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Extent of Disaster Risk Reduction Management in Selected Elementary Schools: Evidence from the Philippines

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Abstract

This study examined the implementation of Disaster Risk Reduction Management (DRRM) in the 11 Elementary Schools in Santiago District in the Philippines using the Gawad Kalasag criteria. It determined the problems encountered by the schools in the implementation of DRRM and assessed the areas of enabling environment, safe learning facilities, school disaster risk reduction management, and disaster risk reduction (DRR) in education. Complete enumeration was employed for the school heads and DRR coordinators while random sampling for teachers and pupils. The responses were analyzed using a four-point Likert scale weighted mean. The results found that the schools have fully implemented safe learning facilities and partially implemented enabling environment and school disaster risk reduction management criteria, with the lowest mean in the DRR in education criteria. Common problems encountered in the implementation of DRRM include creating policies, lack of personnel and budget, and lack of education and information. The study recommends development of DRR integration module, conduct of DRRM training, and budget allocation on DRR.

Keywords: *disaster risk reduction management, gawad kalasag, enabling environment, safe learning facilities, DRR in education*

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1. Introduction

The Department of Education (DepEd) Order No. 50 and 80 series of 2011 had been put in place to ensure that the safety of both teachers and students in the Philippines is taken into consideration. By establishing these orders, the DepEd is striving to ensure that all schools in the country are as prepared as possible for any emergency or disaster situation, reducing the potential risk to both teachers and students. By making sure that schools are adequately prepared for any emergency, the DepEd is determined to ensure the safety of the children and young adults.

While the DepEd has issued several orders to mitigate the effect of calamities, there are several studies conducted to measure the effectiveness of the implementation through the Disaster Risk Reduction Management (DRRM). For instance, Dela Cruz and Ormilla (2022), Tizon and Comighud (2020), Cubillas (2021), Cubillas (2018), Ecolin-Campilla (2017) and Cubillas et al. (2022) assessed the implementation of the DRRM in several public schools in the different areas of the Philippines to establish the good practices and identify challenges. Moreover, there are also several studies measuring the knowledge and awareness of the teachers and students on risk reduction (Ronquillo, 2020; Lapada, 2022) and integration of the DRR in the school curriculum (Cabilao-Valencia et al., 2018). While most of the studies showed satisfactory implementation of the DRRM in the different schools in the Philippines and generally satisfactory level of knowledge and awareness of both students and teachers on risk reduction, there are still identified discrepancies on its implementation (Cubillas, 2021; Cubillas, 2018) specifically in the Butuan area in the Philippines. In addition, the previously conducted studies are focused on remote areas and regions rather than high risk areas in the country.

One of the high risk areas in the Philippines is Santiago District. It is located in Mindanao region that is highly prone to natural disasters such as earthquakes, floods, and landslides. There are several studies emphasizing the risk of natural disasters in the region (Eugenio et al., 2016; Cayamanda, 2020; Cayamanda et al., 2021; Cayamanda & Paunlagui, 2022) in general and the Santiago District in particular (Varela et al., 2021; WWF-Philippines, n.d.). With the studies pinpointing that the area has increasing frequency and intensity of disasters and has discrepancies in the implementation of DRRM in public schools, there is a need to understand how the risk of these disasters can be managed better specially in the elementary schools. Hence, this study assessed DRRM in the 11 elementary

schools located in Santiago District. It aims to identify the current practices and challenges related to DRRM.

2. Literature review

2.1. Disaster

Disasters are sudden events that bring disruption to a society with human, material, economic, and environmental losses or impacts that exceed the ability of the affected community to cope by using their own resources (UN/ISDR, 2009). According to a report from the United Nations (2015), the rate of weather-related disasters (such as cyclones, typhoons, and droughts) is growing. Between 2005 and 2014, the annual average of weather-related disasters was 335, an increase of 14 percent from 1995 to 2004 and almost twice the average recorded from 1985 to 1995. In the past 20 years, 90 percent of major disasters have been caused by 6,457 recorded floods, storms, heat waves, droughts, and other weather events. Indonesia, India, and the Philippines are among the five countries hit by the highest number of disasters, besides the United States and China (ChildFund International, 2013). Disasters present a challenge to the affected community's ability to problem-solve, organize, and act in its own best interest, regardless of or together with local and government emergency agencies (Lippmann, 2011). On a global scale, disasters have the most significant and diverse effects on human beings, such as displaced populations, health risks, food scarcity, and emotional aftershocks (ChildFund International, 2013). These adverse effects of disasters always stem from hazards, either natural or man-made.

2.2. Hazards

Hazard is a situation where there is a threat to life, health, environment, or property. Natural hazards, such as floods, typhoons, earthquakes, and landslides, have been a part of human life for centuries, and people have developed their own methods of protection. This knowledge is referred to as "indigenous knowledge" and is based on the skills, resources, and experiences of the affected communities (Guarnizo, 1992). Additionally, natural hazards have been found to cause extensive losses and damages to human lives, physical facilities, and socio-economic conditions, as well as increasing the stress and vulnerability of those affected and disempowering individuals and society (DO No. 37, s. 2015). Thus, it is essential to better understand these hazards and how to protect against them.

2.3. Enabling Environment

It is a school surroundings and classrooms that children learn and develop best in caring, supportive environments which respond to their individual needs, allowing them to play and explore. Meanwhile, learning environment is the context for informal and formal curricula and the matrix that nurtures or inhibits learner growth (Robins, 2005). According to Mahlapahlapana et al. (2014), schools can keep students safe by providing a supportive, respectful, and a caring environment, where students are both secure from physical harm and emotional toxicities (such as bullying, and prejudice), and nourished by community connections to caring teachers and students. Walker et al. (2016) assert that the degree of support in the environment can shape a person's resilience while environment that is stressful can foster disease. In addition, Young et al. (2016) found that learning environments are a significant determinant of student behavior, achievement and satisfaction. Therefore, it is a great challenge to all schools to create an enabling environment.

2.4. Safe Learning Facilities

School facilities are the plan or layout of the building or buildings collectively used for instructional purposes (Australian Council for Educational Research, 2008). It is about the structural and cosmetic conditions of the school with its overall building condition, the age of the building, the windows, the lighting, the ventilation in the instructional areas, and its compliance with the building code. According to Building Educational Success Together (2005), it is the responsibility of educators in every state to ensure that every child had school facilities that provide an educational setting suited for teaching and learning. The poor condition of some schools raised serious concerns about teacher and student safety. Further, Lacoe (2020) emphasizes that when students feel safe, it is easier for them to be at ease, concentrate, analytical, creative, and reflective. When students and teachers feel unsafe, their biological response to the perception of threat compromises their ability to attend to and process information. Their body's response to perceived and real threats to their life, person, or basic sense of safety, affects their emotional regulation, cognition, and their ability to establish positive social relationships as well as their physical health (through allostatic stress). These biological and social-emotional factors are critical to school success. This is particularly the case when trauma is chronic and experienced early in life (Cook et al., 2005; D'Andrea et al., 2012; Evans et al., 2013; Kaplow et al., 2006; McEwen, 1998; Perry & Pollard, 1998). It is therefore essential that school facilities are in good condition in order to

create an environment that is conducive to teaching and learning. Poor school facilities can have a detrimental effect on student's physical and mental health, as well as their academic success. Educators must take responsibility to ensure that every child has access to quality education in safe and effective school facilities.

2.5. Disaster Risk Reduction and Management (DRRM)

DRRM is a systematic process of utilizing administrative directives, organizations, and operational capacities to develop strategies, policies, and improved coping mechanisms in order to reduce the negative effects of hazards and the likelihood of disaster. This is in line with the definition stated in DO No. 37, s. 2015, which is further reinforced by the United Nations International Strategy for Disaster Reduction (UNISDR, 2015). It suggests that disaster management is the organization and management of resources and responsibilities in order to address the humanitarian aspects of emergencies, such as preparedness, response, and recovery. This is in contrast to the traditional approach to disaster management, which focused primarily on emergency response.

There are 16 indicators that contribute to School DRRM. The contingency plan provides an organized way to respond to disasters and emergencies, while the tracking system and first aid kits ensure the safety of students and personnel (Fischer et al., 2019). The pieces of equipment and hazard-specific drills are essential for preparing for and responding to disasters. The early warning system and resumption strategies provide further protection, as well as psychosocial interventions. The evacuation plan and student-family reunification plan are essential for ensuring the safety of students and personnel in the event of a disaster. Finally, participation in the different DRRM/CCA/EiE activities and the completion of the Family Preparedness Plan together provide additional resources and knowledge to the school to help manage potential disasters.

In the 21st century, it has become increasingly evident that disasters are not caused by natural hazards alone (Ismail-Zadeh, 2022; Pearce, 2022). It is by reducing and managing the conditions of hazard, exposure, and vulnerability that we can prevent losses and minimize the impacts of disasters. Thus, we must focus on reducing vulnerability and exposure to hazards, which can be done by recognizing and addressing the underlying risk drivers. These drivers, such as economic and urban development, environmental degradation, poverty and inequality, and climate change, are the main sources of vulnerability and exposure, and thus the main targets for risk reduction (Lal et al., 2009).

It is clear that the DepEd has made a strong commitment to ensuring a safe learning environment and reducing disaster risk through the implementation of various programs, such as the Gawad KALASAG. The Gawad KALASAG is designed to encourage stakeholders to collaborate in crafting and implementing DRRM programs, while also recognizing the exceptional contributions of DRRM practitioners and promoting volunteerism to reduce the impact of risk. Therefore, it is taking a proactive approach to ensure a safe learning environment for students. In response to this, the Philippine government enacted Republic Act 10121 or the Philippine Disaster Risk Reduction and Management (DRRM) Act of 2010. This Act seeks to promote a holistic, comprehensive, integrated, and proactive approach to mitigating the socio-economic and environmental impacts of disasters, including climate change, while also encouraging the involvement and participation of all stakeholders - at all levels, particularly the local community. This mandates the creation of policies and plans, implementation of actions and measures pertaining to all aspects of disaster risk reduction and management, the institutionalization of good governance, risk assessment and early warning, knowledge building and awareness raising, reduction of underlying risk factors, and preparedness for effective response and early recovery.

Despite the efforts, natural disasters still cause serious damage to properties and often claim lives, as seen in typhoon Yolanda in Ormoc in 2013. Studies have shown that public hazard education and levels of preparedness remain low (Ballantyne et al., 2000; Lindell & Whitney, 2000; Paton et al., 2000; Paton et al., 2001; Torani, 2019; Ozmen, 2006; Weber, 2018; Rostami-Moez, 2020). Furthermore, people have not fully internalized the importance of disaster preparedness, making it not part of their usual practice. Thus, Republic Act 10121 serves as a crucial step in the effort to reduce the risks posed by natural disasters, and to ensure that all stakeholders are prepared for the eventuality of such occurrences. Despite the government's increased efforts to educate the public on disaster preparedness, there is still a need to ensure that the public is able to internalize the concepts and fully understand the importance of being prepared, in order to minimize the damages and casualties should a disaster occur.

2.6. DRR in Education

The Philippines is a nation at risk of natural disasters, with its location in the Western Pacific exposed to typhoons, earthquakes, floods, and volcanic eruptions. In recent years, the

number and severity of these disasters have increased, leading to an increase in the number of people affected (World Bank, 2021). As a result, it is essential that the nation adopts effective Disaster Risk Reduction (DRR) strategies to protect its citizens and reduce the impacts of disasters. DRR in Education in Emergencies is an attempt to systemically analyze and reduce disaster risks in order to provide quality education to learners both during and after emergencies. The National Disaster Risk Reduction and Management Council (NDRRMC) of the Philippines aims to raise awareness of integrating DRR concerns into education policies, programs, and plans and to advocate for changing practices in schools.

The primary objective of DRR in Education is to integrate disaster risk analysis and mitigation measures into education sector development policies, planning, and financing. To ensure that students are knowledgeable about the risks and how to respond to them in their schools and communities, educational initiatives promoting Disaster Risk Reduction in Education (DRR-E) should be implemented. Schools all over the country should incorporate DRRM into their curricula by utilizing a variety of instructional strategies. Textbooks should be utilized to provide students with knowledge of the different concepts and issues related to natural hazards. Such initiatives should provide students with the necessary knowledge and skills to identify what makes their school or community unsafe, as well as the appropriate actions to take before, during, and after natural disasters. Education is a key factor in building the nation's resilience to disasters and equipping the population with the skills, knowledge, and resources to respond to disasters. It is evident in the study of Mamon et al. (2018) that the safety of children is a priority during disasters, and that their active participation in DRRM is vital for its success. DRR in education is of particular importance in the Philippines.

Various studies have highlighted the importance of DRR in education in the Philippines. For example, a study conducted by the United Nations International Children's Emergency Fund (UNICEF) found that over 80% of schools in the Philippines lack adequate disaster risk reduction measures. Similarly, a study by the Philippine Institute for Development Studies found that only a small percentage of schools have evacuation plans or disaster drills in place. DRR in education is essential in the Philippines, as it can help to reduce the impacts of disasters and build resilience. The government should take steps to ensure that DRR measures are in place in all schools, including providing training and resources to teachers, developing evacuation plans, and raising public awareness. By doing

so, the nation can ensure that its citizens are adequately prepared for disasters and that the learning environment is safe and secure.

3. Methodology

Using quantitative survey design, this study has complete enumeration of 11 school heads and 11 DRR coordinators while random sampling of 102 teachers and 352 pupils from 11 elementary schools in Santiago District in the Philippines for the purpose of data gathering. All participants answered the four (4) Gawad KALASAG assessment tool criteria namely: enabling environment, safe learning facilities, disaster risk reduction and management and drr in education. The instrument is composed of two parts. Part I is a tool adapted from Gawad KALASAG while part II contains the problems experienced by the school in the implementation of DRRM. The questionnaire is a four-point Likert's scale and supplemented by unstructured/informal interview.

The Gawad KALASAG assessment tool contains the following criteria:

Enabling Environment. This is used to identify the level of DRR-related policies, programs, and resources at the local, regional, and national levels that support DRR and DRR in Education. The ten (10) indicators create an enabling environment. By adapting and localizing existing policies, the school has demonstrated that they take DRR/CCA seriously and are willing to take the initiative to make changes that will have a positive impact. The School DRRM Team and School DRRM Plan provide an organized structure for DRR/CCA activities, ensuring that all necessary personnel are aware of their roles and responsibilities, and that all necessary steps are taken to reduce risk and prepare for potential disasters. The budget allocated for regular DRRM activities ensures that the school has the necessary resources to carry out those activities. The student-led school watching and hazard mapping, as well as the inclusion of students in DRRM planning, demonstrates the school's commitment to involving students in the process and encourages their engagement. The data collection and consolidation of DRRM programs and activities allow the school to track their progress and measure their impact. The Rapid Assessment of Damages Report and the completed DRR-related questions in the EMIS/EBEIS demonstrate the school's commitment to monitoring and reporting incidents and impacts. Finally, the identification of partnerships that can be tapped to support DRRM programs and activities shows the school's commitment

to collaboration and partnership building. All of these indicators work together to create an enabling environment for DRR/CCA.

Safe Learning Facilities. This evaluates the physical safety of educational facilities. It is composed of five (5) indicators that are important in ensuring a safe learning environment for students. A school that follows the approved standard design and specifications of the building/classroom components helps to ensure that the facility is structurally sound and safe for use. A risk assessment of the building can help identify potential safety hazards that may need to be addressed. Taking appropriate action to address identified safety hazards and undertaking regular inspections and repairs of minor damages help to ensure that the school is free from potential dangers. Finally, having clear roles and functions of the school in camp management and being aware of relevant laws and regulations related to evacuation centers help to ensure a safe learning environment for students.

Disaster Risk Reduction and Management. This evaluates the capacity of the educational institution to respond to, mitigate, and manage disasters. It looks at the level of preparedness, including the availability of resources, the development of plans and procedures, and the training of staff and other personnel in DRR and DRR in Education.

DRR in Education. This evaluates the level of DRR education and training that is provided to staff, students, and other stakeholders in the educational institution. The six (6) indicators are important in DRR in education because they demonstrate the level of preparedness of a school's capacity to respond to disasters. For example, if the school has integrated key DRRM/CCA/EiE concepts in at least 4 subjects based on the national curriculum guide, it shows that the school has taken the initiative to prepare their students for disasters. Furthermore, having a DRRM/CCA/EiE capacity-building plan for teachers and personnel, DRRM/CCA/EiE training, and DRRM/CCA/EiE resource materials available indicate that the school is taking proactive steps to build the capacity of its staff to mitigate the effects of disasters. Finally, having a DRRM corner in every classroom and having more than 75% of students actively participating in various DRRM/CCA/EiE activities demonstrates that the school is effectively engaging with its students to help them understand the importance of DRR, and to equip them with the relevant knowledge and skills to respond effectively in the event of a disaster.

The study ensured proper ethical procedures are followed in the conduct of the data gathering. The aims of the study were explained before handing out the survey. The participants also signed the informed consent form that they can withdraw from the survey at any time.

The responses were analyzed using weighted mean and standard deviation.

4. Findings and Discussion

Table 1

Enabling Environment

Indicators	Mean	SD	VI	QD
The School has….				
1. adopted/adapted/localized at least 3 existing policies relating to DRRM/CCA/Education in Emegencies (EiE) in education/school safety	3.48	0.72	Sometimes	PI
2. formed School DRRM Team, with a focal person and consisting of personnel from different offices; with defined membership and roles and responsibilities/function	3.45	0.86	Sometimes	PI
3. comprehensive School DRRM Plan, which includes; CCA and EiE measures, covering risk assessment, risk reduction, and rehabilitation and recovery	3.43	0.73	Sometimes	PI
4. allocated budget that supports regular DRRM activities (SIP/AIP)	2.73	1.08	Sometimes	PI
5. conducted student-led school watching and hazard mapping {DO 23 s. 2015} and involved students in DRRM planning	3.24	0.96	Sometimes	PI
6. incorporated results of student-led school watching and hazard mapping in the School DRRM Plan and School	3.18	0.89	Sometimes	PI
7. data collection and consolidation of programs and activities on DRRM, covering the 3 Pillars to monitor resulted and impact exist	3.20	0.95	Sometimes	PI
8. conducted Rapid Assessment of Damages Report {RADAR} is submitted to Central Office, within 72 hours after the onslaught of a hazard in the area	2.98	0.93	Sometimes	PI
9. 100% completion of DRR related questions in the EMIS/EBEIS	3.08	0.87	Sometimes	PI
10. an identified partnerships that could be tapped to support its DRRM programs and activities, including those during after a disaster	3.23	0.91	Sometimes	PI
Average	**3.20**	**0.89**	**Sometimes**	**PI**

Legend: *1.0-1.50 Never (Not Implemented); 1.51-2.50 Rarely (Poorly Implemented); 2.51-3.50 Sometimes (Partially Implemented); 3.51-4.0 Always (Fully Implemented)*

The data in table 1 shows that, on average, the enabling environment indicators are only '*Partially Implemented*' in schools in Santiago District. This suggests that there is still a lot of work to be done to ensure all schools in the district have an optimal enabling environment. As Walker et al. (2016) argues that the degree of support in an environment can have an impact on a person's resilience, while an environment that is overly stressful can lead to illness. It is therefore important to strive to achieve the best possible outcomes for learners.

The indicator of the school adopting/adapting/localizing at least 3 existing policies relating to DRRM/CCA/Education in Emergencies (EiE) in education/school safety got the highest mean of 3.48 but still partially implemented, showing that the majority of the schools in the district are aware of the importance of school safety. According to Mahlapahlapana et al. (2014), providing a supportive, respectful, and caring environment, where students are both secure from physical harm and emotional toxicities (such as bullying, and prejudice), and nourished by community connections to caring teachers and students, can keep school children at ease and help them to succeed in school. The indicators for enabling the environment encourage the school to engage in partnerships such as involving students in school watching and hazard mapping and other stakeholders to support DRR activities. Although partially implemented, this is a sign of a good start in the District toward ensuring the safety of their schools.

Table 2

Safe Learning Facilities

Indicators	Mean	SD	VI	QD
1.The school abides with the DepEd and/or National Building Code approved standard design and specifications of the school building/classroom components.	3.26	0.69	Sometimes	PI
2.The School conducted risk assessment of buildings, in coordination with the Education Facilities Division, and with support of other agencies and partners	3.27	0.81	Sometimes	PI
3.The School has taken appropriate action with respect to unsafe school building {e.g upgraded/retrofitted, non-usage, ect}	3.25	0.78	Sometimes	PI
4.The school has undertaken regular inspection and repair of minor classroom (including facilities) damages	3.28	0.75	Sometimes	PI
5.The School Heads are clear with the roles and functions of the school in camp management vis-a vis the LGU and DSWD as per Joint Memorandum Circular No.1 series of 2013 "Guidelines on Evacuation Center Coordination and Management" and RA 10821 "Children's Emergency Relief & Protection Act" and its corresponding IRR	3.23	0.76	Sometimes	PI
Average	**3.26**	**0.76**	**Sometimes**	**PI**

Legend: *1.0-1.50 Never (Not Implemented); 1.51-2.50 Rarely (Poorly Implemented); 2.51-3.50 Sometimes (Partially Implemented); 3.51-4.0 Always (Fully Implemented)*

Table 2 presents the results on safe learning facilities in Santiago District. On average, the facilities were rated as partially implemented, which means, while some progress had been made, there was still room for improvement. The indicator with the

highest mean score was "the school has undertaken regular inspection and repair of the minor classroom (including facilities) damages," with 3.28. This suggests that the schools take particular care with the maintenance of classrooms and facilities. This is in line with Building Educational Success Together (2005), which asserted that it is the responsibility of educators to provide quality education in school facilities that are suited for teaching and learning.

The poor condition of some schools has raised serious concerns about the safety of teachers and students. The indicator “school Heads are clear with the roles and functions of the school in camp management vis-a-vis the LGU and DSWD as per Joint Memorandum Circular No.1 series of 2013 entitled “Guidelines on Evacuation Center Coordination and Management” and RA 10821 “Children’s Emergency Relief & Protection Act” and its corresponding IRR scored the lowest mean of 3.23. This indicates that school heads must take more attention to understanding their roles and functions in the school learning facilities.

Overall, these results indicate that the school is generally meeting the standards for building design and safety, and is taking appropriate action with respect to unsafe buildings. However, the school is not always clear with the roles and functions of the school in camp management, as evidenced by a mean score of 3.23 and a variability index (VI) of "Sometimes". The VI is a measure of how consistently the school is meeting the standards. A score of "Sometimes" indicates that there are some inconsistencies in how the school is meeting the standards. The quality index (QI) is a measure of the overall quality of the school's performance. A score of "PI" indicates that the school is performing at a satisfactory level.

Table 3 reflects the School Disaster Risk Reduction Management. The results indicate that the school has some level of preparedness for disasters and emergencies, but not all necessary measures are in place. The mean score was 3.20, which is below the mid-point of 5, indicating that the school is sometimes prepared for disasters and emergencies. The standard deviation of 0.87 shows that the responses were fairly consistent, suggesting that the school is not significantly more or less prepared in any particular area. The Variability Index (VI) of “Sometimes” and the Quality Distinction (QD) of “PI” suggest that the school is at a moderate level of preparedness and further measures may be necessary to ensure the school is adequately prepared for disasters and emergencies.

Table 3

School Disaster Risk Reduction Management

Indicators	Mean	SD	VI	QD
1. The school has a prepared a contingency Plan,(i.e. Preparedness Plan turned into response actions when a disaster strikes)	3.44	0.87	Sometimes	PI
2. The school has established a school personnel and learners tracking system/protocol in the event of a disaster or emergency	3.44	0.87	Sometimes	PI
3. The school has available, accessible, and adequate first aid kit in every instructional classroom	3.38	0.77	Sometimes	PI
4. The school has prepared at least 2 necessary and functional equipment, in case of a disaster { e.g. fire extinguisher, handheld/base radio,generator. Ect.}	3.36	0.82	Sometimes	PI
5. The school has conducted regular hazard-specific drills with participation of stakeholders: {BFP, Medics, LGUs, NGOs, community, PTA, alumni}	3.15	0.92	Sometimes	PI
6. The school has established functional early warning system to inform students and personnel of hazards and emergencies {protocol, warning signs, devices, IEC}, considering national and LGU warning systems and protocols	3.19	0.87	Sometimes	PI
7. The school has trained personnel to administer first aid to students and personnel	3.2	0.86	Sometimes	PI
8. The school has pre-identified spaces for putting up Temporary Learning spaces/shelters in the aftermath of a disaster or emergency	3.38	0.74	Sometimes	PI
9. The school has ready resumption strategies and alternative delivery modes to ensure education continuity {strategies, materials, focal person to implement}	2.81	0.84	Sometimes	PI
10. The school has psychosocial interventions for personnel and students	2.8	0.93	Sometimes	PI
11. The school has trained teachers and other personnel who could provide psychosocial support to students	2.75	1.02	Sometimes	PI
12. The school has an evacuation plan and procedures	3.37	0.82	Sometimes	PI
13. The school has a student-family reunification plan that is clearly disseminated to students, teachers and parents	3.2	0.86	Sometimes	PI
14. The school has conducted awareness and capacity building for families and learners	3.29	0.67	Sometimes	PI
15. The school participated in the different DRRM/CCA/EiE activities of the LGU	3.38	0.97	Sometimes	PI
16. 80% of students and their families have accomplished the Family preparedness Plan together { family Evacuation, reunification}, as per DO No. 27, series of 2015	3.01	0.96	Sometimes	PI
17. Hazard and evacuation maps are located in con conspicuous places in the school	3.32	0.96	Sometime	PI
Average	**3.2**	**0.87**	**Sometimes**	**PI**

This proved that the studies conducted by Ballantyne et al. (2000), Duval and Mulilis (1999), Lindell and Whitney (2000), McClure et al. (1999), Mulilis and Duval (1995), Paton et al. (2000) and Paton et al. (2001) all point to a low level of DRRM implementation. Even with considerable efforts and expenditure on public hazard education, the level of

preparedness remains low. It is clear that people have not fully internalized disaster preparedness and it has not become part of their usual practice. Since it is not possible to reduce the severity of natural hazards, the best opportunity for reducing risk lies in reducing vulnerability and exposure, for which Disaster Risk Reduction Management plays an important role.

Table 4
DRR in Education

Indicators	Mean	SD	VI	QD
1. The school has integrated key DRRM/CCA/EiE concepts in at least 4 subjects based on the national curriculum guide.	3.39	0.64	Sometimes	PI
2. The school has prepared a DRRM/CCA/EiE capacity building plan for teachers and personnel	3.06	0.86	Sometimes	PI
3. The school Head and personnel have received at least 3 DRRM/CCA/EiE trainings from division or region or partners	2.85	0.84	Sometimes	PI
4. The school has at least more than 10 DRRM/CCA/EiE resource materials are available.	2.76	0.82	Sometimes	PI
5. The school has DRRM corner, with updated IEC materials posted in it, in every classroom	3.15	0.94	Sometimes	PI
6. More than 75% of students are actively participating in various DRRM/CCA/EiE activities	3.51	0.67	always	FI
Average	**3.12**	**0.79**	**Sometimes**	**PI**

Legend: *1.0-1.50 Never (Not Implemented); 1.51-2.50 Rarely (Poorly Implemented); 2.51-3.50 Sometimes (Partially Implemented); 3.51-4.0 Always (Fully Implemented)*

The result of DRR in Education, as presented in table 4, has an average of 3.12, indicating partial implementation. Around 78% of the schools have started the implementation of DRR while around 22% are considered not implementing. The highest mean of 3.51 was achieved in indicator 6, showing majority of schools are involving their students actively in various DRRM activities. This is in line with the stories of young Tilly Smith, who saved the lives of 100 tourists from a beach in Thailand in December 2004, and Yogjakarta, wherein children taught their parents about what to do in case of an earthquake. Integrating DRR into school lessons will save lives, particularly in disasters and calamities.

5. Conclusion

This study assessed the DRRM of 11 elementary schools in Santiago, Agusan del Norte in the Philippines. The study employed quantitative method to measure the DRR

strategies employed at each school assessed by the administrators, parents, teachers and students. The results revealed that the 11 public elementary schools varied significantly in their DRR management strategies. All of the schools had basic DRR plans in place, but some had more comprehensive plans than others. In addition, the study found that the DRR plans were often not adequately implemented or enforced. The results suggest that more comprehensive and consistently implemented DRR plans are needed in Santiago's elementary schools in order to effectively reduce the risk of disasters.

The results of this study provide strong support for the need to prioritize the development and enforcement of comprehensive DRR plans in Santiago District's elementary schools. Hence, the methodology of communication of these results should include sharing the findings with all stakeholders of the DRRM project including the school heads, DRR coordinators, teachers, and pupils. The findings should be shared in a comprehensive and understandable manner, which should include the results of the assessment, the common problems encountered, and the recommendations for improvement. It should be communicated through a variety of methods, such as face-to-face meetings, print materials, online materials, and social media. The communication should be tailored to the needs and preferences of the stakeholders, as this will ensure that the message is received and understood. Additionally, the communication should be ongoing and continuous, as this will help ensure that the implementation of the DRRM project is improved in the long term.

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References

Cabilao-Valencia, M.I., Mohammad Ali, Enok Maryani, Nana Supriatna (2018). Integration of Disaster Risk Reduction in the Curriculum of Philippine Educational Institution. Proceedings of the 3rd Asian Education Symposium (AES 2018). *Advances in Social Science, Education and Humanities Research*. 10.2991/aes-18.2019.104

Carmil D. & Breznitz S. (1991) Personal trauma and world view: are extremely stressful experiences related to political attitudes, religious beliefs, and future orientation. *J Trauma Stress 4:393–405*

Catedral Mamon MA, Vargas Suba RA, Son IL (2017). Disaster risk reduction knowledge of Grade 11 students: Impact of senior high school disaster education in the Philippines. *Int J Health Syst Disaster Manage* 2017;5:69-74

Cayamanda, K.G. & Paunlagui, M.M. (2022). *Community-based Risk Communication Management*. Institute of Industry and Academic Research Incorporated. DOI: https://doi.org/10.53378/12.22.003

Cayamanda, K.G. (2020). Exploring a Social Vulnerability Model for Disaster Studies: The Case of the 2011 Flashflood in Davao City, Southern Philippines. *International Journal of Educational Management and Development Studies*. Volume 1 Issue 1, pp. 43 - 75. DOI: https://doi.org/10.53378/346006

Cayamanda, K.G., Paunlagui, M.M., Baconguis, R.D.T. & Quimbo, M.T. (2021). Vulnerability Profile and Risk Perception towards an Inclusive Disaster Risk Reduction for the Flood Vulnerable Communities of Davao City. *International Review of Social Sciences Research*, Volume 1, Issue 1, pp. 25- 53. DOI: https://doi.org/10.53378/346474

Clarke Guarnizo, C. (1992*). Living with hazards. communities' adjustment mechanisms in developing countries*. In A. Kreimer & M. Munasinghe (Eds.). Environmental Policy and Research Division Environment Department, The World Bank.

Cubillas AU, Aviles GM & Cubillas TE (2022). Awareness, compliance and implementation of disaster risk reduction and management in flood-prone public elementary schools in Butuan city, Philippines. *International Journal of Educational Policy Research and Review* 9(4):156-171. https://doi.org/10.15739/IJEPRR.22.017

Cubillas, A.U. (2018). The implementation of the school disaster risk reduction and management program components of the disaster elementary schools. *International Journal of Current Research 10*, (11), 75309-75314

Disaster Risk Reduction Resource Manual (2008). *Safer Schools Resource Manual*. Department of Education (DepED) Philippines

DO 21, s. 2015. *Disaster Risk Reduction and Management Coordination and Information Management Protocol*

DO 23, s. 2015. *Student-Led School Watching & Hazard Mapping*

DO 27, s. 2015. *Promoting Family Earthquake Preparedness*

DO 37, s. 2015. *The Comprehensive Disaster Risk Reduction and Management (DRRM) in Basic Education Framework*

DO 50, s. 2011. *Creation of Disaster Risk Reduction and Management Office (DRRMO)*

Domingo Dela Cruz, R., & Ormilla, R. C. G. (2022). Disaster Risk Reduction Management Implementation in the Public Elementary Schools of the Department of Education, Philippines. *International Journal of Disaster Risk Management*, 4(2), 1-15. https://doi.org/10.18485/ijdrm.2022.4.2.1

Donner, W., &Rodriguez, H. (2011). Disaster risk and vulnerability: the role and impact of population and society. *Population Reference Bureau*. Retrieved November 28, 2016, from http://www.prb.org/Publications/Articles/2011/disaster-risk.aspx

Ecolin-Campilla, M. (2017). Disaster Risk Reduction Management Practices Of School Managers. *Asia Pacific Journal of Contemporary Education and Communication Technology* (APJCECT). Volume: 3, Issue: 1

Elena A. Eugenio, E.A., Lilibeth A. Acosta, L.A., Damasa B. Magcale-Macandog, D.B., Paula Beatrice M. Macandog, P.M., Elaine Kuan-Hui Lin, E.K., Jemimah Mae A. Eugenio, J.A. and Jessie B. Manuta, J.B. (2016). Adaptive capacity of Philippine communities vulnerable to flash floods and landslides: assessing loss and damage from typhoon Bopha in Eastern Mindanao. *International Journal of Sustainable Development*, Vol. 19, No. 3, pp 279-314. https://doi.org/10.1504/IJSD.2016.078290

Fischer, R. J., Halibozek, E. P., & Walters, D. C. (2019). Contingency Planning Emergency Response and Safety. *Introduction to Security*, 249–268. https://doi.org/10.1016/B978-0-12-805310-2.00011-1

Fletcher, SM, Thiessen, J, Gero, A, Rumsey, M. & Kuruppu, N. (2013). Traditional Coping Strategies and Disaster Response: Examples from the South Pacific Region. *Journal of Environmental and Public Health*, Vol. 2013: 264503. DOI:10.1155/2013/264503

Ismail-Zadeh, A. (2022). Natural hazards and climate change are not drivers of disasters. *Nat Hazards* 111, 2147–2154 (2022). https://doi.org/10.1007/s11069-021-05100-1

Lacoe, J. (2020). Too Scared to Learn? The Academic Consequences of Feeling Unsafe in the Classroom. *Urban Education*, 55(10), 1385–1418. https://doi.org/10.1177/0042085916674059

Lal, P.N., Singh, R. & Holland, P. (2009*). Relationship Between Natural Disasters And Poverty: A Fiji Case Study*. SOPAC Miscellaneous Report 678

Lapada, A. (2022). Disaster Risk Reduction Knowledge Among Filipino Senior High School Students. *Journal of Social Sciences Review*, 2(1), 56–73. https://doi.org/10.54183/jssr.v2i1.27

Mahlapahlapana T. & Osher, D. (2014). Schools as Enabling Environments. *South African Journal of Education*. Vol. 34, No. 4.

Manyena, B. Siambabala (2013). Disaster event: window of opportunity to implement global disaster policies. *Journal of Disaster Risk Studies* vol. 5, s. 2013

Martinez, S., Placino, P., & Philippines Geographic Society. (2015). *WHAT TO MAP: Integrating Geographic Information into Disaster Risk Reduction and Management. Social Studies Corner*. Retrieved November 28, 2016

NDRRMC Memorandum Circular no. 6, s.2012 dated May 16,2012 on the revised guidelines of Gawad KALASAG: Search for Excellence in Disaster Risk Regional Consultative Committee (RCC) on Disaster Management 2007.

Ozmen, F. (2006). "The level of preparedness of the schools for disasters from the aspect of the school principals", *Disaster Prevention and Management*, Vol. 15 No. 3, pp. 383-395. https://doi.org/10.1108/09653560610669873

Paton, Douglas (2003). Disaster preparedness: a social-cognitive perspective. *Disaster Prevention and Management* vol. 12, s. 2003 pp 210-216. DOI 10-1108/09653560310480686

Pearce, F. (2022). *It's Not Just Climate: Are We Ignoring Other Causes of Disasters?* Yale Environment 360. Yale School of Environment

Republic Act (RA) No. 10121 entitled "Philippine Disaster Risk Reduction and Management (DRRM) Act of 2010"

Roche, S., Propeck-Zimmermann, E., & Mericskay, B. (2011). GeoWeb and crisis management: Issues and perspectives of volunteered geographic information. *GeoJournal*, (78), 21-40. doi:10.1007/s10708-011-9423-9

Rodriguez, H., Wachtendorf, T., Kendra, J. and Trainor, J. (2006), "A snapshot of the 2004 Indian Ocean tsunami: societal impacts and consequences", *Disaster Prevention and Management*, Vol. 15 No. 1, pp. 163-177. https://doi.org/10.1108/09653560610654310

Ronquillo, R.B. (2020). Teachers' Preparedness on Disaster Risk Reduction and Management Measures among Public Senior High Schools in the Division of Batangas City. *International Journal of Innovative Science and Research Technology*. Volume 5, Issue 12, December – 2020

Rostami-Moez, M., Rabiee-Yeganeh, M., Shokouhi, M. et al. Earthquake preparedness of households and its predictors based on health belief model. *BMC Public Health* 20, 646 (2020). https://doi.org/10.1186/s12889-020-08814-2

Tizon, R.T. & Comighud, S. T. (2020). *Implementation of the Public Schools' Disaster Risk Reduction Management Program and Level of Capabilities to Respond*. UBT International Conference. 1.

Torani, S., Majd, P. M., Maroufi, S. S., Dowlati, M., & Sheikhi, R. A. (2019). The importance of education on disasters and emergencies: A review article. *Journal of education and health promotion*, 8, 85. https://doi.org/10.4103/jehp.jehp_262_18

Varela RP, Apdohan AG, & Balanay RM (2022). Climate resilient agriculture and enhancing food production: Field experience from Agusan del Norte, Caraga Region, Philippines. *Front. Sustain. Food Syst*. 6:974789. doi: 10.3389/fsufs.2022.974789

Walker, L. et al. (2016). *Psychosocial Environment*. Collaborative on Health and Environment 2016.

World Bank (2021). *Metadata Climate Change Knowledge Portal (CCKP)*.

WWF-Philippines (n.d.). *Business Risk Assessment and The Management Of Climate Change Impacts*.

Young JE, Williamson MI, & Egan TG (2015). Students' reflections on the relationships between safe learning environments, learning challenge and positive experiences of learning in a simulated GP clinic. *Adv Health Sci Educ Theory Pract*. Mar;21(1):63-77. doi: 10.1007/s10459-015-9611-3.