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Implementation of Disaster Risk Reduction and Management in a Philippine Public Elementary School

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Abstract. This study aimed to determine the status of the implementation of disaster risk reduction and management (DRRM) in a mega public school. Specifically, the respondents were 58 teachers from Cauayan South Central School, Cauayan City, Isabela. The respondents' profiles included sex, position, highest educational attainment, and the number of relevant trainings attended. The structured questionnaire used was modified and adapted from the Department of Education's School Disaster Risk Reduction and Management Manual. The results revealed that DRRM coordination and information management protocols were "well-implemented" as evinced by (M = 3.437). The activities in school disaster management were also rated as "well-implemented" (M = 3.339), while key indicators of education facilities (M = 3.147), learning environments (M = 3.190), and risk reduction and resilience education (M = 3.207) were rated as "implemented." The study found no significant differences in DRRM implementation based on sex (p = 0.064), position (p = 0.061), or highest educational attainment (p = 0.065). However, the number of relevant training sessions attended showed a significant difference (p = 0.001), with higher training attendance correlating with better DRRM implementation. Additionally, the study identified that some of the key challenges, according to the respondents, are shortages or lack of material resources (M = 3.138) and insufficient training programs (M = 3.034) being conducted at the school level. The study concluded that while DRRM measures are generally implemented, there should be targeted training and resource allocation to further improvements.

Keywords: Disaster management; Disaster risk reduction; Philippines; Public school.

1.0 Introduction

The Philippines, due to its geography and geology, is uniquely exposed to disasters and hazards. Among the prevalent disasters and hazards are hydro-meteorological events such as recurrent typhoons and floods, accounting for over 80% of the natural disasters in the country, earthquake-induced disasters, volcanic eruptions, and human-induced disasters (i.e., armed fighting, war). On average, the country experiences about 20 tropical cyclones entering the Philippine Area of Responsibility (PAR), with approximately 8 or 9 typhoons making landfall and causing damage to people and properties. According to Yusuf and Francisco (2009) and the 2017 Philippine Climate Change Assessment by Cruz et. Al (2017), the most vulnerable regions to tropical cyclones in the country are the National Capital Region (NCR), Southern Tagalog, Cagayan Valley, Central

Luzon, the Cordillera Administrative Region, and Bicol Province. Consequently, damages to the people, animals, and livelihoods cause millions or billions every time a typhoon strikes. In addition, the Philippines, being situated in the Pacific Ring of Fire, experiences frequent earthquakes and volcanic eruptions. The Philippine Institute of Volcanology and Seismology (Phivolcs) reports that about 100 to 150 earthquakes hit the country every year. On the other hand, of about 300 volcanoes in the country, 24 were listed as active by Phivolcs.

To mitigate the impacts of these disasters on the country, Republic Act 10121 or the Philippine Disaster Risk Reduction and Management (PDRRM) Act was enacted and paved the way for the need to "adopt a disaster risk reduction and management approach that is holistic, comprehensive, integrated, and proactive in lessening the socio-economic and environmental impacts of disasters including climate change, and promote the involvement and participation of all sectors and all stakeholders concerned, at all levels, especially the local community" (RA 10121, 2010). Then, in compliance with the Act, the National Risk Reduction and Management (NDRRM) Framework was developed with the vision of attaining a "safer, adaptive and disaster-resilient Filipino Communities towards sustainable development". This framework provided for a pro-active and participatory disaster risk reduction process, highlighting the need for effective and coordinated disaster response to save lives and protect the more vulnerable groups during and after disasters (Comighud & Tizon, 2020).

Unfortunately, one of the most vulnerable sectors during these hazards and disasters is the education sector. These disasters threaten the lives of young children and their families, depriving them of their right to a safe environment and disrupting quality education. Reducing these disaster risks is therefore very important, as further stipulated in the Department of Education's Comprehensive DRRM in Basic Education Framework, disseminated in DepEd Order No. 37, series of 2017. It mandated the schools to institutionalize their DRRM structures, systems, protocols, and practices. They shall be guided by the three pillars, such as safe learning facilities, school disaster management, and DRR in education (School Disaster Risk Reduction and Management Manual, n.d.). With such directives, it is expected that all divisions and schools have DRRM practices in place and shall warrant an evaluation of the status of their implementation to identify gaps, challenges, or best practices. Reducing hazards remains a critical concern; however, limited research explores its direct impact on educational safety, particularly in enhancing school preparedness, infrastructure resilience, and student well-being. Thus, this study aims to describe the profile of the respondents, the disaster risk reduction and management measures and practices of Cauayan South Central School, and the challenges encountered in the implementation of disaster risk reduction and management.

2.0 Methodology

2.1 Research Design

The study employed a quantitative research design, using both descriptive and inferential statistics. Specifically, a survey method was conducted, which involved the administration of a questionnaire to the participants via Google Forms. It assessed the implementation of disaster risk reduction and management in a public school setting as perceived by the teachers.

2.2 Research Locale

The study was carried out in Cauayan South Central School, a mega-school and the biggest elementary school in Cauayan City, Isabela, in Region 2, Philippines. This school was selected due to its size, diverse student population, and strategic location in a disaster-prone area, especially since Cauayan City experiences frequent disasters such as typhoons and floods. It is also perfect for evaluating successful DRRM implementation in a basic education setting because, as a mega school, it has better resources than smaller schools and takes disaster preparedness more seriously.

2.3 Research Participants

The study utilized a total population sampling method, where all 79 permanent teaching personnel, consisting of teachers and master teachers of Cauayan South Central School, were invited to participate. However, 21 teachers were excluded, with 11 due to incomplete survey responses, and 10 who failed to respond. As a result, the final sample consisted of 58 respondents, representing 73.42% of the total teaching population, who are actively engaged in DRRM practices within the school.

2.4 Research Instrument

This study used a structured questionnaire that was adopted from the School Disaster Risk Reduction and Management Manual (DRRM) developed by the Department of Education to serve as a common template for localization, contextualization, and adaptation in the sub-national context. It has three parts wherein part I pertains to the profile, part II is on the disaster risk reduction and management measures and practices, and part III is the challenges in the implementation of disaster risk reduction and management. The questions were evaluated using the Likert scale.

2.5 Data Gathering Procedure

The authors first sought approval from the school administration before conducting the study. Upon approval, a structured questionnaire adapted from the Department of Education's School Disaster Risk Reduction and Management Manual was distributed to the respondents via Google Forms. Clear instructions were provided to ensure accurate and honest responses. The collected data were then organized, analyzed, and interpreted using appropriate statistical tools. Ethical guidelines, including informed consent and data confidentiality, were strictly followed throughout the process.

2.6 Ethical Considerations

This research study followed ethical guidelines. Informed consent was obtained from all respondents, ensuring their voluntary participation. Confidentiality and anonymity were strictly maintained by protecting personal information and ensuring that data were used solely for research purposes. The study also complied with institutional and ethical guidelines, ensuring fairness, transparency, and the responsible handling of research findings.

3.0 Results and Discussion

3.1 Demographic Profile of Respondents

Table 1 shows the demographic profile of the respondents. It revealed that most of the respondents are female (49 = 84.50%) and majority of them are Teacher III position (43 = 74.10%). Moreover, there is a greater number of respondents who have MA units (37 = 63.80%) and have attended 1-3 (54 = 93.10%) training relevant to the implementation of disaster risk reduction and management.

Table 1. *The Demographic Profile of the Respondents*

Profile		Frequency	Percentage
Sex	Male	9	15.50
	Female	49	84.50
	N = 58		
Position	Teacher I-II	11	19.00
	Teacher III	43	74.10
	Master Teacher	4	6.90
Highest Educational Attainment	Bachelor's degree	6	10.30
	With MA units	37	63.80
	Master's degree	12	20.70
	With Doctorate units	3	5.10
Relevant Trainings Attended	1-3	54	93.10
	4-6	4	6.90

3.2 Implementation of the DRRM Measures and Practices

Table 2 reveals the level of implementation of disaster risk reduction and management coordination, and information management protocol. It showed that all the statements have means higher than 3.25, which indicates that the disaster risk reduction and management coordination and information management protocols were "well-implemented" except for item no. 4 stating "Provide capacity building activities for teachers, non-teaching staff and learners on DRRM." As such, the grand mean of 3.437 presented that the DRMM coordination and information management protocols were "well-implemented". The study by Dela Cruz et al. (2022) highlights the successful implementation of safe learning facilities and environments in the Alfonso Lista District under the Schools Division of Ifugao. Moreover, a school-based Disaster Risk Reduction and Management (DRRM) team was organized and maintained, providing a systematic approach to disaster preparedness. Additionally, the integration of the DRRM program into the curriculum has contributed to the well-being of students, school personnel, parents, and other stakeholders involved in the school community.

Table 2. *Level of Implementation of the DRRM Coordination and Information Management Protocol*

Indicators	Mean	Interpretation
1. Ensure the establishment of an Early Warning System (i.e. bulletin board for weather advisories, bell/siren emergency signal and the like).	3.41	Well-Implemented
2. Conduct an annual student-led risk identification and mapping within and around the school premises to ensure a safe environment that is conducive to teaching and learning.	3.25	Well-Implemented
3. Maintain close coordination with local DRRM Council on the conduct of preparedness activities and on response needs, among others.	3.60	Well-Implemented
4. Provide capacity building activities for teachers, non-teaching staff and learners on DRRM.	3.19	Implemented
5. Maintain, disseminate, and post relevant and updated emergency hotlines in strategic locations throughout the school.	3.37	Well-Implemented
6. Post safety and preparedness measures and evacuation plans.	3.39	Well-Implemented
7. Conduct disaster preparedness measures, including but not limited to quarterly multi-hazard drills applicable to the school's identified hazard such as earthquake, fire and flood.	3.43	Well-Implemented
8. Maintain the safekeeping of vital school records and learning materials.	3.51	Well-Implemented
9. Organize school DRRM team to support the implementation of preparedness and response measures.	3.55	Well-Implemented
10. Ensure the availability of updated baseline education data of the school.	3.39	Well-Implemented
11. Integrate DRRM in regular school programs and activities and school improvement plan (SIP)	3.43	Well-Implemented
12. Pre-identify possible Temporary Learning Spaces (TLS) and alternative delivery modes of education.	3.32	Well-Implemented
13. Monitor the effects of hazards, including the use of the school as evacuation center.	3.41	Well-Implemented
14. Track all school personnel during disasters and/or emergencies.	3.44	Well-Implemented
15. Prepare and submit reports on the effects of any hazard.	3.51	Well-Implemented
16. Ensure implementation of DepEd Order No. 43, s. 2012 or the "Guidelines on the Implementation of Executive Order No. 66 s. 2012 (Prescribing Rules on the Cancellation or Suspension of Classes and Work in Government Offices Due to Typhoons, Flooding, Other Weather Disturbances, and Calamities)".	3.60	Well-Implemented
17. Conduct rapid assessment of damages after every hazard and submit RADaR within 72 hours via SMS.	3.53	Well-Implemented
18. Facilitate immediate resumption of classes to track learners.	3.51	Well-Implemented
19. Monitor recovery and rehabilitation interventions being implemented in the school.	3.36	Well-Implemented
Overall Result	**3.43**	**Well-Implemented**

3.3 Implementation of the Three Pillars of the Comprehensive DRRM in Basic Education

Table 3 shows the level of implementation of the key indicators of education facilities that are conducive to the physical well-being of learners. It can be gleaned from the table that majority of the indicators were "implemented" except for items no. 3, 8 and 9 stating that "The school is accessible to all, regardless of physical ability", "Basic health and hygiene are promoted in the learning environment" and "Adequate sanitation facilities are provided, considering age, gender and special education needs and considerations", respectively, which were all rated "well-implemented". Hence, the grand mean presented that the key indicators for education facilities that are conducive to the physical well-being of learners were assessed as "implemented". Table 4 demonstrates the level of implementation of the key indicators of learning environments that are secure and promote the protection and mental and emotional well-being of learners. As reflected in the table, most of the items under key indicators of learning environments that are secure and promote the protection and mental and emotional well-being of learners were rated "implemented", while the two items (1 and 2) were rated "well implemented". Thus, the grand mean revealed that key indicators of learning environments that are secure and promote the protection and mental and emotional well-being of learners were evaluated as "implemented".

Table 5 describes the level of implementation of the activities in school disaster management. It can be seen from the table that all the indicators were rated "well-implemented" except for item no. 2, which states that "Activities in the School Disaster Management ensure the availability of validated education information and monitoring and evaluation (M&E) results. As such, the grand mean presented that the activities in the school disaster management are "well-implemented". Table 6 unveils the level of implementation of the activities in risk reduction and resilience education. It appeared that the majority of the statements are "well-implemented" except for items no. 3 and 6 stating "The classroom teaching of DRRM are complemented by various co-curricular activities such as poster making, slogan and essay writing, multi-hazard drills, solid waste management and posting of hazard maps" and "The National Greening Program (NGP) is implemented to serve as food basket/main source of commodities and as a prevention and mitigation strategy that could make

schools contribute to resilience building" respectively. In essence, the grand mean score indicates that the activities in risk reduction and resilience education were "Implemented".

Table 3. *Level of Implementation on Pillar I – Sub I*

Indicators	Mean	Interpretation
1. National and provincial hazard maps are prepared and displayed in the strategic place/s in the school.	2.94	Implemented
2. School administrators, teacher and students can identify the different hazards and know how to assist the risks.	3.12	Implemented
3. The school is accessible to all, regardless of physical ability.	3.29	Well-implemented
4. The learning environment is marked by visible boundaries and clear signs, as appropriate.	3.17	Implemented
5. The school grounds have adequate space for classes and administration, recreation, and sanitation facilities.	2.98	Implemented
6. Class space and seating arrangements are according to the prescribed ratio of space per learner and teacher, at all grade levels, to facilitate participatory methodologies and learner-centered approaches.	3.03	Implemented
7. Communities participate in the construction and maintenance of the school.	3.12	Implemented
8. Basic health and hygiene are promoted in the learning environment.	3.37	Well-implemented
9. Adequate sanitation facilities are provided, considering age, gender and special education needs and considerations.	3.29	Well-implemented
10. Adequate quantities of water for safe drinking and personal hygiene are available at the learning site	3.12	Implemented
Overall Result	**3.14**	**Implemented**

Table 4. *Level of Implementation on Pillar I – Sub II*

Indicators	Mean	Interpretation
1. School and other learning environments are near the populations they serve.	3.36	Well-implemented
2. Access routes leading to the school are safe and secure for all.	3.37	Well-implemented
3. The learning environment is free from dangers that may cause harm to learners	3.19	Implemented
4. Training programs for teachers, learners and the community are in place to promote safety, security, and protection.	3.05	Implemented
5. Teachers and other education personnel are provided with the skills to give psychosocial support for the learners' emotional wellbeing.	3.10	Implemented
6. The community is involved in decisions concerning the location of the learning environment, and in establishing systems and policies to ensure that learners are safe and secure.	3.19	Implemented
7. The nutrition and short-term hunger need of learners are addressed to allow for effective learning to take place at the learning site.	3.05	Implemented
Overall Result	**3.19**	**Implemented**

Table 5. *Level of Implementation on Pillar II*

Indicators	Mean	Interpretation
1. Facilitates the harmonization of various efforts of DRRM in Education, externally and internally.	3.41	Well-implemented
2. Ensures the availability of validated education information and monitoring and evaluation (M&E) results.	3.20	Implemented
3. Ensures that weather advisories and emergency updates are communicated.	3.53	Well-implemented
4. Focuses on systems, standards, and processes that should be established to improve the implementation of DRRM in school.	3.32	Well-implemented
5. Ensures education in emergency interventions is appropriately implemented (e.g. psycho-social support, temporary learning spaces, ensuring protected and safe spaces for children, reunification).	3.27	Well-implemented
6. Ensures the availability of resources and/or interventions to support affected areas and establishes the mechanism to guide education partners in channeling their assistance during disaster response and recovery.	3.27	Well-implemented
Overall Result	**3.33**	**Well-implemented**

Table 6. *Level of Implementation on Pillar III*

Indicators	Mean	Interpretation
1. DRRM Integration in the K to 12 Curriculum Based on the new K to 12 curriculum	3.43	Well-implemented
2. DRR and CCA are integrated from kindergarten to Grade 10 in subject areas such as Health, Social Studies, and Science.	3.31	Well-implemented
3. The classroom teaching of DRRM is complemented by various co-curricular activities such as poster making, slogan and essay writing, multi-hazard drills, solid waste management and posting of hazard maps.	3.24	Implemented
4. Psychosocial support is also integrated in the learning process of students as a recovery mechanism.	3.32	Well-implemented
5. Co-curricular activities are incorporated in DRR like local activities and events that may be relevant (World Environment Day and Safe Kids Week in June; the National Disaster Consciousness Week)	3.32	Well-implemented
6. The National Greening Program (NGP) is implemented to serve as a food basket/main source of commodities and as a prevention and mitigation strategy that could make schools contribute to resilience building.	2.60	Implemented
Overall Result	**3.20**	**Implemented**

3. 4 Agreement on the Challenges in the Implementation of DRRM

Table 7 discloses the level of agreement on the challenges in the implementation of disaster risk reduction and management. Elaborately, the grand mean of 2.881 revealed that the respondents agreed with all the identified common challenges.

Table 7. *Level of Agreement on the Challenges in the Implementation of DRRM*

Indicators	Mean	Interpretation
1. Shortage of material resources / physical facilities	3.13	Agree
2. Limited training on hazard identification	3.08	Agree
3. Uncooperative environment/neighborhood/surroundings	2.84	Agree
4. Deficient measures of safety and security in the area	2.93	Agree
5. Insufficient training programs on disaster risk reduction and management	3.03	Agree
6. The absence of nutrition classes focused on disaster management	2.94	Agree
7. Inadequate conduct of monitoring and evaluation activity	2.82	Agree
8. Deficient education in emergencies	2.87	Agree
9. Insufficient topics integrated into the curriculum	2.74	Agree
10. Limited conduct of co-curricular activities related to DRRM	2.87	Agree
11. Partial implementation of the NGP	2.82	Agree
12. Teachers, staff, and students are not participative in the endeavors of the DRRM	2.43	Agree
Overall Result	**2.88**	**Agree**

3.5 Difference in the Level of Implementation of DRRM According to Selected Profile Variables

Table 8 shows the significant difference in the level of implementation of disaster risk reduction and management according to respondents' sex. It disclosed that four statements under the nineteen identified protocols were significant. However, this reflects that there is no significant difference (p-value = .064) in the level of implementation of disaster risk reduction and management according to the sex of respondents.

Table 8. *Differences in the Level of Implementation of DRRM According to Sex*

Indicators	t	p
1. Ensure the establishment of an Early Warning System (i.e. bulletin board for weather advisories, bell/siren emergency signal, and the like).	-2.05	.045*
3. Maintain close coordination with the local DRRM Council on the conduct of preparedness activities and response needs, among others.	-2.30	.025*
4. Provide capacity-building activities for teachers, non-teaching staff, and learners on DRRM.	-2.12	.038*
7. Conduct disaster preparedness measures, including but not limited to quarterly multi-hazard drills applicable to the school's identified hazards such as earthquakes, fire, and flood.	-2.27	.047*
Overall Result	**-1.89**	**.064**

*significant at .05 level

Table 9 reflects the significant difference in the level of implementation of disaster risk reduction and management according to respondents' highest educational attainment. It revealed that among the nineteen identified protocols, items 7 and 18 were significant, which states that conduct disaster preparedness measures, including but not limited to quarterly multi-hazard drills applicable to the school's identified hazards such as

earthquake, fire, and flood, and facilitate the immediate resumption of classes to track learners respectively. Nevertheless, this suggests that there is no significant difference (p-value = .065) in the level of implementation of disaster risk reduction and management according to the highest educational attainment of respondents. In the study of Reynoso and Cabigan (2021), it was found that there are significant relationships between school preparedness and disaster risk reduction management capacity in disaster mitigation, relating to the school heads and coordinators who perform disaster management, wherein they strictly and persistently perform their undertakings and capacities.

Table 9. *Differences in the Level of Implementation of DRRM According to Highest Educational Attainment*

Indicators	F	p
7. Conduct disaster preparedness measures, including but not limited to quarterly multi-hazard drills applicable to the school's identified hazards such as earthquakes, fire, and flood.	2.97	.039*
18. Facilitate immediate resumption of classes to track learners.	3.10	.034*
Overall Result	**2.55**	**.065**

*significant at .05 level

Table 10 illustrates the significant difference in the level of implementation of disaster risk reduction and management according to respondents' number of relevant training courses attended. It showed that all nineteen identified protocols were significant. Thus, this shows that there is a significant difference (p-value =.001) in the level of implementation of disaster risk reduction and management according to several relevant trainings attended by the respondents.

Table 10. *Difference in the Level of Implementation of DRRM According to the Number of Relevant Training Attended*

Indicators	F	p
1. Ensure the establishment of an Early Warning System (i.e. bulletin board for weather advisories, bell/siren emergency signal, and the like).	4.72	.000*
2. Conduct an annual student-led risk identification and mapping within and around the school premises to ensure a safe environment that is conducive to teaching and learning.	2.58	.013*
3. Maintain close coordination with the local DRRM Council on the conduct of preparedness activities and response needs, among others.	8.58	.000*
4. Provide capacity-building activities for teachers, non-teaching staff and learners on DRRM.	11.93	.000*
5. Maintain, disseminate, and post relevant and updated emergency hotlines in strategic locations throughout the school.	14.12	.000*
8. Maintain the safekeeping of vital school records and learning materials.	2.54	.014*
9. Organize the school DRRM team to support the implementation of preparedness and response measures.	3.68	.001*
11. Integrate DRRM in regular school programs and activities and school improvement plan (SIP)	15.70	.000*
12. Pre-identify possible Temporary Learning Spaces (TLS) and alternative delivery modes of education.	12.85	.000*
13. Monitor the effects of hazards, including the use of the school as an evacuation center.	3.28	.002*
14. Track all school personnel during disasters and/or emergencies.	4.91	.000*
15. Prepare and submit reports on the effects of any hazard.	2.89	.004*
16. Ensure implementation of DepEd Order No. 43, s. 2012 or the "Guidelines on the Implementation of Executive Order No. 66 s. 2012 (Prescribing Rules on the Cancellation or Suspension of Classes and Work in Government Offices Due to Typhoons, Flooding, Other Weather Disturbances, and Calamities)".	3.59	.001*
18. Facilitate immediate resumption of classes to track learners.	4.04	.000*
19. Monitor recovery and rehabilitation interventions being implemented in the school.	12.16	.000*
Overall Result	**3.56**	**.001***

*significant at .05 level

3.6 Differences in the Level of Implementation on the Three Pillars of the Comprehensive DRRM According to Selected Profile Variables

Table 11 displays the significant difference in the level of implementation on Pillar I – Sub I of the comprehensive disaster risk reduction and management according to respondents' position. It appeared that in ten identified key indicators of education facilities that are conducive to the physical well-being of learners, items 2 and 9 were significant stating that School administrators, teachers, and students can identify the different hazards and know how to assist the risks and adequate sanitation facilities are provided, considering age, gender and special education needs and considerations respectively. Yet, this reflects that there is no significant difference (p-value = 0.62) in the level of implementation of Pillar I–Sub I on the comprehensive disaster risk reduction and management according to the position of the respondents.

Table 11. *Difference in the Level of Implementation on Pillar I – Sub I of the Comprehensive DRRM According to Position*

Indicators	F	p
School administrators, teachers, and students can identify the different hazards and know how to assist the risks.	4.38	.017*
Adequate sanitation facilities are provided, considering age, gender and special education needs and considerations.	4.07	.022*
Overall Result	**2.94**	**.061**

*significant at .05 level

Table 12 displays the significant difference in the level of implementation on Pillar I – Sub I of the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents. It emerged that all ten identified key Indicators of education facilities that are conducive to the physical well-being of learners were all significant. Hence, this indicates that there is a significant difference (p-value = .003) in the level of implementation of Pillar I–Sub I on the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents. This coincides with the study of Bacus (2020) in which the level of knowledge by the school personnel is only "fair," while the level of implementation is at "low extent" only. Furthermore, the insufficient awareness of different DRR measures leads to its implementation not being an impressive one, which is attributed to various challenges and barriers that hinder its effective implementation. To add, they were not as familiar with their roles and responsibilities as the actors in the program were.

Table 12. *Difference in the Level of Implementation on Pillar I – Sub I of the Comprehensive DRRM According to the Number of Relevant Training Attended*

Indicators	t	p
1. National and provincial hazard maps are prepared and displayed in the strategic place/s in the school.	7.63	.000*
2. School administrators, teacher and students can identify the different hazards and know how to assist the risks.	2.79	.007*
3. The school is accessible to all, regardless of physical ability.	2.07	.043*
4. The learning environment is marked by visible boundaries and clear signs, as appropriate.	10.87	.000*
5. The school grounds have adequate space for classes and administration, recreation, and sanitation facilities.	3.00	.004*
6. Class space and seating arrangements are according to the prescribed ratio of space per learner and teacher, at all grade levels, to facilitate participatory methodologies and learner-centered approaches.	3.19	.002*
8. Basic health and hygiene are promoted in the learning environment.	4.19	.000*
9. Adequate sanitation facilities are provided, considering age, gender and special education needs and considerations.	2.89	.005*
10. Adequate quantities of water for safe drinking and personal hygiene are available at the learning site	9.84	.000*
Overall Result	**3.12**	**.003***

*significant at .05 level

Table 13 exhibits the significant difference in the level of implementation of Pillar I – Sub II of the comprehensive disaster risk reduction and management according to respondents' position. It showed that in the seven identified key indicators of learning environments that are secure and promote the protection and mental and emotional well-being of learners, two items were significant. These training programs for teachers, learners, and the community are in place to promote safety, security, and protection, and the nutrition and short-term hunger needs of learners are addressed to allow for effective learning to take place at the learning site. As such, this reflects that there is a significant difference (p-value = .048) in the level of implementation of Pillar I–Sub II on the comprehensive disaster risk reduction and management according to the position of the respondents. This further supports the conclusion of Cabigan and Reynoso (2021) that there are significant relationships between school preparedness and disaster risk reduction management capacity as to disaster preparedness which indicates that school heads and DRRM coordinators are experts in disaster preparedness and disaster risk reduction management like making an outline plan for disaster management that can be used as framework, develop communication plans for disaster, develop whole school approaches to health and safety, identify available support agencies and list of directives during disaster and conduct planning meeting to determine school needs.

Table 13. *Difference in the Level of Implementation of Pillar I – Sub II of the Comprehensive DRRM According to Position*

Indicators	F	p
1. The learning environment is free from dangers that may cause harm to learners	3.66	.032*
2. Training programs for teachers, learners and the community are in place to promote safety, security, and protection.	3.26	.046*
3. The nutrition and short-term hunger needs of learners are addressed to allow for effective learning to take place at the learning site.	3.37	.042*
Overall Result	**3.21**	**.048***

*significant at .05 level

Table 14 presents the significant difference in the level of implementation of Pillar I – Sub II of the comprehensive disaster risk reduction and management according to respondents' highest educational attainment. It explained that in the seven identified key indicators of learning environments that are secure and promote the protection and mental and emotional well-being of learners, item 3, "The learning environment is free from dangers that may cause harm to learners," was significant. Nevertheless, this shows that there is no significant difference (p-value = 0.97) in the level of implementation of Pillar I–Sub II on the comprehensive disaster risk reduction and management according to the highest educational attainment of the respondents.

Table 14. *Difference in the Level of Implementation on Pillar I – Sub II of the Comprehensive DRRM According to Highest Educational Attainment*

Indicators	F	p
1. The learning environment is free from dangers that may cause harm to learners	3.01	.038*
Overall Result	**2.21**	**.097**

*significant at .05 level

Table 15 shows the significant difference in the level of implementation of Pillar I – Sub II of the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents. It emerged that all seven identified key indicators of learning environments that are secure and promote the protection and mental and emotional well-being of learners were all significant. Therefore, this indicates that there is a significant difference (p-value = .001) in the level of implementation of Pillar I – Sub II on the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents.

Table 15. *Difference in the Level of Implementation of Pillar I – Sub II of the Comprehensive DRRM According to the Number of Relevant Training Attended*

Indicators	t	p
1. School and other learning environments are near the populations they serve.	4.03	.000*
2. Access routes leading to the school are safe and secure for all.	3.18	.002*
3. The learning environment is free from dangers that may cause harm to learners	4.32	.000*
4. Training programs for teachers, learners, and the community are in place to promote safety, security, and protection.	9.54	.000*
5. Teachers and other education personnel are provided with the skills to give psychosocial support for the learners' emotional well-being.	3.11	003*
6. The community is involved in decisions concerning the location of the learning environment, and in establishing systems and policies to ensure that learners are safe and secure.	3.64	.018*
7. The nutrition and short-term hunger needs of learners are addressed to allow for effective learning to take place at the learning site.	2.86	.006*
Overall Result	**3.49**	**.001***

*significant at .05 level

As a summary, there are notable significant differences in the level of implementation on the Three Pillars of the Comprehensive Disaster Risk Reduction and Management, specifically on Pillar I – Sub I, when respondents were grouped according to selected profile variables such as position, number of relevant trainings attended, and highest educational attainment. Hence, these give light to address the critical need for policymakers to focus on the design and improvement of existing school infrastructure to safeguard students and teachers during disasters. Also, it highlights the importance of collaboratively developing comprehensive emergency plans and scenarios in coordination with local institutions and disaster response organizations to enhance resilience and self-efficacy in crises. This initiative encompasses school authorities, teachers, and other personnel, providing them with professional development programs centered on emergency response, disaster management, and strategic approaches to school-based disaster preparedness and recovery (Shah et al., 2020).

Table 16 demonstrates the significant difference in the level of implementation of Pillar II of the comprehensive disaster risk reduction and management according to respondents' position. It can be gleaned from the table that among the seven identified activities in school disaster management, item 2, "Ensures the availability of validated education information and monitoring and evaluation (M&E) results," was significant. However, this indicates that there is no significant difference (p-value = 0.77) in the level of implementation of Pillar II of the comprehensive disaster risk reduction and management according to the position of the respondents.

Table 16. *Difference in the Level of Implementation of Pillar II of the Comprehensive DRRM According to Position*

Indicators	F	p
2. Ensures the availability of validated education information and monitoring and evaluation (M&E) results.	4.15	.021*
Overall Result	**2.69**	**.077**

*significant at .05 level

Table 17 describes the significant difference in the level of implementation of Pillar II of the comprehensive disaster risk reduction and management according to respondents' highest educational attainment. It can be seen from the table that among the seven identified activities in school disaster management, item 1, "Facilitates the harmonization of various efforts of DRRM in Education, externally and internally," was significant. Yet, this reveals that there is no significant difference (p-value = .196) in the level of implementation of Pillar II of the comprehensive disaster risk reduction and management according to the highest educational attainment of the respondents.

Table 17. *Difference in the Level of Implementation of Pillar II of the Comprehensive DRRM According to Highest Educational Attainment*

Indicators	F	p
1. Facilitates the harmonization of various efforts of DRRM in Education, externally and internally.	3.22	.029*
Overall Result	**1.62**	**.196**

*significant at .05 level

Table 18 illustrates the significant difference in the level of implementation of Pillar II of the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents. It appeared that among the six identified activities in school disaster management, five were significant. Hence, this signifies that there is a significant difference (p-value = .001) in the level of implementation of Pillar II of the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents.

Table 18. *Difference in the Level of Implementation of Pillar II of the Comprehensive DRRM According to the Number of Relevant Training Attended*

Indicators	t	p
2. Ensures the availability of validated education information and monitoring and evaluation (M&E) results.	12.40	.000*
3. Ensures that weather advisories and emergency updates are communicated.	3.60	.001*
4. Focuses on systems, standards, and processes that should be established to improve the implementation of DRRM in school.	3.17	.002*
5. Ensures education in emergency interventions is appropriately implemented (e.g. psycho-social support, temporary learning spaces, ensuring protected and safe spaces for children, reunification).	12.84	.000*
6. Ensures the availability of resources and/or interventions to support affected areas and establish the mechanism to guide education partners in channeling their assistance during disaster response and recovery.	13.25	.000*
Overall Result	**6.74**	**.001***

*significant at .05 level

As a summary, there are notable significant differences in the level of implementation of the Three Pillars of the Comprehensive Disaster Risk Reduction and Management, specifically on Pillar II, when respondents were grouped according to selected profile variables such as position, highest educational attainment, and number of relevant training attended. This aligns with the perspective of Imperiale and Vanclay (2021), who argue that crises and disasters present valuable opportunities for learning and transformation, thereby enhancing disaster risk reduction (DRR) and resilience. However, the implementation of effective DRR and resilience-building strategies is often impeded by an inadequate understanding of community resilience and the social dimensions of risk. Likewise, the lack of a structured methodology for community engagement and empowerment, along with continued reliance on traditional approaches, poses significant challenges to the successful execution of sustainable DRR initiatives.

Table 19 reveals the significant difference in the level of implementation of Pillar III of the comprehensive disaster risk reduction and management according to respondents' sex. It disclosed that among the six identified activities in risk reduction and resilience education, item 4, "Psychosocial support is also integrated into the learning process of students as a recovery mechanism," was significant. Nonetheless, this connotes that there is no significant difference (p-value = .194) in the level of implementation of Pillar III of the comprehensive disaster risk reduction and management according to the sex of the respondents.

Table 19. *Difference in the Level of Implementation of Pillar III of the Comprehensive DRRM According to Sex*

Indicators	t	p
4. Psychosocial support is also integrated in the learning process of students as a recovery mechanism.	-2.08	.042*
Overall Result	**-1.31**	**.194**

*significant at .05 level

Table 20 unveils the significant difference in the level of implementation of Pillar III of the comprehensive disaster risk reduction and management according to respondents' positions. It divulged that among the six identified activities in risk reduction and resilience education, items 2 and 6 were significant which state that DRR and CCA are integrated from kindergarten to Grade 10 in subject areas such as Health, Social Studies, and Science and The National Greening Program (NGP) is implemented to serve as food basket/main source of commodities and as a prevention and mitigation strategy that could make schools contribute to resilience building respectively. Even so, this means that there is no significant difference (p-value = .092) in the level of implementation of Pillar III of the comprehensive disaster risk reduction and management according to the position of the respondents.

Table 20. *Difference in the Level of Implementation of Pillar III of the Comprehensive DRRM According to Position*

Indicators	F	p
2. DRR and CCA are integrated from kindergarten to Grade 10 in subject areas such as Health, Social Studies, and Science.	3.51	.037*
6. The National Greening Program (NGP) is implemented to serve as a food basket/main source of commodities and as a prevention and mitigation strategy that could make schools contribute to resilience building.	5.64	.006*
Overall Result	**2.49**	**.092**

*significant at .05 level

Table 21 discloses the significant difference in the level of implementation of Pillar III of the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents. It revealed that among the six identified activities in risk reduction and resilience education, items 1, 2, and 3 were significant. Thus, this indicates that there is a significant difference (p-value = .001) in the level of implementation of Pillar III of the comprehensive disaster risk reduction and management according to several relevant trainings attended by the respondents. As a summary, there are notable significant differences in the level of implementation of the Three Pillars of the Comprehensive Disaster Risk Reduction and Management, specifically on Pillar III, when respondents were grouped according to selected profile variables such as sex, position, and number of relevant training attended.

Table 21. *Difference in the Level of Implementation of Pillar III of the Comprehensive DRRM According to the Number of Relevant Trainings Attended*

Indicators	t	p
1. DRRM Integration in the K to 12 Curriculum Based on the new K to 12 curriculum	3.22	.002*
2. DRR and CCA are integrated from kindergarten to Grade 10 in subject areas such as Health, Social Studies, and Science.	13.51	.000*
3. The classroom teaching of DRRM is complemented by various co-curricular activities such as poster making, slogan and essay writing, multihazard drills, solid waste management, and posting of hazard maps.	4.40	.000*
Overall Result	**3.38**	**.001***

*significant at .05 level

3.7 Relationship between and among the Selected Variables

Table 22 reveals the relationship among the selected variables (profile, level of implementation of policies and practices, and level of agreement on the identified challenges). It can be gleaned from the table that there is a negative correlation between the DRRM measures and practices, and several relevant trainings attended by the respondents. However, it is significant with a p-value of .008 with a moderately strong correlation (-.300), which is statistically notable. Likewise, respondents' position is negatively associated with the implementation of Pillar I–Sub I, Pillar I–Sub II, Pillar II, and Pillar III, with all having p-values of .020, .018, .033, and .022 accordingly. Further, these have moderate strength of relationship (CC = -.258; CC = -.264; CC = -.242 and CC = -.255). In addition, respondents' highest educational attainment is negatively correlated with the implementation of Pillar I–Sub I, Pillar I–Sub II, and Pillar II, with all having p-values of .032, .033, and .036, respectively. Supplementary, these have all CCs of -.233, indicating a moderate strength of relationship, which is statistically noteworthy. Furthermore, respondents' number of relevant training attended has a negative moderate strength of relationship with the implementation of Pillar I – Sub I, Pillar I – Sub II, Pillar II, and Pillar III (CC = -.317; CC = -.317; CC = -.337 and CC = -.304). Nevertheless, these have significant relationships with p-values of .006, .006, .004, and .008, respectively.

Table 22. *Relationship between and among the Selected Variables*

		DRRM Measures and Practices	Pillar 1 (Sub1)	Pillar 1 (Sub 2)	Pillar 2	Pillar 3
Position	Correlation Coefficient[1]	-.18	-.25	-.26	-.24	-.25
	Sig	.08	.02*	.01*	.03*	.02*
Highest Educational Attainment	Correlation Coefficient[1]	-.18	-.23	-.23	-.23	-.19
	Sig	.08	.03*	.03*	.03*	.07
Number of Relevant Training	Correlation Coefficient[2]	-.30	-.31	-.31	-.33	-.30
	Sig	.00*	.00*	.00*	.00*	.00*

[1]Corelation is calculated through Kendall's tau-b; [2]Correlation is calculated through Spearman's rho; *significant at .05 level; Correlation is significant at the 0.05 level (2-tailed). CC* Correlation Coefficient 0.6 – 1.00 High strong correlation, 0.2 – 0.6 Moderate strong correlation 0 – 0.2 Low/weak correlation

These results further trail the study of Samera (2022) in which there is importance of the extent of incident command system challenges of public schools on disaster risk reduction management, wherein the level of perception of school heads on the schools' disaster risk reduction management was challenged to the attention of the educational community members. Hence, there is a significant relationship between the level of importance of incident command system challenges in public schools on disaster risk reduction management. Further, there is a significant relationship between the level of importance of incident command system challenges in public schools on disaster risk reduction management and the extent of challenges of school heads on the school's preparedness. Besides, the disaster risk reduction management (DRRM) program in public schools is well implemented, in public schools are also very capable of responding to hazards in the occurrence of disasters. Thus, there is a significant relationship between the status of DRRM implementation and the level of capabilities among public school administrators (Tabilon-Tizon & Comighud, 2020).

4.0 Conclusion

This study illuminated the scenario of the call of nature, specifically on the status of implementation of disaster risk reduction and management in a public school. The identified profile variables contributed to the remarkable differences and relationships in the implementation of disaster risk reduction and management policies and practices, including the three pillars of comprehensive disaster risk reduction and management in basic education. The higher the schools' level of implementation of disaster risk management practices, the higher their level of readiness for disasters. To include, the respondents agree on the challenges in the implementation of disaster risk reduction and management. Finally, the addition of relevant profile variables may be incorporated for future study and may look at the potential strategies in preparation for disaster and to combat the aftermath of the instance.

5.0 Contributions of Authors

All authors contributed equally to all aspects of the research, including conceptualization, design, data collection, analysis, writing, and revision of the manuscript. Each author played an integral role in ensuring the study's accuracy, coherence, and overall quality.

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7.0 Conflict of Interests

There are no conflicts of interest in this study. The authors declare that they have no financial or non-financial competing interests that could have influenced the research.

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