

Program for Enhancing Resilience to Climate Change: A Basis for School-Community Partnership

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Abstract - Naga City in the Philippines as the catchment area of the Bicol River, Naga City Disaster Risk Reduction and Management Office (NCDRRMO) has been actively addressing issues on climate change. Despite of local emergency response team's efforts, people's exposure to threat, increases. Significant impact can be made for climate change advocacies if there is appropriate and effective school-community collaboration. This provides challenge to all Higher Educational Institutions (HEIs). This paper evaluated the status of DRRM in the school and community. This also considered the extent of partnerships so that strategies could be made to help the community address problems in response to climate risk. The study adopted descriptive-evaluative design of mixed methods of research. The methods were utilized to confirm and validate findings. Structured questionnaires, interviews and FGDs were used for data gathering to the selected respondents of HEIs and Barangays in Naga City. Based on the findings of the study, respondents were "slightly prepared" for the exposure to climate change; collaborative efforts as one of the practices of the schools-LGUs in helping the community. Nevertheless, negative attitudes and no ample time to attend the seminar of the households as the problem encountered by schools-LGUs. As a result, inter-agencies collaboration should be established to address climate change related issues. The adoption of *Buronyog sa Pag-Anduyog: A School-Community Initiatives for Climate Change* will give opportunities to the community-beneficiaries be equipped with skills to address climate change impact.

Keywords: Climate Change, partnership, School-Community

INTRODUCTION

Many lives are endangered and properties are lost when disasters of great magnitude strike. The changing climate has been a global issue [1] because there are unpredictable effects on the people. Naga City as the catchment area of the Bicol River and constantly hit by the typhoon every year. Its local government office has been actively consolidated their efforts this addressing such issues. Despite of the hard works, people's exposure to threat, increases. Although, there are well established Disaster Risk Reduction (DRR) policies and strategies that address all forms of hazards [2]. But, the current technology in our country is insufficient to detect it, and not all people fully understand the adverse effects of natural disasters by their exposure to them. A provision, [3] the government should adopt a holistic, comprehensive, integrated, and proactive DRRM approach and promote the involvement and

participation of all sectors and all stakeholders concerned, at all levels, especially the local community. This is one way of strengthening it for a sustainable Climate Change advocacy.

Recent reviews indicate that over the past few decades, the challenge of reducing socio-economic vulnerability to climate has been taken on by researchers and policy communities [4]. Besides Lasco [5] confirmed the key role of local governments in promoting climate change adaptation by means of provincial resources to commit to climate change adaptation. But still, there is one aspect in this country that is not well studied, the potential of inter-local government collaboration for disaster risk reduction [6]. This study is the gap that would attempt to address.

Education is the essential component of adaptive capacity for climate change [7] Highly educated

individuals and societies are reported to have better preparedness and response to the disasters, suffered lower negative impacts, and are able to recover faster[8]. It is because through teaching-learning, the school has capacity not only to influence the community on how to reduce the effect of disasters occurring but also provide them necessary knowledge and skills in CC resiliency.

Risks can be changed by modifying the initial event or activity or by mitigating their impacts [9]. Adverse impacts of natural hazards may be reduced if there is appropriate and effective school-community collaboration. In general, adaptation practices depend for their success on specific institutional arrangements -- adaptation never occurs in an institutional vacuum [10]. This provides challenge to all Higher Educational Institutions (HEIs) not only in the City but also in neighboring towns. Moreover, the schools-LGUs partnership is also the key element for people's adaptation to climate risk. Though the help of the key stakeholders like Barangay Captains, Naga City Disaster Risk Reduction (NCDRR) Taskforce and Institutional Extension Directors and School personnel, this paper evaluated the status of DRRM in the school and community and the extent of its partnership so that strategies could be made to help the community address problems and issues in response to climate risk.

OBJECTIVES OF THE STUDY

This study evaluated the status of Disaster Risk Reduction Management (DRRM) in the school and community and the extent of its partnerships in increasing community's resilience to climate change. Specifically, the study attempted to: (a) determine the level of preparedness of Barangay Officials, School Personnel, and Household Heads on their exposure to climate change; (b) identify the practices of the schools and LGUs in helping the community in climate change adaptation; (c) predict the problems encountered by the school-community in the implementation of DRRM; and (d) propose a school-community partnership program for enhancing resilience to climate change.

METHODS

The study adopted descriptive-evaluative design of mixed methods of research [11]. Two different methods were utilized to confirm, cross validate or corroborate findings in determining the extent of school-community partnership in enhancing resilience

to climate change for the year 2014-2015. The data and information of this study was generated from the responses of the two hundred and ninety-seven (297) household heads, thirty-nine (39) LGUs of the selected barangays and one twenty-one (121) School Personnel of the selected HEIs and Barangays in Naga City respectively, through the use of random sampling. Selected barangays which consist of almost one-third of the total population of Naga City were identified considering their exposure to the different levels of climate related risks (high, moderate and low level of risk). Slovin's formula was used in obtaining the required sample size of the population for both selected HEIs and Barangays in Naga City.

The data and information were collected using a questionnaire-checklist to the LGUs, Household Heads and School Personnel. The questionnaire was composed of two parts the first part was the profile of the respondents and the second part were the series of questions aimed to determine the practices of the school and LGUs in climate change adaptation and its problems encountered. It has also items or statements that described aspects of exposure to climate change levels of preparedness. It contained four items, which were scored on a four-point Likert scale.

Table 1. Level of Preparedness range of scale with verbal description

Weight	Scale	Description
4	4.00-4.99	- Always Prepared
3	3.00-3.99	- Somewhat Prepared
2	2.00-2.99	- Slightly Prepared
1	1.00-1.99	- Unprepared

Its total scores ranged from 1 to 4 and has the following scale: Always Prepared or four (4) described as respondents were organized or equipped and ready all the time; Somewhat Prepared or three (3) which means respondents were organized and ready often or most of the time; Slightly Prepared or two (2) which means respondents have inadequate preparations; and Unprepared or one (1) respondents were not prepared (see Table 1). Interviews and Focus Group Discussions (FGDs) with key stakeholders like Barangay Captains, Naga City Disaster Risk Reduction Taskforce and Institutional Extension Directors were also used to generate different ideas from them. These were conducted concurrently to validate quantitative results used as bases for generalization of research outcomes; hence, mixed method of data collection was obtained. Review of

related documents was also considered. Data gathered were statistically interpreted using frequency count, percentage and weighted mean. They were analyzed and presented in graph and tabular form.

RESULTS AND DISCUSSION

The weather in Naga City from June to October is the typhoon season and it is generally rainy. The city also has a high exposure to tropical cyclones. Records show that it is hit by an average of 2.7 typhoons a year. It is second to Tacloban City, Philippines (6.74) in being the city most vulnerable to climate change among four (4) assessed by the study [12]. Its city proper is also within the catchment area of the Bicol river basin. Climate change such as typhoon triggers the Bicol River to overflow which caused flooding in some parts of the city.

Level of Preparedness on the Exposure to Climate Change

An Organized and well-coordinated disaster units is one of the strengths in Naga City. It also has strong implementation on leadership trainings and seminars on Disaster Risk Reduction and Management (DRRM), just like the seminars conducted every now and then.

Table 2. The Level of Preparedness of the Barangay Officials/LGUs

Item	Mean	Description
Trainings & seminars to people undergoing operations	2.88	Slightly Prepared
Trainings and seminars to the community	2.71	Slightly Prepared
Mobilize the different DRRM taskforce	2.91	Slightly Prepared
Organized & well-coordinated disaster units.	2.96	Slightly Prepared
Average	2.85	Slightly

Barangay Officials/LGUs. Shown in Table 2 are the results of the Level of Preparedness of the Barangay Officials/LGUs on the Exposure to Climate Change. Naga City has an organized & well-coordinated disaster unit, but with (\bar{x} =2.96) Barangay Officials/LGUs were “slightly prepared” for disaster events. Although there were lot of seminars conducted every now and then to DRR taskforce but still, they were “slightly prepared” or (2.91) to mobilize the

different DRRM taskforce before, during and after disaster; likewise to conduct trainings & seminars to people undergoing disaster related operations (2.88). And with 2.71, they were also “slightly prepared” and to conduct trainings, seminars & drills to community-beneficiaries like households, Out of School Youths (OSY) and senior citizens about climate hazard and specific preparedness measures. Still, most of the Barangay Officials/LGUs in Naga City were slightly prepared” for the exposure to climate change.

One of the functions of LGUs is to engage in government’s disaster risk reduction programs towards its effective delivery [13] Its responsibility is to organize a community-based program in capability-building on climate change so that community should deepen their understanding to the climate change and make locally-based approaches for addressing climate change impacts. However, validation reports from key persons through interviews and FGDs, it revealed that LGUs in Naga City haven’t yet conducted trainings, seminars, exercises & drills to the households about climate change preparedness measures.

Household heads. Naga City is second to Tacloban City (6.74) as cities most vulnerable to climate change. Records show that it is always hit by an average of 2.7 typhoons a year [14]. That is why, the ability of its people to achieve regular routine after a major climate change-related event is quite high. Thus, it is reflected in table 3 that among the four(4) categories, household heads perceived “*somewhat prepared*” or “*organized and ready often or most of the time*” in the practice of the emergency plans before disaster comes and (\bar{x} =3.17); aware of the responsibilities in addressing possible disaster related risk of 3.31 respectively. But unfortunately “*slightly prepared*” in attending trainings, seminars and drills conducted by the local government (2.41) and volunteer in the undergoing disaster related operations (2.42). And with the average mean of 2.8, this proves that most of the household-respondents perceived that they were “*slightly prepared*” on the exposure to climate change.

Perceptions of risk and structural inertia in planning processes have emerged as key issues for implementing adaptation responses [15]. Politicians, government agencies, and community leaders were all faced in different conflicting priorities. Sadly, climate change related problems and issues were almost neglected. This maybe one of the reasons behind

among different barangays, few people attended DRR trainings and seminars.

Table 3. The Level of Preparedness of the Household heads

Item	Mean	Description
Practice the emergency plans.	3.17	Somewhat
Attend trainings, seminars and drills conducted by the local government.	2.41	Slightly Prepared
Aware of the responsibilities in addressing possible disaster related risk.	3.31	Somewhat Prepared
Volunteer in related operations.	2.42	Slightly Prepared
Average	2.8	Slightly

Thus, enhancement of local-based policies should be given so much attention for an improved DRR delivery. The participatory planning approach in DRR should also be considered so that each person has the responsibility in addressing possible climate change hazards.

School Personnel. There have been activities in preparedness measures to disaster related events like fire and earthquake drills that are being conducted in every school within the City. That is why, it reflected that school personnel were “*somewhat prepared*” or “*organized and ready often or most of the time*” in the integration of DRR in school curriculum with (\bar{x} =3.07). However, they were “*slightly prepared*” to coordinate with the LGUs in disseminating information (2.83) and strengthening climate change adaptation through informal education with 2.94. Moreover, they were “*slightly prepared*” in the initiating community-school partnerships in addressing disaster related events (2.96). As a result, most of the school personnel were “*slightly prepared*” in preparation for the exposure to climate change. The findings were summarized in Table 4.

Table 4. The Level of Preparedness of the School Personnel

Item	Mean	Description
Integration in school curriculum.	3.07	Somewhat Prepared
Climate change in informal education.	2.94	Slightly Prepared
Coordinates with the LGUs.	2.83	Slightly Prepared
Initiates community-school partnerships.	2.96	Slightly Prepared
Average	2.95	Slightly

An active DRR promotion and implementation would facilitate the restoration and rehabilitation to the disaster-stricken communities. In such, there are activities in the different schools in Naga City would enhance the awareness of students and personnel on how to cope with disaster related events. However, there should also be an active coordination between and among the LGUs, GOs, NGOs and PDCC member agencies for effective DRR implementation.

The Practices of the School and LGUs in Helping the Community in Climate Change Adaptation

Adaptation and cooperation are the basic and often in the interests of survival [16]. That is why, Provinces in the country, that have experienced climate hazards are now a days more aware and responsive of the needs for climate change adaptation. Climate change is fast pushing the poorest and most marginalized communities beyond their capacity to respond. This report draws on case studies from around the world and on Oxfam’s experience working with rural communities. It sets out what is needed to enable people living in poverty to adapt to climate change, and a range of interventions that are available [17]. The technical services rendered of the different schools and LGUs resources will be of great help for disaster risk awareness so that they will be more prepared to face climate change.

Information Dissemination. Among 297 household heads, 39 Barangay Official-respondents and 121 school personnel, 30% perceived that there were “collaborative efforts of the school and LGUs in providing the community about the regular updates on climate change”; then 24.2% assumed that accessible disaster operation center as one of the practices. They believed that “conducts trainings and seminar about climate hazard” with 23.4% as the practices. Although some schools in Naga City have focal persons in DRR yet, most of them do not have established office that would cater on climate change related problems.

Their Community Extension Offices are focused on livelihood and other capability enhancement trainings. That is why, only 21.2% agreed that schools-LGUs have an active disaster management office. There were a lot of trainings done by the City DRRM office to the barangay task force and local authorities and some youth volunteers. Unfortunately, self-awareness in disaster related events as their least priority. But, still respondents agreed that

“Collaborative efforts of the school and LGUs in providing the community about updates on climate change” is one of the practices of school-community in helping them in climate change adaptation in terms of information dissemination as reflected in Figure 1.

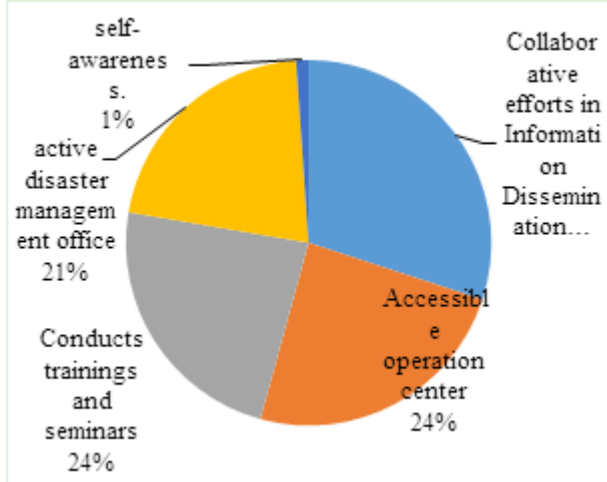


Figure 1. The practices of the school and LGUs through information dissemination.

Trainings done by the NCDRRMO to the barangay task force and local authorities were not enough to prepare the local communities enhance capacities to climate change risk and reduce its level of vulnerabilities. People who directly suffered from disaster risk should also be considered. Community-based activities and locally "owned" strategy should be established with household members as beneficiaries to minimize the effects of climate change.

Policies and Mitigating Practices. Figure 2 provides the data on practices of the school and LGUs in helping the community in climate change adaptation in terms of policies and mitigating practices. Among thirty-nine (39) Barangay Officials/LGUs-respondents, and (121) school personnel and (297) households; more than 25.2% agreed that there were flexible and easy to understand policies and practices made by them in helping the community about DRR. Then 17.7% believed that there were concrete strategies on how to address issues in climate change adaptation.

Moreover, collective efforts of schools and barangay in strengthening climate change management program as one of the practices of the school-community help strengthen climate change resilience with 17.7%. And 16.7% perceived that both have effective implementation plan of activities.

Remarkably 13.8% and 8.9% “integration of DRRM policies in the school development plan and adopt national policies on disaster management as their least priorities.

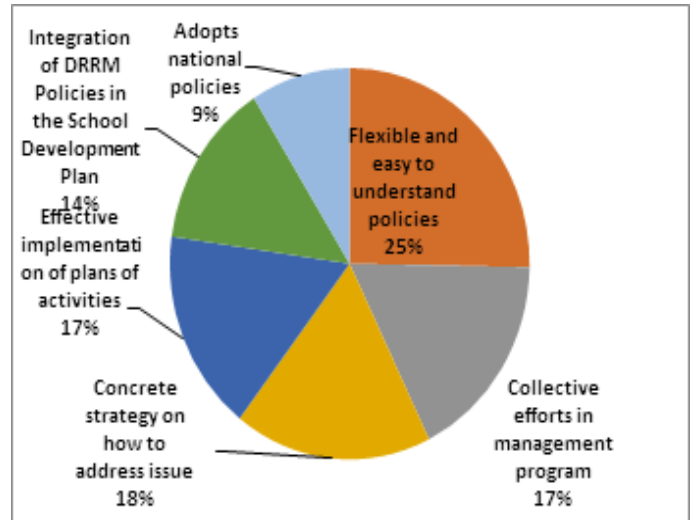


Figure 2. The practices of the school and LGUs through policies and mitigating practices.

HEIs could be of help for disaster response activities. Yet, activities in climate change were not HEIs priority because of some overlapping schedules and time management problems. Hence, most of the respondents believed flexible and easy to understand policies are the practices of school-community in helping the community in climate change adaptation. So far, National Disaster Risk Reduction and Management, empowered local governments to prepare their DRRM plans and utilize at least 5% of their annual budget to support these plans (Republic Act No. 10121).

Monitoring and Evaluation. In Naga City, emergency preparedness, until now has traditionally focused on stockpiling relief goods and providing urgent services to meet the community’s basic needs during the course of hazards. That is why; data revealed in Figure 3, of the 4 common practices, registered, the highest frequency of 28.2% two groups (school and LGUs) perceived that community is encouraged on the utilization of early warning system as their top priority.

Whereas, 27.4% agreed that their practice is to “assess impact on the community about the programs made”. It is followed by “evaluate implementation plans (23.2%)”. Unfortunately, “come up with the strategies to address issues of the vulnerable

community” belong to the last rank, since; local Administrators are more focused on short-term emergency contingencies.

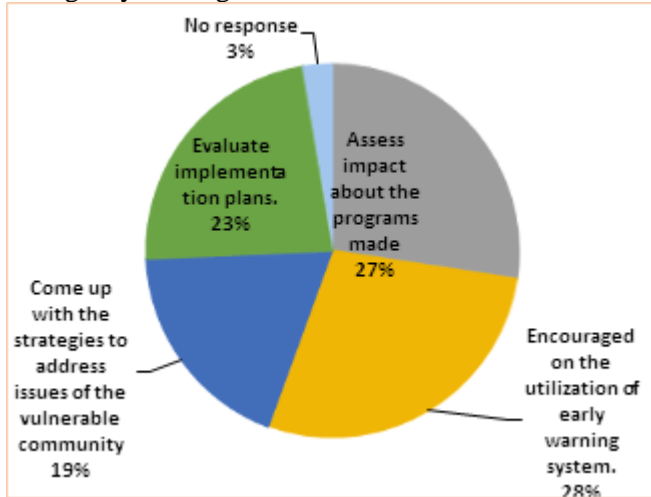


Figure 3. The practices of the school and LGUs through monitoring and evaluation.

Thus, most of the respondents’ perceived community is encouraged on the utilization of early warning system as the practices of the school and LGUs in helping the community in climate change adaptation. Moreover, based from the perception of the interviewed LGUs none of the agencies come up with the strategies to address issues in climate change of the vulnerable communities within the city.

It is true that Early warning systems are highly effective in saving lives and livelihoods. It provides communities with the advance information of risks that can be readily translated into prevention, preparedness and response actions. But then, building up strategies to capacitate humanitarian response should be a priority for all agencies. This should put much greater attention on long term approach in emergency preparedness and risk reduction, focusing on those communities most at risk. It helps also to reduce economic losses by allowing people to protect their assets and livelihood. These need to be strengthened in Naga City.

The Problems Encountered by the School-Community in the Implementation of DRRM

As perceived by the LGUs. Managing in general depends on leader’s political will [18]. And the problems encountered by it, can be linked by leader’s own priorities. Table 5 shows the problems encountered by the school-community in the implementation of DRRM as perceived by the LGUs.

Table 5. The problems encountered by the school-community on DRRM Implementation.

As perceived by LGUs	%
Lack internal revenue allotment	14
Not priority of the barangay	5
Scarcity of DRR emergency supplies	12
Negative attitude of the Community	11
No available funds from the national government.	13
Negative attitudes of some households	22
No ample time to attend seminar	20
No answer	1
Total	100

As reflected, 22% of Barangay Officials agreed, that the biggest problem that they have encountered is having negative attitudes of some households about the program in DRR. While 20% believed that households have ‘no ample time to attend seminar’ and 14% were convinced that they “Lack internal revenue allotment on DRR”. Only few or 5% assured “not barangays’ priority” as one of the problems encountered by the school-community in the implementation of DRRM. This proves that most of the Barangay Official/LGUs-respondents, encountered having negative attitudes of some households about the program related to information dissemination in DRR.

As perceived by Household Heads. We can observed that HEIs tend to focused on academic aspects while some politically affiliated community leaders are more focused on activities that make them gain votes. Hence, the negative attitudes of households towards DRR implementation can be associated by stakeholders’ priorities.

Table 6. Problems encountered by the school-community on DRRM Implementation

As perceived by Household Heads	%
Lack internal revenue allotment	11
Politically motivated LGUs	12
Not priority of the barangay	11
Scarcity of DRR emergency supplies	12
Negative attitude	10
Lack of initiatives	12
No available funds from the national government	8
Negative attitudes of households	10
No ample time	15
TOTAL	100

Table 6 shows the problems encountered by the school-community in the implementation of DRRM as perceived by the household heads. Naga City is Bicol Region's trade business center. For that reason, among 297 household heads, 15% confirmed they do not have time to attend the seminar on Climate Change.

Lack of initiatives of community leaders, scarcity of DRR emergency supplies and politically motivated LGUs with 12% are among the top responses. Only 8% attested that there are no available funds for DRR coming from the national government to support its implementation. Thus, this proves that most of the household-respondents do not have time to attend the seminar on Climate Change

As perceived by School Personnel. Lack of access to DRR information can also be the result of the increase in the level of vulnerability. It can happen simply because people don't find time to attend seminars in climate change. In such, personal priorities are not necessarily the main reasons, but also lack of initiative from DRR taskforce or local leaders, and community's negative perception to LGUs. If not, community may not know where to turn for assistance in times of distress. Nevertheless, it is always the responsibility of individuals to know and understand disaster and climate change related issues.

Table 7. Problems Encountered by the School-Community on DRRM Implementation

As perceived by School Personnel	%
No school-community collaboration	8
Availability of emergency implementation plan	14
Awareness of disaster operations center	13
Lack of specific time allotment for such topics	9
Lack of DRR learning materials	10
Congested curriculum	4
Overlapping school activities	13
Hectic schedule of teachers	14
Negative attitude of some teachers	4
Not a school's priority.	6
Lack of initiatives from the administration	4
Others like Self awareness	1
Total	100

Since, most of the schools in Naga City are focused in teaching instructions and don't have yet established implementation programs; that is why among 121 responses of school personnel-respondents, 14% confirmed availability of disaster risk reduction emergency implementation plan; and hectic schedule of teachers for instructional activities

were the problems encountered. Moreover, 13% believed that overlapping school activities and lack of awareness on disaster operation center were the problems encountered. And few believed lack of initiatives from the administration, negative attitudes of teachers and congested school curriculum were the problems encountered (see Table 7).

The Proposed Program in Enhancing Resilience to Climate Change

1. Title: **BuronyogsaPag-Anduyog**(unity in helping):**A School-Community Initiatives for Climate Change**

2. Rationale

Environmental challenges do not change the role of education; it rather changes its quality. Education must address global issues like climate change. This should be considered by the educational managers so that knowledge, life skills and values of students will be developed. Moreover, series of community-based activities have proven effective if there is school-community collaboration and cooperation.

Buronyog sa Pag-Anduyog is a collaborative efforts of HEIs and LGUs in helping communities be resilient to Climate Change. Through this, existing DRR programs and projects of the LGUs can be utilized considering the needs of the particular community. Moreover, through the help of LGUs and other stakeholders, HEIs will offer technical services to the community-beneficiaries (farmers, fisherfolks, OSY and other household members) about the updates, preparedness measures and mitigating process on climate change. In this way, communities in selected barangays in Naga City and Camarines Sur will be aware and be prepared of DRR and climate change risk.

3. Objectives

Provide opportunities to the communities to be equipped with necessary skills to address climate change impact on the local level. Specifically, it will be able to:

- Acquire basic knowledge on climate hazard and specific preparedness measures;
- Address the issue of disaster preparedness seriously; and

- c. Create local-based activities that will further enhance the capacity on Climate Change problems risk reduction of every community.

4. Description of the Initiative Components

Initiative 1: School-Community Partnership

The established collaborative approach of HEIs and LGUs in helping the community be resilient to climate change will start on November 2015. The first Naga City and Camarines Sur HEIs-LGUs and Other Agencies' organizational meeting will be held at BISCASST Naga City. The inception consultative conference will focus on (1) identifying DRR and climate change common problems based on the research findings; and (2) the creation of multi-disciplinary strategies in addressing climate risk. Partnerships will be formalized through signing of the Memorandum of Agreement (MOA) to clear out roles and responsibilities before, during and after the conduct of capacity enhancement and livelihood training. It is expected to expand gradually all throughout Bicol Region with the help of CHED, NDRRC, LGUs and other agencies and stakeholders as partners.

Initiative 2: Training-Workshop for HEIs Teachers and Student Volunteers

National Disaster Risk Reduction and Management Council (NDRRMC) pool of experts will be invited to share their knowledge and expertise on DRR and climate change to HEIs teachers, extensionist and student volunteers through training-workshops. Thus, they could help the community to improve its capacities in DRR and climate change hazards.

Initiative 3: Capacity Enhancement Activities for community-beneficiaries:

- a. *Trainings and Seminars*. This is a series of trainings and seminars as one of the initiatives of HEIs and LGUs that focuses on providing the community about the regular updates on climate change. This will help them strengthen their prepared/resilience to disasters and climate risk.

- b. *Climate Awareness Resource Education (CARE) Mobile Center*. The Climate Awareness Resource Education (CARE) Mobile Center, is designed to educate communities on climate hazards and specific preparedness measures by reaching out people in the

community through house to house visit and giving of educational resources. This will enable the extensionists/volunteers reach busy households and distant communities with lack of accessibility to any information dissemination about climate change updates because of geographical location.

Initiative 4: Livelihood Options

Many people of the affected communities are unable to engage in normal income generating activities after disaster and climate change phenomena. They normally became dependent on humanitarian aid. That is why, livelihood opportunities to affected communities are essential component for economic reconstruction. Livelihood opportunities will be conducted to the selected communities. This HEIs-LGUs initiative will help them secure alternative occupation or vocation and income generating opportunities and if possible, provide means to start a project. In this way, this will provide direction to vulnerable communities rebuilding their economic situations after disaster.

CONCLUSION AND RECOMMENDATION

Based from findings of the study, the following conclusions/ implications are deduced: The barangay officials, household heads and school personnel are "slightly prepared" on the exposure to climate change; the collaborative efforts in providing the community about its updates was one of the practices done by the school and LGUs in helping the community in climate change adaptation; negative attitudes of some households as one of the problems encountered by the School-LGUs in DRR implementation; and a need for school-community partnership program as blueprint for enhancing resilience to climate change.

Thus, it maybe implied that: (1) implementation strategies of National Disaster Coordinating Council (NDCC) for Local Government should be revisited to support ongoing, proactive adaptation to climate change risks; (2) Disaster Risk Reduction (DRR) policies and framework in capacity-building should be based from the needs of the community; (3) an Inter-agencies collaboration and coordination should be established in addressing all aspects of climate change related issues; and (4) the adoption of the proposed school-community partnership program for enhancing resilience to climate change in the different communities.

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