

Disaster Risk Reduction and Management of a Coastal Grade School: A Case Analysis

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ABSTRACT

Disaster risk reduction keeps the lives and source of living of community people from susceptibility to adversities or crises. This qualitative study, which used the case analysis design, focused on the different endeavors in implementing school disaster risk reduction and management of a coastal grade school, the Bernardo P. Ragasa Elementary School (BPRES). It utilized key informant interviews and focus group discussion to gather relevant data from participants who have associations with the school disaster risk reduction and management (SDRRM) of BPRES. After thematic analysis, this paper concluded that the endeavors in implementing SDRRM of BPRES revolved around its three pillars: 1) safe learning facilities, 2) school disaster management, and 3) risk reduction and resilience education. Further, despite the observable endeavors undertaken by BPRES, limitations still exist when it comes to proper implementation. Therefore, the different endeavors of BPRES on SDRRM were insufficient to capacitate the whole school community against disasters. Efforts to establish safer conditions, reduce the pressures, and address the root causes are required to address the gaps and barriers in implementing SDRRM in BPRES. With this vision to build a prepared and resilient SDRRM, a project proposal is crafted as an output of this study.

Keywords: Education, Facilities, Resilience, Safe learning

INTRODUCTION

The issue of disasters has become a global safety disturbance because of the catastrophic damages it gives to the whole worldwide community. The increasing level of poverty, partnered with natural and human-induced disasters such as typhoons, earthquakes, volcanic eruptions, tsunamis, fires, and man-made conflicts, increases the vulnerability of people, which weakens the community's resilience to disaster risks. Physical devastations and fatalities brought by these disasters have become constant news in all countries, and inevitably, these tragedies will persist and even worsen.

In the Philippines, people are no longer strangers to different devastating disasters. The country's geographical location is along the Typhoon Belt and the Pacific Ring of Fire, making it a consistent target of typhoons, volcanic eruptions, earthquakes, and storm surges. In 2013, one of the world's strongest and deadliest typhoons, Super Typhoon Yolanda, left the Visayan Islands in total devastation and killed more than 6,300 people. Furthermore, the same year, several earthquakes struck the Central Visayan Islands, which swept countless lives and properties.

In these disasters, schools are not exempted from different risks. Bernardo P. Ragasa Elementary School (BPRES) is a public elementary school located along the coastline of Tamorong, Sta. Catalina, Ilocos Sur. Its geographical location makes it vulnerable to disasters like any other coastal school in the country. In the study of Venezuela (2020), on climate change adaptation activities in selected coastal areas of Ilocos Sur, the respondents noticed an increase in the frequency of extreme events like coastal or tidal flooding, coastal soil erosion, saltwater intrusion, and intense typhoons.

Children are the most vulnerable to illnesses and traumas in these emergencies and require special care and attention. Luistro (2012) stated that disasters deprive children of their right to continuous quality basic education in a safe environment. These disasters set back the investments being made by the education sector. These continuously cause damages to thousands of schools, billions of peso destruction costs, and millions of affected school children in both elementary and secondary schools. The Filipino children who are achieving goals are hindered because of displacement. In most cases, schools become unusable for instruction due to damages, prolonged use as evacuation centers, unsafe access, and the loss of equipment and materials or lack of teachers. This idea was conceded by Gibbs et al. (2019) as they mentioned in their study that social disruption caused by natural disasters often interrupts educational opportunities for children.

These misfortunes prompted the creation of Disaster Risk Reduction and Management (DRRM) programs not only in the Philippines but in many countries in order to save lives and lessen destruction. Disaster preparedness has become a primary concern of the Filipino authorities, which led to the creation of the DRRM Program from the national to the local level through the Republic Act 10121 of 2010. The Department of Education (DepEd), being the agency tasked with the optimal development of the youth, mandates its schools to ensure the safety of the whole school community, especially the children. DRRM policies in the department had been developed for the school administrators, School Planning Teams (SPT), and School DRRM Councils to guide the schools with the standards on how to reduce risks and manage the effects of disasters. The importance of school DRRM in securing national safety is highlighted by the study of Mutsau and Billiat (2015), as they pointed out in their findings that many positive outcomes can be realized if disaster risk reduction is mainstreamed through the education of school systems for the schools act like magnets that pull the community at one epicenter.

This qualitative study was conducted to discover the existing gaps in the School DRRM of BPRES by investigating how policies could be implemented to build capacity against future vulnerabilities to disasters. A better understanding of the importance of identifying such breaches in policies would allow practitioners to establish specific indicators for disaster preparedness and could give information about the effectiveness of disaster recovery activities and would therefore be helpful to inform future disaster risk reduction and management programs.

Determining the endeavors in the implementation of School Disaster Risk Reduction and Management in an elementary school is the major concern of this study. It determines the roles played by the school DRRM team, the contribution of practiced policies of school

DRRM in BPRES against disasters, and possible improvement that may be recommended to DRRM of BPRES.

METHODOLOGY

The case analysis method was utilized in this study since it is a critical study of a particular area: the DRRM of a coastal grade school, the Bernardo P. Ragasa Elementary School (BPRES). Some of the approaches of Bermio (2017) were also taken into consideration. The school is a public elementary school located in Tamorong, Sta. Catalina, Ilocos Sur. It lies along the coastline of the municipality adjacent to the West Philippine Sea. The east part of the school has the Sta. Catalina-San Vicente River as its natural boundary to nearby farms. Its geographical location makes it vulnerable to disasters like any other school in the country. The semi-structured interview structure was followed. Specifically, this study used key informant interviews and focus group discussion methods to extract information from interviewees. The interviewees were composed of the BPRES DRRM Team, including representatives from the Sta. Catalina, Ilocos Sur BFP, Local DRRM Office, District DRRM Coordinator, Barangay Tamorong Council, school principal, teachers, pupils, and parents. The questions centered on the roles played by the SDRRM Team, the SDRRM endeavors in implementing policies, and the solutions for improvement. The responses were coded carefully and then subjected to thematic analysis to develop a right and clearer interpretation.

RESULTS AND DISCUSSION

The participants' responses were coded, analyzed, and themed under the three pillars of Comprehensive DRRM in Basic Education: 1) safe learning facilities, 2) school disaster management, and 3) risk reduction and resilience education. The findings are presented accordingly.

Safe Learning Facilities

This pillar refers to the school's physical and other related structures that should be safe and conducive to the physical, mental, and emotional well-being of learners as well as the teachers and administrators. Regarding roles or participation under safe learning facilities, the research participants mentioned their participation in SDRRM as builders of resilience by purchasing durable materials/facilities and being caretakers of existing ones. They are also facility inspectors and risk assessors. A participant's response backed this up: "We are assisting this school through fire safety inspections wherein we check if the electrical wirings of the classrooms are safe and if there are combustible materials that might ignite the fire."

Other participants mentioned the different DRRM policies being implemented in the school to create a safe learning environment. The policies include the following: 1) provision of first aid kits in every room that readily caters to the needs of injured persons; 2) construction of wide pathways that facilitate a good flow of traffic during evacuations; 3)

presence of drainage canals to avoid water stagnation and floods during typhoons; 4) implementation of Oplan Kalusugan; 5) the implementation of the National Greening Program; and 6) the hiring of one utility worker that leads the cleaning and greening projects of the school and making the surroundings free from hazardous objects before and after disasters. For the last question, the participants did on-site inspections, assessments, and observations to give timely, relevant, and comprehensive recommendations for the improvement of the school's DRRM.

The participants agreed that the school needs continuous retrofitting to meet new safety regulations. A participant mentioned that the old facilities were built without knowledge of disaster preparedness, which was why the budget for retrofitting must be allocated primarily from the MOOE. Other supplementary funds may as well come from other school proceeds coming from the canteen, farm, and pond rentals. Donations in cash or in-kind from alumni and other generous benefactors could also be a great support system for the school. The school's budget sourcing initiative was deemed necessary to fuel SDRRM endeavors more independently and readily. A participant suggested, "It is good if the school could already provide the needs of SDRRM because if we still request from offices, it would take time. These needs are urgent ones." While on the massive budget to construct new buildings and other school facilities, the national government would be the one capable of allocating.

School Disaster Management

This pillar refers to the duties and responsibilities of the DRRM team in planning, implementing, monitoring, and reporting DRRM initiatives of the school. In roles under school disaster management, a participant said, "My role is to prepare an Action Plan with my co-teachers and our school head. We are also obliged to implement DRRM policies." Other participants agreed with this statement. They work as activity or program planners, policy implementers, and information coordinators. They carried out instructions from memoranda and orders from higher offices like conducting drills, seminars, and training.

On building the school's capacity against disasters under school disaster management, a participant mentioned creating the SDRRM team and DRRM action plan as a primary step of ensuring that the school is building capacity against disasters. She added that the execution of the DRRM activities by the SDRRM team and the implementation of DRRM memoranda and policies were the primary endeavors the school was doing under disaster preparedness and risk mitigation. The implemented policies are fire and earthquake drills and the National Greening Programs. In the focus group discussion, the participants agreed that their coordination before, during, and after disasters also play a big part in safeguarding lives and properties.

On the recommended solutions under the school disaster management, improvement in the implementation of safety policies could be made by developing awareness and enforcement through in-depth readings and participation in seminars and training. Close monitoring of higher officials in the implementation of policies was also mentioned. Through proper and regular inspection, the SDRRM team could mandatorily exert more effort in their responsibilities and avoid negligence of duties. A participant

identified the thorough preparation of the SDRRM Plan as an initial step in improving the program. The plan for the whole school year should be comprehensive and derived from in-depth readings, keen observations or experiences, and the conduct of risk assessments. With a good SDRRM plan, the school should prioritize SDRRM policies over other school activities. A participant mentioned that good time management and the program's prioritization could be a great advantage to the school to capacitate against future disasters.

With the advancement of technology, the school should also establish an active communication system among all school stakeholders for fast information dissemination. Information, education, and communication materials could also be uploaded on the same media outlets and disseminated through text messages.

SDRRM is an arduous and complex job requiring all school stakeholders' cooperation. This is per Banatin's (2016) study on disaster risk reduction. He concluded that DRRM is a vital and complex task of the school, which requires assistance from the DepEd, government agencies, non-government agencies, and Higher Education Institutions. It is then also a task of the SDRRM team to link with these organizations and agencies to upgrade the quality of disaster risk reduction management.

Risk Reduction and Resilience Education

This pillar refers to integrating DRRM into the school curricula and extracurricular activities and providing necessary material support. It also covers building the capacity and skills of learners and personnel, particularly teachers. Many participants said that their role in risk reduction and resilience education was to teach, lecture, and train school personnel and pupils on disaster risk reduction and management during classes, seminars, and training. They also mentioned the DRRM flyers and posters that disseminate disaster awareness and preparedness information.

Risk reduction and resilience education undertakings, like teaching and training disaster preparedness and safety awareness through classroom discussions and drills on fire and earthquake, had essential roles in diminishing disaster vulnerabilities by enforcing DRRM in the minds of the whole school community. "Lamang ang may-alam," was a statement from a participant that adhered to the purpose of IEC materials posted on the school's DRRM bulletin board.

To improve risk reduction and resilience in education, a participant highlighted the provision of IEC materials in each classroom. Each should have posted safety information on bulletin boards. She also added that IEC materials should be localized in terms of language, and information be supplemented by illustrations for the pupils to understand better and easier the information being presented to them. A participant recommended this when he discussed that "It should not only be here on your SDRRM bulletin board where IEC materials are posted. All the classrooms should also have these. Additionally, it is better to translate these into Ilokano for the pupils to understand it better, especially for those in lower grades who still have difficulty reading English words. Putting pictures is also helpful so that when pupils see these pictures, they will already know what it is all about right away."

In addition, teachers should also be included in life-saving skills training as well as topics on psychosocial aspects, including peace education and conflict mitigation. The school

should also include DRRM lectures in School Learning and Action Cell sessions to ensure that all teachers are aware of the inclusion of DRRM in the curriculum and can implement it correctly.

The progression to safety, which the different mentioned recommendations could bring, is under the release model formulated by Hai and Smyth (2012) in their study. The model suggested that different undertakings to release the pressure between hazards and vulnerabilities would achieve a controlled situation and a resilient community, where there is no loss of life, few casualties, restricted damage, food security, and capacity to recover quickly from any impact of a hazard.

Analyses

This section is formulated on the findings of the study to answer the research question, keeping the literature review, research findings from the KII and FGD, and the policies and practices of SDRRM into consideration. To go into a deeper understanding of the DRRM of BPRES, the researcher analyzed through the lens of the pressure and release model. The models individually showed the progression towards vulnerability and safety. Each had three layers, and the reasons for the increase in vulnerability were recognized as unsafe conditions, dynamic pressures, and root causes. Subsequently, to reduce the intensity of the affected population from vulnerabilities, hazards would require to be mitigated to achieve safer conditions, reduce the pressures and address the root causes. This model, first developed by Blaikie et al. in 1994 and used by Chowdhury in his study on combating urban hazards (2017), was further discussed by Hai and Smyth in their article entitled "The Disaster Crunch Model."

Reasons for vulnerability:

Hai and Smyth (2012) mentioned that any hazard could be analyzed based on the force, warning signs, frequency and duration, and the time of occurrence, as well as it has to be both hazardous and vulnerable to be a disaster. Thus, the intensity of any disaster risk depends not only on the magnitude of the hazards, which were possible to happen in BPRES because of its geographical location but also on the degree of vulnerability of the people, which was known to exist because of mentioned unsafe conditions. Based on these two reasons, BPRES can be considered a vulnerable school.

Figure 1

The Pressure Model of BPRES DRRM

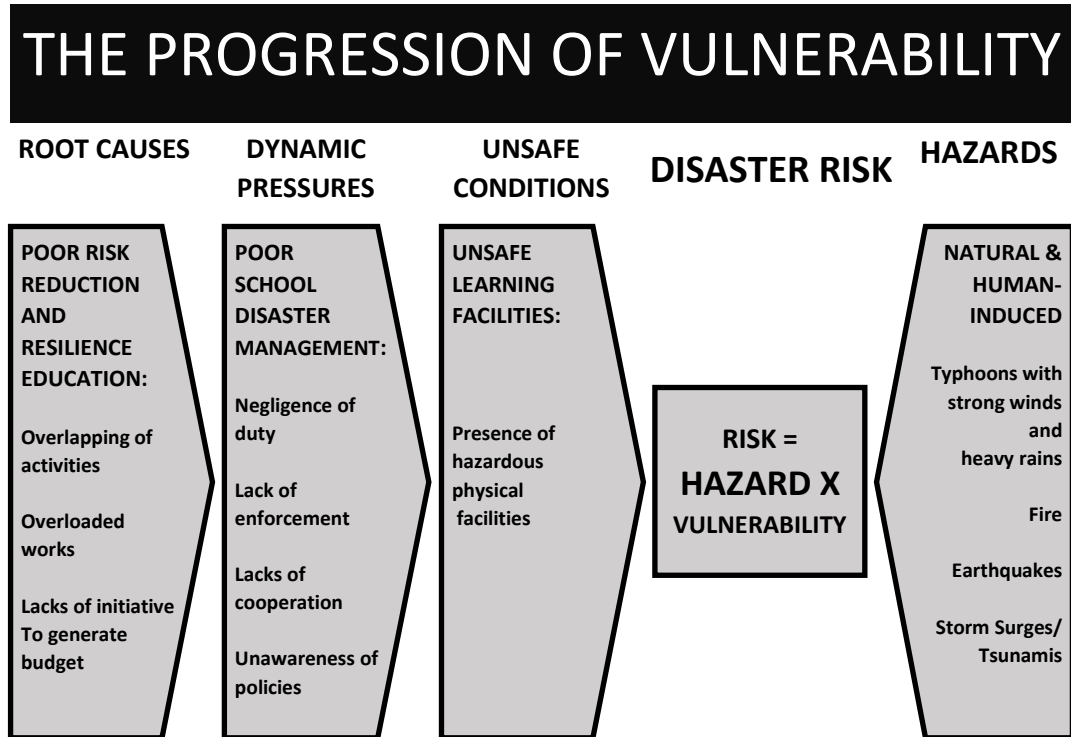


Figure 1 summarizes the reasons for the vulnerability of the school. It shows that the school's disaster risk is a product of natural and human-induced hazards and the vulnerabilities brought by the unsafe conditions, triggered by the dynamic pressures and originating from the root causes.

Unsafe Conditions. The BPRES community is vulnerable. This statement was based on several hazard occurrences that had taken place and were difficult to anticipate, resist and recover. In 2012, the school principal's office suffered damages caused by a fire. The faulty electrical wirings were the fire's origin, as reported by the BFP. Like other areas of the whole municipality, the school was always a consistent target of typhoons with strong winds and flood-causing heavy rains. Moreover, according to the data gathered from the Municipal Planning Office and the Local DRRMO, the school was very prone to earthquakes and tsunamis because of its geographical location.

The several existing elements of risks in BPRES were also the reasons behind the disaster vulnerability of the school. Old infrastructures were vulnerable to earthquakes. Old appliances, faulty electrical wirings, and the presence of combustible materials were prone to fire. Low-floored classrooms, broken windows, and the absence of two-story buildings make the school prone to flooding.

The raised issue of the faulty planning of construction and renovation of school buildings by the participants of the FGD was also alarming. If the absence of comprehensive risk assessments persists, the physical facilities of the school and even other schools in the country will continue to be prone to disasters. Hai and Smyth (2012) recognized that poor infrastructure and lack of disaster preparedness lead to unsafe conditions.

Dynamic Pressures. Under the pillar of safe learning facilities, a participant brought out his/her sentiments regarding the directives of DepEd and the DPWH on constructing and renovating school buildings. For safety precaution purposes, the project plans and designs must be handed to BFP and DRRMO for inspections. The current practice of schools is weak and ill, wherein they only ask for fire and safety permits when the construction and renovations are done already. It will be another waste of money and effort if safety measures are not followed, especially on electrical wirings. This was one of the reasons why the school had low beams and narrow gates, some low elevated classrooms, swing-in doors which are not helpful during an evacuation, and only two electrical outlets per room, which causes overloading and teachers using a lot of dangerous interconnected electrical extensions.

In school disaster management, unawareness and limitations of SDRRM practitioners in implementing SDRRM had been responsible for creating vulnerable conditions. In addition, the negligence of practitioners was a significant setback to DRRM implementation. Overloaded workloads and lack of time caused DRRM policies to remain unpracticed.

Regarding the cooperation of DRRM practitioners, a participant mentioned readily available assistance to the school from the local government unit partners in DRRM, but the coordination was not being observed regularly. Another limitation was observed when an office under LGU failed to enjoin the DRRM teams of all schools in the life-saving skills training conducted under their administration. In all LGU endeavors, which shall include capacity building against disasters of local communities, the schools should be one of the participants because it houses the children, who are considered the most vulnerable members of the society, as well as the teachers who should possess disaster awareness and preparedness skills to safeguard these children in times of emergencies. This issue was seen by Rotherberger et al. (2014) in their study on DRRM in the Philippines following the very destructive hit of super typhoon Yolanda. They concluded that, in general, the capacity for disaster risk reduction at the level of LGU is still low.

The SDRRM could be considered in good standing when it comes to work because of the safe conditions mentioned in the responses of participants that they had already established. However, the lack of enforcement of policies reflected that the SDRRM of BPRES still had a lot to improve.

Root Causes. Unawareness, negligence, and limitations of SDRRM practitioners in implementing SDRRM could result from teachers' overlapping school activities and overloaded work. With the numerous policies of DRRM, many were not being implemented in the school. The school was not practicing student-led hazard mapping that involves the

learners in DRRM planning. There was no existing data for student-family reunification plans that might help the teachers when pupils need to go home in an emergency. No known warning signal was established to be used when these emergencies would come, even though the warning signal facility was present already. Fire and other safety inspections were not being done consistently, even if the school knew that inspections must be done twice a year. The same was true for fire and earthquake preparedness seminars or training, which were done but not as prescribed. The fire and earthquake drills were quarterly done, but the proper routines of doing them were not observed. There were no floor plans posted in each room that could facilitate evacuation.

Moreover, the enforcement of other DRRM policies was also not enough. The segregated wastes under Solid Waste Management were not being appropriately treated. Handwashing and toothbrushing under the WINS program were not being done religiously. At the same time, dental and medical consultations were not done regularly. A participant honestly mentioned that sometimes, the execution of policies extends to where documentation requires reporting and monitoring only by higher officials. On the other hand, with regard to risk reduction and resilience education, a shortage existed in IEC posters wherein only the DRRM corner of the school had the DRRM posters. There were no DRRM bulletin boards in each classroom.

In addition, another participant pointed out the lack of monitoring of SDRRM implementation as one significant cause. Starting from the preparation of the SDRRM plan, monitoring should have been strictly undertaken to ensure that the plan results from assessments conducted in the school and covers all the policies given by higher offices. After the planning, the process of implementation should be checked. However, the school should not need higher officials to monitor SDRRM. Self-monitoring would already do. The SDRRM team should regularly monitor unsafe conditions in the school.

Another aspect found during this study was the budget allocation for SDRRM. In order to support the undertakings of the SDRRM, a budget would be needed, especially in the procurement of safety facilities. BPRES was already working on providing these facilities, as mentioned by participants in answering sub- question 2. However, some other essential facilities were still not provided. The school then should look for other sources of budget.

The limitations mentioned above of the school in the implementation of SDRRM would directly contribute to unsafe conditions of the school that would expose the whole school community to possible damage to properties and loss of lives. The SDRRM existed already, but there was still room for improvement for the SDRRM team.

Progress to Safety

Figure 2 summarizes the school's progression to safety by changing the direction of the variables in the equation of the Crunch Model of Disaster, as pointed out by the study of Hai and Smyth (2012).

Figure 2

The Release Model of BPRES DRRM



The progress toward safety was analyzed through the concept from a theoretical point of the Release Model, which could transform unsafe conditions into safe conditions. This transformation could be done by addressing root causes and dynamic pressures. The key idea was to lead toward mitigation through interventions that could reduce the impacts of school disasters. Reducing impacts could be done by addressing implementing systems and policies which were part of the pressures or root causes that increased the people's vulnerability.

Achieve Safer Conditions. To achieve safer conditions, the three pillars of the comprehensive DRRM in the basic education framework, namely: 1) safe learning facilities, 2) school disaster management, and 3) risk reduction and resilience education, should be addressed. Under pillar 1, more budget should be allocated to implement safety measures, and a regular risk assessment of the facilities should be undertaken to reduce impacts. In pillar 2, the school should exert maximum effort in implementing SDRRM policies. Moreover, the school should establish constant and effective cooperation with all DRRM practitioners. In the study of Chowdhury (2017) on urban hazards, he recognized that, to some extent, vulnerabilities could also be seen as a string that brings people together. This cooperation can successfully help to empower the preparedness of BPRES.

Lastly, educating the minds of the school community on DRRM could be a great tool to build capacity against disasters. For the pupils, the teachers' integration of safety and preparedness measures in the curriculum and the proper conduct of safety drills could effectively empower them when emergencies come. On the other hand, the teachers and

other school personnel could better equip their knowledge on DRRM by attending inclusive seminars and training.

Reduce Pressure. Emphasis on systematic and thorough risk assessment, planning, strict implementation of policies and programs, and the regular monitoring and evaluation of SDRRM endeavors could substantially help reduce the pressures.

Specifically, SDRRM of BPRES could be improved by constant retrofitting of school facilities to be fueled by the availability of budget, enforced cooperation of SDRRM and the local DRRM practitioners, the conduct of inclusive DRRM seminars and training to include the development of more comprehensive and localized IEC materials, SDRRM prioritization, proper time management of practitioners and regular monitoring and assessment. These endeavors were under the nine recommendations by Rothenberger et al. (2014) in their desk study on the Philippines' DRRM platform.

Address Root Causes. The existing policies of the SDRRM were already aligned with international DRRM standards, namely: Sustainable Development Goals (SDG), Hyogo Framework of Action (HFA), and Sendai Framework for Disaster Risk Reduction (SFDRR). The provision of SDRRM manuals by the DepEd shows its great endeavors to improve disaster preparedness and resilience of schools. With this, the schools should then increase knowledge and skills on DRRM to realize the purpose of the existing policies together with the partners in the LGU. This partnership agrees with the study of Queddeng (2018) on understanding the typhoon response of the Ilocano folks, wherein she recommended that continuous information dissemination, assistance, and guidance from the concerned agencies like the LGU and the PDRRMC should be made.

CONCLUSIONS

This paper found out that the roles played by the SDRRM team were being risked assessors, SDRRM planners, SDRRM policy implementers, and SDRRM information and education coordinators. These roles function under the three pillars of the comprehensive DRRM in the basic education framework: 1) safe learning facilities, 2) school disaster management, and 3) risk reduction and resilience education. Under these pillars, different endeavors were conducted under the DRRM of BPRES. The different endeavors are reflected in the implementation of different SDRRM policies. In addition, practiced policies under safe learning facilities, school disaster management, and risk reduction and resilience education were building the capacity of BPRES against disasters by diminishing the vulnerabilities of the school facilities and the whole school community. These would be achieved by establishing safer conditions, reducing the pressures, and addressing the root causes. On the other hand, unpracticed policies would bring about unsafe conditions, dynamic pressures, and root causes which would heighten the susceptibility of the school to disaster risks. With the limitations, SDRRM of BPRES could be improved by constant retrofitting of school facilities to be fueled by the availability of budget, enforced cooperation of SDRRM and the local DRRM practitioners, the conduct of inclusive DRRM seminars and training to include

the development of more comprehensive and localized IEC materials, SDRRM prioritization, proper time management of practitioners, and regular monitoring and assessment. Indeed, it is essential to determine the different endeavors in implementing SDRRM of BPRES. It was found that the SDRRM policies of BPRES revolve around the three pillars mentioned above. This paper further found that despite the existing observable endeavors undertaken by BPRES, limitations still exist regarding proper implementation. Therefore, it could be said that the different endeavors of BPRES on SDRRM were insufficient to capacitate the whole school community against disasters. More efforts are required to address the gaps and barriers in implementing SDRRM in BPRES.

RECOMMENDATION

Based on the conclusions drawn, the following recommendations are advanced: The DRRM practitioners should establish more enforced cooperation, starting from planning until the evaluation of activities to build a more prepared and resilient community. The Department of Education should conduct inclusive seminars and training on building capacity against disasters. The School DRRM Team of BPRES should consider executing the project proposal crafted from this study that shall address the limitations in implementing policies to promote the safety of the school community. Further research on specific disasters employing the Pressure and Release Model used in this study would give an insight into the situation of the schools in terms of disaster preparedness. For better understanding and observation, the inclusion of more organizations working on DRRM would be helpful, along with close discussion among the government policymakers.

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