FLOOD PREPARATION AND MITIGATION OF LOCAL GOVERNMENT UNITS OF CAGAYAN

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ABSTRACT

This study assessed the flood preparedness and mitigation activities of six disasters prone Local Government Units (LGUs) in Cagayan with the end in view of formulating policies to address the problems and needs of these LGUs on flood preparedness and mitigation. The LGUs include Alcala, Amulung, Enrile, Iguig, Solana, and the City of Tuguegarao. Descriptive survey method was employed since the study attempted to determine the status of the disaster programs and activities, best practices, and problems encountered by the LGUs in the implementation of disaster plans. The respondents included the flood-affected community residents, Barangay Disaster Risk Reduction Management Council (BDRRMC) members, the MDRRMC officials and Flood Preparedness and Mitigation implementers. All the six LGUs have disaster risk reduction and management plans but do not have a separate flood preparedness and mitigation plans. Their disaster plans include contingency plans for flooding, erosion, and landslide. There was no separate budget allocated for floods. The majority of the LGUs assessed their budget, equipment, and manpower as inadequate and their flood preparedness as very much prepared. The respondents also positively rated the extent of implementation of their various flood preparation and mitigation activities. Their most pervasive problem include limited financial resources and the refusal of flood victims to be evacuated to safe places. The LGUs find their strong networking and linkages and quick coordination among civic organizations, government, and non-government agencies as one of their best practices. Other practices also include adequate sets of training on Disaster Preparedness and Rescue Operations, provision of soft loan for livelihood programs to affected families and presence of early warning system.

Keywords*: Flood Preparedness, Flood Mitigation, Best Practices*

INTRODUCTION

The Philippines is identified as a natural disaster-prone country in the world. The International Red Cross and Red Crescent Societies (Post-Disaster Needs Assessment, November 2009) described the Philippines as the fourth most accident-prone country in the world. The two institutions concluded that some 5,809,986 Filipinos were killed or injured as a result of disasters or man-made calamities over a ten-year period from 1992 to 2001.

The Philippine National Red Cross (PNRC) Governor Dante Liban reported that the Philippines is a natural laboratory for floods, typhoons, monsoon rains, earthquakes, volcanic eruptions, and landslides. (Philippine Daily Inquirer, July 10, 2011).

The Province of Cagayan has the second largest population in Region 02 in the 1990 and 1995 Population Commission (POPCOM) survey. Cagayan is basically an agricultural-based province, and its towns have large land areas and/or vast areas of flat land, usually those with large populations like Penablanca, Baggao, Gattaran and Lallo, all east of the Cagayan River, and Allacapan, Lasam, Solana, and Tuao on its west bank.

Tuguegarao, an identified primary growth center of Region 02, is a rapidly urbanizing city that provides socio-economic support services not only for the province of Cagayan but also for the whole Region 02. Sometimes it also includes the provinces of Kalinga and Apayao of the Cordillera Administrative Region.

In Cagayan, municipalities vulnerable to severe flooding include Solana, Amulung, Alcala, Tuguegarao City, Enrile, and Iguig. Other municipalities expecting flash floods and flooding as an effect of three to four days continuous rain are areas near tributaries like Gattaran, Baggao, Sto. Nino, Lasam, Abulug, Piat, Tuao, Rizal, Gonzaga, Claveria, Camalaniugan, Lallo, and Sta. Teresita. Tributaries that can cause flooding and erosion to these municipalities include Cagayan River, the longest and the largest river in the country which traverses from North to South, the Dummun River of Gattaran, Zinundungan River of Lasam, Matalag River of Rizal, Chico River of Piat, Tuao, and Sto. Nino, Pata River of Sanchez Mira, Abulug River, Buguey River, Cabicungan River of Claveria, Pared/Fulay River of Baggao and Alcala, and the Pinnacannauan River of Tuguegarao City (DSWD, R02).

Region 02 was affected by four (4) out of eight (8) cyclones in 2008 leaving behind millions of pesos in damages to properties. The typhoons affected 679 barangays with 56,016 families or 249,790 individuals. Totally damaged houses were reported at 1,961 and partially damaged houses at 11,029.

In December of 2011, the first-ever region-wide flood summit, which was hatched amid the series of floods besetting Cagayan Valley in recent years, was held. The summit dealt with the impact of climate change on the agricultural sector, with emphasis on how to minimize or mitigate the effects of floods brought about by typhoons and torrential rains on food production. This is a concerted effort of all sectors of society, especially the agricultural sector which has been severely affected by recent floods (Philippine Star, 2011).

Cagayan, the country's northernmost mainland province is also a major rice and corn producer, has been on the losing end every time the region is inundated. Since stakeholders noticed that typhoons usually hit the region during the last quarter of every year, some studied the possible rescheduling of the planting season so that the farmers could harvest their crops before the typhoon months. Included in the plan was the dredging of the Cagayan River, the country's longest river system, whose siltation has been blamed for the widespread flooding in the region.

Each year, billions of pesos in the Philippines is spent for aiding typhoon victims and repairing damaged infrastructure nationwide which significantly impedes the country's social and economic development. Thus, one way to cope with the situation is to strengthen disaster risk preparation and mitigation activities, particularly on the reduction of risks in the Philippine archipelago, especially in Cagayan province.

Moreover, ensuring one's safety and security during disasters is a concern of everyone. Psychological, physical, emotional, cognitive and other forms of preparatory support from individuals, families, neighbors, barangays, municipalities, provinces and the government and non-government organizations is a necessity.

Some professionals contend that the impact of natural disasters goes beyond physical effects and often result in a range of stresses. All who have been through a disaster can attest to this fact of life. Stress can be very detrimental to one's health. Stress has often been associated with negative outcomes including illness, loss of motivation and depression. Children, in particular, are very adversely affected by stress that may eventually lead to serious consequences. In the article "Everything You Ever Wanted to Know about Natural Disasters and Mental Health," it said, "The need to seek and receive all forms of preparatory and post-disaster support then becomes essential to lessen the impact of stress. Ensuring mental health (not just physical health or injuries from disasters) needs attention. Because of this, professionals often advise never to underestimate the importance of food, water, shelter, medicines and others alike, to positive physical and mental health preparation and recovery. Families must help families, neighbors must help neighbors, co-workers must help co-workers and so on to prevent or reduce the continued presence or decrease the mental stressors before and after a disaster ", (National Center for PTSD, 2009).

With the Philippines' susceptibility to natural disasters, emergency preparedness has always been a priority concern. The Local Government Units have the primary responsibility to deal with disasters. Under the Local Government Code, the local government serves as the first line of defense. They are expected to prepare contingency plans, invest in prevention, preparedness and mitigation measures, establish a DDC with participation from civil societies, and set aside five percent of their local income for calamity fund. They may also allocate additional human and financial resources from their annual budget to disaster-risk reduction activities and establish the permanent in-house capacity to manage disaster risk on a full-time basis (http://www.pdf.ph/pdna accessed March 12, 2012).

Statement of the Problem

The study aimed to assess the flood preparedness and mitigation activities of six disaster prone areas Local Government Units (LGUs) in Cagayan.

Specifically, it sought to answer the following questions:

1. What is the status of the flood preparedness and mitigation program of disaster prone LGUs with respect to:
   1.1 Municipal Flood Preparedness and Mitigation Plan;
   1.2 Facilities;
   1.3 Manpower Pool; and
   1.4 Fund Allocation?

2. What is the level of preparedness of these LGUs with respect to preparation, mitigation, response, and recovery ?

3. To what extent are these flood preparedness and mitigation activities implemented as perceived by:
   3.1 Community residents; and
   3.2 Flood preparedness and mitigation implementers?

4. What are the best practices of the six selected LGUs in Cagayan with respect to flood preparedness and mitigation?

5. What are the problems encountered by LGUs in the implementation of flood preparedness and mitigation activities?

6. What policies for flood preparation and mitigation can be designed to uniquely address the problems and needs of respondent-LGUs?

METHODOLOGY

Research Design

This study made use of the qualitative survey research as it aimed to explore the views of respondents as expressed in their own words. The descriptive survey was also employed since it attempted to determine the status, disaster programs and activities, and best practices of the LGUs regarding flood preparedness and mitigation and problems they encountered in the implementation of disaster plans.

Participants of the Study

The participants in this research work were the flood-affected community residents, Barangay Disaster Risk Reduction Management Council (BDRRMC) members, the MDRRMC officials and Flood

Preparedness and Mitigation Implementers of the respondent municipalities. The total enumeration was used in taking the respondents. Table 1 shows the profile of respondents.

The study consisted of one thousand and seventy-eight (1078) respondents distributed as follows: 106 MDDRMC members from the six LGUs, 331 BDDRMC members, and 641 Community Residents coming from the forty-six (46) barangays.

Instrumentation

The instrument used was the questionnaire carefully drafted by the researcher after considering other sources as a basis. The sample questionnaire was pre-tested to six MDRRMC members in Solana for validity and reliability. The test group was not included as respondents. Other data like best practices and problems encountered in the implementation of the plans were gathered through interview and general assembly with the respondents.

Data Analysis

Descriptive statistics was used such as frequency, percentage, and mean to analyze the data for the descriptive research questions. The following scale was used to interpret the weighted mean obtained from the questionnaire.

Mean	Qualitative Description
4.20-5.00	Very knowledgeable/very adequate
3.40-4.19	Knowledgeable/adequate
2.60-3.39	Quite knowledgeable/uncertain
1.80-2.59	Fairly knowledgeable/inadequate
1.00-1.79	Ignorant/very inadequate

Mean	Qualitative Description
4.20-5.00	Very Much Prepared
3.40-4.19	Much Prepared
2.60-3.39	Moderately Prepared
1.80-2.59	Less Prepared
1.00-1.79	Least Prepared

RESULTS AND DISCUSSIONS

Status of the Flood Preparedness and Mitigation Program of Disaster-Prone Local Government Units

All the six LGUs have disaster risk reduction and management plans but do not have a separate flood preparedness and mitigation plans. Contingency plans for flooding, erosion, and landslides are incorporated in their disaster plans. There was no separate budget, too, for floods. The majority of the LGUs find their budget, equipment, and manpower to be inadequate.

Flood Preparedness and Mitigation Activities of the LGUs

Common flood preparedness and mitigation activities of LGUs are as follows:

- Construction of Flood control gates preventing backup of high flood waters
- Intensive orientation on RA 10121
- Organization of rescue groups armed with WASAR and BLS skills
- Purchase of complete rescue paraphernalia like rubber boats
- Designation of evacuation centers
- Pre-positioning of food and non-food items to evacuation areas
- Deployment of rescue paraphernalia, such as rubber boats, ropes, etc

Level of preparedness with respect to preparation, mitigation, response, and recovery

The overall mean of the 6 LGUs as regards Preparation Activities is 4.73, described as “very much prepared.”

The six municipalities are “moderately prepared” in the area of flood mitigation.

Of the seven response activities, only Incident Command System got a rating of “moderately prepared” with a mean of 3.19. The other six items had a rating of “much prepared.”

With regard to recovery activities, five of the LGUS are “much prepared.” Only Enrile has a rating of “moderately prepared.”

The extent of Implementation of the Flood Preparedness and Mitigation Activities as Perceived by:

The Community Residents

The overall mean of the 641 community residents representing the 46 barangays in terms of the extent of implementation of the preparedness and mitigation is 4.06, qualified as "great extent" of implementation.

Flood Preparedness and Mitigation Implementers

The overall mean for the extent of implementation of flood preparedness and mitigation activities as perceived by the implementers was 3.35 with the qualitative description of "moderate extent" of implementation.

As revealed in the data, there was a difference in the perception of the community residents and the implementers on the level of preparedness and mitigation measures in all the LGUs.

Best Practices of the Six Selected LGUs in Cagayan with respect to Flood Preparedness and Mitigation

- Strong networking and linkages with coordinating agencies
- Preparedness of the Barangays that are affected by flood
- Adequate sets of training on Disaster Preparedness and Rescue Operations
- Cooperation and coordinated efforts among civic organizations, GOs, and NGOs.
- Provision of soft loan for livelihood programs to affected families
- Quick coordination among member agencies before any calamity occurs
- Delineation of responsibilities to facilitate smooth cooperation and coordination among member agencies, and
- Presence of early warning system

Problems Encountered by LGUs in the Implementation of Flood Preparedness and Mitigation Activities

Major problems encountered by LGUs are as follows:

- Limited resources in terms of finances resulting in their inability to realize some of their plans
- Refusal of flood victims to be evacuated to safe places

Policies for Flood Preparation and Mitigation Designed to Uniquely Address the Problems and Needs of Respondent-LGUs

The following are the proposed policies to address the problems and needs of LGUs uniquely:

- Strengthening of capability building and sets of training from the barangay to the municipal levels with emphasis on rescue operations and evacuation center management
- Forced pre-emptive evacuation
- Reinforcing the implementation of climate change adaptation in schools through the help of CHED and DepEd
- Provision and installation of flood warning signs in strategic places
- Strong information dissemination in schools from the elementary to the tertiary levels
- Tree planting in backyards, vacant public lots and along highways of trees.
- Creation of Barangay and Family Disaster Contingency Plan. The majority of the respondents said their plans remain on status quo since they find them to be effective; however, minor changes were given like:
- Incorporation of more training especially in rescue operations and in managing evacuation centers.
- Specific unique plans to be incorporated into the existing plans based on the problems and needs of the LGUs.
- Conduct of researches especially on the latest topography of the municipality

CONCLUSION

Based on the findings of this study, the following conclusions were arrived at:

There is no specific Flood Preparedness and Mitigation Plans in all the LGUs under study. At present, the majority of the LGUs do not feel the need of additional equipment and manpower. However, continuous sets of training, especially on rescue operations, are highly identified as one of the major

needs of the LGUs and the constituent barangays.

In general, all LGUs are considered "prepared" in all the cycles of disaster preparedness, mitigation, response, and recovery.

There is a difference in the perception of the implementers and the community residents on the extent of implementation of the flood preparedness and mitigation activities, that is, it varies from "great extent" to "moderate extent."

The 6 LGUs have unique and common best practices. Studying its adaptability and replicability to a certain LGU is the concern of policy makers. LGUs and barangays lack necessary funds to realize all their plans. Barangay folks resist evacuation because they do not like to leave their homes and property even during disaster events.

RECOMMENDATIONS

In the light of the conclusions, the following recommendations are arrived at:

Comprehensive municipal and barangay flood preparedness and mitigation plans and contingency plans to respond to flood events should be properly prepared and maintained in the operational status where flooding might occur in order to increase response capabilities and preparedness of organizations obliged to perform flood fighting and mitigating activities.

For LGUs to have an integrated approach covering all relevant aspects of water management in their plans.

In the development of a flood plan, decision makers at the municipal and barangay levels as well as stakeholders and civil society should be involved.

For a successful flood preparedness and mitigation planning, it is imperative to learn from the experiences and best practices of other towns and countries for greater collaboration and information sharing to enhance the synergy and to extend the resource base for more effective implementation of flood preparedness programs.

The most common problem identified by LGUs and the barangays is limited resources. It is necessary to train and mobilize local structures to seek to fund outside the community. Teaching communities to generate resources for their flood preparedness through networking and income-generating activities do not only discourage dole out mentality but may assure communities of enhanced livelihood sustainability.

As mentioned by one of the respondent barangays, plans must be built up from the grassroots level, respecting the unique qualities of each community, and from the bottom up, not super-imposed from the top-down and that experiences drawn from communities that have suffered from past hazards must be incorporated in the plans while, at the same time, considering their geographical location and vulnerable conditions.

There is a need for a holistic, coordinated and integrated approach to preparing and mitigating floods in all its systems and components.

To minimize the human, property and environmental losses, along with the social and economic disruption associated with extreme hazards, the critical assessment must be made to address the structural as well as non-structural measures adaptable to the localities under study considering its short-term and long-term impacts.

That all academic institutions, private and public, must offer in their curriculum, Disaster Preparedness, and Climate Change Adaptation as to prepare students in the dispensing of their civic responsibilities and to further strengthen their knowledge and awareness on the issue.

To address agriculture losses and the problem of food insecurity, researches along agricultural production practices that are more appropriate to the local environment, crop adaptability and new planting calendar could be conducted by concerned agencies like the Department of Science and Technology (DOST) and the Department of Agriculture (DA).

That an Incident Command System must be strengthened to improve efficiency and effectiveness of individual agencies as they work toward the common goal of stabilizing the incident and protecting life, property, and the environment.

A broad base participation of the community must be ensured, to attain zero casualties and reduced economic losses in times of disasters.

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