

## Analyzing the Risks Affecting the School-aged Children in Disaster-Prone Areas in the Province of Bukidnon

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### *Abstract*

The school-aged children are among the vulnerable sectors in society in times of natural as well as anthropogenic calamities. This study described the hazards, exposures, and vulnerabilities of elementary school learners in the disaster-prone areas in the Province of Bukidnon, Philippines. It determined the effects of disasters, particularly landslide and flood to the school-aged children in terms of their school performance. It also ascertained the adaptive and capacity-building strategies of these learners during landslide and flood. Six schools located in disaster-prone areas were chosen as the locale of the study with 188 school-aged children, six principals, teachers, and parents as participants of the study. The study found that flash flood, unsafe school buildings, and excessive runoff waters in school grounds led to cancellation of classes and caused damages to infrastructures and school properties - which have implications for the performance of school children. Remediation and other alternative delivery modes helped learners cope with missed classes. Drills, life-saving skills, and parents' support for technological gadgets like cell phones improved learners' adaptive capacities to prepare for disasters. However, the study found limited support for implementing disaster preparedness and mitigation activities for learners in rural areas. Promoting access, quality, and sustained DRRM activities for learners in these schools could enhance the adaptive capacities of learners and mitigate the risks and hazards, affecting them.

*Key words and phrases:* Hazards, vulnerabilities, adaptive capacity, school-aged children, exposures

### *Introduction*

The Philippines is one of the top seven countries in the ASEAN region affected by disasters that inevitably threaten the education sector. In 2006, the super typhoon Reming (Durian) caused 20 million US dollars of damages to schools (Ministry of Social Welfare, Relief and Resettlement and Ministry of Education). Reports showed that Typhoon Pablo (Bopha), a category five storm, washed-

out almost 900 classrooms and damaged 355 others, displacing hundreds of students. Typhoon Vinta (Tembin) was believed to be the worst cyclone which affected Mindanao in 2012. Super typhoon Yolanda (Haiyan) in 2013 devastated 3,200 schools affecting some 550,000 children in the Visayan Region.

Bukidnon, a province located in the

southern part of the country, was not considered a typhoon-risk area. However, in recent years, certain disasters like landslides and flash floods have become recurring occurrences in the area. It can be attributed to the topography of the province in which six relatively large river systems run across the territory, namely: Pulangi, Tagoloan, Cagayan, Manupali, Muleta, and Bobonawan rivers. Runoff water from the surrounding mountain ranges results in flashfloods during heavy rains. During the rainy months, the soil in some terrains weakens, triggering landslides.

The school children in outlying areas are among the most vulnerable groups during floods and landslides. They are regularly at risk since they often need to walk distances, cross terrains, and rivers to attend school. The daily trek exposes them to danger, especially from June to October, when the rainfall is most pronounced. Unlike adults, children have yet to establish the safety skills needed to cope with these emergencies.

Protecting the minors is an overriding responsibility of the public. Schools have to identify the danger zones in the locality and employ mechanisms to anticipate the possible impact of potential disasters that must be set before disasters strike. Appropriate responses to the ensuing aftermath also need to be established to ensure coordination among respective emergency responders. The local government units have to be conscious of the available options during catastrophes and the rehabilitation cost in affected schools to lessen the lull periods of classes in devastated areas.

Amri (2013) reported that the Department of Education has already developed some contingency plans for managing disasters. School hazard mapping is currently being done. Emergency drills are supposed to be conducted twice a year in schools. Emergency plans for school children have been established, and Disaster Safety Awareness Program for Children has been developed. Guidelines to prepare for and manage impacts of disasters

and the aftermath have been formulated by the Department. In 2013, trainings relevant to these emerging priorities were conducted nationwide. However, implementing these plans remains a challenge for most schools, especially those located in remote areas like Bukidnon.

Tertiary institutions are supposed to lead, assist, and facilitate the implementation of measures for disaster preparedness and mitigation. Partly, this involves establishing initiatives that will ensure the safety and protection of the most vulnerable members of the education sector and engaging in extension work that will mitigate disasters on the local schools. Realizing the magnitude of this responsibility, the researchers were prompted to conduct this study.

### *Conceptual Framework of the Study*

This study is influenced by Amri (2013) who claims that the governments are responsible for ensuring that the children's right to education is fulfilled even during a disaster. Several aspects have to be considered in ensuring this right for every child. These include determining the hazard exposure and vulnerability of school children, strengthening the adaptive capacity of the potential casualties, thereby raising the resilience levels of affected schools.

The researchers subscribe to the theory that hazard exposure can be determined by looking at the potential risks to school-aged children, the school buildings, and school properties, as well as the threat to the year-round conduct of classes. There is a need to identify the school sites affected by landslides and flashfloods in the past six years and to determine the hazard exposure and vulnerabilities of the school children. The susceptibility of the target population can be identified by determining the loss resulting from landslides and floods. Implicitly, this can mean establishing the value of the damage caused by the hazard to the school-aged children and physical resources of the schools. Resilience focuses on the assessment of the adaptive capacity as well as the ability of the target population to respond to

the hazard, which includes the cost of response and clean up, or of social assistance, and the cost of rehabilitation (Dayton-Johnson, 2004).

Below is the figure that illustrates the framework of this study:



Figure 1. Schematic diagram showing the parameters of the study.

This study considered the following elements at risk: school-aged children, school buildings, and school properties. The vulnerabilities that were studied focused on attrition among school-aged children and the cost of damages on school infrastructure, which included the school properties like books, supplies, furniture, and equipment, as applicable.

### Objectives

This study aims to determine the hazard exposures and vulnerabilities of school-aged children to flood and landslide areas and to assess the risks. Specifically, it sought:

1. To describe the hazard exposure and hazard vulnerabilities of school-aged children in the landslide and flood-prone areas;
2. To determine the effects of landslide and flood on school-aged children in terms of their school performance;
3. To ascertain the adaptive and capacity-building strategies of school-aged children during landslide and flood; and,

4. To formulate implications for disaster mitigation at the school level.

### Review of Literature

In the advent of climate change and natural calamities, school-aged children are the most vulnerable. Researchers have shown that they have less physical strength and are more susceptible to diseases and disasters. They are dependent and sensitive to environmental changes. Hence, they need to be considered in the disaster risk reduction and management plans.

Studies conducted by Stough, Ducey, Kang and Lee (2020) highlighted the importance of providing safety for children during disasters. They estimated that 80% of individuals below 18 years old are enrolled in schools where 'adult to child supervision ratio' is critical. It is then important that schools are built for safety especially when these are located in hazardous places. Perrone, O'Reilly, Montero, and Filiatrault (2020) also declared that assessing school buildings for structural resilience is of prime importance to ensure that lives and properties are protected during and after calamities.

According to Walker (2012), children are active agents in their families and communities but often lack basic knowledge of factors that affect their well-being and the means and understanding to influence these. To address these needs, he stressed that it is important to enable children to take part in the formulation of policies affecting their well-being. Doing this will help them to address their well-being concerns. However, he said that particular barriers prevent this from happening, including underappreciating the value of children's input into policy processes, degrees of technical language, and knowledge. These issues are critical considering the escalating disaster and climate risks that children are exposed to within their communities.

A study reported by Plan International Viet Nam examined the knowledge, attitudes,

and practices of children and young people regarding climate change adaptation comparing urban (Ha Noi) and rural (Quang Tri) settings. There were five indices of vulnerability, namely: population, poverty, livelihoods, social, and biophysical conditions. As to population vulnerability, children under 15 years constitute 60% of the group rendering them in a critical demographic peril and increasingly relevant in policy and practice interventions. In poverty and social vulnerability, the areas were categorized as poor. School attendance in the places studied indicate considerable drop-outs for older cohorts that is 20-50% attendance for ages 16 to 18 years, with 30-50% of girls not completing primary school. In terms of social vulnerability, data showed that the QuangTri's ethnic groups are more at risk because they often have large households- a scenario that is complicated by literacy problems, and unique gender dynamics. In terms of the combined livelihood and biophysical vulnerability, the study also yielded some significant observations. Mountainous communities, like the ones found in the study sites are relatively isolated from services and have limited natural resources of topography and hydrology, and are exposed to growing climatic extremes.

The above study shows similar situations in the Province of Bukidnon, the Philippines, which is highly agricultural with highland and lowland areas. School-aged children in the province are generally from the rural areas, who experience low cohort survival rate and school participation due to nutrition issues.

Ferdinand, Haynes, and Richards (2012) assessed the vulnerability and adaptive capacity of communities to hazards and climate change in small island developing states (SIDS). The survey involved almost 400 participants in four communities, one in each of the Anglophone Windward Islands of Dominica, Grenada, Saint Lucia, Saint Vincent, and the Grenadines of the SIDS Caribbean. Semi-structured interviews and historical analysis of hazards that affected the islands between 1911-2011 was also done. They found that disaster costs and losses are

increasing. It is attributed to several factors, including population growth, urbanization, and an increase in the frequency and severity of meteorological events driven by accelerated climate change. They further found that poverty, low educational achievement, inadequate housing, limited livelihood options, and unemployment make the disaster risk reduction a challenge. These conditions accordingly limit the ability to undertake the necessary and longer-term risk reduction measures like the purchase of insurance.

Ferdinand et al. (n.d.) emphasized that conducting participatory assessments could create provision for at-risk communities to be integrally involved in identifying their vulnerability and enhancing their adaptive capacity to live with hazards and the implications of climate variability. Furthermore, they stated that global models could project climate impacts and estimate the costs of expected investments. They added that decision-makers in developing countries require national assessments that take bottom-up, pro-poor perspective, integrated across sectors, and reflective of local stakeholders' experiences and values to determine appropriate disaster risk reduction and climate responses.

A document of the Ministry of Education in Myanmar shows that complete mainstreaming DRR in schools are in place. The said document presents the impacts of disasters on the education sector. It explained that in addition to providing venues for educational purposes, the school buildings often serve as community meeting points and are used as evacuation centers during disasters. Furthermore, the document presented at a regional scale, facts and figures indicate the impact of disasters on the education sector. Data on the number of deaths of children and teachers, along with the number of school buildings that were damaged were presented in this document. The data revealed how disasters could harm the school systems of various countries.

Interruption to the education system

caused by disasters affects numerous students worldwide. Annually, flooding alone has displaced more than half a million children from school for extended periods worldwide. In countries like Cambodia, Lao PDR, and Vietnam, the yearly flooding season coincides with the school period. The commute between the school and the home in these places becomes a dangerous affair. When the floods become severe, schooling has to stop completely. If the school is spared from any serious damage, its use as a temporary shelter interrupts regular classes. Amid the school term, the educational activities of students could be disrupted.

These are realities that should prompt the Province of Bukidnon to intensify its Disaster Risk Reduction and Management Plan in all the education sectors of the municipalities and barangays, especially those areas prone to flooding and landslides and other natural or human-made disasters. Determining the hazard exposures, the vulnerability and adaptive capacity of schools and school-aged children would be a start of this undertaking.

### *Methodology*

This study used the quantitative and qualitative research approaches. One hundred eighty eight (188) school-aged children, six principals, teachers, and parents consented to take part in the study. The research sites included the affected areas in Bukidnon: Aglayan, Batangan, Guihean, Palacapao, Magsaysay, and Sampaguita. These sites are anonymously referred to as schools A, B, C, D, E, and F in this study. The elements at risk, which included the school-aged children, school buildings, and structures, and the number of affected classes were determined. The study also ascertained the physical vulnerability of the target areas and the social vulnerability of school-aged children. Whenever possible, the hazard mitigation cost that may be spent on disaster recovery measures was presented. The expected "losses" related to class disruptions and structure wreckages were verified, subsequently quantifying the potential rebuilding or rehabilitation cost. Interview

guides were prepared to secure relevant data, and actual on-site visits were done to determine the extent of damages. Document analysis was conducted whenever necessary to validate the data generated in the focus group discussion conducted with the school principals, teachers, parents, and pupils.

### *Results and Discussion*

The data that was gathered from the different study sites were analyzed, and the results are presented as follows:

#### *The Hazard Exposure and Hazard Vulnerabilities of School-aged Children in*

##### *Landslide and Flood Prone Areas*

This study determined the hazard exposure and vulnerabilities of the school-aged children and the ensuing class cancellation implemented by the affected schools. Table 1 shows the summary of the responses gathered from the interviewees.

The disclosures of the respondents in the research sites indicated that classes were cancelled for 1 or 2 days on account of flash floods and landslides, resulting in road blockages during heavy rainfalls. The majority of the pupils in these areas have to travel on foot crossing flood-prone creeks or bridges to attend school, and class cancellation is believed to be the safest option to protect them from harm.

Schools in more vulnerable sites experience class cancellation for weeks or months due to grave threats to ambulant pupils or damaged infrastructure and flooded school grounds. School A, for instance, sits on a lower ground level and is consistently at risk during stormy weather. Runoff water from the pineapple plantation surrounding the area goes into the school ground, which becomes a catch basin for the flood, consequently submerging 18 classrooms for at least one (1) or two (2) days before water gets drained.

School C, which is situated in a flood-prone

area, experienced class cancellation for at least two weeks (10 school days) due to water inundating the roads, especially during the onslaught of major storms like Sendong (2012), Vinta (2017), and Pablo (2019). Intermittent cancellation of classes is also made for 1 or 2 days whenever a Low-Pressure Area (LPA) forms in the immediate vicinity. Even the troughs of LPAs can already bring heavy rainfall in the highland areas resulting in shortened classes. Almost 189 pupils were affected in these instances. The respondents also mentioned that a neighboring school suspended classes for three months (60 school days) when extreme weather threatened the structure of its seven (7) classrooms. Classes were reportedly resumed later in the closest municipality, where pupils had to share learning spaces in the gymnasium. Recent reports indicate that the school remains in the same vicinity despite the environmental threats.

School D, built close to a continental fault line in the Province of Cotabato, had a flash flood as high as one meter in 2013. Tremors later became frequent, and grounds tended to shift very quickly that became a concern in the community every after a heavy downpour. A respondent stated that when walking on footpaths, one can step on seemingly solid ground in the morning and find that the same spot had slid in the afternoon. The entire school ground eventually sunk, resulting in a suspension of classes for two (2) months equivalent to a 40-day instructional loss time pending the negotiations on the logistics of the school's transfer to a safer zone. Two years after the incident, classes were held in tents provided by the Department of Education. As of today, about 180 pupils take a daily trek to reach the new school site. They have to cross a hanging bridge that still gets flooded during rainy days. Frequent flooding also affects School F, a neighboring school, although it stands on a relatively stable location. What happened to School D is similar to the incident in Italy where a school building collapsed after an earthquake (Perrone, O'Reilly, Montero, and Filiatrault (2020). Studies done by Motlagh, Dehkordi,

Eghbali, and Samadian (2020) disclosed that buildings tend to degenerate due to corrosion; hence it is important that school buildings be constantly checked to ensure the safety of occupants during disasters.

Table 1.  
*Hazard Exposure/Vulnerabilities and Class Cancellation Affecting the School-aged Children*

School	Hazard Exposure/ Hazard Vulnerabilities	Class Cancellation (in terms of school days every after a heavy rainfall)	No. of Pupils Affected	Other Data
School A	Excessive Runoff Water	1-2 days	720-900	
School B	Landslide/Flashflood (2011,2012,2014, 2017)	1-2 days	-	
School C	Flashflood (2012, 2017, 2019)	10 days during major storms	280-350	60-day class suspension implemented in a neighboring school due to unsafe infrastructure
School D	Flashflood/ Unsafe school grounds	1-2 days 40 days (2013)	400-500	2 years in tent schools after the school sunk
School E	Landslide/Flashflood	1-2 days	360-450	
School F	Flashflood	1-2 days	1,760-2,200	

Of the five study sites, School E seemed to have the least grave problem during stormy weather since the community tended to be affected only by road blockages most of the time. These were promptly cleared by the disaster responders in the area. Flash floods did happen in this site resulting in tremors and ground shifting, but the community did not feel the need to relocate the school. Class disruptions occurring in the vicinity were caused by other equally pressing problems, mostly relating to peace and order situations and earthquakes.

The data gathered from the study sites indicated that pupils commonly experienced class cancellations during stormy weather. Most of the pupils skipped classes during bad weather. This was disclosed in all six sites under

study. Whenever low atmospheric pressure occurred, pupils tended to stay at home. If they were in school and the weather turned bad, the parents took it upon themselves to pick up their children. This deemed advantageous since roadways would have been unsafe for very young children to navigate during flashfloods. These disclosures imply that the failure of students to attend school for any reason will always have adverse effects on learning outcomes. The problem is aggravated when replacement classes are not done. Marcotte and Hemett (2007) contend that missing one or two days (i.e., as in the case of the students in the State of Maryland during winter) may have a restorative effect especially for teachers, but “losing many days may be more seriously disruptive since lessons are forgotten, and teachers need to re-teach the material.”

It is common knowledge that the Department of Education has sets of competencies to be mastered by the learners for every quarter in a given year. It implies that class cancellations extending into weeks will result in substantial instructional time loss. As a consequence, the competencies not covered can impact the academic performance of the learners not only in the succeeding year but also in the years after. Failure to cover the desired competencies in schools has serious implications, especially among learners in the Philippines who have to take the National Achievement Test, a standardized test, in years 3, 6, 10, and 12.

Reports on holding classes in alternative locations like the gymnasium and tents for weeks and even years were revealed in the interview. This stop-gap measure can be detrimental to learning, as claimed by experts. Van Note Chism (2006) maintained the importance of learning spaces, which he says can have a grave effect on learning. Graetz (2006) corroborated this claim stating that the learning environment has significant cognitive and behavioral consequences affirming that factors like crowd, noise, and physical discomfort can readily interfere with learning. The challenge to

address the instructional needs of the learners in these makeshift learning spaces is daunting, considering that no failures among learners are allowed under the No Child Left Behind Policy currently implemented in DepEd.

Unscheduled class cancellation can have economic risks. It can be costly to the government as teachers continue to get paid despite their inability to hold classes. From 2016 to 2019, teachers in the Philippines had a monthly salary ranging from Ph19,077.00 to Ph20,754 or an estimated daily pay of Ph867 to Ph943. Based on PAGASA postings, roughly 6-8 LPAs can affect Mindanao in a year. It means that 12-16 days of classes can be cancelled. It implies that the government pays Ph11,316-Ph15,088 per teacher per year for cancelled classes. With the 48 classes affected, the amount can reach Ph 543,168 to Ph 724,224 based on the 2019 salary rate. Conducting classes in temporary locations may rationalize the teachers' pay, but this may result in as many as 1,760-2,200 learners getting shortchanged due to the possibility of poor instructional outcomes.

Damages to infrastructure and school properties also prevented the learners from attending school. The extent of this problem is shown in Table 2.

Table 2.

*Estimated Cost of Damages to Infrastructure and School Properties*

School	No. of Classrooms Affected by flash-flood	Estimated Cost of Damages to infrastructure	No. of Damaged School properties	Estimated Cost
School A	18	37.8 million	2,694 books	21,888
	4 (in 2013)	8.4 million	42 manuals	
School B	No available data	-	No available data	-
School C	7 (in a nearby school)	14.7 million	200 books	1,600
School D	10	21 million	3 hectare land area	
School F	9	18.9 million	No available data	-
Total	48	Ph 100.8 million		Ph 23,488

The occurrence of flashfloods or landslides can be costly. As shown in Table 3, five

(5) buildings in School A, consisting of 18 classrooms, are constantly flooded by water from the agricultural plantation in the area. In 2013, four (4) of its classrooms were completely damaged, along with 2694 textbooks and 42 manuals. Pupils in School B are prevented from attending classes due to flooded school grounds resulting in the cancellation of classes. School C lost 200 copies of books when flashflood worsened at one time. Seven (7) classrooms in a nearby school had to be temporarily abandoned after a strong storm. The entire three-hectare site in School D had to be transferred to another location after it sunk. Ten (10) classrooms had to be abandoned. Five (5) buildings with nine (9) classrooms in School F were also affected. Total damages reached more than Ph100 million, as shown above. This figure can increase with the ensuing repair works.

*The Effects of Landslide and Flood to the School-aged Children in Terms of Their School Performance*

The effects of disasters on the school-aged children were determined, and Table 3 shows the results of the interview done with the respondents:

Table 3.  
*Effect of Landslide and Flash Flood to School-aged Children in Terms of School Performance*

School	Instructional Replacement Mode	Percentage of Academic Failure/ Drop-out
School A	Remediation Hours	None
School B	Lesson Enrichment/ Remediation Hours	None
School C	Remediation hours: 2:30-4:00	None
School D	None	None
School E	None	None
School F	None but assignments are given	7%-10% (Pupils had to find food)

Failure of schools to hold regular classes would normally require some alternative delivery system of instruction directed by the Department of Education to ensure that pupils are learning despite the disruptions brought about by disasters. Some responses indicated

that reliable measures were adopted. Some teachers opted to extend their classes to 4 o'clock to cover the missed lessons (i.e., classes normally end at 3 p.m. in the primary grades). Others gave additional assignments to enable the students to keep up with the calendared topics set by the Department of Education. It is noted that the basic education curriculum in the Philippines is adopting the spiral progression approach that aims at having the pupils master definite competencies at the end of each year level.

The teachers understand the necessity of completing lessons at the lower levels to prepare students for more complex learnings at the higher levels. However, the majority of the teachers interviewed were unable to employ instructional remediation for various reasons. There was reluctance in giving assignments since families were mostly farmers or farm-hands and could not provide quality tutorials. The preparation of modules to address the need was a great challenge for the teachers given the regular bulk of work they had to undertake. There were also misgivings about rendering additional instructional hours for the affected pupils considering that DepEd does not grant monetary remuneration for additional work. Besides, some teachers were commuting daily to work and had to leave early. Pupils were encouraged, however, to keep up with the lessons as best as they could.

Based on the focus group discussion composed of school teachers, barangay council members, and residents of the different study locales, all participants except in School E (7% to 10%) answered that there was no drop-out case or academic failure in their schools. The main reason behind this response is that DepEd has a policy called No Child Left Behind. In effect, the school personnel will solve performance-related issues as a result of landslide and flood. If a child is not learning in school, the teacher must use a different and more appropriate teaching method. The school will get credit for its ability to make their children master the competencies.

The teacher-participants shared that if there is a drop-out, the performance of the whole school will be affected. Superintendents will use this information to evaluate which principals are running successful schools and which are not. To raise the performance of at-risk children, the participants said that they have to conduct lesson remediation in summer (April-May) in which they said they are not compensated, no service credit is given to them, and no hazard pay because this is charged to savings which the schools do not have. There are no replacement days for absences due to landslide and floods because the calendar of activities has been planned to the hilt.

The Department of Education Memorandum Order No. 83, s. 2011 which dealt with the Disaster Preparedness Measures for Schools provided guidelines on the implementation of disaster risk education. The memo emphasized that disaster risk education must address the underlying drivers of disaster risk, such as poorly designed school systems, low teacher understanding of risks and risk prevention skills, limited teacher and school administrator disaster preparedness, and lack of alarm mechanisms and lack of risk assessment. The memorandum specifically provided the steps to be taken to reduce the consequences of disasters in schools where catastrophic harm is most apparent and where impacts on children's education are deeply felt. School workers should be able to predict the dangers of natural and man-made hazards and ensure that schools are protected before, during and after an emergency, in order to facilitate continued access to education for learners. In view of this, schools are directed to enforce natural hazard mitigation steps, such as typhoons, floods, landslides, and others ensuring safety and protection of school buildings, facilities and equipment. In addition, schools are encouraged to engage students, their families and communities in disaster preparedness since this is an efficient way to increase their awareness of risk reduction. The memo stressed that the regional and division offices shall track

and provide technical assistance to schools not carrying out their disaster reduction activities.

There is also DepEd 2010 Educational Facilities Manual, which is a revised edition of the 2007 Handbook on Educational Facilities-Integrating Disaster Risk Reduction in School Construction. The school principals will find this material very useful because there is a discussion of the various hazards that may result in disasters. Topics include school building construction, specifically how to make schools safe, proper location of school sites, environment, adherence to building design standards and structural soundness, and flood safety in schools.

#### *The Adaptive and Capacity Building Strategies of School-aged Children during Landslide and Flood*

The adaptive capacity of school-age children refers to their ability to use "available skills and resources to face and manage adverse conditions, emergencies, or disasters" (Shalkowski, n.d.). The training and lessons taught in school could help develop among young children their resilience or adaptive capacities that would help them cope with natural disasters like landslide and flood. Table 4 presents the school-aged children's answers

Table 4.  
*Responses of School-Aged Children Who Participated in Drills*

Schools	Yes		No	
	Frequency	Percentage	Frequency	Percentage
A	37	100%	0	0
B	30	100%	0	0
C	31	100%	0	0
D	27	100%	0	0
E	24	77.72%	7	22.58%
F	31	93.94	1	3.03%
Overall	180	95.24%	8	4.23%

when asked about the training and drills learned in school. It is revealed that six (6) schools have implemented a drill participated by all the participants.

Drills are vital because they teach learners how to prepare themselves during calamities: how to behave, to keep safe, and stay away from danger. It is a mandate of the Department of Education that schools must implement DepEd Order No. 23, s. 2015. This mandate is on student-led school watching, and hazard mapping that aims “to instruct all public elementary and secondary schools in the specific engagement of learners in identifying and addressing hazards and risks evident in the six schools that experienced flood and landslide.

When school-aged learners were asked how often they have drilled in school, most of them responded that drills were often conducted twice a year, while schools A and B had conducted drills quarterly. It means that drills have been integrated into their school calendar and curriculum. According to one participant, this is due to the collaboration between the two schools in their community. Their Barangay Council, especially the DRRM focal person, works well with the school and the Municipal DRRM in charge. These two schools are found in the urban areas while the other four schools are in rural areas.

Schools C, D, and F conducted emergency drills twice a year while school E only once a year. The variation of the conducted drills in schools could be attributed to the school’s location. Schools C, D, and F are located very far from the highway. These are situated in far-flung areas, which can only be reached through a motorcycle. School E is near the national highway; since this is a small school, the barangay, together with the school head, decided to have the emergency drill once a year.

According to the teachers and parents, the holding of successful drills was attributed to the assistance provided by the Municipal and Barangay DRRM focal persons. Some are actively collaborating with them while others wait for the directives of their leaders. School-aged children attested to these statements when

they said that some individuals outside of their school came to help them during emergency drills.

Table 5 shows the kind of drills participated in by the learners. It reveals that the majority of the learners have participated in the earthquake or landslide drill. During this drill, participants know how to evacuate the school area when an earthquake or landslide would happen. They know the bell signals, duck cover, and hold, and they mentioned they have to obey their teachers whenever this would happen. They would not rush, they fall in line, and are taught to relax and remain calm. When asked who participated in the drills, the school-aged children claimed that all learners and teachers actively participated in the drills except those who were absent during the drill.

Table 5.  
*Kind of Drills School Children Participated in*

Schools	Types of Drills Conducted			
	Fire Drill	Earthquake/ Landslide Drill	Flood Evacuation Drill	Others
A	32	37	3	0
B	29	30	0	0
C	0	29	1	1
D	0	27	0	0
E	1	28	0	2
F	0	33	0	0
Overall	62	184	4	3

However, the drills conducted in school were only limited to fire and earthquake drills. There is no drill for flood evacuation even if flood frequently occurs in these schools. Flood evacuation drill is important to better prepare learners to become alert and cautious whenever heavy rainfall occurs. They will know when to call their parents to pick them up, and they will know where to go during evacuation time.

Pupils interviewed in two schools (School A and School B) appeared to be adequately prepared to respond to climatic disturbances.

They were exposed to two types of drills: fire drill and earthquake/landslide drill. They were trained to listen to sounds (i.e., whistle, bells) indicating the signal to vacate the area. The prearranged alarm prompted pupils to leave school before disaster strikes. These schools had focal persons in charge of making decisions when to send out the signal. Pupils also knew where to go in extreme situations as evacuation centers, mostly barangay halls, have been identified in coordination with the DRR committee at the barangay level. Despite this finding, the other study sites tended to have ambiguous DRR coping mechanisms. Pupils' responses were not conclusive when asked about DRR-related training provided by the school.

Learners were asked about the life-saving skills they know. Life-saving skills is an important life skill every learner must learn to become more prepared in times of crisis or natural disasters. Table 6 presents the life-saving skills respondents know and learned. It reveals that most school-aged learners know how to swim and how to do fundamental knot tying. Only a few of the learners learned Cardio-Pulmonary Resuscitation (CPR) and First Aid.

School-aged children from schools A, C, and E mostly know swimming. It is so because their places have river systems and springs where they could swim during family outing and recreation. Some children claim they know how to swim because they have to cross rivers in going to school.

Basic knot tying, according to many learners, are taught to them during scouting activities. However, since their participation is voluntary, only a few were permitted by their parents to join scouting activities. They have this activity in October during the scouting month celebration. It is also integrated into their *Edukasyong Pantahanan* and *Pangkabuhayan* and Physical Education classes.

Table 6.  
*Life Saving Skills Learned and Experienced by the Children*

Schools	Life Saving Skills			
	Swim	CPR	First Aid	Basic Knot Tying
A	26	8	18	14
B	20	5	16	17
C	28	1	2	0
D	18	0	0	26
E	21	2	6	13
F	8	0	0	12
Overall	121	16	42	85

First Aid and CPR are highly technical skills taught by medical practitioners. Only 42 and 16 learners are fortunate to have participated in training such as these. Most of them were sixth grade pupil leaders. Only pupil leaders from Schools A and B had these with Red Cross and Barangay DRRM as sponsors.

When learners were asked regarding the phone numbers of their parents, almost 42.33% of them knew their parents' contact numbers, while the majority (57.67%) claimed their parents did not have cell phones; therefore, they did not have contact numbers of their parents. Most of the children who had cellular phones and knew how to contact their parents were from schools A and B. This signifies that these learners have more access to technological resources. Most of their parents have jobs and were economically stable. It could also be attributed to their school location, which is in urban areas. In contrast, schools C, D, E, and F located in rural areas had issues with connectivity to technology.

Despite the absence of cell phones, most learners claimed that their parents knew where they would be picked up whenever natural disasters occur. Their parents were aware of the school's evacuation area and protocol. It was confirmed by the parents. They were oriented by the school heads during General PTA assembly and HRPTA meetings about this concern.

The Department of Education and the community partners, were found to be conscientious in their post-disaster responses. DepEd conducted regular visits and inspections in affected schools. School A, in particular, was allowed to purchase water pumps for its school grounds. It also provided ten (10) vehicles for rescue as needed. Barangay officials in two sites were heavily involved in disaster mitigation. Parents in School A as well as in School B participated in the room to room campaign for disaster preparedness. Parents in School E facilitated the removal of eroded soil and debris blocking the roadways immediately the day after. There was one instance, however, when difficulty was encountered on account of bureaucratic impediments. School D that sunk had to hold classes in tents for two (2) years pending the transfer of the school to a new site. Parents, however, were quick to offer free labor when new school buildings had to be built.

However, access to DRR training in some schools was limited. Four out of six schools had trained only the schools' DRR focal person, and no cascading was done to the rank and file. The LGUs in these areas have identified the evacuation site in case of emergency, but their participation in disaster mitigation, especially for school-aged children, can still be enhanced.

The adaptive capacity of school-aged children will depend largely on education and support. It is supported by case studies conducted in both San Salvador and Rio, Brazil, which found that "education can have a direct influence on people's level of risk and associated risk reduction" (Wamsler, 2011). Sakurai, Sato, Takeshi and Murayam (2020) found in their studies that children can get involved in programs designed to mitigate disaster. Chen and Adefila (2020) claimed that universities can also help by infusing DRR in the curricula for 'all levels of education' including communities.

### *Conclusions*

The findings of the study led the researchers to conclude that flash flood, unsafe school

buildings, and excessive runoff waters in school grounds leading to the cancellation of classes and causing damages to infrastructures and school properties have serious implications to the academic performance of school-aged children. Drills, life-saving skills, and parents' support for technological gadgets like cell phones can improve learners' adaptive capacities to prepare for disasters. Promoting access, quality, and sustained DRRM activities for learners in these schools could also enhance the adaptive capacities of learners and mitigate risks, hazards, and exposures of school-aged children.

### *Recommendations*

Based on the findings and conclusions of the study, the DepEd officials need to strengthen the disaster mitigation/preparedness mechanisms of schools to educate the teachers and the pupils on what to do when disaster strikes. The Department also needs to intensify its implementation of disaster reduction management. Barangay officials, on the other hand, can actively coordinate with the school officials; create their disaster response; and, reconsider the evacuation centers identified to ensure that they are accessible, safe and structurally resilient.

The following recommendations can also be considered:

1. When cancellation of classes occurs due to natural calamities of disaster, schools could have structured alternative learning delivery modes designed particularly for all subjects missed by the children: objectives, topics, references or IMs, and assessment, performance indicators. The delivery mode could be contextualized based on the unique situations and needs of the learners.
2. The school district may develop a plan in coordination with the LGUs to help augment scarce financial resources. They could provide compensation, service credit, and hazard pay for those using the *gakit* (bamboo rafts) to cross rivers, climb

slippery mountain trails, etc.

3. The schools may conduct resiliency and training drills on landslide and flood, and other disasters for school-aged children to better prepare them. Topics related to these incidences can be integrated into the schools' Disaster Risk Reduction and Management Program. The curriculum may also cover resiliency topics and be infused in different subjects.
4. DOST, which produces videos on disaster preparedness and mitigation, may consider donating DRR drill materials and videos to teach the children.
5. Community drills may also be conducted. Families may be involved in the preparedness activity of every barangay to further strengthen the Family Reunification Plan presently implemented in some schools.
6. A strong collaboration between parents, local government units, Department of Public Works and Highways, DepEd, and other non-government organizations could help in the conduct of these community drills. These drills should not only be limited to earthquake and fire drills but must also include other natural and human-made disasters.
7. Higher education institutions can initiate and implement projects designed to educate the school-aged children on disaster preparedness and mitigation.

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