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ASSESSING DISASTER PREPAREDNESS AND COMMUNITY RESILIENCE: A CASE STUDY OF BARANGAY SUA, CAMALIGAN, CAMARINES SUR

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ABSTRACT: *Barangay Sua in Camaligan, Camarines Sur, is a low-lying community located near the Bicol River, making it highly prone to flooding from typhoons and heavy rainfall. Covering about 54 hectares and encompassing Zones 1, 2, 3, 4, 5, and 7-B, these areas frequently experience hydro-meteorological events that disrupt daily life, delay evacuations, and hinder access to healthcare and emergency resources. This study assessed how households in Barangay Sua prepare for disasters and perceive community resilience. We employed a Convergent Parallel Design, collecting both quantitative and qualitative data simultaneously. We surveyed 160 randomly selected household heads and interviewed barangay officials. Field observations and secondary data reviews further supported our analysis, helping to confirm findings within the local context. All respondents took basic steps, such as securing their homes before disasters. However, only 43.8% kept emergency supplies, indicating that limited financial resources often mean families prioritize immediate needs over disaster preparation. Emotional trauma or anxiety affected 46.9%, showing ongoing mental health struggles and a lack of support. Wind and flood damage concerned 62.5%, highlighting the need for improved infrastructure and better community development. While 46.9% recognized barangay evacuation work, only 25% saw strong coordination with municipal authorities. This highlights the need for improved government collaboration. These results reveal gaps needing action. The study highlights the need to enhance early warning communication, expand access to training, and strengthen coordination between local and municipal disaster teams. The Barangay Local Government Unit (BLGU) should work closely with the Municipal Disaster Risk Reduction and Management Office (MDRRMO) to get funding and resources. The MDRRMO can set aside budget to develop an early warning system. The Department of Social Welfare and Development's KALAHI-CIDSS program can support and conduct preparedness trainings. Support for tree planting, clean-up, and mental health help can boost readiness. Barangay officials, local NGOs, and community leaders should organize these efforts and incorporate them into disaster risk reduction plans. Fixing weak structures and emotional stress is key to making Barangay Sua more resilient.*

Keywords: *Disaster Preparedness, Community Resilience, Flood Risk, Typhoon Exposure, Barangay-Level Study, Camaligan, Philippines*

INTRODUCTION

Barangay Sua, in Camaligan, Camarines Sur, is a low-lying rural community. It frequently faces floods and typhoons due to its proximity to the Bicol River. These hazards pose a threat to residents' safety, livelihood, and mental health. For example, during a recent heavy rain, Maria

Santos and her family had to evacuate at night, fearing for their safety and property. This example shows the real risks community members face. With climate disasters on the rise, understanding the preparedness and resilience of barangays is key. Knowing how barangays prepare and respond to disasters helps develop effective, community-based disaster risk reduction (DRR)



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plans. DRR aims to limit damage from hazards through prevention and preparedness.

This study is also grounded in key national frameworks, particularly Republic Act 10121 (the Philippine Disaster Risk Reduction and Management Act of 2010), and the Climate Change Act of 2009. Both emphasize local governance, risk reduction, and community resilience as core components of disaster preparedness. These legal instruments support the need for localized, people-centered DRRM strategies in vulnerable communities like Barangay Sua.

This study uses frameworks from Norris et al. (2008) and Paton et al. (2006) to analyze disaster preparedness and resilience. Norris et al. identify four adaptive capacities: economic development, social capital, information and communication, and community competence. Paton and Johnston's model focuses on risk perception, trust in authorities, and personal responsibility, which shape preparedness. Together, these frameworks offer a multidimensional perspective by combining the structural and behavioral aspects of disaster readiness.

Recent literature further underscores the importance of community engagement in disaster resilience. Kuhlicke et al. (2021) emphasize the importance of long-term, community-centered strategies, whereas Cutter et al. (2016) advocate for place-based approaches that address localized vulnerabilities. Within the Philippine context, the KALAHI-CIDSS program (DSWD, n.d.), a participatory development initiative implemented by the Department of Social Welfare and Development, has empowered barangays to actively participate in disaster planning and response. In Barangay Sua, this program serves as a meaningful entry point for examining community-led approaches to disaster risk management.

Including Southeast Asian perspectives enhances the relevance of this study. In Vietnam, Nguyen et al. (2021) highlight the importance of household awareness and trust in local governance. In Indonesia, Sattler et al. (2018) emphasize the importance of social support and community knowledge. In Thailand, Leelawat et al. (2015) and Tanwattana (2018) note the

importance of early warning systems, participatory governance, and localized education. Shaw et al. (2011) highlight school-based disaster education, while Luna (2001) and Lo (2016) show the value of grassroots DRR approaches in the Philippines and Thailand.

Gaillard et al. (2007) studied the impact of Typhoon Reming in the Bicol region, including Barangay Sua. They found that self-organization and mutual support were key to how the community coped and adapted. These studies confirm that local, participatory preparedness approaches are effective and provide useful comparisons for this research.

Despite progress in DRR frameworks, research on barangay-level experiences, especially in rural flood-prone areas, is limited. This makes it crucial to examine local responses to disasters within their specific context. Grassroots initiatives like KALAHI-CIDSS offer valuable insights into the realities and limitations of community-based disaster preparedness.

This study examines how Barangay Sua residents prepare for floods and typhoons, their responses, the strategies they employ, and what can enhance their resilience. The study answers: (1) How do residents see and react to disaster threats? (2) What community preparedness strategies exist, how well do they work, and how can they improve? (3) How can resident and local government coordination improve to build resilience? The answers aim to help policymakers and others support communities that face recurring disasters.

MATERIALS AND DESIGN

Given the increasing frequency and intensity of climate-induced disasters, this study assessed how communities prepare for and respond to hazards at the local level, with a focus on disaster preparedness and perceived resilience in Barangay Sua. A descriptive mixed-methods design was employed, specifically using a Convergent Parallel Design, wherein quantitative and qualitative data were collected simultaneously and analyzed independently. This design enabled the integration of statistical trends

with contextual, narrative insights, providing a comprehensive understanding of the community's readiness and coping strategies. For instance, while the quantitative data highlighted only 43.8% of households had emergency supplies, qualitative interviews confirmed this finding and provided deeper insights into why some households are unable to maintain such supplies, citing economic limitations and prioritization of immediate needs. This convergence of methods demonstrated the added value of the design choice, as it allowed for a richer understanding and validation of the quantitative results.

We gathered socio-demographic information from all respondents, including age, sex, educational attainment, and household income, as these factors are important in understanding household-level vulnerabilities and response capacities. We targeted household heads aged 18 and above who had lived in Barangay Sua for at least two years. We excluded individuals who were unable to give informed consent or those who were temporary residents. We included 160 respondents, selected through a computer-generated random process using the barangay's official household registry. Random numbers were matched with unique household codes to ensure unbiased sampling. We checked demographic information against local records to confirm representativeness.

The researcher administered a structured survey instrument of Likert-scale questions to assess preparedness, risk perception, and household response strategies. They also included open-ended questions to capture lived experiences. Experts validated the tool, and the team pilot-tested it with ten residents from a neighboring barangay. Based on pilot feedback, the researchers revised the tool to enhance clarity and contextual fit.

To complement the survey, key informant interviews were conducted with barangay officials, including the captain and treasurer. These interviews explored institutional protocols, resource gaps, and leadership roles in disaster response. Field observations were conducted in flood-prone areas—specifically Zones 1 to 5 and 7-B—to verify environmental risks and

preparedness behaviors. Additional qualitative insights were gathered from secondary sources, including hazard maps and local standard operating procedures (SOPs).

Data collection occurred between February 10 and 24, 2025. Challenges, including inclement weather and respondent fatigue, were addressed through flexible scheduling, clear communication of ethical procedures, and field team supervision. Enumerators were trained to follow consistent, respectful data-gathering protocols.

Quantitative responses were processed in Microsoft Excel to generate descriptive statistics (e.g., frequencies and percentages). Qualitative data from interviews and field notes were transcribed and analyzed thematically using open and axial coding. Triangulation across data sources enhanced the depth, reliability, and contextual understanding of disaster preparedness and resilience in Barangay Sua.

RESULTS AND DISCUSSION

Results

The findings reveal diverse emotional and behavioral responses to disaster exposure in Barangay Sua. Nearly half (46.9%) of respondents reported experiencing emotional stress or trauma due to repeated exposure to typhoons and floods (Table 1). Some expressed a sense of resignation, viewing disasters as a normal part of life during the rainy season, while others reported heightened anxiety linked to disruptions in their livelihoods and daily routines. These findings are consistent with the existing literature, which suggests that prolonged disaster events can negatively impact mental well-being and reduce responsiveness to safety warnings over time (Paton et al., 2006; Kuhlicke et al., 2011).

To address the identified psychosocial stress, a community-based mental health program is proposed. This initiative would offer regular workshops to teach stress management and coping techniques, aiming to build resilience against anxiety and trauma. Additionally, establishing counseling services in collaboration with local healthcare providers could provide

Table 1. Perceptions on Typhoons and Flooding

Perception	Frequency	Percentage	95% Confidence Interval
Trauma and significant emotional stress	75	46.9	39.3%–54.5%
Adapted to frequent disasters (considered routine)	20	12.5	7.3%–17.7%
Stress due to work disruptions	25	15.6	9.8%–21.4%
Severe shock affecting daily activities	15	9.4	4.9%–13.9%
Disruption to daily life	25	15.6	9.8%–21.4%
Total	160	100	–

necessary psychological support. Implementing these workshops and services will help bridge the gap between the current emotional burden and needed mental health resources, transforming awareness into actionable solutions.

While all respondents reported securing their homes as a basic precaution, only 43.8% had emergency supplies (Table 2). A small percentage had taken more advanced measures, such as evacuating due to riverbank erosion (6.3%) or preparing emergency rafts (3.1%). The Barangay Local Government Unit (BLGU) was recognized for its role in evacuation and relief, yet only 25% of respondents noted effective coordination with municipal authorities.

such as securing homes were commonly reported, disparities in the distribution of emergency resources suggest a disconnect between risk awareness and actual preparedness behavior. This supports Tierney et al. (2001), who assert that preparedness is shaped not only by individual initiative but also by the availability of institutional support.

Theme 1: Communication and Coordination Gaps

Key informants identified persistent challenges in disseminating early warnings, especially in geographically isolated areas. As one barangay official noted:

Table 2. Preparedness Measures Taken by Residents (N=160)

Preparedness Measure	Frequency	Percentage	95% Confidence Interval
Secured homes and belongings	160	100	–
Stockpiled emergency supplies	70	43.8	36.2%–51.4%
Evacuated (riverbank erosion risks)	10	6.3	2.6%–10.0%
Prepared emergency rafts	5	3.1	0.4%–5.8%
TOTAL	160	–	–

To further interpret these findings, qualitative insights from key informant interviews were organized into three core themes: (1) communication and coordination gaps, (2) community-led coping mechanisms, and (3) resource limitations in disaster management.

Discussion

The findings reveal heightened emotional stress, particularly among elderly residents and families with young children. This observation is consistent with prior studies that have focused on the psychological burden of recurrent disasters (Paton et al., 2006). While preparedness practices

"Dawa may abiso na, may mga harong na dai naaabot kang megaphone o text alert, lalo na 'itong nasa puro kang barangay. Kaya minsan, huri na bago sinda makahali." (Even when alerts are sent out, some homes—particularly those located deeper within the barangay—do not receive megaphone or text messages in time, resulting in delayed evacuations.)

This concern is corroborated by survey data, which indicate that only 25% of respondents perceived strong coordination between the barangay and municipal governments (Table 3). These findings support the work of Nguyen

Table 3. Barangay Local Government Unit (BLGU) Actions During Disasters (N=160)

BLGU Reaction	Frequency	Percentage	95% Confidence Interval (%)
Effective evacuation assistance	75	46.9	39.3%–54.5%
Collaboration with Municipal LGU	40	25.0	18.3%–31.7%
Positive relief goods distribution efforts	25	15.6	9.8%–21.4%
TOTAL	160	–	–

et al. (2021), who emphasize that effective disaster communication requires clarity, trust, and accessibility—particularly in vulnerable communities.

Understanding the power dynamics involved in communication can further illuminate barriers to equitable outreach. Often, municipal authorities control the primary warning channels, which may not effectively penetrate deeper barangay areas. By mapping these authority relationships, such as identifying who controls the dissemination points and how information filters down to residents, more targeted coordination solutions can be developed to ensure all residents receive timely and actionable alerts.

Theme 2: Coping Through Routine and Mutual Support

Many residents reported relying on informal, experience-based strategies such as elevating belongings and communal food sharing. One barangay official remarked:

“Aram na kang mga tao kung pano ayuson ang atop, isakat ang mga gamit, asin magtao ning pagkakan kung may baha. Garo normal na lang ‘yan pag tag-uran.” (People already know how to repair roofs, raise belongings, and share food during floods. It has become a routine part of the rainy season.)

Although these actions demonstrate community resilience, they also reflect a reliance on habitual coping rather than structured disaster preparedness. This mirrors findings from Leelawat et al. (2015), who observed that disaster familiarity in Thailand often led to normalization rather than vulnerability reduction or improved response mechanisms.

Theme 3: Resource Constraints in Local Disaster Management

Despite the Barangay Local Government Unit's (BLGU) proactive efforts, respondents acknowledged the limitations imposed by insufficient resources. One official stated:

“Ginigibo mi man ang gabos ng makakaya, pero kulang kami sa bangka asin protective gear. Kapag malalaon ang baha, nag-aasa kami sa tabang kang munisipyo.” (We do everything we can, but we lack boats and protective gear. When floods become severe, we depend on support from the municipality.)

This observation aligns with the barangay's limited evacuation and response capacities, underscoring the need for sustained material support. As Tanwattana (2018) contends, robust local disaster governance depends not only on community initiative but also on adequate and consistent resource allocation.

These field observations align with key provisions in national frameworks, such as Republic Act 10121 and the Climate Change Act of 2009. Both emphasize equipping local government units with the tools, funding, and coordination support needed to operationalize preparedness and response plans. The limitations observed in Barangay Sua underscore the need for national DRRM mandates to be reinforced with consistent, localized resource investment to bridge the implementation gap between policy and practice.

CONCLUSION

This study revealed critical insights into household disaster preparedness and perceived

community resilience in Barangay Sua, particularly the psychosocial impacts of repeated typhoons and flooding. Residents reported stress, anxiety, and disruptions to daily life, even in the absence of reported fatalities. To gauge the progress of community resilience efforts, measurable indicators such as a reduction in evacuation times and an increase in the number of households with emergency kits can be implemented. Tracking these metrics will allow for a clearer assessment of improvements in disaster preparedness and community resilience over time.

While many residents demonstrated awareness and engaged in basic preparedness actions, such as securing homes and storing essential supplies, considerable gaps remain. A smaller proportion of households reported having emergency kits, evacuation plans, or reliable access to early warning systems. Emotional adaptation to recurring disasters was evident; however, underlying psychological strain continues to affect vulnerable groups.

The Barangay Local Government Unit (BLGU) plays a vital role in disaster response, particularly in organizing evacuations and distributing relief goods. Nevertheless, findings from both the survey and interviews point to persistent challenges in communication, logistical resources, and coordination with municipal authorities. These limitations underscore the need for a more integrated and community-driven approach to local disaster governance.

Overall, this study underscores the crucial importance of addressing both the structural and psychosocial dimensions of disaster preparedness. Strengthening early warning systems, improving barangay-level response mechanisms, and fostering inclusive community engagement are crucial steps toward enhancing resilience in disaster-prone communities, such as Barangay Sua.

RECOMMENDATION

1. Strengthen Early Warning Systems

- a. Establish an integrated emergency communication system using SMS alerts, sirens, and radio channels.

- b. Develop standardized alert protocols to ensure timely and consistent dissemination of warnings across all barangay zones.

2. Support Community Preparedness Initiatives

- a. Conduct regular evacuation drills and first-aid training to enhance household-level readiness.
- b. Facilitate barangay-wide workshops on disaster awareness, preparedness strategies, and psychosocial coping mechanisms.

3. Address Infrastructure Vulnerabilities

- a. Upgrade and regularly maintain barangay drainage systems to reduce flood-related risks.
- b. Promote elevated housing and home modifications that are flood-resilient in high-risk zones.

4. Build Local Government Capacity and Coordination

- a. Improve the capacity and safety of designated evacuation centers.
- b. Equip the BLGU with modern communication tools to enhance coordination with municipal disaster response teams.
- c. Streamline logistics and supply systems to ensure timely and equitable distribution of emergency resources.

5. Integrate Mental Health and Livelihood Support

- a. Provide accessible psychosocial support and counseling services to disaster-affected residents.
- b. Develop sustainable livelihood programs tailored to households facing recurrent flooding.

6. Promote Community-Based Disaster Management

- a. Form and train local volunteer response teams for preparedness, emergency response, and recovery.
- b. Encourage inclusive community participation in barangay-level disaster planning to foster trust, accountability, and long-term engagement.

Limitations and Directions for Future Research

This study primarily focused on immediate preparedness practices and the emotional impacts of disasters in Barangay Sua. Future studies should investigate the long-term economic and environmental consequences of recurring disasters and assess the sustainability of community-level recovery efforts. Comparative research across multiple barangays or municipalities may help identify scalable and context-sensitive disaster risk management strategies. Additionally, longitudinal methodologies are recommended for how resilience evolves in communities repeatedly affected by hydro-meteorological hazards. These longitudinal studies can play a crucial role in policy learning cycles by providing data that inform revisions to barangay disaster risk reduction and management (DRRM) plans on an annual basis. Establishing a feedback loop between research findings and policy updates will ensure that the evolving understanding of resilience in Barangay Sua directly contributes to more effective and adaptive DRRM strategies, justifying the need for continued inquiry.

Policy Implications

The findings of this study underscore the urgent need to strengthen disaster risk governance at the barangay level through decentralized, context-specific strategies. Empowering local government units to respond based on their unique vulnerabilities is essential for improving preparedness, response, and recovery outcomes. Key policy measures should include institutionalization of robust early warning systems, strategic investment in resilient infrastructure, and the establishment of reliable communication mechanisms between barangay and municipal governments. These align with national mandates under Republic Act 10121 and the Climate Change Act 2009, emphasizing local autonomy, preparedness, and adaptive capacity in disaster-prone communities.

Additionally, comparative case studies such as the KALAH-CIDSS program and resilience models from Southeast Asian countries like Vietnam and Thailand further support the

importance of community-based and context-sensitive approaches. These reinforce the relevance of participatory governance, early warning dissemination, and social capital in strengthening resilience across diverse regions.

Equally important is promoting sustained, inclusive community engagement to ensure preparedness efforts are culturally appropriate, locally led, and socially responsive. Barangay Sua's experience highlights the crucial importance of basing policy interventions in local realities. It serves as a valuable reference for disaster governance in similarly vulnerable rural communities across Southeast Asia, emphasizing the need for coordinated, well-resourced, and participatory approaches to managing climate-related risks.

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