UN-HABITAT

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PARTICIPATORY CLIMATE CHANGE ASSESSMENTS

A toolkit based on the Experience of Sorsogon City, Philippines


2010

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Acknowledgements

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Participatory Climate Change Assessments – *A toolkit based on the Sorsogon City experience*

I. Introduction

This toolkit was developed to be a guide and reference for local governments and other stakeholders for conducting climate change vulnerability and adaptation assessments. In conjunction with a climate footprint assessments (or greenhouse gas inventories) Vulnerability and adaptation assessments are a critical first step in developing the local climate change profile, which would guide the development of a local climate change response.

This toolkit aims to share the processes and tools that local governments could use in conducting a climate change assessment. It is based on the experience from Sorsogon City, Philippines where such an assessment was concluded in early 2010. The purpose of featuring the first-hand experience from a local government is to showcase the doability of the processes and to showcase the tools used. The approach is premised on the understanding that local governments better learn from each other. As such, this toolkit was developed with the aim to:

- Provide users with a better understanding of what climate change assessments are.
- Introduce users to the basic steps of conducting a participatory climate change assessment with guidance, tools, and references for each step
- Share processes followed in Sorsogon City which were developed to estimate local area vulnerability to potential climate change impacts
- Provide the context for local government decision makers to develop local climate change adaptation and mitigation plans as a response to the climate change assessment results

Whilst environmental and vulnerability assessments are not new to cities, the team conducting the climate change assessment in Sorsogon decided to share its experiences as no ready-made tools proved suitable for a relatively small city with limited resources and a limited understanding of the risks associated with Climate Change.

This document can be used by those who are not technically adept in climate science. The toolkit shares the tools and processes in a manner and language that we hope would be easily understood by a wide audience. It is designed to be simple and readable, introducing the basic climate change science and concepts required along the way. The actual Vulnerability Assessment and related documents can be accessed on the website of the UN-HABITAT office in the Philippines (http://www.unhabitat.org.ph/climate-change).

II. Climate Change Assessment Framework

A. Understanding the context and concepts

It is important for local governments and their stakeholders to have a basic understanding of climate change and its related concepts of adaptation and mitigation. Though the term "climate change" may not be new to most local governments, some local authorities still regard climate change issues to be a mainly global and national concern which only requires minimal action from local authorities. While it is true that climate change is global in nature, the reality is that addressing climate change highly requires "local actions". This is because human activities that principally cause the change in climate occur and are managed at the local level. What is more, impacts of climate change are experienced directly at the local level affecting people's lives, their livelihoods and lifelines. It is local action therefore that is called for to protect them as climate change effects may alter or aggravate existing local socio-economic conditions.

While the response to Climate Change is dominant at national and international level – it is equally important that local leaders work on local actions in order to protect their constituencies, safeguard their investments/resource base, and ensure their sustainable development. The call for local action is critically urgent especially because climate change is upon us and its impacts are being experienced now. 1,200 mayors and city leaders descended on Copenhagen in December 2009 for the international climate change negotiations. Whilst no binding agreement was achieved and the greenhouse gas emission reduction targets presented by the countries are far below the requirements to stabilize the climate, the mayors and local government leaders have impressed on the national negotiating teams the need for local action and have reconfirmed their willingness to act locally.

To start with, users of this toolkit are introduced below to some definition of terms and concepts which are significant not only in conducting the climate change assessment but also in developing local climate change action plans.

- ***Climate Change*** refers to any change in climate over time, whether due to natural variability or because of human activity.

- ***Anthropogenic Climate Change*** is the component of climate change that is caused by humans. Scientists are certain that ***Global Warming*** has started and that the warming of the planet will be faster than at any time in the last several hundred thousand years which will cause major disturbances in ocean currents, weather and ecosystems.

- ***Vulnerability*** is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity[1]

[1] www.ipcc.ch/pub/syrgloss.pdf

- ***Adaptation*** adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm of exploits beneficial opportunities" (Third Assessment Report, Working Group II)

- ***Mitigation*** involves taking actions to reduce greenhouse gas emissions and to enhance carbon sinks aimed at reducing the extent of global warming

- ***Greenhouse gases (GHG)*** are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds. This property causes the greenhouse effect. Water vapour (H2O), carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4) and ozone (O3) are the primary greenhouse gases in the earth's atmosphere. The global negotiations to reduce greenhouse gases focus on a number of gases that are caused by human activity. The United Nations Framework Convention on Climate Change (UNFCCC) focuses on the following gases: CO2 (the most prominent anthropogenic greenhouse gas), CH4, N2O as well as three groups of other GHG which are very powerful but may play a less prominent role in the discussions at the local government level (PFCs, HFCs and SF6). The Montreal Protocol (to protect the atmospheric ozone layer) regulates the phasing out of two additional groups of GHG (CFCs, HFCs) which are therefore not covered by the UNFCCC.

B. The Vulnerability and Adaptation Assessment Framework

Following the above definitions, the climate change assessment for Sorsogon City worked on vulnerability being a function of three factors namely: Exposure, Sensitivity, and Adaptive Capacity.

The assessment looked into these three factors given that vulnerability to climate change impacts increases with exposure and sensitivity but could be off-set by higher adaptive capacity (*Figure 1*).

For example, the **exposure** to increased precipitation coupled with an area's defined sensitivity such as poor drainage system and informal structures built in waterways would increase the risks to area flooding. However, the availability of resources to support improvement of the drainage system and an adequate settlement/shelter plan to respond to the needs of the informal settlers are indications of "adaptive capacity". Summing these factors up, vulnerability of the area relative to projected precipitation increase is not as high

Key Concepts

Exposure is what is at risk from climate change (e.g. population, resources, property) and the change in climate itself (e.g. sea level rise, temperature, precipitation, extreme events).

Sensitivity is the biophysical effect (e.g. flooding, strong winds, land inundation, etc) of climate change which also considers the socioeconomic context of the system being assessed

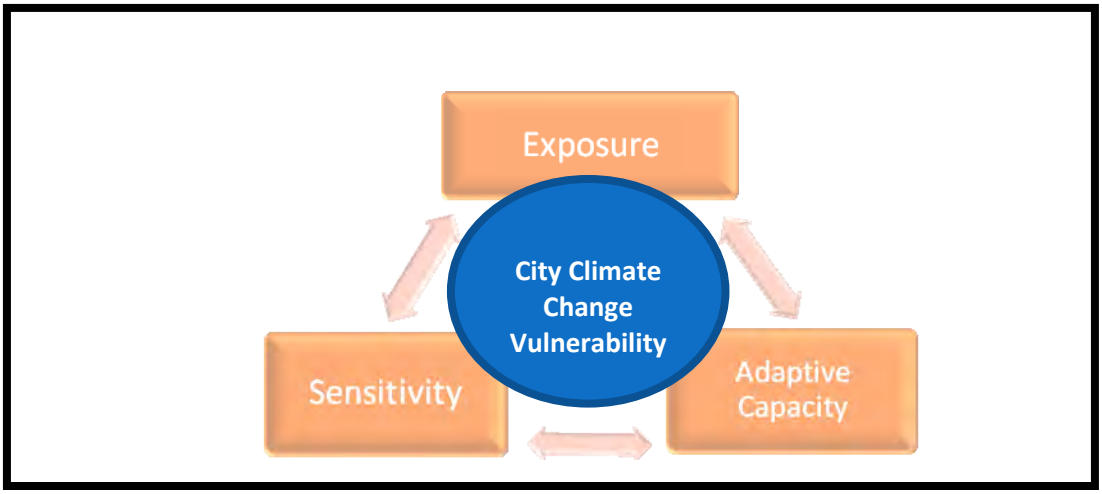
Adaptive Capacity is the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. The IPCC Third Assessment Report outlines that it is a function of wealth, technology, institutions, information, infrastructure, "social capital".

considering that there are means to adjust to the climate change impact; although action is still required because if the existing adaptive capacity is not applied or used, then the area is susceptible to negative impacts that may result to disasters.

Looking into vulnerability factors requires inputs from a variety of stakeholders. Stakeholder involvement in the whole assessment process is essential[2]. Involving a significant segment of the society right from the beginning of the assessment stage facilitates not only the gathering of more detailed information that may not be available from the local government, but also helps in interpreting data and information as it relates to the unique experiences of different segments of the society. The participatory nature of the climate change assessment is expected to bring about broad-based decision making that increases the ability of local governments to mobilize effective local actions.

As said**, the purpose of the climate change assessment** is to provide local government decision makers and community leaders with information relevant in defining their adaptation priorities and plans. The climate change assessment will also provide guidance in identifying where and what critical actions are needed to effectively manage the un-avoidable impacts of climate change.

Figure 1: Assessment Framework



Vulnerability = f (Exposure, Sensitivity, Adaptive Capacity)

[2] UN-HABITAT Sustainable Cities Programme Toolkit Volume 1-4

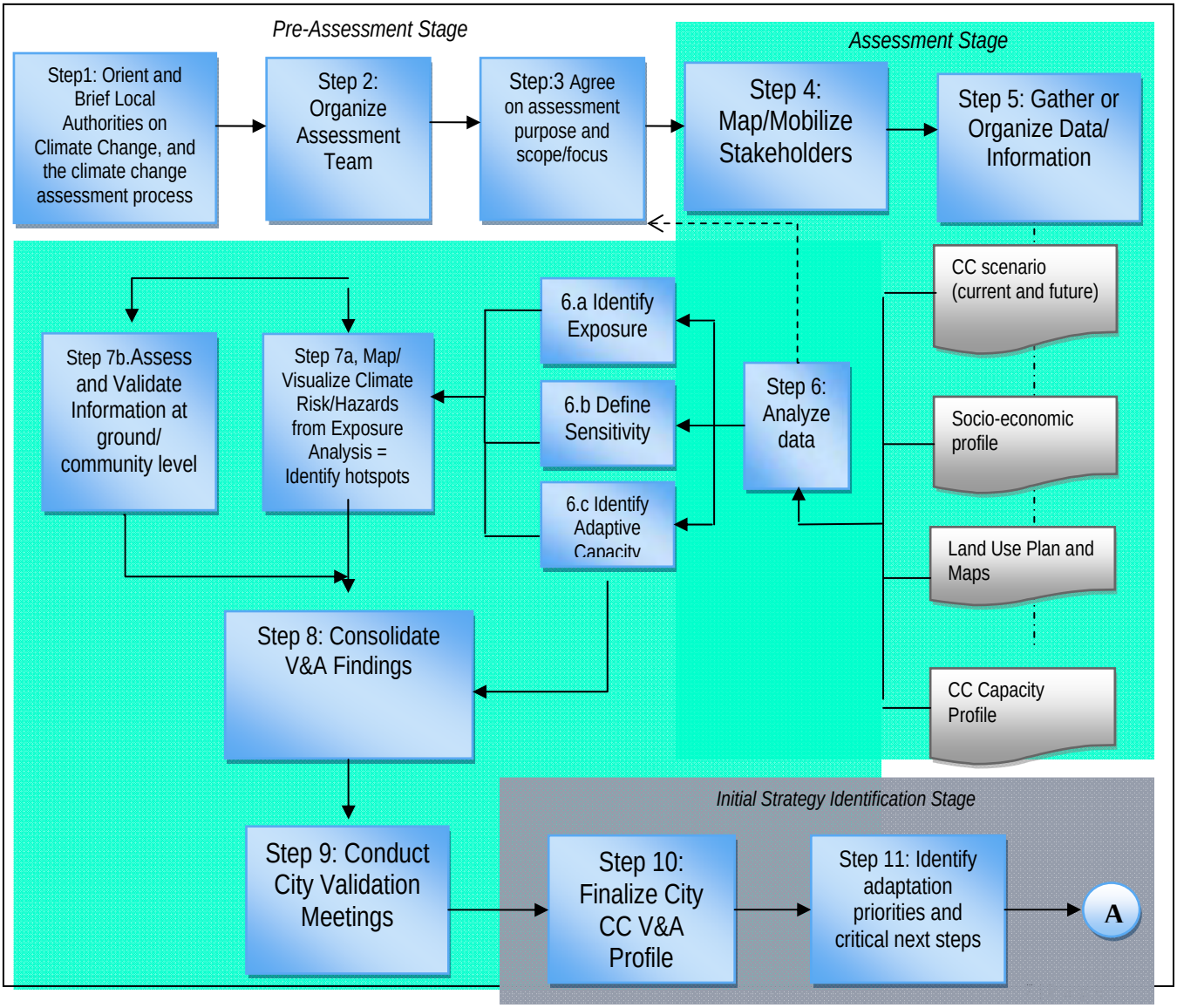
III. Process-based toolkit

A. Over-all Process Flow

This part introduces the entire process flow of the climate change assessment based on the experience of Sorsogon City. It is recognized that local governments are not new to assessment processes and so this section merely aims to aid in showing at a glance what the whole climate change assessment process would entail and therefore immediately address the common local concern on "where and how to start the climate change assessment".

Figure 2 presents the over-all process flow up to the point where it links to adaptation planning. Note that the illustration has colored background per stage which shows the activities entailed in each one.

Figure 2: Over-all Process Flow

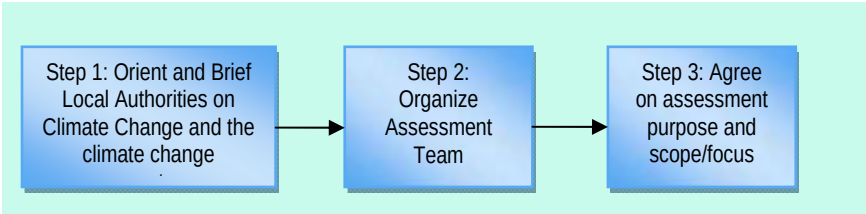


Users must note likewise that though the illustration is presented sequentially, there are activities in the various steps that could be done simultaneously or iteratively depending on data availability and the assessment team's composition and competence.

B. Assessment Stages and Specific Activities

The climate change assessment process has three stages consisting of several steps critical in establishing the climate change profile as basis of developing a local climate change plan. Below is the discussion of the stages and relevant activities involved for each.

B. 1. The Pre-Assessment Stage



This is an important stage because it is here when local ownership and acceptance of the role of the stakeholders (especially the local government unit[3]) not only in the climate change assessment but also in developing/implementing local response actions, must be clearly established. Activities should prepare the whole assessment process while building awareness and reinforcing local understanding of general Climate Change issues.

Step 1: Orient and Brief Local Authorities on Climate Change

Purpose:

Whether it is an external facilitator or the local government itself (city manager or the planning, environment, or other department officer) initiating the climate change assessment process, it is critical to conduct a climate change orientation/briefing for the Mayor and/or other decision makers of the local government prior to the assessment. The goals of this step are:

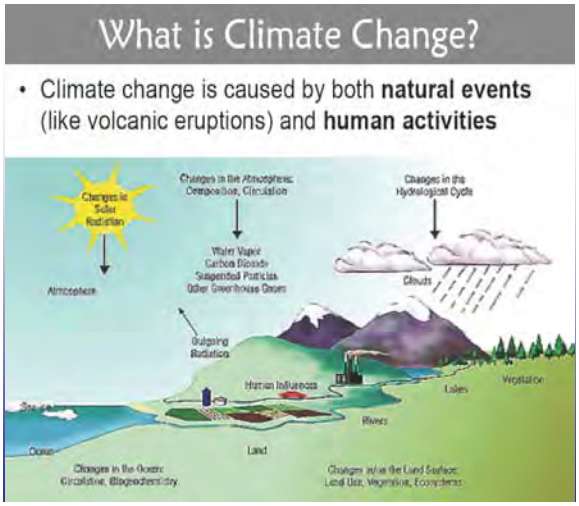
a. for local leaders to be more informed and have a better understanding of the relevance and importance of climate change to the city's sustainable development
b. to establish a common understanding and agreement on the importance of conducting a participatory climate change assessment
c. to get the support and commitment of the Mayor and other local government decision makers for conducting the climate change assessment.

[3] LGUs in the Philippines are the Provinces, the cities or municipalities and the Barangay (villages or wards).

Key points to be shared/discussed:

- ✓ Basic definition of terms
- ✓ The relationship of sustainable development and climate change
- ✓ Projected global/regional/national climate change impacts (whichever is available)
- ✓ The critical role of local governments in climate change adaptation and mitigation
- ✓ Opportunities for local adaptation and mitigation action: examples from what other cities have been doing
- ✓ Support organizations/institutions that could be tapped by local governments
- ✓ The need for a local climate change assessment and what the process would entail

Figure 3



Some pointers:

In the instance that it is an external entity or group (e.g. Training or Research Institute) conducting the climate change assessment, a courtesy call with the Mayor and other officials prior to the actual CC briefing could be done first if it is so required. In delivering the orientation and briefing for Mayors and other local leaders, it would be useful to present illustrations or pictures to share the general concept of climate change. Without compromising the science, it is critical to use language and terms that could be easily understood by the decision makers. Experts could be invited to deliver the briefing. Use of existing Climate change introductory video is also an option. The briefing must be concise and interactive. Some illustrations used in Sorsogon City are presented in Figures 3-5 which were sourced from the KLIMA Climate Change Center *(www. klima.ph)* .

Figure 5

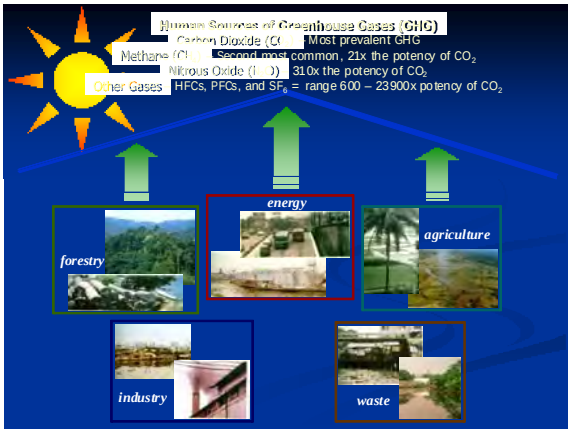
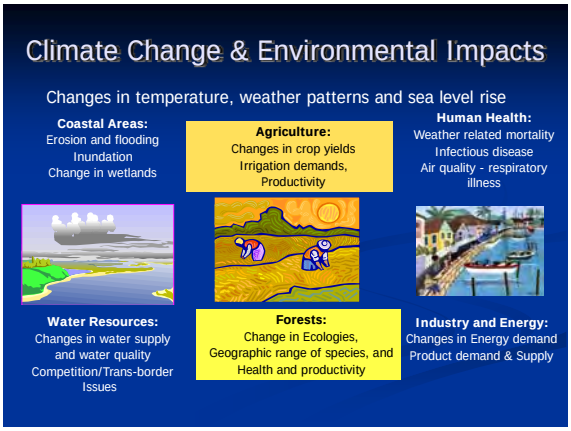


Figure 4



At the end of Step 1, a Memorandum of Agreement or any other form of partnership contract should be arrived at and signed to seal the partnerships and commitment in the conduct of the climate change assessment if it is an external group/institution that is tasked to lead the process.

Step 2: Organize Assessment Team

With the support and commitment of the Mayor and other local government decision makers in conducting the climate change assessment from Step 1, it would then be critical to organize the LGU core climate change assessment team.

Purpose:

The core assessment team that should mainly be composed of technical staff of the local government unit is expected to ascertain efficiency and effectiveness of the process. Having the LGU core team would also ensure local ownership and institutional anchoring. LGU staff's familiarity with reporting channels, procedures, and roles and responsibilities of the local offices would be vital inputs to the process. The composition of the team should however be complemented by additional members from partners such as international development organization, academic/research institutions, and non-government organizations who can provide the needed expertise or knowledge necessary in the process.

Some reminders and tips:

- ✓ The core team should be committed to the assessment process
- ✓ It is ideal to have an interdisciplinary assessment team composed of members with experience and exposure in the areas of: local development planning and /management, socio-economic research, disaster management, engineering and climate science.
- ✓ The team members should maintain an open mind to see opportunities, needs and gaps
- ✓ Team members should be sensitive to political, cultural, and gender contexts
- ✓ Team members should possess good communication and analytical skills

At the end of Steps 1 & 2 it is important to have gained...

- *An MoA amongst climate change assessment partners (if needed)*
- Official marching orders through an Executive Order (EO) supported by the City Council, affirming the local government commitment to conduct the climate change vulnerability assessment. The EO should also direct and already appoint the members of the core assessment team.
- An Office Order directing local government offices or officers to cooperate, support, and provide necessary inputs to the assessment

Republic of the Philippines
Province of Sorsogon
City of Sorsogon
OFFICE OF THE CITY MAYOR

OFFICE ORDER No. 011 – 2009 - ADM

TO : ALL CONCERNED
FROM : THE CITY MAYOR
SUBJECT : DESIGNATION OF PROJECT COORDINATOR, ASSISTANT PROJECT COORDINATOR, MEMBERS OF THE TWG AND SECRETARIAT ON CLIMATE CHANGE
DATE : JULY 1, 2009
CC : CAdmin
CHRMO

In compliance with Executive Order No. 14 creating the Sorsogon City Technical Working Group on Climate Change, its composition and functions, the following are herby designated as Project Coordinator, Assistant Project Coordinator, members of the Technical Working Group and Secretariat, in addition to their regular functions and duties. The heads and representatives of the departments/sections are designated as follows:

Project Coordinator : Honore Jordan
Asst. Project Coordinator : Ma. Cristina Laban
TWG Members :

OFFICE	MEMBER	PERMANENT ALTERNATE MEMBER
CPDO	Raul Jaimanzar	John Jason Palma
CENRO	Rolando Gerona	Bim Dineros
CEO	Regina Derilo	Ma. Editha C. Cornel
CSWDO	Ma Esha	Rica Villanueva
CAO	Adeline Defero	Madelina Fernando
CAssO	Antonio Venturero	Jaime Pura
CPIO	Manny Doep	Divine Grace Diesta
BAFAS	Ma. Elibeth Alindogan	Ferdinand Marbella
CHO	Larry Garrido	Ruel Rebustillo
CLO	Glenn Olbes	Ron Espinosa
CDCC	Irenieo Maragols	

Secretariat :
1. Orlando Huenda
2. John Jason Palma
3. Ma Victoria Pilapil
4. Michelle Bausa

As members of the TWG and Secretariat, you shall perform the task provided in the Executive Order.
For compliance and guidance.

LEOVIC R. DESPEDA
City Mayor

New City Hall, Barangay Balud-an
East District, Sorsogon City
Telefax No. (056) 211-1995

Step 3: Agree on assessment purpose and scope/focus

Once the assessment team has been organized and there is clear support from the local government leaders, the next step would be to agree on the purpose and scope of the climate change assessment. This is essential before proceeding with the climate change assessment considering the complexities of climate change impacts.

Asking the right questions at the beginning will help define the boundaries of the assessment and in determining the methods and approaches needed. The climate change assessment should be geared towards contributing to informed decision-making considering climate change impacts. A comprehensive climate change assessment should take into consideration exposure, sensitivity and adaptive capacity in all its dimensions. In addition, the local government could tailor the climate change assessment (through structured activities) to serve the purpose of raising awareness, building partnerships, mobilizing resource sharing for adaptation, etc.

To decide on the scope of the climate change assessment, the assessment team and local government could use the following as guiding questions/considerations:

1. What are the key development assets and issues of the city and what does the LGU want to get out of the climate change assessment in relation to these assets and issues?
2. Where should the focus of the assessment be? Should the assessment focus on the city as a whole, on specific population groups, on specific locations, on the economy or on specific sectors, etc
3. What resources are available to be used for the assessment?
4. How far into the future should the assessment look into? Are there available climate change models that could be used?
5. Which part of the local governance structure is critical to be assessed- the whole system or only specific groups?

Purpose:

The first two questions will define areas to be covered by the assessment based on the priorities of the local government. These however are tied to the third question on the resources available to support the assessment. Resources to be determined should include funding, time, and expertise available.

On the fourth question, the assessment team should note that, *although climate change models are key tools in the assessment process, they should be viewed as inputs to the process and not ends in themselves. Climate models are systems of differential equations based on the basic laws of physics, fluid motion, and chemistry. Models are necessary to the extent that they help provide useful information. As pointed out, even the best Climate Change model that is sufficiently localized for the geographic area of the city answers only limited questions with regard to the Climate Change exposure. Further quoting the UNFCCC V&A handbook, "the most important thing to keep in mind in conducting an assessment of vulnerability and adaptation is that the assessment is meant to serve the needs of those asking questions, such as stakeholders, not the needs of the analyst. The assessment must be designed to provide information useful to stakeholders to understand vulnerability to climate change and adaptation options. The*

assessment therefore should begin by identifying the questions stakeholders would like to have a vulnerability and adaptation assessment answer"[4].

The last question on the other hand looks into the sphere of governance, viewed to be the prime mover for local actions. This is critical to be asked right at the onset especially if LGU is concerned with developing their local capacity to address issues determined in the climate change assessment.

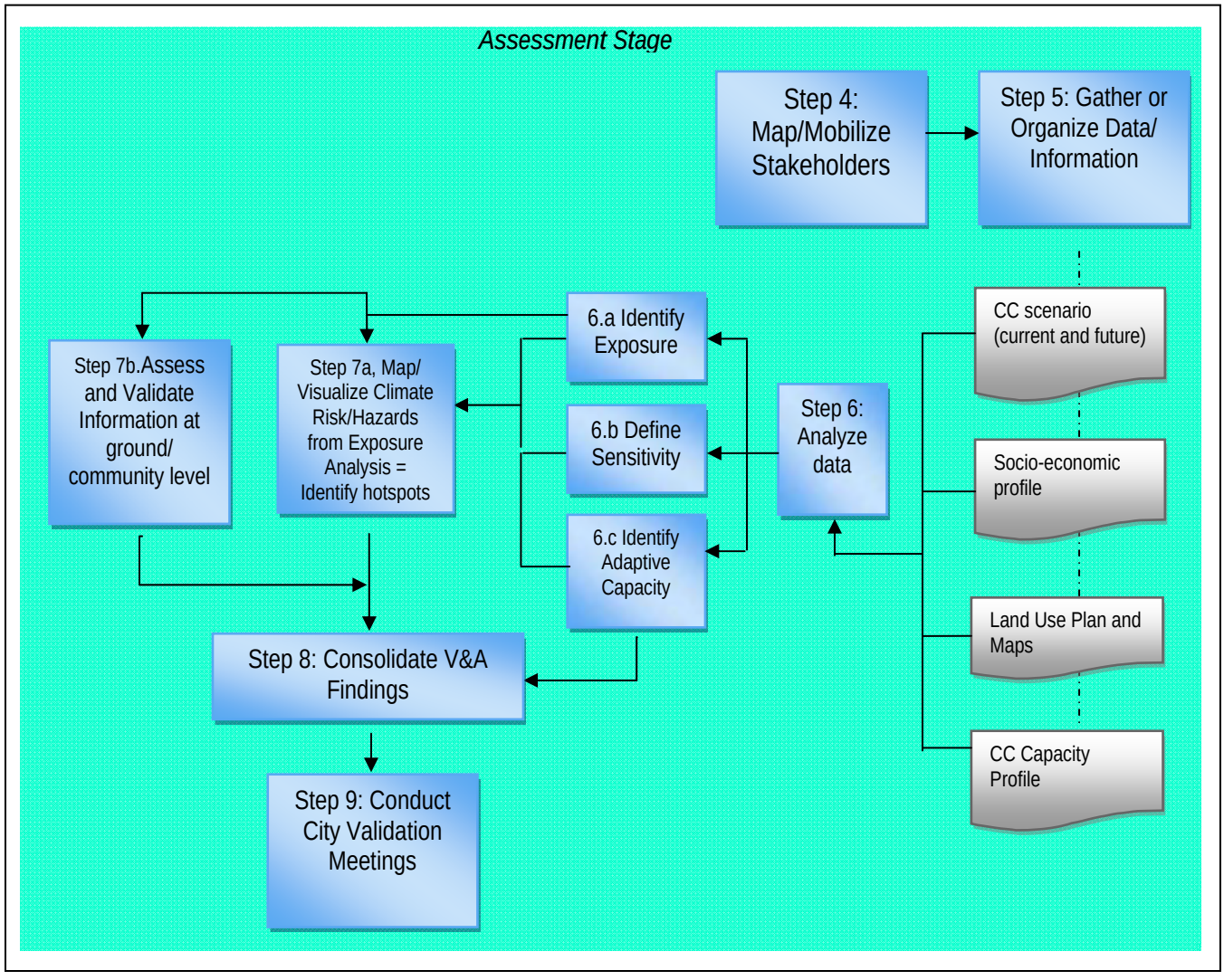
The Sorsogon City climate change assessment focused on determining:

- *What Climate Change impacts are foreseen in the city based on (previous events and future projections)?*
- *Who will be affected by the Climate Change impacts? Who are the vulnerable groups? Where are they?*
- *Where are the Climate Hotspots that, if affected, would impede the city development in general?*
- *What are the adaptation constraints in the hotspots (social and physical)?*
- *What are the current capacities in the identified hotpots and the city in general that could facilitate adaptation to climate change?*

[4] UNFCCC Vulnerability and Adaptation Handbook Chapter 1 http://unfccc.int/resource/cd_roms/na1/v_and_a/index.htm

B. 2. The Assessment Stage

This is now the stage when actual analysis will start. It begins with mapping the stakeholders who may have a critical role to play in the city's climate change response. They will have to be mobilized to participate in the climate change assessment process. While pursuing activities for this stage, it is important to keep in mind the purpose of the climate change assessment as agreed in Step 3. Given the complexities of climate change impacts and the climate science itself, there is a possibility to be overwhelmed by information that could unnecessarily complicate the assessment. It is therefore important to remain focused on the purpose and information needed and maintain the analysis at a level that could be understood by local officials, planners, and stakeholders.



Step 4: Map and /Mobilize Stakeholders

The term "stakeholder" refers to people, groups, organizations who have significant and legitimate interest in a specific issue. Mobilizing stakeholders is a key element to improved governance as it builds local ownership and commitment to development activities and processes. In the context of the climate change assessment, mobilization of stakeholders is crucial not only in gathering information but also in building consensus and conclusions.

Stakeholder mapping is a process that would ensure:

- inclusion of all relevant stakeholders in assessing, programming, planning and implementation of desired actions relative to an issue
- Maximization of the role and contribution of each stakeholder

Key steps in stakeholder analysis/mapping

- ✓ Issue identification (in this case the purpose and focus of the assessment)
- ✓ Long listing of stakeholders (column 1 in Figure 6)
- ✓ Mapping degree of stakes and influence (initial assessment could be perceptive) (columns 2 to 3 in Figure 6)
- ✓ Key Informant Interviews or Structured interviews
- ✓ Assessing Influence, Interest, Capacity (see matrix in Figure 7)

Why is mapping of stakeholders during the preparatory stage important...

Climate change impacts would be cross-cutting and complex as substantiated by the IPCC reports, the most recent being the Fourth Assessment Report (IPCC-AR4). The assessment team therefore needs to seek and interact with potential stakeholders because their early involvement and commitment to the process will be crucial to the success of the climate change assessment. Over the long term- the identification of practical solutions to the identified local climate change vulnerability and the delivery and implementation of response actions will be enhanced and generate momentum to act so plans are actually implemented.

Figure 6

Mapping of Stakes and Influence

	Low Influence	High Influence
Low Stake	*(least priority)*	*(useful for decision making and opinion formulation)*
High Stake	*(important stakeholder groups perhaps in need of empowerment*	*(most critical stakeholder group)*

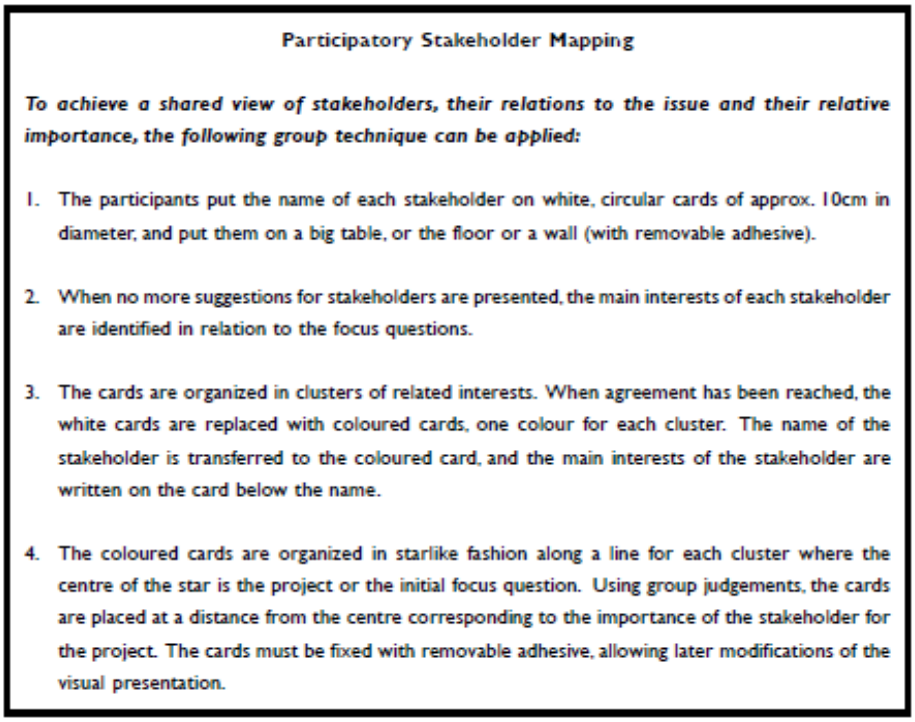
Figure 7

Assessment Summary

WHO?	INFLUENCE	INTEREST	CAPACITY
PUBLIC 1. 2. 3.			
Private 1. 2. 3.			
Civil Society & Academe 1. 2.			

Rate 1- 3 where 1 is low, 2 is medium, 3 is High

Figure 8



Participatory Stakeholder Mapping

To achieve a shared view of stakeholders, their relations to the issue and their relative importance, the following group technique can be applied:

1. The participants put the name of each stakeholder on white, circular cards of approx. 10cm in diameter, and put them on a big table, or the floor or a wall (with removable adhesive).

2. When no more suggestions for stakeholders are presented, the main interests of each stakeholder are identified in relation to the focus questions.

3. The cards are organized in clusters of related interests. When agreement has been reached, the white cards are replaced with coloured cards, one colour for each cluster. The name of the stakeholder is transferred to the coloured card, and the main interests of the stakeholder are written on the card below the name.

4. The coloured cards are organized in starlike fashion along a line for each cluster where the centre of the star is the project or the initial focus question. Using group judgements, the cards are placed at a distance from the centre corresponding to the importance of the stakeholder for the project. The cards must be fixed with removable adhesive, allowing later modifications of the visual presentation.

References: UN-Habitat Participatory Urban Governance toolkit; UN-Habitat SCP toolkit

This climate change assessment toolkit builds on the UN-Habitat Sustainable Cities Programme (SCP) which promotes a participatory process based on the following characteristics and principles:

- central focus on development-environment interactions
- broad-based participation from public, private and community sectors
- concern for inter-sectoral and inter-organisational aspects
- reliance on bottom-up and demand-led responses
- focus on process - on problem-solving and getting things done
- emphasis on local capacity-building

Mapping of Stakes and Influence

	Low Influence	High Influence
Low Stake	DPWH, DOH, Red Cross, Rotary, SBA, SCC, COPE, NGO Health Orgs.,	Congressman, Senator, PAG-ASA, DOE, DILG, BFP, PNP, DSWD, DND, LCP, UN Habitat, MARINA, Coast Guard, CHURCH, Media, Office of the President,
High Stake	Residents, EDC, DENR (EMB, MGB, LMS, Forestry), HUDCC, HLURB,NHA, PAG-IBIG, SCWD, SORECO II, DA, BFAR, DOST, TRANSCO, NEDA, Urban Poor Organization, SSAFI, City Tourism Council,	City Government, Provincial Government, Barangay, DepEd, CHED, TESDA, NDCC, PDCC, CDCC, PANGOPOD, FARMC, PAFC, Telecommunication Companies,

Sorsogon City Stakeholder Assessment:

A mini-workshop on Stakeholder Assessment was conducted with the Technical Working Group (TWG). Members of the TWG were oriented on the key steps in doing stakeholder analysis. They thereafter mapped the degree of stakes and influence of the organizations/groups identified in their long list of stakeholders. Presented at the left is the initial result matrix from Sorsogon City.

Step 5: Gather Data /Information

The assessment team should gather and organize the information needed from various local government departments or offices. Note, however, that some information may not be available from the LGU but may be available elsewhere. Thus, linking and networking with other stakeholders operating locally (or even nationally) is crucial. Moreover, vital information will have to be sourced from the communities themselves thus it is important for the assessment team to conduct community consultations through Focus Group Discussions (FGD).

The table below presents the checklist of basic data requirements that must be organized to support the data collection and analysis.

Assessment Factor	Key Data Needed	Purpose	Possible Source/s
Climate Change Exposure (current and future)	a. Climate data (e.g. cyclones, droughts, flooding events)	- Show trends, and possibly indicate how CC is manifesting locally	- Nat'l/Local Observations
	b. Climate scenario/projections (local/ national/ global	- Show as adequately as possible what can be expected at the locality over the next 10, 30, 50 years or by end of century	- IPCC Global Projections; Regional Projections; National CC communications
	c. Impact reports previous disasters	- Validate exposure to threats of CC bio-physical effects	- City Reports - FGDs with communities
Climate Change Sensitivities	a. Hazard Map/s	- Identify bio-physical effects of Climate Change (e.g. *drought, flooding, landslide, cyclones, etc.)*	- City/National Government releases
	b. Socio-economic profile	- To show who will be affected given current and future condition	- FGDs with communities/ community survey results
Adaptive Capacity	a. Socio-economic profile	- Validate the thresholds of people at risk	- City Data/survey results
	b. Key Physical characteristics	- Present resources and conditions	- City Data
	c. Land Use Plan	- To present spatial information for comparison to with the	- City Comprehensive Land Use Plan

		hazard maps and projected areas at risk	(CLUP)
	d. Local Economic Activities	- To present what economic activities could be at risk	- City Data/FGD reports
	e. Local Development Strategy	- Provide information on the relevance of at risk areas/sectors/ resources to the city priorities	- City Data
	f. City Investment Program/Annual Resource Stream	- Validate availability of resources to support climate change response actions	- City Data
	g. Copies of local Disaster Risk Reduction plan/program	- To present current actions being done and possibly determine existing capacity	- City and Community Data

Some pointers:

- Gather updated or most recent data. As much as possible use data/information consistent with what the local planning uses. This would ensure local ownership and maintain relevance of the assessment results with the context of the locality
- If necessary, the assessment team should write formal letters to request for data/information
- When needed, key informant interviews could be used in gathering and validating information

Step 6: Analyze Data

This step, aims to provide cities or local governments with a framework to help analyze their vulnerability factors from all the information gathered in Step 5. Proposed activity designs and templates as well as guidance notes provided herein may be used to structure discussions in doing participatory analysis.

6a: Understanding Local Climate Change Exposure

It would be crucial for the assessment team (especially if they are not experts in climate science) to have first the basic understanding or knowledge on how climate change projections and models are developed. But again, remember that "scenarios and models are tools" for assessment and adaptation planning and is not the "end-all, be-all" of the climate change assessment. Conduct of climate modeling is costly and complicated and so it is mostly done by institutions/agencies with expertise on climatology. Often what are readily available from such institutions are national level climate change projections and not down-scaled projections for smaller areas like cities/municipalities (as initially experienced in Sorsogon City). Box 1 presents excerpts

from the wide array of Climate Change literature which could aid users of this tool to understand what scenarios, models, and projections are.

Box 1

There are several types of climate change scenarios. They range from scenarios that are devised arbitrarily based on expert judgment (arbitrary climate change scenarios) to scenarios based on past climate (analogue climate change scenarios) to scenarios based on climate model output.

The IPCC developed storylines which are narratives of qualitative (e.g., political, social, cultural and educational conditions) emissions drivers, and scenarios on how future climate may change by using general circulation models or GCM (see Box 1). GCMs model the atmosphere and oceans, and interactions with land surfaces. They model change on a global scale, typically estimating change in grid boxes that are approximately several hundred kilometres wide. GCMs provide only an average change in climate for each grid box, even though real climates can vary quite considerably within several hundred kilometres. Given these, downscaling of scenarios is also being done through regional climate models for finer resolution analysis (50 km or less) to capture regional or sub-regional features that cannot be obtained by GCMs.

THE EMISSION SCENARIOS OF THE IPCC SPECIAL REPORT ON EMISSION SCENARIOS (SRES)

To determine how climate may change in the future, storylines are developed on how both natural and anthropogenic (human) greenhouse gas emissions will change in the future given assumptions on population growth, economic activity, energy use, land use change, etc..

The IPCC Special Report on Emissions Scenarios (SRES; Nakicenovic et al., 2000) details 4 storylines, narratives of qualitative (e.g., political, social, cultural and educational conditions) emissions drivers. The SRES emissions scenarios are the quantitative interpretations of these qualitative storylines. In order to reduce the number of scenarios to be used in climate change studies, six markers, or illustrative, scenarios have been selected based on the consensus opinion of the IPCC modelling teams. These are A1FI, A1T and A1B from the A1 family, and A2, B1 and B2.

A1. The A1 storyline and scenario family describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies. Major underlying themes are convergence among regions, capacity building and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income. The A1 scenario family develops into three groups that describe alternative directions of technological change in the energy system. The three A1 groups are distinguished by their technological emphasis: fossil-intensive (A1FI), non-fossil energy sources (A1T) or a balance across all sources (A1B) (where balanced is defined as not relying too heavily on one particular energy source, on the assumption that similar improvement rates apply to all energy supply and end use technologies).

A2. The A2 storyline and scenario family describes a very heterogeneous world. The underlying theme is self reliance and preservation of local identities. Fertility patterns across regions converge very slowly, which results in continuously increasing population. Economic development is primarily regionally oriented and per capita economic growth and technological change more fragmented and slower than other storylines.

B1. The B1 storyline and scenario family describes a convergent world with the same global population, that peaks in mid-century and declines thereafter, as in the A1 storyline, but with rapid change in economic structures toward a service and information economy, with reductions in material intensity and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social and environmental sustainability, including improved equity, but without additional climate initiatives.

B2. The B2 storyline and scenario family describes a world in which the emphasis is on local solutions to economic, social and environmental sustainability. It is a world with continuously increasing global population, at a rate lower than A2, intermediate levels of economic development, and less rapid and more diverse technological change than in the B1 and A1 storylines. While the scenario is also oriented towards environmental protection and social equity, it focuses on local and regional levels.

As said, do not get bugged-down by the absence of localized climate models. Down-scaled information from climate models is definitely most useful, but the absence of it

should not mean that climate change assessment and adaptation planning cannot be done. To define and assess the city exposure should there be no localized climate projections specifically made for the locality, the rich documented discourse and scientific observations available at the global, regional and national levels could initially be used as basis in defining the city climate change exposure analysis. In such case, what would be crucial is to facilitate ground-truthing of the available projections to establish its relation to actual local observations (recorded or not). The ground-truthing could be done by conducting FGDs with communities and through general stakeholder workshops.

The Sorsogon City Experience in Synthesizing Evidence of CC Exposure...

For the purpose of the Sorsogon City V&A assessment, the local climate change "exposure" was defined/determined by using available or secondary data from the national government as well as by using local accounts of historical data/previous events that emphasizes evidence of climate change impacts in the city.

First, the table below was used in Sorsogon City to incite discussion among the assessment team and identify parallel exposure assessment as those available at the global and national levels. The global projection in the table used climate change projections of the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report while the national projections were sourced from the Philippine Initial National Communication on Climate Change (PINCC). The challenge for the assessment team was to understand how the global and national climate change projections apply and translate to the city.

GLOBAL (IPCC)	NATIONAL (PINCC)	SORSOGON CITY
➢ Average surface temperature increased by 0.74^{o}C (1960-2005) ➢ Global average sea level rose (due to increase in average surface temperature) at an average of 1.8 mm per year over 1961-2003 ➢ Projected increases for further warming from 1.4^{o}C to 5.8^{o}C during the 21st century leading to further increase in sea level rise projected from 18-59 cm in 2010 and from 1 m to 2 m (worst case) at the end of the 21st century	➢ Projected temperature increase of an average of 2 to 3 ^{o}C ➢ 60 to 100% increase in annual rainfall for Central Visayas and Southern Tagalog ➢ Increasing trend in annual mean sea level since 1970's from the tidal gauge stations in the country including the one in Legaspi Albay ➢ Stronger and more frequent tropical cyclone	?

Second, the data gathered in Step 5 was reviewed to get an understanding of the local situation. The assessment team synthesized available secondary data to define the city

exposure to climate-driven phenomena relative to changes in extremes (e.g. tropical cyclone/storm surge, extreme rainfall, El Nino, La Nina) and changes in means (e.g. temperature, precipitation, sea-level rise).

Box 2: Initial synthesis of CC Exposure of Sorsogon City (source: various local/national data)

Climate Driven Phenomena	Evidence of City Exposure based on secondary data and previous events	Remarks (Data Source)
A. Changes Extreme		
Tropical Cyclones, storm surge	• Passing of more typhoons (exceeding the area average of" 3 typhoons within 2 years") • More rain volume from Typhoons surpassing the average (2009) • Stronger winds (between 150 to 260 km/hr.) • Increasing incidence of Evacuation of families from urban coastal areas especially those living in informal colonies/settlements • Occurrence of Storm Surge	- City data and local observations - Case of Tropical Depression Dante (2009) - Super Typhoons Sisang (1987) and Milenyo and Reming in 2006 - City Disaster Profile from CDCC - 1970 and 1983 as noted in the official records from NRDB- PAGASA
Extreme rainfall, riverine floods	• Flashflood events • Riverbank erosion • Areas identified as land slide and erosion prone	- CDCC data - CDCC data - Local geo-hazard map (MGB-DENR)
El Nino/Southern Oscillation	• Recorded episodes of ENSO (El Nino and La Nina) that affected Sorsogon Province	- PAG-ASA - City Data
B. Changes in Means		
Increased Precipitation	• Experiencing more than the average 200 days of rainfall/year; disrupted cropping pattern (e.g. drying of palay rice); decrease in palay rice production (lesser photosynthesis; water lag, bacteria); decrease in vegetable production; increasing "moss density"; decrease in salinity that affects production of cultured species (i.e. prawn, crabs, bangus (milk fish))	- City Agriculture Office

	• Projected 1.0-1.5 change in rainfall ratio in the Bicol Region with 2x CO2 Scenario (Canadian Climate Change Model)	- Philippine Initial National Communication on Climate Change (PINCCC)
Increased in Temperature	• Projected 2-3 ^{o}C change in temperature in the Bicol Region with 2x CO2 Scenario (Canadian Climate Change Model)	- PINCCC
Sea-Level Rise	• Inundation of land in coastal Barangays • Changes in tides in Sorsogon Bay • Observed SLR in the Pacific side in Bacon District	- City visual records - City records - PINCC (Coast and Geodetic Survey Department or CGSD of NAMRIA in Legaspi, Albay)

Regional or national climate projections may be used as reference and applied as the local arbitrary climate scenario for the climate change assessment. What would be critical in using the regional/national scenario is for the local assessment process to include ground-truthing or validation of the regional/national assumptions/projections with city data (observations and previous events) in order to facilitate assessment and consistency whether the larger projections holds true in the local setting.

The ***Third*** essential segment that the city carried out to analyze their CC exposure is the conduct of validation or ground-truthing activities of the secondary information gathered. This was done through FGDs with communities and Key Informant Interviews (KII) with local technical people. The FGDs and KIIs focused on further validating from local people and local technical experts the manifestations of climate change in Sorsogon City considering that the basis of the trends and information in the initial synthesis were inferred from Regional (Bicol Region) and provincial data.

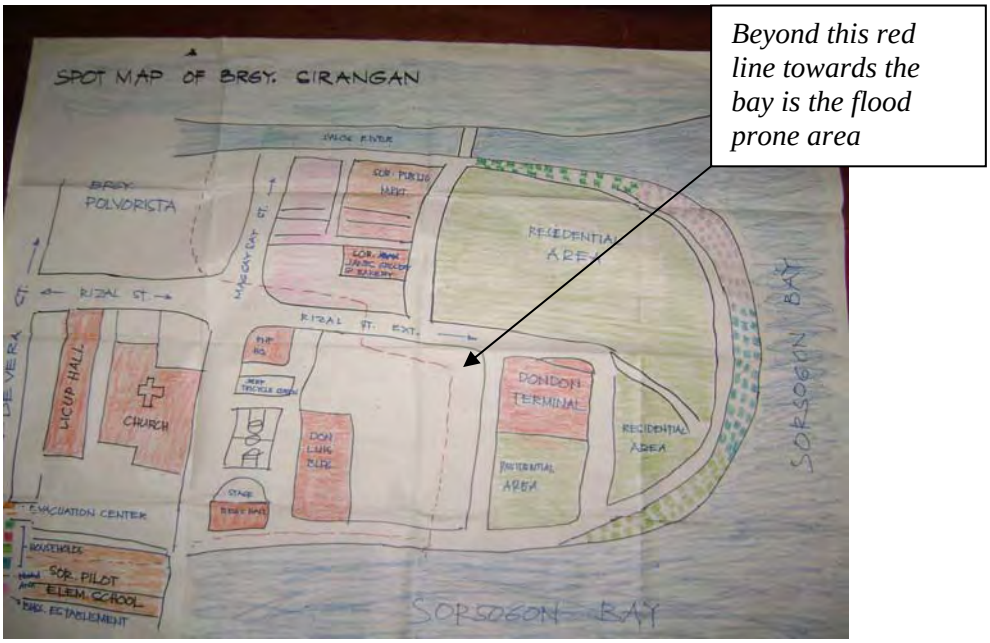
The FGDs with communities was designed to collect information on people's actual experiences and the possible indigenous methods of observing and recording changes in temperature, rainfall, sea level, typhoon intensity/frequency. The FGDs were introduced by a presentation on "what is climate change" thus providing the respondents with enough background to engage in the discussion.

The community FGDs also initiated the local sensitivity analysis. During the activity, answers to questions were further probed and the people were asked to draw/mark from their community base maps the areas that are affected by impacts they have accounted especially previous flooding and storm surge.

The FGDs also highlighted how the communities currently responded to weather phenomena and sea level rise (providing an initial assessment on autonomous coping strategies). The need for involvement of the community in developing local climate change actions, starting from the climate change assessment given that they are the ones directly affected by Climate Change impacts, was also discussed.

Suggested Focus Group Discussion Activity Design (As used on Sorsogon City)	
5 minutes	**Introduction of FGD Participants and Assessment Team**
5 - 10 mins.	**Presentation of FGD Objectives and Overview of Climate Change**
1 – 2 hours	**Guided Discussions:** *(Each discussion topic should be asked in an open ended manner so that the participants could answer as they see fit and in their own terms. Probing will be done during the FGD to gather more information)* - What is the community's observation on local temperature? How has temperature change manifested in their community? - What is the community's observation on rainfall pattern and volume? What evidences of this change are seen/experienced by the community? - What is the community's experience of drought/El Nino? - What are the community's experiences on previous tropical cyclones/typhoons? - What have the local people observed in the coast? What changes have you seen over the years? - How have storm surges affected the community over the years? *(During the discussion, park/note each hazard named and discussed by the respondents)*
1 to 1.5 hours	**<u>Exposure Impact Mapping</u>** *Using the community base map, ask the participants to mark areas/households which were previously affected and by the climate related hazards noted during the discussion.* *Let them share/explain their outputs and probe if needed*
1 to 1.5 hours	Sensitivity Assessment Following the Mapping exercise, ask the community on the relevance of effects to their community. The template for Sensitivity Assessment of Hotspots could be used
15 minutes	**Recap and Closing** *Summarize what has been discussed and share how this would input into the climate change assessment.* *Thank and congratulate the participants.*

Figure 6: Sample Output from community exposure mapping



6.b Participatory Analysis of the City Sensitivity to Climate Change Exposure

A workshop design is presented below as a guide to facilitate participatory analysis of the bio-physical implications of the city's climate change exposure vis-à-vis the current local conditions (e.g. socio-economic, natural endowments, and built environment). The benefit of this is that it engages stakeholders in a multi-sector discussion to analyze the data gathered. This is particularly important when climate scenarios (derived from models) downscaled to the city-level are not available and the strategy of the assessment is to infer analysis from the science-based global/regional/national scenarios.

The workshop is expected to result in agreement on quantitative and qualitative assessments of how the different biophysical impacts of climate change would impact on the socio-economic and other development factors of the city.

Table 1: Activity Design

Purpose of the Activity:

To analyze climate change exposure and define local sensitivities to impacts (by Risk Areas which could be people, places, activity sector, and others)

Attendees:

LGU Assessment Team
Other stakeholders (local and external) identified to have knowledge and key input to share

Resources and materials to be used: Gathered data, presentations, etc.

	Time	Activity	Methodology	Responsible Person/s	Output
Part 1	5 mins	Introduction of Participants		Facilitator	
	5 mins	Presentation of Activity Objective		Workshop Focal person	Agreement on Activity Output
Part 2	20 mins	Overview of Climate change (CC), CC Scenario, and Possible CC effects/impacts	Presentation	Resource Person	Increased participants info and knowledge on CC (scenario, general CC effects and projected impacts)
Part 3	1 hour	Identification of Local CC exposure and risks/effects (using as reference the presentation inputs in Part 2 and the synthesis results in 6a)	Workshop	Facilitator and participants	List of local CC exposure and risks/effects
Part 4	3 hours	Identification of CC Risk Areas (who and what) per identified CC impact	Workshop	Facilitator and participants	List of Risk Areas (people, places, activity sector, others) and their sensitivity to effects
Part 5	1 hour	Presentation and Discussion of Outputs	Plenary presentation and Facilitated discussion	Facilitator Workshop Group Rapporteurs	Exposure & Sensitivity Ratings/Assessment

Workshop Template for Part 3 of Activity:

During the workshop, it would be practical to provide frameworks and use templates as tools for analysis in order to structure the discussions. The sample template below is expected to aid participants to organize information and establish what effects or risks are triggered by climate variability and change

Matrix A: Identifying related risks or sensitivities of the city to the current and projected exposure

1	2	3
Climate Indicator *(current and future exposure scenario)* *Note: Refer to data gathered in Step 5 and 6a*	**Relative Risks/Effects** *(List in this column biophysical effects relative to the CC exposure indicator in column 1. The biophysical effects are mainly the climatic-induced conditions that may trigger disaster events or alterations in local activities i.e. drought, flooding, landslide, strong cyclones, etc.)*	**Reference or Sources**
Temperature		
a. Establish the long term trend (observations of 30 years – ideally indicating seasonal variations and extremes) from the secondary data and FGDs/KIIs. b. What is the present average temperature?	*List/characterize here effects of historic temperature variations as well as the positive and negative effects of the present temperature levels*	*List down here and in each cell below the sources/reference of the answers listed in column 1 and 2 of every row*
c. What is the projected change in mean temperature (and extremes)? - 2020 : - 2050 :	*Given the projected change in the left cell, what risks could it further bring relative to the past and current accounts (refer to above cell)*	
Rainfall		
Long term trends (observations of 30 years – ideally indicating seasonal variations and extremes) Present average annual rainfall Present seasonal variations and extremes	*List/characterize here effects of historic rainfall variations as well as the positive and negative effects of the present rainfall volume*	
Projected change in rainfall - 2020 : - 2050 :	*Given the projected change in the left cell, what risks could it further bring relative to the past and current accounts (refer to above cell)*	
Tropical Cyclone		
Present historical data (no. of tropical cyclones per year / averages per decade). Present trends in strength of cyclones	*List the risks/hazards which triggered by previous typhoons/cyclones?*	

Projected change in tropical cyclone occurrences	*How would the risks/hazards listed in the above cell be exacerbated due to the projected change? List other risks/hazards that may arise due the projected change.*	
Sea-level Rise		
Present sea-level (historical data over last 30 years)	*List the risks/hazards brought by rising sea level over the years? What conditions were observed?*	
Projected Sea-level Rise (globally, locally)	*How would the risks/hazards listed in the above cell be exacerbated due to the projected change? What conditions could further change?*	

Some Notes and Pointers in Filling-up Matrix A:

- The present or current climate data establishes the "climate baseline" with which the city is already coping and adapting to. Such information will facilitate understanding of the local coping range and the parameters to which present development activities are being programmed.

- Always refer to city official documents in presenting current climate data for consistency with existing local planning parameters and considerations. This would help in aligning the analysis with local considerations and in increasing local ownership of the climate change assessment results.

- For the climate change assessment, scenarios are used as Exposure indicators. There are several types of climate change scenarios. They range from scenarios that are devised arbitrarily based on expert judgment (arbitrary climate change scenarios) to scenarios based on past climate (analogue climate change scenarios) to scenarios based on climate model output.

- Column two is for the bio-physical effects attributed to the exposure indicators in column 1. These are hazards that the locality currently experiences as well as the projected slow-creeping hazards (e.g. land inundation due to sea level rise, salinitization, etc) due to climate change, even variability and extremes.

- The third column is crucial to fill up as this provides information on where data for the assessment has been sourced/referenced. As the resultant climate change assessment report is projected to be a dynamic document that could be updated as need arise, future users of the document should be provided with the bases for the information/data used. This column is also critical to clearly state which storyline/emission scenario was used as reference for the climate projection used in the vulnerability assessment.

Workshop Template for Part 4 of Activity:

Template B is proposed for use in conducting a workshop for Part 4. In this session, further analysis will be done to identify "who and what" are sensitive to climate conditions and the participants should agree on ratings that may describe how critical the risks effects of climate change are with respect to the socio-economic conditions of the city. The discussion should work around the outputs in Part 3 as well the results of the previous steps conducted like the community FGDs.

Some guidance in Filling-up Matrix B:

- Per indicator (column 1) in Matrix A, Matrix B should then be accomplished. This is the identification of who/what is at risk to projected impacts per indicator.

- Write the CC Indicator in the first row while in the second row list all the effects/impacts of change in climate as identified in Matrix A.

- In Column 1 list the critical socio-economic factors/elements of the city or municipality which may bear the impacts or effects of climate change. Considering that the main "actor" for both mitigation and adaptation would be the "people" themselves, it would be good to focus the assessment on the "population", where they are (places), and their activities identified to be drivers of development and socio-economic stability or perhaps instability of the locality/area. The template therefore suggests focusing on People, Places, and Activity Sectors. Other factors could be added by the assessment team as they deem necessary.

  While the city level assessment could focus on the general population, a good baseline information if available could further present disaggregated exposure and sensitivity assessment per demographic groups e.g. women, children, etc. ***(see discussions and city example on this in STEP 7)***

  The "places" assessment could focus on the classification of areas covered by the city/municipality as identified in their Comprehensive Land Use Plan or Development Plan. Evaluating local exposure and sensitivity to CC by land use also provides a picture as to what local resources would be affected as well as present a good information for re-strategizing existing plans of area development to ensure sustainability.

  Activity sectors could be defined as a category of development activity in the city/municipality. Each activity sector will include groups and organizations which have broadly similar interests and needs - and broadly similar relationships with

*city/municipal development and with environmen*t[5]- in this case climate. In the template, "activity sector" focuses on local economic activities and infrastructure lifelines which are critical drivers of local development as they facilitate resilience of people to impacts of disaster events either through opportunities for income/earnings or access to support.

- Climate risk could be characterized and rated through its probability of occurrence and its consequences (possible losses and damages)[6]. The template proposes a scoring scheme to evaluate/analyze the risks. Using the scores, risk rating could be derived for each of the factors listed in column 1. ***(see Sorsogon City Example on Page 31)***

- Take note that there are many vital facts and information that the risk rating may not be able to express. As such, documentation of discussion and basis for rating should be fully captured as this would form part of the narrative report of the assessment.

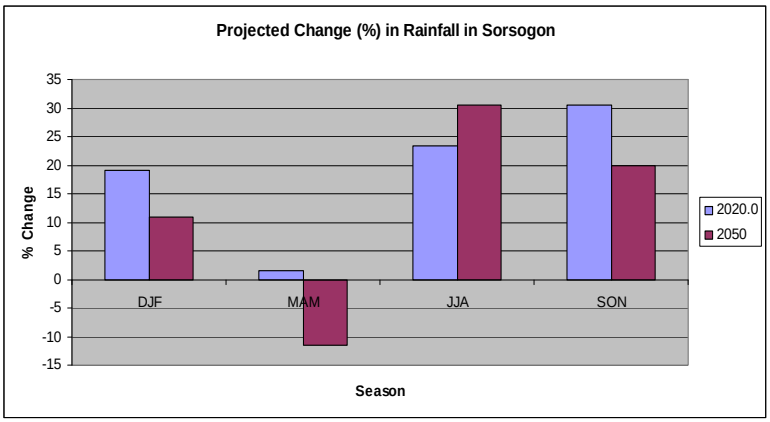
- To derive the risk value of each climate indicator, the ratings provided for the exposure and sensitivity on each risk effect (identified in row 2) must be normalized. The risk rating could be further generalized such that it will present the rating for combined climate risks.

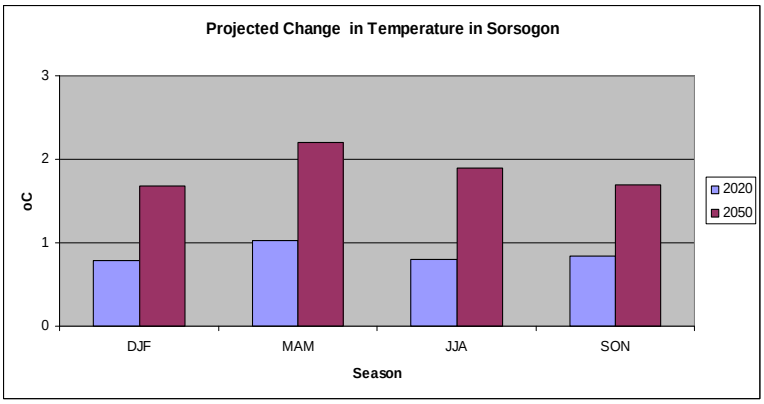
- The workshop should result in analyses relative to exposure and sensitivity that includes: what climate indicator presents greater negative impacts to the city; what climate change factor are the people most at risk with; for every climate change risk indicator, to which effect are key areas (places) highly susceptible to negative impacts;

[5] UN-HABITAT SCP toolkit 1- Writing Environmental Profile
[6] Risk= probability x consequence (Gouldby & Samuels, 1995)

Downscaled Climate Change Projection for Sorsogon using the PRECIS Model

Through partnerships with and involvement in the Joint Program of the UN System and the Philippine Government (MDG-F 1656), Sorsogon City was able to get a downscaled climate projection from the Philippine Atmospheric, Geophysical and Astronomical Services Administration or PAGASA.





This has provided the assessment team with better information on the degree of change that could be expected (by season) in Sorsogon while validating the CC exposure used in the assessment during the preliminary stages on inferring from regional and global projections. In general it shows that by 2020 and 2050, during the hot season it will be hotter, and wetter during the rainy season.

What is glaring here is the decrease of rainfall during summer months (March to May) for the 2050, which would be a major change, as currently the city has no pronounced dry season having rains throughout the year.

This seasonal projection would be critical in adaptation planning. People and local government should have this information in mind when programming activities, livelihoods, physical developments and other development strategies and plans.

Assessment Template/Matrix B: City Exposure and Sensitivity Analysis (Who/what are at risk to CC Effects)

CC Risk Indicator: *(refer to column 1 in Matrix A) (e.g. increased rainfall)*									
Risk Effects:	*(e.g. Flooding)*		*(e.g. Erosion)*		*(e.g. Landside)*		*(others...)*		
	Exposure	*Sensitivity*	*Exposure*	*Sensitivity*	*Exposure*	*Sensitivity*	*Exposure*	*Sensitivity*	
Who/What will be affected?	**Probability or Likelihood of impact**	**Possible Adverse Consequence/s (expected losses)**	**Probability or Likelihood of impact**	**Possible Adverse Consequence/s (expected losses)**	**Probability or Likelihood of impact**	**Possible Adverse Consequence/s (expected losses)**			**Risk Rating (total score over count of scores)**
People									
- Population									
Places									
- Built-up Area									
- Agricultural Zone									
- Forest/Watershed Area									
- Others...									
Activity Sector (Local Economy and lifelines)									
- Trading									
- Tourism									
- Agriculture (Fishing /Farming)									
- Service Oriented livelihoods									
- Infrastructure Systems									
- bridges									
- communications									
- electric power									
- others...									

Suggested Rating Probability/Likelihood: 1=Frequent or Very Likely; .75=Likely; .50=Moderately Likely; .25=Low probability
Suggested Rating for Possible Adverse Effect: 1= Very Severe Consequence; .75= Severe Consequence; .50=-Moderate Consequence; .25= Low Consequence (previous experience as basis)

6c. Impact Valuation: Projecting the Cost of "Doing Nothing"

Knowing the value or cost of impacts due to non-action is very important towards directing development of focused strategies and stirring actual responses on the ground. Having established the risks and sensitivities that the city is faced with due to climate change, the assessment team endeavored to do a monetary impact assessment.

With the goal to align the assessment with the development of the City Comprehensive Development Plan, focus was aimed at presenting impact values for sectoral concerns namely social, economic, infrastructure, and environmental.

<u>Some Guidance in doing valuation of Impacts:</u>

- Overlaying hazard maps and base maps will be useful to define units/quantities of at risk structures (houses, bridges, schools, etc.). Estimation based on spatial information or actual values could be used depending on data availability.

- Initial impact valuation should use current prices or local pricing standards to estimate cost of at risk indicators. For projected cost (when doing 2020 and 2050 impact valuation) use applicable formulas used by the city in development programming considering inflation rates and depreciation values of units being assessed

- Assume the percentage of damage from the exposure and sensitivity ratings that was initially done. Conservative assumptions could also be used

- Make sure that worksheets are annotated with assumptions for easy reference and ensuring understanding of information by other or future users of the data

Cyclone
Sorsogon City
Valuation relative to Risks in case of direct impact

Sector	Sub	Estimating Indicator	Estimated vulnerable to typhoon		Available in the city	Percent to total	unit cost estimate	Possible damage %	Estimated value exposed to risk	Es
Social										
	Housing									
		number of housing units (permanent)	15,000	units	15,000	100.0%	300,000.00	0.25	4,500,000,000.00	
		semi permanent and indigenous(assumed)	15,000	units	15,000	100.0%	132,000.00	0.64	1,980,000,000.00	
		household furnitures and equipment	30,000	units	30,000	100.0%	10,000.00	0.75	300,000,000.00	
	Education	number of classrooms in the affected area	936	clrooms	936	100.0%	384,000.00	0.25	359,424,000.00	
		number of libraries, sports area,	80	units	80	100.0%	480,000.00	0.50	38,400,000.00	
		number of desks, armchairs, tables, chairs	28,080	units	8,000	351.0%	300.00	0.25	8,424,000.00	
		educational equipment and supplies	4	units	4	100.0%	500,000.00	0.75	2,000,000.00	
		education sector offices	3	units	3	100.0%	480,000.00	0.25	1,440,000.00	
	Health	number of hospitals	4	hosp	4	100.0%	5,000,000.00	0.10	20,000,000.00	
		number of health centers	69	units	69	100.0%	384,000.00	0.25	26,496,000.00	
		medical equipment and supplies	4	lots	4	100.0%	2,000,000.00	0.25	8,000,000.00	
		furnitures and beds	345	units	345	100.0%	10,000.00	0.50	3,450,000.00	
		health offices	4	units	4	100.0%	1,000,000.00	0.25	4,000,000.00	
Economic										
	Agriculture									
		area of riceland	2,100	hectares	2,100	100.0%	300,000.00	0.02	630,000,000.00	
		area of coconut land	9,900	hectares	9,900	100.0%	200,000.00	0.10	1,980,000,000.00	
		area of abaca	2,000	hectares	2,000	100.0%	100,000.00	0.10	200,000,000.00	
		area of fruits and vegetable plantation	570	hectares	570	100.0%	150,000.00	0.10	85,500,000.00	
		buildings and warehouses	32	units	32	100.0%	500,000.00	0.25	16,000,000.00	
		irrigation	50	kms	50	100.0%	1,000,000.00	0.25	50,000,000.00	
		machineries and equipments	64	units	64	100.0%	5,000.00	0.25	320,000.00	
		agri and livestocks	10,000	stocks	10,000	100.0%	1,500.00	1.00	15,000,000.00	
	Fisheries						-			
		Banca (motorized and non-motorized)	100	units	100	100.0%	15,000.00	0.50	1,500,000.00	
		Fishing gears	100	units	100	100.0%	10,000.00	0.50	1,000,000.00	
		Shrimps/Mudcrab/Milkfish/seaweeds	300	has	300	100.0%	150,000.00	0.50	45,000,000.00	
		Fishponds	300	has	300	100.0%	1,000,000.00	0.25	300,000,000.00	
	Commerce						-			
		buildings and warehouses	200	units	200	100.0%	500,000.00	0.25	100,000,000.00	
		machinery and equipment	10	lots	10	100.0%	1,000,000.00	0.25	10,000,000.00	
		stocks	10,000	stocks	10,000	100.0%	1,500.00	0.50	15,000,000.00	
	Tourism									
		hotels, restaurants, resorts	65	units	65	100.0%	500,000.00	0.25	32,500,000.00	
		cultural and historical sites and attractions	10	sites	10	100.0%	5,000,000.00	0.25	50,000,000.00	
		machineries and equipments	65	lots	65	100.0%	20,000.00	0.25	1,300,000.00	
Infrastructure										
	Transportation									
		roads	160	kms	160	100.0%	5,000,000.00	0.10	800,000,000.00	
		bridges	600	m	600	100.0%	350,000.00	0.10	210,000,000.00	
		drainage system	300	kms	300	100.0%	50,000.00	0.10	15,000,000.00	
		ports	3	units	3	100.0%	100,000,000.00	0.10	300,000,000.00	
		airport	1	units	1	100.0%	50,000,000.00	0.05	50,000,000.00	
		terminal buildings	1	units	1	100.0%	500,000.00	0.25	500,000.00	
	Water	water sources and facilities	20	units	20	100.0%	2,000,000.00	0.10	40,000,000.00	
		transmission lines	15	kms	15	100.0%	2,000,000.00	0.05	30,000,000.00	
		distribution lines	50	kms	50	100.0%	1,500,000.00	0.10	75,000,000.00	
		water dist machineries and equipments	4	units	4	100.0%	500,000.00	0.10	2,000,000.00	
	Energy						-			
		hydro energy sources	1	units	1	100.0%	20,000,000.00	0.05	20,000,000.00	
		geothermal energy sources/wells	10	units	10	100.0%	3,500,000.00	0.05	35,000,000.00	
		buildings and offices	5	units	5	100.0%	10,000,000.00	0.25	50,000,000.00	
		energy machineries and equipments	1	lots	1	100.0%	500,000,000.00	0.10	500,000,000.00	
		sub stations	1	units	1	100.0%	50,000,000.00	0.05	50,000,000.00	
		power transmission lines	50	kms	50	100.0%	10,000,000.00	0.10	500,000,000.00	
		power distribution lines	50	kms	50	100.0%	1,500,000.00	0.25	75,000,000.00	
	Communications				-					
		cell site towers	10	units	10	100.0%	3,500,000.00	0.10	35,000,000.00	
		machineries and equipment	10	units	10	100.0%	10,000,000.00	0.10	100,000,000.00	
		offices	10	units	10	100.0%	500,000.00	0.25	5,000,000.00	
		radio and tv stations	8	units	8	100.0%	5,000,000.00	0.25	40,000,000.00	
Environmental							-			
	Forest						-			
		area of forestlanf	7,000	hectares	7,000	100.0%	100,000.00	0.25	700,000,000.00	
		area of mangove forest	)	hectares	)		-		#VALUE!	
		wildlife (bacman)	)	hectares	)		-		#VALUE!	
	Others		-	-	-		-			
		damage in corral reefs	)	lump	)		-		#VALUE!	
		loss of beaches/shoreland	)	lump	)				#VALUE!	

6.d Assess/Analyze Local Climate Change Adaptive Capacities

Adaptive capacity is the capability to adapt to climate stimuli. *Mainly it is characterized as a function of various factors like wealth, technology, institutions, information, infrastructure, and social capital*[7]. These factors are used by a system to adjust and expand its coping range under existing climate variability, or future climate conditions[8]. Higher adaptive capacity lowers climate risks and offsets the negative effects of climate change to sensitive socio-economic factors of a given system or area.

This toolkit introduces both qualitative and quantitative methodologies that could be used in the climate change assessment. **Quantitative analysis** could be done through desk assessment using available data from municipal/city profiles. The results of quantitative assessment would be useful for rating and comparing with the values derived from the exposure/sensitivity assessment in STEP 6a. However, further characterization is needed through **qualitative assessment** in order to expand understanding of the coping range of the system/area and provide other critical information crucial in developing local climate change action plans. Qualitative assessments also provide wider opportunities for other stakeholders especially the communities themselves to participate in the V&A process.

Quantitative Analysis of CC Adaptive Capacity

The assessment team must identify relevant indicators that enable the system/area to adjust its practices, processes, or structures to offset or lessen potential damages from climate hazards. This could be derived from a consultative process with experts, development practitioners, and local stakeholders. The assessment team and experts should also decide on the weights for the indicators which again must consider the purpose of the climate change assessment.

[7] IPCC Third Assessment Report.
[8] UNDP Adaptation Policy Framework Technical Paper 1- Scoping and Designing Adaptation Project

Template for Quantitative Assessment of Adaptive Capacity

	A	B	C	D	E	F
	Dimension of Adaptive Capacity and select Indicators	**Weight per indicator**	**Total Weight (Sample)**	**Score**	**Weighted Score per indicator**	**Total Score**
	Wealth		.25			(Sum in G x C)
	(Possible Indicators) - *GDP* - *% HH earning above Poverty Threshold*			*(rate/score based on city data)*	*(=score in D x B)*	
G					**(=Total Score)**	
	Technology		.25			(Sum in H x C)
	(Possible Indicators) - *% HH with access to communication* - *% HH with access to electricity*			*(rate/score based on city data)*	*(= score in D x B)*	
H					**(=Total Score)**	
	Infrastructure		.25			(Sum in I x C)
	(Possible Indicators) - *Road Density* - *% paved road* - *% HH with safe housing unit*			*(rate/score based on city data)*	*(=score in D x B)*	
I					**(=Total Score)**	
	Information		.25			(Sum in J x C)
	(Possible Indicators) - *Literacy Rate* - *School participation rate*			*(rate/score based on city data)*	*(= score in D x B)*	
J					**(=Total Score)**	
	TOTAL		1.00			**(= Sum of Above)**

Guide in using the Matrix:

- *Decide on the dimensions (e.g. wealth, technology, infrastructure, information, etc) most relevant to the assessment*
- *Consider availability of data*
- *Discuss and agree on the weights per dimension. Weights to be assigned would depend on how the assessment team and stakeholders view the dimension to be critical or crucial for CC adaptation.*
- *Provide weights per indicator (should always sum up to 1). Weights to be assigned would depend on how the assessment team and stakeholders view the indicator to be critical or crucial for CC adaptation.*

The table below presents the quantitative assessment of the Sorsogon City's adaptive capacity using as reference the template above. Note however that the city used selected socio-economic indicators and proxy indicators for technology and infrastructure as measures of adaptive capacity. Weights were defined based on the judgment of the assessment team as to the dimension's and indicators degree importance in off-setting negative climate change impacts. The results shows that from the highest possible value of 1, the city's adaptive capacity is found to be below the mid-point as it only registers with a 0.38 rating.

QUANTITATIVE ASSESSMENT OF SORSOGON CITY CC ADAPTIVE CAPACITY

DIMENSIONS, INDICATORS AND RATINGS TO BE USED			CITY ADAPTIVE CAPACITY ASSESSMENT			
				Score	Wtd Score	Total Score
Socio-economic		**0.50**				**0.25**
Poverty Incidence	*0.40*			0.57	0.23	
Informality (Tenure)	*0.20*			0.46	0.09	
Literacy Rate	*0.20*			0.17	0.03	
PO/CBO/MFI membership	*0.20*			0.7	0.14	
					0.49	
Technology		**0.25**				**0.06**
Access to telecommunications	*0.30*			0.1	0.03	
Access to electricity	*0.30*			0.06	0.02	
Functional DRR Plan	*0.40*			0.5	0.20	
					0.25	
Infrastructure		**0.25**				**0.07**
HH with safe water access		*0.25*		0.28	0.07	
Paved Road		*0.25*		0.4	0.10	
Protective Infra		*0.50*		0.22	0.11	
-Sea Wall	*0.5*		0.7	0.35	0.28	
-Unsafe Housing Unit	*0.5*		0.16	0.08		
				0.43		
		1.00				**0.38**

Qualitative Assessment of CC Adaptive Capacity

Qualitative assessment should be directed to those who facilitate systemic local actions (i.e. institutions especially the local government unit) and those who actually perform the adaptive action (people or communities).

The key output would be a characterization of the existing structure, mechanisms, processes, strategies, and systems used by the local government and the vulnerable people/population themselves towards adapting to climate related disasters (using as reference the past experiences and current plans/programs).

Guide for Qualitative Assessment of Adaptive Capacity for the climate change assessment

- Gather information from FGDs (with communities, women's group, etc) and KIIs with key respondents from institutions
- Characterization of how people recovered from or coped with previous climate related disasters should be included
- Describe existing community assets that facilitate/help people to cope and adjust to climate hazards
- For KII with institutions, the informant/s should provide information of their present structure, human and financial resources, available technologies, current plans and programs as well as previous efforts related to helping people adapt to climate risks are critical to be highlighted. Summary of this should be presented highlighting the strengths of the particular institution in relation to climate change adaptation (current and future).
- On governance, describe the local government's capacity (knowledge, resources, and programs) and priorities towards developing a local climate change action plan. Its partnership dynamics with stakeholders should also be described in the report.

Increased Rainfall Quantitative Exposure & Sensitivity Analysis from Sorsogon City

CC Risk Indicator: Increased Rainfall																			
RISK EFFECTS	Flooding						Erosion						Landslide						Risk Rating *(total score over count of count of scores)*
Who/What will be affected?	Exposure			Sensitivity			Exposure			Sensitivity			Exposure			Sensitivity			
	Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			
	2010	2020	2050	2010	2020	2050	2010	2020	2050	2010	2020	2050	2010	2020	2050	2010	2020	2050	
People																			
- Population	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
Places																			
- Built-up Area	1	1	1	1	1	1	0.5	1	1	0.5	1	1	0.75	1	1	0.75	1	1	0.92
- Agricultural Zone	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Forest/Watershed Area	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Others…																			
Activity Sector (Local Economy and lifelines)																			
- Trading	1	1	1	1	1	1	0.25	0.5	1	0.25	0.5	1	0.5	1	1	0.5	1	1	0.81
- Tourism	1	1	1	1	1	1	0.5	1	1	0.5	1	1	0.5	1	1	0.5	1	1	0.89
- Agriculture (Fishing /Farming)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.94
- Service Oriented livelihoods	1	1	1	1	1	1	0.25	0.5	1	0.25	0.5	1	0.25	1	1	0.25	1	1	0.78
- Infrastructure Systems	0.87	1	1	0.87	1	1	0.5	1	1	0.5	1	1	1	1	1	1	1	1	0.93
- bridges	1	1	1	1	1	1	0.5	1	1	0.5	1	1	1	1	1	1	1	1	0.94
- communications /power	0.5	1	1	0.5	1	1	0.5	1	1	0.5	1	1	1	1	1	1	1	1	0.89
- Public School Bldg.	1	1	1	1	1	1	0.5	1	1	0.5	1	1	1	1	1	1	1	1	0.94
- Roads/ seawall/river control	1	1	1	1	1	1	0.5	1	1	0.5	1	1	1	1	1	1	1	1	0.94

Exposure Rating Probability/Likelihood: 1=Frequent or Very Likely; .75=Likely; .50=Moderately Likely; .25=Low probability

Suggested Rating for Possible Adverse Effect:
1= Very Severe Consequence; .75= Severe Consequence; .50=-Moderate Consequence; .25= Low Consequence (previous experience as basis)

Sea Level Rise Exposure & Sensitivity Analysis from Sorsogon City

CC Risk Indicator: Sea Level Rise													
RISK EFFECTS	Permanent Flooding						Salinitization						Risk Rating (total score over count of risk effects)
Who/What will be affected?	Exposure			Sensitivity			Exposure			Sensitivity			
	Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			
	2010	2020	2050	2010	2020	2050	2010	2020	2050	2010	2020	2050	
People													
- Population	1	1	1	1	1	1	1	1	1	1	1	1	1
													0
Places													0
- Built-up Area	1	1	1	1	1	1	1	1	1	1	1	1	1
- Agricultural Zone	1	1	1	1	1	1	1	1	1	1	1	1	1
- Forest/Watershed Area	1	1	1	1	1	1	1	1	1	0	0	0	0.75
- Others...													0
													0
Activity Sector (Local Economy and lifelines)													0
- Trading	1	1	1	1	1	1	1	1	1	1	1	1	1
- Tourism	1	1	1	1	1	1	1	1	1	1	1	1	1
- Agriculture (Fishing /Farming)	1	1	1	1	1	1	1	1	1	1	1	1	1
- Service Oriented livelihoods	1	1	1	1	1	1	1	1	1	1	1	1	1
- Infrastructure Systems	1	1	1	1	1	1	0	0	0	0	0	0	0.5
- bridges	1	1	1	1	1	1	0	0	0	0	0	0	0.5
- communications /power	1	1	1	1	1	1	0	0	0	0	0	0	0.5
- Public School Bldg.	1	1	1	1	1	1	0	0	0	0	0	0	0.5
- Roads/ seawall/river control	1	1	1	1	1	1	0	0	0	0	0	0	0.5

Exposure Rating Probability/Likelihood: 1=Frequent or Very Likely; .75=Likely; .50=Moderately Likely; .25=Low probability

Suggested Rating for Possible Adverse Effect:
1= Very Severe Consequence; .75= Severe Consequence; .50=-Moderate Consequence; .25= Low Consequence (previous experience as basis)

Typhoon Exposure & Sensitivity Analysis from Sorsogon City

CC Risk Indicator: Typhoon/Tropical Cyclones																		
RISK EFFECTS	Flooding						Storm Surge						Strong Wind						Risk Rating (total score over count of risk effects)
Who/What will be affected?	Exposure			Sensitivity			Exposure			Sensitivity			Exposure			Sensitivity			
	Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			Probability or Likelihood of impact			Possible Adverse Consequence/s (expected losses)			
	2010	2020	2050	2010	2020	2050	2010	2020	2050	2010	2020	2050	2010	2020	2050	2010	2020	2050	
People																			
- Population	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
Places																			
- Built-up Area	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Agricultural Zone	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Forest/Watershed Area	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Others...																			
Activity Sector (Local Economy and lifelines)																			
- Trading	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Tourism	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Agriculture (Fishing /Farming)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.94
- Service Oriented livelihoods	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Infrastructure Systems	0.9375	1	1	0.9375	1	1	0.87	1	1	0.87	1	1	1	1	1	1	1	1	0.98
- bridges	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- communications /power	0.75	1	1	0.75	1	1	0.5	1	1	0.5	1	1	1	1	1	1	1	1	0.92
- Public School Bldg.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00
- Roads/ seawall/river control	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.00

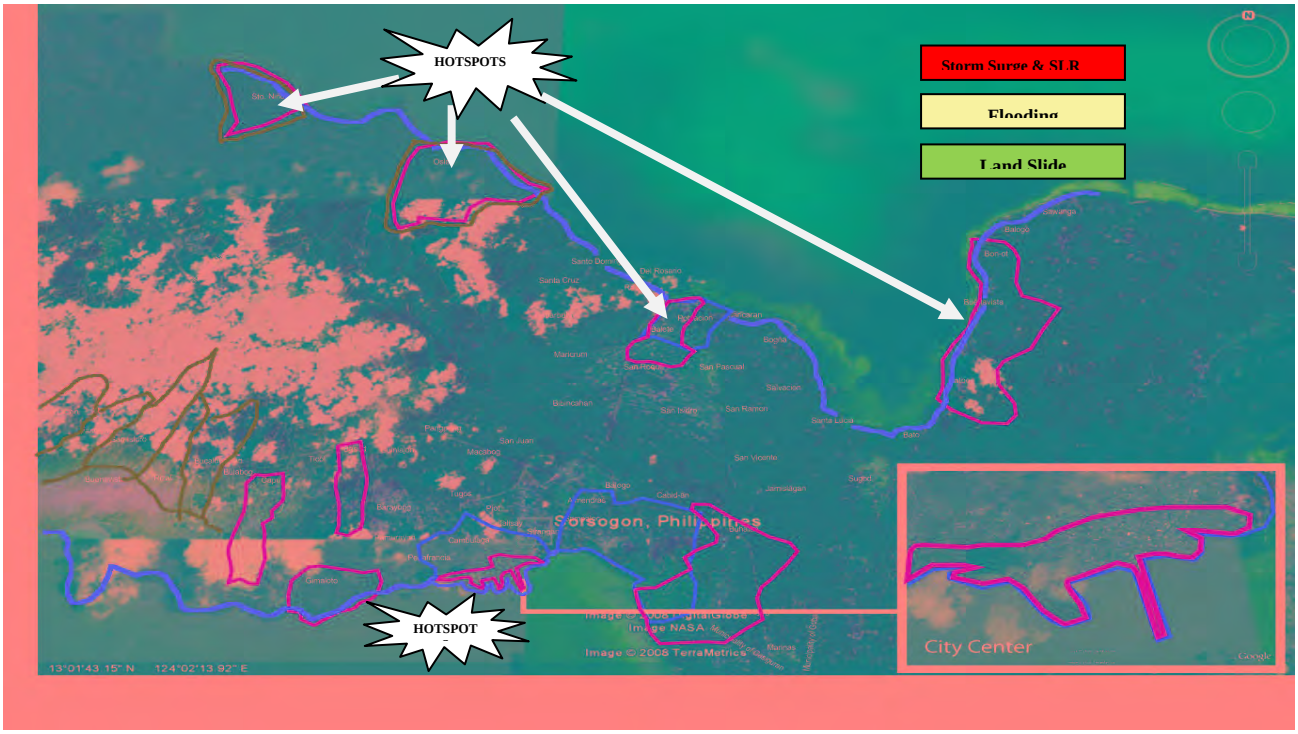
STEP 7: Zeroing in on Critical Areas/Hotspots:

7.a. Map/Visualize areas at risk and Identify Hotspots

Local maps are valuable tools to identify the specific location of the group of people, livelihoods and economic sectors whose current state might be negatively affected due to climate change.

Climate risk and hazard maps will aid in locating areas facing higher risks as a function of their climate change exposure, sensitivity, and magnitude of people directly at risk. For local governments with GIS facility this may come easy but for those who do not have such facilities some innovative process could be done like using computer software that allows overlaying of map images. Consistency of image scales should however be maintained to ensure minimal variations to actual data.

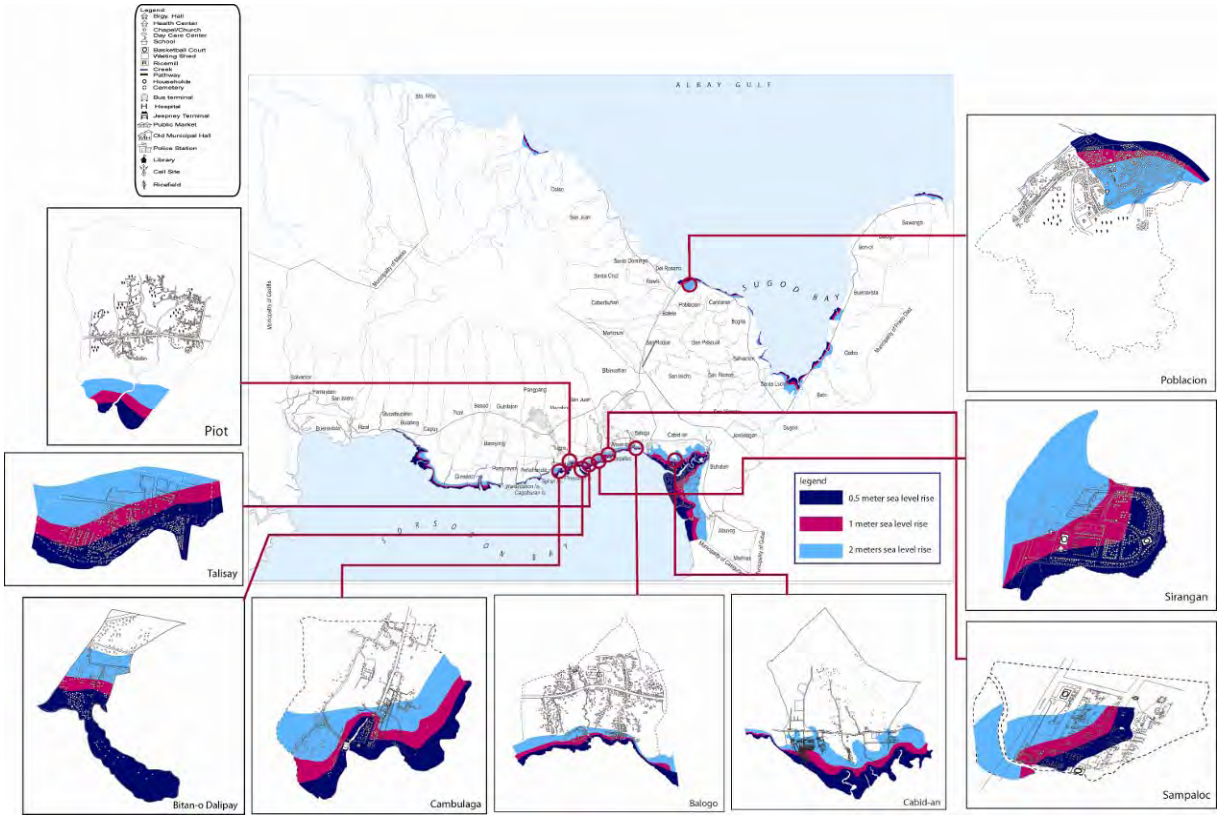
Figure 7: Sorsogon City Hotspots using overlaying of CC hazards



Climate change **hotspots** could be identified by overlaying all climate-related hazard maps covering SLR, increase in rainfall, increase in temperature, tropical cyclone occurrences, etc. Climate change "hotspots", for the purpose of this climate change assessment tool, is defined as areas which face multiple climate related hazards.

Mapping/Visualizing Sea-Level Rise in Sorsogon City

Sorsogon City does not have a mapping capacity or a Geographic Information System yet that could have helped the climate change assessment. The technical team for the assessment therefore used innovative approaches to visualize and projected sea level rise. Using the city base maps and topographic, maps, projected SLR impact was visualized. The scale of existing base maps of the City was overlaid and stretched to fit that of the scaled topographic map which was used to show elevation. The guide in overlaying the maps were identified reference points like structures, water bodies etc from the base map to assume the scale and relate projected SLR (.5m, 1m, and 2m) relative to the points of elevation in the topographic map.



For coastal cities, it is critical to produce during the climate change assessment a risk/hazard map showing the inundation of land due to sea level rise (for coastal zones). It is apparent that in most areas there is no available risk map on sea-level rise because recorded data/observations are commonly scarce. If there are information that the sea level has increased over the years (based on undocumented people's account and other evidences) together with the high probability that sea level will rise due to climate change, an assessment of SLR impact and effects is crucial to be visualized/simulated relative to the available CC scenario.

In the absence of a local projection or precise observation data, one could use an incremental scenario of 0.5 meter, 1.0 meter and 2.0 meter sea level rise (SLR) as hazard factor. These scenarios are still essentially aligned to the projected change in *eustatic*[9] *sea-level* of 0.3 to 0.65 meters SLR (IPCC). The mapping of exposure to SLR Hazard could use the local topographic maps/surveys available to the city/municipality.

Sea-level rise visualization for one Urban Village (Sirangan) in Sorsogon City

This visualization used the same technique as that of the figure above. Images below are from Google Earth sourced in the internet which was used to visualize impact of SLR in the village. Top image (L-R) is the base map of the village and the base map with projected 0.5 m sea level rise. Bottom images (L-R) presents visualization of 1.0m and 2.0m SLR. The visualization however could not project water depth but shows the extent to which water could reach relative to area elevation.

[9] Global average SLR.

7.b Conduct of Community Profiling through baseline surveys

The climate change assessment results is expected to generate appropriate local actions on climate change and so far only general directions/strategies and not specific/direct actions could be borne out of the findings from the previous steps. To arrive to the goal of providing more information in aid of decision makers and planners, the conditions at the identified CC hotspots could be further detailed through socio-economic baseline surveys. The baseline survey is valuable especially in presenting the hotspots' CC vulnerability at the neighborhood level while making accessible gender disaggregated information that must be considered in local climate change action planning. Furthermore, the baseline data are critical instruments to facilitate monitoring and evaluation of actions taken by the city.

THE EXPERIENCE OF SORSOGON CITY BASELINE DATA GATHERING:

A. Designing the survey tool

The survey tool must be designed such that it will capture the current socio-economic conditions of the respondents while providing the demographic profile of each family including age and gender information. Depending on the information need to get a good sense of the individual and community adaptive capacity, the survey could be tailored to capture core poverty indicators being monitored by the government using the Millennium Development Goals and targets as a framework. Such was how the Sorsogon City climate change assessment team proceeded with the survey tool development, the conduct of actual enumeration, and the analysis of data gathered.

B. Community involvement in the baseline survey

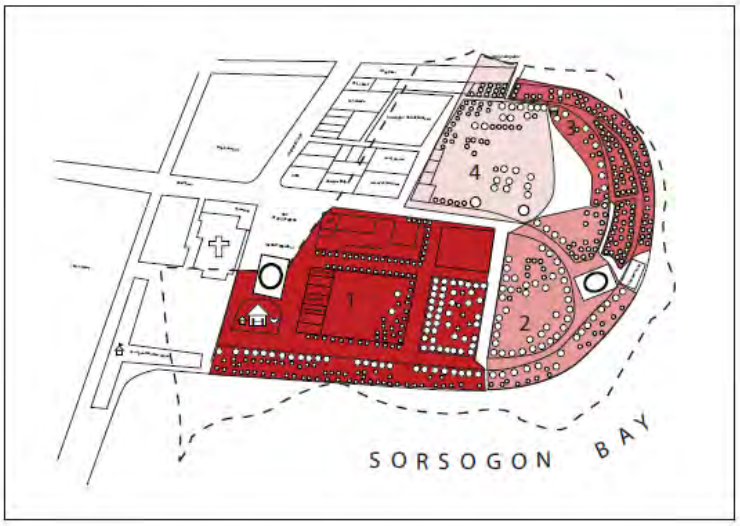
Having the communities involved throughout the process, it was deliberate on the part of the assessment team to directly involve the community in the conduct of enumeration. The assessment team partnered with the community health workers (who are actually village members) to conduct the enumeration considering the following:

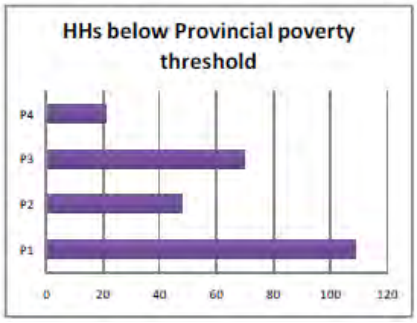
- They have previous experience in gathering community information
- Since they are part of the community, they are familiar with the area and families living in the village. This would ease establishing rapport with and trust from the respondents
- Given the above, data integrity could be ensured

Training for the selected enumerators was held to familiarize them with the survey tool and facilitate discussion with them on why the enumeration must be conducted. During the training, testing on the use of the tool was carried out where each one was asked to interview other training participants so they could try and practice on asking the questions and writing the responses in the actual survey form.

The figures below are examples of the baseline survey results that presents gender disaggregated information. The assessment team through the survey was able to map indicators at the neighborhood level shown in the figure as P1, P2, and so on. This detailed assessment and the mapping provide a strong analytical tool determining the spatial distribution of vulnerability.

HHs below provincial poverty threshold



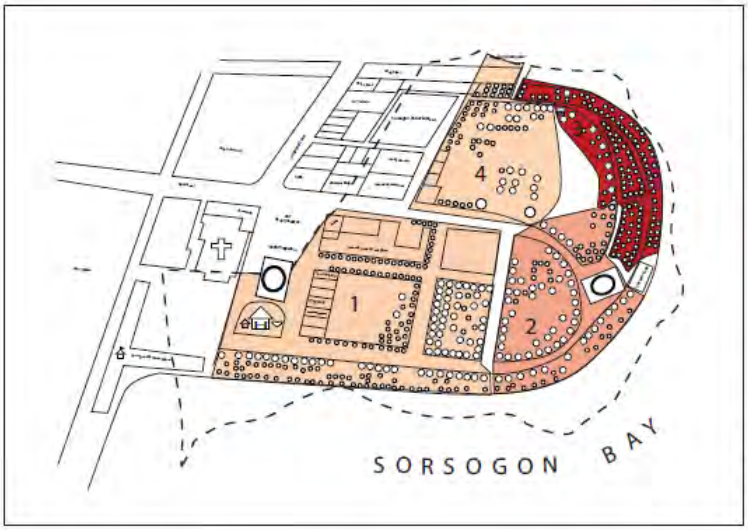


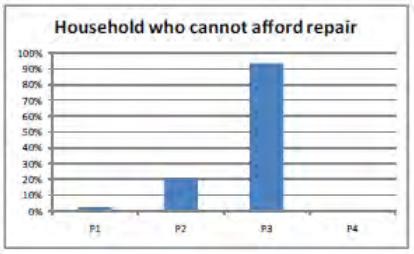
Number HH (by gender of HH Head)					
		P1	***P2***	***P3***	***P4***
Female headed	116	54	23	19	20
Male Headed	376	130	114	94	38
TOTAL no. of HH	492	184	137	113	58

HH living below PT (by gender of HH head)					
	TOTAL	***P1***	***P2***	***P3***	***P4***
Female headed HH	58	31	8	12	7
Male Headed HH	190	78	42	57	13
	248	**109**	**50**	**69**	**20**

Household who cannot afford repair

Sirangan





	P1	P2	P3	P4
Household who cannot afford repair	2%	21%	33%	0%

low *high*

HH Who cannot afford repair (by gender of HH head)

	TOTAL	*P1*	*P2*	*P3*	*P4*
HH Who cannot afford repair	141	6	31	104	0
Female headed HH	24	2	5	17	
Male Headed HH	117	4	26	87	

<u>Measuring Hotspot Adaptive Capacity through Community Asset Mapping Exercises</u>

Asset mapping is a technique for cataloguing local community assets/resources. Mapping community assets focuses on the positive assets of the community, defining what a community has and can build on, rather than what it is lacking. It is about 'building the community from the inside out' and recognizes that everyone has skills, abilities and talents that they can contribute to their community *(Kretzmann.J.P & McKnight J.L, 1993).*

Design for Structured Meeting on "Community Asset Mapping" (qualitative assessment)

ACTIVITY	Discussion Output
Introduction and Overview of the Activity	
Presentation/Sharing - What is a Community - What are assets	Common understanding of activity objective
Activity 1: Group Work "What has the community got and What are you proud of?" - Human Assets (demographics) - Land, Water, etc. - Structures including roads and other infra - Institutions and organizations - Livelihoods - Services - Technology - Others	List of community assets that could be used for adaptation
Activity 2: Facilitated Group Discussion: "What would you miss in the community if it was taken away?"	List of community values and focus adaptation priorities
Activity 3: Facilitated Group Discussion: What assets do you use and could use in preparing for climate related disasters (choose from the list/outputs from Activity 1).	Current community adaptive capacity

Step 8: Consolidate climate change assessment Findings

The findings derived from the process should be consolidated and presented in a report. The climate change assessment report should include all the outputs of the activities conducted and therefore must include both the quantitative and qualitative findings.

The report should include the integration of the ratings for the CC vulnerability factors namely exposure, sensitivity, and adaptive capacity could be done to define the CC vulnerability rating/score relative to an index that could be developed.

The exposure and sensitivity scores have been transposed into one quantitative value which is the risk rating in Assessment Matrix B for every socio-economic dimension. The mean rating for each climate risk (Indicated in Row 1 of same matrix) could also be derived should the assessment team deem necessary.

To quantitatively combine the derived climate risk scores (for exposure and sensitivity) with the adaptive capacity score, the assessment team could normalize the scoring as needed.

The report outline below may be used to present/consolidate the climate change assessment findings:

I. Introduction and Background

- ✓ City/Municipality Introduction
- ✓ The need for a Vulnerability and Adaptation assessment: Purpose and Objective
- ✓ climate change assessment framework used

II. Assessment Findings (Qualitative and Quantitative Assessment)

1.1 City/municipality Climate Change Exposure

1.2 City/municipality Sensitivity

1.3 City/municipality Adaptive Capacity

III. Conclusion

From the discussions and outputs in Chapter II, present the city/municipality key climate change V&A key findings and its implications.

- ✓ Relevance of the climate-related risks to city development based on the exposure and sensitivity assessment
- ✓ Strengths and weakness of the city and local stakeholders in managing the risks brought by climate change based on the adaptive capacity assessment
- ✓ What key adaptation options both at the city and hotspots level were identified to increase city adaptive capacity and manage sensitivity (adverse consequences) to

	climate-change exposure ✓ What local governance facilitative actions (practices, process, system, etc) are crucial to minimize local vulnerability
IV. Annexes	

Step 9: Conduct City Validation Meeting

Prior to finalization of the climate change assessment, the same should be validated through a broad-based consultation in a City Validation Meeting. This is to ensure that inputs from all relevant stakeholders, especially those who were not able to participate in the assessment workshop, will be considered in the final report.

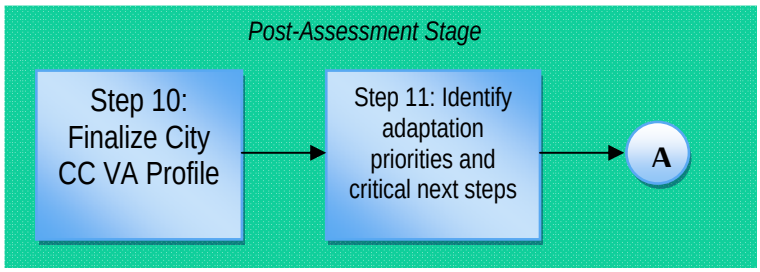
The primary objective of the city multi-stakeholder validation is to present the initial findings of the assessment and gather more inputs from stakeholders. Another objective of the activity is to identify priority areas for adaptation based on the results.

A sample activity design for a City Validation (as conducted in Sorsogon City) is shown below.

A Validation Meeting with Stakeholders		
02 December 2008, 8:30 – 11:30 am *City Hall*		
(Part 1) **Tentative Program**		
Time	**Topic/Activity**	**Presenter**
8:30 am	Registration	
9:00	Acknowledgement of Guests/participants Welcome Remarks	 Mayor Leovic Dioneda
9:15	Overview of the HUDCC/UN-Habitat/City Partnership on Climate Change and agenda for conducting the Vulnerability and Adaptation Assessment	Ms. Eden Garde HPM, UN-Habitat Phils.
9:30	Presentation of Results of the Vulnerability and Adaptation Assessment ✓ Who are vulnerable? To what,	UN-Habitat and City TWG

	in what way, and where. ✓ What is the society's adaptive capacity? ✓ What are the socio-economic characteristics of the system that leads to its sensitivity to climate hazards? ✓ Degree of present and future climatic risks ✓ Institutional processes of planning adaptation strategies and options	
10:15	Discussion/Open Forum	*Facilitator*
10:50	Synthesis of discussions and Agreements on Way Forward	*Facilitator*
11:00	Closing Remarks	

B. 3 Initial Strategy Identification Stage



STEPS 10&11:

The climate change assessment report could then be finalized following the results and inputs gathered from the city validation meeting. A LGU-wide and multi-sectoral workshop will facilitate initial identification of critical priorities and strategies towards addressing the identified city vulnerabilities. The participation of the local chief executive and other leaders to the workshop would be critical as this would inspire and drive the LGU staff and its partners to work on the CC issue/s.

Activity Design: LGU Technical Staff CC Workshop
Activity Objective: - Enhance LGU employees understanding on climate change facts and issues - Build a common understanding on climate change issues relative to the city context - Define propositions (priorities and strategies) to address possible climate change impacts in the city

Timeframe	Activity	Output
30 minutes	Opening Remarks & Presentation of Activity Objectives: - City Mayor	Directive for the LCE or LGU action
40 mins	Introduction on Climate Change and Discussion of V&A findings - Resource Person/Facilitator	Common understanding on local CC issues
2 hours	Workshop 1: Identification issues, priorities, and strategic actions (See template below)	Agreed Priorities and Strategies for Adaptation
30 minutes	Presentation of Outputs and Plenary Discussion	
1.5 hours	Workshop 2: Internal and External Assessment (LGU and possible institutional partners in pursuing proposed strategy/focus area for adaptation) *Guide Questions:* ▪ *Who should be involved in taking the action and what can they contribute?* ▪ *What are the constraints (structure, legislative, procedures, mandates, capacities, skills, etc) must the city overcome/address to enhance the role of the stakeholders in making the contribution?*	List of possible partners and identified capacity building priorities for the LGU and possible partners
30 minutes	Presentation/Plenary Discussion of Workshop Outputs	
10 minutes	Synthesis and Closing	Proposed Priorities and plans for next steps (preparation of proposition papers shall take off from this)

TEMPLATE FOR WORKSHOP 1			
Issue	**Sector/groups likely Affected**	**Key components of the Issue**	**Possible short term and mid-term actions to address the issues**
1. 2. 3. *(In what ways do you think will climate*	1. 2. 3. *(who will bear the costs of this effects)*	1. 2. 3. *(what are the key components of the*	1. 2. 3.

change affect the socio-economic development of the city)		*issues that need to be looked into in order to address the issue in a holistic manner)*	

This activity should lead to participatory action planning for the next phase. This is particularly important because the above process is still very LGU-centered and there is a need to broaden ownership of the strategy formulation process.

End Note

In September 2008 Sorsogon City commenced with the climate change assessment described here. The Validation workshop, described in Step 9, where an early draft was presented, was held in December of the same year. The climate change assessment was revised for the City Consultation, brining together nearly 200 representatives of the local government, national government, local and national NGOs, representatives of the Barangay, faith-based organizations and the community. At this event which was held in May 2009 the propositions (step 11) the city team had developed were critically reviewed. Four Issue Working Groups were constituted, developing a wide range of actions that could be taken by the city and its citizens. These were further prioritized and implementation has started in early 2010.

A second climate change assessment is currently (May 2010) being drafted. This edition will reflect more recent releases of localized climate data (which is referred to in this tool but which was not available when the first edition of the climate change assessment was drafted) and the in-depths household surveys which were conducted in the second half of 2010.

UN-HABITAT supports the documentation of the on-going Climate Change response in Sorsogon as well as city related climate change action in the Philippines. For more information please visit:
http://www.unhabitat.org.ph/climate-change

IV. References