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INTEGRATED DISASTER ACTION PLAN: ENHANCING FARMER RESILIENCE AGAINST AGRICULTURAL THREATS IN CALAPAN CITY, ORIENTAL MINDORO FOR TYPHOONS, FLOODING, STORM SURGE AND CROP DAMAGE

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Abstract:

This Disaster Risk Management Action Plan was developed to enhance the resilience of farming communities in Barangays Gutad, Nag-Iba I, and Nag-Iba II in Calapan City, Oriental Mindoro against typhoons, flooding, storm surge, and crop damage. These climate-induced hazards have repeatedly disrupted agricultural production, damaged farm infrastructure, reduced household income, and threatened local food security. Climate change has further intensified the frequency and severity of these hazards, highlighting the need for a localized, integrated, and agriculture-centered disaster risk reduction strategy.

The study employed a descriptive-developmental research design utilizing survey questionnaires, documentary analysis, key informant interviews, hazard assessment, and the application of SWOC and PESTEL analyses. Data were gathered from farmers and key stakeholders to determine hazard exposure, preparedness, institutional capacity, and existing disaster risk management practices. Findings revealed that although farmers possess a high level of awareness regarding disaster risks, significant gaps remain in climate-resilient farming practices, early warning dissemination, infrastructure, institutional coordination, emergency response, and post-disaster agricultural recovery.

Based on these findings, an Integrated Disaster Action Plan was formulated following the four thematic areas of the Philippine Disaster Risk Reduction and Management Framework: Prevention and Mitigation, Preparedness, Response, and Rehabilitation and Recovery. The proposed Programs, Projects, and Activities (PPAs) focus on strengthening hazard and vulnerability assessment, promoting climate-resilient agriculture, improving early warning systems, enhancing farmer capacity building, expanding crop insurance coverage, reinforcing emergency agricultural response mechanisms, restoring livelihoods, and improving institutional collaboration among local government units, the Department of Agriculture, and other partner agencies. Each intervention includes measurable objectives, responsible implementing offices, implementation schedules, and monitoring and evaluation indicators to ensure effective implementation and continuous improvement.

The proposed action plan provides a comprehensive and evidence-based framework for reducing disaster risks in agricultural communities while strengthening adaptive capacity and institutional preparedness. Through sustained collaboration among government agencies, farming communities, and development partners, the plan is expected to reduce agricultural losses, improve disaster preparedness and recovery, protect farmer livelihoods, enhance food security, and contribute to the long-term resilience and sustainable agricultural development of Calapan City, Oriental Mindoro

Keywords — **Disaster Risk Reduction and Management, Farmer Resilience, Climate Change Adaptation, Typhoon, Flooding, Storm Surge, Crop Damage, Climate-Resilient Agriculture, Calapan City, Oriental Mindoro.**

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I. INTRODUCTION

Climate change has increased the frequency and intensity of disasters around the world, particularly hydro-meteorological hazards such as typhoons, flooding, and storm surges. These hazards have caused significant damage to agriculture, infrastructure, livelihoods, and food security, especially in developing countries. As a result, strengthening disaster resilience has become an important priority for governments and communities.

The Philippines is one of the most disaster-prone countries in the world because of its location along the Western Pacific Typhoon Belt. Every year, the country experiences several tropical cyclones that bring heavy rainfall, strong winds, flooding, and storm surges. These disasters greatly affect the agriculture sector by damaging crops, disrupting farming activities, and reducing farmers' income.

Calapan City, Oriental Mindoro, is an important agricultural area where many families depend on farming for their livelihood. The barangays of Gutad, Nag-Iba I, and Nag-Iba II are among the agricultural communities that are frequently affected by typhoons, flooding, storm surge, and crop damage. Their low-lying location and proximity to coastal areas make them highly vulnerable to climate-related hazards. These disasters often result in crop losses, damaged farm infrastructure, and reduced agricultural productivity, affecting both farmer livelihoods and local food security.

The Department of Agriculture has implemented several programs to help farmers prepare for and recover from disasters. These include climate-resilient agriculture technologies, the Quick Response Fund (QRF), the Philippine Crop Insurance Corporation (PCIC), farmer training through the Agricultural Training Institute (ATI), and other agricultural support services. While these programs provide important assistance, there is still a need for a localized disaster action plan that addresses the specific needs of farming communities in Calapan City.

This Integrated Disaster Action Plan was developed to strengthen the resilience of farmers against typhoons, flooding, storm surge, and crop damage. It provides strategic interventions under the four thematic areas of Disaster Risk Reduction and Management (DRRM): Prevention and Mitigation, Preparedness, Response, and Rehabilitation and Recovery. The plan identifies appropriate programs, projects, and activities that aim to reduce disaster risks, improve preparedness, strengthen institutional coordination, protect agricultural livelihoods, and support sustainable recovery.

Through the implementation of this action plan, Calapan City can enhance the resilience of its farming communities, reduce agricultural losses, improve food security, and promote sustainable agricultural development despite the increasing impacts of climate change.

II. SITUATIONAL ANALYSIS

A. Pestel Analysis

The disaster risk environment of Calapan City is shaped not only by internal capacities but also by broader external factors that influence how disaster risk reduction and resilience planning are developed and implemented. A comprehensive understanding of these external conditions is essential in identifying opportunities, constraints, and strategic directions for improving disaster preparedness and community resilience. The PESTEL analysis provides a structured examination of the political, economic, social, technological, environmental, and legal factors that collectively affect disaster risk management in the locality.

1) ***Political:*** The implementation of disaster risk reduction and management in Calapan City is supported by national and local government policies. Republic Act No. 10121, the Local Government Code, and other related laws provide the framework for disaster preparedness, response, and recovery. The City Disaster Risk Reduction and Management Office (CDRRMO), the City Agriculture Office, and other government agencies regularly implement programs to reduce disaster risks. Likewise, the Department of Agriculture provides technical and financial assistance through programs such as Climate-Resilient Agriculture, the Quick Response Fund (QRF), and the Philippine Crop Insurance Corporation (PCIC). Despite these initiatives, stronger coordination among government agencies and continuous implementation of agricultural resilience programs remain necessary.

2) ***Economic:*** Agriculture is one of the primary sources of livelihood in Calapan City, particularly in Barangays Gutad, Nag-Iba I, and Nag-Iba II. Frequent typhoons, flooding, and storm surge cause crop losses, damage irrigation facilities and farm-to-market roads, and reduce farmers' income. These disasters also affect the local food supply and the overall agricultural economy. Limited financial resources often prevent farmers from investing in climate-resilient technologies and farm improvements, highlighting the need for increased government support, crop insurance, and livelihood assistance.

3) ***Social:*** Farming communities in the study area generally recognize the risks brought by natural hazards because of their repeated experiences with disasters. However, many farmers still have limited access to disaster preparedness training, climate information, and agricultural technologies that can reduce disaster impacts. Strengthening community participation, farmer

organizations, and continuous capacity-building programs will improve disaster preparedness and encourage the adoption of resilient farming practices.

4) ***Technological:*** Technology plays an important role in improving disaster preparedness and agricultural productivity. The use of weather forecasting, early warning systems, Geographic Information Systems (GIS), hazard maps, mobile communication, and climate-resilient farming technologies can help farmers make informed decisions before and after disasters. However, some farming communities still experience limited internet connectivity, insufficient access to modern agricultural equipment, and inadequate early warning communication systems. Continued investment in technology and digital agriculture will enhance disaster preparedness and resilience.

5) ***Environment:*** Calapan City is highly exposed to climate-related hazards because of its geographical location, low-lying agricultural areas, and proximity to Calapan Bay. Typhoons, flooding, storm surge, and prolonged rainfall regularly affect agricultural production. Climate change has further increased the intensity and frequency of these hazards, making farming communities more vulnerable to crop damage and livelihood losses. Sustainable land management, environmental protection, climate-resilient agriculture, and improved flood mitigation measures are essential to reduce environmental risks..

6) Legals: Several national laws and policies support the implementation of the proposed action plan. These include Republic Act No. 10121 (Philippine Disaster Risk Reduction and Management Act of 2010), Republic Act No. 9729 (Climate Change Act of 2009), Republic Act No. 8435 (Agriculture and Fisheries Modernization Act), Republic Act No. 11022 (Sagip Saka Act), and other Department of Agriculture policies promoting agricultural resilience. These legal frameworks provide guidance for local government units in planning, implementing, and monitoring disaster risk reduction and climate adaptation programs. Continuous compliance with these policies and stronger collaboration among implementing agencies will contribute to more effective disaster management and sustainable agricultural development.

SWOC Analysis

1) ***Strengths***

- Presence of the City Disaster Risk Reduction and Management Office (CDRRMO) and City Agriculture Office (CAO) implementing DRRM and agricultural programs.
- Availability of hazard maps, contingency plans, and local disaster risk reduction plans.
- Strong support from the Department of Agriculture through Climate-Resilient Agriculture programs.
- Availability of the Philippine Crop Insurance Corporation (PCIC) to assist farmers affected by disasters.
- Provision of emergency assistance through the Department of Agriculture's Quick Response Fund (QRF).
- Continuous farmer capability-building and extension services through the Agricultural Training Institute (ATI).
- Presence of organized farmers' associations and cooperatives.
- Existing coordination among the LGU, Department of Agriculture, and other partner agencies.
- High awareness among farmers regarding recurring typhoons, flooding, and storm surge.

2) ***Weaknesses***

- Frequent crop damage caused by typhoons, flooding, and storm surge.
- Limited financial capacity of farmers to adopt climate-resilient farming technologies.
- Inadequate drainage systems and flood mitigation infrastructure.
- Limited access to modern farm machinery and post-harvest facilities.
- Insufficient early warning dissemination in some farming communities.
- Limited farmer participation in disaster preparedness training and simulation exercises.
- Dependence on rice farming as the primary source of livelihood.
- Damage to farm-to-market roads and irrigation facilities during disasters.
- Delayed agricultural recovery after major disasters.
- Limited resources for continuous monitoring and maintenance of agricultural infrastructure.

3) ***Opportunities***

- Expansion of Climate-Resilient Agriculture initiatives of the Department of Agriculture.
- Increased enrollment of farmers in the Philippine Crop Insurance Corporation (PCIC).
- Greater access to the Quick Response Fund (QRF) for emergency agricultural assistance.
- Adoption of Geographic Information Systems (GIS), hazard mapping, and digital agriculture technologies.
- Improved weather forecasting and early warning systems from PAGASA.
- Partnerships with universities, research institutions, NGOs, and the private sector.
- Availability of national funding for Disaster Risk Reduction and Climate Change Adaptation programs.

- Strengthening of farmers' cooperatives and agricultural organizations.
- Promotion of sustainable and climate-smart agricultural practices.
- Increased government investment in agricultural resilience and food security.

*4) **Challenges***

- Increasing frequency and intensity of typhoons due to climate change.
- Recurring flooding and storm surge affecting agricultural production.
- Rising costs of farm inputs and agricultural production.
- Fluctuating market prices affecting farmers' income.
- Pest and disease outbreaks associated with changing climatic conditions.
- Damage to irrigation systems, farm-to-market roads, and agricultural infrastructure.
- Limited government resources during multiple disaster events.
- Saltwater intrusion and prolonged flooding in low-lying agricultural areas.
- Continued dependence of farmers on climate-sensitive crops.
- Long-term impacts of climate change on agricultural productivity and food security.

III. GOALS AND OBJECTIVES

A. Goal 1:

To reduce disaster risks and agricultural losses caused by typhoons, flooding, and storm surge in Calapan City through strengthening financial protection and climate-resilient agricultural practices and risk-sensitive land and water management by 2028.

Objectives:

1.1 To assess and update hazard and risk maps for flood- and storm surge-prone agricultural areas in target barangays within two (2) year.
1.2 To improve drainage and irrigation systems in at least 70% of identified flood-prone farmlands within three (3) years.
1.3 To promote climate-resilient agricultural practices (e.g., crop diversification, flood-tolerant varieties, soil conservation) among at least 80% of farmers by 2028.
1.4 To strengthen land-use planning and zoning regulations to minimize agricultural exposure in high-risk areas within two (2) years.
1.5 To strengthen financial protection and enhance climate resilience among farmers within 2 years.

*1) **PPA Matrix: Goal 1 – Objective 1.1***

Outcome: Updated, accurate, and comprehensive multi-hazard risk maps for flood- and storm surge-prone agricultural areas in target barangays are developed and utilized by local government units, planners, and farmers to guide climate-resilient agricultural planning, land use decisions, and disaster risk reduction interventions.

The Programs, Plans, and Activities (PPA) Matrix for Goal 1 of a strategic plan ensures that accurate and updated data are available to support planning, decision-making, and disaster risk reduction in Calapan City. It also helps improve land use planning and climate-resilient agricultural development. Specifically, Objective 1.1 seeks to update flood and storm surge hazard maps for agricultural areas.

To operationalize this objective, the CDRRMO, CPDO, CASD, DA, PAGASA, and the concerned barangay local government units will collaborate in conducting multi-hazard risk assessments, Geographic Information System (GIS)-based mapping, field validation, and community participatory mapping activities. These activities include collecting updated hazard and exposure data, validating flood and storm surge boundaries, identifying vulnerable agricultural lands and critical farm infrastructure, and developing digital agricultural hazard maps and databases. The updated hazard maps will be integrated into the CLUP, CDP, and LDRRMP to support land-use planning, agricultural investment planning, emergency preparedness, and disaster response. Through these interventions, the City Government and farming communities will have improved access to accurate hazard information that supports climate-resilient agriculture, minimizes disaster risks, and enhances the long-term resilience of the agricultural sector.

2.) PPA Matrix: Goal 1 – Objective 1.2

Outcome: Enhanced drainage and irrigation systems in flood-prone farmlands leading to reduced flooding and improved agricultural productivity**.**

The Programs, Plans, and Activities (PPA) Matrix for Goal 1 – Objective 1.2, which aimed at improving drainage and irrigation systems in flood-prone farmlands. The implementation of structural flood mitigation projects, the construction of small-scale irrigation systems, and regular canal clearing operations aim to reduce flooding and improve water management. These interventions contribute to improving drainage and irrigation systems in at least 50% of identified flood-prone farmlands, thereby reducing agricultural losses and enhancing productivity.

To operationalize this objective, the CDRRMO, CEO, CPDO, NIA, DA, and the concerned barangay local government units will collaborate in implementing structural flood mitigation projects, rehabilitating existing

drainage canals, installing solar-powered irrigation systems, and conducting regular canal clearing and maintenance activities. These interventions will prioritize flood-prone agricultural areas identified through hazard and risk assessments. Routine inspections, preventive maintenance, and community participation will be encouraged to ensure the long-term functionality of drainage and irrigation facilities. Through these initiatives, the City Government aims to improve water management, reduce flood-related agricultural losses, strengthen climate resilience, and increase agricultural productivity across the target barangays.

3.) PPA Matrix: Goal 1 – Objective 1.3

Outcome: Climate-resilient agricultural practices were adopted by farmers, resulting in reduced vulnerability and improved productivity.

The Programs, Plans, and Activities (PPA) Matrix for Goal 1 – Objective 1.3, which aimed at promoting climate-resilient agricultural practices among farmers. The promotion of flood-tolerant crop varieties, the conduct of climate-smart agriculture trainings, and the implementation of crop diversification programs enhance farmers' adaptive capacity. These interventions contribute to achieving at least 60% adoption of climate-resilient practices, thereby reducing vulnerability and improving agricultural productivity.

To operationalize this objective, the DA, ATI, CASD, PhilRice, NIA and farmers' organizations will collaborate in implementing demonstration farms, farmer field schools, technical training, and extension services on climate-smart agriculture. The program will promote the distribution of flood-tolerant and climate-resilient crop varieties, encourage crop diversification and sustainable land management practices, and strengthen farmers' access to technical assistance and agricultural technologies. Information, education, and communication (IEC) campaigns and regular monitoring will be conducted to assess the adoption of climate-resilient farming practices and identify areas requiring additional support. Through these interventions, the City Government and its partner agencies aim to improve agricultural productivity, reduce crop losses, strengthen food security, and enhance the resilience of farming communities against climate-induced hazards.

4.) PPA Matrix: Goal 1 – Objective 1.4

Outcome: Risk-sensitive land use planning and zoning regulations were strengthened, minimizing agricultural exposure in high-risk areas.

The Programs, Plans, and Activities (PPA) Matrix for Goal 1 – Objective 1.4, which aimed at strengthening land-use planning and zoning regulations to minimize agricultural exposure in high-risk areas. The integration of DRR into local development and land use plans, along with the implementation of ecosystem-based mitigation strategies, ensures that agricultural activities are aligned with risk-sensitive planning. These interventions contribute to reducing exposure to hazards and promoting sustainable land management.

To operationalize this objective, the CDRRMO, CPDO, CENRO, CASD, and the concerned barangay local government units will work together to integrate disaster risk reduction and climate change adaptation into the Comprehensive Land Use Plan (CLUP), Comprehensive Development Plan (CDP), and zoning ordinances. Hazard-prone agricultural areas will be identified to support risk-sensitive land-use planning and decision-making.

The City Government will also implement ecosystem-based measures such as tree planting, watershed rehabilitation, riverbank protection, and regular canal clearing to reduce flooding and protect agricultural lands. These activities will be supported by policy implementation, environmental protection programs, and community participation. Through these interventions, the City aims to reduce agricultural exposure to hazards, protect natural resources, and strengthen the resilience of farming communities in Barangays Gutad, Nag-Iba I, and Nag-Iba II.

3.) PPA Matrix: Goal 1 – Objective 1.4

Outcome: Enhanced financial resilience and improved recovery capacity of farmers against climate-related agricultural losses.

The Programs, Plans, and Activities (PPA) Matrix for Goal 1 – Objective 1.4, which helps protect farmers from financial losses caused by disasters. Through this PPA, farmers can recover more easily from damages caused by typhoons and flooding. This reduces financial risks and supports continuous farming activities. In the long run, it improves farmers' resilience and recovery capacity.

To operationalize this objective, the Department of Agriculture (DA), Philippine Crop Insurance Corporation (PCIC), and the City Agriculture Services Department (CASD) will work together to increase farmers' enrollment in the crop insurance program. Information campaigns, registration assistance, and coordination with farmers' organizations will be conducted to encourage wider participation and ensure that eligible farmers receive insurance coverage before the planting season. Priority will be given to farmers in flood- and storm surge-prone areas

Goal 2:

To enhance the preparedness capacity of farmers and agricultural institutions in Calapan City through strengthened early warning systems, community-based

training, contingency planning and resource preparedness by 2028

Objectives:

2.1 To conduct farmer-focused DRRM trainings and simulation drills reaching at least 80% of farming households annually.
2.2 To strengthen early warning systems by ensuring 100% accessibility and timely dissemination of hazard information in all target barangays within two (2) years.
2.3 To develop and institutionalize agriculture-specific contingency plans for typhoon, flooding, and storm surge in all barangays within one (1) year.
2.4 To promote household and farm-level preparedness practices (e.g., evacuation plans, crop protection measures) among at least 70% of residents by 2028.
2.5: To strengthen agricultural preparedness and post-disaster recovery support through the strategic prepositioning and efficient distribution of agricultural inputs and resources.
2.6: To strengthen agricultural emergency preparedness by establishing evacuation protocols and pre-disaster protection measures that reduce evacuation time and minimize crop and livestock losses within three (3) years.

1) PPA Matrix: Goal 2 – Objective 1.3

Outcome: Enhanced farmer preparedness and DRRM capacity leading to reduced disaster impacts and improved resilience.

The Programs, Plans, and Activities (PPA) Matrix for Goal 2 – Objective 2.1, which aimed at strengthening the preparedness capacity of farmers through the conduct of DRRM training and simulation drills. The implementation of farmer-focused training, community-based simulation exercises, and training of trainers (TOT) for FCA leaders ensures that at least 80% of farming households are equipped with the necessary knowledge and skills on disaster preparedness. These interventions directly address the identified gaps in farmer-level preparedness and contribute to enhancing community resilience against disasters.

To operationalize this objective, the Department of Agriculture (DA), CASD, CDRRMO, ATI, and the concerned barangay local government units will conduct farmer-focused DRRM training, community-based simulation drills, Training of Trainers (TOT) for Farmers' Cooperative and Associations (FCAs), and inter-agency disaster coordination exercises. These activities will equip farmers, community leaders, and local responders with the knowledge and skills needed to prepare for, respond to, and recover from disasters.

Regular training and simulation exercises will improve coordination among government agencies, farmers' organizations, and community volunteers while promoting disaster preparedness, early action, and effective emergency response. Through these interventions, Calapan City aims to strengthen the preparedness and resilience of farming communities against typhoons, flooding, storm surge, and other climate-induced agricultural hazards.

2) PPA Matrix: Goal 2 – Objective 2.2

Outcome: Fully functional early warning system ensures timely alerts and improved farmer preparedness.

The PPA under Goal 2, Objective 2.2 designed to strengthen early warning systems in all target barangays. The procurement and installation of early warning devices, the establishment of an SMS-based alert system, and the capacity building of barangay EWS focal persons aim to ensure 100% accessibility and timely dissemination of hazard information. These initiatives respond to the existing gaps in early warning communication and are essential in improving preparedness and reducing disaster risks among farmers.

The specific targets and outputs focus on improving the accessibility and reliability of early warning systems in the target barangays. For the procurement and installation of early warning devices, the target is to provide operational warning equipment in all flood- and storm surge-prone barangays, with key outputs including functional warning devices and timely hazard notifications. For the SMS-based alert system, the target is to register farmers and establish an efficient communication platform that enables the rapid dissemination of hazard information. Meanwhile, the Barangay Early Warning System (EWS) focal training aims to strengthen the capacity of BDRRMC members and FCA leaders through training on early warning protocols, communication procedures, and emergency coordination. These interventions are expected to improve farmer preparedness and ensure timely response before disasters occur.

3) PPA Matrix: Goal 2 – Objective 2.3

Outcome: Institutionalized agriculture contingency plans enable coordinated and effective disaster preparedness and response

The Programs, Plans, and Activities (PPA) Matrix for Goal 2 – Objective 2.3, which focused on the development and institutionalization of agriculture-specific contingency plans. Through the preparation of barangay contingency plans, the conduct of planning workshops, and the integration of barangay and city plans, a coordinated and systematic approach to disaster preparedness is established. These interventions ensure that all barangays are equipped with clear and actionable plans, thereby improving disaster readiness and response efficiency.

The specific targets and outputs focus on strengthening contingency planning and coordination among stakeholders. The development of barangay agriculture contingency plans aims to provide all agricultural and coastal barangays with updated disaster response plans. Contingency planning workshops will improve the knowledge and preparedness of barangay officials and farmers on disaster response procedures. Plan integration workshops will align barangay contingency plans with the City Contingency Plan to ensure coordinated implementation. In addition, the development of a digital reporting system will support real-time information sharing and improve decision-making before, during, and after disasters.

4) PPA Matrix: Goal 2 – Objective 2.4

Outcome: Household and farm-level preparedness practices were widely adopted, reducing disaster risks and improving response readiness.

The Programs, Plans, and Activities (PPA) Matrix for Goal 2 – Objective 2.4, which initiatives aimed at promoting household and farm-level preparedness practices among residents. The implementation of IEC campaigns, farm protection measures, and distribution of preparedness kits encourages the adoption of practical disaster preparedness strategies at the community level. These efforts contribute to achieving at least 70% adoption of preparedness practices, thereby reducing vulnerability and enhancing response readiness.

The specific targets and outputs focus on increasing preparedness among farming communities. The Information, Education, and Communication (IEC) campaign aims to improve household preparedness through awareness activities and disaster preparedness education. Farm protection measures will promote crop protection practices that minimize agricultural losses during disasters. The distribution of farm preparedness kits will provide farmers with essential emergency supplies to support faster response and recovery. These interventions are expected to strengthen disaster preparedness, reduce agricultural losses, and enhance the resilience of farming households in Calapan City.

5.) PPA Matrix: Goal 2 – Objective 2.5

Outcome: Improved agricultural preparedness and faster post-disaster recovery through the timely availability and efficient distribution of seeds, inputs, and emergency agricultural resources.

The Programs, Plans, and Activities (PPA) Matrix for Goal 2 – Objective 2.5, which aims to strengthen agricultural preparedness and post-disaster recovery support through the strategic prepositioning, storage, and distribution of agricultural inputs and resources. The identified interventions focus on ensuring the timely availability of seeds and inputs and establishing storage facilities to facilitate efficient resource management and distribution during emergencies

The specific targets and outputs focus on improving the availability and distribution of agricultural resources. The prepositioning of seeds and farm inputs aims to ensure that affected farmers receive immediate assistance after disasters, enabling faster recovery and the resumption of farming activities. The establishment of functional agricultural warehouses will provide secure storage for emergency supplies and facilitate their timely distribution during disaster response and recovery operations. These interventions are expected to strengthen agricultural preparedness, reduce recovery time, and enhance the resilience of farming communities in Calapan City.

6.) PPA Matrix: Goal 2 – Objective 2.6

Outcome: Farmers and agricultural institutions demonstrate improved preparedness and readiness for hazard-related emergencies through established evacuation protocols and pre-disaster protection measures.

The Programs, Plans, and Activities (PPA) Matrix for Goal 2 – Objective 2.6, designed to improve response time for evacuation and emergency services. The establishment of evacuation protocols for farmers and the implementation of emergency harvesting and livestock evacuation programs ensure a timely and organized response during disasters. These measures contribute to reducing response time and minimizing agricultural losses.

The specific targets and outputs focus on improving emergency preparedness in hazard-prone communities. The establishment of evacuation protocols will provide farmers with clear procedures for safe and timely evacuation during disasters. The emergency harvesting and livestock evacuation program will encourage farmers to protect crops and livestock before disasters occur, reducing potential losses and supporting faster agricultural recovery. These interventions are expected to enhance farmer preparedness, minimize disaster impacts, and strengthen the resilience of agricultural communities in Calapan City.

Goal 3:

To improve the timeliness, coordination, and effectiveness of disaster response systems for agricultural communities affected by multi-hazard events in Calapan City by 2028.

Objectives:

3.1 To strengthen coordination and command mechanisms among agricultural and DRRM Offices through the activation of the Incident Command System (ICS).

3.2 To ensure availability and pre-positioning of emergency agricultural resources (e.g., seeds, tools, inputs) in all agricultural barangays annually.

3.3 Rapid and accurate agricultural damage assessment was institutionalized, enabling timely decision-making and resource allocation.

1) PPA Matrix: Goal 3 – Objective 3.1

Outcome: Improved coordination, communication, and resource management among response agencies, resulting in a more organized and effective agricultural disaster response.

The Programs, Projects and Activities (PPAs) aimed at strengthening coordination among DRRM agencies and agricultural offices through the activation of the Incident Command System (ICS) in the agriculture sector. The intervention establishes a clear command structure, improves communication among responders, and enhances the efficiency of disaster response operations, leading to a more organized and effective response for affected farming communities.

The specific target is to ensure the activation of the Incident Command System (ICS) in all agricultural disaster response operations in Calapan City by 2028. The key output is a functional Agriculture Incident Command System with designated ICS personnel, clearly defined roles and responsibilities, and coordinated emergency response procedures. Through this intervention, CDRRMO, CASD, BFP, Farmers' Cooperative Associations (FCAs), and other partner agencies will improve inter-agency coordination, optimize resource utilization, and strengthen disaster response operations to minimize agricultural losses and protect farming communities.

2) PPA Matrix: Goal 3 – Objective 3.2

Outcome: Emergency agricultural resources were pre-positioned and readily available, ensuring immediate support to affected farmers.

The Programs, Projects and Activities (PPAs) aimed at ensuring the availability of emergency agricultural resources for affected farmers during disasters. The procurement of emergency agricultural resources ensures that essential tools, equipment, seeds, fertilizers, and other inputs are readily available when needed. This intervention enables immediate assistance to affected farmers, minimizes delays in response, and supports faster agricultural recovery following disaster events.

The specific target is to pre-position emergency agricultural resources for all affected farmers in hazard-prone areas. The key output is the availability of emergency agricultural resource stocks that can be immediately distributed following typhoons, flooding, and storm surge. Through this intervention, the CDRRMO, DA, and the CASD will strengthen emergency response, minimize delays in assistance, and support the rapid recovery of agricultural production in Calapan City.

PPA Matrix: Goal 3 – Objective 3.3

Outcome: Fast and accurate damage assessment leads to timely decisions and quicker support for affected farmers.

The Programs, Projects and Activities (PPAs) aimed at institutionalizing rapid and accurate agricultural damage assessment. Through capacity building, development of a digital reporting system, and the conduct of post-disaster field assessment operations, timely and reliable data on agricultural damages are ensured. These interventions support evidence-based decision-making and efficient allocation of resources during disaster response

The specific targets and outputs focus on improving the speed and accuracy of damage assessment and reporting. The rapid damage assessment activation aims to mobilize trained personnel to assess agricultural losses immediately after a disaster. The post-disaster field assessment will validate damage to crops, livestock, and agricultural infrastructure within 24 to 72 hours after disaster impact, providing reliable information for resource allocation and recovery planning. These interventions are expected to improve decision-making, facilitate the timely delivery of assistance, and support the rapid recovery of affected farmers in Calapan City.

Goal 4:

To enhance recovery capacity and livelihood resilience of farmers affected by climate-induced hazards in Calapan City through sustainable rehabilitation and support mechanisms by 2028.

Objectives:

4.1 To provide post-disaster agricultural assistance (e.g., seeds, inputs, tools) to at least 80% of affected farmers within three (3) months after disaster occurrence.

4.2 To establish livelihood recovery programs and alternative income opportunities for affected farming households within one (1) year.

4.3 To strengthen access to agricultural insurance and financial support mechanisms among farmers by 2028.

1) PPA Matrix: Goal 4 – Objective 4.1

Outcome: Post-disaster agricultural assistance was efficiently delivered, enabling farmers to restore production within a short period.

The Programs, Projects and Activities (PPAs) aimed at providing post-disaster agricultural assistance to affected farmers. The distribution of seeds, fertilizers, and farming tools, along with farm rehabilitation support, ensures that

farmers can quickly resume agricultural activities. These interventions aim to support at least 80% of affected farmers within three (3) months after disaster occurrence, thereby restoring agricultural production and livelihoods.

The specific targets and outputs focus on accelerating the recovery of affected farmers. The distribution of agricultural inputs aims to provide immediate assistance that enables farmers to resume farming activities after disasters. The rehabilitation support program will restore damaged farm infrastructure, including irrigation systems and agricultural facilities, to improve agricultural productivity and strengthen community resilience. These interventions are expected to reduce recovery time, restore livelihoods, and promote sustainable agricultural recovery in Calapan City.

2) PPA Matrix: Goal 4 – Objective 4.2

Outcome: Livelihood recovery programs were established, providing alternative income opportunities for affected farming households.

The Programs, Projects and Activities (PPAs) aimed at establishing livelihood recovery programs and alternative income opportunities for affected farming households. The implementation of skills training programs and cash-for-work initiatives provides both immediate and sustainable livelihood support. These interventions ensure that affected households are able to restore income and strengthen their economic resilience within one (1) year after disaster occurrence.

The targets for this objective are focus on providing immediate livelihood support to affected farmers. The alternative livelihood program, implemented in partnership with the Department of Labor and Employment (DOLE), the Technical Education and Skills Development Authority (TESDA), and other partner agencies, will provide skills training and income-generating opportunities to diversify household livelihoods. The Cash-for-Work Program will offer temporary employment to disaster-affected households while supporting rehabilitation and community recovery activities. These interventions are expected to restore household income, strengthen livelihood resilience, and promote sustainable recovery among farming communities in Calapan City.

3.) PPA Matrix: Goal 4 – Objective 4.3

Outcome: Access to agricultural insurance and financial support mechanisms was strengthened, reducing economic vulnerability of farmers.

The Programs, Projects and Activities (PPAs) aimed at improving farmers' access to agricultural insurance and financial support. Through financial literacy training and loan facilitation, farmers can better access financial resources, strengthen their resilience, and recover more quickly from disasters. These interventions help reduce economic vulnerability and support sustainable agricultural recovery.

The specific targets for these objectives focus on expanding financial assistance and improving farmers' knowledge of agricultural financing. Financial literacy and credit access activities will help farmers understand available loan programs, agricultural insurance, and financial management practices. The facilitation of agricultural loans will provide affected farmers with access to financial assistance for farm rehabilitation and the resumption of agricultural production. These interventions are expected to reduce farmers' financial vulnerability, improve recovery after disasters, and support the long-term sustainability of agricultural livelihoods in Calapan City

MONITORING AND EVALUATION

Monitoring and evaluation are essential to ensure the effective implementation of the proposed Integrated Disaster Action Plan. This chapter provides the framework for monitoring the progress of the Programs, Projects, and Activities (PPAs) under the four thematic areas of Disaster Risk Reduction and Management (DRRM): Prevention and Mitigation, Preparedness, Response, and Rehabilitation and Recovery. It identifies the key performance indicators, means of verification, responsible offices, monitoring frequency, and expected outcomes to assess whether the objectives of the action plan are achieved.

Regular monitoring will enable the City Government, the Department of Agriculture, and partner agencies to track implementation progress, identify implementation gaps, and recommend corrective actions when necessary. Periodic evaluation will also determine the effectiveness, efficiency, and sustainability of the interventions in enhancing farmer resilience, reducing agricultural losses, and improving disaster preparedness and recovery in Calapan City, Oriental Mindoro.

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