and Land-Use Compliance Program that aims to completely relocate households from high-risk zones to safer resettlement areas within three years.

TABLE IX
action plan for GOAL 2, OBJECTIVE 2.1

GOAL 2	To prevent Dengue Outbreaks Through Effective Mosquito Control Measures.
OBJECTIVE 2.1	To reduce the number of mosquito breeding sites in all high-risk areas by at least 50% over the next six months, which starts in the rainy seasons, by conducting regular source reduction initiatives, enhancing waste management practices, and encouraging community-driven clean-up efforts.
OUTCOME	The city is expected to significantly reduce mosquito breeding sites by at least 50% within six months through regular source reduction, improved waste management, and active community clean-up efforts. As a result, dengue transmission risks decrease during the rainy season, leading to safer, healthier, and more resilient high-risk communities.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	2.1.1 Community-Based Mosquito Source Reduction and Clean-Up Drive Program.

This initiative focuses on implementing the Community-Based Mosquito Source Reduction and Clean-Up Drive Program to proactively prevent dengue outbreaks, specifically targeting a 50% reduction in mosquito breeding sites within high-risk barangays over six months. Scheduled for execution from January to December 2027, the health-focused initiative operates on a PHP 3 million budget co-funded by the CESU and CHO, which includes PHP 300,000 specifically earmarked for the top 10 highest-risk barangays to support localized tools, supplies, and logistics. By requiring methodical progress tracking—such as compliance reports and documented breeding site eradications—the program ensures accountability across collaborating agencies (CDRRMO, BDRRMC, CESU, and CHO). Ultimately, this comprehensive strategy aims to foster community responsibility, improve environmental sanitation, and build healthier, more resilient neighborhoods during the high-risk rainy season.

A. Disaster Preparedness

TABLE X
Action plan for GOAL 3, OBJECTIVE 3.1

GOAL 3	To enhance Community Readiness for Floods, Landslides, and Dengue outbreaks.
OBJECTIVE 3.1	Improve community preparedness by organizing annual warning and evacuation exercises, aiming for 80% household participation in disaster preparedness kits and informational sessions in high-risk barangays vulnerable to floods and landslides within a year.
OUTCOME	The community becomes significantly more prepared for floods, landslides, and dengue outbreaks, with at least 80% of households in high-risk barangays actively participating in annual drills, preparedness kit usage, and informational sessions, resulting in improved readiness and safer response during emergencies.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	3.1.1 Community Disaster Preparedness Training and Household Emergency Kit Mobilization Program. 3.1.2 Installation of CCTV camera in the river with high-risk of flooding and paging system in the Poblacion. 3.1.3 Dengue Community Early Anticipatory Actions and Surveillance, Household Preparedness, and Rapid Response Awareness Program.

This table outlines the PPA Matrix for Goal 3, Objective 3.1, which aims to achieve at least 80% household participation in disaster and health preparedness activities across high-risk barangays through structural interventions, early warning systems, and community education. To accomplish this, the plan details three major programs running through 2026 and 2027: first, a PHP 6 million Community Disaster Preparedness Training program led by CDRRMO and BDRRMC to conduct annual drills and distribute 10,000 emergency kits; second, a PHP 2 million infrastructure project managed by the City Engineering Office to install a paging system and CCTV cameras for 360-degree monitoring along flood-prone rivers; and third, a PHP 6 million Dengue Early Anticipatory Actions program implemented by CDRRMO, BDRRMC, CHO, and CESU to conduct household orientations and distribute mosquito prevention kits. Together, these initiatives provide a comprehensive approach to strengthening community resilience against floods, landslides, and dengue outbreaks.

TABLE XI
action plan for GOAL 3, OBJECTIVE 3.2

GOAL 3	To enhance Community Readiness for Floods, Landslides, and Dengue outbreaks.
OBJECTIVE 3.2	Enhance community readiness for dengue outbreaks by educating a minimum of 70% of barangay health workers and community volunteers on monitoring and the early detection of symptoms, while achieving 80% participation from households in pre-season cleanup and implementing 5S preventive measures.
OUTCOME	Enhanced community readiness for dengue outbreaks, with trained health workers and volunteers conducting early detection and monitoring, and at least 80% of households practicing pre-season cleanups and 5S preventive measures, leading to a reduced risk of dengue transmission.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	3.2.1 Barangay Health Worker and Community Volunteer Training Program on Dengue Monitoring and Early Detection

This objective 3.2 focuses on enhancing community dengue readiness by training at least 70% of barangay health workers and community volunteers in symptom monitoring and early detection, while ensuring 80% of households engage in pre-season cleanups and "5S" preventive practices. To achieve this, the Barangay Health Worker and Community Volunteer Training Program on Dengue Monitoring and Early Detection will be implemented from January to December 2027 by the City Health Office (CHO) and the City Epidemiology and Surveillance Unit (CESU). Backed by a PHP 1 million budget from the CHO and CESU for training and awareness initiatives, the program aims to output successfully executed training sessions and post-training evaluations demonstrating increased knowledge. Ultimately, this strategic capacity-building and household-level reinforcement seeks to reduce dengue transmission risks and foster safer, healthier, and more resilient communities through sustained monitoring and community engagement.

B. Disaster Response

TABLE XII
Action plan for GOAL 4, OBJECTIVE 4.1

GOAL 4	To strengthen Emergency Response and Relief Operations During Flooding, Landslides, and Dengue Crisis.
OBJECTIVE 4.1	Facilitate a rapid and organized emergency response by deploying trained response teams, setting up operational evacuation centers, and providing crucial relief supplies to impacted communities within the initial 24 to 8 hours of flooding, landslides, or health emergencies.
OUTCOME	Communities receive timely and organized emergency response, with trained teams deployed, evacuation centers operational within 4 hours, and essential relief supplies delivered to 80% of affected households within the first 8–24 hours of flooding, landslides, or dengue outbreaks.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	4.1.1 Inter-Agency Rapid Emergency Response. (CDRMMO, BFP, PNP, RHU, DPWH) 4.1.2 Conduct quarterly inter-agency simulation exercises. (CDRMMO, BFP, PNP, RHU, DPWH)

This initiative focuses on enhancing emergency response and relief efforts during flooding, landslides, and dengue outbreaks. Under Objective 3.1, the city aims to ensure swift emergency measures within the first 8–24 hours of a crisis by establishing operational evacuation centre's within four hours and delivering relief goods to at least 80% of affected households. This objective is supported by two 2027 initiatives: the Inter-Agency Rapid Emergency Response and Relief Operations program (PHP 1 million budget) for rapid team deployment, and quarterly inter-agency simulation exercises across 30 barangays (PHP 500,000 budget) to refresh protocols among partner agencies like the CDRMMO, BFP, PNP, RHU, and DPWH. Complementing this, Objective 4.2 targets dengue threats through the Rapid Dengue Emergency Response and Vector-Control Deployment Program, which mandates the full activation of medical and vector-control teams across 100% of high-risk barangays within 24 to 48 hours of identification, with the ultimate goal of achieving a measurable 20% reduction in new dengue infections within the first four weeks of emergency operations.

To operationalize the strategic vision of **Goal 4**, which aims to strengthen emergency response and relief operations during severe flooding, landslides, and dengue crises, **Objective 4.1** establishes a rigid timeline to facilitate a rapid, highly organized response across affected communities. By prioritizing swift action, the outcome mandates the activation of fully operational evacuation centers within four hours of an emergency, paired with the targeted distribution of essential relief supplies to at least 80% of impacted households within the critical first 8 to 24 hours. Achieving these ambitious milestones relies on key Programs, Projects, and Activities (PPAs)—specifically PPA 4.1.1 (*Inter-Agency Rapid Emergency Response*) and PPA 4.1.2 (*Quarterly Inter-Agency Simulation Exercises*). These initiatives pool resources and streamline command structures among vital partner agencies, including the City Disaster Risk Reduction and Management Office (CDRMMO), Bureau of Fire Protection (BFP), Philippine National Police (PNP), Rural Health Unit (RHU), and Department of Public Works and Highways (DPWH), ensuring that field teams remain expertly trained, synchronized, and ready to deploy at a moment's notice.

TABLE XIII
action plan for GOAL 4, OBJECTIVE 4.2

GOAL 4	To strengthen Emergency Response and Relief Operations During Flooding, Landslides, and Dengue Crisis.
OBJECTIVE 4.2	Deploy rapid medical and vector-control teams to all identified high-risk barangays within 24 to 48 hours of detection, aiming to reduce new dengue cases by at least 20% within the first four weeks of emergency response operations.
OUTCOME	Communities in high-risk barangays receive timely medical and vector-control interventions within 24–48 hours, resulting in at least a 20% reduction in new dengue cases within the first four weeks of emergency response operations.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	4.2.1 Rapid Dengue Emergency Response and Vector-Control Deployment Program

Under Goal 4, Objective 4.2 focuses on mitigating dengue outbreaks by deploying medical and vector-control teams to 100% of high-risk barangays within 24 to 48 hours of an identified threat, aiming for a minimum 20% reduction in new cases within the first four weeks of emergency operations. To achieve this, the Rapid Dengue Emergency Response and Vector-Control Deployment Program (PPA 4.2.1) will be implemented from June to December 2027 under the management of the City Health Office (CHO) and the City Epidemiology and Surveillance Unit (CESU). Backed by an estimated ₱2.5 million budget for medical response, vector control, logistics, and communication support, the program's key outputs emphasize swift team mobilization, active disease-reduction field operations, and recorded case declines. Ultimately, this coordinated rapid-deployment strategy ensures critical health interventions reach vulnerable areas before outbreaks escalate, strengthening the city's overall resilience against climate-related health crises.

C. Disaster Rehabilitation and Recovery

TABLE XIV
action plan for GOAL 5, OBJECTIVE 5.1

GOAL 3	To reestablish secure living environments, essential services, and community stability in affected barangays impacted by floods, landslides, and dengue by implementing prompt rehabilitation and long-term risk mitigation strategies.
OBJECTIVE 3.1	To restore displaced communities and essential services by providing safe shelters, livelihood support, and access to water, sanitation, and healthcare to fully reintegrate affected families.
OUTCOME	Families who have been displaced successfully return and reintegrate into their communities, benefiting from functional housing, restored essential services, and opportunities for livelihoods, allowing at least 80% of impacted households to restore normal living conditions within 3 to 6 months following the disaster.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	5.1.1 Livelihood Restoration and Community Reintegration Support Project 5.1.2 Identify and relocate families living in high-risk areas, landslide and flood zones, to safe resettlement areas.

This section focuses on detail the implementation plans for Goal 5, which focuses on restoring safe living conditions, essential services, and community stability in disaster-affected barangays through rehabilitation and long-term risk reduction. Under Objective 5.1, the city aims to return at least 80% of impacted households to normal living conditions within 3–6 months post-disaster via two major initiatives running from January 2027 to late 2028: the PHP 8.5 million Livelihood Restoration and Community Reintegration Support Project, which provides livelihood starter kits, skills training, and cash-for-work options; and a PHP 20 million relocation initiative to provide safer resettlement housing and basic utilities for 30 families vulnerable to flooding and landslides. Supporting environmental recovery, Objective 5.2 targets a reduction in mosquito-borne diseases by restoring clean, secure community settings through targeted waste disposal, vector control, and PPA 5.2.1, a three-month community cleanup intervention across 30 barangays designed to clear stagnant water, debris, and active mosquito-breeding sites.

TABLE XV
Action plan for GOAL 5, OBJECTIVE 5.2

GOAL 5	To reestablish secure living environments, essential services, and community stability in affected barangays impacted by floods, landslides, and dengue by implementing prompt rehabilitation and long-term risk mitigation strategies.
OBJECTIVE 5.2	To restore secure and clean community settings by removing areas where mosquitoes breed, enhancing waste disposal practices, and implementing focused fogging/misting and vector-control measures.
OUTCOME	Reduced incidence of mosquito-borne diseases and improved environmental health in affected barangays, demonstrated by cleaner community surroundings, restored waste management systems, and sustained implementation of targeted vector-control measures following floods and landslides.
PROGRAMS, PROJECTS, AND ACTIVITIES (PPA)	5.2.1 Community Cleanup and Removal of Mosquito-Breeding Sites 5.2.2 Rehabilitation of Drainage and Environmental Health Infrastructure

This section outlines two major environmental and health interventions targeting 30 barangays. The first intervention, led and funded by the City Health Office (CHO) and the City Epidemiology and Surveillance Unit (CESU), has a PHP 4.4 million budget that covers labor, equipment, waste hauling, community mobilization, safety gear, and contingencies for vector-control operations. The second intervention, also under 5.2.1, focuses on the Rehabilitation of Drainage and Environmental Health Infrastructure to repair major drainage lines and restore environmental health systems within 12 months. Running from January 2027 to December 2028, this infrastructure project is implemented and funded by the Mayor's Office, City Engineering Office (CEO), and DPWH with a total budget of PHP 40 million, which is strategically distributed as PHP 20 million for the top 10 barangays with the highest dengue cases (PHP 2 million each) and PHP 20 million for the remaining 20 barangays (PHP 1 million each).

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