

VOLUME 1

ISSUE 2

JULY-SEPTEMBER

2026



Print ISSN: 3116-4919



Electronic ISSN: 3116-4927



INGOPIGA

International Journal of Governance,
Public Policy, Internationalization,
and Global Affairs

A Quarterly Peer-Reviewed
International Research Journal



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Implementation and compliance of school-based disaster risk reduction management as predictors of disaster resilience among public secondary schools in Davao del Norte

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Received: 14 June 2026

Revised: 15 July 2026; 16 July 2026; 17 July 2026;
18 July 2026; 19 July 2026

Accepted: 20 July 2026

Available Online: 21 July 2026

Volume 1 (2026), Issue 2, P-ISSN – 3116-4919; E-ISSN - 3116-4927

<https://doi.org/10.63498/ingopiga4>

Abstract

Aim: This study examined the relationship between the implementation of School-Based Disaster Risk Reduction and Management (DRRM), compliance with DRRM policies and guidelines, and disaster resilience among public secondary schools in Davao del Norte. It aimed to generate empirical evidence on how effective DRRM implementation and policy compliance contribute to disaster resilience and support evidence-based educational governance and policy development.

Methodology: The study employed a quantitative, descriptive-correlational research design using validated survey questionnaires administered to public secondary schools. Correlation and multiple regression analyses were performed to determine the relationships among School-Based DRRM implementation, policy compliance, and disaster resilience.

Results: The findings revealed that higher levels of School-Based DRRM implementation were positively associated with greater disaster resilience. Policy compliance also demonstrated a significant contribution to strengthening schools' disaster preparedness, response, recovery, and adaptive capacity, highlighting its important role in enhancing institutional resilience.

Conclusion: The findings emphasize the importance of strengthening School-Based DRRM implementation and ensuring sustained compliance with DRRM policies to build disaster-resilient schools. The study provides evidence to support education leaders, policymakers, and governance institutions in improving DRRM governance, enhancing policy implementation, and promoting safer, more resilient, and policy-responsive learning environments.

Keywords: *disaster risk reduction and management, educational governance, policy compliance, disaster resilience, public secondary schools*

INTRODUCTION

The increasing frequency and severity of natural hazards have made disaster risk reduction (DRR) and resilience central priorities of global governance. Climate change, environmental degradation, rapid urbanization, and population growth have intensified disaster risks, prompting governments and international organizations to strengthen disaster governance through proactive policies, institutional capacity, and evidence-based decision-making. Recognizing these challenges, the United Nations Office for Disaster Risk Reduction (UNDRR) adopted the Sendai Framework for Disaster Risk Reduction 2015–2030, which emphasizes understanding disaster risk, strengthening disaster risk governance, investing in resilience, and enhancing preparedness for effective response and recovery. Similarly, the 2030 Agenda for Sustainable Development, particularly Sustainable Development Goals (SDGs) 4, 11, and 13, highlights the importance of integrating disaster resilience into education, sustainable communities, and climate action. Complementing these initiatives, UNESCO's Comprehensive School Safety Framework promotes safe learning environments, effective school disaster management, and disaster risk reduction education to ensure learning continuity during emergencies.

The Philippines is highly vulnerable to disasters because of its location along the Pacific Ring of Fire and the Western North Pacific typhoon belt. PAGASA (2023) reports that about 20 tropical cyclones enter the Philippine Area



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

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of Responsibility each year, with eight to nine making landfall. These hazards frequently disrupt education through class suspensions, damaged facilities, and interruptions in learning, highlighting the need for resilient schools.

To address these risks, the Philippine government enacted Republic Act No. 10121, which institutionalized a comprehensive disaster risk reduction and management framework covering prevention, preparedness, response, and recovery. In the education sector, DepEd Order No. 37, s. 2015 established the Comprehensive DRRM in Basic Education Framework, requiring schools to implement DRRM through prevention and mitigation, preparedness, response, and rehabilitation and recovery.

Despite these policies, the implementation and compliance of School-Based DRRM vary across public schools. Factors such as leadership, institutional capacity, resource allocation, stakeholder participation, and accountability influence the effectiveness of DRRM programs. In the Division of Davao del Norte, schools remain exposed to floods, earthquakes, and severe weather disturbances, yet limited evidence explains how DRRM implementation and policy compliance contribute to school resilience.

In response to this research gap, this study examines the implementation and compliance of School-Based DRRM as predictors of disaster resilience among public secondary schools in the Division of Davao del Norte. Specifically, it determines the extent to which DRRM implementation and policy compliance influence school disaster resilience. The findings are expected to provide evidence that will assist the Department of Education, local government units, DRRM councils, school administrators, and policymakers in strengthening school disaster governance and institutional resilience.

Review of Related Literature and Studies

Disaster Risk Reduction and Management (DRRM) has evolved from a reactive emergency response approach to a governance-based framework that emphasizes prevention, preparedness, resilience, and institutional accountability. The United Nations Office for Disaster Risk Reduction (UNDRR, 2015) identifies disaster risk governance as a key priority under the Sendai Framework for Disaster Risk Reduction 2015–2030, highlighting the importance of coordinated institutions, evidence-based policies, and effective implementation. Similarly, the 2030 Agenda for Sustainable Development and the UNESCO Comprehensive School Safety Framework promote safe learning environments, resilient communities, and the integration of disaster risk reduction into educational systems.

Studies consistently show that schools with effective governance, strong leadership, stakeholder collaboration, and continuous monitoring demonstrate higher levels of disaster preparedness and resilience. In contrast, weak institutional capacity and poor policy implementation reduce the effectiveness of DRRM initiatives, indicating that resilience depends on both sound policies and their effective implementation. School-Based DRRM is an essential strategy for protecting learners, ensuring educational continuity, and strengthening institutional resilience. It integrates disaster preparedness into school governance, planning, infrastructure, curriculum, and community participation.

In the Philippines, School-Based DRRM is mandated by Republic Act No. 10121 and DepEd Order No. 37, s. 2015, which require schools to implement disaster prevention and mitigation, preparedness, response, and recovery measures. These policies assign responsibilities to school administrators, teachers, learners, local government units, and DRRM councils to promote coordinated and accountable disaster management. Philippine studies indicate that while schools generally comply with DRRM policies, implementation varies due to differences in leadership, resources, technical capacity, and stakeholder participation. Parcon et al. (2025) found that teacher implementation, integration of risk reduction management and community engagement enhance the effective implementation of DRRM, while Pandapatan (2024) reported that schools with active collaboration among teachers, parents, and community stakeholders demonstrate higher levels of disaster preparedness and organizational resilience.

Disaster resilience is the ability of schools to prepare for, respond to, recover from, and adapt to disasters while maintaining educational services. It involves safe infrastructure, effective governance, preparedness, leadership, resource management, and continuity of learning. Research consistently shows that schools with comprehensive DRRM implementation recover more quickly from disasters and experience fewer disruptions. Collectively, these studies demonstrate that effective DRRM implementation contributes to disaster preparedness and organizational resilience. However, existing research has largely examined DRRM implementation, policy compliance, and disaster resilience as separate constructs. Few studies have investigated their interrelationships within a governance framework, particularly among public elementary schools in the Division of Davao del Norte. This gap underscores the need for the present study.



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

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Theoretical Framework

This study is anchored on the Sendai Framework for Disaster Risk Reduction (2015–2030) as the overarching international policy framework and is supported by Institutional Theory and Policy Implementation Theory to explain the relationships among School-Based Disaster Risk Reduction and Management (DRRM) implementation, policy compliance, and disaster resilience.

The Sendai Framework for Disaster Risk Reduction (2015–2030), adopted by the United Nations Office for Disaster Risk Reduction (UNDRR), provides the global framework for strengthening disaster governance and building resilient communities. The framework emphasizes four priority areas: (1) understanding disaster risk; (2) strengthening disaster risk governance to manage disaster risk; (3) investing in disaster risk reduction for resilience; and (4) enhancing disaster preparedness for effective response and recovery. Within the education sector, these priorities encourage schools to institutionalize disaster risk reduction through comprehensive planning, coordinated governance, stakeholder participation, and continuous capacity-building. The framework guides this study by identifying disaster resilience as the expected outcome of effective DRRM implementation and governance.

To explain how schools adopt and sustain DRRM policies, this study incorporates Institutional Theory, developed by Meyer and Rowan (1977) and further advanced by DiMaggio and Powell (1983). Institutional Theory posits that organizations become effective when they align their structures, policies, and practices with formal rules, institutional expectations, and societal norms. In the context of School-Based DRRM, public secondary schools are expected to comply with Republic Act No. 10121, Department of Education (DepEd) Order No. 37, s. 2015, and other national DRRM policies. Compliance enables schools to institutionalize disaster preparedness, establish standardized safety procedures, strengthen accountability, and enhance organizational resilience. Accordingly, schools that institutionalize DRRM policies are more likely to achieve higher levels of disaster resilience through standardized governance structures, coordinated preparedness activities, and organizational accountability.

The study is further supported by Policy Implementation Theory, particularly the work of Mazmanian and Sabatier (1983), which explains that the effectiveness of public policies depends on how they are translated into practice through leadership, organizational capacity, resource availability, stakeholder participation, and continuous monitoring and evaluation. The theory emphasizes that policy compliance alone is insufficient unless supported by effective implementation. Within School-Based DRRM, successful implementation requires schools to conduct hazard assessments, develop contingency plans, organize disaster preparedness activities, allocate adequate resources, and collaborate with Local Government Units (LGUs) and Disaster Risk Reduction and Management Councils. Consequently, schools demonstrating stronger implementation and higher compliance are expected to exhibit greater preparedness, adaptability, and resilience during disaster events.

Collectively, these frameworks provide the theoretical foundation of the study. The Sendai Framework establishes the global governance context for disaster risk reduction, while Institutional Theory and Policy Implementation Theory explain the organizational processes through which DRRM policies are implemented and complied with in schools. Together, they support the proposition that effective implementation and compliance with School-Based DRRM policies contribute to enhanced disaster resilience in public secondary schools.

Conceptual Framework

This study examines the implementation of School-Based Disaster Risk Reduction and Management (DRRM) and compliance with School-Based DRRM policies as predictors of disaster resilience among public secondary schools in the Division of Davao del Norte.

The first independent variable is the implementation of School-Based DRRM, which reflects the extent to which schools operationalize disaster risk reduction through safe learning facilities and environment, effective school disaster risk reduction and management practices, and the integration of DRRM into the curriculum. These dimensions demonstrate how schools institutionalize disaster preparedness and safety measures within their operations and educational programs.

The second independent variable is compliance with School-Based DRRM policies, which refers to the extent to which schools adhere to the requirements of Republic Act No. 10121, DepEd Order No. 37, s. 2015, and other relevant DRRM policies and guidelines. Compliance is assessed through the dimensions of enabling environment, safe learning facilities, school disaster risk management, and risk reduction and resilience education.

The dependent variable is disaster resilience, defined as the capacity of schools to anticipate, prepare for, respond to, recover from, and adapt to disasters while ensuring the continuity of education and maintaining a safe, inclusive, and resilient learning environment.

The framework suggests that effective implementation of School-Based DRRM and a high level of compliance with DRRM policies contribute significantly to strengthening disaster resilience in public secondary



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

P - ISSN: 3116-4919; E - ISSN: 3116-4927

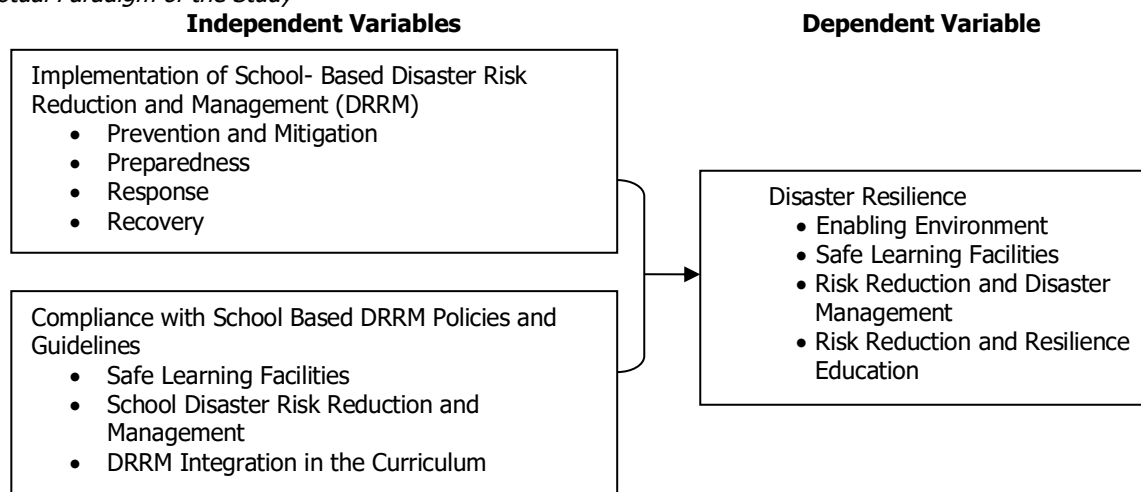
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schools. Schools that consistently implement DRRM programs and comply with established policies are expected to demonstrate greater preparedness, improved emergency response, faster recovery, and enhanced capacity to sustain educational services during and after disasters. Conversely, inadequate implementation and poor policy compliance may weaken institutional preparedness, hinder effective disaster response, and compromise learning continuity. Guided by this framework, the study examines the predictive influence of School-Based DRRM implementation and policy compliance on disaster resilience among public secondary schools in the Division of Davao del Norte.

Figure 1

Conceptual Paradigm of the Study



Statement of the Problem

Disasters continue to pose significant challenges to the safety, continuity, and quality of education, making School-Based Disaster Risk Reduction and Management (DRRM) a critical component of educational governance. In the Philippines, comprehensive DRRM policies, including Republic Act No. 10121 and Department of Education (DepEd) Order No. 37, s. 2015, provide schools with a framework for disaster preparedness, prevention and mitigation, response, and recovery. Despite these policy mandates, variations in the implementation of School-Based DRRM and compliance with DRRM policies persist across public secondary schools, potentially affecting their capacity to achieve disaster resilience.

While previous studies have examined disaster preparedness, DRRM implementation, and school resilience, limited empirical evidence has investigated the combined predictive influence of School-Based DRRM implementation and compliance with DRRM policies on disaster resilience in the context of public secondary schools, particularly in the Division of Davao del Norte. This gap constrains a comprehensive understanding of the institutional and policy-related factors that contribute to resilient schools and limits the availability of evidence to inform improvements in disaster risk governance within the education sector.

Accordingly, this study examines whether the implementation of School-Based DRRM and compliance with School-Based DRRM policies significantly predict disaster resilience among public secondary schools in the Division of Davao del Norte. The findings are expected to contribute to the existing body of knowledge on school disaster risk reduction and management and provide empirical evidence to support policy enhancement, strengthen DRRM governance, and promote more resilient learning environments.

Research Objectives

General Objective:

To determine whether the implementation of School-Based Disaster Risk Reduction and Management (DRRM) and compliance with DRRM policies and guidelines significantly predict disaster resilience among public secondary schools in Davao del Norte.



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

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Specific Objectives

1. To determine the level of implementation of School-Based Disaster Risk Reduction and Management in terms of:
 - o Safe learning facilities and environment;
 - o School disaster risk reduction and management; and
 - o DRRM integration in the curriculum.
2. To assess the level of compliance with School-Based DRRM policies and guidelines.
3. To determine the level of disaster resilience among public secondary schools.
4. To examine the significant relationship between School-Based DRRM implementation, compliance with DRRM policies, and disaster resilience.
5. To determine whether School-Based DRRM implementation and compliance with DRRM policies significantly predict disaster resilience.

Research Questions:

1. What is the level of implementation of School-Based Disaster Risk Reduction and Management in terms of:
 - o Safe learning facilities and environment;
 - o School disaster risk reduction and management; and
 - o DRRM integration in the curriculum?
2. What is the level of compliance with School-Based Disaster Risk Reduction and Management policies and guidelines?
3. What is the level of disaster resilience among public secondary schools?
4. Is there a significant relationship between:
 - o School-Based DRRM implementation and disaster resilience?
 - o Compliance with DRRM policies and guidelines and disaster resilience?
5. Do School-Based DRRM implementation and compliance with DRRM policies and guidelines significantly predict disaster resilience?

METHODOLOGY

Research Design

This study employed a quantitative, non-experimental, correlational research design to examine the relationships among the implementation of School-Based Disaster Risk Reduction and Management (DRRM), compliance with DRRM policies, and disaster resilience among public secondary schools in the Division of Davao del Norte. A quantitative approach was appropriate because it enabled the collection and statistical analysis of numerical data to objectively measure the variables and determine the magnitude and direction of their relationships.

A non-experimental design was adopted because the study investigated naturally occurring conditions without manipulating the independent variables. Specifically, the study examined the existing levels of School-Based DRRM implementation, compliance with DRRM policies, and disaster resilience as they occurred in the participating schools. According to Creswell and Creswell (2023), a correlational research design is appropriate for determining the degree of association among variables without establishing experimental control or causal relationships.

The correlational design was particularly suitable because the study sought to determine whether the implementation of School-Based DRRM and compliance with DRRM policies significantly predicted disaster resilience. These variables represent organizational and governance-related constructs that reflect the effectiveness of policy implementation, institutional compliance, and disaster governance within public schools. Since the study focused on examining naturally occurring relationships among these governance variables rather than manipulating them, a quantitative correlational design provided the most appropriate methodological approach for achieving the research objectives.

Population and Sampling

The study involved permanent public secondary school teachers from five large public secondary schools in the Division of Davao del Norte, with a total population of 569 teachers. Teachers were selected because they are directly responsible for implementing School-Based Disaster Risk Reduction and Management (DRRM) programs and promoting disaster preparedness and resilience in schools.

Using Slovin's Formula with a 5% margin of error, a sample of 237 respondents was determined. A simple random sampling technique was employed to ensure equal chances of selection and enhance the representativeness



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of the sample. Only permanent teachers assigned to the participating schools who voluntarily provided informed consent were included in the study. Teachers on extended leave, newly hired teachers, substitute teachers, and non-teaching personnel were excluded because of their limited or no involvement in School-Based DRRM implementation.

Instruments

This study employed a structured survey questionnaire as its primary research instrument. The questionnaire was adapted and modified from previously validated instruments to ensure its relevance to the Philippine educational context and the objectives of the study. The research instrument consisted of three sections. Firstly, the questionnaire assessed the implementation of School-Based Disaster Risk Reduction and Management (DRRM) across four dimensions: prevention and mitigation, preparedness, response, and recovery. Secondly, it measured compliance with School-Based DRRM policies through three dimensions: safe learning facilities, school disaster risk reduction and management and DRRM integration in the curriculum. The second part of the survey was to assess compliance with DRRM policies. It was adapted and modified from Cubillas et al. (2022), who used a Likert-type scale to measure disaster preparedness and behavioral responses in public elementary schools in Butuan City, Philippines, which were identified as being located in flood-prone areas. Lastly, the questionnaire assessed disaster resilience using the dimensions of enabling environment, safe learning facilities, risk reduction and disaster management and risk reduction and resilience education. All items were measured using a five-point Likert scale ranging from (5 – very high, 4 – high, 3 – moderate, 2 – low, and 1 – very low).

The research instrument underwent expert validation to assess its clarity, relevance, content validity, and alignment with the study objectives. Following the incorporation of the experts' recommendations, the revised questionnaire was pilot-tested among respondents who were not included in the actual study to establish its reliability and ensure the clarity and appropriateness of the instrument. After satisfactory validity and reliability were established, the finalized questionnaire was administered during the formal data collection phase.

Data Collection

Data collection was conducted from February to March 2026 after securing an endorsement from the Dean of the Graduate School of the University of Mindanao (UM) Tagum City and approval from the Schools Division Superintendent of the Department of Education (DepEd), Division of Davao del Norte. Upon approval, the researcher coordinated with the District Supervisor and the principals of the five participating public secondary schools to schedule the administration of the survey without disrupting school operations. Before administering the questionnaires, the researcher explained the purpose of the study, the voluntary nature of participation, and the respondents' rights. Informed consent was obtained from all participants prior to data collection. The questionnaires were personally distributed to the selected respondents and retrieved after completion. The collected questionnaires were checked for completeness, coded, encoded, and prepared for statistical analysis. All information gathered was kept confidential and used solely for the purposes of the study.

Treatment of Data

The data collected from the respondents were encoded, tabulated, and analyzed using appropriate descriptive and inferential statistical techniques. Statistical analysis was performed to describe the study variables, determine their relationships, and examine the predictive influence of the independent variables on disaster resilience.

The following statistical tools were employed:

1. Mean and Standard Deviation. These descriptive statistics were used to determine the level of implementation of School-Based Disaster Risk Reduction and Management (DRRM), compliance with DRRM policies, and disaster resilience among public secondary school teachers. The mean described the average responses of the respondents, while the standard deviation measured the variability of their responses.
2. Pearson Product-Moment Correlation Coefficient (Pearson's r). This inferential statistical test was used to determine the significance, direction, and strength of the relationship between the implementation of School-Based DRRM, compliance with DRRM policies, and disaster resilience.
3. Multiple Linear Regression Analysis. This statistical technique was used to determine whether the implementation of School-Based DRRM and compliance with DRRM policies significantly predicted disaster resilience. Regression analysis also determined the relative contribution of each independent variable to the prediction of the dependent variable.



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

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Prior to conducting the regression analysis, the assumptions of normality, linearity, independence of errors, homoscedasticity, and absence of multicollinearity were examined to ensure the appropriateness of the statistical model.

Table 1 presents the scale used to interpret the mean scores obtained from the respondents. The descriptive interpretations served as the basis for determining the levels of School-Based Disaster Risk Reduction and Management implementation, policy compliance, and disaster resilience.

Table 1
Interpretation of Mean Scores

Mean Range	Descriptive Interpretation
4.20–5.00	Very High
3.40–4.19	High
2.60–3.39	Moderate
1.80–2.59	Low
1.00–1.79	Very Low

Table 2 presents the statistical techniques employed to address each research objective of the study.

Table 2
Statistical Techniques used to address the Research Objectives

Research Objectives	Statistical Tool
Determine the level of implementation of School-Based DRRM	Mean, Standard Deviation
Determine the level of compliance with DRRM policies	Mean, Standard Deviation
Determine the level of disaster resilience	Mean, Standard Deviation
Determine the significant relationship among the variables	Pearson Product–Moment Correlation
Determine whether implementation and compliance significantly predict disaster resilience	Multiple Linear Regression Analysis

Ethical Considerations

The study adhered to the ethical principles of educational research to ensure the protection of the participants' rights, privacy, dignity, and welfare throughout the research process.

Proper Coordination. Prior to data collection, the researcher obtained an endorsement from the Dean of the Graduate School of the University of Mindanao (UM) Tagum College and secured approval from the Schools Division Superintendent of the Department of Education (DepEd), Division of Davao del Norte. Coordination was also made with the District Supervisor and the principals of the participating schools before administering the survey.

Voluntary Participation. Participation was voluntary. Respondents were informed of the study's purpose, procedures, benefits, and their right to decline or withdraw at any time without penalty.

Informed Consent. Written informed consent was obtained from all participants before the administration of the questionnaire.

Confidentiality. The confidentiality and anonymity of the respondents were strictly maintained. No personal identifiers were collected, and all responses were coded and reported only in aggregate form. Data were stored securely, accessed only by the researcher, and used solely for academic purposes.

Academic Integrity. The researcher upheld academic integrity by ensuring the honest collection, analysis, and reporting of data. All sources were properly cited in accordance with the APA 7th Edition, and no data were fabricated, falsified, or manipulated.



RESULTS AND DISCUSSION

Table 3

Level of Implementation of School-Based Disaster Risk Reduction Management

Indicator	<i>M</i>	<i>SD</i>	Interpretation
Prevention and Mitigation	4.79	0.31	Very High
Preparedness	4.79	0.34	Very High
Response	4.58	0.41	Very High
Recovery	4.60	0.43	Very High
Overall	4.68	0.27	Very High

Note. *M* = Mean; *SD* = Standard Deviation

The results presented in Table 3 indicate that the overall level of implementation of School-Based Disaster Risk Reduction and Management (DRRM) among the participating public secondary schools was Very High ($M = 4.68$, $SD = 0.27$). This finding suggests that the schools consistently implemented School-Based DRRM practices in accordance with the disaster risk reduction policies and guidelines of the Department of Education. Among the four implementation domains, Preparedness obtained the highest mean score ($M = 4.79$, $SD = 0.34$), followed closely by Prevention and Mitigation ($M = 4.79$, $SD = 0.31$), Recovery ($M = 4.60$, $SD = 0.43$), and Response ($M = 4.58$, $SD = 0.41$). Although slight variations were observed among the domain mean scores, all were interpreted as Very High, indicating a consistently strong implementation of DRRM practices across the participating schools.

The relatively low overall standard deviation ($SD = 0.27$) indicates a high degree of agreement among respondents regarding the implementation of School-Based DRRM practices. This consistency suggests that disaster risk reduction has been effectively institutionalized within school operations through regular hazard assessments, contingency planning, emergency preparedness drills, early warning systems, and the integration of DRRM into school management and instructional activities. These findings imply that disaster preparedness has become an integral component of school governance rather than merely a compliance requirement.

The findings support the Sendai Framework for Disaster Risk Reduction (2015–2030), which emphasizes strengthening institutional capacity, disaster preparedness, and disaster risk governance as essential strategies for reducing disaster risks and enhancing resilience. Similarly, UNESCO's Comprehensive School Safety Framework underscores the importance of integrating disaster management, safe learning facilities, and disaster risk reduction education to establish resilient learning environments. The consistently high level of DRRM implementation observed in this study suggests that the participating schools have established governance mechanisms that promote preparedness, organizational capacity, and institutional resilience.

The present findings are likewise consistent with previous studies conducted in the Philippine context. Batallones (2025) reported a very high level of School-Based DRRM implementation among public schools, while Parcon et al. (2025) found that effective DRRM implementation is strengthened through active teacher participation, community engagement, and collaborative disaster governance. Collectively, these studies and the present findings indicate that sustained implementation of School-Based DRRM contributes significantly to enhancing schools' organizational capacity to anticipate, prepare for, respond to, recover from, and adapt to disaster events.

Table 4

Level of Compliance with School-Based Disaster Risk Reduction and Management Policies

Indicator	<i>M</i>	<i>SD</i>	Interpretation
Safe Learning Facilities and Environment	4.70	0.32	Very High
School Disaster Risk Reduction and Management	4.52	0.52	Very High
DRRM Integration in the Curriculum	4.42	0.52	Very High
Overall	4.54	0.33	Very High

Note. *M* = Mean; *SD* = Standard deviation.

The results presented in Table 4 indicate that the overall level of compliance with School-Based Disaster Risk Reduction and Management (DRRM) policies and guidelines among the participating public secondary schools was Very High ($M = 4.54$, $SD = 0.33$). This finding suggests that the schools consistently adhered to the policy



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

P - ISSN: 3116-4919; E - ISSN: 3116-4927

PRC-CPD Accredited Provider:
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National Book Development Board
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(Print & Digital): 6312

requirements and standards prescribed by the Department of Education for School-Based DRRM. Among the three compliance domains, Safe Learning Facilities and Environment obtained the highest mean score ($M = 4.70$, $SD = 0.32$), followed by School Disaster Risk Reduction and Management ($M = 4.52$, $SD = 0.52$) and DRRM Integration in the Curriculum ($M = 4.42$, $SD = 0.52$). Although slight differences were observed among the domain mean scores, all domains were interpreted as Very High, indicating a consistently high level of compliance with School-Based DRRM policies and guidelines across the participating schools.

The relatively low overall standard deviation ($SD = 0.33$) indicates a high degree of agreement among the respondents regarding their schools' compliance with DRRM policies and guidelines. This consistency suggests that the participating schools have institutionalized DRRM policies and practices by maintaining safe learning environments, implementing disaster risk reduction and management measures, and integrating disaster risk reduction concepts into the curriculum. These findings imply that compliance with national DRRM policies has become an established component of school governance and operational practice.

The findings support Institutional Theory, which posits that organizations become more effective when they align their structures, policies, and practices with formal rules and institutional expectations. In the context of this study, the consistently high level of compliance demonstrates that public secondary schools have effectively institutionalized the requirements of Republic Act No. 10121, Department of Education Order No. 37, s. 2015, and other relevant DRRM policies. Likewise, the Sendai Framework for Disaster Risk Reduction (2015–2030) emphasizes strengthening disaster risk governance through policy implementation, institutional accountability, and coordinated action to enhance resilience.

These findings are consistent with previous studies that emphasize the importance of institutional compliance in strengthening disaster preparedness and resilience in educational settings. Daminar and Cabonce (2026) reported that compliance with DRRM policies enhances school safety and organizational resilience. Similarly, Arcegon et al. (2024) found that sustained adherence to DRRM policies promotes the continuity of disaster preparedness initiatives through effective monitoring and institutional support. Furthermore, Vicencio and Quiñones (2025) concluded that schools demonstrating higher levels of policy compliance exhibit greater organizational readiness and more effective implementation of disaster risk management programs. Collectively, these findings suggest that sustained compliance with School-Based DRRM policies provides a strong institutional foundation for strengthening disaster preparedness and enhancing disaster resilience among public secondary schools.

Table 5
Level of Disaster Resilience

Indicator	<i>M</i>	<i>SD</i>	Interpretation
Enabling Environment	4.54	0.35	Very High
Safe Learning Facilities	4.68	0.37	Very High
Risk Reduction and Disaster Management	4.75	0.43	Very High
Risk Reduction and Resilience Education	4.68	0.47	Very High
Overall	4.66	0.35	Very High

Note. M = Mean; SD = Standard deviation

The results presented in Table 5 indicate that the overall level of disaster resilience among the participating public secondary schools was Very High ($M = 4.66$, $SD = 0.35$). This finding suggests that the schools possess a strong capacity to anticipate, prepare for, respond to, recover from, and adapt to disaster events while ensuring the continuity of educational services. Among the four dimensions of disaster resilience, Risk Reduction and Disaster Management obtained the highest mean score ($M = 4.75$, $SD = 0.43$), followed by Safe Learning Facilities ($M = 4.68$, $SD = 0.37$), Risk Reduction and Resilience Education ($M = 4.68$, $SD = 0.47$), and Enabling Environment ($M = 4.54$, $SD = 0.35$). Although minor variations were observed among the dimension mean scores, all were interpreted as Very High, indicating that the participating schools consistently demonstrate strong disaster resilience across all dimensions.

The relatively low overall standard deviation ($SD = 0.35$) indicates a high degree of agreement among respondents regarding the disaster resilience practices implemented in their schools. This consistency suggests that disaster resilience has been effectively institutionalized through supportive governance structures, safe learning environments, comprehensive disaster risk management practices, resilience-focused education, and continuous



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

P - ISSN: 3116-4919; E - ISSN: 3116-4927

PRC-CPD Accredited Provider:
PTR-2025-749

National Book Development Board
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(Print & Digital): 6312

preparedness initiatives. These findings imply that the participating schools have established systems that promote organizational readiness, minimize disaster-related disruptions, and sustain learning continuity during emergencies.

The findings support the Sendai Framework for Disaster Risk Reduction (2015–2030), which identifies disaster resilience as a key outcome of effective disaster risk governance, institutional capacity, and risk-informed planning. Likewise, the Comprehensive School Safety Framework emphasizes that resilient schools are achieved through the integration of safe learning facilities, effective school disaster management, and disaster risk reduction and resilience education. The consistently high level of disaster resilience observed in this study indicates that the participating schools have successfully institutionalized these components, thereby strengthening their capacity to manage disaster risks and maintain educational continuity.

The present findings are likewise consistent with previous empirical studies. Mutch (2023) emphasized that resilient schools are characterized by effective preparedness, collaborative leadership, and coordinated disaster response mechanisms. Similarly, Rasca (2025) reported that schools implementing comprehensive disaster risk reduction and management initiatives exhibit greater adaptive capacity and organizational resilience. Furthermore, recent studies have highlighted that integrating disaster risk reduction into school governance and instructional practices enhances institutional preparedness and long-term resilience. Collectively, these findings support the present study by demonstrating that sustained implementation of disaster risk reduction measures contributes significantly to building resilient public secondary schools capable of effectively responding to and recovering from disaster events.

Table 6

Pearson Correlation Between Implementation of School-Based DRRM and Disaster Resilience

Independent Variable	<i>r</i>	<i>r</i> ²	<i>p</i>	Decision
Implementation of School-Based DRRM	.81	.66	< .001	Reject <i>H</i> ₀
Compliance With DRRM Policies and Guidelines	.21	.04	.006	Reject <i>H</i> ₀

Note. *r* = Pearson correlation coefficient; *r*² = coefficient of determination; *p* = probability value. *H*₀ = null hypothesis. Correlation is significant at *p* < .05.

The results presented in Table 6 indicate a statistically significant positive relationship between School-Based Disaster Risk Reduction and Management (DRRM) implementation and disaster resilience (*r* = .81, *p* < .001). The null hypothesis was therefore rejected. The coefficient of determination (*r*² = .66) indicates that approximately 65.6% of the variance in disaster resilience is associated with the implementation of School-Based DRRM. This finding suggests that schools demonstrating higher levels of DRRM implementation tend to exhibit greater disaster resilience.

Similarly, compliance with DRRM policies and guidelines demonstrated a statistically significant positive relationship with disaster resilience (*r* = .21 *p* = .006). Accordingly, the null hypothesis was rejected. However, the coefficient of determination (*r*² = .04) indicates that only 4.3% of the variance in disaster resilience is associated with compliance with DRRM policies and guidelines. This result suggests that, although policy compliance is significantly related to disaster resilience, the strength of the relationship is relatively weak compared with the implementation of School-Based DRRM.

The findings imply that effective implementation of DRRM practices contributes more substantially to disaster resilience than policy compliance alone. While compliance provides the institutional and regulatory framework for disaster risk reduction, resilience is more strongly influenced by the consistent execution of preparedness activities, hazard assessments, emergency response planning, recovery strategies, and the integration of DRRM into school operations. These results highlight the importance of translating policies into sustained organizational practices that strengthen schools' capacity to anticipate, prepare for, respond to, and recover from disaster events.

The findings support the Sendai Framework for Disaster Risk Reduction (2015–2030), which emphasizes that effective disaster risk governance depends not only on the existence of policies but also on their implementation through coordinated institutional action, continuous capacity building, and stakeholder participation. Likewise, Institutional Theory and Policy Implementation Theory suggest that organizations achieve desired outcomes when formal policies are effectively institutionalized and consistently implemented in practice.

The present findings are consistent with previous empirical studies. Cueva and Nistal (2025) reported that schools with comprehensive DRRM implementation demonstrate significantly higher levels of disaster resilience



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

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through enhanced preparedness and institutional capacity. Similarly, Quiachon (2024) emphasized that policy compliance contributes to disaster resilience only when supported by effective implementation, continuous monitoring, and organizational commitment. Collectively, these findings reinforce the conclusion that sustained implementation of School-Based DRRM serves as a stronger predictor of disaster resilience than policy compliance alone.

Table 7

Pearson Correlation Between Compliance with School-Based DRRM Policies and Guidelines and Disaster Resilience

Independent Variable	<i>r</i>	<i>r</i> ²	<i>p</i>	Decision
Safe Learning Facilities and Environment	.36	.13	< .001	Reject H ₀
School Disaster Risk Reduction and Management	-.02	.00	.83	Do Not Reject H ₀
DRRM Integration in the Curriculum	.19	.04	.01	Reject H ₀

Note. *r* = Pearson correlation coefficient; *r*² = coefficient of determination; *p* = probability value. H₀ = null hypothesis. Correlation is significant at *p* < .05.

The results presented in Table 7 indicate that Safe Learning Facilities and Environment was significantly and positively correlated with disaster resilience (*r* = .36 *p* < .001). The null hypothesis was therefore rejected. The coefficient of determination (*r*² = .13) indicates that approximately 13.2% of the variance in disaster resilience is associated with safe learning facilities and the school environment. This finding suggests that schools with safer learning environments tend to demonstrate higher levels of disaster resilience.

In contrast, School Disaster Risk Reduction and Management did not exhibit a statistically significant relationship with disaster resilience (*r* = -.02, *p* = .83). Consequently, the null hypothesis was not rejected. The negligible coefficient of determination (*r*² = .000) indicates that this dimension contributes virtually no explained variance in disaster resilience among the participating schools. This result suggests that, when considered independently, this component was not associated with differences in disaster resilience.

Meanwhile, DRRM Integration in the Curriculum demonstrated a statistically significant positive relationship with disaster resilience (*r* = .19, *p* = .01). Accordingly, the null hypothesis was rejected. However, the coefficient of determination (*r*² = .04) indicates that only 3.8% of the variance in disaster resilience is associated with curriculum integration, suggesting a statistically significant but relatively weak relationship.

Overall, the findings indicate that not all dimensions of compliance contribute equally to disaster resilience. Among the three dimensions, Safe Learning Facilities and Environment exhibited the strongest positive relationship with disaster resilience, highlighting the importance of maintaining safe physical learning spaces and supportive school environments. Although DRRM Integration in the Curriculum was also significantly associated with disaster resilience, its influence was comparatively modest. Conversely, School Disaster Risk Reduction and Management did not demonstrate a significant relationship, suggesting that policy structures and organizational mechanisms alone may be insufficient to enhance resilience unless they are effectively implemented and translated into operational practices.

These findings support the Comprehensive School Safety Framework, which emphasizes that resilient schools are built through the integration of safe learning facilities, effective disaster management systems, and disaster risk reduction education. They are likewise consistent with the Sendai Framework for Disaster Risk Reduction (2015–2030), which underscores that disaster resilience depends not only on the existence of policies but also on their effective implementation, institutional capacity, and sustained stakeholder engagement. Previous studies have similarly reported that safe school infrastructure and the integration of disaster risk reduction into educational programs contribute significantly to school resilience, whereas administrative compliance alone may not necessarily translate into improved disaster preparedness or adaptive capacity. Collectively, these findings suggest that strengthening physical safety measures and embedding disaster risk reduction within the curriculum are essential strategies for enhancing disaster resilience in public secondary schools.



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

P - ISSN: 3116-4919; E - ISSN: 3116-4927

PRC-CPD Accredited Provider:
PTR-2025-749

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Table 8

Multiple Linear Regression Analysis Predicting Disaster Resilience from School-Based DRRM Implementation and Compliance with DRRM Policies and Guidelines

Predictor	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	Decision
Constant	0.22	0.27	—	—	—	—
Implementation of School-Based DRRM	1.16	0.06	.97	19.10	< .001	Reject H_0
Compliance With DRRM Policies and Guidelines	-0.22	0.05	-.21	-4.42	< .001	Reject H_0

Note. Dependent variable = Disaster Resilience. *B* = unstandardized regression coefficient; *SE* = standard error; β = standardized regression coefficient. Model summary: $R = 0.83$, Adjusted $R^2 = 0.68$, $F = 194.50$, $p < .001$. H_0 = null hypothesis.

The results presented in Table 8 indicate that the multiple regression model significantly predicted disaster resilience, $F = 194.50$, $p < .001$. The model yielded a multiple correlation coefficient of $R = 0.83$ and an adjusted coefficient of determination of $R^2 = .68$, indicating that approximately 68.7% of the variance in disaster resilience was explained jointly by School-Based Disaster Risk Reduction and Management (DRRM) implementation and compliance with DRRM policies and guidelines. These findings suggest that the two predictor variables collectively provide a substantial explanation of variations in disaster resilience among the participating public secondary schools.

Among the predictor variables, Implementation of School-Based DRRM emerged as the strongest and most significant predictor of disaster resilience ($B = 1.16$, $SE = 0.06$, $\beta = .97$, $t = 19.10$, $p < .001$). Accordingly, the null hypothesis was rejected. The positive standardized regression coefficient indicates that higher levels of DRRM implementation are associated with higher levels of disaster resilience, after controlling for compliance with DRRM policies and guidelines. This finding underscores the importance of translating disaster risk reduction policies into sustained operational practices, including preparedness planning, emergency response, recovery initiatives, and risk reduction activities.

In contrast, Compliance with DRRM Policies and Guidelines also significantly predicted disaster resilience ($B = -0.22$, $SE = 0.05$, $\beta = -.21$, $t = -4.42$, $p < .001$), leading to the rejection of the null hypothesis. The negative regression coefficient indicates an inverse relationship after controlling for DRRM implementation. This finding suggests that, when implementation is already considered in the model, higher compliance scores are associated with a slight decrease in disaster resilience. Such a result may reflect overlapping contributions between implementation and compliance or a statistical suppression effect, where two related predictors influence each other's regression coefficients despite both being significantly associated with the outcome.

Overall, the findings demonstrate that School-Based DRRM implementation is the primary determinant of disaster resilience, whereas compliance with DRRM policies and guidelines provides an additional but comparatively smaller contribution within the regression model. These results emphasize that disaster resilience depends not only on adherence to policy requirements but, more importantly, on the effective and sustained implementation of disaster risk reduction practices within schools.

The findings support the Sendai Framework for Disaster Risk Reduction (2015–2030), which emphasizes that disaster resilience is strengthened through effective disaster risk governance, institutional capacity, and the practical implementation of risk reduction measures. Likewise, Policy Implementation Theory argues that the success of public policies depends on how effectively they are translated into organizational practices, while Institutional Theory suggests that organizations achieve desired outcomes when formal policies are embedded within everyday operations. The present findings reinforce these theoretical perspectives by demonstrating that implementation exerts a stronger influence on disaster resilience than policy compliance alone.

The results are likewise consistent with previous empirical studies reporting that comprehensive implementation of School-Based DRRM significantly enhances institutional preparedness and resilience. Studies by Batallones (2025) and Parcon et al. (2025) similarly concluded that schools with well-established DRRM implementation mechanisms exhibit higher levels of organizational readiness, adaptive capacity, and disaster resilience. Collectively, these findings highlight that sustained implementation of disaster risk reduction initiatives remains the most critical factor in strengthening disaster resilience among public secondary schools.



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

P - ISSN: 3116-4919; E - ISSN: 3116-4927

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Table 9

Regression Analysis on the Influence of the Domains of DRRM Policies and Guidelines to Disaster Resilience

Predictor	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>	Decision
Constant	2.71	0.41	—	—	—	—
Safe Learning Facilities and Environment	0.38	0.08	.34	4.81	< .001	Reject Ho
School Disaster Risk Reduction and Management	-0.11	0.056	-.163	-1.99	.049	Reject Ho
DRRM Integration in the Curriculum	0.16	0.06	.23	2.75	.01	Reject Ho

Note. Dependent variable = Disaster Resilience. *B* = unstandardized regression coefficient; *SE* = standard error; β = standardized regression coefficient. Model summary: $R = .41$, Adjusted $R^2 = .16$, $F = 11.79$, $p < .001$. H_0 = null hypothesis.

The results presented in Table 9 indicate that the multiple regression model significantly predicted disaster resilience, $F = 11.79$, $p < .001$. The model yielded a multiple correlation coefficient of $R = .41$ and an adjusted coefficient of determination of $R^2 = .16$, indicating that approximately 15.5% of the variance in disaster resilience was explained by the three dimensions of compliance with School-Based Disaster Risk Reduction and Management (DRRM) policies and guidelines. Although statistically significant, the model explains a relatively modest proportion of the variability in disaster resilience, suggesting that other factors not included in the model may also contribute to school resilience.

Among the predictor variables, Safe Learning Facilities and Environment emerged as the strongest positive predictor of disaster resilience ($B = 0.38$, $SE = 0.08$, $\beta = .34$, $t = 4.81$, $p < .001$). Accordingly, the null hypothesis was rejected. This finding indicates that schools providing safe physical learning environments, structurally sound facilities, and adequate safety measures are more likely to demonstrate higher levels of disaster resilience. The result underscores the importance of investing in safe school infrastructure as a foundation for effective disaster preparedness and resilience.

DRRM Integration in the Curriculum also significantly and positively predicted disaster resilience ($B = 0.16$, $SE = 0.06$, $\beta = .23$, $t = 2.75$, $p = .01$). The null hypothesis was therefore rejected. This finding suggests that integrating disaster risk reduction concepts into classroom instruction and learning activities enhances students' and school personnel's awareness, preparedness, and capacity to respond effectively to disaster events, thereby contributing to overall school resilience.

Conclusion

Based on the findings of the study, the implementation of School-Based Disaster Risk Reduction and Management (DRRM) among public secondary schools in the Division of Davao del Norte was found to be at a very high level, indicating that disaster risk reduction practices have been widely institutionalized within school operations through prevention and mitigation, preparedness, response, and recovery initiatives.

Compliance with School-Based DRRM policies and guidelines was likewise found to be at a very high level. The participating schools consistently adhered to the requirements of Republic Act No. 10121, DepEd Order No. 37, s. 2015, and other relevant DRRM policies, particularly in maintaining safe learning environments, implementing disaster risk management programs, and integrating DRRM into educational activities.

The level of disaster resilience among the participating schools was also very high, reflecting strong institutional capacities to anticipate, prepare for, respond to, recover from, and adapt to disaster events while ensuring the continuity of education. Correlation analysis revealed significant positive relationships between School-Based DRRM implementation and disaster resilience, as well as between compliance with DRRM policies and disaster resilience. Although both relationships were statistically significant, the association between DRRM implementation and disaster resilience was substantially stronger than that between policy compliance and disaster resilience.

Multiple regression analysis further demonstrated that the implementation and compliance domains did not contribute equally to disaster resilience. Among the implementation domains, preparedness, response, and recovery emerged as significant predictors, whereas prevention and mitigation did not make a significant independent contribution after controlling for the other implementation domains. Among the compliance domains, safe learning facilities and environment and DRRM integration in the curriculum significantly predicted disaster resilience, while the school disaster risk reduction and management domain exhibited a significant negative regression coefficient when the other compliance domains were considered simultaneously.



International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

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Overall, the findings demonstrate that effective implementation of School-Based DRRM and consistent compliance with DRRM policies are significantly associated with disaster resilience in public secondary schools. The study provides empirical evidence that disaster resilience is strengthened not only through adherence to policy requirements but also through the effective implementation of critical DRRM practices, particularly those related to preparedness, response, recovery, safe learning facilities, and disaster risk reduction education. These findings contribute to the growing body of knowledge on educational governance and disaster risk reduction by identifying the key institutional factors associated with strengthening disaster resilience in public secondary schools.

Recommendations

1. The Department of Education (DepEd) and school administrators should strengthen monitoring, evaluation, and accountability mechanisms to sustain the high levels of School-Based DRRM implementation and policy compliance observed in this study. Developing and institutionalizing a standardized monitoring and evaluation system would facilitate regular assessment of DRRM implementation, identify implementation gaps, and support evidence-based planning and policy improvement.
2. School administrators and School DRRM Committees should conduct periodic internal evaluations of DRRM implementation and policy compliance, with particular emphasis on preparedness, response, and recovery activities, which were identified as significant predictors of disaster resilience. Effective DRRM practices should be documented, evaluated, and shared across schools to promote organizational learning and strengthen institutional disaster governance.
3. The Department of Education, in collaboration with Local Government Units (LGUs) and Local Disaster Risk Reduction and Management Councils (LDRRMCs), should expand capacity-building programs for school personnel by providing regular training on updated DRRM policies, hazard-specific preparedness, emergency response, incident management, psychological first aid, mental health and psychosocial support, and community-based disaster risk reduction. These initiatives will help sustain and further enhance schools' disaster preparedness and resilience.
4. Policymakers and educational leaders should strengthen partnerships among schools, LGUs, emergency response agencies, community organizations, and other stakeholders to support collaborative disaster governance. Schools should further institutionalize DRRM within School Improvement Plans and establish recognition and incentive mechanisms for DRRM coordinators and committee members to reinforce sustained commitment, accountability, and continuous improvement in DRRM implementation.
5. Future studies should examine additional organizational and contextual variables, including leadership effectiveness, organizational capacity, resource availability, infrastructure safety, stakeholder collaboration, and community participation, to provide a more comprehensive explanation of disaster resilience in schools. Similar studies may also be conducted in other divisions, regions, or educational settings using comparative, mixed-methods, or longitudinal research designs to validate and extend the findings of the present study.

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International Journal of Governance, Public Policy, Internationalization, and Global Affairs (INGOPIGA)

P - ISSN: 3116-4919; E - ISSN: 3116-4927

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