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An Analysis of the Disaster Management Program of Selected Higher Education Institutions in Cavite, Philippines: Towards the Development of a Disaster Risk Reduction Management Model for Schools

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Abstract

This study sought to analyze the Disaster Management Program of selected Higher Education Institution in Cavite with the goal of developing a Risk Reduction Management Model for Schools. A mixed method research design specifically triangulation using validating quantitative data was utilized in this study. Seven Higher Education Institutions in Cavite, Philippines were involved. This comprised of two State Universities and five Private Universities/Colleges. Respondents from each institution are the Administrators, Faculty, and Non-teaching personnel, Head of disaster management program, and 3rd year and 4th year students. Findings revealed that some measures and provisions on the NDDRMC RA 101211 are not strictly followed by the participating HEIs in Cavite. Furthermore, the participating HEIs in Cavite differs on the level of adequacy of the resources used and the extent of implementation of the disaster management program. Having earthquake and evacuation drill and support from the management are the major strenghts that was identified however, budget allocation and evaluation of the program are the weaknesses and based from the findings of the study, a disaster risk reduction management model for school is proposed.

Keywords: Disaster Management Program, School Safety, Higher Education Institutions, NDDRMC, Disaster Management Model

Introduction

The Philippines as situated within the Pacific Ring of Fire, makes it one of the worst places to live in due to its exposure to natural disasters next to United States of America, China and India (UNODRR, 2016). These natural disasters can all result in life-threatening injuries, extensive property damage and ultimately, loss of life.

In recent events 16,000 students died when the school building collapsed in 2005 Pakistan earthquake UNICEF (2015). During 1990 Luzon earthquake, 150 students trapped and died when Christian College of the Philippine school building collapsed (UNHA, 1990) and in 2006 at St. Bernard town in Southern Leyte 200 students, six teachers and school principal were buried alive due to mudslide. Due to these

events the three million students of over 2,000 HEIs (CHED, 2018) belongs to the most vulnerable groups when calamities strike during school hours.

The West Valley Fault Line and the "Big One" will not only affect Metro Manila but the entire Cavite as well, particularly the towns of Carmona, Gen. Mariano Alvarez, and Silang. (Manila Bulletin June 2017). Thus, the 55 HEIs in Cavite (CHED, 2018) are expected that they are prepared whenever a natural or man-made disaster may strike.

While natural disasters cannot be prevented, the HEIs can concentrate on organizing efforts to avert the potential disastrous effects of these calamities. Educational institutions, so to speak, are duty-bound to safeguard the welfare of all its members and protecting them during natural hazards require two distinct yet inseparable priorities for action – disaster risk education and school safety as stated by ISDR (2006).

Hence, given these potential events, the following pertinent questions must be addressed – are our schools ready and prepared? Do they have the capability to mount a university-wide evacuation of all students, faculty, and school personnel to safety? Can they provide the appropriate emergency health care services required? It is in this view that their current disaster management design / model require a thorough analysis to ascertain whether it meets the needs of the academic community regarding safety and security as well as determining its effectiveness in managing resources to counteract the impact of disasters.

This study is anchored by Philippines' National Disaster Risk Reduction and Management Framework (NDRRMC 2010). The framework indicates the paradigm shift towards a proactive and preventive approach to disaster management and emphasizes that resources invested in disaster prevention, mitigation, preparedness and climate change adaptation will be more effective towards attaining the goal of adaptive, disaster resilient communities and sustainable development

Materials and Methods

Research Method

This study made used of mixed method research design specifically triangulation using validating quantitative data.

Research Environment

The study focused on selected universities and colleges in the Province of Cavite. Two state universities: Philippine Polytechnic University and Cavite State University Main; private institutions: University of Perpetual Help – Molino, University of Perpetual Help – GMA, San Sebastian College – Recolletos, St. Jude College and Imus Institute.

Research Respondents

The higher education institutions in the Province of Cavite and their respective officials and students were the respondents of this research to analyze the disaster management program. Respondents from each institution include administrators, faculty, non-teaching personnel, head of disaster management program and 3rd and 4th year students.

Research Instruments

A self made survey form based from the Department of Education Disaster Risk Reduction Resource Manual (2008) was utilized in this study to analyze the disaster management program of selected Higher Education Institutions (HEIs). The research tool is divided into two parts Part 1 is composed 22 stated

question on the level of adequacy on resources used (Human, System, Equipment/materials/supplies, Financial and Information) in implementing Disaster Management Program. The five point likert scale signifies the level of adequacy with the following interpretation (PAASCU Scoring) 4 – provision or condition exists extensively, 3 - provision or condition exists moderately, 2 - provision or condition is very limited, 1 - provision or condition is missing out but needed, 0 - provision or condition does not apply Part II is composed of 76 stated questions on the extent of implementation of the disaster management program divided into 4 categories (a) prevention and mitigation (b) preparedness (c) response and (d) rehabilitation. A likert scale checklist scoring of 4 – Implemented to a Great Extent, 3 – Implemented to a Moderate Extent provision, 2 – Implemented to a Limited Extent 1 – Implemented to a Very Limited Extent, 0 – Not Implemented. Structured and unstructured interviews were also used to determined the strengths and weaknesses of the disaster management program of the school and to validate the quantitative data that was gathered.

Data Gathering Procedure

Seeking permission from the university/college heads was the preliminary procedure done in preparation for this study. The instrument was given to a point person in the university/college for distribution, but in other institutions the researcher personally handed to the target respondents. The respondents identified the date and time for the retrieval of the said instrument. The researcher made an appointment to the head of disaster management program for the interview. The Data collection was done from September 2018 to February 2019.

Statistical Tool

Variables	Statistical Tools
1. Profile of the participating HEIs in Cavite	Percentage and Frequency
2. Level of adequacy of the resources used in the implementation of the disaster management program of the participating HEI in Cavite?	Mean and verbal interpretation
3. Extent of implementation of the disaster management program implemented by the participating HEIs in terms of prevention and mitigation, preparedness, response, rehabilitation and recovery.	Mean and Verbal Interpretation
4. Testing the significant differences in the level of adequacy of the resources used in the implementation of the disaster management program of the participating HEIs	Analysis of variance (ANOVA)
5. Testing the significant differences on the extent of implementation of the disaster management program (prevention and mitigation, preparedness, response, and rehabilitation and recovery) in the participating HEIs.	Analysis of variance (ANOVA)

Results and Discussion

The researcher employed 789 respondents, which are composed of 38 administrators, 167 faculty, 142 non-teaching personnel, seven head of disaster management program and 435 students from seven higher education institutions in Cavite. A student dominates the number.

Table number 1 shows the number of the respondents of the participating higher education institutions. Most of the respondents came from HEI - A with 220 (27.9 %) and there are three HEIs who have similar

frequencies of 100 (12.7 %) namely HEI - B, HEI - E and HEI - F.

Table 1 Number of the Respondents from each of the participating Higher Education Institution in Cavite. (n=789)

Higher education institutions	Frequency	Percentage
A	220	27.9
B	100	12.7
C	95	12.0
D	85	10.8
E	100	12.7
F	100	12.7
G	89	11.3
Total	789	100

The summary table for the overall level of adequacy of the resources (Human, Systems, Equipment/Materials/Supplies/Facilities, Financial and Information) used in the implementation of the disaster management program of the participating higher education Institutions in Cavite is shown in table number 2.

Human Resource

It is noteworthy to mention that HEI F has a very limited provision or condition in the implementation of disaster management program in terms of human resources while the remaining participating HEIs has a moderate level of provision or condition. Possibly, HEI F has an internal problem regarding disaster management since one of the respondents stated that *"Our disaster management team is not yet organize, actually I am the only person handling disaster management program of our school and I included this topic on one of my subjects and the final output of my students is to conduct a drill"*

System Resources

On the area of system resources HEI F has a very limited condition or provision in implementing disaster management program however, the condition or provision of system resources moderatlty exist in the remaing participating HEI. The IFRC, 2000 stated that constant review and critiquing from other government service agencies can reduce overlapping of efforts, make the plan more realistic, increase the overall efficacy of the safety plan. This is further validated by an interview from HEI A *"Our disaster management plan is updated, and we have completed the disaster management team that was submitted to the University President".*

Equipment/Materials/Supplies/Facilities resources

As shown in table 2 HEI F and G has a very limited condition or provision in implementing disaster management program compared with HEI A,B,C,D and E. It is imperative that the HEI should have complete and functioning equipment needed for the emergency response. Section 10.2.9.5 provision of the RA 9514 Fire Code of the Philippines, series of 2008 implementing rules and regulations (IRR), requires not just a fire extinguisher (Sec 10.2.9.12.6c), rather fire alarm system (section D), automatic fire suppression system (E), smoke/heat detectors (Sec 10.2.9.12.6a), stand pipes (Sec 10.2.9.12.6d), sprinkler

system, hose boxes, hose reels (RA 9514 series of 2008). The respondent from HEI F stated *"We do not have sufficient supplies and materials needed for disaster response this is due to lack of budget since we are a government institution, which the budget is always a problem*

Financial

The condition or provision exist moderately in terms of financial resources in all participating higher education institutions except HEI F which the provision or condition is very limited. Hockrainer-Stigler S. (2014) stated the threats to education from hazards are evident, policy- makers are reluctant to dedicate adequate funding towards safe school initiatives. Reluctance to fund safe school initiatives may be caused by nearsighted horizons, already limited budgetary resources, and other pressing issues that take precedent over prevention. This is supported by the claims of majority that was interviewed that budgetary allocation is the major hindrance on their disaster management program the respondents clamed that *"Our major problem in disaster management program is the financial allocation due to lack of budget that is allocated for disaster management program"*

Information

The condition or provision is very limited in HEI F In terms of information resources. However, the condition or provision of financial resources moderately exist in HEI A,B,C,D,E, and G. UNISDR (2010) prescribed that the DRR plan should contain specific instructions with a clear chain of command. However, The head of disaster management program of HEI F stated that *"Our disaster management plan is not yet organized").*

Table 2. The Overall Level of Adequacy of the Resources (Human, Systems, Equipment/Materials/Supplies/Facilities, Financial and Information) Used in the Implementation of the Disaster Management Program of the Participating Higher Education Institutions in Cavite

HEI	Human		Systems		Equipment		Financial		Information		Overall	
	M	VI	M	VI	M	VI	M	VI	M	VI	M	VI
A	3.01	PCEM	3.00	PCEM	2.91	PCEM	2.78	PCEM	2.95	PCEM	**2.93**	**PCEM**
B	2.89	PCEM	2.87	PCEM	2.83	PCEM	2.72	PCEM	2.80	PCEM	**2.82**	**PCEM**
C	2.48	PCEM	2.51	PCEM	2.33	PCEM	2.42	PCEM	2.45	PCEM	**2.43**	**PCEM**
D	2.79	PCEM	2.58	PCEM	2.51	PCEM	2.58	PCEM	2.66	PCEM	**2.62**	**PCEM**
E	2.92	PCEM	2.91	PCEM	2.88	PCEM	2.75	PCEM	2.88	PCEM	**2.86**	**PCEM**
F	2.22	PCVL	2.16	PCVL	1.84	PCVL	1.81	PCVL	2.02	PCVL	**2.01**	**PCVL**
G	2.94	PCEM	2.92	PCEM	2.36	PCVL	2.75	PCEM	2.88	PCEM	**2.77**	**PCEM**

Mean Values	VI	Verbal Interpretation
3.21 – 4.00	PCEE	Provision or condition exists extensively
2.41 – 3.20	PCEM	Provision or condition exists moderately
1.61 – 2.40	PCVL	Provision or condition is very limited
0.81 – 1.60	PCMBN	Provision or condition is missing but needed
0.00 – 0.80	PCDNA	Provision or condition does not apply

The summary table for overall extent of implementation of the disaster management program implemented by the participating HEIs in Cavite in terms of prevention and mitigation, preparedness, response, rehabilitation and recovery are shown in table number 3.

Prevention nad Mitihgation

All participating HEIs implemented moderately the disaster management program in terms of prevention and mitingation except HEI F which implemented the disaster management program in a limited extent in terms of prevention. Khan (2008) stated that the absence of a central authority, internal and external coordination is considered a culprit for the failure of a disaster plan. This is further supported by the committee that handled disaster management program based on their response on the interview that was conducted by most of the person that was interviewed stated that the DRR programs is supported and headed by their President. Majority of the head of disaster management program stated that that the DRR programs is supported and headed by their President. However, these findings suggest that the participating HEIs in Cavite do not fully implement the necessary measures needed for the disaster management program in all areas of Disaster Management Plan. The findings further indicate that the need for regular and strict compliance measure for the improvement of disaster management plan in HEIs in Cavite. Further, the results suggest the conduct of comprehensive assessment and evaluation of the HEIs in Cavite disaster management plan based on the NDDRMC protocol.

Preparedness

HEI C, F and G implemented the disaster management program in terms of preparedness in a limited extent and HEI A, B,D and E moderately implemented. a school disaster preparedness plan is composed of policies and procedures developed to promote the safety and welfare of the school community, protect school property, or regulate the operation of schools in the event of an emergency or disaster. The plan assures the protection and safe care of students, teachers, and staff before, during, and immediately after a threatened or actual emergency or disaster (Oreta, 2010). According to Guevara, et. (2006) in selected public schools in Luzon, which revealed that majority of the respondent schools, have insufficient preparedness in making school disaster preparedness plans.

Response

In terms of response as shown in table 3 HEI A,B,C,D and E moderately implemented the disaster management program. However, the extent of this is limited in HEI F and G. UNISDR (2010) included various sections in safety like: emergency drills and exercise, school fire drill procedure, school earthquake drill procedure and evacuation and assembly. During the interview, all the university respondents have had information officer or safety and security officer, but majority of the selected HEIs do not have a strong team in terms of disaster response as reported by the respondents during interview

one of the HEIs stated that *"We still don't have a clear team in terms of Disaster Response I have submitted the proposal to the University President but I was not able to follow up what happened to that request").*

Recovery and Rehabilitation

Rehabilitation and recovery is the ability of the institution to restore order in the school community (UNESCO). In terms of Rehabilitation and recovery HEI A, B, and E implemented the disaster management program in a moderate extent. And HEI F, C and G has implemented the disaster management program in a limited extent. Paño J. et. al (2015) stated that the rehabilitation and recovery measures of different HEI's vary due to the following conditions: Physical plant office lacks manpower, financial constraints on certain constructions, compliance to government policies prevents immediate debris management, moreover, the same policies may hinder fund release, thus delay building constructions, and administrative support in hiring more engineers and in building constructions and repair may also be considered in the lull of rehabilitation and recovery implementation.

Table 3. The Overall Extent of Implementation of the Disaster Management Program implemented by the Participating Higher Education Institution in Cavite in terms of Prevention and Mitigation, Preparedness, Response, Rehabilitation and Recovery

HEI	Prevention and Mitigation		Preparedness		Response		Rehabilitation and Recovery		Overall	
	M	VI	M	VI	M	VI	M	VI	M	VI
A	2.94	IME	2.84	IME	2.92	IME	2.91	IME	**2.90**	**IME**
B	2.89	IME	2.85	IME	2.82	IME	2.83	IME	**2.84**	**IME**
C	2.52	IME	2.32	ILE	2.25	ILE	2.33	ILE	**2.35**	**ILE**
D	2.54	IME	2.43	IME	2.39	ILE	2.51	IME	**2.46**	**IME**
E	2.83	IME	2.83	IME	2.88	IME	2.88	IME	**2.85**	**IME**
F	2.20	ILE	1.84	ILE	1.80	ILE	1.84	ILE	**1.92**	**ILE**
G	2.45	IME	2.32	ILE	2.34	ILE	2.36	ILE	**2.36**	**ILE**

Mean Values	VI	Verbal Interpretation
3.21 – 4.00	IGE	Implemented to a Great Extent
2.41 – 3.20	IME	Implemented to a Moderate Extent
1.61 – 2.40	ILE	Implemented to a Limited extent
0.81 – 1.60	IVE	Implemented to a Very Limited Extent
0.00 – 0.80	NI	Not Implemented

The comparison on the level of adequacy of the resources (Human, Systems, Equipment/Materials/Supplies/Facilities, Financial and Information) used in the Implementation of the disaster management program of the participating HEIs in Cavite is shown in table number 4

The table shows that there are significant differences in all areas of recourses used in implementing disaster management program. This findings can be attributed on the different aspects of adequacy on the five areas of resouces used in the implementation of disaster management program of selected HEIs in Cavite. The seven HEIs has similarities and differences on how they used the five resources (Human, System,

Equipment/Supplies/Materials, Financial and Information). Specifically, there are higher education institutions that don't have a specific program for disaster management. The development of NDRRMF or the National Disaster Risk Reduction and Management Framework is mandated and stipulated in Section 6 a) whereas the said framework was signed for approval on June, 2011, with a vision of providing a "safer, adaptive and disaster-resilient Filipino communities towards sustainable development". The Disaster Risk Reduction Management was subdivided into four thematic areas. These are Prevention and Mitigation, Preparedness, Response and Rehabilitation and Recovery.

Table 4. Comparison on the Level of Adequacy of the Resources (Human, Systems, Equipment/Materials/Supplies/Facilities, Financial and Information) Used in the Implementation of the Disaster Management Program of the Participating Higher Education Institutions in Cavite

Areas	Higher Education Institution Mean							Computed F - value	p - value	Interpretation
	A	B	C	D	E	F	G			
Human	3.01 0.65	2.89 0.51	2.48 0.70	2.79 0.66	2.92 0.64	2.22 0.73	2.94 0.65	22.39	< 0.001	S
Systems	3.00 0.66	2.87 0.61	2.51 0.77	2.58 0.80	2.91 0.55	2.16 0.73	2.93 0.67	21.83	< 0.001	S
Equipment	2.91 0.70	2.83 0.80	2.33 0.81	2.51 0.83	2.88 0.77	1.84 0.71	2.36 0.73	24.78	< 0.001	S
Financial	2.78 0.80	2.72 0.87	2.42 0.85	2.58 0.99	2.75 0.81	1.81 0.90	2.75 0.74	18.09	< 0.001	S
Information	2.95 0.80	2.80 0.73	2.45 0.79	2.66 0.82	2.88 0.76	2.02 0.84	2.88 0.70	21.40	< 0.001	S
Overall	**2.93 0.64**	**2.82 0.50**	**2.43 0.70**	**2.62 0.66**	**2.87 0.64**	**2.01 0.73**	**2.77 0.65**	**28-92**	**< 0.001**	**S**

The comparison on the extent of implementation of the disaster management program (Prevention and Mitigation, Preparedness, Response, and Rehabilitation and Recovery) implemented by the participating HEIsin Cavite is shown in table 5.

The table shows that there are significant differences on the extent of implementation of the disaster management in all areas. This findings can be attributed to the different disaster management program of

the selected HEIs in Cavite in four areas of disaster namely prevention, and mitigation, preparedness, response and recovery and rehabilitation. Specifically, there are higher education institutions that don't have a specific program for disaster management. The development of NDRRMF or the National Disaster Risk Reduction and Management Framework is mandated and stipulated in Section 6 a) whereas the said framework was signed for approval on June, 2011, with a vision of providing a "safer, adaptive and disaster-resilient Filipino communities towards sustainable development". The Disaster Risk Reduction Management was subdivided into four thematic areas. These are Prevention and Mitigation, Preparedness, Response and Rehabilitation and Recovery.

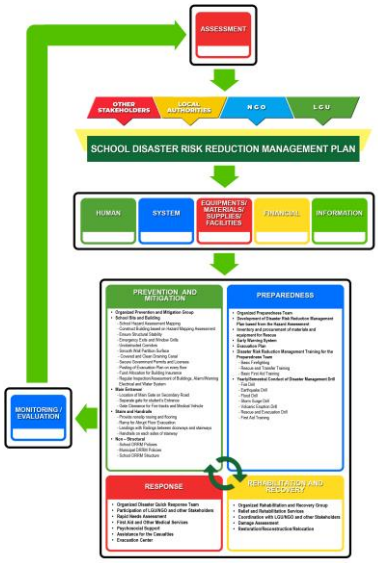
Table 5. Comparison on the Extent of Implementation of the Disaster Management Program (Prevention and Mitigation, Preparedness, Response, and Rehabilitation and Recovery) implemented by the Selected Participating Higher Education Institutions in Cavite

Areas	Higher Education Institution Mean							Computed F - value	p - value	Interpretation
	A	B	C	D	E	F	G			
Prevention and Mitigation	2.94 0.67	2.89 0.58	2.52 0.74	2.54 0.74	2.83 0.64	2.20 0.59	2.45 0.78	18.77	< 0.001	S
Preparedness	2.84 0.62	2.85 0.59	2.32 0.70	2.43 0.72	2.83 0.60	1.84 0.59	2.32 0.84	35.30	< 0.001	S
Response	2.92 0.76	2.82 0.64	2.25 0.77	2.39 0.76	2.88 0.65	1.80 0.72	2.34 0.96	34.07	< 0.001	S
Rehabilitation and Recovery	2.91 0.81	2.83 0.71	2.33 0.84	2.51 0.54	2.88 0.96	1.84 0.81	2.36 0.91	23.77	< 0.001	S
Overall	**2.90 0.72**	**2.85 0.75**	**2.36 0.84**	**2.47 0.99**	**2.86 0.80**	**1.92 0.89**	**2.37 1.04**	**60.16**	**< 0.001**	**S**

Strengths and Weaknesses in the implementation of the disaster management program in selected HEIs in Cavite

In terms on the strenghts and weaknesses the researcher have identified different themes and sub themes that reflects the views of the participants regarding strengths and weaknesses on their disaster management program of their school. The positive views of disaster management reflect the strengths on their disaster management program and the researcher have identified five themes namely (a) Fire/Earthquake and evacuation drill; (b) Training of staff and other stakeholders; (c) support on disaster management; (d) post evaluation and (e) disaster management organizational structure. However, the 2nd theme myriads of difficulties among universities/colleges reflects the weaknesses regarding disaster management program and the researcher have identified eight themes namely (a) Poor participation; (b) Disorganization structure of DRRM; (c) evaluation of disaster plans; (d) preparedness; (e) disaster drills; (f) priority; (g) logistics and (h) budget.

Figure 1. Proposed disaster risk reduction management model for schools.



This proposed Disaster Risk Reduction Model for School was based from the findings of this study. The Higher Education Institutions is one of the most crowded places that the students and the employees are among the vulnerable groups when earthquake or fire emergencies occurred. In order to reduce this vulnerability it is important that the school is prepared by implementing a disaster risk reduction programs. In this Model for Disaster Management Plan for schools, effort has been made to make a simple and precise plan that can be adopted by each school.

Conclusions

The researcher therefore concludes that measures and provisions on the NDDRMC RA 101211 are not strictly followed by the participating HEIs. Furthermore, the participating HEIs differs on the level of adequacy of the resources used in implementing their disaster management program and they also differs on the extent of implementing their disaster management program in terms of four areas prevention and mitigation, preparedness, response and rehabilitation and recovery.

Recommendation

Based on the findings, the following recommendations are hereby proposed:

There is a serious need for regular and strict compliance of the protocol in the provision of the resources and implementation of disaster management program among HEIs in Cavite based on the NDDRMC protocols and standards.. The institution should prioritize the disaster management program in their school improvement plan to strengthen the disaster management program of the institution. It is highly recommend that the Higher Educational Institution must have a systematic approach in assessing, monitoring and evaluating the disaster management program based from the Commission on Higher Education and National Disaster Risk Reduction Management Council policies and guidelines. Furthermore, It is greatly recommend that the Commission on Higher Education and the Municipal and Provincial Disaster Risk Reduction Council should conduct a monitoring process in the Higher Educational Institutions in Cavite.

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