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Disaster Preparedness in Barangay Sapang, Cabanatuan City, Nueva Ecija: A Basis for Community Extension Project

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Abstract: This study assesses the disaster preparedness of Barangay Sapang in Cabanatuan City, Nueva Ecija, a community highly vulnerable to natural hazards such as typhoons, floods, and earthquakes. Using a quantitative research design and a self-constructed survey questionnaire, the study measured residents' awareness of hazards, resource availability, emergency response protocols, community participation, and challenges related to disaster preparedness. A total of respondents were selected through convenience sampling, and data were analyzed using weighted mean and statistical tools in SPSS.

Findings reveal that while residents demonstrate strong awareness of disaster risks and possess adequate knowledge of evacuation routes and emergency procedures, gaps remain in practical skills, hands-on training, and consistent participation in disaster drills. Resource availability, particularly first-aid kits, training modules, and emergency supplies, was found to be limited despite good access to communication channels and evacuation centers. Community involvement was generally positive, though participation varies across population groups. Major challenges identified include inadequate funding, limited resources, poor coordination, and insufficient training.

Based on these findings, the study proposes Project HANDA: Holistic Approach to Neighborhood Disaster Awareness, a community extension program aimed at strengthening disaster preparedness through capacity-building, improved resource accessibility, enhanced coordination, and sustained community engagement. The results emphasize the importance of localized assessments and targeted interventions to build resilient, informed, and disaster-ready communities.

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I. INTRODUCTION

Natural disasters are becoming more frequent and severe due to the effects of climate change, with typhoons, floods, earthquakes, and droughts increasingly affecting vulnerable communities worldwide (IPCC, 2021). In the Philippines, the risks are heightened due to the country's location within the Pacific Ring of Fire and the typhoon belt, exposing it to multiple hazards such as tropical cyclones, earthquakes, and floods. Communities like Barangay Sapang in Cabanatuan City, Nueva Ecija are particularly vulnerable,

given their geographic exposure and socioeconomic challenges. These vulnerabilities highlight the urgent need for effective disaster preparedness and resilience-building at the local level.

Despite the national government's efforts through the Philippine Disaster Risk Reduction and Management (DRRM) Act of 2010 (RA 10121), the capacity of barangays to prepare for and respond to disasters remains a significant concern. This law emphasizes a community-based approach to disaster risk reduction, placing local communities at the

forefront of disaster planning and response efforts (NDRRMC, 2020). However, localized assessments of preparedness are necessary to ensure that plans and interventions align with the specific needs and characteristics of individual barangays.

Existing studies underscore the importance of community resilience in disaster management. Patel et al. (2017) emphasize the role of local knowledge, social networks, and active community participation in reducing disaster risks. Similarly, Mayer (2019) identifies key factors influencing resilience in the Philippines, including social capital, government support, and access to infrastructure and resources. However, localized studies that evaluate preparedness efforts at the barangay level, such as this research on Barangay Sapang, are essential to uncover specific challenges and strengths.

This study aims to evaluate the disaster preparedness of Barangay Sapang by assessing the community's knowledge of hazards, available resources, response protocols, and participation in preparedness activities. The findings will provide insights into gaps and challenges in the current disaster management system and inform practical recommendations for improving the barangay's capacity to withstand and recover from future disasters. Such localized insights are crucial for enhancing the overall resilience of vulnerable communities.

II. MATERIALS AND METHODS

➤ Research Method

Researchers will use quantitative research method in order to obtain an in depth understanding towards Disaster Preparedness in Barangay Sapang, Cabanatuan City, Nueva Ecija. The researchers will use convenient sampling in identifying the respondents.

➤ Data Gathering Tool

The researchers will make use of a self-made survey questionnaire as the main data gathering tool. The questionnaire will be used to gather quantitative data from barangay residents, and barangay officials regarding their level of preparedness and the challenges they encounter. Structure of the survey is composed of Likert-scale questions to assess knowledge, awareness, resources, and community involvement.

➤ Data Gathering Procedure

The researchers will personally administer and explain the mechanics and concepts in answering the questionnaire, and that is, within the subject and setting of the study. The researchers likewise made an individual and personal approach to facilitate the expeditious and early retrieval of the duly accomplished questionnaire checklist, monitoring of the responses also undertaken to enhance the making of interpretation and validation of the results of the study.

➤ Treatment of Data

In this section, the researchers will discuss the statistical treatment of data used to tabulate the gathered data from the

respondents. Here, the researcher will utilize the Statistical Package for the Social Sciences (SPSS). This treatment describes the main features of the study conduct and summarizes the data collection.

• Statistical Treatment:

✓ SOP 1:

Average Weighted Mean. This will be used in assessing the disaster preparedness of Barangay Sapang. It could be computed using the formula:

$$\frac{WM}{N} = \frac{\sum fx}{N}$$

Where,

WM	=	Weighted Mean
f	=	Frequency
x	=	Mean or average value
N	=	Number of respondents

Likert scale:

- Very Much Prepared
- Prepared
- Moderately Prepared
- Slightly Prepared
- Not at all Prepared

✓ SOP 2:

AVM. This will be used in assessing the challenges encountered by the respondents in the disaster preparedness efforts of Barangay Sapang. It could be computed using the formula:

Where,

W	Weight
X	Raw sources
N	Number of cases

Likert Scale:

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

III. RESULTS

➤ Presentation, Analysis, and Interpretation of Data

This chapter presents the results of the survey conducted among the residents of Barangay Sapang regarding their disaster preparedness. Data are arranged according to the variables of the study, supported with tables and narrative interpretation.

- SOP 1

Table 1 Awareness and Capability of the Barangay on Disaster Risks and Hazards

Indicators	WM	Verbal Description
Knowledge of types and impacts of disasters	4.84	Very Much Prepared
Knowledge of evacuation routes/centers	4.40	Prepared
Skills/capacity to cope with disaster impacts	4.445	Prepared
Confidence in ability to respond	4.303	Prepared

✓ *Interpretation:*

Most respondents show a high level of disaster awareness, particularly in terms of knowledge of disaster types, evacuation routes, and response ability. However, skills and coping capacity need improvement.

Table 2 Availability and Accessibility of Resources

Indicators	WM	Verbal Description
Access to radio/TV for emergency alerts	4.62	Very Much Prepared
Availability of first-aid kits	4.03	Prepared
Accessibility of emergency shelters	4.56	Very Much Prepared
Existence of a barangay emergency plan	4.31	Prepared
Availability of DRRM training modules	4.29	Prepared

✓ *Interpretation:*

Strong access to communication channels exists, but resources such as first-aid kits and DRRM modules are insufficient.

Table 3 Emergency Response Plans and Protocols

Indicators	WM	Verbal Description
Awareness of emergency response plan	4.50	Very Much Prepared
Knowledge of how to contact responders	4.61	Very Much Prepared
Effectiveness of the response plan	4.43	Prepared
Participation in emergency drills	4.33	Prepared
Sufficiency of barangay resources	4.30	Prepared

✓ *Interpretation:*

Residents are aware of emergency plans but lack consistent participation in drills.

Table 4 Community Participation and Involvement

Indicators	WM	Verbal Description
Barangay's involvement in disaster preparedness efforts	4.09	Prepared
Participation in community-based disaster preparedness activities	4.18	Prepared
Civil Society Organization's participation in disaster preparedness activities?	3.9	Prepared

✓ *Interpretation:*

There is strong community and CSO participation, though some residents remain less engaged.

- SOP 2

Table 5 Challenges in Disaster Preparedness

Challenges	WM	Verbal Description
Lack of awareness on risks/hazards	4.46	Agree
Limited access to resources	4.2	Agree
Lack of training/education	4.32	Agree
Poor communication and coordination	4.50	Strongly Agree
Lack of trust in barangay's response	4.11	Agree
Inadequate evacuation infrastructure	4.30	Agree
Limited access to early warning systems	4.36	Agree
Insufficient emergency supplies	4.20	Agree
Lack of comprehensive DRRM plan	4.22	Agree
Limited participation of vulnerable groups	4.30	Agree
Lack of awareness of individual responsibilities	4.46	Agree
Inadequate funding for DRRM programs	4.56	Strongly Agree

✓ *Interpretation:*

The most concerning challenges include limited resources, inadequate funding, poor coordination, and insufficient training.

IV. DISCUSSION

The findings of the study provide a comprehensive view of the disaster preparedness level of Barangay Sapang based on the residents' perceptions of awareness, resource availability, emergency response protocols, community involvement, and challenges encountered. The findings cover four major areas under SOP 1—awareness and capability, resources, emergency protocols, and community participation—and one major area under SOP 2, which focuses on challenges affecting disaster preparedness. Overall, the barangay demonstrates strong preparedness in several dimensions but continues to face constraints that may hinder full readiness during disasters.

➤ *Awareness and Capability of the Barangay on Disaster Risks*

The results from Table 1 indicate a high level of awareness among residents, as reflected by the very high weighted mean for knowledge of disaster types (WM = 4.84, *Very Much Prepared*). Respondents also showed a strong understanding of evacuation routes (WM = 4.40, *Prepared*), confirming that information dissemination efforts have been effective.

However, despite strong awareness, practical skills and coping capacities registered slightly lower values (WM = 4.445 and 4.303, both *Prepared*). This suggests that although residents understand what disasters are and how to respond in theory, they may lack the actual hands-on skills needed during emergencies. More drills, workshops, and simulation activities may be needed to bridge the gap between awareness and applied capability.

Many Philippine studies show the same pattern observed in Barangay Sapang: high levels of hazard awareness but lower levels of applied skills and household-level preparedness. National-level assessments and local surveys have repeatedly found that public information campaigns raise risk awareness effectively, yet awareness alone rarely translates to concrete preparedness actions (e.g., household stockpiles, trained first responders, or practiced evacuation behavior). For example, national evaluations and local governance studies note that while communities often know about typhoon and flood risks, fewer are consistently engaged in regular drills or hands-on training that build practical coping skills.

Philippine case studies emphasize that translating awareness into capability requires structured, sustained, and context-specific capacity-building programs. Research on barangay-level preparedness in Cabanatuan and other localities shows that drills, participatory contingency planning, and scenario-based exercises significantly improve residents' confidence and ability to act during emergencies. Programs that combine information dissemination with

repeated simulations and skill-focused workshops — for example, community first-aid, search-and-rescue basics, and household preparedness planning — record higher retention of practical skills and better actual performance during events. These findings align with international reviews that recommend “practice-based” interventions (drills/simulations) as the most reliable method to convert knowledge into action.

➤ *Availability and Accessibility of Resources*

Table 2 reveals mixed findings. Residents reported strong access to communication channels, such as radio and TV alerts (WM = 4.62, *Very Much Prepared*), and high accessibility of emergency shelters (WM = 4.56, *Very Much Prepared*). These strengths indicate that the barangay has functional early warning and evacuation systems.

However, other essential resources were found to be lacking. The availability of first-aid kits (WM = 4.03, *Prepared*) and DRRM training modules (WM = 4.29, *Prepared*) was not rated as highly as communication systems. This indicates that while the barangay can effectively warn residents about dangers, the actual tools needed for response and basic medical care remain insufficient. Such limitations may pose challenges during high-impact disasters where immediate support is crucial.

Studies of local DRRM in the Philippines frequently report a two-tier pattern: communication and warnings (e.g., radio, TV, barangay alarm systems) tend to be relatively well-established, while the availability of basic response materials (first-aid kits, household emergency caches, localized DRRM training modules) is more variable and often insufficient. The Saint Bernard community-based early warning system, for instance, highlights how effective EWS implementation can substantially improve timely alerts and evacuations, but the same case underscores the need to pair EWS with local stockpiles and trained local volunteers to ensure the alerts lead to lifesaving action.

Government audits and policy reviews also point to resource constraints at the barangay and municipal levels. The Commission on Audit and Department of Budget/Management analyses note that while legal frameworks for procuring emergency supplies and training exist, actual procurement, sustained replenishment of supplies, and allocation of DRRM training modules are often limited by competing budgetary priorities and procedural bottlenecks. Consequently, communities may receive timely warnings but lack adequate first-response materials or trained personnel to act effectively once an event occurs. Strengthening local procurement flexibility and planning for pre-positioned supplies are recurrent recommendations in Philippine DRRM literature.

➤ *Emergency Response Plans and Protocols*

Residents displayed strong awareness of the barangay's emergency response plan (WM = 4.50, *Very Much Prepared*) and how to contact responders (WM = 4.61, *Very Much Prepared*). This finding reflects clear communication channels and effective dissemination of response procedures.

Despite this, participation in actual emergency drills scored lower (WM = 4.33, *Prepared*), indicating that not all residents are engaged in practical preparedness activities. This gap between knowledge and participation suggests that disaster plans may be understood in theory but not fully practiced, which could hinder coordinated response during emergencies. Barangay resources were rated as merely *Prepared* (WM = 4.30), reinforcing earlier concerns about resource limitations.

Local experience in the Philippines demonstrates that the mere presence of an emergency response plan does not guarantee operational readiness; active practice through drills and exercises is essential. Large-scale assessments across Philippine municipalities reveal that when response protocols are rehearsed with real participants (including vulnerable groups and barangay responders), coordination improves, response times shorten, and household adherence to evacuation directives increases. In Panay Island, comparative studies showed municipalities with regular, scenario-based drills performed better in simulated and actual disaster events than those with plan documents only.

Barriers to regular drill participation documented in Philippine contexts include scheduling conflicts, inadequate outreach to working residents, and insufficient inclusivity for PWDs and elderly citizens. Practical recommendations from local pilots (e.g., Barangay Tatalon and other community action research projects) include holding multiple drill sessions at different times, integrating drills into local festivals or market days, and developing lighter “household-level” drills people can do independently — all of which increase participation and make rehearsal more representative of the population. When drills are designed to be inclusive and repeated, they measurably raise both individual readiness and community-level coordination.

➤ *Community Participation and Involvement*

Table 4 shows that residents perceive both the barangay and community organizations as generally active in disaster initiatives. Barangay involvement (WM = 4.09) and resident participation (WM = 4.18) were both rated *Prepared*. CSO participation was slightly lower (WM = 3.9), though still within the *Prepared* category.

These results indicate consistent but not universal engagement. While many community members and organizations are involved, there are still segments of the population that remain less active. Reaching vulnerable groups, non-participating households, and busy working residents may require targeted programs or more flexible community engagement strategies.

Civil society organizations and community-based groups are widely documented as critical partners in Philippine DRRM. Empirical studies from regions such as Northern Mindanao and urban barangays in Metro Manila demonstrate that CSOs often fill important gaps — providing localized outreach, specialized training, and continuity of community programs where government capacity is limited. Research in Bukidnon (Northern Mindanao) highlights how

CSO engagement in LDRRMCs has strengthened program design and alignment with community needs, yet also shows variability in the depth of engagement and resource capacity across different CSOs.

At the barangay level, successful cases combine government leadership with active CSO participation: CSOs bring local networks, volunteer mobilization, and technical support (e.g., first-aid trainers, psychosocial support teams), while barangays provide official coordination and access to local budgets. However, literature also notes that inconsistent participation—especially of the most vulnerable groups—remains a challenge. Disability-inclusive DRR initiatives in the Philippines, for example, stress institutionalizing CSO representation in barangay planning bodies and mainstreaming inclusive practices in outreach to ensure that engagement reaches beyond already-active community segments.

➤ *Challenges in Disaster Preparedness*

SOP 2 results (Table 5) identified several key challenges that continue to affect the barangay’s disaster preparedness efforts.

The highest-ranked challenge was inadequate funding for DRRM programs (WM = 4.56, *Strongly Agree*), suggesting that limited financial resources hinder the barangay’s ability to expand or sustain preparedness initiatives. Poor communication and coordination (WM = 4.50, *Strongly Agree*) also emerged as a critical concern, highlighting gaps in vertical and horizontal communication mechanisms within the barangay.

• *Other Significant Challenges Include:*

- ✓ Lack of awareness on individual responsibilities (WM = 4.46, *Agree*)
- ✓ Lack of training and education (WM = 4.32, *Agree*)
- ✓ Insufficient emergency supplies (WM = 4.20, *Agree*)
- ✓ Limited access to resources and early warning systems (WM = 4.2–4.36)

These findings are consistent with earlier results showing insufficient first-aid kits and limited hands-on preparedness training. While residents are aware of disaster risks, structural and resource constraints continue to limit actual disaster readiness.

The funding challenge is prominent in Philippine DRRM literature: government and independent reports regularly cite constrained local budgets and competing development priorities as major obstacles to sustained DRRM investments. Fiscal analyses by Philippine agencies recommend dedicated local DRRM budget lines and greater use of contingency mechanisms to allow pre-event procurement of supplies and training — measures shown to reduce response costs and losses in post-event assessments. Internationally informed cost-benefit assessments adapted for the Philippines also emphasize that upfront DRR investments are typically cost-saving in the long term.

Coordination and communication gaps persist despite advances in early-warning infrastructure. Philippine case studies suggest that poor coordination is often institutional (unclear roles, gaps between barangay and municipal responsibilities) rather than purely technical. Audits and local studies call for clearer SOPs, regular joint multi-stakeholder exercises, and mechanisms that institutionalize after-action reviews to fix coordination weaknesses. Training and supply shortfalls are intertwined with funding and coordination

problems: without stable budgets and transparent procurement pathways, barangays struggle to keep emergency supplies replenished or to sustain recurrent training programs — thereby limiting the practical impact of otherwise well-designed plans.

Proposed Community Extension Project to Enhance the Residents' Disaster Preparedness, Awareness and Resiliency.

Project Title:	Project HANDA: Holistic Approach to Neighborhood Disaster Awareness
Proponents	Cindy DC. Cariaga, MCJE
Partner Community/Agency	
Rationale	The discussion of results is essential for understanding the overall disaster preparedness of Barangay Sapang by connecting the quantitative findings to established disaster risk reduction and management (DRRM) concepts. By examining the weighted means from each variable—awareness, resources, emergency protocols, community participation, and challenges—the study identifies both strengths and deficiencies that influence the barangay's ability to respond effectively during disasters. Interpreting these findings allows the researchers to determine whether existing preparedness measures align with national and international DRRM standards. It also highlights the gaps that must be addressed to enhance resilience at the community level. Moreover, the discussion provides evidence-based insights that will support the formulation of practical recommendations and the development of a community extension program tailored to the needs of Barangay Sapang. Overall, this rationale underscores the importance of analyzing the results not only to evaluate the current state of preparedness but also to guide future planning, policy adjustments, and capacity-building initiatives that contribute to a safer and more disaster-resilient community.
Project Goal	The primary goal of Project HANDA is to enhance the disaster preparedness and resilience of Barangay members by implementing a comprehensive, community-centered program that strengthens awareness, improves access to essential resources, develops practical response skills, and fosters active participation among residents and local organizations. Through capacity-building activities, knowledge dissemination, and collaborative engagement with community stakeholders, the project aims to equip households and barangay volunteers with the competencies, tools, and coordinated systems necessary to effectively respond to and recover from disasters. Ultimately, the project seeks to build a safer, more informed, and more disaster-resilient community.
Specific Objectives	1. To evaluate the level of disaster risk awareness among residents of Barangay Sapang, including knowledge of hazards, early warning systems, and emergency response procedures. 2. To determine the accessibility and adequacy of resources—such as first aid kits, evacuation centers, communication tools, and emergency supplies—available to the barangay in times of disaster. 3. To examine the effectiveness of existing emergency response protocols and the readiness of local authorities, volunteers, and households to implement them during disasters. 4. To pinpoint key challenges, deficiencies, or barriers that hinder disaster preparedness and response within the barangay, including structural, informational, or social constraints. 5. To design and implement a community-based program that educates, trains, and mobilizes residents toward proactive disaster preparedness and resilience-building measures.
Target Beneficiaries	• Residents aged 18 years and above • Household heads • Youth leaders and parent leaders • Barangay Environment and Natural Resources Council (BENRC)
Project Components and Activities	1. Community Awareness and Education • Conduct seminars and workshops on disaster risk reduction and management (DRRM). • Distribute educational materials such as brochures, flyers, and infographics on disaster preparedness. • Launch awareness campaigns through community boards, social media, and local radio. • Organize school-based disaster preparedness programs and competitions.

	2. Resource Assessment and Mobilization • Conduct an inventory of available resources, including first aid kits, evacuation centers, emergency communication tools, and relief supplies. • Map strategic locations for disaster response and evacuation. • Establish partnerships with local government units (LGUs), NGOs, and private sectors for resource support. • Develop a resource mobilization plan for efficient use during emergencies. 3. Emergency Protocols and Training • Review current barangay emergency response procedures. • Conduct drills and simulation exercises for different disaster scenarios (floods, fires, typhoons, earthquakes). • Provide specialized training for community volunteers, barangay officials, and emergency responders. • Develop a barangay emergency response manual and quick-reference guides. • 4. Community Participation and Engagement • Form community disaster preparedness committees or volunteer groups. • Organize regular community meetings to discuss disaster plans and share feedback. • Promote participation in local and national DRRM programs and activities. • Recognize active participants through awards or community acknowledgment programs. 5. Community Extension Program Development • Design a holistic community extension program based on assessment findings. • Conduct training-of-trainers (TOT) sessions for community leaders and volunteers. • Implement ongoing educational sessions, workshops, and drills in collaboration with local schools and organizations. • Monitor and evaluate program effectiveness and make improvements as needed.
Expected Output	1. At least 3–5 barangay-wide IEC sessions conducted 2. Distribution of 200–300 localized IEC materials 3. Conduct of hands-on segregation and composting demonstrations 4. Participation of at least 70% of targeted households 5. Community engagement activities successfully conducted
Expected Outcomes	• Strengthened community resilience and ability to respond effectively during disasters. 1. Improved access to and utilization of emergency resources, facilities, and communication systems. 2. Implementation of evidence-based recommendations to address identified gaps in preparedness and response. 3. Sustainable community extension programs promoting disaster education, training, and volunteer engagement. 4. Alignment of Barangay's disaster preparedness measures with national and international DRRM standards. 5. Development of a culture of proactive disaster risk management within the barangay, leading to reduced vulnerability and faster recovery from disasters.
Project Timeline	Month 1 – Planning and coordination Month 2 – Baseline survey and resource preparation Month 3–5 – Demonstrations and activities Month 6 – Monitoring and evaluation Month 7 – Final reporting and turnover
Budgetary Requirements	1. Printing of materials 2. Tarpaulins and posters 3. Training kits and demonstration materials 4. Meals/snacks for participants 5. Token/honorarium for speakers 6. Documentation expenses
Monitoring and Evaluation	Pre- and post-tests to measure change in awareness Feedback forms and participation records

	Final evaluation and impact assessment
Sustainability Plan	Turnover of modules and materials to barangay Training of youth volunteers as peer educators Annual awareness reinforcement sessions

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