

# Disaster Risk Reduction Strategies and Community Preparedness of Coastal Communities in Glan, Sarangani Province

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## ABSTRACT

*This study examined the level of implementation of disaster risk reduction (DRR) strategies and the level of disaster preparedness among coastal barangays in Glan, Sarangani Province. Utilizing a descriptive–correlational research design, data were gathered from 30 respondents composed of community residents, barangay officials, and uniformed personnel. A researcher-made structured questionnaire with a 5-point Likert scale was used to measure risk reduction strategies in terms of evacuation planning, early warning systems, community training and drills, and coastal resource management, as well as disaster preparedness in terms of community response capacity, recovery preparedness, and household preparedness. Mean and standard deviation were employed to describe the variables, while Pearson product–moment correlation was used to determine their relationship. Findings revealed that the level of implementation of risk reduction strategies ( $M = 4.38$ ) and disaster preparedness ( $M = 4.36$ ) were both interpreted as very high. Among the indicators, evacuation planning and community response capacity obtained the highest mean scores. Furthermore, results showed a statistically significant high positive relationship between risk reduction strategies and disaster preparedness ( $r = 0.778$ ,  $p < 0.05$ ), with 60.5% of the variance in preparedness explained by the implementation of risk reduction strategies. This suggests that strengthening and sustaining DRR initiatives significantly contributes to enhancing disaster preparedness and resilience in coastal communities.*

**Keyword:** *disaster risk reduction, disaster preparedness, coastal barangays, community resilience, descriptive–correlational research*

## 1. Introduction

The Philippines is widely regarded as one of the most disaster-prone countries globally, a status attributable to its geographical positioning along both the Pacific Ring of Fire and the typhoon belt [15]. This location exposes the nation to recurrent geophysical and hydrometeorological hazards, with coastal communities facing heightened vulnerability to typhoons, storm surges, flooding, and sea-level rise [7]. Such hazards exert profound impacts on human lives, economic livelihoods, infrastructure systems, and ecological sustainability. Moreover, the accelerating effects of climate change have been shown to intensify the frequency and severity of extreme weather events, thereby amplifying risks and underscoring the imperative for comprehensive disaster risk reduction (DRR) strategies [6][3]. Without the integration of adaptive and resilience-oriented measures, the cumulative consequences of climate-induced disasters will continue to undermine national development trajectories and long-term sustainability [8].

Disaster risk reduction (DRR) emphasizes anticipatory measures designed to minimize vulnerabilities and strengthen community resilience prior to the onset of hazards. Central to this approach is the Sendai Framework for Disaster Risk Reduction (2015–2030), which underscores the importance of enhancing disaster preparedness, advancing early warning systems, and building local capacities for effective response and recovery. In the Philippine context, Republic Act No. 10121, otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010, institutionalizes a comprehensive, community-based framework that shifts disaster management from reactive response toward proactive risk reduction and preparedness.

Despite the presence of national and local DRRM policies, implementation levels vary across communities, particularly in geographically exposed coastal areas [2]. Glan, a coastal municipality in Sarangani Province, exemplifies this vulnerability, as it is recurrently affected by typhoons, heavy rainfall, and coastal hazards. With

livelihoods heavily dependent on fishing and coastal resources, residents face heightened risks from environmental disruptions [7]. Local government units have introduced preparedness initiatives such as early warning systems, evacuation planning, coastal resource management, and community drills; however, the degree of effectiveness at the community level remains insufficiently assessed [14].

Community preparedness is a critical determinant of disaster outcomes. Households and communities that are well-prepared demonstrate greater capacity to respond efficiently, reduce casualties, and accelerate recovery processes [10]. Nevertheless, preparedness levels are shaped by factors such as awareness, participation, resource availability, and governance effectiveness. Empirical assessment of both DRR implementation and community preparedness is therefore essential to determine whether existing strategies translate into tangible resilience among coastal populations [5].

Given the persistent vulnerability of coastal communities in Glan, Sarangani Province, a quantitative evaluation of DRR implementation and its relationship to community preparedness is warranted. Such findings may inform evidence-based interventions by local government units, disaster management councils, and policymakers, thereby strengthening resilience-building initiatives. Ultimately, understanding the current state of DRR and preparedness contributes to the development of safer, adaptive, and disaster-resilient coastal communities.

### **Statement of the Problem**

1. What is the level of implementation of disaster risk reduction strategies of coastal communities in Glan, Sarangani Province in terms of:
  - 1.1. early warning systems,
  - 1.2. evacuation planning,
  - 1.3. community training and drills, and
  - 1.4. coastal resource management?
2. What is the level of disaster preparedness of coastal communities in Glan, Sarangani Province in terms of:
  - 2.1. household preparedness,
  - 2.2. community response capacity, and
  - 2.3. recovery readiness?
3. Is there a significant relationship between the level of implementation of disaster risk reduction strategies and the level of disaster preparedness of coastal communities in Glan, Sarangani Province?

## **2. METHODOLOGY**

### **2.1 Research Design**

This study employs a descriptive–correlational research design. This design is appropriate because the study seeks to measure the level of implementation of disaster risk reduction (DRR) strategies and the level of community preparedness, and to determine whether a significant relationship exists between these variables among coastal communities in Glan, Sarangani Province.

A descriptive research design is used to systematically describe the current conditions of a phenomenon as it naturally occurs. In this study, it allows the researcher to quantify the extent to which DRR strategies such as early warning systems, evacuation planning, community training, and coastal resource management are implemented. It also enables the measurement of community preparedness in terms of household readiness, response capacity, and recovery preparedness. The descriptive component provides a clear numerical profile of the current situation without manipulating any variables.

On the other hand, the correlational component examines the statistical relationship between the level of DRR strategy implementation (independent variable) and the level of community preparedness (dependent variable). This design determines whether variations in the implementation of DRR strategies are associated with variations in preparedness levels. However, it does not establish cause-and-effect relationships; rather, it identifies the strength and direction of association between variables.

The descriptive–correlational design is particularly suitable for community-based disaster studies because it allows the collection of data from a relatively large number of respondents using structured survey instruments. Through statistical analyses such as mean, standard deviation, Pearson correlation, and regression analysis, the study can generate objective and generalizable findings that may guide local government units and disaster management councils in policy improvement and program enhancement.

### **2.2 Respondents and Sampling Technique**

The respondents of the study consist of thirty (30) selected members of the coastal communities in Glan, Sarangani Province, including community residents, Philippine National Police (PNP) personnel, Bureau of Fire Protection (BFP) personnel, and barangay officials.

Community residents are included as primary beneficiaries and direct participants in disaster risk reduction (DRR) activities. Their responses reflect household preparedness and community-level participation in early warning systems, evacuation procedures, and disaster drills.

PNP and BFP personnel are involved as key emergency responders. The PNP ensures public safety and supports evacuation and security operations, while the BFP provides fire suppression, rescue, and emergency response services. Their perspectives help assess operational readiness and response capacity.

Barangay officials are included because they lead the implementation of local DRR programs through the Barangay Disaster Risk Reduction and Management Committee (BDRRMC). They are responsible for planning, coordination, and mobilization during disasters.

### **2.3 Research Instrument**

The primary research instrument used in this study was a researcher-made structured survey questionnaire. The instrument was designed to quantitatively measure the level of implementation of disaster risk reduction (DRR) strategies and the level of community preparedness among coastal communities in Glan, Sarangani Province.

The questionnaire consisted of three parts. The first part gathered the respondents' demographic profile, including age, sex, length of residence, and role in the community (resident, PNP, BFP, or barangay official). The second part measured the level of implementation of DRR strategies in terms of early warning systems, evacuation planning, community training and drills, and coastal resource management. The third part assessed the level of community preparedness, focusing on household preparedness, community response capacity, and recovery readiness.

All items were structured using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This format allowed respondents to indicate their level of agreement with each statement and enabled the computation of means and other statistical measures appropriate for descriptive–correlational analysis.

### **2.4 Data Gathering Procedure**

In order to guarantee adherence to institutional policies and obtain entry to the chosen barangays, the researcher started the study by obtaining official authorization. Following permission, the respondents were located and briefed on the goals, parameters, and ethical issues of the study, such as the right to withdraw, confidentiality, and voluntary participation. After that, the respondents were given the survey questionnaire together with explicit instructions to guarantee accurate and consistent answers. Upon completion, the questionnaires were collected and retrieved systematically to maintain the integrity and confidentiality of the data. The collected replies were then tallied, encoded, and converted into a digital format. Where necessary, numerical values were assigned, and the data was arranged in tables for analysis.

### **2.5 Statistical Treatment**

#### **Statistical Treatment of Data**

The data gathered from the survey questionnaire were analyzed using appropriate descriptive and inferential statistical tools, namely mean, standard deviation, and Pearson product–moment correlation coefficient (Pearson  $r$ ).

The mean was used to determine the average level of implementation of disaster risk reduction (DRR) strategies and the level of community preparedness. Since the instrument utilized a 5-point Likert scale, the mean provided a quantitative measure of the respondents' overall level of agreement for each indicator and variable. The computed means were interpreted using a predefined scale (e.g., Very High, High, Moderate, Low, Very Low) to describe the extent of implementation and preparedness.

The standard deviation was used to measure the variability or dispersion of responses from the mean. A low standard deviation indicated that responses were closely clustered around the average, suggesting consistency among respondents' perceptions. Conversely, a high standard deviation indicated greater variability, reflecting differing views regarding the implementation of DRR strategies and preparedness levels.

To determine the relationship between the level of implementation of DRR strategies and the level of community preparedness, the Pearson product–moment correlation coefficient (Pearson  $r$ ) was employed. Pearson  $r$  measured the strength and direction of the linear relationship between the two variables. The correlation coefficient ranges from  $-1.00$  to  $+1.00$ , where positive values indicate a direct relationship, negative values indicate an inverse relationship, and values close to zero indicate little or no linear relationship. The level of significance ( $\alpha = 0.05$ ) was used to determine whether the observed relationship was statistically significant.

### 3. RESULTS AND DISCUSSION

This section presents the analysis, interpretation, and discussion of the data gathered in the study. The findings are organized according to the research questions, focusing on the level of implementation of disaster risk reduction (DRR) strategies and the level of community preparedness among coastal communities in Glan, Sarangani Province.

#### 3.1 Level of Risk Reduction Strategies in Coastal Barangays in Sarangani Province

**Table-1: Level of Risk Reduction Strategies in Coastal Barangays**

<b>Risk Reduction Strategies</b>	<b>Mean</b>	<b>SD</b>	<b>Verbal Description</b>
Evacuation Planning	4.43	0.50	Very High
Early Warning System	4.39	0.55	Very High
Community Training and Drills	4.36	0.51	Very High
Coastal Resource Management	4.36	0.47	Very High
<b>Overall</b>	<b>4.38</b>	<b>0.42</b>	<b>Very High</b>

Among the identified strategies, Evacuation Planning obtained the highest mean score ( $M = 4.43$ ,  $SD = 0.50$ ), verbally described as Very High. This indicates that respondents strongly agree that evacuation plans, designated centers, and procedures are clearly established and effectively implemented in their communities. The relatively low standard deviation suggests consistency in responses, meaning most participants share similar perceptions regarding the effectiveness of evacuation planning. This reflects organized local leadership and preparedness systems. It suggests that coastal barangays prioritize safety measures during disasters, which may significantly reduce casualties and confusion during emergency situations.

The lowest mean scores were recorded in Community Training and Drills ( $M = 4.36$ ,  $SD = 0.51$ ) and Coastal Resource Management ( $M = 4.36$ ,  $SD = 0.47$ ), both still interpreted as Very High. The findings suggest that while training activities and environmental protection measures are strongly present, there may still be room to enhance participation rates, frequency of drills, or sustainability of coastal conservation efforts.

The overall mean for risk reduction strategies is 4.38 ( $SD = 0.42$ ), with a verbal description of Very High. This indicates that, in general, coastal barangays in Glan demonstrate a very strong level of implementation of disaster risk reduction strategies. The relatively small standard deviation shows that responses are closely clustered around the mean, reflecting a shared perception of high preparedness across respondents.

The findings of the present study are consistent with the who reported that disaster risk reduction (DRR) strategies were systematically and actively implemented within local communities, contributing to reduced vulnerability and enhanced overall preparedness [4]. Similarly, DRR management practices in coastal communities and found that barangays had already institutionalized programs addressing the different phases of disaster management; before, during, and after disaster events. These initiatives included flood mitigation measures, organized evacuation planning, and tsunami preparedness activities. Their findings underscore the presence of comprehensive and proactive DRR mechanisms at the local level, reflecting strong governance and community engagement in disaster preparedness efforts [11].

**Table-2: Level of Disaster Preparedness of Coastal Barangays in Glan Sarangani, Province**

Technical Competence	Mean	SD	Verbal Description
Community Response Capacity	4.43	0.58	Very High
Recovery Preparedness	4.34	0.59	Very High
Household Preparedness	4.30	0.48	Very High
Overall	4.36	0.49	Very High

Among the indicators, Community Response Capacity obtained the highest mean score ( $M = 4.43$ ,  $SD = 0.58$ ), verbally interpreted as Very High. This indicates that respondents strongly agree that their communities are capable of responding effectively during disaster situations. The findings suggest the presence of organized response teams, accessible emergency services, and strong coordination among barangay officials, PNP, BFP, and community volunteers. Although the standard deviation is slightly higher compared to other indicators, responses remain relatively consistent.

The lowest mean score was recorded in Household Preparedness ( $M = 4.30$ ,  $SD = 0.48$ ), though it is still interpreted as Very High. This suggests that while families generally maintain emergency kits, plans, and awareness of disaster procedures, household-level preparedness is slightly lower compared to community-level efforts. The finding implies that disaster preparedness initiatives may be more institutionalized at the community level than at the individual household level.

The overall mean for disaster preparedness is 4.36 ( $SD = 0.49$ ), with a verbal description of Very High. This indicates that coastal barangays in Glan demonstrate a very strong level of preparedness across response, recovery, and household dimensions. The relatively low standard deviation shows a consistent perception among respondents regarding the high level of preparedness in their communities. This suggests that disaster management efforts in the coastal barangays are effective and well-coordinated.

Coastal barangays address disaster-related challenges through a range of resilience-building initiatives led by local governments and community organizations. These initiatives include the establishment of functional early warning systems, the development of hazard-resilient infrastructure, and the strengthening of community-based disaster risk reduction and management (DRRM) programs. Such structured and proactive measures reinforce the capacity of coastal communities to anticipate and manage disaster risks effectively [1]. Furthermore, while prevention and mitigation activities, as well as rehabilitation and recovery efforts, are practiced to a moderate extent, disaster preparedness, response, and early recovery measures are more consistently implemented in local communities. This pattern suggests that operational readiness and immediate response mechanisms often receive stronger emphasis at the barangay level [9].

**Table-3: Relationship Between Level of Risk Reduction strategies and Disaster Preparedness in Coastal Barangays**

Variables	n	t-stat	r	r <sup>2</sup>	p-value	Interpretation
Level of Risk Management Strategies and Disaster Preparedness	30	6.56	0.778	0.605	0.000	high positive relationship

The results reveal a **Pearson correlation coefficient (r) of 0.778**, indicating a **high positive relationship** between the level of risk reduction strategies and disaster preparedness. This means that as the implementation of risk reduction strategies increases, the level of disaster preparedness also tends to increase. The computed t-value of 6.56 with a p-value of 0.000 ( $p < 0.05$ ) shows that the relationship is statistically significant. Therefore, the null hypothesis stating that there is no significant relationship between the two variables is rejected.

Moreover, the coefficient of determination ( $r^2$ ) is 0.605, which implies that approximately 60.5% of the variation in disaster preparedness can be explained by the level of implementation of risk reduction strategies. This indicates a substantial practical effect, suggesting that risk reduction strategies play a major role in shaping preparedness levels within the coastal barangays.

The findings demonstrate that communities with stronger implementation of early warning systems, evacuation planning, community training, and coastal resource management tend to exhibit higher levels of preparedness in terms of response capacity, recovery readiness, and household preparedness. The high correlation coefficient reflects a strong alignment between proactive risk management efforts and actual readiness outcomes. The significant and strong positive relationship suggests that continuous investment in risk reduction strategies directly contributes to

enhancing community preparedness. Strengthening and sustaining programs such as disaster drills, environmental protection initiatives, and structured evacuation systems may further improve readiness levels.

The findings indicate that early warning systems serve as a critical foundation for strengthening community preparedness. Effective early warning mechanisms enhance hazard awareness, support timely and informed decision-making, and encourage protective actions that reduce vulnerability. When communities receive accurate and prompt warnings, they are better positioned to coordinate evacuation, mobilize resources, and respond collectively during emergencies [12]. Similarly, community-centered early warning systems, when integrated with localized training and indigenous knowledge, significantly enhance household preparedness and overall resilience. Such systems empower residents not only to receive information but also to understand and act upon it appropriately [13].

#### 4. CONCLUSIONS

The findings of the study indicate that coastal barangays in Glan, Sarangani Province demonstrate a strong and well-established system of disaster risk reduction and preparedness. The consistent implementation of structured risk management practices reflects a proactive approach to disaster governance at the community level. The alignment between institutional strategies and community readiness suggests that disaster management efforts are not merely procedural but are integrated into local practices and collective action. The study further implies that sustained planning, coordination, and community engagement contribute meaningfully to strengthening disaster resilience. When preventive strategies are systematically implemented, they reinforce preparedness behaviors, improve response mechanisms, and support recovery capacity. This underscores the importance of maintaining and continuously enhancing local disaster risk reduction programs.

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