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A Proposed Model on Disaster Risk Reduction Management for Basic Education Schools

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ABSTRACT

This study determined and described the status of the emergency preparedness and response system of basic education schools in Romblon, Philippines. Using descriptive evaluative and development research design, validated questionnaires were used as a data gathering technique supplemented with interviews from public elementary and high school principals and teachers, and barangay officials from areas prone to disasters in the islands of Sibuyan, Romblon, Tablas and Carabao in the province of Romblon. Frequency, percentage, mean, and one-way ANOVA were used for data analysis. Results showed that schools moderately practiced the identified five emergency preparedness and response system components, which calls for improving and strengthening the disaster risk reduction management programs and activities. Findings were used as a basis for the development of a Proposed Model of Disaster Risk Reduction Management for Basic Education schools.

Keywords: *basic education, disaster risk reduction management model, program assessment.*

INTRODUCTION

Philippines is one of the disaster-prone countries, frequently hit by calamities/disasters due to its geographical location. The province of Romblon, considered the heart of the Philippine archipelago, is also susceptible to these disasters. That is why Schools Division of Romblon should undergo evaluation for its preparedness for emergencies, considering that school children are considered the most vulnerable during disasters and calamities.

Department of Education (DepEd) Order 55 s. 2007, known as Prioritizing the Mainstreaming of Disaster Risk Reduction Management in the School System and Implementing Related Programs and Projects, emphasizes building disaster-resilient schools, nations, and communities. This is also one of the goals of the Hyogo Framework for Action 2005 – 2015, which is a priority policy for the department to pursue. Its focus is to have school programs that are secure and invulnerable to disaster. To ensure that DepEd orders are properly implemented at the lower level, evaluation of the general implementation of the status of basic education schools' emergency preparedness and response system is vital.

In consonance with the Republic Act No. 10121, known as the Disaster Risk Reduction and Management Act of 2010, the Disaster Risk Reduction and Management Office recommends policy measures, and propose programs and projects that will mitigate the impact of disasters on DepEd teaching, non-teaching personnel and staff, learners, and properties (Fig. 1).

Prioritization of DRRM programs is supported by various legal issuances to wit: Executive Order 888 Disaster Risk Reduction (DRR); RA 10121 – Philippine Disaster Risk Reduction Mgt. Act 2010 (PDRRM); National Disaster Coordinating Council (NDCC); PD No. 1566 S. 1978 – Philippine Disaster Control, Capability and Establishing National Program on Community Disaster Preparedness; Dep. Ed. Order No. 50 S. 2011, Creation of Disaster Risk Reduction and Management Office (DRRMO); Dep. Ed. Order No. 55 S. 2007, Prioritizing the Mainstreaming of Disaster Risk Reduction Management in the School System and Implementation of Programs and Projects and Relative Therefore; Dep. Ed. Order No. 43 S. 2012- Guidelines on the Implementation of Executive Order No. 66 (Prescribing Rules in the Cancellation or Suspension of Classes & Work in the Government Offices Due to Typhoons, Flooding, other Weather Disturbances & Calamities; and Dep. Ed. Order No.48 S. 2012 – Quarterly Conduct of the National School–Based Earthquake and Fire Drills.

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Objectives

This study aimed to develop a disaster risk reduction management system model for basic education schools in the province of Romblon. Specifically, it attempted to determine the status of disaster risk reduction management of the school as perceived by school managers, teachers, and barangay officials during calamities/disasters in terms of the following components: team organization and leadership capabilities with the following teams: building safety inspection; early warning; fire safety; supply; search and rescue; evacuation; first aid; communication; site security; relief and damage control; transportation; coordinating; financial and material capabilities; response mechanism; preparedness skills and abilities; reporting system/management.

Likewise, the study further aimed to identify the strengths and weaknesses of the disaster risk reduction management system of the basic education schools as perceived by the groups of respondents during calamities/disaster in terms of the aforementioned components and determine the significant differences in the perceptions between and among the groups of respondents on the disaster risk reduction management system during disasters and calamities. Finally, the study aimed to develop a Disaster Risk Reduction Management Model (DRRMM) designed for Basic Education Schools.

METHODOLOGY

Descriptive evaluative and development design was used in this study to determine and describe the situation as it existed at the time of the study. The baseline data was the basis for creating a Proposed Model Framework on Disaster Risk Reduction Management DRRM for Basic Education Schools and the extension program of Romblon State University-Sta. Maria Campus. This is an intervention in coping with the gaps in the emergency preparedness and response system of the basic education schools in the province of Romblon and of the whole community as well.

The respondents were public elementary and secondary school principals, teachers, and barangay officials from the islands of Sibuyan, Romblon, Tablas Island, and Carabao Island in the province of Romblon Philippines, which are identified as areas prone to different forms of disasters (Table 1).

Before the distribution of validated questionnaires to the respondents, the provincial governor endorsed the researchers to the different heads of public, private and civil agencies throughout the province for the conduct of the study. Permission was also given by the Schools Division Superintendent.

Interviews were also conducted with selected school personnel and barangay officials to supplement the data gathered. During the interview, teacher-respondents commented that the most common problem of the school is the lack of a committee on safety and rescue operations as well as the emergency vehicles to be used during emergencies. The claim is mostly the same, especially in schools in remote areas except in the province proper Romblon Island since they have enough patrol cars, ambulances, and even private vehicles ready to be used in an emergency. On contrary, the claim of one of the municipal mayors of Sibuyan Island when their market and nearby houses were burned by fire and

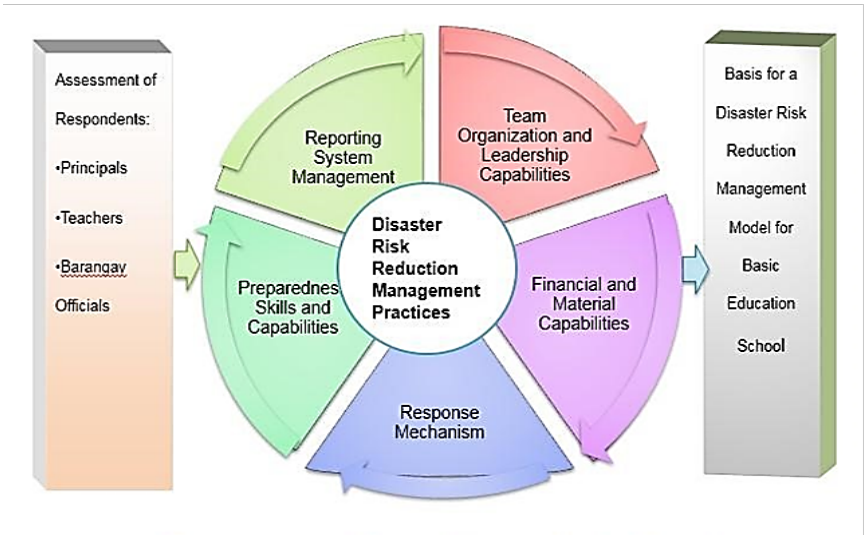

Figure 1. Conceptual Framework of the Study

brought millions of damages/casualties because they didn't even have a firetruck to be used for emergency cases, the same happened in Looc, Romblon, while Bonga Elementary School in Sta. Maria, Romblon was also damaged because of fire, and this was due to faulty wirings.

It was seen and observed in the study that some of the participating schools were flooded for a week, and school children were still playing in the school ground submerged with water. Landslides were also observed, and when interviewed, some of the residents of Sibuyan Island commented that it was due to mining. Statistical tools such as frequency, percentage, mean, and one-way ANOVA were applied in interpreting and analyzing the study results. The Regional Director, Office of the Civil Defense MIMAROPA and the PDRRMO Romblon validated the proposed model.

RESULTS AND DISCUSSION

As shown in Table 2, the participating barangays and the basic education schools moderately practiced the five components of the emergency preparedness and response system of the basic education schools: Team Organization and Leadership Capabilities, Financial and Material Capabilities, Response Mechanism, Preparedness Skills and Abilities, and Reporting System Management.

The school's team organization and leadership capabilities were found to have been moderately practiced almost of the indicators on the respective teams except for the supply team and search and rescue team which were found fairly practiced in most of the indicators hereof. Among the teams, the principal as the coordinating team was ranked second from the highest and interpreted as moderately practiced which means participants' assessment was arbitrary when it comes to strengths and weaknesses, the principals were perceived to be strong in handling such functions. The overall implication found its weaknesses and needs to be improved in ensuring the capabilities of leaders and members of the different teams.

The financial and material capabilities of the schools were perceived by teachers, parents and

Table 1. Distribution of the Respondents by School

Island	Name of School	Principals / Head Teachers	Teachers	Barangay Officials	Frequency	Percentage
		N	n	n		
Carabao Island	San Jose ES	1	10	0	11	3.48%
Tablas Island	Alcantara CES	1	10	4	15	4.75%
	Alcantara NHS	1	10	2	13	4.11%
	Bonga ES	1	7	2	10	3.16%
	Calagonsao ES	1	10	2	13	4.11%
	Carmen NHS	1	4	0	5	1.58%
	Concepcion Norte ES	1	10	4	15	4.75%
	Esteban Madrona ES	1	9	0	10	3.16%
	Esteban Madrona NHS	1	9	2	13	4.11%
	Libertad NHS	1	10	0	11	3.48%
	Looc CES	1	10	2	13	4.11%
	Looc NHS	1	7	4	12	3.80%
	Odiongan South CES	1	10	4	15	4.75%
	Panique ES	1	10	0	11	3.48%
	Romblon NHS (Odiongan)	0	0	2	2	0.63%
	San Agustin CES	1	10	0	11	3.48%
	San Andres CES	1	10	0	11	3.48%
	San Andres NHS	1	10	2	13	4.11%
	Sta. Fe ES	1	10	0	11	3.48%
	Sto. Niño ES	1	2	0	3	0.95%
Romblon Island	Romblon West CES	1	20	4	25	7.91%
	Romblon NHS (Romblon)	2	17	2	21	6.65%
Sibuyan Island	Cajidiocan ES	1	10	2	13	4.11%
	Cambijang ES	1	10	0	11	3.48%
	Magdiwang ES	1	10	2	13	4.11%
	Magdiwang NHS	1	10	4	15	4.75%
TOTAL		**26**	**245**	**44**	**316**	**100%**

barangay officials as moderately to fairly practice. This perception was because the school head was not directly in-charge of conducting relief operations instead assists only concerned agencies. To prepare the school for possible expenses, the Head may generate funds to supplement the budget for emergency cases. He/she can establish linkages and may ask for assistance from the 5% calamity fund of the Local Government Unit (LGU).

As to the school's response mechanisms, it was observed moderately practiced. This shows that the principals, teachers and parents/barangay officials perceived that the school principal is satisfactorily participating in terms of emergency and disaster by providing and installing an alarm system, informing all personnel and students on what to do upon hearing signals such as sirens, bell, megaphone or whistles, updates teachers, students and other personnel on the latest warning media, identifies and introduces an evacuation plan, posts the evacuation map in every classroom and ensures the minimum standards of evacuation centers/areas by taking into consideration the space for each family.

On the other hand, the respondents perceived some indicators as Fairly Practiced. It was noted significantly that the component of the response mechanism interviews has impacted their observations in the real situations of the schools in the division of Romblon. Hence, a collaborative effort of school heads and other stakeholders plays a significant role in responding to emergencies.

At this point, the schools in Romblon lack this particular equipment because of the big gaps observed in ensuring the preparedness for possible impacts of worse-case disasters in the province. At this juncture, the need to call the attention of the concerned higher officials or agencies in providing the needed equipment and supplies to different institutions, particularly the schools for their preparedness, is one of the major roles and responsibilities of school principals and local executives in managing their respective units.

On preparedness skills and abilities, the respondents perceived the indicators as Moderately Practiced except for one of the indicators "the school principal conducts training for safety like fire and earthquake drills regularly," was perceived and rated the highest by the respondents. This indicates that the elementary and high school principals can conduct lectures about different hazards such as typhoons, floods, fire, landslide and earthquake on what to prepare in case any of these disasters strike the school. Moreover, some responses from interviews of the school principals are indicative of the data obtained as follows:

> Our school organizes School Disaster Risk Reduction Management Committee (SDRRMC) to ensure safety. On the other hand, the teachers, parents, students and nearby residents are informed about preparations for emergencies arising during Parents Teachers Association (PTA) meetings.

Table 3. F-Test Values on Significant Differences on the Perceptions among the Respondents on the Disaster Risk Reduction Management System of Basic Education Schools

Components	**Source of Variation**	**Sum of Squares**	***df***	**Mean Square**	***F***	**Sig. (*p*-value)**	**Interpretation**
Organization and Leadership Capabilities	Between Groups	11.01	2	5.51	90.85	0.00	Significant
	Within Groups	17.15	28	.06			
	Total	28.16	28				
Financial and Material Capabilities	Between Groups	12.56	2	6.28	103.66	0.00	Significant
	Within Groups	17.15	28	.06			
	Total	29.71	28				
Response Mechanism	Between Groups	13.99	2	7.00	115.50	0.00	Significant
	Within Groups	17.15	28	.06			
	Total	31.15	28				
Preparedness Skills and Abilities	Between Groups	11.55	2	5.77	95.26	0.00	Significant
	Within Groups	17.15	28	.06			
	Total	28.70	28				
Reporting System Management	Between Groups	23.98	2	11.99	197.81	0.00	Significant
	Within Groups	17.15	28	.06			
	Total	41.13	28				
TOTAL	Between Groups	13.45	2	6.73	110.98	0.00	Significant
	Within Groups	17.15	28	.06			
	Total	30.60	28				

Table 4. Post Hoc Test on Significant Differences on the Perceptions between and Among the Respondents on the School Disaster Risk Reduction Management System

Key Areas	Principals VS Teachers	Difference	Principals VS Parents/Brgy. Officials	Difference	Teachers VS Parents/Brgy. Officials	Difference
Organization & Leadership Capabilities	-0.01	Not Significant	0.16	Significant	0.15	Significant
Financial & Material Capabilities	-0.09	Not Significant	0.07	Significant	0.16	Significant
Response Mechanism	0.07	Not Significant	0.13	Significant	0.20	Significant
Preparedness Skills & Abilities	0.15	Significant	0.05	Significant	0.15	Significant
Reporting System Management	0.61	Significant	0.78	Significant	0.11	Significant

G1 = Principals, G2 = Teachers, G3 = Parents/Barangay Officials HSD Value: a = .15 , b = 0.05, c = 0.15

Nevertheless, most schools, especially in remote areas, have not organized School Disaster Risk Reduction Management Committee (SDRRMC) since only a few teachers were assigned to their schools when interviewed during the study, but still followed DepEd Memo by conducting earthquake drill.

Based on the DepEd Manual on Disaster Risk Reduction, every school should train and maintain a pool of trainers on Disaster Risk Reduction. The school head should initiate capability training, programs and projects to improve the skills and capabilities of teaching and non-teaching personnel. Likewise, the school must have a Database Management Team, which shall take in charged by a Programmer as the head, assisted by five (5) encoders. The main function of the database management team is to collect, validate and analyze the data based on emergencies and/or calamities. Its qualitative and quantitative impact will be presented to the education sector.

Strengthening the preparedness on disaster risk reduction at all levels of education is very vital. After evaluating and analyzing the result of the conduct of earthquake, fire and/or flood drills, these will be presented and submitted to the authorities for improvement and enhancement, to ensure preparedness for emergencies.

Being prepared tips from the Department of Science and Technology (DOST) PHIVOLCS, was adopted. School Disaster Risk Reduction Management Council (SDRRMC) should have a yearly update on the information of school population, prepare the most recent school map, and prepare the building floor plan of each building. Conduct watching exercises by observing safe and unsafe zones, suggest corrections for improvements, assess the structural integrity of building/s with the assistance of an engineer, and assess if the school location is tsunami or flood-prone.

Good practices and safe zones must be observed. Swing outdoors, wide corridors, and wide-open spaces for evacuation, fire exits, and public alarm system. Some of the unsafe zones: windows and glass panes, bookshelves, machinery, cabinets, and furniture that may topple or slide narrow alleys.

The last component on emergency preparedness and response system assessed was reporting system management, rated as moderately practiced by the school officials. Big gaps show that in this component school heads missed to implement this function to a very high extent, thus, there is a need to improve this component. It should create website for repository and retrieval of data on disasters/calamities that will be used for information dissemination, policy formulation, resource allocation and decision-making: 1) assist the programmer in processing disaster related data; 2) assist the preparation of office orders, memoranda, communications and power point presentations; and 3) assist in preparations of reports, checks, classifies official communications and maintains files of disaster related data.

Although there are strengths in School's Emergency Preparedness and Response System to emergencies, still they need to improve and strengthen their programs and activities in ensuring prevention and mitigation of disasters. The findings suggest the attention of higher Dep. Ed. officials in ensuring the safety of school personnel, students, enhance the level

of awareness, the capacity of the community to mitigate threats and minimize impacts of all forms of hazards.

Based on the findings the researchers developed a proposed model framework for emergency preparedness and response system of the basic education schools. It incorporated the findings and observations of the study as well as the insights gained from interview with the respondents. The participants perceptions on the five key areas/components and their indicators were mainly considered in deriving at the model framework and give emphasis on the additional components which is the monitoring and evaluation, recovery and rehabilitation to prevent and mitigate the prolonged agony of victims to disasters. This proposed model framework is in response to the Department of Education Disaster Risk Reduction Management Vision: Its purpose is to deliver effective and efficient disaster program and assistance in a culture of safe and disaster risk resilient members of the school communities who are empowered and accountable citizens in an atmosphere of collaboration and synergy with a response mechanism through synchronize and concerted effort. The model was based also on various Disaster Risk reduction Management (DRRM) mandates/ thrusts through the following issuances: Executive 888 Disaster Risk Reduction (DRR), RA 10121 – Philippine Disaster Risk Reduction Mgt. Act 2010 (PDRRM), National Disaster Coordinating Council (NDCC), Dep. Ed. Order No. 555 2007 Philippine Disaster Management System (PDMS), PD No. 1566 s. 1978 – Disaster Control, Capability, and the Establishment of a National Community Disaster Preparedness Program in the Philippines.

Basic Education Schools in Romblon, different departments, international and national organization both government and non-governmental organizations acted collaboratively just to mitigate the vulnerability brought by the natural and human induced disasters/calamities. UNICEF, National Disaster Risk Reduction and Management Council (NDRRMC) under the National Defense Office, Department of Science and Technology-PHIVOLCS, PAG-ASA, MGB, and Philippine National Red Cross in cooperation with the Dep. Ed. made safety measures through information dissemination by making journals fliers concerning earthquake safety in schools- a primer for teachers (2008), how to conduct an earthquake drill in school (2005), Pag alerto, Malayo sa Peligro, what to do during an earthquake, PHILVOCS (2010), a Primer on Storm Surge PAG ASA (2009), Iba ang Ready sa Paguho MGB (2007) Earthquake Preparedness Guide of Marikenyo (2000) help Filipinos to be prepared save lives, and properties, and help decrease the number of casualties from the different disasters.

As stipulated in an Earthquake safety in schools a primer for teachers (2008) one can observe safety measures to avoid the impacts of an earthquake by familiarizing themselves and teaching students about school surroundings.

In the framework, the components of the School Emergency Preparedness and Response System include: before the disaster – prevention and mitigation, during the disaster – emergency response mechanism, and after the disaster – reporting system/management, monitoring / evaluation and recovery / rehabilitation.

Under prevention and mitigation, the leadership capabilities of the school are important. The principal may assign a coordinating team to chair the School Disaster Risk Reduction Management Committee.

To determine further which among the pairs of respondents were significantly different, the Honestly Significant Difference (HSD) or Turkey Method was computed to be statistically significant, any obtained mean difference must be the same or higher than the HSD values. (Punzalan and Uriarte, 2000).

As shown in the Table above, in the first, second and third components, the principals and teachers' perceptions were found not significantly different from each other with mean differences of -.01, -.09, and .07 which were lower than the HSD values of 0.15, 0.05, and 0.15 respectively. However, the perceptions between principals and parents/barangay officials were found significantly different in all the five (5) key areas with mean difference ranging from 0.05 – 0.78 which were found equal to or higher than the HSD values of 0.15, 0.05, and 0.15 respectively.

Both the principals and teachers perceived that the school has organized programs for emergency preparations, has sources for financial needs and material capabilities, and somehow has been doing response mechanism in times of emergency.

On the other hand, principals, teachers, parents and barangay officials do not have the same perceptions with regards to organization and leadership capabilities of the school, its financial and material capabilities, response mechanism, preparedness skills and abilities and reporting system managementThe teachers believed that the objective of the school in organizing School Disaster Risk Reduction Management Committee (SDRRMC) is to prepare the school for emergency. This consists of different committees, and each committee is headed by a team leader who was chosen on the bases of preference, skills, experience and background.

However, the parents and some barangay officials have seen some problems in the operation of disaster management, such as lack of rooms for evaluation, and comfort rooms where victims of calamity can be sheltered. Besides, the school is located along the road; there is a danger for young children evacuees to meet an accident if there's no Barangay Tanod to take charge of the traffic.

With regards to availability of disaster equipment in school, the parents/barangay officials observed that there is a limited fire extinguisher, fire hydrant, and no available fire track in case of emergency. To add on these observations, some barangay captains noticed that in some elementary and high schools, the facilities are present, only, there is lack of leaflets used for information dissemination, and the resource persons who handle the training and drills have limited knowledge on waste management and calamity awareness. Hence, they found that in some schools, the most common problems in disaster management are facilities, equipment and financial support.

Management nature depends on local economic and social conditions. Some disaster relief experts like Fred Cuny (1994) have long noted that the cycle of Emergency Management must be a long-term work on infrastructure, public awareness, and even human justice. Cuny said that the process of Emergency Management involves four phases: mitigation; preparedness; response; and recovery.

Therefore, if these phases were not well understood by the schools' stakeholders, such as principals, teachers and parents, it will result to disagreement of beliefs, ideas and reactions.

In view of the findings, Total Quality Assurance (TQA) was not attained in all areas, there is a need to develop a framework on Disaster Risk Reduction Management for Basic Education Schools in Romblon.

This study presents the proposed Disaster Risk Reduction Management Model (DRRMM) for Basic Education schools. It incorporated the findings and observations of the study as well as the insights gained from interviews with the respondents. The participants' perceptions of the five key areas/components and their indicators were mainly considered in deriving at the model framework. Other sources, such as the DepEd Disaster Risk Reduction Management Manual, were also considered. Management nature depends on local economic and social conditions. Some disaster relief experts like Fred Cuny (2009) have long noted that the cycle of Emergency Management must be a long-term work on infrastructure, public awareness, and even human justice. Cuny said Emergency Management involves four phases: mitigation; preparedness; response; and recovery.

Therefore, if these phases were not well understood by the schools' stakeholders, such as principals, teachers and parents, it would result in disagreement of beliefs, ideas and reactions.

Given the findings, Total Quality Assurance (TQA) was only attained in some areas, there is a need to develop a framework on Disaster Risk Reduction Management for Basic Education Schools in Romblon.

CONCLUSION

Basic Education schools in Romblon, Philippines have been implementing emergency preparedness and response system programs/activities in addressing disaster preparedness. However, their implementation did not reach the intent status in attaining total quality assurance. It was perceived and practiced only in a moderate scheme, and the gap shows its weakness and a need to improve them. Basic Education schools need more materials and supplies in preparation for and during emergencies. The proposed model framework for the emergency preparedness and response system of basic education schools (Figure 2) as an output of the study served as the basis for an extension program of Romblon State University Sta. Maria Campus where important information will be disseminated to the community and to the Department of Education Division of Romblon to make them aware of their emergency preparedness status and response system. The proposed model was validated and improved based on the suggestions and recommendations of the Regional Director, Office of the Civil Defense (OCD) MIMAROPA and the Provincial Disaster Risk Reduction Management Officer (PDRRMO) Romblon.

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AUTHORS' CONTRIBUTIONS

The authors confirm the authors' equal contribution to the paper.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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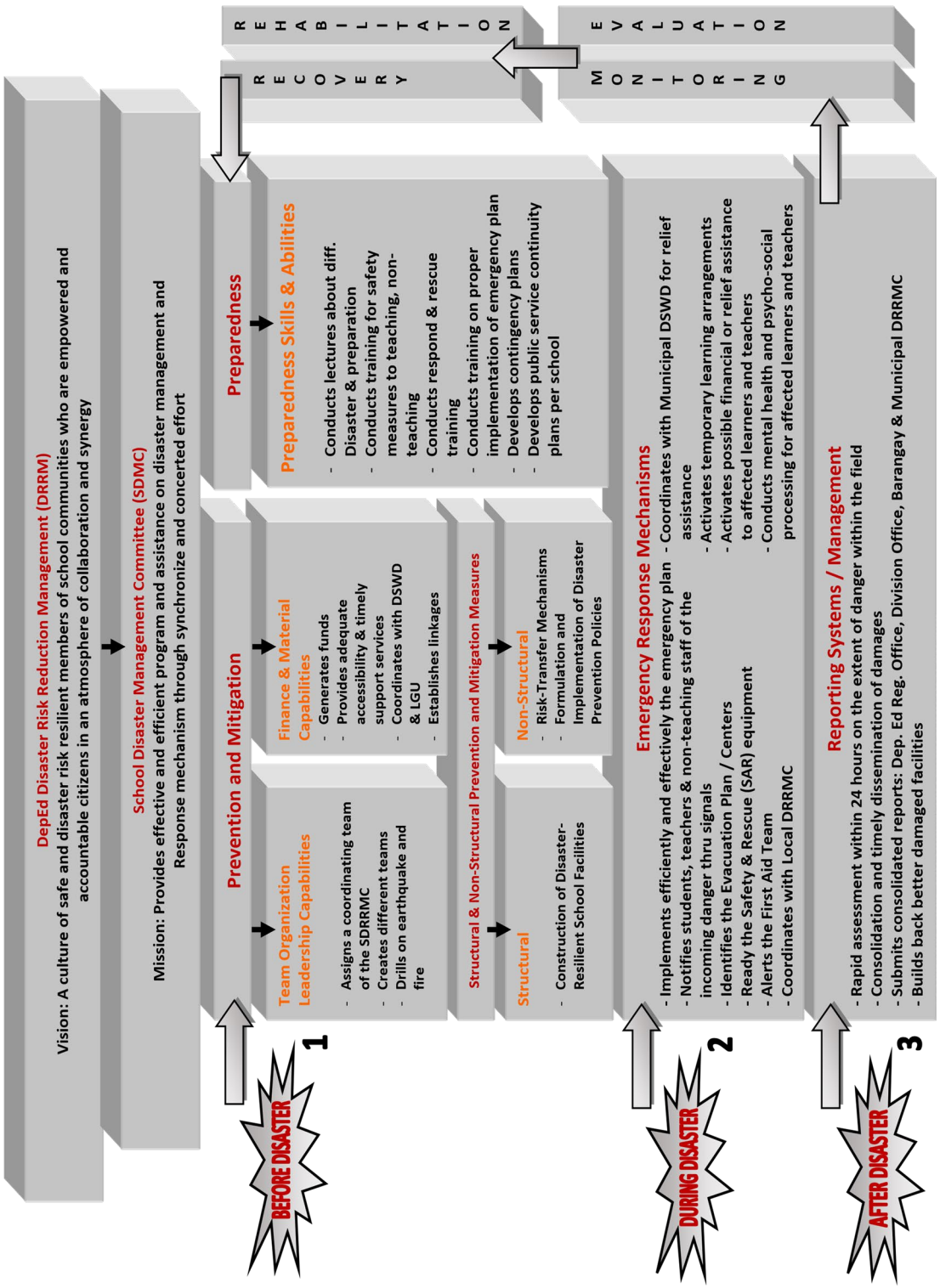

Figure 2. Proposed Model Framework on Disaster Risk Reduction Management of Basic Education Schools in Romblon