International Journal of Education Humanities and Social Science

ISSN: 2582-0745
Vol. 4, No. 04; 2021

COMMUNITY VULNERABILITY ON CLIMATE CHANGE IMPACTS AND TRAINING NEEDS ASSESSMENT FOR LOCAL GOVERNMENT UNITIN THE PHILIPPINES

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ABSTRACT

This study look how climate change may affect the community, Identify the needs for training on climate change adaptation. Develop a proposed training plan and training design for LGU-CET to capacitate the community in adapting climatic changes. Typically require some information on future climate conditions for a define area and a combination of quantitative and qualitative data and information to characterize how climate change affect the daily life of the constituents. A survey involving (n=333) respondents was conducted from April- September 2018 by using a climate change adaptation protocol. This has been supplemented with focus group discussions and key informant interviews and In-depth household interview . Results of this study revealed that Data revealed that majority of the vulnerable groups in barangay adiangao, san jose, camarines Sur,(Philippines). Belong to the age group from zero (0) months old up to 17 years old (n=231). However, (n=126) were identifed from various sectors to wit; elderly headed households, women headed household,erdely, household with morethan five children, Residents on/near seashore and rivers, Fisherman, Widows, Household with high incidence of poverty, Agriculture sector, Informal Setlers. Reducing climate change vulnerability and developing more adaptation strategies require assistance from the government, Non-Government organizations, and other stakeholder. This can help in the form financial assistance, providing basic training, and other activities relevant to climate change adaptation strategies. Consultation with other key stakeholders is also required to create awareness and to build capacity of local communities towards reducing climate change vulnerability and facilitating timely and effective adaptation.

Key Words: Community vulnerability, climate change impacts, training needs assessment, local government unit.

1. INTRODUCTION

The adverse impacts of climate change will severely affects the the economic activity of the local constituents in barangay adiangao, san jose, camarines sur and nearby barangay within the municipality, Specifically, the fishing communities, and agricultural sectors. It is expected that changing climatic conditions is likely to increase the frequency and magnitude of some extreme weather events and disasters like flood, droughts, storms and cyclones (Mirza, 2003; Greenough et al., 2001; Field,2012).The impacts of climate change may also differ considerably between

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regions and socioeconomic groups. the less developed regions there are more vulnerable communities will be affected, as they lack the basic social and economic capital (Maharjan and Joshi, 2013;Bouroncle et al., 2016). While the other due to geographical locations of some of the most vulnerable regions of the country, their high exposure, limited assets, rapid and unmanaged population growth, as well as the likelihood of their mal-adaptation (Huq et al., 2004; Hay and Mamura, 2010; Atta-ur-Rahman and Khan, 2011).Within developing countries, this asymmetry of conditions and vulnerabilities can particularly be represented by the dichotomies between small/large and family/non-family farms (Zhang et al., 2016).

The micro-level social science studies contain substantial knowledge on individual behavior, decisions under risk and climate adaptation, and go beyond monetary losses by focusing on resilience. Kelly P M,et al(2000) developing countries like the Philippines have lesser capacity to adapt and are more vulnerable to climate change damages, just as they are to other stresses. This condition is most extreme among the poorest people. (IPCC 2001: 8) Among others, rapid population growth, uncontrolled development and unmanaged expansion of infrastructure are the most common factors resulting in more people being vulnerable to natural hazards than ever before (Cardona et al., 2003). Studies suggest that poor people in rural areas of Pakistan are the most vulnerable to climate change (Ali and Erenstein, 2016; Deressa et al., 2009; Füssel, 2007). These communities are struck hard by those changes in climate identified by many studies conducted throughout the country (Tingju et al., 2014; Atta-ur-Rahman and Khan, 2013; Qasim et al., 2015; Abid et al., 2015). While there are regions and populations throughout the country are vulnerable to climate change and warrant the attention of policy-makers. It is clear that climate change will, in many parts of the world, adversely affect socio-economic sectors, including water resources, agriculture, forestry, fisheries and human settlements, ecological systems and human health with developing countries being the most vulnerable. (IPCC 2000a). According to the IPCC third assessment report, adaptation "has the potential to reduce adverse impacts of climate change and to enhance beneficial impacts, but will incur costs and will not prevent all damages."

Furthermore, it is argued that human and natural systems will, to some extent, adapt autonomously and that planned adaptation can supplement autonomous adaptation. However, "options and incentives are greater for adaptation of human systems than for adaptation to protect natural systems" (IPCC 2001: 6-8). This paper determined the community vulnerability on climate change impacts and training needs assessment for local government unit (LGU-CET) in the context of eco -tourism, and to identify the needs for training of the community.

2. MATERIALS AND METHODS

Study sites

The study was conducted at barangay Adiangao in Munipality of San Jose Camarines Sur, Philippines. The project had two major components such as, vulnerability assessment within the pilot area, and training needs assessment for climate change adaptation. The municipality is the primary political and administrative division with geographical jurisdiction over a number of

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barangays. The barangay Adiangao is one of the coastal barangays in San Jose Camarines Sur. This barangay has the potential in tourism because of a cave with underwater river hidden in a virgin forest. With total population of 1,997,and 345 households and 782 registered voters. It is located about 28 km. by land or 15 km. by water away from the population of San Jose. It is also 8 km away from barangay sabang and with a distance also of 8 km away from the municipality of Presentacion when you travel by land. It has 7 purok/zones and a total land area of 400 hectares with rolling agricultural land and forest mountains. It is bounded on the north by cocoland and northeast by barangay Ayugao, Presentacion were the Talidtidon Falls and Kawa River lies. On the west by barangay Maangas, Presentacion where Gipangpang River can be found. On the south is barangay Lagha also of Presentacion. This condition puts the researcher to identify the vulnerable sectors on climate change impacts and conduct training needs assessment for local government Unit in the context of eco –tourism. To designed training plan for LGU-CET.

Prior to data collection, permission to conduct the study will be sought from all concerned officials such as the municipal mayor, barangay officials, DRRM officials, and the like. Consent of the respondents was also sought, where they were given the choice to participate or not in the survey. They were given the full information about the study including its objectives, the utility of the information, and the treatment for the confidentiality of data. Data were presented as aggregate in forms of percentages and mean to maintain the confidentiality of the respondents. Followed by Training Needs Assessment (TNA) The TNA is a method used for determining if a training needs is exist and if does, to fill the gap. The expectation of knowledge and abilities of officials at different levels is different, so the training needs as this different level is different. The objectives of conducting needs assessment are several and include: (1.) To validate the hypothetical judgment with actual training needs; (2.) to ensure that the solution addresses the most needed subjects and effectively focused appropriate resources, time and effort, towards targeted solutions; (3.) to identify the gaps between the model situation and the actual situation. The results of training needs analysis aim the highlight subjects needed to effectively fulfill the knowledge and needs gaps, helps in the preparation of training modules, and facilitates in the development of a climate-based change learning program.

Research Design and Sample Population

The study employed the qualitative descriptive survey method involving the community Households in barangay Adiangao, San Jose, Camarines Sur, Philippines. Respondents (n = 333) were selected randomly from the total population, and were stratified by their purok. They were distributed as follows: Purok1- 42, Purok2-42, Purok3-40, Purok4-57, Purok5-57, Purok6-46, Purok7-54.

Instrument in Data Collection

The researcher were used survey questionnaire to collect data, key informant interview (KII) and focus group Discussion (FGD) adapted in (Mendoza, 2014) the responses of the respondents we

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were classified systematically according to different variables included in this study. All the data gather we were presented quantitatively.

Data Analysis

Collected data will be subjected to a descriptive and inferential statistical analysis to address the objectives or research questions of the study.

3. RESULTS

A. Male Population in Barangay Adiangao, San Jose Camarines Sur(Philippines)

To determine the impact of climate change in the vulnerable secotors in the community. Table 1 presents the breakdown of the male population in barangay adiangao, san jose, camarines ur,(Philippines**)** as to infant, toddler, pre-school, school age, teenage, adault, senior citizen, PWSNs, this is socially and spatially differentiated across population scales of dicisions making. Data revealed that the out of one hundred fourty five 145 male respondents in the pilot study sites (n=109 or 76.39 percent) ranging from 0-month old to 17 years old respectively, while (n=8 or 5.51%) were senior citizen and (n=1or 0.68%)person with specials needs.

Table 1. Breakdown of the Male Population in Barangay Adiangao, San Jose Camarines Sur(Philippines) N-145

LOCATION OF POPULATION	MALE																	
	Infant		Toddler		Pre-school		School Age		Teenage		Adult		Senior Citizen		PWSNs		Total	%
	0-12 mos		1-3yo		4-5yo		6-12		13-17yo		18-59yo		60 above					
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
Purok1	1	0.68	3	2.06	4	2.75	5	3.44	3	2.06	4	2.75	1	0.68	0	0	**21**	**14.48**
Purok2	2	1.37	3	2.06	4	2.75	2	1.37	2	1.37	2	1.37	2	1.37	0	0	**17**	**11.72**
Purok3	3	2.06	4	2.75	2	1.37	4	2.75	3	2.06	4	2.75	1	0.68	0	0	**21**	**14.48**
Purok4	4	2.75	1	0.68	6	4.13	2	1.37	4	2.75	2	1.37	0	0	1	0.68	**20**	**13.79**
Purok5	1	0.68	5	3.44	2	1.37	5	3.44	4	2.75	5	3.44	1	0.68	0	0	**23**	**15.86**
Purok6	1	0.68	4	2.75	5	3.44	2	1.37	3	2.06	3	2.06	2	1.37	0	0	**20**	**13.79**

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Purok7	2	1.37	5	3.44	4	2.75	1	0.68	5	3.44	5	3.44	1	0.68	0	0	**23**	**15.86**
Total	**14**	**9.65**	**25**	**17.24**	**27**	**18.62**	**21**	**14.48**	**24**	**16.55**	**25**	**17.24**	**8**	**5.51**	**1**	**0.68**	**145**	**100**

Source from: Records from Baragay Adiangao
Legend: PWSNs – Persons With Special Needs

Althought there is not much different as to the number of respondents in the purok level. However, this results could be used as a basis in determinng the program/projects implemented to capacitate the vulnerable sectors with in the baragay level. The Sendai Framework for Disaster Risk Reduction 2015-2030 Priorities for action to wit; Priority 1: Understanding disaster risk ,Priority 2: Strengthening disaster risk governance to manage disaster risk ,Priority 3: Investing in disaster risk reduction for resilience, Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

B. Female Population in Barangay Adiangao, San Jose Camarines Sur(Philippines)

To measure the impact of climate change in the vulnerable sectors in the community. Table 2 presents the breakdown of the female population in barangay adiangao, san jose, camarines ur,(Philippines**)** as to infant, toddler, pre-school, school age, teenage, adault, senior citizen, PWSNs, pregnant and lactating mother, socially and spatially differentiated across population scales of dicisions making. Data revealed that out of one hundred eighty-eight 188 female respondents in the pilot study sites (n=122 or 64.87 percent) ranging from 0-month old to 17 years old respectively, while (n=38 or 20.70%) were senior citizen, person with specials needs, preganant and lactataing mother.(n=28 or 14.89%) belong to the age group from 18-59 years old. Interstingly, there is not much difference as to number of the female respondents in the purok level in pilot study sites.

Table 2 Breakdown of the Female Population in Barangay Adiangao, San Jose Camarines Sur(Philippines)N-188

LOCATION OF POPULATION	**FEMALE**																			
	Infant		**Toddler**		**Pre-school**		**School Age**		**Teenage**		**Adult**		**Senior Citizen**		**PWSNs**		**Pregnant**		**Lactating**		Total	%
	0-12 mos.		**1-3yo**		**4-5yo**		**6-12**		**13-17yo**		**18-59yo**		**60 above**									
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**		
Purok 1	1	0.53	3	1.59	4	2.12	2	1.06	2	1.06	4	2.12	2	1.06	0	0	1	0.53	2	1.06	**21**	**11.17**
Purok 2	1	0.53	4	2.12	3	1.59	4	2.12	4	2.12	3	1.59	1	0.53	0	0	2	1.06	3	1.59	**25**	**13.29**
Purok 3	1	0.53	3	1.59	4	2.12	2	1.06	4	2.12	3	1.59	1	0.53	0	0	0	0	2	1.06	**20**	**10.63**

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Purok 4	2	1.06	4	2.12	5	2.65	3	1.59	7	3.72	5	2.65	3	1.59	1	0.53	1	0.53	6	3.19	**37**	**19.68**
Purok 5	1	0.53	5	2.65	2	1.06	5	2.65	8	4.25	4	2.12	1	0.53	0	0	1	0.53	1	0.53	**28**	**14.89**
Purok 6	1	0.53	3	1.59	5	2.65	5	2.65	4	2.12	4	2.12	2	1.06	0	0	1	0.53	1	0.53	**26**	**13.82**
Purok 7	3	1.59	5	2.65	4	2.12	4	2.12	4	2.12	5	2.65	2	1.06	0	0	1	0.53	3	1.59	**31**	**16.48**
Total	**10**	**5.31**	**27**	**14.36**	**27**	**14.36**	**25**	**13.29**	**33**	**17.55**	**28**	**14.89**	**12**	**6.38**	**1**	**0.53**	**7**	**3.72**	**18**	**9.57**	**188**	**100**

Source from: Records from Baragay Adiangao
Legend: PWSNs – Persons With Special Needs

C. Social Vulnerability Analysis

Table 3 presents the indicators of the vulnerable groups in barangay adiangao, san jose, camarines ur,(Philippines**).** Among the ennumerated indicators childrens estimated with two hundred thirty one (n=231) from zero (0) months old up to 17 years old identified as the highest number in barangay adiangao, while the lowest were handicap person with one (1) identified in purok 4, however, (n=126)were identifed from various sectors to wit; elderly headed households, women headed household,erdely, household with morethan five children, Residents on/near seashore and rivers, Fisherman, Widows, Household with high incidence of poverty, Agriculture sector, Informal Setlers.

Table 3 Vulnerable Sectors to Climate Change Impacts in Barangay Adiangao, San Jose Camarines Sur, (Philippines)

Indicators	**No of Household** N-35							**Total**
	Purok 1	**Purok2**	**Purok3**	**Purok 4**	**Purok 5**	**Purok6**	**Purok7**	
Elderly headed-households	1	2	1	0	1	2	1	**8**
Elderly	1	2	1	0	1	2	1	**8**
Women headed-households	2	1	1	3	1	2	1	**11**
Handicapped	0	0	0	1	0	0	0	**1**
Children	28	29	30	37	38	33	36	**231**
Household with morethan five children	5	2	4	2	5	4	2	**24**
Residents on/near seashore and rivers	1	2	1	3	1	2	4	**14**
Fisherman	4	3	5	3	2	4	4	**25**
Widows	1	0	0	1	0	0	1	**3**
Household with high	2	1	2	1	1	2	2	**11**

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incidence of poverty								
Agriculture sector	2	2	0	2	3	1	3	**13**
Informal Setlers	1	2	1	1	2	1	1	**9**

Source: *Household Survey*

This results catch the attention of the reseacher to formulate and design a training program to capacitate the respondents in the study sites. Studies suggest that poor people in rural areas are the most vulnerable to climate change (Ali and Erenstein, 2016).These communities are struck hard by those changes in climate identified by many studies conducted throughout the country (Tingju et al., 2014). The socially and spatially differentiated across population scales of dicisions making. Different sectors of the society experienced different level of vulnerability to climate hazards. Focused group discussions conducted among various ectors and key stakeholders in the study sites identified vulnerable groups and sectors are found in Table 3. Among these are children, elderly headed -households, including widows, those engage in agriculture, with high incidence of poverty. This study supported by the study of Yusuf et. al. (2010) poverty was consistenly found to be the factors in vulnerability on climate change impact . Most household with high incidence of poverty were found to be vulnerable. Rural residents in developing countries are more exposed to the risks of global warming than urban residents because their livelihoods, such as farming and the availability of drinking water, are closely linked to the climate (IPCC, 2014). The DRRM Act comes at a time when the Philippines grapples for answers to the ever increasing risk of its people to disasters, particularly in the face of intensified global climate change. We need a more proactive approach to managing disaster risks. The DRRM Act transforms and reforms the way we deal with disasters. We now recognize that impacts of disasters can be reduced by addressing the root cause of disaster risks.

Policy implications, there is clearly a large spectrum for social and technical intervention in adiangao. Besides climate risks, the characteristics of farms, farmers and their production systems reinforce the low productivity in this region. Policies of rural extension have had a limited range, as the percentage of producers receiving technical guidance for the production or credit-orientation is still low. Although family and non-family farms are roughly subject to the same climatic risks, small-scale with limited educational base are the most vulnerable groups in the region (Fraser, 2007; Simelton et al., 2009). Among these, there is a yet morcritical group, characterized by self-subsistence farming, with scarce access to technology and technical guidance. It may be possible that rural communities need more locally and personally relevant information on climate change. They need concrete information on local climate change and its possible impact on them, on the relationships between their agricultural production, behaviour and lifestyles and global warming and on how to act to mitigate global warming (Leal-Filho, 2009). Armed with locally and personally relevant information and knowledge, they are more likely to respond to global warming. The other policy suggestion is that climate policies should take their possible influence on residents into account. Measures that will not bring obvious economic costs to individuals and families should be preferentially adopted. Additionally, governments at various levels should provide financial support for coastal residents in barangay adianago to mitigate the impacts of climate change, such as subsidies for the agricultural farming. Within developing countries, this asymmetry of conditions and

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vulnerabilities can particularly be represented by the dichotomies between small/large and family/non-family farms (Zhang et al., 2016)

D. Socioeconomic Condition of the Respondents

To guage the direct impact of climate change to the vulnreble populations we applied the analysis in a purok level on the project sites to determine the adaptive capacity of the respondents.

Table 4. Socioeconomic Condition of the Respondents in Barangay Adiangao, San Jose Camarines Sur(Philippines)

Indicators	No of Household N=35														Total	%
	Purok1		Purok2		Purok3		Purok4		Purok5		Purok 6		Purok7			
Lot	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**		
Owned	3	8.57	4	11.42	2	5.71	5	14.28	4	11.42	5	14.28	3	8.57	**26**	**74.28**
Not owned	2	5.71	1	2.85	3	8.57	0	0	1	2.85	0	0	2	5.71	**9**	**25.71**
Type of houses																
Conrete	1	2.85	2	5.71	2	5.71	3	8.57	2	5.71	1	2.85	1	2.85	**12**	**34.28**
Semi-Concrete	2	5.71	2	5.71	1	2.85	2	5.71	2	5.71	3	8.57	3	8.57	**15**	**42.85**
Native	2	5.71	1	2.85	2	5.71	0	0	1	2.85	1	2.85	1	2.85	**8**	**22.85**
Electricity																
With	4	11.42	3	8.57	3	8.57	4	11.42	3	8.57	4	11.42	3	8.57	**24**	**68.57**
Without	1	2.85	2	5.71	2	5.71	1	2.85	2	5.71	1	2.85	2	5.71	**11**	**31.42**
Water source																
Water line to hose	1	2.85	0	0	1	2.85	0	0	1	2.85	1	2.85	0	0	**4**	**11.42**
Well on property	1	2.85	1	2.85	0	0	0	0	0	0	1	2.85	0	0	**3**	**8.57**
Public water faucets	2	5.71	3	8.57	1	2.85	2	5.71	2	5.71	1	2.85	2	5.71	**12**	**34.28**
Public	1	2.85	1	2.8	2	5.7	2	5.71	1	2.8	2	5.71	1	2.85	**10**	**28.**

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well				5		1				5						**57**
River /stream	0	0	0	0	1	2.85	1	2.85	1	2.85	0	0	2	5.71	**5**	**14.28**

Legend *:N- Number of respondents, n- number of responses*

Results in table 4 showed that the socioeconomic situation of the community in barangay adiangao, san jose, camarines sur (Philippines),is reflected in the results generated by community/household survey, focused group discussions, key informant interview and in depth household interview, majority (74.28%) owned their lots. in terms of types of houses (42.85%) semi-concrete, while (22.85%) native and are made of light materials such as nipa and bamboo trees. (34.28%) Interestingly, (68.57%) of household with electircity, that's why when there a disaster occurrence there directly affected, In addition, the highest number of the respondents water source are public water fucets and public well (62.85%) while the other source of water such as, water line to hose,well on property,river/stream were (37.15). This condition affect the health and economic development of the constituents in the project sites.

E. Perceived knowledge on Climate Change

Climate change/variability and environmental degradation have increased particularly in the bicol region (Philippines), which in turn making the people inhabiting in the coastal area are more vulnerable to the impacts.Table 5 presents the understanding on climate change knowledge of the respondents in coastal communities. In general most of the respondents knew the impacts of climate change during the interview (wm=3.61).Only Climate change is mostly caused by human activity, and the international scientific community understands the science behind global climate change appeared to be relatively uncommon among the respondents with only (wm=2.54) while Climate change is happening, Climate change is a Risk in the Partido Area, Climate change is a risk to me, my family and my friends, In trust the scientific community to truthfully report their findings related to climate change, The government and local officials understand the implications of global climate change in the region, The media I rely on communicate honestly with us about climate change respondents reported that they have knowledge about it.

Table 5. Respondents Perceived knowledge on Climate Change

Indicators	**Weighted Mean**							**GWM**	**Verbal Interpretation**
	Purok1	**Purok2**	**Purok3**	**Purok4**	**Purok5**	**Purok6**	**Purok7**		
Climate change is happening	4.69	4.15	4.33	4.89	4.24	3.92	4.87	**4.44**	**Agree**
Climate change is mostly caused by human activity	2.25	3.91	4.16	2.45	4.18	4.13	2.25	**3.33**	**Moderately Agree**
Climate change is a Risk in the Bicol	3.79	3.95	4.39	3.96	4.22	3.95	3.79	**4.00**	**Agree**

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Region									
Climate change is a risk to me, my family and my friends	3.68	4.38	3.98	4.38	4.44	3.98	3.68	**4.07**	**Agree**
The international scientific community understands the science behind Global climate change	1.34	1.78	2.33	1.34	2.38	2.45	1.47	**1.87**	**Disagree**
In trust the scientific community to truthfully report their findings related to climate change	3.56	3.96	4.48	4.17	4.25	3.87	4.21	**4.07**	**Agree**
The government and local officials understand the implications of global climate change the region.	3.61	3.93	3.91	4.11	3.95	4.12	4.37	**4.00**	**Agree**
The media I rely on communicate honestly with us about climate change	3.79	3.88	3.99	4.14	4.09	4.19	3.68	**3.96**	**Agree**
Grand Weighted Mean(GWN)	**3.65**	**3.19**	**3.44**	**3.68**	**3.96**	**3.82**	**3.54**	**3.61**	**Agree**
Verbal Interpretation	**Agree**	**Agree**	**Agree**	**Agree**	**Agree**	**Agree)**	**Agree**	**3.70**	**Agree**

Legend;4.51-5.00 -Strongly Agree **3.51-4.50**-Agree **2.51-3.50** –Moderately Agree**1.51-2.50** – Disagree**1.00-1.50**- Don't Know

This results implied that this presents study is an attestation of the respondents knowledge acquired through experienced. Because the study site belongs to type II climate characterized by the absence of a dry season and very pronounced maximum rainfall from November to December. It is during these months that the Northeast monsoon season occurs and the tropical cyclones contribute to the increased rainfall in the area. Coastal ecosystems, particularly intertidal wetlands and reefs (coral and shellfish), can play a critical role in reducing the vulnerability of coastal communities to rising seas and coastal hazards, through their multiple roles in wave attenuation, sediment capture, vertical

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accretion, erosion reduction and the mitigation of storm surge and debris movement Spalding M., (2014). The participation of youth in any disaster risk reduction activities could be enhanced when they have high levels of awareness on climate change. But there seems to be scanty information about their level of awareness (Barreda, A.(2018). Therefore, excluding them from the disaster risk reduction processes would threaten their safety from disasters and neglects a valuable resource for risk communication, education, advocacy, and action-oriented risk reduction activities (Anderson, 2005). Likewise, they possess significant qualities which when tapped could serve as important resources for households and communities in preparing for, responding to, and recovering from disasters (Fernandez & Shaw, 2013).

F. Respondents Concern on Impacts Related to Vulnerable Populations

Vulnerability associated with climate change is a core benchmark in science and policy. Yet, global damage assessments are criticized for neglecting risk distribution, adaptation dynamics beyond top-down public protection, and resilience of communities, cities and regional economies. Within developing countries, this asymmetry of conditions and vulnerabilities can particularly be represented by the dichotomies between small/large and family/non-family farms (Zhang et al., 2016) The projected climate change will affect certain groups of people depending on where they live and their ability to cope with different climate hazards. In some cases, the impacts of climate change are expected to worsen existing vulnerabilities. Particularly, the groups located in vulnerable areas and the poor, young, old, or sick. Coastal communities are uniquely sensitive to many impacts, especially extreme weather impacts. Climate change may threaten people's jobs and livelihoods. As a society, we have structured our day-to-day lives around Table 6 presents the results that measures the impacts related to vulnerable populations in barangay adiangao, san jose, camarines sur. Interestingly, Majority of the respondents are some concerned about the impact of climate change (wm=3.77) relating to vulnerable populations . However, the respondents have a little concern on mentally disable person, and rice farmers (wm=3.16) and the respondents also has a great concern on elderly sectors (wm=4.70).

Table 6. Determined the Respondents Concern on Impacts Related to Vulnerable Populations

Indicators	Weighted Mean							GWM	Verbal Interpretation
	Purok1	Purok2	Purok3	Purok4	Purok5	Purok6	Purok7		
Elderly	4.51	4.87	4.84	4.56	4.76	4.81	4.58	**4.70**	**Great Concern**
Elderly headed households	4.87	3.48	3.96	4.25	3.44	4.80	4.18	**4.14**	**Some Concern**
Women hedaed households	4.72	4.64	4.73	4.42	4.81	4.36	3.44	**4.44**	**Some Concern**
Physically disabled	4.72	4.64	4.73	4.42	4.87	4.36	3.44	**4.45**	**Some Concern**

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Mentally disabled	3.55	2.34	3.88	3.45	2.40	3.47	3.07	**3.16**	**Little Concern**
Racial minorities/indigenous people	4.87	3.48	3.96	4.25	3.44	4.80	2.41	**3.88**	**Some Concern**
Handicapped	4.88	4.81	4.14	3.73	2.71	3.26	2.44	**3.85**	**Some Concern**
Children	4.72	4.64	4.73	4.42	4.87	4.36	3.44	**4.45**	**Some Concern**
Household with morethan five children	4.18	4.21	4.68	2.19	3.14	4.16	4.73	**3.89**	**Some Concern**
Residents on/near lakeshore and rivers	4.72	4.64	4.73	4.42	4.87	4.36	3.44	**4.45**	**Some Concern**
Rice Farmers	3.55	2.34	3.88	3.45	2.40	3.47	3.07	**3.16**	**Little Concern**
Fisherman	4.87	3.48	3.96	4.25	3.44	4.80	2.41	**3.88**	**Some Concern**
Widows	4.88	4.81	4.14	3.73	2.71	3.26	2.44	**3.85**	**Some Concern**
Agriculture sector	4.18	4.21	4.68	2.19	3.14	4.16	4.73	**3.89**	**Some Concern**
Informal Setlers	4.11	4.13	4.61	2.10	3.43	4.31	4.89	**3.94**	**Some Concern**
Grand Weighted Mean	**3.28**	**4.00**	**4.10**	**3.72**	**3.62**	**4.18**	**3.51**	**3.77**	**Some Concern**
Verbal Interpretation	**Some Concern**	**Some Concern**	**Some Concern**	**Some Concern**	**Some Concern**	**Some Concern**	**Some Concern**	**3.99**	**Some Concern**

Legend : 4.51-5.00 Great Concern, **3.51-4.50** Some Concern, **2.51-3.50** Little concern, **1.51-2.50** No Concern, **1.00- 1.50** Not Applicable

This results implied that the local officials in adiangao should innovate program to disseminate information regarding climate and environmental issues, Scholza et al. (2004) applied participatory analysis to integrate local ecological knowledge into marine protected area policy planning processes. Indicators of progress monitoring in the field of sustainable development have been identified through participatory process application (Chiranjeewee and Harald, 2012), whereas participation of stakeholders has also been used for the identification and prioritisation of policy-relevant research questions in the management of natural resource

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G. Respondents Concern on climate change Impact Related to the Environment and Natural Resources

Natural resources in the study sites are the major sources of livelihood of the respondents. The fascinating Adiangao Caves is located in the barangay of Adiangao, San Jose, Camarines Sur. The inner part of the cave reveals a seemingly chain of grottoes in an enormous column, as well as numerous stalactites and stalagmites, both along the floor and ceiling which formed like drip-stones or semblance of icicles, and the hanging waterfalls.Table 6.1 present the determinant of the respondents concern on climate change impact related to the environment and natural resources. Interestingly, the respondents have a great concern on higher air/water temperatures (wm=4.71), sea level rise(wm=4.65),decline marine water quality(wm=4.78). This results implied that the respondents understand the implications of global climate change the region, and know that climate change is a risk to the community and family, environment and natural resources, specifically on economic tourism. While on the other hand the respondents had a little concern the following indicators such as, Increasing intensity of rainfalls events(wm=3.17),beach and dunes loss(wm=2.68),tidal wetland erosion and loss (wm=2.77), Spread and vector-borne disease and pathogens(wm=2.89). In addition, the respondents has some concern drought may be because the study site were belong to type II climate and absence of dry season from January to December. However, the respondents had no concern on decline air quality (Allergens, particulates matter, ozone, etc.) (wm=1.83)Increase in salt water intrusion(wm=1.79).

Table 6.1Determinant of the Respondents Concern on climate change Impact Related to the Environment and Natural Resources (N=333)

Indicators	Weighted Mean							GWM	Verbal Interpretation
	Purok1	Purok2	Purok3	Purok4	Purok5	Purok6	Purok7		
Higher air/water temperatures	4.64	4.47	4.79	4.85	4.75	4.79	4.72	**4.71**	**Great Concern**
Increasing intensity of rainfalls events	4.36	4.34	1.60	4.18	1.75	1.60	4.36	**3.17**	**Little Concern**
Sea level rise	4.58	4.63	4.78	4.58	4.63	4.78	4.58	**4.65**	**Great Concern**
Drought	3.97	4.17	4.12	3.88	4.23	4.11	3.94	**4.06**	**Some Concern**
Decline air quality (Allergens, particulates matter, ozone, etc.)	1.33	2.46	1.95	1.33	2.46	1.95	1.33	**1.83**	**No Concern**
Increase in salt water intrusion	2.38	1.42	1.30	2.38	1.42	1.30	2.38	**1.79**	**No Concern**
Decline in marine	4.57	4.87	4.87	4.57	4.87	4.87	4.57	**4.78**	**Great**

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water quality									**Concern**
Beach and dune loss	2.95	3.15	2.87	2.45	1.93	2.81	2.65	**2.68**	**Little Concern**
Tidal wetland erosions and loss	4.62	1.43	1.36	4.62	1.43	1.36	4.62	**2.77**	**Little Concern**
Spread and vector-borne disease and pathogens	1.55	1.92	3.43	2.96	3.63	3.84	3.91	**2.89**	**Little Concern**
Grand Weighted Mean	**3.49**	**3.28**	**3.10**	**3.58**	**3.11**	**3.14**	**3.70**	**3.34**	**Little Concern**
Verbal Interpretation	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**3.33**	**Little Concern**

Legend : 4.51-5.00 *Great Concern,* ***3.51-4.50*** *Some Concern,* ***2.51-3.50*** *Little concern,* ***1.51-2.50*** *No Concern,* ***1.00- 1.50*** *Not Applicable*

The province of Camarines Sur in the Bicol Region has long been a destination for nature lovers and adventurers as this rugged land is filled with many idyllic locales that one can explore and enjoy right in the heart of nature. (Decio 2014) the exploitation of natural resources is an essential condition of human existence, throughout the history of mankind; humans have manipulated natural resources to produce the materials they needed to sustain growing human populations. This refers primarily for food production and economic development but many other entities from the natural environment have been extracted. Natural resources are an important material basis for a stable natural economy and social development, they can be divided into two; the exhaustible: such as minerals and the inexhaustible: such as forests and grasslands, with industrialization and urbanization mankind's great demands for natural resources and their large scale exploitation and their consumption has resulted in weakening, deterioration and exhaustion of these resources In the struggle for survival and development man creates a lot of negative impacts on the environment, these impacts ranges from over-exploitation of resources, destruction of ecosystem and pollution. Often the exploitation of nature has been done in a non-sustainable way, which is causing an increasing concern, as the non-sustainable exploitation of natural resources ultimately threatens the human existence. One difficult task faced by both developed and developing countries is to guarantee the lasting utilization of natural resources at the lowest possible environmental cost, while still assuring the economic and social development.

H. Respondents Concern on Climate Change Impact Related to Emergency Management

Table 6.2. presents the determinants of respondents concern on climate change impact related to emergency management out of seven(7) purok in barangay adiangao, san jose camarines sur (Philippines) almost all indicators the response of the respondents have no concern

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on human rescues /strandings, death and injuries from storms events, Increase in occurrence and severity of flooding, Stress and strain on responders, power outages, Increase need for sheltering, Disruption of drinking water supply, disruption of medical services. While only purok (3) showed little concern on the impacts related to emergency management. This results implied that the respondents are not aware of this incidents that is why shows no concern about this. And the local officials should create an intervention program to make the community aware of this if this is happen in that locality. However, emergency management concern in the study sites are basic necessities of the communities in order to mitigate the impact on climate change. Thus, while responses to climate change may initially have been framed by a longer-term outlook, there is now as much emphasis on the present and immediate future. Similarly, the DRM community is moving rapidly from looking only at historic and current risk, to considering future risks. (IPCC, 2007).

Table 6.2. Determinants of the Respondents Concern on Climate Change Impact Related to Emergency Management

Indicators	Weighted Mean							GWM	Verbal Interpretation
	Purok 1	Purok 2	Purok 3	Purok 4	Purok 5	Purok 6	Purok 7		
Human rescues /strandings	1:19	1:87	2:27	3:11	3:34	2:42	2:36	**2.36**	**No Concern**
Death and injuries from storms events	3:40	1:67	4:46	4:23	3:42	4:16	3:36	**3.52**	**Some Concern**
Increase in occurrence and severity of flooding	1:46	1:47	1:32	1:24	3:46	1:34	1:38	**1.66**	**No Concern**
Stress and strain on responders	3:74	4:18	3:96	1:22	4:12	1:29	4:11	**3.23**	**Little Concern**
Power outages	1:36	1:43	1:32	1:28	3:46	1:34	1:38	**1.65**	**No Concern**
Increase need for sheltering	3:29	4:16	3:12	4:38	3:35	3:47	4:18	**3.70**	**Some Concern**
Disruption of drinking	1:46	1:47	1:32	1:24	3:46	1:34	1:38	**1.66**	**No Concern**

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water supply									
Disruption of medical services	2:87	2:87	2:87	2:87	2:87	2:87	2:87	**2.87**	**Little Concern**
Grand Weighted Mean	**2.34**	**2.39**	**2.58**	**2.44**	**3.43**	**2.27**	**2.62**	**2.58**	**Little Concern**
Verbal Interpretation	**No Concern**	**No Concern**	**Little Concern)**	**No Concern)**	**No Concern)**	**No Concern)**	**No Concern)**	**2.58**	**Little Concern**

***Legend** : **4.51-5.00** Great Concern, **3.51-4.50** Some Concern, **2.51-3.50** Little concern, **1.51-2.50** No Concern, **1.00- 1.50** Not Applicable*

As the population growth and relocation, often into more at risk areas, have contributed to an overall trend of more people being affected by disasters. On the other hand, Hay and Mimura (2010) present evidence that major investments in disaster preparedness and response in recent decades in the Pacific islands region have resulted in fewer fatalities per disaster.

I. Respondents Concern on Climate Change Impacts Related to Infrastructure

Table 6.3. presents the determinant of the respondents concern on climate change impacts related to infrastructure. Out of seven (7) purok, five (5) or (GWM=3.61)shows little concern about the impact of climate change related to infrastructure to wit, damage to transportation infrastructure, energy infrastructure, communication infrastructure, water supply infrastructure, boardwalks,school buildings., while, purok 5 and purok 5 in the study site (GWM=3.24) shows little concern on climate change impacts related to infrastructure. althought there is not much different as to the response of the respondents the local government should communicate the community about the impacting climatic change the infrastrure in order to show great concern.

Table 6.3. Determined the Respondents Concern on Climate Change Impacts Related to Infrastructure

Indicators	**Weighted Mean**							**GWM**	**Verbal Interpretation**
	Purok 1	**Purok 2**	**Purok 3**	**Purok 4**	**Purok 5**	**Purok 6**	**Purok 7**		
Damage to transportation infrastructure	4.72	4.64	4.73	4.42	4.87	4.36	3.44	**4.45**	**Some Concern**
Damage to energy	3.55	2.34	3.88	3.45	2.40	3.47	3.07	**3.13**	**Little Concern**

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infrastructure									
Damage to communication infrastructure	4.87	3.48	3.96	4.25	3.44	4.80	2.41	**3.88**	**Some Concern**
Damage to water supply infrastructure	4.88	4.81	4.14	3.73	2.71	3.26	2.44	**3.71**	**Some Concern**
Damage to boardwalks	2.41	1.61	2.44	2.13	2.19	1.44	1.41	**1.94**	**No Concern**
Damage to School buildings	4.18	4.21	4.68	2.19	3.14	4.16	4.73	**3.89**	
Grand Weighted Mean	**4.10**	**3.51**	**3.97**	**3.36**	**3.12**	**3.58**	**2.91**	**3.50**	**Little Concern**
Verbal Interpretation	**Some Concern**	**Some Concern**	**Some Concern**	**Little Concern**	**Little Concern**	**Some Concern**	**Some Concern**	**3.5**	**Little Concern**

Legend: 4:51-5:00 Great Concern, **3:51-4:50** Some Concern, **2:51-3:50** Little concern, **1:51-2:50** No Concern, **1:00- 1:50** Not Applicable

J. Respondents Concern on Impacts Related to Private and Economic Activity

Table 6.4. presents the determinant of the respondents concern on impacts related to private and economic activity. Results revealed that (GWM= 3.34) interpreted as some concern, while majority of the respondents shows (GWM=3.37) little concerned on the following indicators such as, , Reduction of property values, Loss of business income, Damage to eco-tourism industry, commercial fishing and shellfish industries, and lastly, to local businesses. However, the respondents showed great concern on Private property damage and recreational fishing industry (GWM=4.68). and no concern about the reduction of property tax revenue, Loss of jobs (GWM=2.15).This results implied that the constituents in barangay adiangao lack of sufficient knowledge on the impacting change of climate variability. Interestingly, the respondents shows great concern on private property damage (wm=4.63), and damage to recreational fishing industry (wm=4.74) may be because the source of economic activities in adiangao is basically an agricultural and fishing barangay. Coconut, abaca and tiger grass production are the main livelihood also of its residents. However, others derived their income from fishing, labor, self-employment and public employment.

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Table 6.4. Determinant of the Respondents Concern on Impacts Related to Private and Economic Activity

Indicators	Weighted Mean							GWM	Verbal Interpretation
	Purok 1	Purok 2	Purok 3	Purok 4	Purok 5	Purok 6	Purok 7		
Private property damage	4.58	4.63	4.78	4.58	4.63	4.71	4.54	**4.63**	**Great Concern**
Reduction of property values	3.29	4.16	3.12	4.38	3.35	3.47	4.18	**3.70**	**Some Concern**
Reduction of property tax revenue	2.41	1.61	2.44	2.13	2.19	1.44	1.41	**1.94**	**No Concern**
Damage to local businesses	3.55	2.34	3.88	3.45	2.40	3.47	3.07	**3.16**	**Little Concern**
Loss of business income	2.95	3.15	2.87	2.45	1.93	2.81	2.65	**2.68**	**Little Concern**
Loss of jobs	1:19	1:87	2:27	3:11	3:34	2:42	2:36	**2.36**	**No Concern**
Damage to eco-tourism industry	4.18	4.21	4.68	2.19	3.14	4.16	4.73	**3.89**	**Some Concern**
Damage to recreational fishing industry	4.57	4.87	4.87	4.57	4.87	4.87	4.57	**4.74**	**Great Concern**
Damage to commercial fishing and shellfish industries	4.87	3.48	3.96	4.25	3.44	4.80	2.41	**3.88**	**Some Concern**
Grand Weighted Mean	**3.51**	**3.36**	**3.65**	**3.45**	**3.25**	**3.57**	**3.32**	**3.44**	**Some Concern**
Verbal Interpretation	**Little Concern**	**Little Concern**	**Some Concern**	**Little Concern**	**Little Concern**	**Some Concern**	**Little Concern**	**3.34**	**Some Concern**

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Legend: 4:51-5:00 Great Concern, **3:51-4:50** Some Concern, **2:51-3:50** Little concern, **1:51-2:50** No Concern, **1:00- 1:50** Not Applicable

The other areas of place are planted with various vegetables and roof crops. It has also a labor force of 337 economically productive people, or about 98.76% of its total household. About 80% earns less than ₱3,000 a month with each earner supporting an average of 2 dependents. On income dependcy ration, more than half of the families are estimated to be living below the poverty threshold line. Most of these families own their own home lots which are usually built with light and mixed materials, and some are concrete and related on this indicators. However, the respondents are not concern on loss of job. In the sense that majority of the respondents are elementary and high school graduate and no permanent job. The barangay adiangao is controversial since it is geographically located in between the barangays of Maangas and Lagha, both of Lagonoy before, and now of Presentatcion. Hence, it was then part of Lagonoy but its territorial jurisdiction was eventually transferred to san jose, camarines sur purposely to provide the then newly established town a forest where it can make use of the resources there such as rattan and firewood. It said that adiangao was thick with "dadiagnao", a tree from which "salong" was taken. The people used this salong as lighting material or torch. It was told by old folks that this barangay was a witness to Moro raids which the people's settlement had been transferred more frequently from the different parts of the place due to these attacks. Now, the present settlement of the people is near the sea making fishing as the main source of livelihood.

K. Respondents Concern on Impact of Climate Change Impacts

Table 7 presents the summary of table on the determinant of the respondents on the impacts of climate change to measure the concern of the vulnerable communities. out of seven (7) purok in the study sites almost shows little concern (GWM= 3.32) on the following indicators to wit; impact related to vunerable population, environment and natural resources, emergency management, infrastructure, and economic activity. Interestingly, the
respondents from purok 1-7 shows some concern to impacts related to vulnerable populations and environment and natural resources (WM= 3.55) because the topography of the study site were forest land and also a beautiful spots and sceneries to offer to both local and foreign tourists, namely: Adiangao Cave, Talidtidon Falls, Kawa Falls, Star Falls, Parina Falls and Gipangpang River. The implication of this is that the respondents are aware of this climatic change impact. In the since, that majority of the respondents focuses on their daily routine of life to sustained the family needs. Results, of this study can be utilized by the local government unit to developed programs and projects needed in the study sites and the neighboring community to become aware and shows great concern about the natural climatic change. Because climate change could affect our society through impacts on a number of different social, cultural, and natural resources. For example, climate change could affect to vulnerable populations, environment and natural resources, emergency management, private and economic activity, human health, infrastructure, and transportation systems, as well as energy, food, and water supplies. As a society, we have structured our day-to-day lives around historical and current climate conditions. We are accustomed to a normal range of conditions and may be sensitive to extremes that fall outside of this range.

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Table 7. Summary Table on determinant of the Respondents Concern on Impact of Climate Change Impacts (N=333)

Indicators	Weighted Mean							GWM	Verbal Interpretation
	Purok1	Purok2	Purok3	Purok4	Purok5	Purok6	Purok7		
Impacts Related to Vulnerable Populations	3.28	4.00	4.10	3.72	3.62	4.18	3.51	**3.77**	**Some Concern**
Impact Related to the Environment and Natural Resources	3.49	3.28	3.10	3.58	3.11	3.14	3.70	**3.34**	**Some Concern**
Impact Related to Emergency Management	2.34	2.39	2.58	2.44	3.43	2.27	2.62	**2.58**	**Little Concern**
Impacts Related to Infrastructure	4.10	3.51	3.97	3.36	3.12	3.58	2.91	**3.50**	**Little Concern**
Impacts Related Private and Economic Activity	3.51	3.36	3.65	3.45	3.25	3.57	3.32	**3.44**	**Little Concern**
Grand Weighted Mean	**3.34**	**3.30**	**3.48**	**3.31**	**3.30**	**3.34**	**3.21**	**3.32**	**Little Concern**
Verbal Interpretation	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**3.32**	**Little Concern**

Legend : 4:51-5:00 Great Concern, **3:51-4:50** Some Concern, **2:51-3:50** Little concern, **1:51-2:50** No Concern, **1:00- 1:50** Not Applicable

There is strong evidence, both globally and in the Pacific, that there is an increase in the observed frequency and intensity of weather and climate-related hazards. In addition to this, the IPCC anticipates that, in the short to medium term, many impacts of climate change may manifest themselves through a change in the frequency, intensity or duration of extreme events(IPCC, 2007). Particularly in the present decade, the numbers of people affected by disasters and the economic losses per disaster have been consistently low (Hay and Mimura, 2010). However, the reduced economic and social consequences of the extreme events experienced in the 2000s may be due to the anomalous nature of that decade. This is likely

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associated with the decade being dominated by La Niña conditions, during which cyclone frequency is low for much of the Pacific (Kuleshov et al., 2008). Climate projections suggest that, as a result of global warming, conditions in the Pacific will become increasingly El Niño-like. For this reason, Hay and Mimura (2010) warn that cyclone frequencies and intensities are likely to increase for much of the Pacific.

L. Programs needed to support coastal communities in preparing for and responding to climate change impacts.

Table 8 presents the needed program to support coastal communities in preparing for and responding to climate change impacts. This table presents to gauge respondents concern on the program. Out of seven (7) purok in the study sites the Grand Weighted Mean (GMW=2.77) and six(6) purok shows little concern(wm=3.10) on the program to wit. Development of local-scale climate forecasts, Property vulnerability assessment, Census of vulnerable populations, Infrastructure vulnerability assessment, Utilization of hazard infrastructure(e.g. jetties, bulkheads, sea walls), Utilization of soft/green infrastructure(e.g. dunes, riparian buffers, living shorelines), Elevation of structures, Development of local climate change adaptation plans, Rapid response system for extreme events, Development of resilient emergency communications infrastructure, Planning for water supply and protection conservation programs, Monitoring fisheries and shellfisheries, Diversification of coastal economy away from beach tourism, Financial support programs for homeowners to make homes more climate resilient, Financial support programs for small business to make businesses more climate resilient, Incentive programs (e.g. blue acres, community rating system) to protect natural areas. While one (1) purok show no concern (wm=2.45) on the program.

Table 8. Programs needed to support coastal communities in preparing for and responding to climate change impacts.

Indicators	Weigthed Mean							GWM	Verbal Interpretation
	Purok1	Purok2	Purok3	Purok4	Purok5	Purok6	Purok7		
Development of local-scale climate forecasts	3:24	3.80	3.21	2.21	4.14	2.95	4.26	**3.40**	**Little Concern**
Property vulnerability assessment	1:55	3:14	3:28	1:46	3:23	3:34	3:19	**2.74**	**Little Concern**
Census of vulnerable populations	4:67	3.10	3:83	4:17	1:66	2:23	3:24	**3.27**	**Little Concern**
Infrastructure vulnerability assessment	4.18	3.27	2.27	1:33	1.12	1.44	3.42	**2.43**	**No Concern**
Utilization of	3:16	2.23	2.46	2.35	2.13	4.17	4:17	**2.95**	**Little Concern**

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hazard infrastructure(e.g . jetties, bulkheads, sea walls)									
Utilization of soft/green infrastructure(e.g. dunes, riparian buffers, living shorelines)	3:47	2.33	2.25	2.04	2.13	2.09	2. 31	**2.37**	**No Concern**
Elevation of structures	1:79	3:36	2:32	4:88	4:41	4:68	4:92	**3.76**	
Development of local climate change adaptation plans	4:67	3:60	3:83	4:17	1:66	2:23	3:24	**3.34**	**Little Concern**
Rapid response system for extreme events	4.18	3.27	2.27	1:33	1.12	1.44	3.42	**2.43**	**No Concern**
Development of resilient emergency communications infrastructure	3:16	2.23	2.46	2.35	2.13	4.17	4:17	**2.95**	**Little Concern**
Planning for water supply and protection conservation programs	3:47	2.33	2.25	2.04	2.13	2.09	2. 31	**2.37**	**No Concern**
Monitoring fisheries and shellfisheries	1:79	3:36	2:32	4:88	4:41	4:68	4:92	**3.76**	**Some Concern**
Diversification of coastal economy away from beach tourism	4:67	3:60	3:83	4:17	1:66	2:23	3:24	**3.34**	**Little Concern**
Financial support programs for homeowners to make homes more climate	3:24	3.80	3.21	2.21	4.14	2.95	4.26	**3.40**	**Little Concern**

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resilient									
Financial support programs for small business to make businesses more climate resilient	1:55	2.23	1:55	1:55	1:55	1:55	1:55	**1.64**	**No Concern**
Incentive programs (e.g. blue acres, community rating system) to protect natural areas	4:67	3:60	3:83	4:17	1:66	2:23	3:24	**3.34**	**Little Concern**
Grand Weighted Mean	**3.34**	**3.22**	**2.70**	**3.09**	**2.45**	**2.77**	**3.49**	**3.00**	**Little Concern**
Verbal Interpretation	**Little Concern**	**Little Concern**	**Little Concern**	**Little Concern**	**No Concern**	**Little Concern**	**Little Concern**	**2.77**	**Little Concern**

Legend : 4:51-5:00 Great Concern, **3:51-4:50** Some Concern, **2:51-3:50** Little concern, **1:51-2:50** No Concern, **1:00- 1:50** Not Applicable

This results implied that the local government unit (LGU) will initiate provide linkages with other stakeholders to develop program that will address the little concern of the communities on the impacting change of climate. In the context of climate there is a clear need to reconsider existing approaches to educate the communities, specifically, the vulnerable communities to develop their potential thought education and training that will help them respond to diverse and rapidly changing world. A range of specific topics and contents to address environmental change and impacts, and these may vary significantly depending on particular context.

However, and indicative outline of key areas of knowledge and skills includes; knowledge of climate change and wider environmental process, knowledge of environmental conditions, associated risks and management strategies, and disaster risk reduction (DRR). While DRR has been quite community focused, Change Adaptation CCA experience stem from global policy agendas, rather than DRR,s practical implementations (Thomalla et al., 2006; Tearfund, 2008) whilst global policies in guiding practical action, policy and action at the community level where climate change effect are being experienced urgently require (DFID,2005; Shipper and Pelling, 2006, Shea 2001; UNDP, 2004; UNFCCC, 2007).

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M. Training Needs Analysis in Barangay Adiangao, San Jose Camarines Sur (Philippines)

The Training Needs Analysis (TNA) is a method used for determining if training needs is exist and if does, to fill the gap. The expectation of knowledge and abilities of the local officials, communities at different levels is different, so the training needs as this different level is different. The results of training needs analysis aim the highlight subjects needed to effectively fulfill the knowledge and needs gaps, helps in the preparation of training modules, and facilitates in the development of a climate-based change learning program.

Table 9. Results of Priority Topics for Training Needs Analysis in Barangay Adiangao, San Jose Camarines Sur (Philippines) N-333

No	Subjects	No of Responses	%	Rank
1	Community Based Disaster Risk Reduction Management	35	**10.51%**	**1**
2	Barangay Disaster Response and Readiness	31	**9.30%**	**2**
3	Climate Change Adaptation Strategies	26	**7.80%**	**3**
4	Livelihood Training (e.i. meat/fish processing, bread and pastry production. others)	25	**7.50%**	**4**
5	Eco- Tourism enterprise	23	**6.90%**	**5**
6	Participatory Learning Assessment	22	**6.60%**	**6**
7	Community Manage Early Warning System(EWS)	17	**5.10%**	**7**
8	Household Vulnerability Assessment	16	**4.80%**	**8**
9	Household disaster preparedness plan	15	**4.50%**	**9**
10	Community Risk Assessment	14	**4.20%**	**10**
11	Community Risk Mapping	13	**3.90%**	**11**
12	Hazard Mapping	13	**3.90%**	**12**
13	Contingency Planning	12	**3.60%**	**13**
14	First Aid and Water Rescue	12	**3.60%**	**14**
15	Evacuation Plan	12	**3.60%**	**15**
16	Psychosocial	11	**3.30%**	**16**
17	Camp Management	10	**3.00%**	**17**
18	Environmental sustainability	10	**3.00%**	**18**
19	Entrepreneurial skills	10	**3.00%**	**19**
20	Mainstreaming Climate change	6	**1.80%**	**20**

Table 9 present the results of the training needs assessment in barangay adiangao as pilot study area in this project. Out of (20) indicators presented in order the highest response priority topic were Community Based Disaster Risk Reduction Management (CBDRRM) (35 or 10.51%) as interpreted as rank 1. While rank 20 or 1.80% priority topic were mainstreaming climate change. However, Barangay Disaster Response and Readiness 31 or 9.30%, Climate Change Adaptation Strategies 26 or 7.80%, Livelihood Training (e.i. meat/fish processing, bread and

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pastry production. others) 25 or 7.50%, Eco- Tourism enterprise 23 or 6.90% , these are all belong to top five (5) topics for the training of the stakeholders. Results of this assessment could be used as a baseline data by the local government unit to prepare training design for loco official in the context of eco-tourism.

TRAINING DESIGN FOR LOCAL GOVERNMENT UNIT IN THE CONTEXT OF ECO-TOURISM - BASED ON RESULTS OF TRAINING NEEDS ASSESMENT

Rationale

This training provides participants knowledge and skills on how to prepare for disaster. During the training you will learn the concept and practice of reducing disaster risks through systematically analyzing and managing the causal factors of disasters. The program explain on how to examine and reducing exposure to hazards, lessening vulnerability of people and property, wisely managing land and the environment, and improving preparedness for adverse events.

General Objectives:

This program provides training and capacitate the Multi-Stakeholders, Local government officials, first responders, communities through Community Based Disaster Risk Reduction Management and Climate Change Adaptation Strategies (CBDRRM-CCAS)

Specific Objectives:

1. Conduct survey on disaster risk profile to the project sites.
2. Conduct lecture on the Philippine Context and Importance of Community-Based Disaster Risk Reduction and Management (CBDRRM)
3. Identify and develop appropriate community and family preparedness mechanisms; and
4. Conduct the key processes in CBDRRM such as Community Risk Assessment , Participatory DRRM Planning , Further strengthening of the BDRRMC

The Activities

Location	Title of Training Needs	Descriptions/ Objectives	Strategies/Activities	Target clientele Person Responsible	Timeline
	Community Based Disaster Risk Reduction Management	This program provides the participants the knowledge and skills on how to manage/lessen the impacts of climate change.	Lecture /discussions/ interactive learning/power point presentation/ etc	Fisherman, farmers, local officials, DRRM official etc.	5days

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Barangay Adiangao, San Jose Camarines Sur, Philippines	Barangay Disaster Response and Readiness	This program design to provides the participants with knowledge on how to response on specific event before during and after.	Lecture /discussions/ interactive learning/pow er point presentation/ etc	Local officials, DRRM official etc. head of the family,	5days
	Climate Change Adaptation Strategies	This program provide the participant with knowledge skills on how to integrate relative to climate change adaptation strategies in a daily routine of life.	Lecture /discussions/ interactive learning/pow er point presentation/ etc	Communities, local officials, DRRM official etc.	5days
	Livelihood Training (e.i. meat/fish processing, bread and pastry production. others	This program provides the participant in meat/fish processing, bread and pastry production. others	Lecture /discussions/ interactive learning/pow er point presentation/ etc	Communities, Women's Group, local officials, DRRM official etc.	5days
	Eco-Tourism enterprise	This programs provide the a knowledge and skills in relation to sustainable eco-tourism using indigenous product. To produce eco-friendly environment	Lecture /discussions/ interactive learning/pow er point presentation/ etc	Communities, Women's Group, local officials, DRRM official etc.	5days

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5. CONCLUSIONS

This study provides insights into the climate related risk to the community, including their vulnerabilility and adoptive responses. Constraints that limit their adaptive capacity and concern regarding nagative impacts of climaye change on the vulnereble communities. Identifying the needs for training on climate change adoptation, develop a design for training to capcitate the cummunity in adopting climate change.

This study identified the negative impacts of climate change to vulnerable sectors, which in most cases they are directly affected when there is a natural disaster all over the Philippines. This situation is consistent with other climate related studies conducted throughout the country and in our study area. Recents cahnges in climatic conditions have exposed in rural farming and fishing communities to numerous risk. For instance farmers and fisherman mention that disastrous severe droughts, storms, extreme maximum temperatures, changes in rainfall pattern, crop diseases are among the worst situations negatively affecting economic activity of the respondents. Major adaptation methods identified by households were changing seed quality, changing crop type or variety and planting shade trees. Lack of access to financial services and to information on training and lack of support from provincial and local governments were among the major constraints to adaptation. Respondents in the study area had no access to extension or training that could build their capacity. Government and other relevant stakeholders should provide easy access to those services so that they can learn advanced techniques and how to effectively adapt climate change. Therefore, building capacity of the locals toward reducing CCV and facilitating effective adaptations are important. Future policies need to address barriers to the adoption of advanced adaptation techniques at the local level. There is a dire need for research on identifying locally specific adaptation of community to climate change so that they can decide the most suitable adaptation measure to apply. Support from research and extension institutions and policy makers is also needed to provide updated information on weather and access to quality inputs used for improving yields.

6. RECOMMENDATIONS

1. Prioritizes on community level DRRM focusing on the most vulnerable sectors (i.e., the poor, the sick, people with disabilities, the elderly, women and children)
2. Cooperation among communities is also key in improving their adaptive capacity and resolving other problems at the community level.
3. Development of institutional systems to provide localized information with lead time a.) 3-5 days (weather forecast) b.) 5-10 days (medium range forecast) c.) 20-50 days(sub-seasonal forecast)
4. Development of local demonstration that use climate change model outputs(future climate), climate forecast information(very near future climate and near real-time data) and climate analogue products (past climate) for enhancing adaptive capacity to climate change.
5. Training intermediary user institutions to translate probabilistic forecast into location-specific impact outlooks for use in preparing contingency plans for end users.

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6. The study also recommends that other researchers, especially females, explore this issue with women as they are more vulnerable to climate-related risks, a topic that this study could not address due to cultural and religious barriers.
7. Improved understanding of how climate change might impact to t the community.
8. Information on how my community can adapt to climate change
9. Recognizes the important role and strengthens capacities of local communities, addresses root causes of disaster risks
10. Effective integration of disaster risk considerations into sustainable development policies, planning and programming at all levels - disaster prevention, mitigation, preparedness and vulnerability reduction
11. Development and strengthening of institutions, mechanisms and capacities at all levels
12. Systematic incorporation of risk reduction approaches into the design and implementation of emergency preparedness, response and recovery programmes and reconstruction of affected communities.

7. ACKNOWLEDGEMENT

The author would like to acknowledge the fund provided by the Partido State University for this research on "community vulnerability on climate change impacts and training needs assessment for local government unit". This paper is the output of the study. The author is also grateful to Dr. Raul G. Bradecina our University President for the continuous mentoring and encouragement to conduct research. Professor Patricia Candelaria Vice -President for Research Extension and External Affairs, Ms Luisa M. Lanciso Director for Research for the motivation to pursue this research.

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