DISASTER RISK REDUCTION AND MANAGEMENT IMPLEMENTATION AMONG SECONDARY SCHOOLS IN REGION III, PHILIPPINES

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Abstract: **The study aimed to describe the implementation of disaster risk reduction and management of secondary schools in Region III, Philippines. This descriptive study used a survey questionnaire supported by unstructured interviews. Both administrator (153) and parent (147) respondents were selected through random and convenience sampling. The data collected were processed and treated using frequency count, percentage, mean, weighted average mean, t-test, Likert Scaling Technique, Analysis of Variance. The mean summary of the administrator-respondents perception on disaster risk reduction and management are all satisfactory which are arranged from highest to lowest based on its mean values: Phase V Preparedness and Response; Phase IV Underlying Risk Factors; Phase I Disaster Risk Reduction Prioritization; Phase II Risk Assessment, Monitoring and Warning; and, Phase III Knowledge and Education. On the other hand, the mean summary of the parent-respondents perception which are arranged from highest to lowest based on its mean values: Phase V. Preparedness and Response; Phase I Disaster Risk Reduction Prioritization; and Phase IV Underlying Risk Factors are all satisfactory; Phase III Knowledge and Education; and Phase II Risk Assessment, Monitoring and Warning, are both fair. Overall the mean perception on Disaster Risk Reduction and Management is satisfactory.**

Keywords: **Disaster Risk Reduction and Management, Perception, Administrator, Parent, Descriptive, Region II Philippines.**

1.   INTRODUCTION

Environmental change brought by natural catastrophe and human conflicts impact the lives of a great number of people across the world, especially in developing and unstable countries like the Philippines. Miranda (2014) reported that the Philippines, located near the Pacific Ocean, is among one of the most disaster-prone and at-risk countries in the world, with many areas being divastated by a number of natural calamities, ranging from typhoons, heavy monsoon rains, flooding, earthquakes, land-erotions, volcanic eruptions, public health emergencies and other forms of natural devastation.

Asian Development Bank Research (2014) summarized that natural hazards continue to cause significant loss of life in Asia and the Pacific, with 1.7 million hazard-related deaths being recorded from 1970-2010. The direct physical losses from disasters are not only following a steady vertical path, but are also increasing more rapidly than regional Gross Domestic Product (GDP). Nonetheless, for every disaster experienced there are causal factors underlying the losses and, by implication, measures that could be taken to avoid a repeat event.

Wageningen (2014) mentioned that the impact of conflicts and disasters on people's security, livelihood and future prospects is often dramatic, and disproportionally hits those that are already poor and marginalized. Despite synergies to solve these problems, these are likely to persist to mark global development in the decades to come. Disasters have become more frequent and intense, due to the increasing social vulnerability for instance through the formation of slum areas on steep slopes, environmental degradation and human-induced climate change.

There have been growing calls for greater clarity about the components of Disaster Risk Reduction and Management and about indicators of progress toward resilience - a challenge that the international community took up at the United Nation's World Conference on Disaster Reduction (WCDR) in Japan, in 2005, only days after the 2004 Indian Ocean earthquake. The World Conference on Disaster Reduction began the process of pushing international agencies and national governments beyond the vague rhetoric of most policy statements and toward setting clear targets and commitments for Disaster Risk Reduction. The first step in this process was the formality on the approval of the Hyogo Framework for Action (2005–2015).

The Hyogo Framework for Action is the first internationally accepted framework for Disaster Risk Reduction and Management. It sets out an ordered sequence of objectives and priorities, with five priorities for action attempting to capture the main areas of Disaster Risk Reduction intervention. The United Nations biennial Global Platform for Disaster Risk Reduction and Management provides an opportunity for the United Nation and its member states to review progress against the Hyogo Framework. United Nations initiatives have helped to refine and promote the concept at international level, stimulated initially by the United Nations designation of the 1990s as the International Decade for Natural Disaster Reduction.

The decade of nineties was considered as "The Decade of Natural Disasters in the Philippines" due to the great number of severe disasters that have occurred. The eruption of Mt. Pinatubo in Zambales which was considered as the greatest vulcanic eruption in the Philippines in the nineteenth century, the Typhoon Uring and Magnitude Scale 7 Baguio City Earthquake which brought thousands of loss of lives, billions of damages to crops and properties and thousands of tens of hundreds of displaced families. Region III also severely suffered from these calamities. In fact, there instances that many provinces, municipalities or cities in the region was declared under the "state of calamity" particularly due to strong typhoons and flooding brought by Habagat's from the past and up to present times.

The enactment of Republic Act 10121 otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010 has laid the basis for a paradigm shift from just disaster preparedness and response to disaster risk reduction and management. The National Disaster Risk Reduction and Management Plan serves as the national guide on how sustainable development can be achieved through inclusive growth while building the adaptive capacities of communities; increasing the resilience of vulnerable sectors; and optimizing disaster mitigation opportunities with the end in view of promoting people's welfare and security towards gender-responsive and rights-based sustainable development (Report on the National Disaster Risk Reduction and Management Plan, 2011).

The National Disaster Risk Reduction and Management Council (NDRRMC), formerly known as the National Disaster Coordinating Council (NDCC), is a working group of various government, non-government, civil sector and private sector organizations of the Government of the Republic of the Philippines established by Republic Act 10121 of 2009. It is administered by the Office of Civil Defense under the Department of National Defense (DND). The Council is responsible for ensuring the protection and welfare of the people during disasters or emergencies (Report on the National Disaster Risk Reduction and Management Plan, 2011).

The Council utilizes the United Nation Cluster Approach in disaster management. It is the countrys' focal for the Association of South East Asian Nations Agreement on Disaster Management and Emergency Response (AADMER) and many other related international commitments.

There is increasing evidence that students of all ages can actively study and participate in school safety measures, and also work with stakeholders and other adults in the community towards minimizing risk before, during and after disaster events. Methods of participatory vulnerability assessment, capacity assessment and hazard mapping have been be used with wider communities surrounding schools and other institutions of education and research. Government can efficiently reach out to communities and protect them by focusing on schools in Disaster Risk Reduction initiatives to achieve greater resilience to disasters.

Through the implementation of Republic Act 10121 or the Philippine Disaster Risk Reduction and Management Act (DRRM Act) of 2010, various local governments throughout the country have established Local Disaster Risk Reduction and Management Offices at the regional, provincial, municipal, city and barangay levels. As functional arms of the local governments, these Offices are responsible for the implementation of the disaster management cycle at the local levels.

Local Offices usually have a Chief Disater Risk Reduction and Management Officer supported by Administrative and Training, Research and Planning, Operations and Warning Officers. Some of these Offices have advanced to organizing their own search and rescue and emergency medical services squads and command-control-and-communications centers.

The evolution of disaster management thinking and practice since the 1970's has seen a progressively wider and deeper understanding of causes disasters happen, accompanied by more integrated, holistic approaches to reduce their impact on society The modern paradigm of disaster management which is the Disaster Risk Reduction represents the latest step along this path. Disaster Risk Reduction is a relatively new concept in formal terms, but it embraces much earlier thinking and practice. This is tighly embraced by international agencies, governments, disaster planners and civil society organizations.

Miranda (2014) stated that the Philippines, together with the global community, now realizes the importance of setting up integrative risk management and all-hazards multi-sectoral mechanisms. These focus on sustainable all-level preparedness to build capacities to respond to social disruptions, disunity and unrest that large-scale disasters generate. This aims to strengthen every part of society so that the whole system is better able to reduce risk, and if necessary, to respond to severe shocks such as massive absenteeism and disruptions that result in secondary impacts such as widespread hunger and increased illnesses and casualties due to food shortages, drinking water contamination, power outages, breakdown in health services and hygiene, and consequently, social unrest, which often poses greater aggravation to vulnerable populations and multi-sectors.

Higher education are therefore highly encourage to be sensitive to how it may enable core competency building toward strengthening integrative community disaster risk reduction, emergency responses, and recovery and reconstruction efforts. There programs must be aligned to address vulnerabilities, and enhance community and institutional resilience to mitigate and cope with a range of disaster impacts. It must enable speedier re-establishment of normal life and livelihood (Miranda, 2014).

The importance of education in promoting and enabling Disaster Risk Reduction and Management has already been identified by researchers and policy makers. There is a recent renewed focus on disaster risk reduction education in primary and secondary schools. Mainstreaming Disaster and Risk Reduction and Management into school curricula aims to raise awareness and provide a better understanding of disaster management for school heads, children, and other stakeholders. Structural changes to improve safety in building schools will not only protect children and their access to education, but will also minimize the long term costs (Campbell, et al., 2006).

The rationale of this study is to provide the school administrators' insights on how to improve their supervision on the implementation of disaster risk reduction and management. Public Elementary and Secondary Schools are often used as evacuation areas of residents in times of emergencies and disasters, most especially during strong typhoons and high level floods or storm surges. Emergency feeding is also being given to the evacuees in these schools to satisfy their immediate needs and to boost their morale. Medical assistance is also given for the treatment or prevention of sickness for the evacuees or residents.

It is therefore essential to ensure that school administrators or department heads of the Department of Education (DepEd) are more prepared and resilient to emergencies, risks and disasters since they play a major role in all phases of disaster and risk management and reduction together with other national public agencies like the National Disaster Risk Reduction and Management Council (NDRRMC), Department of Health (DOH), Department of Science and Technology (DOST) and Department of Social Welfare and Development (DSWD).

2. METHODS

This study used the descriptive method or type of research. Descriptive research is a purposive process of gathering, analyzing, classifying, and tabulating data about existing conditions, practices, beliefs, processes, trends and cause-effect relationships. These processes are followed to make accurate interpretations and generalizations about the subject.

The participants of the study were the three hundred (300) respondents from the different cities of Region III. These cities are under the Department of Education (DepEd) City Schools Divisions of Region III. The respondents were either school administrators or parents of public secondary schools. The respondents were selected through the convenience sampling technique. The researcher used the convenience sampling which is one of the nonprobability sampling techniques because

the researcher selects the easiest population members from which to obtain information (Dawson, 2002). Hence, during the process of data gathering, the researcher had chosen the present or available administrators and parents as respondents of the study.

The evaluation survey questionnaire is the main data gathering instrument. This study utilized the survey checklist type (with a Likert Scaling Technique of 1-5) of questionnaire to gather data.

This questionnaire is divided into two parts: Part I is the Respondent's Profile in terms of age, sex, civil status, and educational attainment. Part II is the implementation of secondary school administrators on disaster risk reduction and management in terms of the following phases: prioritization, risk assessment, monitoring and warning, knowledge and education, underlying risk factors, preparedness and response.

For the validity and reliability of the questionnaire, the researchers analyzed various related foreign and local references and studies. The researcher also conducted the dry-run of questionnaire to be answered by head teachers and principals from some public and schools of Olongapo City before the actual administration of the questionnaire to the actual target public secondary schools.

The said research instrument was supported by the unstructured interviews to the respondents. With the help of the school administrators, school authorities and acquaintances on various public secondary schools, the researcher had no difficulty in retrieving the evaluation questionnaire. The retrieval rate of the questionnaire was one hundred percent (100%) because the respondents shown willingness and cooperation in answering the survey questionnaire.

3.   RESULTS AND DISCUSSION

Administrator's Perception:

The overall mean for Risk Reduction Prioritization is 3.30 interpreted as satisfactory. This shows that the prioritization of risk management is satisfactory as perceived by the administrator-respondent. This finding coincides with the Chinese research which states that the aim of early warning is to raise and improve awareness and encourage preparedness. The channels through which the early warning messages are delivered and the design of the messages are of critical importance in assuring the effectiveness of early warning. Being aware of the inadequacy in broadcasting warning messages through television and radio and learning from the lesson of the great flash flood, Beijing municipal government added mobile text message as another channel for disseminating warning messages. Issuing early warning and receiving warning message do not guarantee making sense of the message. How to design messages for the general public who has little domain knowledge is one of the major concerns of risk communication experts. Governmental agencies added more channeled for warning message dissemination after this event, but seem unaware of the importance of message design, since the messages delivered in ensuring rainstorms were not different from the wordings used before. Even if the messages are designed in plain language, there are still issues worthy of attention. For instance, research found that people are prisoners of their own experiences and unable to imagine the severity of extreme disasters beyond their experience (Jianhua, 2013).

Based on to DepEd Order No. 28, series of 2005, classes in all public and private elementary and secondary schools are automatically suspended or cancelled without having to wait for announcement under the following circumstances: When Signal No. 1 is raised by the Philippine Atmospheric, Geophysical & Astronomical Services Administration (PAGASA), classes at the preschool level shall be automatically suspended in all public and private schools. When Signal No. 2 is raised, classes at the preschool, elementary, and secondary levels shall be automatically suspended in all public and private schools. When Signal No. 3 is raised, classes in all levels are automatically suspended. In the absence of storm signals, localized suspension is allowed by the Department of Eduction. The decision may be made by the school principal, division superintendent, or local government executive. DepEd has also furnished media outfits with the guidelines, which they can use to reiterate to the public during inclement weather.

Moreover, this implies that more effort must be exerted on the part of administrator to have more access to core information about disaster risk reduction and management thus to enhances efficiency of response actions and increases coordination throughout the networking of responding organizations (Comfort, et al., 2010).

The overall mean for Underlying Risk Factors is 3.34 interpreted as satisfactory. This shows that the underlying risk factors of disaster risk reduction and management is satisfactory as perceived by the administrator-respondent. School

education, can provide useful information as the knowledge base for earthquake. In school education, more active ways of disaster education through conversation, experiencing, and visual aids are found to be more effective (Shaw, 2004). The overall mean which is satisfactory, can be interpreted that there is an inadequacy of urbanization practices and development processes which increases vulnerability and risk factors of the communities and schools. In addition to this, there are deficiencies in construction techniques on public facilities, the cities have had rapid population growth along with accelerated urbanization processes without due planning. Housing, schools and infrastacture constructed on hillsides and landfill zones do not offer optimum stability conditions (Dickson, 2011).

Table 1: Administrator-respondents Perception on Disaster Risk Reduction and Management

	Mean	SD	Interpretation
I. Disaster and Risk Reduction Prioritization	3.30	0.71	Satisfactory
II. Risk Assessment, Monitoring and Warning	3.13	0.74	Satisfactory
III. Knowledge and Education	3.03	0.72	Satisfactory
IV. Underlying Risk Factors	3.34	0.75	Satisfactory
V. Preparedness and Response	3.38	0.71	Satisfactory
Overall Mean	3.24	0.65	Satisfactory

This shows that the Disaster Risk Reduction and Management is satisfactory as perceived by the administrator-respondent. This can be interpreted that there are improvements in individual and collective reactions and perceptions based on social sciences studies regarding disaster risk reduction. Generally speaking, in the industrialized countries like the United States, social science studies and research have focused on the reaction or response of the population during emergencies and not strictly on the study of risk. Emphasis on the fact that disaster is not a synonym of natural events and on the need for considering the adaptation and adjustment capacity of community leaders including school administrators when faced with a natural or technological event was, without doubt, the springboard for the development of the concept of multi-dimensional vulnerability (Instituto de Estudios Ambientales, 2003).

Parent's Perception:

The overall mean for Risk Reduction Prioritization is 2.89, interpreted as satisfactory. This shows that the prioritization of risk management is satisfactory as perceive by the parent-respondent.

This fair rating implies that there is no comprehensive national warning strategy being practiced in the country even those developed countries like United States of America (Sorensen 2000).

Another implication of the fair rating by the parents is because of their lack of knowledge regarding the risk warning of the schools of their children. Parents have the ultimate responsibility to determine whether their children attend to school, if they feel that traveling to or from school will place their children at risk even when no classes suspension order has been issued. Parents may check the media advisories of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAG-ASA), Department of Education (DepEd), National Disaster Risk Reduction and Management Council (NDRRMC) and the Local Government Units (LGU's) (http://www.parefwoodrose.edu.ph).

This findings implies that with regards to knowledge and education, technology and learning approaches to public education directed at increasing awareness and risk perception especially on parents have proven inadequate/insufficient and ineffective.

One reason why this may have occurred is that many parents did not finish their college studies from formal schools, most of them just completed elementary or high school. (Patton, et al., 2001).

The overall mean for Underlying Risk Factors is 2.75 interpreted as satisfactory. This implies that meeting the Millennium Development Goals and broaden human development objectives, and implementing a successful response to climate change are aims that can only be realized if they are undertaken in an integrated manner.

Policy responses to address each of these may be redundant or conflicting. This conflict can be attributed primarily to a lack of interaction and institutional overlap among the three communities of practice but also that there is much that can be learnt and shared between realms to ensure a move towards a path of integrated and more sustainable development (Schipper, 2006).

Furthermore, the overall mean for Preparedness and Response is 3.26 interpreted as satisfactory. This shows that the preparedness and response of risk reduction and management is satisfactory as perceived by the parent-respondent. There are connections between disaster recovery programmes and the resilience of affected communities. The adoption of The Hyogo Framework for Action (2005–2015) causes an increasing attention to the capacity of disaster-affected communities or countries to 'bounce back' or to recover with little or no external assistance following a disaster. This highlights the need for a change in the disaster risk reduction work culture, with stronger emphasis being put on resilience rather than just need or vulnerability (Manyena, 2006).

Table 2: Parent-respondents' Perception on Disaster Risk Reduction and Management

	Mean	SD	Interpretation
I. Disaster Risk Reduction Prioritization	2.89	0.62	Satisfactory
II. Risk Assessment, Monitoring and Warning	2.42	0.61	Fair
III. Knowledge and Education	2.57	0.68	Fair
IV. Underlying Risk Factors	2.75	0.55	Satisfactory
V. Preparedness and Response	3.26	0.72	Satisfactory
Overall Mean	2.78	0.49	Satisfactory

The over-all findings which is fair implies that there is a need to 'embed' a gendered humanitarian response within existing development initiatives. However, there is also a need for those working in development to understand that Gendered Disaster Risk Reduction (GDRR) is primarily a development, not a humanitarian issue. They need to see disasters, not just as a risk to development, but reducing disaster risk as a long term development goal or plan (Bradshaw, 2013).

Comparison of Perceptions:

The evaluation of the three hundred (300) total respondents composed of administrators and parents were tested using the T test.

The T test was the main statistical technique used to test the null hypothesis (Ho) to determine if there is a significant difference on the perception of the administrator and parents on the implementation of the different phases of disaster risk reduction and management.

Table 3 presented the difference on the implementation of disaster risk reduction and management as perceived by the administrators and parents.

Table 3: Perception of the Administrator and Parents on Disaster Risk Reduction and Management

		Mean	SD	t	df	p-value	Significance
Disaster Risk Reduction Prioritization	Administrator	3.30	.71	5.37	298	0.00	Significant
	Parent	2.89	.62				
Risk Assessment, Monitoring and Warning	Administrator	3.13	.74	9.05	298	0.00	Significant
	Parent	2.42	.61				
Knowledge and Education	Administrator	3.04	.72	5.79	298	0.00	Significant
	Parent	2.57	.68				
Underlying Risk Factors	Administrator	3.34	.75	7.77	298	0.00	Significant
	Parent	2.75	.55				
Preparedness and Response	Administrator	3.38	.71	1.40	298	0.16	Not Significant
	Parent	3.26	.72				
Disaster Risk Reduction and Management	Administrator	3.24	.65	6.94	298	0.00	Significant
	Parent	2.78	.49				

Table 3 shows the t-test result on the difference of perceptions of the administrators and parents on Disaster Risk Reduction and Management.

First, administrators had a higher mean and standard deviation than parents have and t (297, 2 tailed) = 5.37, p < 0.05 thus, there is a significant difference on the perception of the administrators and parents in terms of disaster risk reduction prioritization. Second, the table also shows the difference of perceptions of the administrators and parents on Risk

Assessment, Monitoring and Warning. The administrator had a higher mean and standard deviation than parents have with 9.05, p < 0.05 thus, there is a significant difference on the perception of the administrators and parents in terms of risk assessment, monitoring and warning. Third, the table shows the difference of perceptions of the administrators and parents on Knowledge and Education. The administrator had a higher mean and standard deviation than parents have with 5.79, p < 0.05 thus there is a significant difference on the perception of the administrators and parents in terms of knowledge and education. Fourth, the table shows the difference of perceptions of the administrators and parents on Underlying Risk Factors. The administrator had a higher mean and standard deviation than parents have with 7.77, p < 0.05 thus there is a significant difference on the perception of the administrators and parents in terms of underlying risk factors.

Lastly, the table shows the difference of perceptions of the administrators and parents on Preparedness and Response. The administrator had a higher mean and standard deviation than parents have with 1.40, p > 0.05 thus, there is no significant difference on the perception of the administration and parents in terms of preparedness and response.

In general, the mean and standard deviation of the administrators are higher than of the parents. With t (298, 2-tailed) = 6.94, p < 0.05, therefore there is a significant difference on the perceptions of the administrators and parents on Risk Reduction Management. This implies that administrators have higher perceptions than that of the parents. This implies that administrators have extensive environmental and resource management work to provide applied risk science skills to both the public and private sectors. These skills particularly useful in mitigating the impact of natural disasters on developed communities (The Australian Institute for International Development or IID, 2013).

4. CONCLUSIONS

The administrator-respondents perception on Disaster Risk Reduction and Management are all satisfactory which are arranged from highest to lowest based on its mean values: Phase V Preparedness and Response; Phase IV Underlying Risk Factors; Phase I Disaster Risk Reduction Prioritization; Phase II Risk Assessment, Monitoring and Warning; and, Phase III Knowledge and Education.

Likewise, the parent-respondents perception on Disaster Risk Reduction and Management which are arranged from highest to lowest based on its mean values: Phase V. Preparedness and Response; Phase I Disaster Risk Reduction Prioritization; and Phase IV Underlying Risk Factors are all satisfactory; Phase III Knowledge and Education; and Phase II Risk Assessment, Monitoring and Warning, are both fair.

There is a significant difference on the perception of the administrator and parents on the disaster and risk reduction and management.

5. RECOMMENDATIONS

In consideration of the findings and conclusions, the following recommendations are formulated by the researchers:

1. The Department of Education Division of City Schools may utilize local knowledge in community-based disaster risk management: The indigenous knowledge of people such as parents, elders who live in hazard-prone areas should be considered as complementary to scientific knowledge in the development of community-based disaster risk management plans and programmes.

2. The public secondary schools may perform its role in educating the parents in the community regarding disaster risk reduction.

3. The public secondary schools may set aside specific resources for disaster risk reduction for its development and relief work.

4. The public secondary schools may make concrete timeframe/timetable of disaster management action plans/strategies (for example, a three-year or five year term disaster plan).

5. The public secondary schools may provide technical aids like books etc. on disaster risk reduction and resources to faculty and staff.

6. The public secondary schools may empower teachers by involving them in planning, designing and evaluating disaster risk and reduction strategies.

7. The public secondary schools should comply for the effective and sustainable environmental policies and practices mandated by law.

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