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Creating Climate-Disaster Resiliency on the Indigenous People, “Tagbanuas”, in Coron, Palawan

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Abstract: The purpose of this research is to create a climate-disaster resiliency on indigenous people, "Tagbanuas", in Coron, Palawan. Indigenous people's dependence and close relationship to the natural environment define them to be vulnerable to climate change. Palawan, regarded as the Philippines' last frontier being the last unsettled area in the country is not exempted to the consequences of the changing environment. The Tagbanuas tribe, one of the oldest ethnic groups in the Philippines, has been affected by the environmental change. This study aims to review and create concrete ways for resilience on this ethnic group as climate change threatens their survival through assessing their food security, economic stability, biophysical assessment, indigenous or psychological beliefs and institutional framework. In addition, the study aims to draw creative ways based on their cultural beliefs and the use of possible technology to create pertinent solutions on their vulnerability to climate change. Auspicious environmentally maintainable economic development will also form indigenous people's resilience to climate change by enriching their economic status. Additional income and access to resources allows vulnerable tribe populations to better adjust to climate-related challenges and reduce weather-related losses.

Key Words: Indigenous people; “Tagbanuas”; climate change

1. Introduction

Climate change requires a twofold approach which assimilates mitigation and adaptation or resilience building that deals with the remaining impacts of climate change. However, regardless of uncertain progress through decreasing greenhouse

gas emissions, scientists come to an agreement irreversible effects that will continue and deteriorate within the lifetime, as the past emissions continue to heat up the earth's atmosphere. This is why the focus on climate changes mitigation and adaptation, particularly in indigenous people, has become so critical.



In relation to climate change, the terms resilience and adaptation are often used interchangeably. In theoretical terms, climate change resilience is the ability of an individual, municipal, or society to enthusiastically and efficiently respond to unstable climate impact conditions while continuing to utilize and prosper. Basically, it is the ability to survive, recover from, and even overcome in changing climatic conditions. It includes the ability to understand possible impacts and to take suitable action before, during, and after a certain event, such as a typhoon, major flooding or prolonged drought, to minimize negative effects and maintain the ability to respond to changing conditions, even unpredictable conditions.

Indigenous people (IPs) are one of the most vulnerable to natural and anthropogenic disasters. These indigenous minority depend on their traditional knowledge as bumper against environmental distinction, letting them to identify, forecast and adjust consequently (Mclean, 2012). In a global context, indigenous people living in different countries of the world reside in or consume resources on particular 22% of the global land area. Although there is no particular description for indigenous people, a core-set of conditions monitor the identification of this extremely varied group. Tagbanua, an IP group in the Philippines, is an optimistic footstep headed for appreciating them. This effort also exposed means and ways of working with this ethno-linguistic group toward self-determination. The earliest investigations before 2008 of the general effects of climate change are irregularity of rainfall, warmer weather, drying of wells, rise in sea level and warmer sea (Corpuz, Abayao, Magata, Tugendhat, 2009). Another study found out that indigenous people were skilled at emerging and applying effective initiative to cope with local level stressors such as climate change, active responding to major environmental changes such as natural disasters. Indigenous knowledge concentrating on elements of importance for local livelihoods, safety and health, and as an outcome is essential for climate change adaptation. Tagbanuas are mainly exposed and penetrating to climate change impacts due to their resource-based support and the location of their motherlands in peripheral environments. Effects cannot be out-of-the-way from the multiple social, political, economic and environmental changes antagonizing present-day tagbanua community. These impacts cooperate together to prompt intensifying and cascading effects

(Nakashima, Mclean, Thulstrup, Castillo, Rubis, 2012). Also, indigenous people have added the smallest amount to biosphere greenhouse gas emissions and have the minimum ecological footprints on Earth due to their modest and maintainable routines and practices, yet they undergo the most horrible effects not only of climate change but also from some of the global mitigation measures being taken, according to organizers of a United Nations University. They are also point to growth in human moralities abuses, dislocations and struggles due to expropriation of ancestral lands and forests for plantations and as well as for carbon sink and renewable energy projects, without the free, prior and informed consent of indigenous people (Salva, C. Santos, T. Santos, Lobrio, Estrella, Sioson, Nuestro, Banaguas, 2010). The Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) noted that climate-related change represents potential additional stress on systems that are already under intense and growing pressure in coastal zones (Banaguas,2009).

2. METHODOLOGY

2.1 Participants

The models of this particular study are the different stakeholders in Coron, Palawan: a) the Municipal Planning and Development Head for Preparation, monitoring and assessment to respond efficiently to *Tagbanua* needs; b) Mr. Rodolfo Aguilar, the chief captain of *Tagbanua*; c) *Tagbanua* Tribe for self-preservation through economic advancement.

2.2 Materials

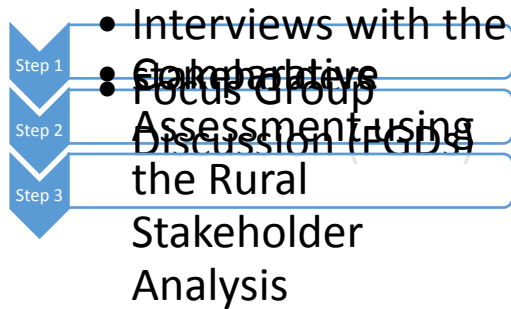
The study was conducted through the use of Participatory Action Research, a type of research that promotes multiple perspectives concerning issues, getting people to systematically analyze the causes and effects of issues with the intent of helping people take on the task of changing their situation themselves. This multi-stakeholder scheme generates perspectives that are helpful in unscrambling the multi-dimensionality of social issues. In more specific terms, PAR is a technique for data collection and analysis that uses combination of methods wherein participants are not the objects but the subject of the research. This study utilized PAR to increase the community's awareness of the changes in the environment and its impact on the



lives of the *Tagbanuas*, and to encourage participation in collective decision-making.

2.3 Procedure

Figure 2.1 provides the step-by-step procedure on how Participatory Action Research was conducted.



3. RESULTS AND DISCUSSION

Coron is one of the three municipalities in the Calamian Group of Islands located in the northernmost municipality of Palawan. It is composed of around 50 islands and islets which cover the southern half of Busuanga Island.

3.1 Biophysical Assessment



Figure 1.1 Participatory Action Research Resiliency Flow Chart

Interviews with the Stakeholders

The course of interview with the Municipal PDO and the *Tagbanua* chieftain were asked with the four primary aspects. The questions were pre-formulated and are patterned after the modified NFR's Field Guide. First is the questions under the biophysical changes, followed by socio-economic status, then the psychological assessment and lastly, the institutional framework concerning the *Tagbanuas*. These questions were distributed to three sub-groups to ensure a simultaneous and systematic way of questioning.

Focus Group Discussion

In this qualitative method of research, a group of *Tagbanuas* were invited for a course of interview. The same questions distributed in three sub-groups were given to the participants.

Comparative Assessment using the Rural Stakeholder Analysis

The method empowers the process of observation, semi-structured interviews and collects socio-economic data.

	PDO	Tagbanua Chief	Tagbanuas
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Biophysical 1 Typhoon	-Before, as we notice in the weather bulletin we are not prone to typhoons but starting last	- We are least prone to typhoons.	-We are now experiencing strong typhoons. -It affects the land of Palawan but not in Coron.		tlgang huli noon” Present: low income due to the outsider fishers.	Its not like the time of are ancestors now. The water now gets warmer so that the fish wouldn’t come out.	-If its Dry season you will have a hard time in fishing but if its rainy season it can be good or bad day of fishing. Its not permanent.
Month Begin Month Ends	December (2012) we are now prone to typhoons.	-November and december	-November (past and present) -January (past and present)	Common Fisher Starting Age for Working Alternative Livelihood	-Tagbanua’s are still in below poverty. They’re not educated there is for them to be deceived. Male 8,9,10 Cashew	Male 7 Cashew, balinasasayaw	Male, but it can be Female 10 Banig (mat), Tambalang(seaweeds) they make it plastic ware, plastic.
Rainy Season Month Begin Month Ends	-october (past and present) -december (past and present)	-June -October	-June (past) Last week of May (present) -November (past and present)	Health	Male 8,9,10 Cashew		When it comes to income sometimes we have none. As we see our ocean is abused that’s why sometimes we have a hard time in fishing especially when its windy.
Drought Dry Season	-Before its June, July but now December, January, February.	-Nowadays we experience drought (April) -naibsan ang mga katubigan	-April-May (past) -March-May (present) -Jan-May (past and present but its hot nowadays)	Common illnesses		- They have their own culture like using herbs. They have a Health Center. Diarrhea is the common disease because of the water. The water system is not yet improved.	In the health center, antibiotic...Its free.. Sometimes there’s a doctor sometimes none. Asthma, Flu due to the hotness of weather
Humidity	-Before, at the month of February we experience a little warm but now we are experiencing super hot weather. -its hotter nowadays than the past.	January until April (past and present) -Before its not that hot even though your expose to the sun -Currently you can’t take the warm in 1pm to 2pm	-Its hot nowadays	Education	Day care		Day care
Socio Economic Livelihood	-80% of them are fishers, but some use trading of Balinasasaya w edible birds nest. Past: we have more income “sa kwento nga ng mga matatanda marami	-Balinasasayaw edible birds nest -Fishing -Before, there so many fish here but fishers from outside came like Cebu, Mindoro, Bohol, Lucena. So that, are income when it comes to fishing get low.	“Pangangawil”(Angling), Fishing, Mat making -Its harder to fish nowadays -The same kinds of fish, depends on the kind if fishing that you will use. In pangangawil-octopus/pugita, if we use net we caught different types of fish.	Institutional Disaster	Plan about Intigrate climate change adaptation of the municipal.	They preparing their house like putting braces and binding ropes to it.	We’re just helping each other.
				Assistance Program	Evecuation center are schools near	-Few rice -damages are reported to	Sometimes you can’t understand. Sometimes its not

	<p>them, and brgy. Hall They received supports like relief goods. Program: Municipal disaster risk reduction council. They're preparing for any disasters that they will encounter.</p>	<p>municipality -Its not enough especially to the big families.</p>	<p>enough. 8-10 can of sardines? All of the families will be given.</p>
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December and January before. Today typhoons already enter by the month of October and end by the month of January. These typhoons are rarely catastrophic compared to those that destructed the others parts of the Philippines which left grave damage and mortality. This is because of the mountain ranges of the area which serve as the walls that weaken the intensity of the typhoons. One of the most unforgettable typhoon that hit Coron is the Typhoon Undang in the year 1984.

Wet and Dry Season

Wet and dry season are the definite season in Coron, the same with the rest of the country. The wet season before, comes during the month of June and ends in November, today, it enters by the last week of May and ends by November.

Dry season on the other hand, comes by the month of January to May then and now. But it is observed that more intense heat is being experienced today compared to the past.

Humidity

Compared to the humidity of Coron before, the temperature has risen evidently.

B. Socio-Economic

According to the Municipal PDO head, the Tagbanuas are still living below the poverty line. That 80% of the Tagbanuas being surrounded with water rely on fishing as their primary source of living. While there are also a number of them who rely on edible bird's nest hunting of the Balinsasayaw or the edible-nest Swiftlet which gains a height in the market and banig weaving.

Primary Source of Living

Fishing is participated by both men and women but still men do the most. While children are trained to go out of the sea and fish at even the age of 7 until the age that they are capable. Before, the fishing ground also comes by the epipelagic zone but today, fishfolks tend to go beyond by the deep part of the water to fish. The primary reason is the invasion of fishermen from other nearby places like Cebu, Mindoro and Bohol. On the other hand, water temperature has also risen but there are no existing

Topography

According to the comprehensive land use plan, the area of coron is bumpy and mountainous with slopes from 0 to 30 percent and above. Flat lands are usually along the coasts while the mountain ranges run approximately in every direction crossing the Busuanga Island. The lands on the other hand are encompassed of broken narrow coastal plains, valleys between mountains and plateaus. There are several rivers too but most are unnavigable.



Typhoon

The Municipality of Coron is annually visited by typhoons during the months of November,



accounts that state its effect on the status of fishing. When fishing comes insufficient the Tagbanuas also rely on agriculture of kasuy and banana.

Health

Water system has been the problem of the Tagbanuas since then. This has led to numerous cases of diarrhea and other diseases. Though health centers are available within the community, others still believe in the Balyan who is their traditional herbal doctor.

Education

The Tagbanua community has a day care school but they still do not have an elementary nor high school to continue their study around their area that they have to go to the town just to acquire the higher learning.

Psychological Assessment

Indigenous People (IPs) have difficulties when there are calamities. They are worried about the safety and health of their family especially to their children that needs more protection. Their sources of living were gone and made their life miserable and knowing that the government does not give enough support that should be responsible for taking care of them. Climate-change worsens the difficulties already faced by the Tagbanua group of people including economic marginalization, loss source of income in fishing and unemployment.

Institutional Framework

Resilience depends on their local knowledge, since the Tagbanua tribe's lack complete education facilities and only day care centers are present. Though relieve goods are provided among the tagbanuas in order to reduce their distress, help and appreciable influence from the government are still inadequate, thus the tagbanuas tend to rely on each other.

Interpretation of Results

The purpose of this study was to assess and create concrete ways for resilience on this indigenous group as climate change threatens their survival through evaluating their food security, economic stability, biophysical assessment, indigenous or psychological

beliefs and institutional framework. Indigenous people's dependence and close relationship to the natural environment delineate them to be vulnerable to climate change.

Palawan, considered as the Philippines' last frontier being the last anxious area in the nation is not excused to the consequences of the changing environment. The Tagbanua tribe, one of the oldest ethnic groups in the Philippines who reside in Coron, Palawan, have been affected and struggled as changes in the environment they live in occurs. The prospective hazard of climate change to Tagbanua is very existence joined with different legal and institutional barriers, which affect their capacity to survive with and adapt to climate change, marks climate change a concern of human rights and disparity to indigenous people. Such methods like adaptation and mitigation are the greatest broadly used key to minimize vulnerability of places to climate change, as well as to diminution the gas emissions, which are alleged to be the anthropogenic source of this ecological issue. Adaptation to different circumstances involves supplementary monetary funds and the transmission of technological capability that most ethnic societies do not have. Whereas short-range adaptation actions are underway, resource and capability restraints are regulating the implementation of longstanding adaptive approaches. Climate change has hazardously transformed the applicability of the traditional knowledge of indigenous groups such as the normal indicators that were used to generate actions in the earlier are now less dependable. Aside from the facts about adaptation and mitigation, as well as the regulations and programs executed by the national government, indigenous people also transmit the right to be well knowledgeable and notified by what are happening due to ecological matters like climate change, and disasters. Since usual signs they must use to depend on are not certainly dependable at the present time, it is essential that they distinguish how to be notified earlier before the catastrophe will come.

4. CONCLUSIONS



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In conclusion, the study aims to introduce ingenious ways based on the cultural belief and the use of possible knowledge to react relevant solution in their vulnerability climate change. The possible hazard of climate change to indigenous peoples' actual way of life combined with numerous legitimate as well as utilitarian barriers that affect the capability to cope with and adapt to climate change. Climate change affects the lives of tagbanua in several aspect, warmer weather and drying of wells were common impact and abundant disaster to tagbanuas. In some point, indigenous people are vital to, and active in, the various ecosystems that dwell in the territories and may consequently help improve the resilience of these ecosystems. Indigenous people interpret and respond to the impacts of climate change in creative methods, drawing on traditional knowledge and other equipment to discovery answers which may support the society at large to cope with impending changes.

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