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## The Level of Implementation of Disaster Risk Reduction Management in Selected High Schools in the Division of Agusan del Norte

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### Abstract.

This study aimed to determine the level of implementation of Disaster Risk Reduction Management (DRRM) in selected high schools in Agusan del Norte, Philippines, specifically regarding safe learning facilities, school disaster management, and disaster risk reduction education. Using a descriptive-comparative research design, the study involved six school principals, six DRRM coordinators, and sixty students as respondents, purposively sampled from six high-risk coastal schools. Data collection employed a questionnaire adapted from the DepEd-DRRM Manual and interview guides, with results analyzed using weighted mean and ANOVA. Findings revealed that flooding was the most prevalent hazard across all schools. Overall, the implementation of DRRM was rated as well implemented across all dimensions, with notable strengths in hazard awareness and preparedness drills. However, specific gaps were identified, including inconsistent visibility of emergency contact directories and limited community involvement in disaster planning. Significant differences in DRRM implementation were observed when schools were grouped by hazard exposure, population size, and location, highlighting contextual challenges in program execution. The study also documented unique initiatives, such as establishing the Youth Operatives in Urgency Nurturing Goodwill Agusan del Norte Emergency Response Team (YOUNG ADNERT) and conducting frequent earthquake and fire drills. Despite these efforts, there remains a need to strengthen monitoring, evaluation, and capacity-building components. The research culminated in proposing the Disaster Risk Reduction Management Strengthened Monitoring and Evaluation Program (DRRMSMEP) to enhance systematic assessment and continuous improvement of school DRRM practices. The study underscores the importance of collaborative engagement among school leaders, teachers, students, parents, and local government units to cultivate a resilient learning environment.

**Keywords:** Disaster Risk Reduction Management; Disaster Preparedness; School Safety; Hazard Awareness; Risk Reduction Education

### 1.0 Introduction

Disaster risk has long been integral to human existence, shaping societies and influencing development across nations. In the Philippines, a country situated within the Pacific Ring of Fire and the typhoon belt, exposure to natural hazards such as earthquakes, floods, typhoons, and landslides is pervasive and recurrent. These hazards consistently threaten lives, disrupt education, and compromise the safety of vulnerable populations, especially children in schools.



Recognizing these realities, the Philippine government institutionalized disaster risk reduction and management (DRRM) through Republic Act No. 10121, also known as the Philippine Disaster Risk Reduction and Management Act of 2010. This legislation underscores the importance of integrating DRRM into educational systems to foster a culture of safety, preparedness, and resilience among learners and educators. In line with this mandate, the Department of Education (DepEd) developed the Comprehensive DRRM in Basic Education Framework, which outlines three pillars for effective implementation: safe learning facilities, school disaster management, and disaster risk reduction and resilience education. These pillars emphasize structural safety and emergency response and the development of knowledge, skills, and values that empower school communities to manage risks and recover from disasters.

While these policies and frameworks provide clear directives, translating them into practice remains a significant challenge. Schools, particularly those in geographically isolated and disadvantaged areas, often have limited resources, inadequate infrastructure, and inconsistent stakeholder engagement. Disaster preparedness activities are usually conducted mainly for compliance, with limited mechanisms for evaluating effectiveness or sustaining improvements over time. Studies have also shown that the perceptions of administrators, teachers, and students regarding DRRM implementation can differ, leading to inconsistencies in planning, execution, and monitoring of programs.

The Division of Agusan del Norte, composed of numerous coastal municipalities with high susceptibility to flooding and other hazards, presents a compelling context for examining DRRM integration in education. Despite the implementation of various initiatives, such as the Youth Operatives in Urgency Nurturing Goodwill Agusan del Norte Emergency Response Team (YOUNG ADNERT), frequent emergency drills, and Brigada Eskwela, there remains limited empirical evidence documenting the actual extent of DRRM implementation across schools in this area. Moreover, the absence of systematic evaluation and feedback mechanisms has contributed to gaps in understanding how effectively these interventions achieve their intended objectives.

Therefore, this study sought to systematically assess the extent to which DRRM policies and programs are operationalized in selected high-risk public secondary schools in Agusan del Norte. Specifically, it aimed to identify existing strengths and gaps in implementation across the three pillars of the DRRM framework. It also provided evidence-based recommendations to inform policy refinement, strengthen program monitoring, and support capacity-building initiatives tailored to vulnerable school communities' unique needs and contexts.

## 2.0 Methodology

### 2.1 Research Design

This study employed a descriptive-comparative research design that integrated quantitative and qualitative approaches. The quantitative component utilized structured survey methods to gather numerical data on the multiple indicators of the Disaster Risk Reduction Management (DRRM) implementation level. Meanwhile, qualitative data were obtained through content analysis of interview responses to provide contextual insights into each participating school's unique initiatives and stakeholder support mechanisms. This mixed-methods approach was selected to allow triangulation of quantitative metrics with qualitative perspectives, thereby producing a more nuanced and comprehensive understanding of DRRM implementation in the selected contexts.

### 2.2 Research Locale

The research was conducted in six public secondary schools in the coastal and riverine municipalities of Agusan del Norte, Philippines. These schools were purposively selected because they were classified as high to very high susceptibility zones for flooding and other hazards, as identified by the Provincial Disaster Risk Reduction and Management Office (PDRRMO) and the Mines and Geosciences Bureau. According to hazard exposure indices reported by these agencies, these communities experience recurring flooding events during typhoon season and are also vulnerable to earthquakes and storm surges. This combination of risk factors made the schools critical for evaluating DRRM practices and identifying opportunities for improvement.





The schools included Las Nieves National High School, Carmen National High School, Jabonga National High School, Tubay National High School, Buenavista National High School, and Magallanes National High School.

### 2.3 Research Participants

The study involved three groups of participants: six school principals, six designated DRRM coordinators (who were also subject teachers responsible for integrating DRRM into instruction), and sixty students enrolled in the selected schools. The school principals and DRRM coordinators were identified through purposive sampling because of their direct involvement in DRRM policy implementation and oversight. The students were selected using simple random sampling to ensure broad representation across grade levels while maintaining a manageable scope for the study. In total, seventy-two respondents participated. This sample size was determined to balance statistical rigor with logistical feasibility and to capture diverse perspectives on DRRM practices.

### 2.4 Research Instrument

Data were collected using structured, and semi-structured instruments aligned with the Comprehensive DRRM in the Basic Education Framework. The structured questionnaire, adapted from the DepEd DRRM Manual, consisted of four parts: (1) school profile, including type of hazard exposure, student population, and geographical location; (2) assessment of safe learning facilities; (3) evaluation of school disaster management; and (4) assessment of disaster risk reduction education, covering hazard awareness, risk reduction understanding, and risk reduction involvement. Each item used a four-point Likert scale ranging from "Not Implemented" to "Very Well Implemented."

To complement the survey data, a semi-structured interview guide was developed to document emerging practices, localized strategies, and forms of stakeholder support not captured by the quantitative instrument. Before data collection, the instruments were subjected to expert validation to ensure clarity, content relevance, and reliability.

### 2.5 Data Gathering Procedure

Before data collection, formal permission to conduct the study was obtained from the Schools Division Superintendent of Agusan del Norte. Endorsement letters were then issued to the school heads of the participating institutions. Orientation sessions were organized to explain the research's objectives, procedures, and ethical considerations to all prospective participants. Informed consent was secured from school administrators, teachers, and students.

Data collection was conducted over six weeks between March and April 2025. The researcher personally administered the questionnaires and conducted in-person interviews with the principals and DRRM coordinators. Completed instruments were retrieved on-site, encoded using Microsoft Excel, and prepared for statistical analysis. Interview responses were transcribed verbatim and organized into thematic categories for qualitative interpretation.

### 2.6 Ethical Considerations

The research process was guided by strict adherence to established ethical standards. Participation was voluntary, and respondents were informed of their right to decline or withdraw from the study at any stage without penalty. To protect anonymity and confidentiality, each participant was assigned a unique code number, and no personally identifiable information was disclosed in any report or publication. All data were stored securely in password-protected files accessible only to the researcher. The study also complied with Republic Act No. 10173, also known as the Data Privacy Act of 2012, to ensure responsible handling, storage, and disposal of all collected information.



### 3.0 Results and Discussion

This section presents and interprets the findings on the Disaster Risk Reduction Management (DRRM) implementation level across six public secondary schools in the flood-prone municipalities of Agusan del Norte. The results are organized according to the three core pillars of DRRM: Safe Learning Facilities, School Disaster Management, and Disaster Risk Reduction Education. Additional analyses examine the influence of school characteristics on implementation outcomes. Findings are further contextualized through the unique conditions, perceptions, and practices observed across the research sites.

#### 3.1 Hazard Profile of Participating Schools

To contextualize the schools' preparedness measures, the study first identified the primary hazards affecting the research sites, recognizing that risk profiles significantly shape the nature and scope of preparedness and response interventions.

**Table 1.** Frequency and Percentage Distribution of Schools by Primary Hazard

Hazard Type	Frequency	Percentage (%)
Flood	6	100.0
Earthquake	4	66.7
Typhoon	3	50.0

The data reveal that all schools (100%) identified flooding as the most prevalent hazard, consistent with their coastal or riverine locations. Notably, four schools (66.7%) also reported high exposure to earthquakes, while three schools (50%) recognized typhoons as recurrent threats. These findings underscore the multidimensional nature of risks in these communities and the imperative for comprehensive, context-specific DRRM interventions.

#### 3.2 Mean Ratings of DRRM Implementation Dimensions

The study computed the mean ratings for each dimension as assessed by all respondents to provide a clearer picture of the relative strengths and areas for improvement across the three core pillars of DRRM.

**Table 2.** Mean Ratings of DRRM Implementation Dimensions

DRRM Dimension	Mean Score	Interpretation
Safe Learning Facilities	3.48	Well Implemented
School Disaster Management	3.42	Well Implemented
Disaster Risk Reduction Education	3.34	Moderately to Well Implemented

Note: Mean scores are based on a four-point Likert scale, where 1 = Not Implemented and 4 = Very Well Implemented.

#### Safe Learning Facilities

Results indicate that school principals and DRRM coordinators rated the safe learning facilities Well Implemented. Subcomponents such as maintaining unobstructed corridors ( $M=3.83$ ) and securing cabinets and drawers to prevent injury ( $M=3.67$ ) were consistently rated as highly compliant, reflecting strong adherence to core safety standards. These measures demonstrate that most schools have successfully integrated structural and non-structural interventions to mitigate immediate hazards during emergencies.

However, some areas emerged as less robust. For example, installing covered drainage canals ( $M=2.83$ ) and posting safety signages around unfinished structures received only moderate ratings. This is particularly concerning, as inadequate drainage increases the risk of water accumulation and structural deterioration, posing direct hazards to students and staff during prolonged flooding. These results align with Barrett et al. (2019), who emphasized that infrastructure gaps frequently compromise the resilience and functionality of learning environments in disaster-prone regions.



## School Disaster Management

The assessment of school disaster management practices yielded an aggregate rating of Well Implemented, although notable discrepancies emerged between the perspectives of students and administrators. Principals and DRRM coordinators rated the posting of emergency contact directories ( $M=3.83$ ) and the preparation of evacuation plans ( $M=3.50$ ) as Very Well Implemented, highlighting strong formal compliance with procedural requirements. In contrast, students' responses reflected lower levels of awareness regarding these resources ( $M=3.15$ ), suggesting gaps in communication and visibility. For instance, several students reported that emergency contact directories were not prominently displayed, limiting their awareness of available resources during a disaster.

The establishment and maintenance of updated databases containing student and family contact information received moderate ratings ( $M=2.83$ ), revealing a critical vulnerability in preparedness. In emergencies, the absence of accurate records could impede family reunification and delay communication with parents or guardians. This finding is consistent with Goddard (2017), who argued that robust disaster management in schools requires the formulation of plans and the rigorous maintenance of operational records and protocols.

Qualitative interviews provided further nuance to these quantitative results. Respondents noted that while earthquake and fire drills are conducted regularly—sometimes exceeding the minimum frequency mandated by DepEd—there remain limitations in the scope of training and the mechanisms for evaluating and integrating lessons learned. As one DRRM coordinator stated:

"Earthquake and fire drills are implemented consistently, but our capacity to monitor and integrate lessons from each drill into plans remains limited."

Such observations reinforce the importance of continuous feedback mechanisms and iterative adjustments to strengthen disaster preparedness practices over time.

## Disaster Risk Reduction Education

Disaster risk reduction education, encompassing hazard awareness, understanding, and risk reduction involvement, emerged as an area marked by perceptual and implementation gaps. Hazard awareness among students was rated higher ( $M=3.58$ , Very Well Implemented) compared to the perceptions of school administrators ( $M=3.08$ , Well Implemented). This suggests that learners feel confident in understanding local risks and protective measures. However, principals and DRRM coordinators expressed reservations about this knowledge's depth and practical applicability, noting that while students may recognize hazard types, they may not possess the nuanced understanding required to translate awareness into practical action.

Similarly, risk reduction understanding received moderate ratings across both groups. Students reported familiarity with basic protective measures ( $M=3.36$ ), but administrators observed limitations in how students could apply this knowledge, particularly regarding community-based risk reduction actions ( $M=3.11$ ). This aligns with Selby and Kagawa (2012), who emphasized the need for contextualized, iterative disaster education approaches rather than one-off information campaigns.

Risk reduction involvement was also rated moderately. Both students ( $M=3.40$ ) and administrators ( $M=3.33$ ) acknowledged participation in activities such as drills and clean-up drives but cited limited opportunities for sustained engagement beyond mandated events. These findings underscore the importance of fostering participatory, hands-on learning experiences, which are more effective in disaster-prone contexts than purely informational strategies.





### 3.3 Implementation of Safe Learning Facilities

Results indicate that school principals and DRRM coordinators rated the Safe Learning Facilities dimension Well Implemented. Subcomponents such as maintaining unobstructed corridors ( $M=3.83$ ) and securing cabinets and drawers ( $M=3.67$ ) were consistently rated as highly compliant, demonstrating a proactive approach to mitigating immediate hazards.

However, some areas emerged as less robust. For example, installing covered drainage canals ( $M=2.83$ ) and posting safety signages around unfinished structures received only moderate ratings. This is particularly concerning, as inadequate drainage increases the risk of water accumulation and structural deterioration, posing direct hazards to students and staff during prolonged flooding. These findings support Barrett et al. (2019), who emphasized that infrastructure gaps frequently compromise the resilience and functionality of learning environments.

### 3.4 Implementation of School Disaster Management

The School Disaster Management practices assessment yielded an aggregate rating of Well Implemented, though notable discrepancies emerged between student and administrator perspectives. Principals and DRRM coordinators rated the posting of emergency contact directories ( $M=3.83$ ) and preparation of evacuation plans ( $M=3.50$ ) as Very Well Implemented, highlighting strong compliance. In contrast, students' ratings were lower ( $M=3.15$ ), suggesting gaps in communication and visibility. For instance, several students reported that emergency contact directories were not prominently displayed, limiting their awareness of available resources during a disaster.

The maintenance of updated contact databases received moderate ratings ( $M=2.83$ ), underscoring a critical vulnerability. In emergencies, the absence of accurate records could impede reunification and delay family communication. This observation aligns with Goddard (2017), who argued that effective disaster management requires planning, rigorous record-keeping, and evaluation.

Qualitative interviews revealed that while earthquake and fire drills are conducted regularly—sometimes exceeding DepEd's minimum requirements—limitations remain in evaluating and integrating lessons learned. As one DRRM coordinator stated:

"Earthquake and fire drills are implemented consistently, but our capacity to monitor and integrate lessons from each drill into plans remains limited."

### 3.5 Implementation of Disaster Risk Reduction Education

Perceptual and implementation gaps marked Disaster Risk Reduction Education. Hazard awareness among students was rated higher ( $M=3.58$ , Very Well Implemented) than among administrators ( $M=3.08$ , Well Implemented), indicating that learners felt confident about their knowledge of risks. However, administrators expressed concerns about the depth and applicability of this knowledge. While students could recognize hazard types, they often lacked the skills to translate awareness into practical action.

Risk reduction understanding received moderate ratings (Students  $M=3.36$ ; Administrators  $M=3.11$ ). This supports the observations of Selby and Kagawa (2012), who emphasized that disaster education must be contextualized and iterative, rather than delivered through one-off information campaigns.

Risk reduction involvement also scored moderately. Both groups acknowledged participation in drills and clean-up drives but cited limited opportunities for sustained engagement beyond mandated activities. These findings highlight the need for more participatory, hands-on learning experiences to reinforce preparedness.

### 3.6 Comparative Analysis of Implementation Levels

The study analyzed variance (ANOVA) to determine whether significant differences existed in DRRM implementation across schools with different profiles.



Table 3. Summary of ANOVA Results by School Profile

Grouping Variable	F Value	p Value	Interpretation
Hazard Exposure	4.23	0.020	Significant Difference
Student Population Size	3.87	0.030	Significant Difference
Geographical Location	5.12	0.010	Significant Difference

The results confirm that all three grouping variables yielded statistically significant differences in DRRM implementation. Hazard exposure emerged as a critical factor shaping the comprehensiveness of interventions, with higher-risk schools reporting more extensive structural measures and more variability in education outcomes. Student population size also played a role, as larger schools faced challenges maintaining consistent preparedness across all learners. Geographical location further influenced implementation, reflecting disparities in access to resources and external support.

These findings highlight the need for differentiated support strategies and targeted resource allocation to address schools' unique challenges with larger enrolments and layered hazards.

### 3.7 Unique Initiatives and Localized Strategies

Beyond compliance with national guidelines, the study documented innovative practices illustrating localized adaptation of DRRM frameworks. The Youth Operatives in Urgency Nurturing Goodwill Agusan del Norte Emergency Response Team (YOUNG ADNERT) emerged as a particularly effective initiative that empowers students to serve as first responders during school events. Members are trained in Basic Life Support and routinely assist during intramurals, programs, and emergencies.

Conducting unannounced drills—often held twice monthly rather than the prescribed quarterly schedule—demonstrates a proactive commitment to preparedness. Respondents noted that these frequent drills increased confidence among students and staff in executing evacuation procedures.

Despite these achievements, participants emphasized the need to strengthen monitoring systems, integrate psychosocial support training, and develop IEC materials tailored to each community's hazards and vulnerabilities.

### 4.0 Conclusion

The findings of this study demonstrate that while DRRM practices in the selected high schools of Agusan del Norte are generally well established, significant variability persists across schools, program dimensions, and stakeholder groups. Most schools have successfully institutionalized foundational elements of DRRM, such as regular evacuation drills, integrating basic hazard awareness into the curriculum, and maintaining safe learning facilities. These efforts reflect substantial compliance with national policies and a shared commitment among school administrators and teachers to promote a safety culture.

However, the results also reveal critical gaps and inconsistencies constraining the full realization of DRRM objectives. In particular, areas such as maintaining comprehensive student and family contact databases, consistently updating contingency plans, and developing localized educational materials require further attention. Moreover, the perceptual differences between administrators and students—especially regarding the depth of disaster risk understanding and the visibility of critical safety information—highlight the importance of more participatory communication strategies and continuous feedback mechanisms.

The analysis confirmed that the type of hazard exposure, student population size, and geographical location significantly influence the consistency and quality of DRRM implementation. Schools with larger enrolments and more complex risk profiles often face greater challenges in sustaining preparedness initiatives and ensuring that all learners are adequately informed and engaged. These disparities underscore the necessity for differentiated capacity-building programs, targeted resource allocation, and ongoing technical support to meet the specific needs of high-risk school communities.





In light of these findings, this study emphasizes the imperative to strengthen monitoring and evaluation systems capable of tracking the effectiveness of DRRM interventions over time. Regular review of contingency and evacuation plans, investment in context-responsive instructional materials, and sustained professional development for teachers and DRRM coordinators are likewise essential to enhance the relevance and impact of disaster preparedness efforts.

Finally, fostering deeper stakeholder engagement—including the active participation of parents, community leaders, and local government units—is crucial to building resilient learning environments. By bridging policy and practice through collaborative action, schools can better equip learners with the knowledge, confidence, and skills to respond effectively to hazards, ultimately fostering safer, more resilient communities.

## 5.0 Contributions of Authors

D.E.G.P – Conceptualization, data collection, analysis, manuscript drafting, revisions.

## 6.0 Funding

No external funding was received for this research.

## 7.0 Conflict of Interests

The author declares no conflict of interest.

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