Disaster Resiliency Practices of Barangay Disaster Risk Reduction and Management Committee (BDRRMC)

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Abstract— With the goal of evaluating the degree of disaster resilience practices at the Barangay DRRMC, a descriptive survey was utilized to examine how the community and staff of the BDRRMC perceived these efforts. The study discovered that, in the opinion of the BDRRMC staff, disaster resiliency procedures related to mitigation, response, recovery, and rehabilitation are all highly practiced. However, results showed that the community thought the BDRRMC only minimally practiced recovery, rehabilitation, and mitigation in addition to disaster-resilient response. Results also indicated that the community's and the BDRRMC staff's perspectives on disaster-resilient measures, including mitigation, response, recovery, and rehabilitation, differed significantly. Lastly, a three-day seminar workshop that focuses on BDRRMC skill and knowledge capacity is suggested as a means of improving and advancing Barangay DRRMC's disaster resilience practices. The study's conclusions led the researcher to suggest that the DBRRMC's procedures be improved by creating a more detailed and localized emergency response and catastrophe resiliency strategy. On top of that, it is advised that the LDRRMO regularly monitor the barangay DRRMC's compliance and adherence. Lastly, it is advised to carry out parallel research on the BDRRMC's understanding of and adherence to national emergency response system standards.

Indexed Terms— Community, Disaster Resilience, Rehabilitation, Recovery, Staff

I. INTRODUCTION

The United Nations Disaster and Risk Reduction (Ward, 2020) reported that a variety of disasters, whether natural, technical, hostile, anthropogenic, or resulting from disease epidemics, claimed close to one million lives and affected over 100 million people. These continuous catastrophes pose a serious threat, especially to countries still getting over the effects of the COVID-19 outbreak. A disaster, according to the Centre for Research on the Epidemiology of Disasters (CRED), is an occurrence of such size that it requires national and/or international help to mitigate the devastation of property, the environment, or the loss of human life. Disasters are further defined by the United Nations (UN) as a major disruption of a community's or society's ability to function, regardless of their size, as a result of hazardous events interacting with exposure, vulnerability, and capacity conditions. One or more of the following losses result from this interaction: material, economic, environmental, and human. Disasters, according to Paz-Alberto, et al (2021), are events of such size that they exceed a community's capacity to respond with its own resources, causing devastation, material loss, damage, and fatalities. Moreover, as supported by Gaudiel (2023), a catastrophe is defined as a significant disturbance to the normal operations of a community or society, irrespective of its size, that arises from the interaction of hazardous occurrences with exposure, vulnerability, and capacity circumstances. There are losses resulting from this connection on all fronts: personal, material, economic, and environmental. Disasters are events of such size that a community's capacity to respond with its own resources is overwhelmed, leading to devastation, material loss, damage, and human casualties, according to Atilano-Tang (2023). When one considers that the delicate balance between resources, resilience, hazards, and disaster response affects all of these factors, it becomes easier to understand why similar events can have wildly different results in different communities or nations. Each country must use these international frameworks to guide its own disaster risk reduction and management (DRRM) initiatives in order to support these goals both domestically and internationally. This is particularly significant when considering the Philippines, a country that frequently experiences natural catastrophes and climate-related dangers. It scored ninth out of 181 nations in the World Risk Report 2020 for catastrophe risks; in prior years, it had ranked as high as second in 2014 or third in 2018 (Rosales, et al., 2023). This is because of the country's geographic features, socioeconomic and political

climate, and location along the Pacific Ring of Fire, all of which increase its susceptibility to natural disasters. With members from several departments, government agencies, local government units (LGUs), civil society organizations, and the commercial sector, the National Disaster Risk Reduction and Management Council (NDRRMC) is the highest decision-making body in terms of institutional frameworks. A Barangay Disaster Risk Reduction and Management Committee (BDRRMC) and the Disaster Risk Reduction and Management Office (DRRMO) in each province, city, and municipality make up the multi-tiered bodies that make up the architecture of DRM. These bodies are in charge of carrying out the vertical coordination-required operations that are required by the DRRM Act. With its four pillars—preparedness, response, recovery, and mitigation—disaster resiliency provides an organized analysis of the disaster process. It gives emergency managers the ability to set priorities and allocate resources according to these discrete stages (Pas-iwen, 2023). Using the catastrophe cycle, emergency management's main objective is to protect people, property, and the environment. It's critical to understand that this cycle is an ongoing, continual process as stated by Belandres (2023) Plans for mitigating hazards should mainly benefit the people living in the community, with an emphasis on the special need's population (Tan, 2022). Emergency managers and mitigation planners should make use of both official and informal knowledge about the area's special needs population in order to accomplish this goal. They have to adjust mitigation strategies to the particular requirements of the scenario they are analyzing. Emergency responders need to concentrate on improving their response times in advance of a disaster. Emergency managers should set up protocols and gather the tools they'll need during this phase in case of a crisis. The term "preparedness" refers to a range of actions, including creating a plan, conducting training sessions, identifying resources, designating facilities, and taking additional steps to strengthen readiness and resilience (Robielos, et al., 2020). Furthermore, documentation from the municipality's local archive reveals a regular pattern of flash floods in a number of Natividad barangays. The low landscape, inadequate drainage, and inadequate irrigation are the causes of these (Donato and Lorica, 2020). The present circumstances motivate the researcher to ascertain the catastrophe resiliency, practices, and innovations of the BDRRMCs as part of their public service under the Department of the Interior and Local Government (DILG). As a result, the study's output will serve as a baseline of data for the Municipality of Natividad's program creation and improvement of disaster resilience.

II. METHODOLOGY

With the objective of ascertaining the disaster resilience practices of the BDRRMC staff in the Municipality of Natividad based on the opinions of the community and the BDRRMC personnel themselves, this study used the descriptive survey method of research. Determining the barangay's level of disaster resilience is necessary since they are the first to respond to emergencies and catastrophes in the community, and they are also in a position to develop current trends and practices. These factors may justify the endeavor. The Municipality of Natividad in Pangasinan was the site of this investigation. The Barangay Disaster Risk Reduction and Management Committee (BDRRMC), whose job it is to respond as soon as possible to emergencies or catastrophes in the community while professional services are still en route, served as the study's respondents. The 18 barangays that make up the Municipality of Natividad are home to the ten (10) departments that make up each BDRRMC. These departments include search and rescue, assessment and rehabilitation, evacuation and evaluation, relief operations, fire service, communication, transportation, resources, health and medical, security, and peace and order, with up to ten (10) members. As a fourth-class municipality, the Municipality of Natividad designates the barangay captain as the chairman of the BDRRMC. Each department has a chairman and one (1) member, for a total of 24 BDRRMC personnel in each barangay. Thus, there are 432 BDRRMC employees working in the municipality of Natividad. In order to determine how many samples to use based on the total number of BDRMMC employees, this study used convenient sampling, with five (5) randomly selected employees from each of the 18 barangays acting as respondents. In an effort to compare the staff's perspective of the BDRRMC's disaster resiliency strategies, information about the community's perception was also obtained. In a similar vein, this study employed non-probability random sampling, with ten (10) individuals selected from each barangay, or a total of 180 community members. Consequently, 90 of the 432 residents of the BDRRMC in the Municipality of Natividad constituted the sample size, and 180 of the community's members made up the entire sample size. Utilizing the Predictive Analytic Software (PASW), formerly known as the Statistical Package for Social Science (SPSS), the researcher processed the data quantitatively based on the study questions with the assistance of a statistician. Additionally, the first and second specific problems (i.e., the level of practices on disaster resiliency of the BDRRMC) were addressed using the average weighted mean. For a more accurate interpretation of

the data acquired with descriptive interpretation and statistical limits, the 5-point Likert scale was employed. The study employed Analysis of Variance (ANOVA) to determine the significance of the disparity between the community's and BDRRMC personnel's perceptions regarding the organization's disaster preparedness strategies.

III. RESULTS AND DISCUSSION

Based on the opinions of the community and the BDRRMC staff, Table 1 presents the information acquired on the disaster resiliency procedures of the organization. Their disaster resiliency practices provide crucial information in understanding the strengths and weaknesses of risk reduction and emergency preparedness at the level of barangays in the Philippines, since disaster resilience is the primary role of the BDRRMC, particularly in lowering vulnerabilities, identifying risks, and increasing the measurements of the barangay to cope with the adverse consequences of natural disasters.

Table I. Disaster Resiliency Practices of the BDRRMC as perceived by the BDRRMC Personnel and the Community along Mitigation

Indicators	BDRRMC		Community	
	Mean	DE	Mean	DE
Gathers local information related to natural hazards or risks, vulnerabilities, or weaknesses, and develop and maintain risk maps in our barangay	3.84	P	3.14	MP
Organizes and conducts trainings and orientations related to DRRM to members of the community to strengthen the capacities of barangay volunteers and emergen….cy response teams	3.80	P	3.75	P
Conducts regular simulation exercises or drills to prepare for the identified primary hazards and risks	3.93	P	3.19	MP
Ensures that there is proper, secure, and adequate number of evacuation centers and isolation facilities to be used in times of calamities, health emergencies, conflict, and others	4.02	P	3.81	P
Ensures that there are working and complete communication devices, as well as a reliable system to regularly update and coordinate with authorities such as BFP, PNP and RHU	3.87	P	3.73	P
Ensures the Existence of an activated Incident Command Post and Barangay Operations Center 24/7 in every barangay	4.11	P	2.88	MP
Conducts regular meetings to discuss response plans	3.90	P	3.30	MP
Weighted Mean	3.92	P	3.40	MP

*Descriptive Equivalent:
4.21-5.00 – Highly Practiced (HP)
3.41-4.20 – Practiced (P)
2.61-3.40 – Moderately Practiced (MP)
1.81-2.60 – Slightly Practiced (SP)
1.00-1.80 – Not Practiced (NP)

Table 1 presents the community's and staff members' opinions regarding the BDRRMC's disaster preparedness and mitigation measures. These were their findings and ideas about the ways in which the BDRRMC works to lessen or eliminate the hazards and potential effects of disasters in the barangay. The weighted mean of 3.92 indicates that, according to the table, the staff of BDRRMC believes that they are practicing disaster resiliency in addition to reducing the risks and potential effects of catastrophes. However, with a weighted mean of 3.40, the community felt that the BDRRMC was only marginally implementing disaster resilience techniques for mitigation. The outcome shows that the

community's perspective on the BDRRMC's implementation procedures and that of its staff are significantly different. In particular, the community notes that this is only somewhat practiced, with a mean of 2.88, while BDRRMC personnel, with the highest mean of 4.11, believe that having an activated Incident Command Post (ICP) and Barangay Operations Center 24/7 in their barangay is practiced. In a similar vein, the community saw frequent simulation exercises or drills as being minimally practiced, with a mean score of 3.19, whereas the BDRRMC staff believed that they were practiced with a mean score of 3.93 to prepare for the identified key hazards and risks. The results suggest that their differing opinions and assessments of the BDRRMC's degree of implementation of procedures to reduce the possibility of hazards may stem from their individual experiences and backgrounds. Whereas the public may depend more on anecdotes, firsthand accounts, and local knowledge, council members may base their assessments and opinions of disaster risk on logical data, historical trends, and methodological study. This conclusion therefore prompt more extensive research in the future to determine the community's and the BDRRMC's degree of awareness regarding disaster response protocols as well as the organization's roles and responsibilities in ensuring disaster resilience. However, both the community and the BDRRMO personnel believe that their barangays have functioning and complete communication devices as well as a dependable system to update and coordinate with authorities like BFP, PNP, and RHU, as evidenced by the 3.87 (community) and 3.73 (BDRRMO) systems. In the study of Cortejo, et al (2024), this is true despite differences in their perceptions of some disaster resilience practices and mitigation.

Table II. Disaster Resiliency Practices of the BDRRMC as perceived by the BDRRMC Personnel and the Community along Response

Indicators	BDRRMC		Community	
	Mean	DE	Mean	DE
Activates the Barangay Operations Center and the Incident Command System 24 hours (24/7)	4.09	P	3.15	MP
Acts as first responder to any emergencies, calamities, and disasters in the barangay	4.13	P	3.97	P
Alerts the authorities immediately and provides first aid while waiting for professional help	4.18	P	3.78	P
Helps in crowd control and maintains peace during emergencies	4.13	P	3.66	P
Conducts search, rescue, and retrieval operations, in coordination with the authorities	4.22	HP	3.69	P
Conducts immediate assessment and identification of the affected population or affected patient/victim and submit the report to the City/Municipal Health Officer	4.11	P	2.62	MP
Uses personal protective equipment (PPE) during response such as gloves, head gears, face masks, etc.	4.02	P	2.60	SP
Weighted Mean	4.13	P	3.49	P

*Legend:
4.21-5.00 – Highly Practiced (HP)
3.41-4.20 – Practiced (P)
2.61-3.40 – Moderately Practiced (MP)
1.81-2.60 – Slightly Practiced (SP)
1.00-1.80 – Not Practiced (NP)

The table displays the findings of the data collected on the BDRRMC's disaster response and resilient practices. The findings demonstrated how the community and the BDRRMC viewed the quick responses given in the event of a typhoon, car accident, earthquake, fire, or other emergency. The chart shows that the community and BDRRMC staff agreed that the organization practices disaster resiliency and response, with weighted means of 3.49 and 4.13, respectively. This suggests that, on the whole, the community and the staff of the BDRRMC witnessed the collaboration between the organization and other relevant government agencies and stakeholders, including the Philippine National Police, the Bureau of Fire Protection, the Local Government Unit, and the Rural Health Unit. With a mean score of 4.22, the BDRRMC staff members believe they are doing a great job of conducting search, rescue, and retrieval operations in collaboration with the authorities. The community, with a mean score of 3.69, also held this belief and was considered "practiced." The BDRRMC and the community both regard the work of the BDRRMC staff as "practiced" in terms of crowd management and maintaining calm during emergencies, with means of 4.13 and 3.66. However, there was a difference in the perceptions of the community and the BDRRMC staff regarding the 24-hour activation of the incident command system and the barangay operation center. The community thought that the system was only moderately practiced, while the BDRRMC personnel considered it to be "practiced" (4.09). Along with the perception gaps between the BDRRMC and the community, there are also perception gaps between the two groups. The community believed that the BDRRMC personnel used gloves, headgear, and face masks sparingly during emergency response (mean of 2.60), while the BDRRMC personnel felt they used PPE sparingly (mean of 4.02). Apart from individual experiences, the levels of comprehension, expertise, and knowledge that differ can be considered as possible sources of these variances in perception. Some community members may not be familiar with the fundamental emergency response procedures, while many may (Florece, et al., 2020). The BDRRMC staff may not all be fully aware of normal operating protocols during emergency situations, such as crowd management and the usage of personal protective equipment (PPE), particularly during search and rescue missions. Conversely, it is inadmissible that the community's view of the presence of a 24-hour incident command position and operations center—which necessitates that BDRRMC staff work 24-hour shifts—is the consequence of a lack of awareness and comprehension in the community. Their impression—likely derived from firsthand observation and experience—is that their barangay lacks a 24-hour incident command station.

Table III. Disaster Resiliency Practices of the BDRRMC on Recovery and Rehabilitation as perceived by the BDRRMC Personnel and the Community

Indicators	BDRRMC		Community	
	Mean	DE	Mean	DE
Maintains regular coordination with the City/Municipal Health Office to update progress of the affected families or individual after the incident had transpired	3.90	P	3.41	P
Monitors the physical status of the barangay such as water level, housing conditions, livelihoods, and food supply during typhoons, before, during, and after the calamity and report to the authority for appropriate decision-making	4.40	HP	2.61	MP
Assists in the conduct of immediate assessment (damage assessment) and evaluation of the affected persons	3.93	P	3.66	P
Consults the status of affected families or individual after	4.56	HP	2.21	SP

the incident had transpired				
Conducts clearing operations after the accident, disaster, or calamity to ensure the cleanliness of the community and safety of the residents	4.20	P	3.66	P
Ensures the continuity of operations and planning, including social and economic recovery, and the provision of basic services in the post-disaster	3.82	P	2.75	MP
Keep a record of the number, names, age and gender of those who need immediate assistance, especially those belonging to the vulnerable sectors, such as children, children with disabilities, expecting mothers, breastfeeding mothers, elderly, elders with disabilities, and others, and tag them as priority groups in case of disasters and calamities	3.98	P	3.68	P
Weighted Mean	4.23	HP	3.26	MP

*Legend:
4.21-5.00 – Highly Practiced (HP)
3. 2.61-3.40 – Moderately Practiced (MP)
41-4.20 – Practiced (P)
1.81-2.60 – Slightly Practiced (SP)
1.00-1.80 – Not Practiced (NP)

The table summarizes the findings from the data collected on the BDRRMC's disaster-resilient practices during recovery and rehabilitation. The table primarily discussed how the community and the BDRRMC acknowledged the practices of the BDRRMC in aiding individuals in their barangay to recuperate from the negative consequences of any emergency or disaster. The findings indicated that the community's and the BDRRMC personnel's perceptions differed with regard to the manner in which the BDDRMC provides recovery and rehabilitation services. The BDRRMC staff ranked the indicators as highly practiced with a weighted mean of 4.23, while the community rated them as moderately practiced with a weighted mean of 3.26. Additionally, with an equally high mean, the BDRRMC staff maintained that they were actively practicing recovery and rehabilitation activities, whereas the community believed that they were only moderately active in these areas. The community's perception was that the staff was monitoring the barangay's physical status, including water levels, housing conditions, livelihoods, and food supply, before, during, and after typhoons, and reporting to the authority for appropriate decision-making (mean of 2.61). These findings suggest that the community's perception of the BDRRMC's recovery and rehabilitation techniques differs from that of the staff, who self-rated. There may have been delays in the community's access to recovery assistance, including regular status checks, health exams, and food supplies. It was determined that there is a lack of continuity in the planning and operations of the barangay councils. It is a confirmation that the people's social, emotional, and financial recovery is not receiving the required attention due to the lack of consistency in operations and planning (Paz-Alberto, et al., 2021).

Table IV. Significant Difference between the Perception of the BDRRMC Personnel and the Community to Disaster Resiliency Practices of the BDRRMC

Source of Variation	F-Value	P-value	F-critical	Interpretation

Mitigation Between Groups Within Groups	13.7	0.003 **	4.747	Signifi cant
Response Between Groups Within Groups	12.9	0.004 **	4.747	Signifi cant
Recovery and Rehabilitation Between Groups Within Groups	15.1	0.002 **	4.747	Signifi cant

Legend: ** Significant at alpha level (0.05)

The table reveals a notable disparity in the perspectives held by the community and BDRRMC staff about the organization's disaster-resilient measures, encompassing mitigation, response, recovery, and rehabilitation. The calculated p-values of $p = 0.003$, $p = 0.004$, and $p = 0.002$, respectively, when tested under the alpha level of significance, serve as evidence for this. According to the rejection rule, the null hypotheses are disproved when the p-value is less than the 0.05 alpha threshold. As a result, the table showed that the community and BDRRMC staff share a common concept, perception, and observation of the services and procedures provided by the organization during emergencies or disasters in their barangay. The outcome demonstrated that the BDRRMCs are carrying out their duties in the event of a typhoon, car accident, earthquake, fire, or health emergency. This further clarified how the BDRRMCs are handling disaster mitigation, response, recovery, and rehabilitation immediately after it occurs. It also supports the previous study's finding that the community and BDRRMC staff believed that the response indicators were being followed. It is safe to assume that the community and BDRRMC staff had comparable perceptions of the organization's catastrophe preparedness procedures. The results indicated that the community and BDRRMC personnel expressed similar sentiments and opinions about the BDRRMC's practices in their barangays, despite the possibility of biases and personal experiences influencing the differences in perceptions of the two groups (Herrera, 2021). In contrast to the BDRRMC staff's practical expertise, the community's understanding of mitigation, recovery, and rehabilitation techniques, for example, may be less extensive. In a similar vein, bias may also be inevitable when BDRRMC staff members give themselves high ratings for disaster preparedness, recovery, and rehabilitation; however, this study revealed that the community shared these opinions and gave high ratings for BDRRMC methods.

CONCLUSION

First, based on the results, the staff of the BDRRMC believed that the organization highly practiced disaster resilience techniques related to recovery and rehabilitation as well as practices related to mitigation and response. Furthermore, the results showed that the community thought the BDRRMC only marginally implemented recovery, rehabilitation, and mitigation measures in conjunction with disaster resiliency operations. However, the community believed that the BDRRMC implemented disaster resilience in addition to response. Additionally, the findings demonstrated a notable disparity in the community's and BDRRMC staff's assessments of the organization's disaster-resilient procedures, including mitigation, response, recovery, and rehabilitation. Finally, a suggested training program and a year-round action plan were created in order to improve and promote the barangay's disaster resilience practices. The program, "Capacity Building in Upscaling the Skills of the BDRRMC in Disaster Response," will be a three-day seminar workshop with an emphasis on BDRRMC knowledge and skill development.

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