

STRENGTHENING CAPACITIES OF THE LOCAL GOVERNMENT UNIT OF GARCHITORENA FOR DISASTER PREPAREDNESS AND CLIMATE RISK REDUCTION AND MANAGEMENT

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ABSTRACT

The study was conducted to determine the disaster preparedness and climate risk reduction and management of the Municipality of Garchitorena focused on farming and fishing. Three most vulnerable barangays were selected in determining the communities' hazard, risk, vulnerability and capacity. The study used descriptive-evaluative and developmental research designs that utilized progressive system of assessment. Primary data was gathered through Participatory Rural Appraisal (PRA) sessions: Focused Group Discussions (15-20 selected participants) and Key Informant Interviews. The secondary data was gathered through profiling. Results show that Garchitorena is very vulnerable to natural hazards and climate related risks. Major hazard is typhoon. The risks in agriculture include destruction of farms resulting to very low or no yield, declining in farm income, shifting to gambling. The risks in fishery include decreasing in fish catch, resulting to scarcity in food, very low or no income, shifting to illegal fishing. Risks impact on various sectors were identified. Gaps in disaster preparedness and climate risk reduction and management were discovered. On the basis of findings, current socioeconomic condition of the communities and poor governance in disaster risk reduction and climate change adaptation intensify the vulnerability of the municipality. From the evaluation of the LGU's programs and initiatives, DRR and CCA in agriculture and fishery is behind in its policy and planning. Thus, plan of action is formulated and recommended to strengthen the capacity of the municipality for disaster preparedness and climate risk reduction and management towards resilient and climate smart farming and fishing communities.

Keywords: Disaster Preparedness, Climate Risk Reduction and Management, Local Government Unit (LGU), Farming and Fishing.

INTRODUCTION

THE PROBLEM

The Philippines ranked as the **3rd in the list of countries most vulnerable to climate change**, (Philippine Daily Inquirer, 2011).

Highly exposed to natural hazards and climate change risks. This condition is exacerbated by the fact that the country is a **developing country, characterized by low level of economic development and poor access to resources**, (Binoya & Muñoz, 2011)

The **livelihood systems are most vulnerable to climate change and natural hazards. Agricultural and fishery production is affected** including the Municipality of Garchitorena.

THE SOLUTION

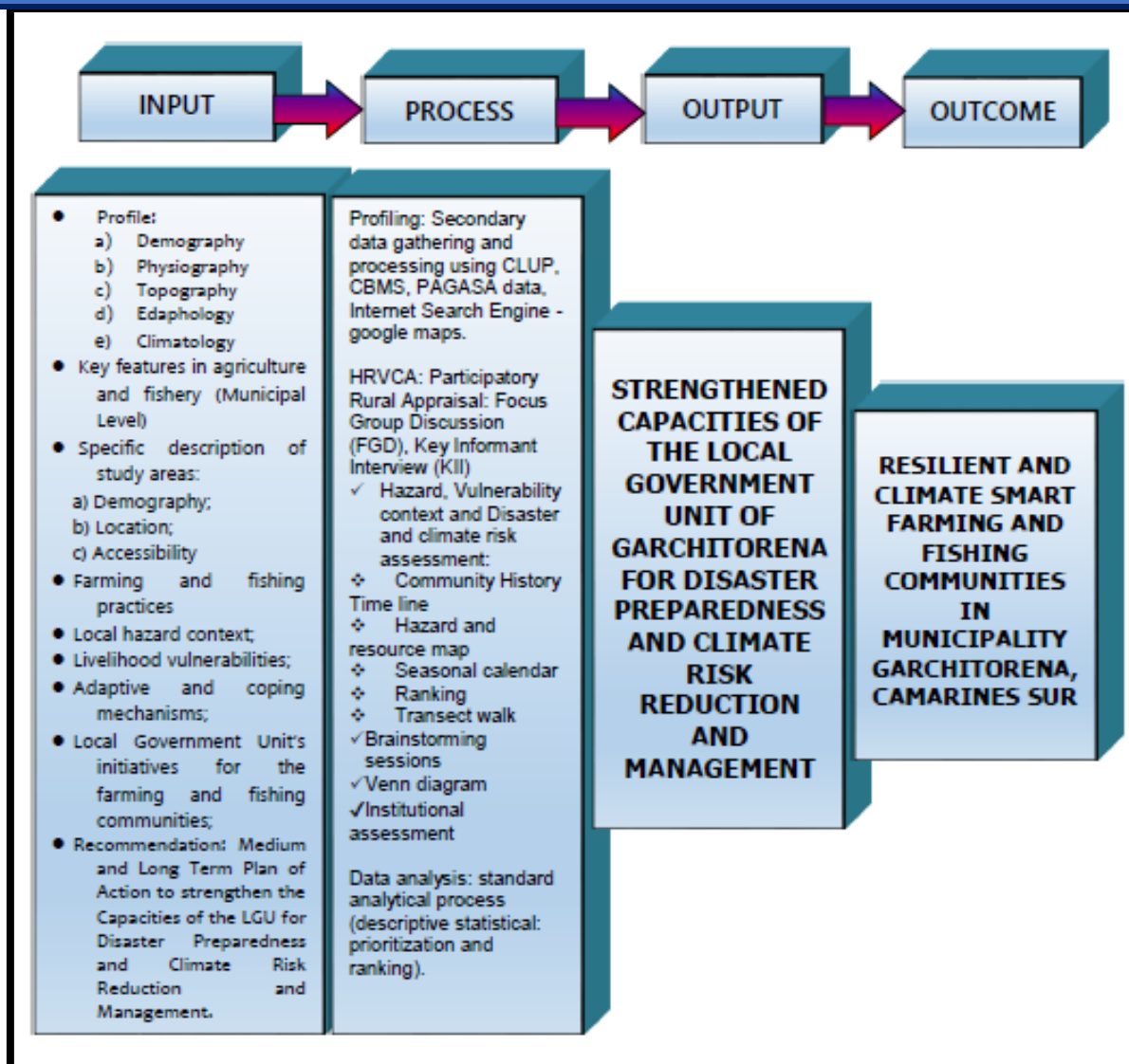
The growing threat of climate change, require **Urgent concerted policy and responses**. (FAO, 2015)

Situational Assessment is the first task to be carried to collect basic information about the communities' hazard, risk and vulnerability to climate risks. (FAO, 2015).

To contribute to the **strengthening capacities of the communities** in the Philippines, this study was conducted in the Municipality of Garchitorena.

The result will lead to a recommendation to **Strengthen the Capacity** of the Local Government Unit of Garchitorena for **disaster preparedness and climate risk reduction and management towards resilient and climate smart farming and fishing communities.**

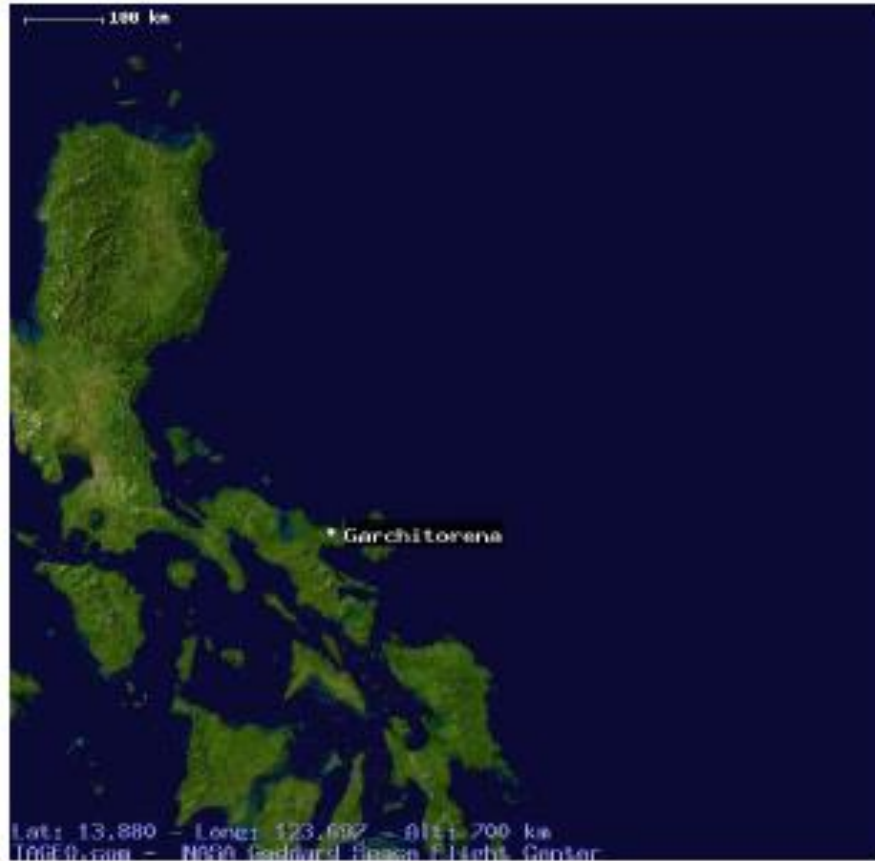
THE CONCEPTUAL FRAMEWORK/METHODOLOGY



RESULTS OF THE STUDY

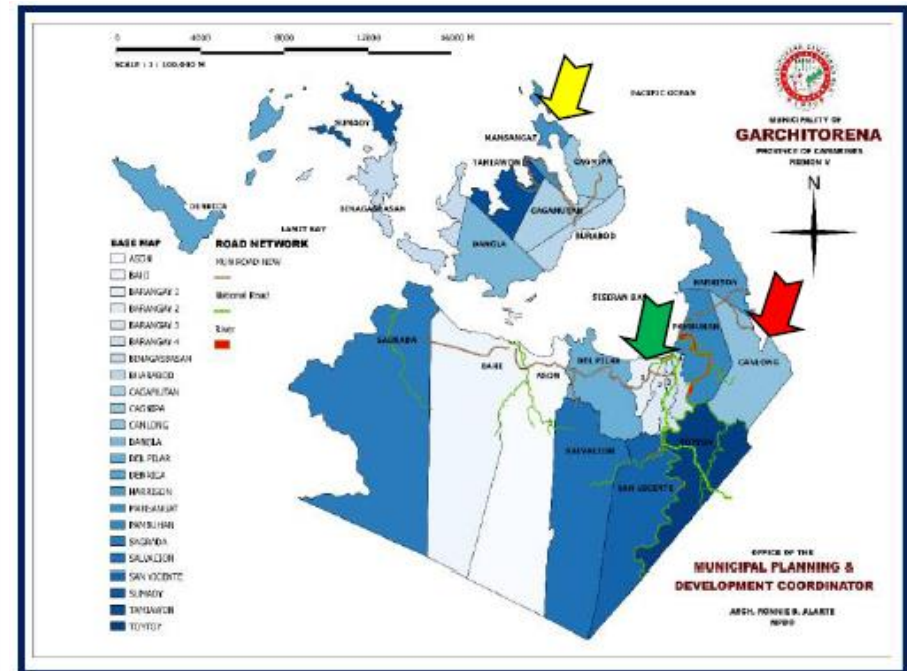
Locale of the Study

13.880 latitude and 123.697 longitude



MUNICIPALITY OF GARCHITORENA PROVINCE OF CAMARINES SUR REGION V, PHILIPPINES

THE STUDY BARANGAYS: MANSANGAT,
BARANGAY 1, CANLONG



DEMOGRAPHY

source: MPDC, 2015

LAND AREA: **273.92 SQ.KM.**

NUMBER HOUSEHOLD: **4,348**

POPULATION: **32,061**

AGRICULTURAL LAND AREA:
15,859 has or **57.91%** of the total land area.

MAJOR FISHING GROUND:

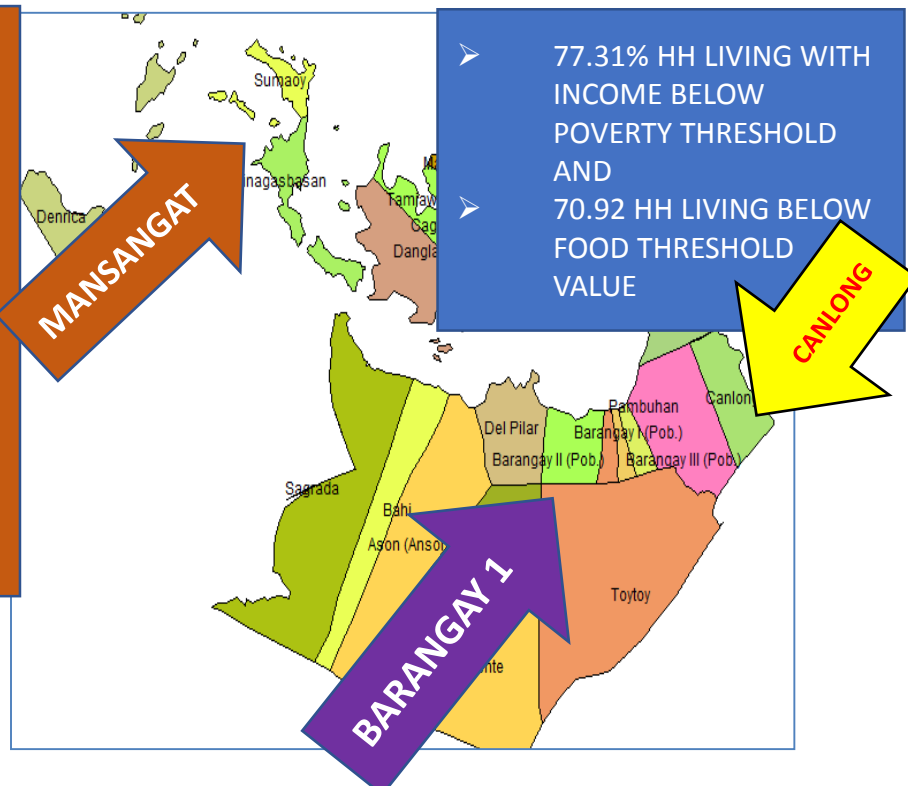
- San Miguel Bay - 1,152 km²
- PACIFIC OCEAN

SOCIOECONOMIC CONDITION

SOURCE: CBMS 2011

- 91.07% HH LIVING WITH INCOME BELOW POVERTY THRESHOLD;
- 78.57% HH LIVING BELOW FOOD THRESHOLD

- 77.31% HH LIVING WITH INCOME BELOW POVERTY THRESHOLD AND
- 70.92 HH LIVING BELOW FOOD THRESHOLD VALUE



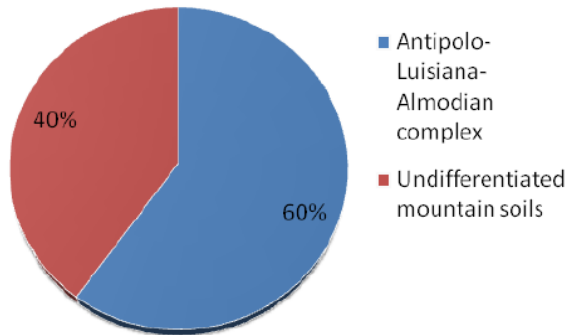
- 77.7% HH LIVING WITH INCOME BELOW POVERTY THRESHOLD
- 59.71 HH LIVING BELOW FOOD THRESHOLD

Type Of Land	Area (Has)	%
Coconut	11,148.9	70.3
Rice	634.4	4
Root crops	444.1	2.8
abaca	429.8	2.71
High value crops	3,201.9	20.19
Total	15,859.00	100

AREA DEVOTED TO AGRICULTURAL LAND

EDAPHIC:SOIL CHARACTERISTICS

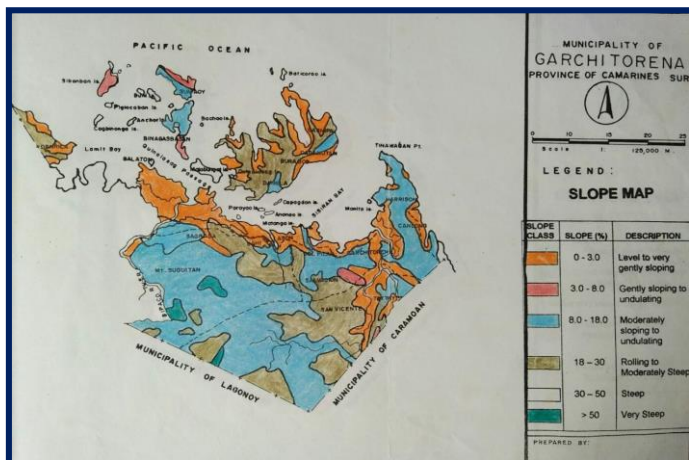
Soil Characteristics



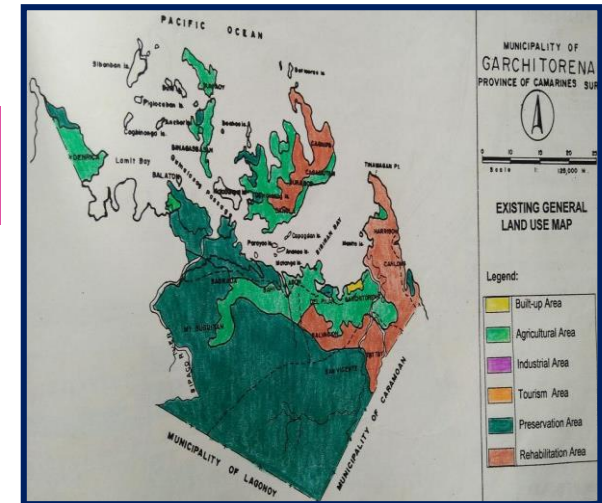
EXISTING LAND USE AND LAND COVER

LAND USE	AREA	%
Coconut	11,151	40.71
Cultivated areas mixed with grasses/shrubs	4,708	17.2
Woodland, preservation forests	10,157	37.1
Wetland, Mangrove	1376	5.02
Total	27,392	100

TOPOGRAPHY/SLOPE MAP

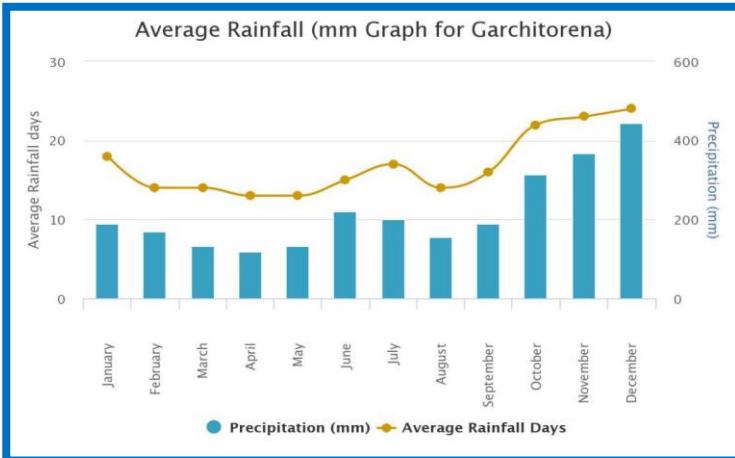


Class	Description	Percentage	Area (has)
0-3	Level to nearly level	17.42	4,772
8-18	Undulating to rolling	15.87	4,348
18-30	Rolling to moderately steep with 18-30 percent slope cover	40.35	11,052
30-50	Steep slope	26.36	7,220
Unclassified		16.29	



CLIMATE (Source: WWO, CLUP)

RAINFALL

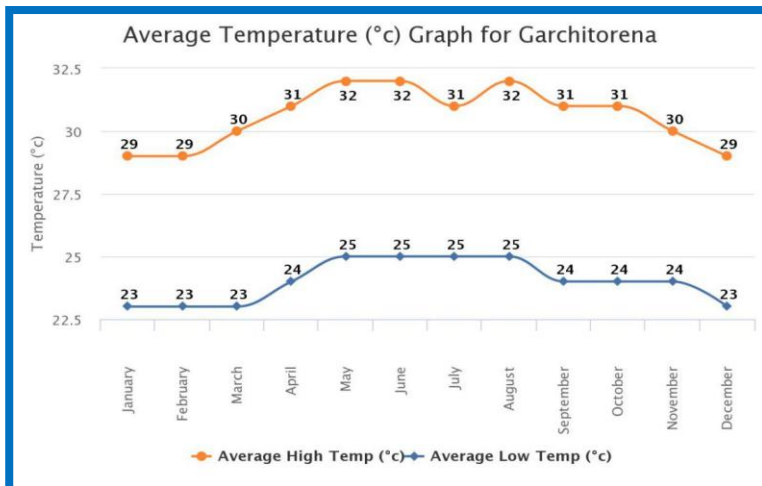


THE MUNICIPALITY BELONGS TO TYPE II CLIMATE:

No dry season with a very pronounced maximum rain period from December to February. There is not a single dry month. Minimum rainfall occurs during the period from March to May

- **MONTHS WITH HIGHEST RAINFALL: NOVEMBER/ DECEMBER - 490 AND 390 mm AVERAGE PRECIPITATION**
- **MONTHS WITH LOWEST RAINFALL: MARCH/APRIL/MAY Source: (WWO 2012)**

TEMPERATURE



- **HOTTEST MONTH IS MAY, JUNE - 32 DEGREES CENTIGRADE**
- **COOLEST MONTH IS JANUARY, FEB, MAR, DEC - 20.8 DEGREE CENTIGRADE**

The municipality's climate is influenced greatly by the northeast monsoon winds and the trade winds. (CLUP)

MAJOR HAZARDS, source: PRA sessions

Scoring is based from the Supplemental Guidelines on mainstreaming Climate Change and Disaster Risks in the Comprehensive Land Used Plan, Housing and Land Use Regulatory Board (HLURB), 2015

Primary and Secondary Hazard	Severity of Consequence	Likelihood of occurrence	Degree of Impact	Impact on Various Sectors	TOTAL SCORE	Rank
Typhoon that results to secondary hazards like strong wind, intense rainfall, storm surge, river/creek/urban flooding, saline water intrusion, siltation and coastal flooding and erosion.	4	6	3	125	138	1
Strong Destructive Winds Northeast, Southwest and other local winds	1	6	3	21	31	3
Seasonal Rainfall/Climate Extreme that results to secondary hazards like: coastal and river flooding, landslide, storm surge, siltation, saline water intrusion	1	6	2	77	86	2
Temperature Increase that results to Longer period of Drought	2	6	2	15	25	4
Pests and diseases in Crops	1	6	1	5	13	6
Disease outbreak in Livestock	1	6	1	5	13	6
Sea level rise that results to coastal flooding, saline water intrusion.	1	6	1	16	24	5

RISKS source: PRA sessions

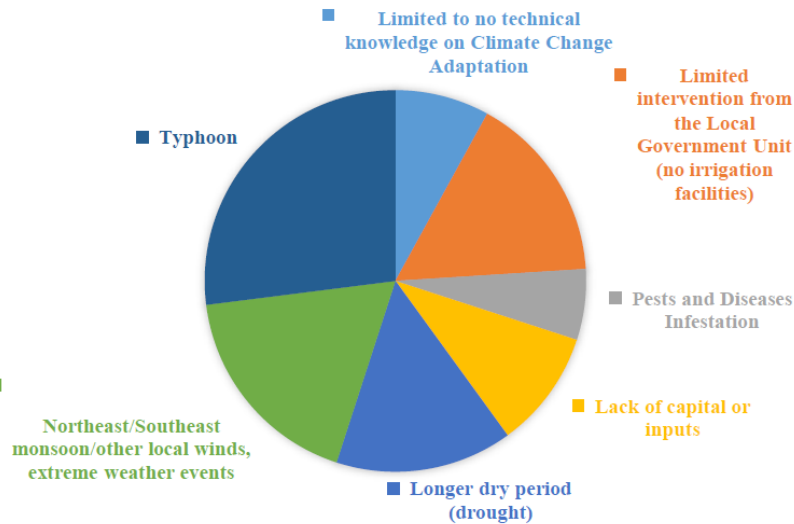
Hazard	Risk Statements of Farmers and Fisher folks
Typhoon	<ul style="list-style-type: none"> ➤ Farm areas are totally or partially damaged; ➤ Harvest is greatly affected, either reduced or totally no harvest; ➤ No income; ➤ Daily wage laborers/workers are not be able to work; ➤ Can't fish or cross the sea resulting to food scarcity; ➤ Mortality in livestock/poultry.
Strong wind	<ul style="list-style-type: none"> ➤ Destroys crops; ➤ Can't fish or cross the sea; ➤ Harvest is affected due to strong wind damages
Heavy Rainfall	<ul style="list-style-type: none"> ➤ Will result in flooding; ➤ Affect farms and livestock; ➤ Difficult for daily wage laborers/workers to be able to work; ➤ Sickness; ➤ Rapid run-off caused siltation that damage corals and sea weeds; ➤ Mixing of more fresh water to salt water caused mortality in sea shells and sea weeds; ➤ Occurrence of pests and diseases in crops that results to low yield
Drought	<ul style="list-style-type: none"> ➤ Difficult to find water for irrigation; ➤ Decrease in harvest; ➤ No planting-No harvest ➤ Warming of ocean that caused seaweeds mortality; ➤ Occurrence of pests and diseases in crops that decreased yield. ➤ Difficulty in finding sources of planting materials that is tolerant to drought; ➤ Usage of chemicals to minimize pests and diseases infestation
Flooding	<ul style="list-style-type: none"> ➤ Farms activities are affected ➤ Destroys crops resulting to low yield, Crops are submerged and cannot recover resulting to low yield.

VULNERABILITIES OF FARMERS AND FISHER FOLKS

source: PRA sessions

VULNERABILITY FACTORS OF FARMERS

Most Vulnerable Months:
Experienced Food Shortage
(PRA Sessions)



**Months of
shortage**

**Average Number
of days**

January

12

February

10

October

6

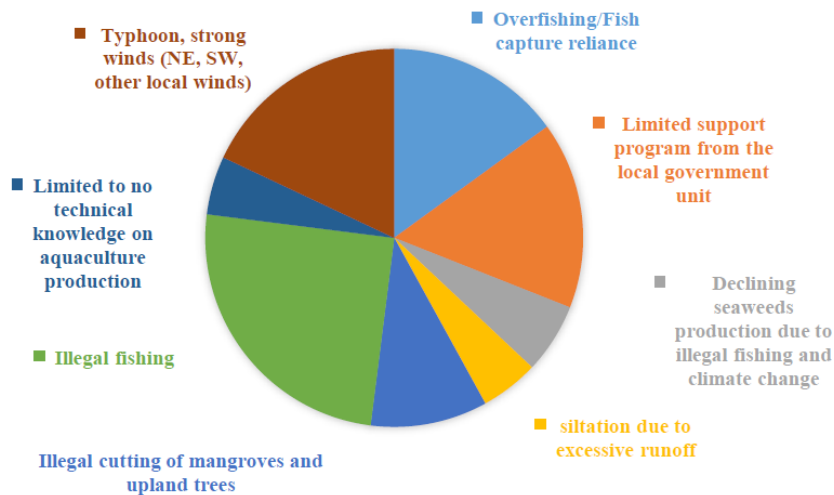
November

9

December

10

VULNERABILITY FACTORS OF FISHER FOLKS



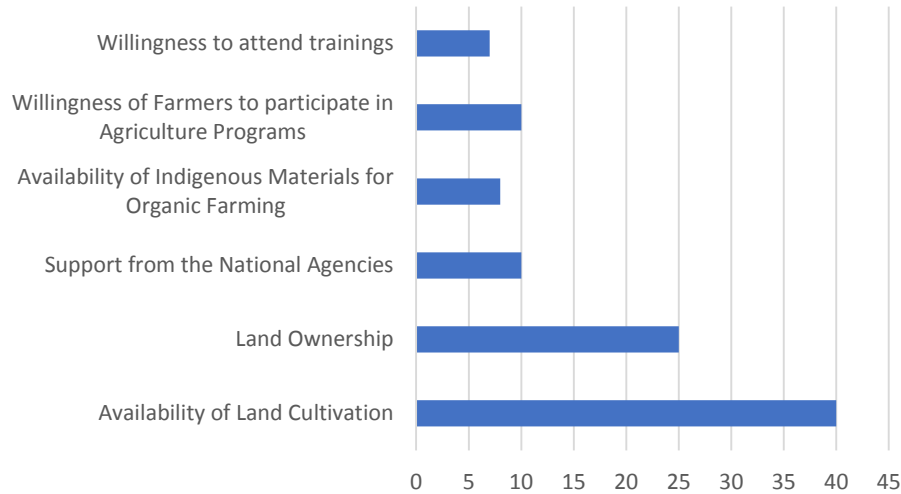
Most Vulnerable Months: Constituents Experienced Food Shortage (PRA Sessions)

Months of shortage	Average Number of days
January	12
February	10
October	6
November	9
December	10

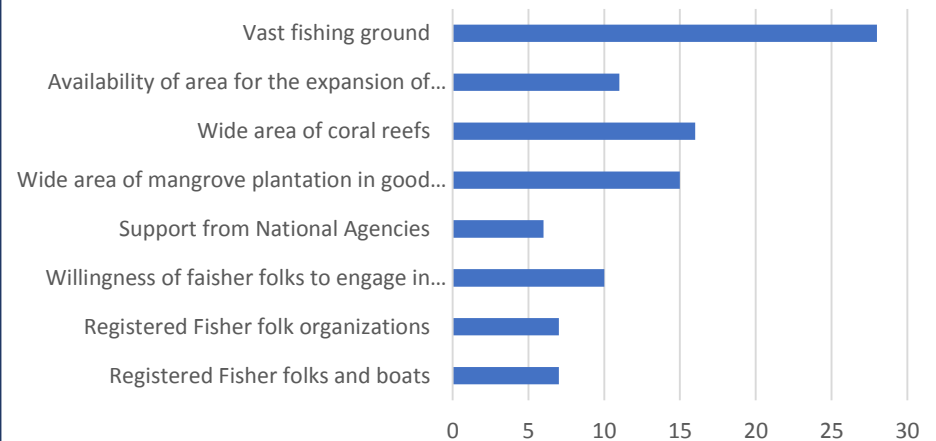
THE STRENGTHS AND CAPACITIES OF FARMERS AND FISHER FOLKS

Source: PRA session

Strengths and Capacities of Farmers



Strengths and Capacities of Fisher folks



ADAPTATION AND COPING MECHANISMS OF FARMERS AND FISHER FOLKS, source: PRA sessions

Communities' Perception Change	Experienced Impacts on Livelihood Systems	Coping and Adaptation Mechanisms
Decrease in rainfall Longer dry spells (drought)	Overall decline in agricultural productivity	Planting of crops that do not need more water, like shifting from rainfed to upland rice , planting of root crops, delaying the planting of rice and vegetable; Planting of early maturing rice variety.
	Drying up of creeks and springs, Rice lands are cracked	If vegetable are already planted, farmers water it manually morning and afternoon, then covering or mulching with indigenous materials like leaves of coconut to give shelter.
	Land become less productive	No planting of rice, vegetables and corn; Buying of foods; switching to other means of livelihood, i.e. fishing, buying and selling
Extreme weather events/ Intense/excessive Rainfall	Damage in new planted crops i.e, vegetable, due to the strong impact of raindrops that affects growth during vegetative stage; Totally damage rice/veg crops due to flood/flash flood; Very low to no yield No income	Construction of temporary drainage canal; Mulching for vegetable production; Switching to other livelihood
	Mortality in seaweeds and corals due to siltation and acidification. Decrease of marine species in mangrove areas; Death of corals affected by acidification due to excessive runoff passing through the fishponds that carry out toxic wastes to the coral reefs;	Seaweeds farms are transferred outside the barangay vicinity, far from the shoreline where sediments cannot affect the growth of seaweeds Fishing outside the vicinity of Barangay or in the open sea
Sea level rise	Damage in rice establish near the seashores due to saltwater intrusion; Decaying of plant, resulting to death. Very low yield.	Relocation of farms; no farming in months when farmers usually experienced salt water intrusion in the farm.
Attack of pests and diseases during extreme climate events especially drought period	Loss/Decrease production in rice, corn and vegetable	Application of traditional methods to avoid the attack of pests in crops; Spraying of insecticides and pesticides;

On-going Projects for Agriculture and Fishery (2014-2016)

Plans/Programs/Activities	Date of Implementation	Amount	Source of Fund
Establishment of Marines Reserve and Fish Sanctuaries	Dec 2015 - onward	2,400,000.00	BUB-BFAR
Sustainable Livelihood Project of DSWD	2015 - onward	4,000,000.00	BUB-DSWDO
Promotion and Development of Organic Agriculture	2014 - onward	2,000,000.00	BUB-DA
Establishment of Agro-Processing Facility and other agribusiness activities	2015 - onward	4,000,000.00	BUB-DA
DAR Climate Change Proofing Project on Agriculture	2016 - onward	1,000,000.00	DAR

Source: Municipal Planning and Development Office and Municipal Agriculture Office

FINDINGS AND RECOMMENDATIONS

FINDINGS

Very vulnerable to Natural Hazards and Climate Risk due to its Geographical Location, intensified by the current socioeconomic condition and poor local governance in DRR and CCA focusing farming and fishing;

Poor local governance: The LGU is very dependent to the Programs of National Agencies, No self supporting and funding initiative for DRR and CCA programs; DRRM and CCA in agriculture and fishery sector is of low priority in the local government unit's policy and planning, this includes: Limited to no intervention for DRR for Farming and Fishing, Poor capacity of LGU staff in DRR and CCA, No rehabilitation program, Less importance given to DRR and CCA Technical issues, No early warning system and weather forecasting, No hazard mapping, Poor or no loan facilities, No disaster preparedness plan, Poor knowledge dissemination for DRR and CCA issues; Negligible alternative livelihood resource; Poor coordination; Poor knowledge dissemination for DRR and CCA issues.

Lacking of Climate and Disaster Risk Assessment (CDRA) and Hazard, Risk, Vulnerability and Capacity Assessment (HRVCA);

Lacking of Local Climate Change Adaptation Plan

CLUP is not updated since 2005;

The results during the FGD about the communities experiences on sea level rise and the months with dry and wet conform with the scientific data about the sea level rise and the local temperature and rainfall.

RECOMMENDATIONS

Include DRR and CCA in the priority agenda of the LCE; Mainstream, institutionalize and integrate the concepts of DRR and CCA in the comprehensive Development Plan consisting of Legislative and Executive Agenda (CDP-ELA) and Comprehensive Land Use Plan (CLUP);

Incorporate and mainstream the 6 to 10-Year Development Plan for Climate Change Adaptation and Disaster Risk Reduction and Management for Farming and Fishing (2018-2028), formulated in this study, in the Local Development Plan and Comprehensive Development Plan of the LGU;

Follow the recommendation per priority area in DRR and CCA in agriculture and fishery based from the results of this study;

Conduct CDRA and HRVCA as much as possible conduct disaster resiliency detailed assessment anchored in the 10 essentials in making cities/municipalities resilient to disasters

**Formulate LCCAP based from CDRA;
UPDATE Contingency Plan based from HRVCA;**

Update CLUP and mainstream LCCAP and DRRM in agriculture and fishery

The municipality should focus implementing disaster preparedness plan during the vulnerable months to lessen the adverse impacts of natural hazards and climate change risks.

Sample Plans/Programs/Activities for Climate Change Adaptation and Mitigation in Agriculture (2018-2028)

Goal	Indicators		Means Of Verification		Assumptions/ Risks		
A climate change resilient, food secure, productive farming communities by 2020	Reduced poverty among the farming sector of Garchitorena		MAO and MNAO reports and surveys		Demand and sufficiency level for agriculture production in Garchitorena		
	Attained self-sufficiency level of 100% and is able to supply the food requirement of Garchitorena						
	Increased capacity of farming communities in disaster risk reduction and climate change adaptation and mitigation				Agriculture and development and DRR in agriculture becomes one of the priorities of LCEs		
Outcomes							
Increased men and women’s farmers productivity	Increased household income above poverty level of by 2020 or 5% increase in income per year		Data and documentations of LGU-MAO		No land conversion		
	Increased average yield from 2.5 MT to 3.5-5 MT/ha by 2020 in rice production		Farmers feed backs		Rice areas the same or increase		
Established sustainable farming systems that are adapted to existing and future agro-climatic situations through organic farming, crop/livestock integration and diversification, Upland Rice Development Program	80% of farmers are practicing integrated farming systems and value adding activities Chemical farming reduced to 50% Increased adoption by 40% of sustainable climate proof agricultural technologies Established organic fertilizer and biopesticides (vermicomposting, vermitea, foliar) production centers in major rice producing barangays by 2020		Data and documentation of LGU-MAO		Willingness of farmers		
			Publications				
			Site validation				
Expected Impact/Outcome		Indicator		Data Source	Responsible Person/ Agency		Frequency of M & E
Key Activities	Expected Output	Time Frame And Targets (Fy 2018-2020)	Resource Requirements			Budgetary Requirements/ Source	
			Man Power	Supplies/ Materials	Machine/ Equipments	Lgu	Da/Ati

RECOMMENDATIONS FOR FUTURE RESEARCHES

- ✓ Conduct related study considering the remaining 20 barangays to acquire more accurate data;
- ✓ Conduct Disaster Risk Assessment (CDRA);
- ✓ Conduct disaster resiliency detailed level assessment anchored on the 10 essentials in making cities/municipalities resilient to disasters;
- ✓ Conduct geographical hazard mapping, GIS mapping for agriculture and fishery sector which must be incorporated in the contingency plan;
- ✓ Systems Approach: Ridge to reef ecosystem and management;
- ✓ Conduct Participatory Fishery and Coastal Resource Management Assessment in the municipality that has an implication with the climate change impact;
- ✓ Landscape and seascape ecology;
- ✓ The impact of climate change on agriculture and fishery productivity;
- ✓ Localized good practice options in agriculture and fishery adaptable to the changing climatic condition;

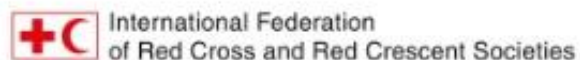
ULTIMATELY

A MEETING WITH THE LOCAL CHIEF EXECUTIVE TOGETHER WITH THE STAKEHOLDERS MUST BE ORGANIZED TO PRESENT AND DISCUSS THE FINDINGS AND RECOMMENDATIONS COLLECTED IN THIS STUDY.

INITIATE, PLAN, ACT TOWARD
RESILIENT AND **CLIMATE SMART** COMMUNITIES!

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