Community First Responders: A Case Study on the Effectiveness of the BDRRMC Search and Rescue Team of Barangay Ibayugan in Buhi, Camarines Sur during STS Kristine

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ABSTRACT

This study investigates the effectiveness of the Barangay Disaster Risk Reduction and Management Committee (BDRRMC) Search and Rescue (SAR) Team of Barangay Ibayugan, Buhi, Camarines Sur, during Severe Tropical Storm (STS) Kristine. Situated in a geographically vulnerable area prone to flooding and landslides, the community's reliance on the SAR team's preparedness and response capabilities was critical. The primary objectives were to evaluate the SAR team's preparedness, resource adequacy, coordination efficacy, and response outcomes, while also identifying operational challenges and proposing evidence-based improvements.

Employing a mixed-methods approach, this research combined qualitative data gathered through semi-structured interviews with barangay officials, SAR team members, and affected residents with quantitative data obtained from surveys assessing the team's performance. Barangay records and relevant documents were also analyzed to corroborate the findings.

The results indicated that while the SAR team had received foundational training, a significant lack of essential resources hampered their operational effectiveness. Adverse weather conditions, the absence of critical equipment, and difficult access to affected areas presented substantial obstacles. However, strong community engagement and the team's adaptive capacity enabled them to conduct rescue operations that successfully prevented fatalities and minimized injuries. The study recommends the provision of essential rescue equipment, the implementation of advanced and specialized training programs, and the improvement of infrastructure to ensure better accessibility during emergencies.

Despite facing resource limitations, the SAR team's teamwork, adaptability, and the robust support from the community were pivotal in safeguarding lives, leading to an overall assessment of moderate effectiveness. Strategic investments in enhanced equipment, continuous and advanced training, and deeper community involvement are crucial for bolstering disaster response capabilities in Barangay Ibayugan.

INTRODUCTION

The 2024 World Risk Report, published by Denmark's Institute for International Law of Peace and Armed Conflict at Ruhr–University Bochum, identified the Philippines as the nation most at risk among 193 countries, encompassing all UN member states and 99% of the global population. With a risk score of 46.91, an increase from 46.82 in 2022 and 46.86 in 2023, the Philippines was evaluated based on its exposure, vulnerability, susceptibility, and deficits in coping and adaptive capacities to various crises, including natural disasters, conflicts, pandemics, and wars (Garcia, N., 2024). This underscores the critical importance of effective disaster risk reduction and management (DRRM) at all levels, particularly at the community level, where the immediate impacts of disasters are most acutely felt.

The Philippine Disaster Risk Reduction and Management Act of 2010 (Republic Act No. 10121) establishes a clear legal framework for the creation and operation of Barangay Disaster Risk Reduction and Management Committees (BDRRMCs) as integral components of the national and local disaster risk reduction and

management system. Mandating the establishment of a BDRRMC in every barangay, the Act tasks these committees, under the auspices of the Barangay Development Council, with ensuring the effective implementation of disaster risk reduction and management initiatives at the community level.

The BDRRMC is typically structured with four sub-committees: Disaster Prevention, Disaster Preparedness, Disaster Response, and Disaster Rehabilitation. The Disaster Response sub-committee includes various teams, notably the Search and Rescue (SAR) Team, which aims to provide a rapid, organized, and compassionate response during emergencies. The SAR Team plays a critical role in saving lives and ensuring the safety of affected individuals, contributing directly to the national objective of achieving "Zero Casualty."

Barangay Ibayugan, one of the thirty-eight (38) barangays in the Municipality of Buhi, Camarines Sur, is situated adjacent to Lake Buhi and characterized by a mountainous topography. This geographical context renders the barangay particularly susceptible to both flooding and landslides, classifying it as one of the most hazard-prone communities within the municipality. During Severe Tropical Storm (STS) Kristine, Barangay Ibayugan experienced significant flooding and a devastating landslide, especially in Zone 2, Sitio Manupak. This event severely tested the response capabilities of the BDRRMC's Search and Rescue Team.

This study provides an in-depth analysis of the BDRRMC SAR Team's situation in Barangay Ibayugan, Buhi, Camarines Sur, focusing on the effectiveness of their disaster response during STS Kristine. While the importance of community-level DRRM is well-established, there remains a gap in understanding the specific challenges and successes of BDRRMC SAR teams in resource-constrained settings during actual disaster events. This study addresses this gap by examining the operational readiness, capability, and leadership of the BDRRMC Search and Rescue (SAR) Team in Barangay Ibayugan, Buhi, Camarines Sur, to ensure its contribution to enhancing community-level disaster response strategies. This research seeks to identify both the strengths and weaknesses of the current system to inform targeted improvements and ultimately bolster the community's resilience to future disasters.

Statement of the Problem

This study aimed to assess the effectiveness of the BDRRMC Search and Rescue (SAR) Team in Barangay Ibayugan, Buhi, Camarines Sur, during STS Kristine. Specifically, this study sought to answer the following questions:

1. How prepared was the BDRRMC SAR Team in Barangay Ibayugan in Buhi, Camarines Sur, prior to the onset of STS Kristine in terms of:
    - Organizational Status
    - Availability and Adequacy of Resources and Equipment
    - Emergency Operations Center (EOC) Coordination
2. What were the primary challenges faced by the BDRRMC SAR team of Barangay Ibayugan during the disaster response amidst STS Kristine, and how were these addressed?
3. What were the outcomes of the Team’s SAR operations in terms of lives saved and injury minimization?
4. What recommendations can be proposed to enhance the effectiveness and performance of the BDRRMC Search and Rescue Team in Barangay Ibayugan, Buhi, Camarines Sur?

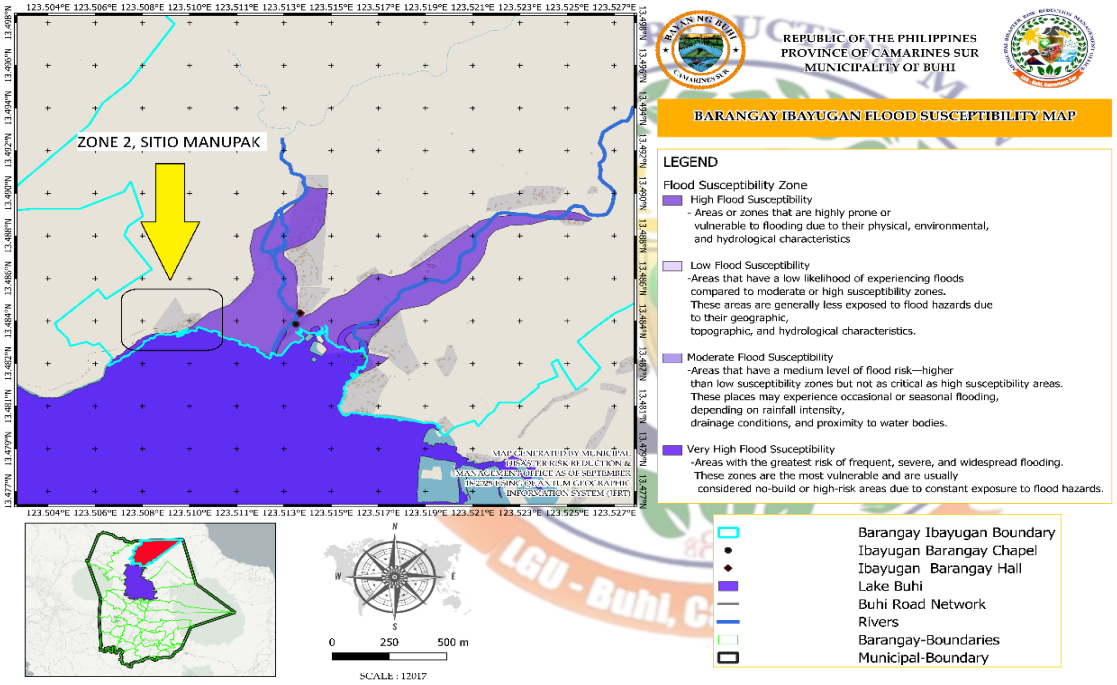
Scope And Delimitation

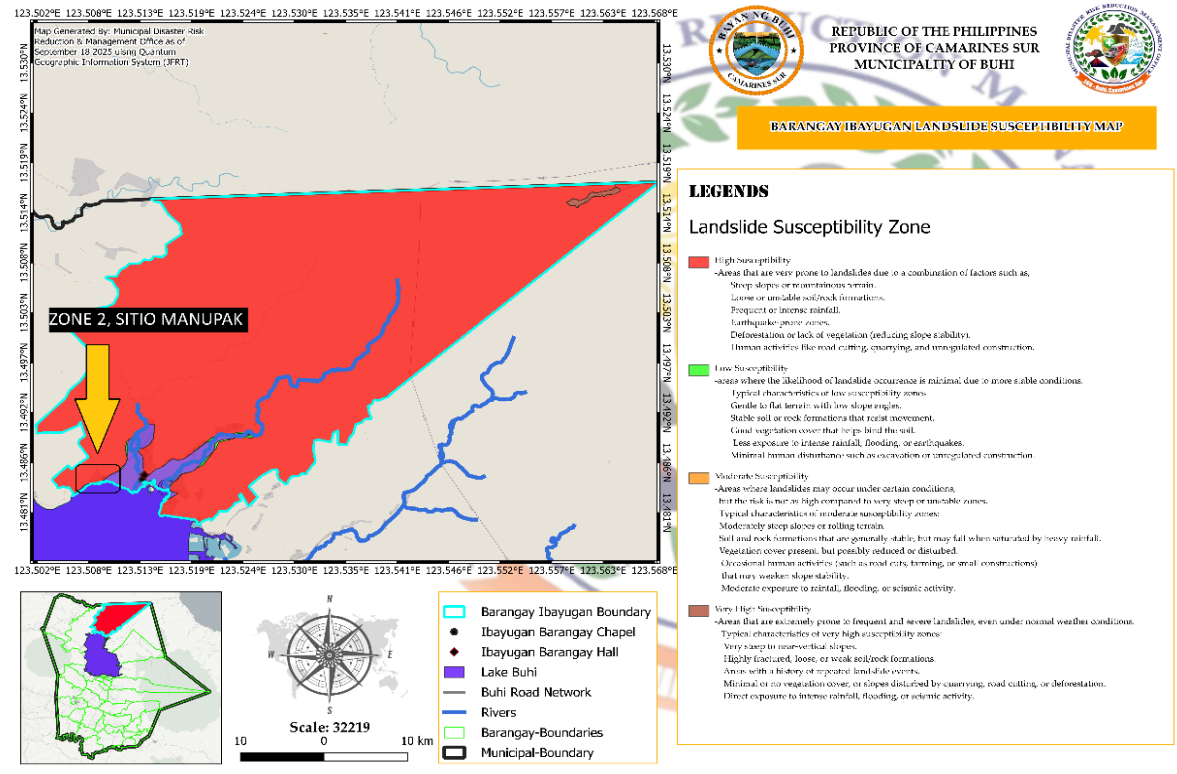
This study focused on assessing and evaluating the effectiveness of the BDRRMC Search and Rescue (SAR) Team of Barangay Ibayugan in Buhi, Camarines Sur, specifically during the response to STS Kristine. It aimed to identify the primary challenges encountered by the team and the actions taken to address them. Furthermore,

this study sought to provide recommendations that can be utilized to enhance the effectiveness and performance of the BDRRMC Search and Rescue (SAR) Team in the target barangay.

The respondents of this study included Barangay Officials, BDRRMC Search and Rescue (SAR) Team Members, and affected residents of Barangay Ibayugan. These participants were selected to provide detailed narratives and first-hand accounts of the response during STS Kristine.

The study's scope was delimited to Zone 2, Sitio Manupak, Ibayugan, Buhi, Camarines Sur. This specific area was chosen due to its frequent experience with flooding and the occurrence of three (3) simultaneous landslides during STS Kristine, which displaced all its residents and made the entire zone particularly difficult for the Search and Rescue (SAR) Team to access.





Figures 1 and 2 show that Zone 2, Sitio Manupak) is located within areas identified as flood- and landslide-prone. The boxed area indicates the delimited study site, which was selected due to its high exposure to multiple

REVIEW OF RELATED LITERATURE AND STUDIES

Community participation and preparedness form the bedrock of effective disaster risk reduction, a principle strongly advocated by the United Nations Office for Disaster Risk Reduction (UNDRR) in the 2015 Sendai Framework for Disaster Risk Reduction 2015–2030 (UNDRR, 2015). This global framework emphasizes a paradigm shift from reactive disaster response to proactive prevention. By empowering local communities to take ownership of risk reduction, it enables them to actively mitigate hazards and enhance their resilience.

In the Philippines, this community-based approach is operationalized through the Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121), which champions community-based disaster risk reduction and management (CBDRRM) to ensure that individuals at the grassroots level are equipped and prepared to confront potential crises.

The Act mandates the establishment of Barangay Disaster Risk Reduction and Management Committees (BDRRMCs) to ensure that disaster preparedness begins within the communities most vulnerable to risks. Studies such as that by Cuya-Antonio and Antonio (2017) highlight the critical role of BDRRMCs in enhancing preparedness in flood-prone areas. However, the effectiveness of these efforts is contingent upon consistent training and the availability of adequate resources.

While the importance of community-based DRRM is widely acknowledged, the literature also reveals ongoing debates and challenges. For instance, Alexander (2013) cautions against romanticizing community participation, arguing that local capacities can be overwhelmed in large-scale disasters.

Additionally, research by Bankoff (2003) highlights the historical context of disaster management in the Philippines, emphasizing how deeply rooted social inequalities can exacerbate vulnerability and hinder effective response. These perspectives suggest that the effectiveness of BDRRMCs, including their SAR teams, is not solely dependent on community involvement but is also shaped by broader socio-political and economic factors.

Beyond the provision of tools and training, effective disaster risk management hinges on social capital and community cohesion. Heijmans (2009) in "The Social Life of Community-Based Disaster Risk Management" underscores that while technical skills are essential, they are insufficient without strong community bonds and mutual support.

Wisner et al. (2004) in "At Risk: Natural Hazards, People's Vulnerability, and Disasters" further argue that genuine vulnerability reduction necessitates engaging the most affected populations in the planning and implementation processes from the outset. Fuentes and Yaneza (2021) corroborate this, stating that "effective emergency response relies heavily on proper training, adequate equipment, and the community’s trust in their rescue teams." These insights collectively suggest that communities characterized by strong social trust and collaborative spirit are significantly better positioned to prepare for and respond to disasters. Recent studies have continued to emphasize the importance of social capital. For example, a study by Aldrich (2020) found that communities with higher levels of social capital experienced faster recovery rates after disasters.

Building resilience is another crucial dimension of disaster management. Gaillard (2010) emphasizes that capacity-building initiatives must be context-specific, tailored to the unique risks and resources of local communities. Twigg (2009) proposes a framework for developing disaster-resilient communities, highlighting the importance of governance, social cohesion, and adaptability.

Benson et al. (2016) build upon this by outlining practical strategies such as clear risk communication and ensuring the timely availability of resources. Paton and Johnston (2017) further assert that true resilience emerges from collaborative efforts spanning from the community level to larger institutions. These perspectives collectively indicate that fostering resilience requires a holistic approach that integrates local knowledge and strategies with broader, coordinated initiatives involving all stakeholders. Recent research has also focused on

the role of technology in enhancing resilience. For example, studies by Meier (2023) have explored the use of social media and mobile technology in improving disaster communication and response.

THEORETICAL FRAMEWORK

This study is primarily anchored in the **Sendai Framework for Disaster Risk Reduction 2015–2030** (UNDRR, 2015), which strongly emphasizes the critical role of community involvement in mitigating disaster risks. The framework advocates for a proactive approach to disaster management, shifting from mere response to empowering local communities to take ownership of their preparedness and response strategies. By leveraging local knowledge, skills, and resources, the Sendai Framework posits that community-driven actions can significantly enhance resilience. This study examines the role of Barangay Disaster Risk Reduction and Management Committees (BDRRMCs), particularly their Search and Rescue (SAR) Teams, in communities like Barangay Ibayugan. These teams are crucial for ensuring rapid and effective responses to disasters such as floods and landslides. The study will analyze how the SAR team and the broader community align with the principles of the Sendai Framework, especially in the context of Typhoon Kristine.

The Sendai Framework's emphasis on community-based approaches is particularly relevant in the Philippine context, where RA 10121 mandates the establishment of BDRRMCs. However, the effectiveness of these committees in implementing the Sendai Framework's goals depends on various factors, including resource availability, training, and coordination. This study assesses these factors in the case of Barangay Ibayugan.

Furthermore, the Sendai Framework underscores the necessity of enhancing disaster risk governance by actively involving local leaders and community members in all phases of planning, decision-making, and implementation of disaster preparedness measures. By focusing on strengthening local capacities, such as the effectiveness of BDRRMC SAR teams, the framework highlights the vital importance of continuous training, resource mobilization, and effective leadership. In the context of Barangay Ibayugan, this study will assess the SAR team's readiness, available skills and resources, and the quality of their leadership. These factors are paramount in ensuring community safety and minimizing loss of life during disasters. Ultimately, this research aims to illuminate the effectiveness of community-based responses in reducing the impact of disasters, thereby supporting the Sendai Framework's overarching goal of fostering resilient, self-reliant, and collaboratively capable communities during crises.

To further enrich the theoretical grounding, this study also draws upon **Social Capital Theory** (Coleman, 1988; Putnam, 2000), which posits that strong social networks, trust, and reciprocity within a community can significantly enhance its ability to cope with and recover from shocks, such as natural disasters. The presence of strong social capital can facilitate better coordination, resource sharing, and mutual support during emergency response efforts. In Barangay Ibayugan, the level of social capital among residents and between residents and the BDRRMC SAR team likely influenced the effectiveness of the rescue operations. This study will explore these relationships.

METHODOLOGY

This chapter outlines the research design employed in conducting the study. It details the sources of data, the population and participant selection criteria, the key informants, the data collection instruments, and the sampling methodology used for data interpretation. The overarching aim of this chapter is to provide a clear and transparent account of the methods used to generate actionable recommendations for enhancing the effectiveness of the BDRRMC Search and Rescue (SAR) Team in the target barangay.

Research Method

To assess and evaluate the effectiveness of the BDRRMC Search and Rescue Team of Barangay Ibayugan in Buhi, Camarines Sur, during STS Kristine, this study adopted a **mixed-methods research design**, integrating both qualitative and quantitative analyses to provide a comprehensive understanding of the phenomenon under investigation (Creswell & Plano Clark, 2017). The qualitative component involved conducting semi-structured interviews with key informants, including barangay officials, SAR Team members, and affected residents. This

approach aimed to capture detailed narratives, personal experiences, and in-depth perspectives on the disaster response. Furthermore, archival records, official documents (such as Executive Orders and Resolutions), and other relevant information provided by the Barangay were reviewed and analyzed using documentary analysis techniques to provide contextual and factual background.

The quantitative component utilized surveys administered to affected residents to gather data on community perceptions of the SAR Team's response, focusing on aspects such as response time, adequacy of resources, the number of individuals rescued or assisted, and the overall impact of the team's actions. This quantitative data provides measurable evidence of the operational effectiveness as perceived by the beneficiaries of the SAR team's efforts.

The rationale for using a mixed-methods approach stems from its ability to provide a more holistic and robust understanding of the research problem. Qualitative methods offer rich contextual data and allow for the exploration of complex social phenomena, while quantitative methods provide statistical rigor and enable the generalization of findings to a larger population. In this study, the qualitative data from interviews helped to explain and interpret the quantitative data from surveys, providing a more nuanced and comprehensive assessment of the BDRRMC SAR team's effectiveness.

Purposive sampling, a non-probability sampling technique, was employed in this study. This method allowed for the selection of specific key stakeholders who were directly involved in or affected by the SAR Team's operations during STS Kristine. These included SAR team members themselves, barangay officials who oversaw the disaster response efforts, and residents who experienced the impact of the storm and the subsequent rescue operations. The rationale behind this sampling strategy was to obtain rich, empirical insights and diverse perspectives from individuals with direct knowledge and experience relevant to the study's objectives (Patton, 2015).

The sample size for the survey component of this study was 31 out of 70 households in Zone 2, Sitio Manupak. This sample size represents approximately 44% of the total household population in the delimited area. While a larger sample size would have been ideal, the constraints of time and resources, coupled with the logistical challenges of accessing the disaster-affected area, necessitated a more focused approach. However, to ensure the representativeness of the sample, the following measures were taken:

- **Maximum Variation Sampling:** The researcher attempted to include participants with diverse demographic characteristics (e.g., age, gender) and experiences within the affected area.
- **Key Informant Verification:** The findings from the survey data were corroborated and triangulated with data from key informant interviews with barangay officials and SAR team members, who had a broader understanding of the overall situation in the community.
- **Population Homogeneity:** Zone 2, Sitio Manupak, while affected by the landslide, is a relatively small and geographically defined area, which increases the homogeneity of the population and reduces the potential for significant variations in experiences.

Sources Of Data

The data utilized in this study were obtained from both **primary and secondary sources**. Primary data sources included in-depth semi-structured interviews, survey questionnaires, and documentary analysis of barangay-level records. These methods allowed for the collection of firsthand accounts and direct observations related to the BDRRMC SAR Team's effectiveness during STS Kristine.

Key informants such as Barangay Officials, BDRRMC Search and Rescue (SAR) Team Members, and residents directly affected by STS Kristine provided crucial insights through interviews and surveys. Secondary data sources, such as archival records, academic literature on disaster risk reduction and management, and relevant online resources, were consulted to provide context, theoretical grounding, and comparative information for the study.

Respondents of The Study

This study employed a **purposive sampling** technique, which enabled the researcher to gather in-depth data on specific topics or issues from a strategically selected group of participants with substantial expertise, experience, and relevance to the study's goals.

The researcher successfully collected data from thirty-one (31) rescued residents, specifically the heads of households, who were residing in Zone 2, Sitio Manupak, Barangay Ibayugan, Buhi, Camarines Sur, during STS Kristine. This was achieved through the use of a survey questionnaire guide and in-depth face-to-face interviews. The Punong Barangay, along with selected Barangay Officials and BDRRMC Search and Rescue (SAR) Team Members, also participated in semi-structured interviews to provide their perspectives and insights.

Instrumentation

Key informant interview (KII) guides and **survey questionnaires** were the primary instruments used in this study to gather information on the effectiveness of the BDRRMC SAR Team of Barangay Ibayugan in Buhi, Camarines Sur. These instruments were specifically designed to address the stated research questions.

The **survey questionnaire** focused on eliciting the opinions and assessments of the affected residents regarding the SAR team's performance. To ensure uniformity and facilitate comparable analysis, the questions were structured to assess their perceptions of the team's response time, the adequacy of resources provided, the number of rescued or assisted individuals within their households and immediate community, and their overall assessment of the team's impact. The questionnaire employed a Likert scale (ranging from 1 = Not Effective to 4 = Very Effective) to measure the intensity of their agreement or disagreement with statements related to these aspects.

The **key informant interview (KII) guides** were used to gather qualitative data from barangay officials and SAR team members. These guides contained open-ended questions designed to explore their experiences, challenges, and insights related to the SAR operations during STS Kristine. The interviews aimed to capture detailed narratives about the preparedness measures in place, the specific challenges encountered during the disaster response, the strategies employed to overcome these challenges, and their perspectives on the overall effectiveness of the SAR team.

Archival records, documents, and information provided by the Barangay, such as Executive Orders establishing the BDRRMC and SAR team, resolutions related to disaster preparedness and response, and any available incident reports pertaining to STS Kristine, were reviewed and analyzed through **documentary analysis**. This process helped to corroborate information obtained through interviews and surveys and provided a broader contextual understanding of the organizational and operational framework of the BDRRMC SAR team.

Data Gathering Procedure

The researcher initiated the data collection process by preparing and sending a formal letter of request to the Punong Barangay of Barangay Ibayugan, seeking permission to conduct interviews regarding the effectiveness of the BDRRMC Search and Rescue (SAR) Team, specifically focusing on the team's level of preparedness and the challenges encountered during STS Kristine. Upon receiving approval, the researcher collaborated with the Punong Barangay of Barangay Ibayugan, Buhi, Camarines Sur, to coordinate with the BDRRMC SAR Team members who were active during STS Kristine and in locating the affected residents of the barangay who were the respondents of the study. Subsequently, the researcher conducted house-to-house interviews with the participants.

During the interviews, the researcher explained the purpose of the research, the interview process, and the survey questionnaire to be answered. The data gathering procedure of the study complied with ethical requirements to guarantee participant anonymity and obtain informed consent. The respondents were assured of the confidentiality of their answers.

The key informant interview (KII) guide was administered to gather the insights of the affected residents and capture detailed narratives and first-hand accounts of the response during the onslaught of STS Kristine. Documents such as archival records of the Barangay were provided by the officials as reference for the documentary analysis of the study. All gathered data were recorded and analyzed for the interpretation of the results and findings to provide answers to the stated problem of the study and to contribute to the enhancement of the effectiveness of the BDRRMC SAR Team.

Data Analysis

To assess the effectiveness of the SAR team, the researcher used survey responses and applied a quantitative scoring system to key questions addressing organization (Q6), communication (Q8), professionalism (Q9), and perceived overall effectiveness (Q19). Each response was assigned a numeric value based on its intensity, e.g., "Very Effective" scored 4, and "Not Effective" scored 1.

For each question, the researcher calculated the mean score (μ) by summing all responses (Σx) and dividing by the number of respondents (n):

$$\mu = \Sigma x / n$$

Next, the scores were weighted to prioritize critical aspects of effectiveness, assigning higher importance to perceived overall effectiveness (Q19). The weighting system is as follows:

- Organization (Q6): Weight = 1
- Communication (Q8): Weight = 1
- Professionalism (Q9): Weight = 1
- Perceived Overall Effectiveness (Q19): Weight = 2

The weighted scores were summed and divided by the total weights to compute the overall effectiveness score.

$$\text{Overall Effectiveness Score} = (\mu Q6 * 1 + \mu Q8 * 1 + \mu Q9 * 1 + \mu Q19 * 2) / 5$$

The resulting score was then categorized based on the following scale:

- 3.26 - 4.00: Highly Effective
- 2.51 - 3.25: Moderately Effective
- 1.76 - 2.50: Slightly Effective
- 1.00 - 1.75: Not Effective

To provide a measure of dispersion, the standard deviation (σ) was calculated for each of the key questions, including the overall effectiveness score. The standard deviation indicates the degree to which individual responses deviate from the mean. A lower standard deviation suggests that the responses are clustered closely around the mean, indicating greater consistency in the respondents' perceptions. A higher standard deviation suggests greater variability in the responses. The formula for standard deviation is:

$$\sigma = \sqrt{[\Sigma(x - \mu)^2 / n]}$$

Where:

- x = individual response
- μ = mean score

- n = number of respondents

The quantitative data was analyzed using descriptive statistics (means and standard deviations) to summarize the respondents' perceptions of the SAR team's effectiveness. The qualitative data from the semi-structured interviews were analyzed using thematic analysis. This involved identifying recurring themes and patterns in the interview transcripts to provide a rich and nuanced understanding of the challenges and successes of the SAR team's response efforts. The qualitative data was used to support, explain, and contextualize the quantitative findings.

RESULTS AND DISCUSSION

This chapter provides an in-depth discussion of the findings of the case study on the effectiveness of the BDRRMC Search and Rescue Team of Barangay Ibayugan in Buhi, Camarines Sur, during STS Kristine. The presentation of the study follows the sequence of the statement of the problems, which includes the level of preparedness of the BDRRMC SAR Team, the challenges faced during the disaster response amidst STS Kristine and its course of action to address those challenges, the impact of the team's SAR operations, and the recommendations given to enhance its effectiveness and performance.

The Barangay Disaster Risk Reduction and Management Committee-Search and Rescue Team is created and formalized by an Executive Order with 34 Barangay Tanod that serve as responders. In 2024, the SAR Team received vital training, Barangay Responders Training: Standard First Aid and Basic Life Support and Basic Rescue Operation that equipped them with foundational knowledge. However, gaps in resources are very evident, as the barangay has no existing rescue equipment, relying instead on borrowed resources from the community, personal items from SAR Team members, and barangay officials. Despite this, the BDRRMC maintained consistent coordination with the Emergency Operation Center of LGU-Buhi, providing timely situational reports and updates throughout the incident.

The BDRRMC SAR faced many significant challenges during their response operation to STS Kristine. It was observed that there were 3 primary challenges faced by the SAR team: adverse weather conditions (31 responses) is the most pressing issue they encountered, lack of equipment (27 responses) ranked second, and finally difficulty accessing the area (26 responses) due to severe flooding going to the area. These primary challenges made their rescue efforts incredibly difficult. To address these challenges, it is noted that community support (11 responses) to the operation played a crucial role; community members stepped up to provide manpower and some resources. Improvisation by the SAR team (2 responses) with available materials to address the lack of equipment was also noticed. The SAR team's adaptability and community support enabled the rescue operation to continue despite the obstacles.

The outcomes of SAR team operations of Barangay Ibayugan in terms of lives saved and injury minimized highlight their effectiveness. Out of 70 households, 31 were interviewed, representing 137 individuals. All 31 respondents confirmed that their family members and neighbors were successfully assisted and rescued. Although no fatalities were recorded, there were minor injuries; bruises and scratches (7 cases) are the leading injuries, trauma and fear (2 cases) from the incident were also recorded, with residents recalling, "sobrang nakaktakot po, ang lakas ng ragasa ng lupa akala mo pagunaw na ang mundo" (it was so terrifying, the sound of the rushing earth was so strong, you'd think it was the end of the world) and "halos wala po kami makita, sobrang dilim, tumatakbo po kami pero wala kami nakikita lahat ng tao di alam saan pupunta" (we could hardly see anything, it was so dark, we were running but we couldn't see anything, everyone didn't know where to go)**,** and back pain (1 case) due to strain.While the other 21 respondents shared that there were no injuries within their families. In summary, given the severity of the incident, the SAR team ensured the safety of the affected population, with minimal injuries.

The study results highlight key community recommendations to enhance the effectiveness and performance of the Barangay Ibayugan BDRRMC Search and Rescue Team during emergencies. Among the suggestions, the community emphasized the need for additional rescue equipment, including rescue boats (23 respondents), flashlights (18 respondents), ropes (13 respondents), and lifejackets (12 respondents). Additionally, the importance of further training for the SAR team was noted (11 respondents). Specific infrastructure needs were

identified, such as a dedicated rescue boat for Sitio Manupak (8 respondents), an access road for the sitio (5 respondents), and a bridge (1 respondent). Furthermore, (2 respondents) recommended that every household in the sitio be equipped with flashlights and floating devices, while (1 respondent) highlighted the need for a barangay evacuation center. These findings underline the community's priorities in enhancing disaster preparedness and response.

The overall effectiveness of the SAR team was evaluated based on survey responses to key questions addressing organization (Q6), communication (Q8), professionalism (Q9), and perceived overall effectiveness (Q19). Using the quantitative scoring approach described in the methodology, the SAR team achieved a weighted effectiveness score of 2.78, categorizing their performance as Moderately Effective (scale: 2.51–3.25). The results indicate that while the team demonstrated moderate organizational capacity (mean score = 2.9, standard deviation = 0.59) and professionalism (mean score = 2.35, standard deviation = 0.48), communication clarity (mean score = 2.65, standard deviation = 0.48) emerged as an area for improvement. Despite these challenges, the perceived overall effectiveness score (mean score = 3.0, standard deviation = 0.62) reflects community acknowledgment of the team's efforts in achieving satisfactory outcomes during the rescue operation.

Discussion

The findings of this study reveal that the BDRRMC SAR Team of Barangay Ibayugan demonstrated moderate effectiveness during the STS Kristine response. This level of effectiveness was achieved despite significant challenges, primarily stemming from a lack of adequate resources and difficult access to the affected area.

The team's moderate organizational capacity and professionalism, as indicated by the survey results, suggest that the SAR team members were generally perceived as being organized and capable in their roles. However, the lower score for communication clarity highlights a potential area for improvement.

Effective communication is crucial during disaster response, as it ensures that information is disseminated accurately and timely, and that affected individuals are kept informed of the situation and the actions being taken to assist them. The standard deviations for these scores indicate a moderate level of variability in the responses, suggesting that while the majority of respondents had similar perceptions, there were some differences in their assessments.

The lack of essential rescue equipment, including rescue boats, lifejackets, and ropes, significantly hampered the SAR team's ability to respond quickly and efficiently. This finding aligns with previous research that has emphasized the importance of adequate resources in disaster response (Fuentes & Yaneza, 2021). The reliance on borrowed equipment and personal items not only slowed down the response time but also potentially put the SAR team members at risk.

Difficult access to Sitio Manupak due to flooding and landslides further compounded the challenges faced by the SAR team. This highlights the vulnerability of geographically isolated communities to natural disasters and the importance of having appropriate infrastructure, such as access roads and bridges, to facilitate effective disaster response.

Despite these challenges, the SAR team's adaptability and the strong support from the community were crucial factors in their ability to save lives and minimize injuries. The community's willingness to provide assistance, including manpower and resources, underscores the importance of social capital in disaster response. This finding is consistent with the theoretical framework of this study, which emphasizes the role of social capital in enhancing community resilience (Coleman, 1988; Putnam, 2000).

The findings indicate that while the BDRRMC SAR Team lacked formal resources, they utilized a high degree of "adaptive capacity"—the ability to adjust to potential damage and take advantage of opportunities during a crisis. The team's reliance on improvisation, such as using borrowed materials and personal items, was a critical factor in their moderate effectiveness. However, relying on spontaneous improvisation during a disaster often borders on individual bravery or "luck," which is not a sustainable or safe strategy for long-term disaster management.

To move beyond individual-led improvisation, these "soft skills" must be formalized into the team's training and Standard Operating Procedures (SOPs). This includes integrating "Creative Problem-Solving" and "Resource Resourcefulness" modules into the Barangay Responders Training. By training responders to systematically assess available community resources (e.g., private boats, construction tools) before a storm hits, the team can transition from reactive improvisation to "planned adaptability." Formalizing these skills ensures that the team can respond effectively regardless of which individual members are present, shifting the burden of success from personal bravery to institutionalized competence.

The fact that there were no fatalities and only minor injuries recorded during the rescue operation is a testament to the SAR team's efforts, despite the resource constraints. This outcome also suggests that the community's preparedness measures, to the extent that they existed, may have contributed to reducing vulnerability.

Comparison with Existing Literature

The findings of this study both confirm and challenge some of the existing literature on disaster risk reduction and management. Consistent with the Sendai Framework (UNDRR, 2015) and other studies on community-based DRRM, this research highlights the importance of local knowledge, community participation, and capacity building in enhancing disaster response. The study also supports the notion that strong social capital can significantly improve a community's ability to cope with disasters (Aldrich, 2020).

However, the study also reveals the limitations of community-based approaches in resource-constrained settings. Despite the strong community support and the SAR team's adaptability, the lack of adequate resources and infrastructure posed significant challenges to effective disaster response. This finding underscores the need for greater investment in DRRM at the local level, particularly in vulnerable communities like Barangay Ibayugan.

Implications for Policy and Practice

The findings of this study have several important implications for disaster risk reduction policy and practice at the municipal, provincial, and national levels:

- **Increased Investment in Local DRRM:** Local government units (LGUs) need to allocate more resources to support BDRRMCs, particularly in vulnerable communities. This includes providing funding for the procurement of essential rescue equipment, the implementation of regular training programs, and the development of disaster-resilient infrastructure.
- **Strengthening SAR Team Capacity:** SAR teams need to be provided with advanced training and equipment to enhance their operational readiness and effectiveness. This includes training in specialized rescue techniques, such as water rescue and mountain rescue, and the provision of appropriate personal protective equipment (PPE).
- **Improving Infrastructure:** Investments in infrastructure, such as access roads, bridges, and evacuation centers, are crucial for facilitating effective disaster response and reducing the vulnerability of communities to natural hazards.
- **Enhancing Community Preparedness:** Communities need to be empowered to take a more active role in disaster preparedness. This can be achieved through public awareness campaigns, community-based training programs, and the provision of resources to help households prepare for disasters.
- **Integrating DRRM into Development Planning:** DRRM should be integrated into all aspects of local and regional development planning. This means considering disaster risks in the design and implementation of development projects and ensuring that development efforts contribute to building community resilience.

Limitations of the Study

This study has several limitations that should be acknowledged:

- **Sample Size:** The sample size of 31 households, while representing a significant portion of the affected population in Zone 2, Sitio Manupak, may limit the generalizability of the findings to other communities.
- **Geographic Scope:** The study focused on a single barangay, which may not be representative of the diverse experiences of other communities in the Philippines that are vulnerable to natural disasters.
- **Data Collection Challenges:** The logistical challenges of accessing the disaster-affected area may have affected the comprehensiveness of the data collected.

CONCLUSION AND RECOMMENDATION

Conclusions

The purpose of this study was to evaluate the effectiveness BDRRMC SAR team of Barangay Ibayugan during the STS Kristine operation. And based on the findings the SAR team demonstrated moderate effectiveness during their response. Receiving basic knowledge certainly benefited the SAR operation, the absence of essential rescue equipment severely limited their operational capacity. The team had to rely on borrowed resources and personal items; this slowed down their response effort and affected their overall effectiveness. Difficulty accessing the area was one of the major difficulties faced by the responders; this is due to the absence of critical infrastructures like bridges and roads that cause the SAR team to traverse dangerous flood water to access the area, delaying their response time and further affecting their effectiveness.

Despite these challenges, the SAR team demonstrated resilience and adaptability, successfully rescuing all affected individuals with only minor injuries reported. The community's support played a crucial role in overcoming some of the operational limitations, reflecting strong communal solidarity during emergencies. However, the presence of significant resource and communication gaps suggests that the team's moderate effectiveness was achieved through improvisation and determination rather than optimal preparedness.

In conclusion, the BDRRMC SAR Team of Barangay Ibayugan demonstrated moderate effectiveness in responding to the challenges posed by STS Kristine. While basic training and community support contributed to their ability to save lives and minimize injuries, the lack of essential resources, difficult access to the affected area, and communication challenges hindered their overall performance. These findings highlight the need for greater investment in local DRRM, including the provision of adequate equipment, advanced training for SAR teams, and improvements in infrastructure, to enhance the resilience of vulnerable communities like Barangay Ibayugan.

Recommendations

Based on the findings and conclusions of this study, the following recommendations were formulated:

To higher sanggunian

- The researcher recommends the government improve the access road from barangay Tambo going to Sitio Manupak, ensuring mobility and accessibility during disasters. This is consistent with Section 21 of RA 10121, which mandates that the Local Disaster Risk Reduction and Management Fund (LDRRMF) be used for disaster preparedness and mitigation, including infrastructure that ensures community safety.
- Establish a dedicated evacuation center to provide families with a safe and secure place during disasters.
- Provide a permanent relocation site for all families living at Sitio Manupak.
- Build an access bridge to improve connectivity and prevent the community from traversing flooded areas during evacuation. Pursuant to the "Build Back Better" principle of RA 10121, the sanggunian should prioritize the allocation of the 70% preparedness component of the LDRRMF for these permanent structural mitigations to reduce long-term vulnerability.

To the Barangay

- The researchers recommend that the barangay prioritize disaster preparedness, providing capability building/training for the SAR Team focusing on advanced skills like water and mountain search and rescue.
- Procure essential rescue equipment such as a rescue boat, lifejackets, ropes, and flashlights.
- Formalize the team's "adaptive capacity" by integrating scenario-based training that teaches systematic improvisation and resourcefulness. Rather than relying on individual bravery, the barangay should develop Standard Operating Procedures (SOPs) for rapid resource mapping (e.g., pre-storm inventory of community-owned tools and boats) to ensure that improvisation is a planned strategy rather than a matter of luck.

To the Community

- Encourage every household to prepare an emergency go-bag with essentials like flashlights, first-aid supplies, and floating devices.
- Advocate for a dedicated rescue/transport boat stationed in Sitio Manupak.

Long-Term Sustainability of Recommendations

The long-term sustainability of these recommendations' hinges on several factors:

- **Political Will and Prioritization:** Local and higher-level government units must prioritize DRRM and allocate sufficient resources to support these initiatives.
- **Community Ownership and Participation:** The community must be actively involved in the implementation and maintenance of these recommendations to ensure their sustainability.
- **Resource Mobilization:** In addition to government funding, other sources of funding, such as non-governmental organizations (NGOs) and private sector support, should be explored.
- **Capacity Building and Training:** Ongoing training and capacity-building programs are essential to ensure that the SAR team and the community have the knowledge and skills to effectively respond to future disasters.
- **Monitoring and Evaluation:** A system for monitoring and evaluating the implementation of these recommendations should be established to track progress and identify any challenges or areas for improvement.

By addressing these factors, it will be possible to ensure the long-term sustainability of the recommendations and enhance the resilience of Barangay Ibayugan to future disasters.

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