

CLIMATE RESILIENCY OF LOCAL GOVERNMENT UNITS IN THE DOWNSKIRTS OF MAJOR ABRA RIVER BASIN

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ABSTRACT

Local government units (LGUs) in the Philippines are confronted with many issues and concerns. Recent years show increasing extremities in weather patterns in the country which is believed to be caused by climate change. Diverse climate has an adverse impact on species, their habitats and the ecosystem in general. Climate change experts anticipate more extreme weather events; but their severity and location are difficult to predict. Its adverse effects are fast becoming a common concern especially to LGUs, which are prime movers of development. Often, LGUs collaborate or merge in order to respond for a common concern, like ecosystem management. Collaboration and/or amalgamation between adjacent LGUs provide greater resources and create a cumulative impact on natural resource management. In the province of Ilocos Sur, the Abra River is a major river basin (MRB) ecosystem that traverses within the jurisdictions of various adjacent LGUs.

This study looked into the capability of LGUs along the downskirts of Major Abra River Basin in Climate Change Adaptation and Mitigation (CCAM). Specifically it looks into the effects of CC impacts experienced by the LGUs in terms of ecosystem, water, health, and communities; and the capability of the LGUs in cross-cutting activities to become climate-resilient community; and implementing CC adaptation and mitigation activities.

It made use of ground assessment and validation information through Key informant interview, diary and documentary analysis.

Assessment showed that the ecosystem, water, health and community of the LGUs experienced various effect of CC. However, there are activities to show that the LGUs are capable in cross-cutting activities along capacity development, knowledge management, IEC and advocacy, gender mainstreaming, R&D and Techno Transfer to become climate-resilient community.

The LGUs have CC adaptation activities along Vulnerability and Adaptation (VA) Assessments, integrated-ecosystem based mgt., climate-responsive agriculture and water,

climate-responsive health sector and disaster-risk reduction management. The LGUs had been implementing CC mitigation activities along energy efficiency and conservation, sustainable infrastructure and transportation and waste management.

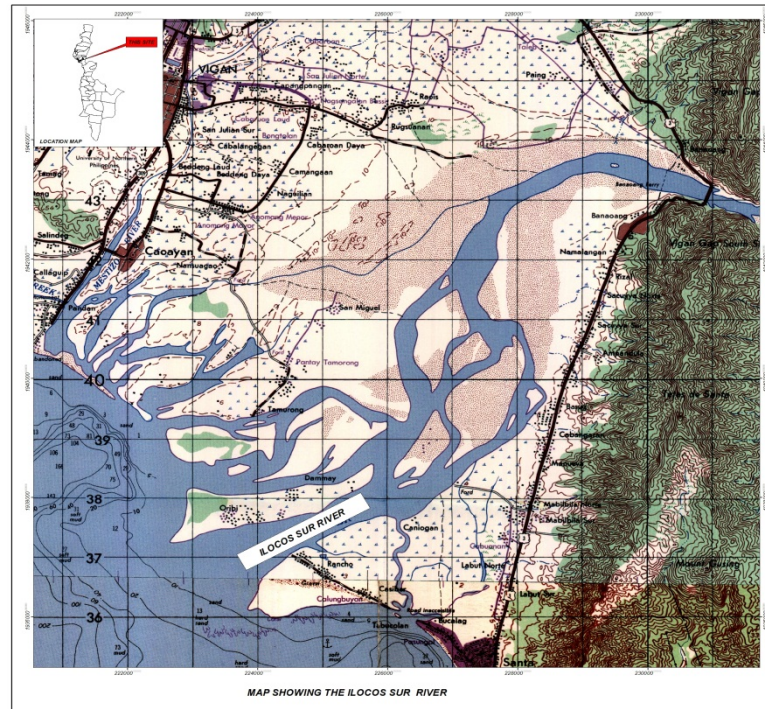
LGUs within the down skirts of river basins are more susceptible to the impacts of CC because coastal areas adds up immense impact of CC, hence, with greater responsibilities assigned, often without correspondingly increasing financial resources. The degree of impact from which municipalities suffer from CC will depend on the actions and initiatives LGUs take now to build a resilient municipality or city. Unknown or not read as report or accomplishment in CCAM, LGUs have been doing already activities on CCAM even before the creation Climate Change Act or even before LGUs were made to prepare their CC Adaptation Plan. It was NOT only packaged as one Climate Change Resiliency Report.

Result of this study could be used to start a more intensive data bank for programs and projects towards Climate Change Resiliency of MRBs. Climate Change Strategic Framework and Action Plan should be formulated for the province.

Introduction

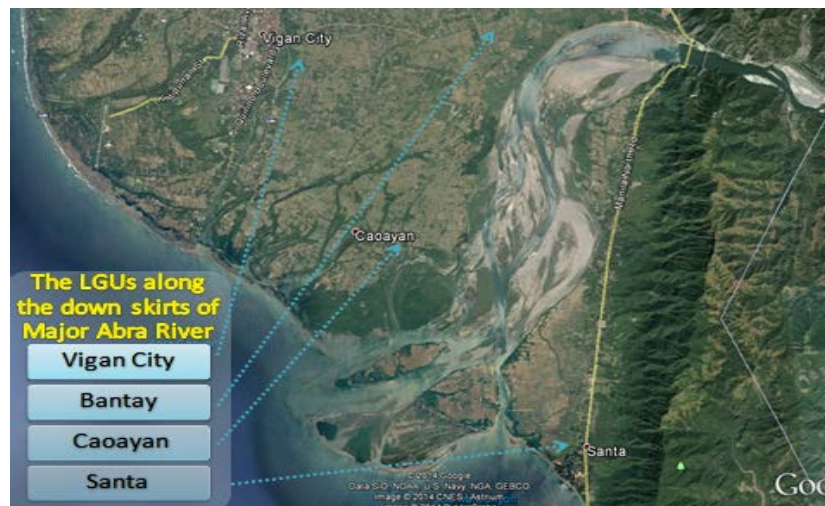
Recent years show increasing extremities in weather patterns in our country. With diverse climate on one hand and species and their habitats dwindling, chances for ecosystems to adapt naturally are diminishing. The climate is changing and blamed to be human-induced. Climate change experts anticipate more extreme weather events; but their severity and location are difficult to predict. Increases are expected in: flash flooding; landslides, as a result of intense rainfall or flood water; storm surges; man-made floods, such as breaches of embankments; and areas not previously prone to flooding, such as urban areas. Its adverse effects are fast becoming a common concern of government units. Addressing climate change (CC) is part of good governance.

Meanwhile, Local government units (LGUs) in the Philippines merge and join forces together to respond for a common concern, like ecosystem management. Amalgamation of LGUs had led to garnering awards for good administration or governance, socio-econ development, local legislation, and environmental management. Amalgamation between adjacent LGUs provides greater resources and creates a cumulative impact on natural resource management. An ecosystem could possibly be seated within the jurisdictions of various adjacent LGUs. Major river basins (MRB) usually traverse within provinces or municipalities. The Abra River Basin traverse within 2 regions, that is within neighboring provinces or several municipalities and one city.



LGUs within the down skirts of river basins are more susceptible to the impacts of climate change because coastal areas adds up immense impact of climate change, hence, with greater responsibilities assigned, often without correspondingly increasing

financial resources. The degree of impact from which municipalities suffer from CC will depend on the actions and initiatives local governments take now to build a resilient municipality or city.



Republic Act 9729 or known as Climate Change Act of 2009 require the LGUs to come out with their Climate Change Framework Plan. The plan should allow ecosystems to adapt naturally to

climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. Likewise, adopts the

strategic goals in order to build resilience to climate change-related disasters.

Understanding and addressing CC will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings. Actions to address climate change can be justified in their own right and can also help in solving other environmental problems. Hence, assessing the capabilities the LGUs along the downskirts of river basins of Ilocos Sur in meeting its concerns in Climate Change Adaptation and Mitigation (CCAM) is so important and relevant because this will serve as an input in the protection, conservation and management a crucial natural resource and public administration.

An assessment of the capability of the key players of development (GAs, NGOs/POs and business sector) on how they harmonize their efforts will provide a clear understanding of their roles and directions towards resiliency. This study specifically viewed into the degree of experiencing climate change impacts and vulnerabilities of the municipalities and city found the downskirts of Abra River in terms of Ecosystem, Energy, Water, Health, Infrastructure, and Communities. Furthermore, the study looked into degree of capability of the cities and selected municipalities in the following cross cutting activities to become climate-resilient community; Capacity development, Knowledge management, IEC and advocacy, Gender mainstreaming, and Research and development and technology transfer.

This study looked into the capability of LGUs in the downskirts of Abra River Basin on Climate Change Adaptation and

Mitigation (CCAM). Specifically, it aimed to answer the following questions:

1. What is the degree of experiencing climate change impacts and vulnerabilities of the LGUs in terms of ecosystem, energy, water, health, infrastructure and communities?
2. What is the degree of capability of the LGUs in the following cross cutting activities to become climate-resilient community; Capacity development, Knowledge management, IEC and advocacy, Gender mainstreaming, and Research and development and technology transfer?
3. What is the degree of capability of the LGUs in the implementation of CCAM program along following: Multi-stakeholder partnership, Financing, Valuation, and Policy and Planning?
4. What is the extent of capability of the LGUs in implementing climate change adaptation activities in terms of: Enhance vulnerability and adaptation assessments; Integrated-ecosystem based management, Climate-responsive agriculture, Water governance and management, Climate-responsive health sector, and Disaster-risk reduction?
5. What is the extent of capability of the LGUs in implementing the climate change mitigation activities in terms of: Energy efficiency and conservation, Sustainable infrastructure and transportation and Waste management

Methodology

The researchers conducted a Qualitative Study using Ground Assessment and Validation of Information (GAVI) through Key Informant Interview (KII). Diary and transcript of meetings will

facilitate in generating individual interviews. Documentary analysis of existing secondary data or files or any related documents of concerned organizations or individuals will be used in documentary analysis.

Results and Discussion:

1. The effects of climate change impacts experienced in the downskirts of Abra River Basin in terms of ecosystem, energy, water, health, infrastructure and communities could be described as follows:

a. Ecosystems

The Cordillera mountain range stands stately on the eastern part of the LGUs found at the downskirts of Abra River Basin. It has abundant spring resources that can be harnessed for adequate supply of water, not only for household use but for irrigation purposes, too. The city of Vigan and municipalities of Santa and Caoayan are bounded on the west by the West Philippine Sea. The Abra River is the only big river that cuts across the LGUs.

The climate of the place is arid, characterized by two (2) well-pronounced seasons; dry and wet. Dry season is usually experienced from November to April; while wet (rainy) season starts in May until October. Occasional rainfall also occurs at the onset of the dry season caused by the northeast monsoon passing through the region. The town is naturally shielded from the trade winds by the Cordillera Mountain Ranges. In the middle of May, drift winds from the Pacific Ocean sweep over the area, signaling the imminent wet season. Typhoons and tropical depressions bring about abundant rain during the months of July to September. Temperature ranges from 21.6°C to 34.7°C or a minimum temperature

of 23.9°C and a 31.9°C maximum. Relative humidity is 87.3.

The greeneries at the down skirts of the MRB is adorned both public forest and private ones. Some native plants found in the upland are vanishing. *Panarien*, *kamangeg* and other related indigenous tubers, the *tebbeg* tree are claimed to be just of the few plants that are diminishing in quantity. However, they agree that climate change might be a reason because the soils now are drier as compared before. A small group of fish vendors claimed that quantity of *igat*, *lagdaw* and varieties of shells like *arusangis* are decreasing already. Their reason, its gone because the “baak” (old or mature) ones were not able to lay eggs anymore. The temperature of the river water might be too high already to allow the eggs to hatch or for the juveniles to survive into adult ones. Fish travel to places that are deeper because the water is colder as compared to the nearby shallow water. However, they claim that the absence of big fishes is due to overfishing of fish while they are still young.

The absence of natural water breaker in its shoreline like rocks or corals, and being directly exposed to the open seas make the coastal LGUs more prone to erosion. The possibility of erosion is present in their sandy beach areas.

The agricultural practices in the area are sensitive to atypical change in weather pattern. Its main products like rice, corn, vegetables and Aquaculture products like tilapia, bangus, grouper, shrimp and crabs are dependent to right weather condition. The mango industry of the municipality suffered a lot. The hot weather induced the fast proliferation of insects that produces black sticky excreta that destroy both flowers and young fruits of mango. The

insects (black rot) are also responsible for the block spots of mature fruits. The strong winds during the cold season blow off the flowers and young fruits from the tree. Prolonged rainy season destroy the quality of dragon fruits.

b. Energy

There are no records available to show the impact of Climate Change to energy use. According to one person interviewed, the demand for energy depends on whether you are rich or poor and not on the climate change. If a poor farmer feel hot, he will just go under the mango tree and refreshed by the shade and breeze of the wind, but if a rich Chinese businessman feels hot, he will just open the electric fan or if not the air conditioner. Typhoons with thunderstorms usually led to brown-outs. This could be due to the standard operation of ISECO in the maintenance and protection of its facilities.

c. Water

People primarily depend on shallow groundwater for domestic and agriculture. However, there are water stores selling treated water for drinking. Metro Vigan District supply chlorinated water to some barangays.

Abra River is the only big river that cuts across the towns. The barangays that lie along the Abra River are flood prone areas during the rainy season. The strong flow of flood waters and uncontrollable surges of water erode the properties that line the river endangering life and properties.

d. Health

There are no specific records that deal specifically on effect of climate change to the health status of the municipality. However, the RHU personnel claim that increase in blood pressure could be related

to climate change especially during extreme cold months and intense hot summer months. Prolonged rainy season induce the presence of vector responsible for incidence of influenza and colds.

e. Infrastructure

The LGUs have just updated their DRRM/CCA Plan and one of its concern is to respond to the infrastructure needs like road repair and construction of flood and erosion controls. Roads including those that traverse the Poblacion areas are sometimes severely affected by flood waters rising from its rivers. The Quirino bridge was flooded during the presence of typhoons Fera and Pepeng. The strength of flood waters during typhoon Fera destroyed the bridge and impassable. Mobilization was severely affected. Some unpaved barangay roads were further damaged by typhoons and dusty during dry season.

f. Community

It is the mandate of the municipality through its MDRRM Office to attend possible victims of both man-made and natural disaster before, during and after a disaster. Tourism facilities at the coastal are expected to have lower visitors during wet season. Mobility of transportation and prices of commodities were not generally affected by disasters except during the time typhoon Fera. Signal or reception of communication facilities are none or weaker during typhoons however the duration is short only.

2. The capability of the LGUs in the cross cutting activities to become one climate-resilient River Basin is assessed as follows:

a. Capacity Development.

A number of the Agriculture Technicians (AT) at Municipal Agriculture have attended seminars on CCAM

particularly on rice crops and vegetables at OPAG and other government agencies like the Philrice. Information dissemination was undertaken by the AP to individual target farmers on the use of climate change resilient agricultural practices.

The MPDO, ILGO or the DRRMO were the most probable offices that were assigned to prepare for the CCA Plan despite the presence of a designated environmental officer in most of the municipalities and city. Information needed in the preparation of the plan were taken from various offices.

b. Knowledge management

Base in an informal conversation with some farmers, fishermen and fruit growers, information on Climate Change is learned between them as well as the others through the AT, radio, and tv. The schools in the municipality integrated in their teachings some basic concepts in climate change concepts to the pupils. In high school principal, climate change is part of the science subject for first year and is again introduced in chemistry. Books, magazines, newspaper and the internet were used by the students and teachers in understanding climate change. However, just like most municipalities, the LGUs has no specific activity along data management concerning CCAM and neither print materials on CCAM is displayed in their municipal/city hall nor posted in the internet.

c. Information, Education, Campaign and Advocacy

Climate Change as a general concept is integrated in the curriculum of basic education. Science public high school teachers claimed that they organize the (Young Environment Steward-Organization) because it is a DepEd directive. The organization initiates activities along climate change and celebration of climate change

week. Environment month and Climate change week were celebrated in Vigan and other LGUS only celebrate environment month. It is usually celebrated by tree planting activities and clean-up activities. Disaster management related activities are disseminated but not explicitly on climate change. There are no activities that bring information on climate change by the municipal government to the barrios.

d. Gender mainstreaming

The women sector are not directly involved in the annual climate change-related activities of the municipalities, except in Vigan City. However, it could be noted that the LGUs along the downskirts of Abra River Basin have activities on cleanliness and beautification activities. These activities may not be written through papers but these help in lessening impact of climate change.

e. Research and development and technology transfer

All the LGUs along the downskirts of the River Basin had conducted Vulnerability Assessment that served as base-line information used in the preparation of the Municipal/City Disaster Risk Reduction Management /Climate Change Adaptation Plan (MDRRM/CCA). The LGUs are still dependent with other government agencies in gathering information and other pertinent data along CCAM.

3. The capability of the LGUs along the down skirts of the Abra River Basin in the implementation of CCAM program is presented as follows:

a. Multi-stakeholder partnership

The response for disasters caused by climate change is centralized at the mayor's office. Offices like DRRMO, Engineering, Agriculture and Rural Health Unit as well as

the Barangay Chairmen report directly to him for planning and monitoring purposes. The mechanism for CC coordination follows the formal Organizational Structure of the municipality. Implementing CCAM is participatory and community based since they themselves are the ones that identify the vulnerable groups and the priority. CCAM related endeavors between and among LGU, business sector and civil societies are also more visible during disasters. Records and interviews gave an idea that there are no mechanisms to facilitate private sector to invest activities that support CC concerns neither partnership with foreign institution in implementing CCAM related-activities

b. Policy and Planning

Records from the MPDOs shows policies related to CCAM. The LGUs have developed their own CCA Plan likewise DRRM Plans. CC concerns are considered in development planning since the updated CLUP of the municipality also updates locations of areas vulnerable to drought, erosion and infestation.

c. Valuation

As per records, there are neither standard mechanisms nor procedure that directly measure estimate gain or loss of any of the LGUs due to CC. The engineer's office has its own way of valuating physical and infrastructure damages caused by incidence of typhoon. According to agriculture's office, their valuation is limited only on lost caused CC while they don't have any method to determine gain. The RHU has no specific reporting and planning on health-related programs that directly respond CC.

d. Financing

Based on records, there are no identified funds that specifically respond to

CC concerns but rather is allocated to similar once like those for Disaster Risk, Reduction and Mitigating Program, resilient seeds in agriculture and medicines in RHU. Plans on CCA, DRRM and Development plans reflect funding for CCAM related programs.

Funds are available are limited to implement local support programs on CCAM. There is an approved policy defining the distribution of funds to different the offices but not specifically identify as CCAM-related programs. The amount of financial distribution varies as per income class municipalities.

4. The extent of capability of the cities and municipalities along the down skirts of Abra River Basin in implementing climate change adaptation activities is seen as follows:

a. Enhanced vulnerability and adaptation (V&A) assessments

Vulnerability and adaptation (V&A) assessments could be found in the Climate Change Adaptation Plan of the Municipality or city. The MPDO, LGO or/and the DRRMO are tasked to prepare said plan. The staff of said offices together with the engineering office worked with the Phivocs of DOST in mapping and producing needed data in preparing geohazard maps that are crucial in assessing the vulnerability.

Base on records, updating of vulnerability and adaptation assessment is not done periodically and is done only when there is updating of the CLUP and preparation of the CCA. Moreover, the risk sectors were included in the risks assessment but rather were only informed of the findings of the scientific study. In return, those that were at risks were informed that they report to the municipal/city hall

whenever flashflood or erosion is about to happen.

b. Integrated-ecosystem based management

All plans and ordinances of the LGUs provides that the mayor lead the management natural resources, from upland to coastal resources management. The municipalities of Caoayan and Santa and Vigan City had declared a Marine protected area. Fisheries ordinance reflects provision on safeguarding of its coastal and water inland resources of the LGUs. They are all working with CENRO in the reforestation activities to sustain forest areas. They have tree nurseries to sustain tree planting activities. The CCA serves as the blueprint of the municipality in identifying the integration of National policies on protection vulnerable ecosystems from CC.

There are no regular neither timely protection or rehabilitation activities of at-risk ecosystems. While there are environmentalists and agriculturists in the LGUs of the lower stream of Abra River, there is no specific technical person that responds to the conservation activities of the area.

c. Climate-responsive agriculture

All the mayors happened to be all supportive to agricultural activities. Because of this scenario, the farmers are distributed with certified rice seed and corn seeds that are suitable in arid place like Ilocos Sur. Technology in farming onions and other vegetable cash crops were based from researches on climate resilient farming that were recommended by the OPAG to ensure a year-round food sufficiency.

Inland aquaculture stops when the fishponds turn to become shallow. This is to prevent fishkill because of high water

temperature. It also gives time for fish growers to condition the fishpond for the next incubation period.

Fruit and vegetable growers claimed that some of the several forms of infestation were reported to the agricultural office so that appropriate actions be given. The municipal agriculture office sent technicians to attend seminars and trainings facilitated by OPAG on Climate Change and its impact to agricultural crops including high value fruit crops like mangoes.

Efforts on maintaining clean drinking water supply for households could be seen in the LGUs. The CLUP provides for the mainstreaming water resource management not as a result of CC but to ensure a clean water supply for every household since most of which still depend on either shallow or deep well as water resource.

There is no document showing the particular concern on groundwater resource management but there are documents in the ensuring of safe and clean coastal water to promote and enhance the tourism industry. Community participation in water resource conservation was seen during the consultation meeting provided by the NIA in the establishment of irrigation system for agriculture.

Water conservation and also the importance and how to protect it is for sure integrated in basic education because this is prescribed by the DepEd. Observance of Water Day Conservation was neither celebrated in schools nor the local government unit.

f. Climate-responsive health sector

The rural health unit has organized persons to identify, monitor and control

diseases related to climate change. It has physicians, nurses and other health staff to respond to its constituents. The RHU has allotted funding for its services but there is none that specifically funds for disease control programs brought by CC. The RHU respond to all forms of emergency cases not only to climate-sensitive and vector-borne diseases but also to other diseases. The health staff interviewed claimed that they are particularly active in clean-up drives, campaigning for proper sanitation and advocacy in fighting dengue mosquitoes. Despite the presence of private clinics and hospitals, the RHU still caters most of the health and medical needs of the city/municipality.

g. Disaster-risk reduction

The LGUs marked efforts to minimize or reduce risks from climate change induced hazards. They have their own people that are directly working for climate and disaster risk management. This is reflected from the organizational chart of the DRRM Task Force per municipality or city. They established system to prepare residents of coming of typhoons or drought and that assures vulnerable parties to assistance on impact of CC.

The cities have but the municipalities do not have their policy framework for climate change adaptation and mitigation. However, all of them has a Climate Change Adaptation Plan. The inclusion of CCAP is an additional requirement of DILG in the preparation of DRRM Plan. There is no concrete evidence that exclusively discuss monitoring and reporting mechanisms related to climate and disaster management.

5. The capability of the LGUs along the down skirts of the Abra River Basin in implementing the climate change

mitigation activities is presented as follows:

a. Energy efficiency and conservation

The mayors of the LGUs led the conservation of energy particularly on electricity in all public offices. This is done so that the municipality could be able to conserve payment for electric consumption and not as a concern of climate change. The LGUs has thier own way in campaigning for and monitoring energy efficiency and conservation.

The LGUs have no program on the utilization of renewable and alternative energy. Moreover, although the LGUs are silent in campaigning for energy conservation among households, some residents conserve energy not because of climate change concerns but to decrease electric bills. Funds are not available to promote energy efficient technologies.

b. Sustainable Infrastructure and Transportation

Sustainable infrastructure and transportation refers to the activities that promote environment friendly designs and technologies for infrastructure and transportation. There are no ordinances and resolutions that provides for climate change resiliency however records shows that there are ordinances that calls for waste management, adoption of organic farming, fishery, tourism-related activities and others. There is no evidence that the LGUs are into green architecture neither green infra. There are neither favorable conditions nor incentives in the issuance of building permit to those that will practice green architecture.

Generally, the air quality in the LGUs in Abra Riber Basin is not yet polluted although a part of the national road traverses along the LGUs. An ordinance

regulating smoke belching vehicles is in place in each of the municipality/city. There is no organized body assigned to guarantee eco-friendly transportation system, however there are programs of the PNP on preventing of the operation of smoke belching vehicles.

c. Waste management

Waste management refers to the ways and means towards full implementation of proper waste management. The municipalities have no strong programs on solid waste management since none have sanitary landfills as provided by RA 9003. IEC on waste management program is sustained along its public offices and in the public market. Part of the IEC is the scheduling of collection of waste. Waste collection is limited only in its Poblacion and adjacent Barangays.

Conclusion

The LGUs along the down skirts of Abra River Basin are faced with many challenges of climate change. Its long summer months pose hot temperature that is detrimental to the agricultural crops and animals of the city. However, it provides better avenues to do business related to the historic industry of the city.

The LGUs have various cross-cutting activities, programs and projects that made them capable to address climate change. Its public officials and other personnel likewise the women sector are usually exposed to seminars and even in-house trainings to adapt with or mitigate the effects of climate change. They have applied various media to educate the city constituents on concerns and programs in climate change. CC concerns are updates of its web sites, television and radio news, and concepts in

traditional basic education. Despite humble efforts of the city to become climate resilient, it still depends on the services of technical people from other government in monitoring that effects CC to the city.

Unknown or not read as report or accomplishment in CCAM, LGUs have been doing already activities on CCAM even before the creation Climate Change Act or even before LGUs were made to prepare their CC Adaptation Plan. It was NOT only packaged as one Climate Change Resiliency Report.

Recommendation

Result of this study could be used to start a more intensive data bank for programs and projects towards Climate Change Resiliency of MRBs.

Climate Change Strategic Framework and Action Plan should be formulated for the province.

References

- Center for Science in the Earth System (The Climate Impacts Group) 2007
Preparing for Climate Change. A Guidebook for Local, Regional, and State Governments. University of Washington, Washington and ICLEI – Local Governments for Sustainability
- Mani, Muthukumara, Anil Markandya and Viju Ipe. 2008. Climate Change Adaptation and Mitigation. A Practical Guide. The International Bank for Reconstruction and Development. World Bank, Washington

Regional Development Council -R12009.

Regional Conference on
Environmental Issues and Concerns.

Simpson, M.C., Gössling, S., Scott, D., Hall,
C.M. and Gladin, E. (2008) Climate
Change Adaptation and Mitigation in
the TourismSector: Frameworks,
Tools and Practices. UNEP,
University of Oxford, UNWTO,
WMO: Paris, France.

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