Sorsogon City Strategy for Climate Change Resilience

2010-2011

Sorsogon City Strategy for Climate Change Resilience

Table of Contents

1.0 Executive Summary

Sorsogon City is no stranger to the impacts of the changing climate. Having been frequently visited by typhoons and storm surges way before climate change was mainstreamed, Sorsoganons somehow managed to cope with the stress and uncertainties brought by these disasters. Those living in urban barangays especially those residing in exclusive villages believe that they are relatively safe from strong winds and inundation. Those dwelling along coastal areas and those from rural areas rely on the existing system of rescue, evacuation, and rehabilitation in times of disasters. Those whose houses are made of light, wooden, or makeshift materials somehow have been accustomed to patch up whatever remains from the havoc. But with the surfacing of Climate Change manifested in stronger cyclones and storm surges, sea level rise, increased precipitations, and combined or overlapping risks that are simultaneously happening all over the globe, it is time for the City to properly and seriously assess its capacities, deficiencies, disadvantages, and resources to adapt to all these changes.

2.0 PROPOSITION PAPERS

2.1 Improving settlements and basic infrastructure in Sorsogon City to increase resilience to impacts of climate change

Sorsogon City is situated in the country's geographical Zone 6 where 3 typhoons/cyclones pass in two years. The city is also prone to storm surge as revealed by data gathered from the Natural Disaster Reduction Branch of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (NRDB-PAGASA). Stronger typhoons and storm surges caused by the changing global climate are foreseen to create further stress to the city's settlements especially in terms of housing and basic infrastructure. Strengthening these structures is crucial to increase the city's resilience to projected climate change impact. Not only would infrastructure strengthening initiatives help ensure the people's safety in the event of strong typhoons but also save the family assets and lessen household and government costs for recovery and reconstruction. In 2006, more than 10,000 houses in the city were totally damaged while damages to public infrastructure were estimated at P208 million pesos.

2.1.1 Settlements and basic infrastructure vulnerability of Sorsogon City in view of the impacts of climate variability and change

The climate change vulnerability of settlements and basic infrastructure in 9 identified urban hotspots of Sorsogon City could be generally attributed to existing social issues, current structural designs and available technology as well as existing governance policies and processes.

2.1.1.1 Informal settlements in danger areas

Forty five percent of the households in the city have no rights to the land their houses are built on. Informal settlements are usually situated in coastal areas, riverbanks, road-right-of-ways/roadway, and unlawfully dwells in private and government lands. Most of the houses in poor urban communities are either made of makeshift materials or light materials which are very susceptible to damages that could be caused by strong tropical winds and heavy rains.

2.1.1.2 Make shift houses and limited knowledge on typhoon resilient housing technology

House structure reinforcement and new technology to adapt to stronger winds, heavier rain fall and the increasing sea level are not yet popular with the general public. The vulnerable urban communities are hesitant to build stronger structures because they lack security of tenure. People use indigenous means to cope with cyclones like tying their makeshift houses to strong poles and putting weight (e.g. old tires and stones/rocks) on the roof. However, such indigenous ways have proven to be insufficient to protect their

houses from damages. With about 5,000 housing structures in the city being damaged yearly by typhoons, about Php 150 million is spent for housing reconstruction each year assuming a Php 30,000 cost of reconstruction for each house.

2.1.1.3 Aging and damaged bridges

Based on DPWH reports, the strong cyclones in 2006 (Milenyo and Reming) caused critical damage to Buhatan, Alice, Cawayan, and Abuyog Bridges. The flow of goods and trade as well as the mobility of people are at risk whenever anextreme event occurs.

2.1.1.4 Insufficient water drains and absence of river dikes

Based on the city disaster profile, a total of 20 barangays were identified to be flood prone. Previous floodings in those areas were attributed to insufficient drains and absence of river dikes. Assuming a 50% increase in annual rainfall and continuous downpour in 3 straight days, the existing drainage system in the urban areas as well as the present natural drain from the rivers will not be able to contain and hold the water resulting in damaging flash floods and run-offs to houses near the rivers and streams. Flooding could halt economic/livelihood activities and cause damage to properties making disaster recovery more costly and difficult.

2.1.1.5 Damaged seawall

The seawall that protects most of the coastal communities from storm surges has been heavily damaged by the two super typhoons in 2006. Though repair activities have already been done, only minor sections have been repaired due to limited budget from both local and national government. As revealed during FGDs, most of the hotspots considered the present damaged condition of the sea wall in their areas as a major factor that increases their vulnerability to storm surge and sea level rise. The city government, however, lacks consolidated information on the structural gaps of the sea wall considering that the said protective infrastructure is managed and maintained by the national government through the Department of Public Works and Highways.

2.1.1.6 Land use plans are not yet responsive to climate change impact scenarios and built-up areas are within zones threatened by sea-level rise

Development of the city is guided by the approved city land use plan. It is intended to be a planning guide for city development to be situated in the most appropriate and suitable areas. The existing land use plan of the city has not considered climate change impacts scenarios and their underlying development constraints implications to specific areas. Currently, the built-up environment as planned is highly concentrated in areas near the coast that could be threatened by storm surges and rising sea levels.

During focus group discussions, people from these coastal barangays shared their actual observation of inundation in beach areas and coastal shores especially in the Bacon District. Older citizens estimated that about 50 meters of land in Poblacion and about 15 meters of land along the shoreline in Cambulaga have been inundated by sea waters. Some people interviewed in Poblacion recounted that, in the 1950's, there were access roads that served as their play area in the area where shore lines are now situated.

2.1.1.7 Absence of city shelter plan

The city has yet to define its shelter plan with strategies and options on how to address its housing backlog and future needs. Existing government reports present that 43% of the households do not have security of tenure and informal settlers lack basic services. The city population is growing at 1.7% annually, including the migration of families from

nearby municipalities magnetized by the city's role as education, administrative and trade center of the province. Yet, there is no appropriate strategy defined yet on how to respond to the shelter concern that matches with the existing resources of the local government, the families needing housing, and the other actors such as NGOs providing shelter assistance. The coordination among national government, local authorities and civil society needs strengthening to ensure complementarity of actions considering that climate change impacts could result to displacement of a large number of people in the city.

2.1.1.8 Weak "local policy on construction of safe housing" that considers Sorsogon's exposure to natural and climate risks

Building and construction of settlements in Sorsogon city is guided by the National Building Code. The code, which was formulated three centuries ago, does not provide for guidance on technology that must be applied considering risks brought about by climate change and variability. There is no local policy that could help enforce the national law which also considers the local context and disaster risks that the city faces.

2.1.1.9 Secondary/underlying risks

- *Solid waste.* Since the informal settlers are located in high risk areas, these sites have no access to solid waste collection systems resulting in dumping of waste in waterways, vacant lands and bodies of water. This indiscriminate dumping is the major cause of clogging of waterways, flooding and contamination of water bodies.

- *Sanitation.* The city has 25% of the total households with no sanitary toilets. The figure is higher in informal settlements. For households along the shorelines with septic tanks, the septic tanks are encroached by the bay during high tide. Source of potable water is also insufficient in these areas with only 72% having access to potable water.

2.1.2 Efforts and measures taken to address issues on shelter and basic community infrastructure

The city's shelter activities are mostly facilitated by the national shelter programs like the GSIS, SSS, and Pag-IBIG housing programs. These agencies also open up facilities to support families affected by calamities. But it caters mostly to the upper 10% of the housing sector in the city and has not actually solved the needs of the informal settlers.

There are on-going projects in the city that help promote safe housing and community development. These include the Gawad Kalinga (Christian Village) in partnership with a religious group and Core Shelter program in partnership with Habitat for Humanity. The LGU helped in concreting of road networks in the housing sites.

Land acquisition for the purpose of establishing resettlement sites for indigents were also done by the LGU. However, these were limited and insufficient to address the needs in conformity with the land use plan of the city or thoroughly considering the suitability of the area.

The city government already created an urban poor affairs office but only on temporary terms under the Office of the Mayor. This led to the inventory of housing needs and acquisition of more resettlement sites with the advocacy of an NGO (COPE Foundation). Other activities included the participation in the city sharing of UHDA implementation, organization of the urban poor, passage of an ordinance for the development of the urban poor and soft loans to this sector.

2.1.3 Lessons from previous experiences

2.1.3.1 Participation of stakeholders is needed in all aspects. Strong community mobilization is needed so that people could better understand the need for safe housing and the need to cooperate and participate in improving and maintaining basic community infrastructure. No single institution or group could resolve disaster related issues and the responsibility should be shared among all. Civil society plays a main role in working with communities while governments provide the appropriate policy environment to make things work on ground.

2.1.3.2 Proliferation of informal settlers may be attributed to the weak implementation of policies. Proximity to livelihood sources and access to basic services (education and health), and poverty are factors driving the informal settlers to live in high risk areas. Institutionalization of an urban poor affairs or housing office with permanent structure is necessary for an effective housing program. It will improve the government's relations and services to the poor as it functions as platform for discussion and opens opportunities for dialogues resulting in better services for the poor.

2.1.3.3 Safe housing policies have not been instituted at the local level. Communities need to learn how to reinforce their houses and build back better to avoid the cycle of "build and bust" because of annual typhoons.

2.1.4 Immediate measures for Sorsogon City to increase housing and basic infrastructure resilience to impacts of climate change

To ensure sustainable development of the city, the built-up area must be planned and built with full consideration of the risks that impacts of climate change could bring. This is important as the changing climate could undermine development projects and infrastructure investment. Over the short term, poor people who are the most vulnerable living and working in the city's built environment should be assisted in order to minimize climatic induced disasters. Likewise, a responsive policy environment and coordinated stakeholder support must be ensured to facilitate appropriate anticipatory planning and

2.1.4.1 Information and education campaign on the importance of building climate resilient housing and infrastructure

a. Engage with local media and schools in the city to promote awareness on climate change especially its impact on housing and settlements.

b. Research on and localize for application the "basic principles in building typhoon resilient housing". This could be done in strong coordination and involvement from the barangay leaders and the youth (for information campaign).

c. Train community builders/leaders in assessing vulnerability of houses in their respective areas. Validate community vulnerability maps and develop community action plans to increase housing and basic infrastructure resilience to climatic induced hazards.

d. Organize regular community water drain clean-ups to avoid flooding and increase local people's participation to activities.

2.1.4.2 Establish partnerships among communities, NGOs, academe and local government for projects that would result to the rehabilitation of protective and linkage infrastructure like sea walls and bridges.

2.1.4.3 Research and demonstrate micro-insurance mechanisms for housing damages. The local government and NGOs engaged in micro-lending could best figure in this endeavour considering that the poor who are constrained to engage with formal institutions are best served by the first two.

2.1.4.4 Improving local policies, plans, and programs to support climate resilient settlements

a. Plan and identify appropriate areas where to lead investments and situate development infrastructures to support the city's competitiveness despite climate change impacts. This shall lead to the revision of Sorsogon City's current CLUP.

b. Develop local maps that identify safe and unsafe areas to better manage people's access to public service (health, education, recreation, etc.).

c. Formulate and implement a city shelter plan through a participatory process. City government should create/identify the office that will be responsible for its formulation and implementation with the participation of the stakeholders and other LGU departments.

d. Institutionalize local policy guidelines and monitoring scheme on the implementation of safe building principles as aligned with the National Building Code.

2.2 Enhancing livelihoods in Sorsogon City to increase resilience to impacts of climate change

Sorsogon City is the administrative, commercial, and educational center of Sorsogon Province. Given this role, the trade and services sector of the city is fast growing and is supporting families living in urban areas. The natural endowments of city, however, encourages its people to engage in agriculture and fishing where products are in demand and easily tradable in the market.

2.2.1 Livelihoods risks in Sorsogon City which are posed by climate variability and change

The poor populace is projected to be further challenged by impacts of climate change which could alter their livelihoods sources and patterns of productivity. Since the poor in Sorsogon City source their income directly and indirectly from trade, agriculture, and fisheries-related activities (the last two being generally climate dependent), poor families would have difficulty in meeting their basic needs such as health, water, sanitation, and food security. Without adaptation, the poor families in Sorsogon relying on climate related/dependent activities will have limited ability to cope with a changed climate.

2.2.1.1 Inundation of the center for trade and commerce

The threat of climate-induced risks to Sorsogon City has far-reaching implications as the city is the urban center of the province of Sorsogon and a hub of trade and commerce. With the sea level-rise scenarios of 0.5 m, 1.0 m of the IPCC as well as the 2.0 m worst case scenario, the downtown area, where major commercial establishments are located, would be inundated.

2.2.1.2 Threatened tourism sector

Given the multiple climate change risks exposure of the city, the tourism sector which is highly weather/climate dependent is facing risks. Climate change would impact on the revenues of beach resorts and the parks located in the coastal areas as well as the income of small traders and micro-entrepreneurs linked with tourism establishments.

2.2.1.3 Decrease in farming and fishing productivity

Increased precipitation and warmer temperatures could alter the productivity of farmers in the city. Around 6,000 rice and coconut farmers would have to face the risks of climate change impacts. In 2006, the damage of Typhoon Milenyo to agriculture and fisheries sector was estimated at Php 234 million. Coconut farms were damaged with prolonged impacts to families as it takes 2 to 4 years to fully recover thus limiting income sources over the same period.

The fisheries sector is highly disturbed and challenged by impacts of warming waters and excessive rains which are contributory to the lingering case of red tide in Sorsogon Bay. The red tide in Sorsogon Bay is disrupting the employment and incomes of at least 245 households who are dependent on “green mussel” culture with an estimated production of 141.8 metric tons in 2006 (prior to Typhoon Milenyo).

Farming tools and fishing of gears were also lost or damaged during heavy typhoons and flooding that affects people’s capacity to immediately return to their productive activities.

2.2.1.4 Job losses and limited skills

Workers and service providers to businesses whether micro, small or medium often end up losing their jobs and income sources when climate related disasters happen as shops close down or reduces overhead spending. There are people in the city who account the loss of their jobs to the two strong cyclones in 2006.

2.2.1.5 Limited skills and knowledge alternative livelihood sources

Famers and fisherfolks in Sorsogon City present themselves to have limited options in earning income when disaster strikes considering their limited skills and knowledge. Those engaged in vending and peddling products in the informal market experience limited opportunities to go into other activities once supply becomes limited. Government and other stakeholders’ response to these scenario were not adequate considering that there is no information that they could refer to which may help in strategically matching affected families with new income opportunities and sources.

2.2.2 Efforts and measures taken to address declining productivity in the city due to climate variability

2.2.2.1 The City Agriculture Office (CAO) through the support of the Department of Agriculture (DA) at the national level has produced and has been promoting new rice varieties that could more or less withstand the hazards and variability brought about by climatic conditions. For instance, the CAO is now promoting and distributing some seed stocks that are adaptable to excessive water (flooding) and strong winds and humidity. The IRRI 46 variety is an example of this adaptation. There are rice varieties that were developed and promoted by DA as adaptation to climate variability such excessive water, drought and strong winds.

2.2.2.2 Alternative livelihood assistance were provided to affected fishing families due to the red-tide case in Sorsogon Bay. The provincial government and different municipalities in Sorsogon including the city have been engaged in activities towards rehabilitating the Sorsogon bay and responding to the needs of affected fishing families. The Bicol University has undergone research activities to support this inter-municipality effort while NGOs have been engaging with fishing families to find alternative livelihood sources.

2.2.3 Immediate measures for Sorsogon City to increase housing and basic infrastructure resilience to impacts of climate change

Considering the vulnerability of the agriculture and fisheries sector to climate variability, there is a strong need to support families in Sorsogon City to expand their livelihoods and get income from activities that could be less disrupted by weather disturbances and climate variability. Options could include directing and encouraging poor people to get more involved in micro-enterprises and other skill-related jobs and services. Such is highly feasible as farming and fishing families often explore other means of livelihoods when it is off-season to farm and fish. Support to the tourism sector would also be highly vital as city development programs are highly anchored on the said sector while there are existing micro enterprises linked to the industry. These micro-enterprises are often the lifeline of middle income and poor families. Immediate activities to increase livelihoods resilience could therefore be on the following:

2.2.3.1 Develop a livelihoods baseline for the city that considers climate change and disaster risk typologies per livelihood activity

2.2.3.2 Develop alternative livelihood programs that take into account the vulnerability of the communities in the identified hotspots to increase people's resilience to impacts of climate change. Activities may include:

- Skills mapping
- Training and re-tooling
- Linkage to Technical Education and Skills Development Authority (TESDA) for job matching and training
- Micro-lending for start-up funds (through established MFI in the City)

2.2.3.3 The tourism areas (Caricaran resort area) should work on utilizing and adapting building designs and structures that are more resilient to stronger winds and more frequent and prolonged rainfall.

2.2.3.4 Sustain and support the Agriculture Department's assistance to farmers and fishing families by expanding research and disseminating information on varieties that are adaptable to excessive water, strong winds and humidity.

2.2.3.5 Strategically plan urban growth areas that would place commercial centers in places with less risks while also helping the development of new urban growth nodes and expanding more opportunities for families in Sorsogon.

2.3 Improving environmental management and promoting climate change mitigation actions in Sorsogon City

Environmental management plays a crucial role in achieving sustainable development. Likewise, environmental management is very important in reducing risks and vulnerabilities of people to disasters that could be brought by impacts of climate change. With environmental degradation, the natural and dynamic barriers to hazards are weakened thus resulting in disasters and affecting social equity and economic efficiency of cities. Sorsogon City boasts of diverse natural endowments (forest and

coastal/marine resources) that support its development and ecological balance. These resources however are threatened because of human activities and impacts of climate change.

2.3.1 Emerging issues on environmental management in Sorsogon City vis-à-vis climate change issues on adaptation and mitigation

2.3.1.1 Degradation of coastal and marine resources

Sorsogon Bay and Albay Gulf are the main fishery sources for the city. However, Sorsogon Bay is at present experiencing a major setback. Because of intense economic activity and waste discharges from informal settlers around Sorsogon Bay, it is plagued with red tide and other pollutants which affects the mortality of marine and coastal species in the area.

The rampant use of illegal fishing methods, over- fishing, inadequate coastal zone management, poor water quality and loss of commercially important species exacerbate the degradation of Sorsogon Bay. The degradation of the bay is worsened by indiscriminate dumping of domestic and industrial wastes and the massive conversion of mangrove forest into fishponds as well as the unregulated utilization of these mangrove resources for personal and commercial purposes. With the degradation of the coastal and marine resources in the city, fishing communities' adaptation to climate change impacts could be strained as their income sources becomes limited.

2.3.1.2 Inadequate forest cover

Forestland, which is 7,612.76 hectares, is 24% of the total land area of the city. This was once an economic resource where timber, mangrove firewood, and rattan poles were being extracted. The period of Sorsogon City as a timber and hardwood production place has long been gone. Secondary growth forest, which is equally accounted for by open and close canopy mature trees, now covers the logged-over timberland. It is a reality however that the forest cover of the city should still be improved as run-offs still causes floods. Together with heavier rainfalls and stronger typhoons due to climate change, the built environment is facing great risks from flash floods and erosion. This issue also limits carbon sequestration capabilities of the city that could contribute to the global campaign to lower CO2 levels in the atmosphere.

2.3.1.3 Pollution and lack of waste management systems and facilities

- The city has no sanitary sewerage system. In the city proper, septic tank effluent and wastewater flow through the existing drainage system. In areas without drainage facilities, wastewater and effluent are disposed through seepage pits and ground surface. These flow through natural waterways and eventually to Sorsogon Bay.

- The solid waste disposal need of the city is being served by 9 operational garbage trucks and 256 environmental aides (100 garbage collectors and 156 street cleaners) under the supervision of the City Environment & Natural Resources Office (CENRO). Though the city has established material recovery facilities in each barangay, it is yet to establish its controlled dumpsite to comply with the Solid Waste Management Act of the Philippines.

2.3.1.4 Residential electricity users contribute the highest in the city carbon emission profile (electricity and gas consumption).

Though Sorsogon city produces renewable (geothermal) energy, the power generated is fed back into the Luzon Grid for distribution. Therefore, the local geothermal source is not maximized by the city. Energy saving lighting and other means to minimize consumption of electricity is not yet as popular in the Sorsogon City as it is in Metro Manila. Based on the city GHG profiling, it is the residential electricity users that emit the most carbon.

2.3.1.5 A significant number of the dominant transport vehicles (tri-cycles) still use 2 stokes engine.

About 40% of the total 3,114 registered tricycle in the city still use 2 stroke engines with high pollutant emissions.

2.3.2 On-going environmental management and climate change mitigation efforts of the city

2.3.2.1 **Mangrove rehabilitation projects.** Environmental management is one of the priority programs of the city. The "Luntiang Daigdig" program was coined for these environmental-related programs. Under which is the "Luntiang Dalampasigan" Project, aimed at rehabilitating and protecting the coastal and marine resources of the City. The CENRO takes full responsibility in the propagation, protection and maintenance of these mangrove forests from all agents of destruction.

2.3.2.2 **Massive IEC on environmental protection and solid waste management.** The city through the CENRO is conducting an LGU-wide and intense Information, Education and Communication Campaign on proper management, handling and disposal of solid wastes. Future plans include IEC on other environmental concerns such as in air and water quality protection.

2.3.2.3 Declaration of Sugod Bay as marine protected area in 1998. The marine and coastal resources of Sugod Bay are protected through its declaration as Marine Protected Area since 1998.

2.3.2.4 Passage of EO No. 750 (Sorsogon Bay Rehabilitation and Development Council). The Council is tasked to formulate plans and programs for the rehabilitation and protection of coastal and marine resources of Sorsogon Bay.

2.3.2.5 Establishment of fish shelters and seaweed farms. The city through the CENRO is putting-up fish shelters, seaweed farms and marine-culture projects for the propagation and enhancement of marine species in the area.

2.3.3 Proposed actions to promote environmental management and climate change mitigation

There are several measures that could be undertaken to promote environmental management and climate change mitigation activities. Immediate actions could include:

2.3.3.1 **Reforestation of mangrove and watershed areas.** These should include rehabilitation of coral reefs and seagrass beds. Also to be considered is the provision on the massive conversion of mangrove forest areas into fishponds.

2.3.3.2 **Proper sewage disposal.** The promotion of proper waste management to the surrounding areas, especially to rivers that flowed-down to Sorsogon Bay, should be

intensified. Promote waste recovery schemes that will prevent further destruction to the environment.

2.3.3.3 **Massive Information, Education and Communication Campaign.** Promote awareness and education to local settlers through multi-media campaigns and community organizations. Encourage multi-sectoral support to develop a concerted program against environmental degradation and climate change mitigation through lowering of energy consumption, reforestation, and conversion to 4 stroke engines for tricycle/motorcycles.

2.4.0 ENHANCING CLIMATE AND DISASTER RISK REDUCTION PROGRAM OF SORSOGON CITY

Disaster preparedness is at the core of the city's development agenda and it is mainly the City Disaster Coordinating Council (CDCC) who is tasked to handle it. In times of natural catastrophe and other man-made hazards, the city carries out its disaster preparedness plans and contingencies through the City CDCC headed by the City Mayor. The CDCC is mirrored at the barangay/village level with the existence of the BDCCs headed by the Punong Barangay. Assisting also are the volunteers of the Sorsogon Emergency and Rescue Team and the Philippine National Red Cross for relief operations.

Due to the geographic location of the city, the most common hazards/risks that could lead to disasters are the ones related to typhoons and resultant storm surge and flooding. Accelerated sea-level rise has also been realized as a threat that is associated with climate change. Climatological science has foreseen that because of climate change, stronger typhoons, heavier rain fall and warmer temperature could happen. As experienced, strong typhoons that damaged the city include Wilming in 1966, Sisang in 1987 and Milenyo and Reming in 2006, all with wind velocity of more than 200 kph. They brought enormous destruction and loss of life, property and livelihood. The poor living in the high risk coastal areas took most of the toll. The poor people are more impoverished because of these calamities.

Disaster risk management is primarily intended to prevent the losses of lives, minimize human suffering, reduce property damages and economic losses and speed up the recovery process. The major part of it is informing the public including the authorities of the risks.

2.4.1 The need to enhance climate risk reduction and disaster preparedness

The city, especially the 37 coastal barangays, must have enhanced mechanisms in reducing the risks they face due to stresses that climate change is projected to bring. These coastal barangays are foreseen to experience more damaging threats associated with both sudden onset disasters like stronger typhoons and storm surge as well as the slow creeping disasters like accelerated sea level rise.

It could be said that Sorsogon City has already established a way of saving lives when it comes to sudden on-set disasters because of previous experiences. The 2006 typhoon events caused no death toll in the city but caused massive damages to properties, public infrastructures and livelihoods.

2.4.1.1 Limited management and planning tools to link DRR program to city climate change vulnerability and exposure

The city DRR scope is focused on rescue and emergency situation and oftentimes preparedness is anchored on the same scope. The climate change scenario of Sorsogon City would require a more pro-active stance and anticipatory planning and contingency measures.

2.4.1.2 Weak participation of stakeholders in DRR

The CBDRR concept is mostly lodged with the barangay leaders and locals/village people has limited inputs and participation in planning for various disaster management activities. People in the community, being the most immediate sector which needs to adapt and cope with disaster and changes in the environment, should have a prime role in CRR actions.

2.4.1.3 Outdated data gathering and management

There are weak data management capacities among DRR players. This limits the facilitation of a more scientific (e.g. mapping) and strategic DRR and CRR planning. Vital components of DRR like spatial and physical planning considerations are hampered by the outdated information management schemes.

2.4.1.4 Weak institutional capacity for recovery and reconstruction

DRM in the city is very reactive and response-oriented and so consequently missing the equally important items that contributes to disaster mitigation and preparedness such as recovery and reconstruction.

Training programs on DRR are usually inclined to emergency and relief strategies leaving the equally important aspects like recovery, reconstruction, and now anticipatory strategies aligned with climate change.

Due to the absence of a long term DRR plan and a permanent department that will manage the DRR activities, the CDCC compile the damage reports from the different agencies present in the city and submit through channel. Activities of the government on the rehabilitation of damaged infrastructures are implemented by various agencies. But there is lack of mechanism for the LGU to consistently monitor, supervise and evaluate rehabilitation efforts.

2.4.2 A look at the existing DRR mandate and previous actions

As mandated by Law, the city has an existing City Disaster Coordinating Council (CDCC) and every barangay has its own Barangay Disaster Coordinating Council (BDCC). However, past and present activities were focused on evacuation and relief operations. They do not focus on pre-disaster prevention and long term rehabilitation activities. Moreover, not all BDCCs have the capacity in terms of conducting rescue operations because of lack of rescue equipments.

The LGU has Disaster Risk Reduction Plan 2008-2009 and the CDCC is usually active during and immediately after every calamity. At present, the Local Government of Sorsogon has taken initiatives in disaster preparedness and risk reduction through the re-organization and reactivation of the CDCC. The information campaigns are into community level tackling information on disaster risks, response mechanisms, and structures.

2.4.3 General measures that could be taken to improve the city CRR and DRR program

2.4.3.1 Improve the CRR and DRR management and planning tools and capacities

Build capacities of City Disaster Coordinating Council and establish a secretariat or a permanent office for disaster risk management who shall coordinate with the different departments in the formulation of plans (comprehensive disaster risk reduction plan, contingency plan) and implementation of programs and projects related with climate

change and its impacts. This shall institutionalize a structure that would plan and implement short and long term actions towards climate risk reduction and disaster preparedness.

Having responsive planning tools and programme and a structure that could promote CRR and DRR will help facilitate for the sensitisation of existing plans and programs (i.e. CDP and CLUP) of the local government. This shall lead to the climate proofing of projects and development initiatives and thereby increasing resiliency of the city to future untoward climatic events.

2.4.3.2 IEC to increase stakeholder participation

It is said that disaster preparedness and climate adaptation really starts from the households and the community they are in. It is therefore crucial to increase awareness of people to risks and hazards they face in order for them to adjust to and be prepared with what is ahead.

Participation of various local actors, like the civil society and private groups, through IEC must be incited to strengthen people's social network and support mechanisms in case of disasters. Through IEC, harnessing of resources and social mobilization for action could be facilitated.

2.4.3.3Increase involvement of the youth, children, and women

The impacts of disaster vary depending on the status and capacities of a person or group. The youth, children, and women are most vulnerable when catastrophes happen. It is but crucial that they participate in CRR/DRR initiatives so that their specific needs could be addressed or acted upon from the planning stage to actual engagement.

3.0 City consultation on climate change actions

The Local Government of Sorsogon City, in partnership with the UN Habitat-Philippines, conducted a two-day workshop/consultation on climate change actions on May 14-15, 2009 at the Our Lady of Peñafrancia Seminary in Sorsogon City, Sorsogon Province, Philippines. Stakeholders both from Albay and Sorsogon, representatives from different peoples organizations, government line agencies, local officials, media practitioners, academicians and local leaders participated in the multi-stakeholder consultation and shared their experiences, concerns, and ideas on climate change issues.

3.1 Objectives

The consultation was undertaken to do the following:

3.1.1 To consult and dialogue with public, private, and civil sectors on their stake and interest in the city climate change initiative;

3.1.2 Multi-sector participants to jointly identify priority issues and actions and key actors that should critically take part in the city climate change initiative

3.1.3 To mobilize social and political support and commitments from all.

At the end of the two day activity, the following were achieved:

- Identified and reviewed climate change issues
- Created common and better understanding of issues

- Identified multi-sectoral approach/strategy/priorities for climate change adaptation and mitigation
- Secured commitment of support by all actors and stakeholders to play a role

3.2 Highlights

As inputs to the formulation of actions plans, General Ireneo Manaois, head of the Sorsogon City Technical Working Group on Climate Change, updated the body on the project status. Mr. Bernhard Barth, Human Settlements Officer, UN-HABITAT HQ in Nairobi, Kenya, discussed the principles on Sustainable Urban Development and laid the reasons why the pressing concern on climate change is putting at risk sustainable urban development. The mere fact that most of the cities are situated in coastal areas and urban slums thrive in said areas, thus making them all the more vulnerable to storm surge and sea level rise. Mr. Barth underscored that such phenomenon proliferates practically in search of greater and better opportunities to sustain their existence unmindful of the perils of living in coastal slums. So that when Mother Nature strikes, coastal communities especially the poor are the most severely affected. He reiterated that while these scenarios continue to sprawl, adaptation and mitigation are the most feasible means to reduce vulnerability and climate change impact. Basic services on climate-proof hardware, knowledge in infrastructure, solid waste management and better urban planning should be the primordial concern of all entities to arrest the disastrous effects of climate variability and change.

Ms. Ma. Adelaida Mias-Mamonong, Climate Change Project Coordinator, UN Habitat-Philippines, on the other hand, highlighted the findings they had gathered from the research and study conducted by the technical working group. Having identified nine (9) urban hotspots to be highly vulnerable to the climate change impact, Ms. Mamonong stressed that there is a dire need to enhance GIS capacity as this would give outright information as to what areas are sensitive or prone to flooding, liquefaction, siltation or landslide. In this way, erection of settlements whether permanent or temporary would discourage developers both in the private and government sector. The result of the study also strongly advocates the revision and reconsideration of the current land use plan. In the presentation, untoward events are most likely to happen to the central business district of the City of Sorsogon including those that were identified as urban hotspots in the event that there will be a storm surge or sea level rise. This could practically doff some areas including landmarks from the map. Ms, Mamonong, likewise, encouraged LGUs to intensify and fortify the PDCC, CDCC and BDCC to take into account all anticipatory planning on saving properties. While it is rational to save lives, emphasis on saving property should also be looked into to make sure that the people, when the storm subsides, have intact dwellings to return to. In this way, the people may save their penny for other expenses rather than toil themselves in rebuilding houses leaving them perennially broke.

Mr. Mon Diño queried as to why the UN Habitat is focusing on adaptation rather than prevention, like planting of trees to obviate flooding. He also queried on the measure of validity of the findings, including the level of impact and damage should extreme events occur. Ms. Mamonong construed that these phenomena are certain. She recounted on the impact and damage caused by Typhoon Milenyo and Typhoon Reming which happened to be the result of man's relentless abuse of nature. And since these events are inescapable, adaptation and mitigation are the only practical means to save lives and property. It is best to be prepared. The measure of damage in the environment had tremendously impacted all continents, countries, cities sparing none including the lowly province of Sorsogon. He also asked whether rain gauges were used during the course of study to measure the actual rainfall. Ms. Maribeth Fruto informed the group that there is a rain gauge in Gubat, Sorsogon. Ms. Alice Lopez also said that there is a rain gauge in Sorsogon Dairy Farm and also a crustal gauge given by the United Nations. Ms. Mamonong explained that the results of the study were based on scientific research and Focus Group Discussion with the people in coastal barangays. Stories of older citizens regarding inundation of shores particularly in Bacon District were highly noted and given weight. Mr. Ed Laguerta of PHIVOLCS, on the other hand, stated that the siltation could be one of the reasons for sea level rise. According to him, fine

earth, boulders, rocks in rivers, ponds and lakes through heavy downpour could cause it to empty in seas, attributing to the sea level rise. A representative from the Mines and Geosciences Bureau also stated that identifying fault lines play an important role in the mitigation and adaptation measures initiated by the communities and LGUs. He added that the Bureau is done with the identification of areas suitable for housing development, as well as areas perilous for development as these are either prone to flooding or siltation.

Mr. Frejas of Barangay Piot raised his concern on the unabated logging in Barangay Guinlajon, Basud, Ticol and Capuy. He was anxious of the possible misfortune that illegal logging would bring should the government fail to stop or regulate said activity. Ms. Mamonong, however elucidated that the aforementioned barangays are not included in the hotspots although they are considered to be landslide-prone areas.

The afternoon session was allotted for the workshop wherein the stakeholders were divided into two groups. Group 1 tackled the issues on Environmental Management. Group 2 tackled the issues on Settlements and Infrastructure. From these groups have emerged actual pressing needs of the community in terms of housing and livelihood which the stakeholders have attempted to address in the hope of resolving the issues on feasible short-term and mid-term actions.

3.3 Consultation Workshops

The groups presented their workshop outputs in the plenary. The group on Housing stressed the need to intensify information and education campaign to rouse consciousness on environment concerns as we all play a major role as to what and how our mother nature have become. The group strongly suggested that environmental issues particularly climate change needs to be included in the curriculum. In fact Bicol University in Albay had already jump started this noble task of incorporating the issue on climate variability and change in academics. Film showing would be of help but it is advisable to view Filipino/Tagalog films or in a language that could be well understood by the public. Having tried airing the “Inconvenient Truth” did not leave any impact as it appeared to be “too foreign” and “too technical”.

The group also raised the concern on what the local government should do in the event that disasters would again strike the locale. Soft loans should be offered by the LGUs to save our lowly “kababayans” from loan sharks.

As elucidated from the workshop, the group inferred that the city shelter plan has to be instituted and that it should be made mandatory by the local government to make stiffer and tougher housing policies. IEC and provision of basic services on the internationally accepted standards on erecting typhoon resilient settlements and infrastructures should also be given bearing by the government. In this way, we can save lives and protect the people from disaster risk and more so from bankruptcy and insolvency.

Current land use plan should be revisited as it is for now not responsive to the challenge of times considering the proximity of the central business district and the bulk of built up area along the coastal areas which is highly vulnerable and poses imminent danger to the coastal communities.

3.4 Group Reports

GROUP 1: Information and Education Campaign

PRIORITY SPECIFIC ISSUES	SECTOR/GROUPS LIKELY AFFECTED	POSSIBLE SHORT TERM AND MID-TERM ACTIONS TO ADDRESS THE ISSUE/S (1-3 YEARS)
Community (children and adults) have limited knowledge on what is climate change and specifically what a climate resilient housing is	Everyone Lead agency to take action: LGU with inputs from line agencies (MGB, DepED, BU,SSC)	Film showing, documentation of local experiences, exhibit roll-out of clippings, footages (pictures, stories); seminar on lifestyle changes (energy, lifecycle assessments, consumption, etc); environmental contests; Curriculum development (primary, secondary, and tertiary)
No available Housing and Building Standards in terms of Climate Resilient Housing considering local situation (weather, building materials, location, etc.)	Community, Contractor, Engineers, Architects Lead agency: CHED, PRC	Issuance of permit can require attendance to workshops/trainings on climate resilient building codes; showcase of designs of resilient houses
Limited specific information on designating hotspot areas, danger zones	Would-be owners, contractors Lead: LGU and MGB	Survey/Gathering of data of existing structures (houses, buildings, etc.) which include locations, vulnerability; dissemination of geohazards maps which should go down to the barangay level
Few barangays undertake regular water drain clean-ups and are not continuing projects	Community; all sectors	Adopt-a-barangay Project or Adopt-a-river Project which could be done by schools (primary to college) and different agencies; intensify solid waste mgt thru community/barangay training or workshops

Group 2. Establishing partnership amongst communities, NGOs, academe, local government etc…for projects (sea-wall/bridges)

PRIORITY SPECIFIC ISSUES	SECTOR/GROUPS LIKELY AFFECTED	POSSIBLE SHORT TERM AND MID-TERM ACTIONS TO ADDRESS THE ISSUE/S (1-3 YEARS)
No organized groups	Community Agriculture	Encourage volunteers to participate in community undertaking
Political affiliations	Transients	Set aside politics and prioritize needs of the community
Limited fund of LGU	Business	Establish lobby groups with LGUs
Fund sourcing and no capability/knowledge in networking	Transport	Seek information on how to coordinate/network with other agencies
	Tourism industry	

		Forward report to DPWH and DPWH to reconsider sea wall design for Sorsogon

Group 3: Research and Demonstrate micro-insurance mechanisms for housing damages

PRIORITY SPECIFIC ISSUES	SECTOR/GROUPS LIKELY AFFECTED	POSSIBLE SHORT TERM AND MID-TERM ACTIONS TO ADDRESS THE ISSUE/S (1-3 YEARS)
1.Lack of experience on doing/implementing housing micro-insurance (and livelihood implements). Boats farm machines, crop, little shops, etc)	Lead actor: PALFSI, SSC, LGU	Conduct of research/feasibility study
2. Lack of Property Insurance	1.Affected: Informal Settlers Key Sectors: LGUs NGOs: PALFSI HIGC	1. Subsidized Property Insurance that is: accredited by the Government;
2. Loan Sharks	2. Affected: Informal Settlers Key Sectors: LGUs NGOs	2. Soft Loans
3. Lack of Office that specifically address Insurance Concerns	3. -do-	3. Pool or Create an Office that will cater to "Paluwagan System"

PRIORITY SPECIFIC ISSUES	SECTOR/GROUPS LIKELY AFFECTED	POSSIBLE SHORT TERM AND MID-TERM ACTIONS TO ADDRESS THE ISSUE/S (1-3 YEARS)
1. Lack of LGU personnel in charge in the study and preparation of CLUP	Business sector Transport group Housing developers Investors General public	Revise CLUP (incorporate local inputs and must be LGU lead) Participatory With geohazard and its effects, earthquake etc..
2. Plans and policies affected by political linage. Lack of political will to implement the policies		Check maps
3. Lack of technical knowhow on the preparation of CLUP, incorporating therein Disaster Risk Management		Create urban development and housing board ---research- policy reform, shelter plan, strategy for climate resiliency
4. No in depth study of local maps		Prepare barangay development plans Demonstrate BLUP – sensitized with CC
5. No policies, re: classification of lands		**Empower barangay leaders in monitoring/ approving housing

		construction/ vis-a-vis safety & sanitation
6. No policies/guidelines, re: construction of buildings and houses		Build Demonstration houses which are climate change resilient

LIVELIHOODS AND EMPLOYMENT		
Priority Specific Issues	**Sector/groups likely Affected**	**Possible short term and mid-term actions to address the issue/s (1-3 years)**
Decrease in farming and fishing productivity	Farmers and fisherfolks	1. Identification of crops that are hazard-resilient 2. Continuous information dissemination on alternative on alternative hazard-resilient livelihoods 3. Promotion of alternative and hazard-resilient farming system 4. Reduce dependence on hybrid seeds 5. Enhance marketing channels of community products with support facilities/integrated marketing and trading center 6. Encourage/request Bureau of Soils and Management to implement promotion of natural farming 7. Immediate repair of irrigation canal in Brgy. Basud and Guinlajon
Unfavorable city policies/taxation to market vendors	Small market vendors	1. Consultation- negotiation with the city government (6 mos.) 2. Rethink the location of the city public market or add mitigation/protective measures
Degradation of coastal marine resources	fisherfolk	1. IEC on sustainable CRM 2. Livelihood support/ facilities for fisherfolks 3. Conduct sanitation and solid waste management projects
Improper waste utilization of farming sector	farmers	Proper waste management/ utilization – could be used as organic fertilizer

Threatened tourism sector	Farmers, fisherfolks, small entrepreneurs	1. Establishment of marketing/trading center/ pasalubong center (1-3 yrs) 2. Assessment/evaluation of tourism industry in the city (6 mos. - 1 yr) 3. Review/develop adaptation plan of the tourism sector in the city (1-2 yrs) 4. Establish hazard-resilient tourist facility (3 yrs) 5. Strictly implement the Marina Law
Multi-sectoral monitoring and evaluation of city's initiatives		Creation/setting-up of multi-sectoral monitoring and evaluation council/committee (1-2 yrs)

Priority Specific Issues	**Sector/groups likely Affected**	**Possible short term and mid-term actions to address the issue/s (1-3 years)**
1. Unwarranted cutting of coconut trees 2. Unrestricted use of chainsaws	Coco farmers	Short-term (2009) 1. Total ban on the use of chainsaw 2. Massive/active replanting/planting projects
3. Decreasing coco population/ production 4. Levels of palay seeds, vegetable seeds, cash crops 5. Lack of capital 6. Need for skills training on livelihood, food processing, soap making, handicraft, meat processing 7. Need for poultry and livestock and backyard farming	Farmers	3. Provision of subsidized seeds and inputs 4. Provision of micro-credit through MFI 5. Provision of skills training by TESDA and other government agencies and private sector 6. Provision of poultry and livestock dispersal
4. Strong coco farmers organization	Coco farmers	Medium-term 1. Organizational strengthening
5. Food and non-food coco product processing 6. Technology transfer 7. Pest and diseases	Non-farmers City/urban dwellers Households	2. Establish/founding of training centers and processing plants 3. Active research on utilization of biological control

Priority Specific Issues	**Sector/groups likely Affected**	**Possible short term and mid-term actions to address the issue/s (1-3 years)**
1. Lack of knowledge/skills 2. Lack of available	1. Vegetable farmers 2. Rice farmers 3. Coconut farmers	1. Extension of immediate capital and intensive training for alternative livelihood 2. Rehabilitation and restoration of the

capital 3. High level of rainfall causing floods, flash floods, high soil erosion, raising of sea water level, strong storms	4. Transport facilities 5. Residents of the coastal area 6. Fisherfolks 7. Vendors 8. All (children, youth, mothers)	environment should be continued through the cooperation of all sectors 3. Study and introduce crops adaptable to the present climate 4. Introduce alternative income generating activities to let people survive in times of high rainfall and storms and marine disorders

Thus, in the succeeding day of the consultation, two major areas were assessed by the issue working groups namely environmental management and disaster risk reduction. Going through the same processes as in the previous day, the groups prioritized issues and identified approaches and strategies to address the distinguished issues. Short, medium, and long term actions were enumerated and commitments from all participants on their specific roles were secured.

Environmental Management.

Sorsogon is said to be relatively clean and green. It has lush forest covers and a share of natural protected areas. Advocacies and collective effort to protect its waters and rehabilitate its rivers, bay, and other conduits is unceasing. It has moderately good air quality as its biggest share of GHG emission comes from the households, given the absence of large-scale industries. Yet, these reasons aren't enough for Sorsoganons to take matters lightly; in fact, unfavorable environmental conditions are starting to take shape affecting more and more communities in the City. Of the issues identified by the issue working group on environment, three are critical; these are red tide and coastal and marine resource degradation, forest and watershed degradation, and solid waste and air pollution.

Coastal and marine resources like mangrove, corals, and sea grasses, are vital in maintaining ecological balance. Corals, specifically is considered an ecosystem by itself and several marine lives are dependent on it. Mangroves protect our shoreline, these serve as natural seawalls during storm surges and as natural garbage collectors or barriers. Protection and rehabilitation of these resources must be sustained. It is important that continuous monitoring be done, and coming out with updated situationer on coastal environment conditions is recommended. Through the LGU and apposite agencies like DENR, DOST, NGA's, NGO's, academe, fishery sector, and communities, efforts to support rehabilitation may be strengthened. But all these will not be possible without strong political will from leaders to enforce existing environmental laws and local policies. Relative to climate change and coastal and marine resource

Priority Specific Issues	**Sector/groups likely Affected**	**Possible short term and mid-term actions to address the issue/s (1-3 years)**
1. Limited access to financial institutions 2. Limited technical knowhow 3. Limited production due to outdated farming technologies 4. Illegal fishing	1. Farming sector/fisherfolks 2. Business sector (MCMEC) 3. Farmers/fisherfolks 4. Farmers 5. Fishing	1. Organize farmers coops/assn 2. Strengthen groups 3. Improve technology through trainings/seminars 4. Conduct trainings/seminars 5. Establish demo farms 6. Value formation 7. Apprehension 8. Introduce alternative livelihood projects/opportunities (handicrafts) 9. Tourism

degradation is the occurrence of Red Tide. Its proliferation is exacerbated by increasing temperature/prolonged heat and poor bay condition, red tide continually stir fear in Sorsoganons and its effects strongly felt by communities whose livelihood are dependent on fishing. Stream/in-land agricultural run-offs, siltation, and wastes disposed by informal settlers along the bay contribute to the poor bay condition. Accumulation of wastes in bodies of water brings further damage to marine ecosystems. It's plain to see that interplay of factors, both natural and human-induced worsen the conditions of our coastal

and aquatic resources. Aside from installing early detection and warning mechanism, water sampling and analysis, sustained upland reforestation, and relocation of informal settlers which are partial to red tide monitoring and reduction, mangrove replanting, river clean-ups, and creation or reactivation of local councils or committees who shall constantly monitor the status of our coastal and marine resources is indispensable.

Similar to our coastal and marine resources, the condition of our forest and watershed areas must also be given focus. For one, less forest covers translate to less absorption of carbon sinks. Trees too are effective wind breakers. Massive, not to mention illegal, cutting of trees aggravate the conditions of our forest. Decreased ventilation leads to frequent use of cooling apparatus like electric fans, air conditioners, thus increasing energy emissions. A call to formulate a comprehensive forest and watershed management and protection plan was heard from the group. A Forest Land Use Plan could address existing gaps on forest and watershed management system. Through the LGU-CENRO, with the assistance of PENRO, DENR, MBG-MMT, NGA's, and the private sector, certain actions can be done and hopefully expedited like rapid assessment and participatory inventory of existing forest cover, formulation of FLUP and doable policies, community re-greening, and IEC's, specifically, coming out with localized assessment tools and documentation of periodic consultations with sectors and communities, alongside regular IEC materials.

Air pollution, although found to be within threshold, is also one of the issues identified, probably because of the interaction of environmental conditions that might eventually affect the quality of air in Sorsogon. Incessant cutting of trees for example could tamper the relatively good air quality. Proper disposal of waste is also a contributing factor. Agricultural inputs could be regulated, taking into consideration Sorsogon being by and large, an agricultural area. To safeguard the air quality of Sorsogon, lead agencies such as DENR and LTO must constantly monitor air pollution sources and impose strict penalties to violators. Creation of an anti-smoke belching unit is recommended. Non-burning of materials, as part of Solid Waste Management campaign, must be intensified and adoption of technologies for renewable energy is desired (tapping solar and green energy as source of electricity). Advocacy and enforcement of Clean Air Act and related policies must be intensified.

It is worth underscoring that in addressing the aforesaid issues, one common factor that is present and critical is proper garbage disposal. Solid Waste Management, its full implementation and strict enforcement, will contribute a large number in curtailing coastal and marine resource degradation, red tide occurrences, and air pollution. Through the LGU-CENRO, the existing actions being done or implemented by the City have to be sensitized with climate change parameters and issues to promote mitigation. In particular, strict implementation of SWM ordinance and mechanisms for waste segregation and resource recovery starting at the household level must be in place, this includes capacitating the barangays or communities through proper skills trainings. Other emerging issues identified by the group are mining waste disposal and management, inadequate drainage system and flawed structure of existing drainages, soil degradation, water contamination, and weak enforcement of national environmental laws.

While it's true that Sorsoganons may have overwhelming experiences, they haven't yet equated these experiences with "Climate Change". Most of them have very little knowledge on what climate change is. Varying information could mislead people which could make the situation even worse. Awareness therefore, is a primary concern. In all aforesaid issues, Information, Education, Campaign or IEC from a reliable source is fundamental. The LGU with the appropriate agencies are the key players in this arena. This is true for both environmental management and disaster risk reduction. For environmental issues, existing IEC strategies on solid waste management must be enhanced, materials on clean air act must be disseminated, community awareness on red tide must be intensified, and mangrove rehabilitation and re-greening must be at the forefront. For disaster risk reduction, community awareness and preparedness program must be conducted piloting disaster-prone areas, year round activities such as drills and simulation exercises as part of awareness and preparedness must also be carried out.

3.5 Issue Working Groups

3.5.1 Issue Working Group No. 1: Environmental Management and Climate Change Mitigation

Issue	How issue relates to Climate Change	Proposed Actions and *key instruments/groups*	IEC on Proposed Action
Coastal and Marine Resource Degradation	Limits carbon sequestration Mangrove protects the coastline as natural seawall especially during storm surge Destruction of corals affects ecological balance Due to climate change, water temperature increases that leads to coral bleaching	Sustain and support mangrove rehabilitation/*LGU,DENR,NGO's, community, fisheries sector* Updated situationer of coastal environment conditions / *LGU, Academe,DOST, NGAs* Strong political will to implement existing laws/ *LGU and community*	IEC thru academe, local media (print broadcast) with focus on coastal and mangrove rehabilitation
red tide	Increased temperature and poor bay condition caused by nutrients, upstream/ in-land, agricultural run-offs, and wastes coming from informal settlers along the bay	Reliable detection capability for early warning / *BFAR* Mangrove replanting/*DENR & CENRO* Relocation of illegal coastal settlers/ *LGU, HUDCC* River clean-up/ *LGU & barangays* Sustained upland reforestation / *DENR & CENRO* Enhance capacity for water analysis / *DA* Monitoring of coastal resource management activities of Sorsogon Bay Development Council / *PLGU & City*	IEC on red tide thru academe, local media (print broadcast with focus on awareness and precautions

Forest and Watershed Degradation	Degradation limits carbon sink/sequestration Limits ventilation resulting to frequent use of cooling apparatus which leads to more use of electricity/energy emission Disasters from extreme weather event could be mitigated thru increased and effective forest cover Trees are excellent wind breakers	Updated participatory inventory or rapid assessment of forest covers/ *DENR & LGU, with NGAs, BMG-MMT, and private sector* Formulation of a Forest Land Use Plan where a comprehensive forest and watershed management and protection plan is laid down/ *DENR,PENRO, LGU-CENRO and appropriate agencies* Formulate doable policies to address the proposed actions above/*LGU-CENRO with NGAs, NGOs, private sector* Encourage private plantation and community to do re-regreening/ *LGU-CENRO, NGAs, NGO's, private sector*	Come up with localized assessment tools, periodic consultative discussions and documentation Maps, posters, flyers, newsletters, bulletins on climate change watch, billboards, and print and broadcast media.
Air Pollution *and* Solid Waste Management	Industry/transportation contributes to GHG Agricultural inputs emit GHG and causes air pollution In Sorsogon, electricity from households are biggest contributor of GHG Garbage disposal involves biological process which give rise to production of methane Disposal of wastes in bodies of water will destruct marine ecosystems	Require lead agencies to constantly monitor air pollution sources and impose strict penalties for violators/ *LGU, NGOs, NGAs, private sectors* Monitor air quality/*EMB, LTO* Establish or create an anti-smoke belching unit / *DENR, EMB, and LTO with support from LGU and private sector* Regulate the use of pesticides/*Dept. of Agriculture* Adhere to non-burning of materials/ *LGU-CENRO, community* Encourage adaptation of technologies for renewable energy/*LGU-CENRO, community* Sensitize the actions being done or implemented by the City with parameters on climate change to promote mitigation/*LGU-CENRO, apposite agencies, community* Strictly implement SWM ordinance through waste segregation and resource recovery like composting and recycling, to start at the	Dissemination of materials on clean air act, preferably translated in local dialect Distribution and posting of IEC materials like leaflets and placing of signages in conspicuous places, TV and

	Wastes from agricultural production contributes to GHG emissions and run-offs contributes to degradation of coastal and marine resources	household and barangay level/*LGU-CENRO* Establish materials recovery facility at barangay and city level/*LGU-CENRO* Capacitate barangays with proper skills and knowledge for them to properly implement SWM in the barangay*/LGU-CENRO* Closure and rehabilitation of open and controlled dumpsite/*LGU-CENRO* Do regular community clean-ups/*LGU-CENRO, NGOs, community* Apprehension and strict imposition of fines and penalties/*LGU-CENRO* Promote organic farming practices, non-burning of agricultural wastes, and prohibition on the use of toxic pesticides/ *LGU-CENRO in coordination with DENR*	radio broadcast, barangay assemblies, publication of IEC materials in local dialect, film and video presentations of environmental issues, and contests with focus on environmental awareness

Mining waste disposal/management	Disrupts ecological balance of coastal ecosystem Mining run-offs lead to flooding		
Inadequate drainage system including natural drain	Waste clogs drainages and cause flooding during heavy rainfall Ordinary or existing drainages are observed to be very small and could not contain heavy rainfall		
Weak enforcement and implementation of national environmental laws	Encompasses all the issues raised		
Soil degradation	Improper utilization of soil leads to heavy degradation leading to creation of siltation causing waters to rise		

	Degradation decreases the absorption capacities of soil		
Water contamination	Land base pollutants will give rise to evaporation which causes high water temperature; intense evaporation causes increase in the amount of rain fall		

3.5.2 Disaster Risk Reduction

Located at the “typhoon belt”, Sorsogon is often visited by strong typhoons. In fact, preparing for every approaching typhoon seems to be mechanical or instinctive for most Sorsoganons. They seem to know exactly what to do and where to go and seem to be accustomed to the existing system of evacuation and rescue as well as relief and rehabilitation. But with exacerbating conditions brought about by the changing climate, the existing set up may not anymore hold reliable.

As revealed by the issue working group in their pre-disaster planning, there are certain areas that need attention. First, although there is an existing disaster coordinating councils in the City and the barangays, a unit that is more integrated need to be activated. This City Unit shall handle disaster preparedness and response. Among its functions include collating and analyzing relevant data and statistics, establishment and maintenance of a database for these data, and providing periodic updates to disaster coordinating councils. At the community or barangay level, Awareness and Preparedness Program must be established to be piloted in disaster-prone areas. It is important that communities be familiarized with macro and micro precursors so that they can do proper observations and establish database for information and recording purposes. Once familiar said mechanism, communities can now recognize trends and threats and could now set up a community warning system and other devices such as simple rain gauges. As stressed, running this system need not be expensive as existing barangay officials as well as volunteers may be utilized for this. Second, when disaster strikes, consternation on the part of the affected area or district is foreseeable. Hence, a policy on Quick Response Team became a priority issue for DRR group. This policy directs the nearest unaffected unit to immediately come to the rescue of the affected districts. Through the DPWH, NIA, and DSWD, policies for quick response teams may be adopted. Third, relative to evacuation and rehabilitation, the DRR group has identified the need for construction of stable evacuation center cum multi-purpose hall erected at a safe and strategic location and could accommodate a cluster of barangays. Ideally, the center must have in it a kitchen, a stock room, comfort rooms, facilities for communication. On regular days, such center may be utilized as venue for events like barangay assemblies, wedding receptions and other special occasions with a minimal fee to offset maintenance cost. Similar to the responses of the other issue working groups, the DRR group has seen the relevance of having an “ideal” Master Plan, where Climate Change parameters and disaster risk reduction are integral parts. In particular, the formulation or revision of the CLUP which is the most comprehensive plan of the City has to undergo thorough planning, a process that should involve technical experts and stakeholders. The master plan will serve as reference in redirecting future developments.

Although evacuation areas are made available especially to communities at risk, existing system/structure, if there is any, is found to be problematic. Apparently, the system for evacuation and identification of specific sites for evacuation is deficient. Foremost, in information and communication, facilities or equipment are very limited, if there is any, no one in the barangay has proper training on handling these gadgets. Awareness or knowledge on policies during evacuation is limited, and worsened by misinformation. Very limited resources could be the primary cause of these difficulties.

Overall, disaster coordinating councils like the CDCC and the BDCC have limited capacity. They lack the coordination system, tools, guidelines, and data management. The same is true for relief and recovery

activities where additional skills and management tools are wanting. There is clamor for an integrated and coherent disaster risk reduction and management plan which could bridge the gaps enumerated.

Short and mid-term actions for issues identified during and pot-disaster phase include establishment of evacuation centers and alongside this, to lay down a well-developed plan and organize a composite team or task group to handle all components of the center. CDCC and BDCC should undergo capacity building including regular drills, simulation exercises, familiarization of protocols and proper training in handling gadgets and equipment. Advance stock piling of relief items at the barangay level is recommended. Regular consultation with the barangay and a continuous update of barangay profiles, particularly the hot spot or high risk areas, is necessary, plus a year round conduct of activities on disaster preparedness. Training on damage and needs assessment is also critical.

Issue Working Group No. 2 Pre-Disaster Planning 1.		
Priority Specific Issues	Sector/groups likely affected	Possible short term and mid-term actions to address the issue/s (1-3 years)
1. Have the national government adopt a policy to establish Quick Response Teams	DPWH, NIA, DSWD	The nearest unaffected national agency unit should immediately assist the affected unit (the affected unit usually cannot immediately respond because it own people have to attend to their own needs) Implement the same in regional, provincial, and district levels
2. Activate a City Unit to handle disaster preparedness and response	LGUs	Collate and analyze data coming from various entities within the City Establish and maintain database Once trend is established, immediately act upon it Provide periodic updates to CDCC members Put up typhoon boards with specific legends
3. Prepare an “ideal” Master Plan/CLUP/Zoning	CPDO	(it is unrealistic to effect immediate resettlement of affected communities in disaster-prone areas) The master CLUP brought about through planning that involves technical experts and stakeholders ; would serve as a reference in directing future development

		Redirected areas may serve as community agri sources to optimize usage while minimizing risks
4. Establish a Community Awareness and Preparedness Program	Barangays	Can be piloted in disaster-prone areas Community will observe macro and micro precursors and establish database for it When trend is appearing, have a community warning set-up (ex. yellow flag for prepare, red flag for imminent disaster, or probably bells) Set up simple rain gauges; any container monitored by a tanod; transfer contents to a container that can measure amount of rainfall Need not be expensive; utilize existing barangay officials (ex. point person is BDCC chair and barangay tanods as members)
5. Construct a strong, stable, evacuation center cum multi-purpose hall	UN-Habitat, LGUs	For cluster of barangays With stock room, CRs, mats, communication facilities, cooking facilities Built at a safe location, with access roads for transport vehicles With utilization plan (can be used for wedding receptions, dances, seminars, etc.) with minimal fee to offset maintenance cost)
During and Post-Disaster Phase 2.		
1. Lack of system during EVACUATION and SPECIFIC SITES for EVACUATION a. Information and Communication a.1. no trained personnel (barangay level) that could handle communication gadgets a.2. limited/lack of communication facilities/gadgets or	Affected sector: evacuees, transient evacuees/strandees Key sector: LGU (CDCC and BDCC), NGOs,GOs, POs, (PNRC, Coast Guard, Electric Coop, Department of Education)	Organize Evacuation Centers and Evacuees through a well-developed plan and advance stockpiling of relief items at the barangay level Regular consultation with the barangay Organize composite team or task group that will handle the community kitchen, household listing, health and sanitation, and security

equipments (search and rescue, emergency) a.3. Misinformation/Information handling a.4. Lack/limited awareness (barangay level) on policies during evacuation a.5. limited resources		Continuous update of barangay profiles Train a quick response team and master list of members/volunteers Identification of transients (tourist lognook)
2. Limited capacity of BDCC and CDCC; coordination system, tools, guidelines on humanitarian and early recovery systems, data management		Conduct capacity building trainings, skills, drills, and others - guidelines/protocols - equipment/facilities
3. Lack of integrated/coherent disaster risk reduction and management plan		Year-round activities on disaster preparedness - IECs - Drills, simulation exercises - Monitoring and evaluation of high risk or hot spot areas
4. Additional skills and management tools for linking relief and recovery activities		Development and training on "damage and needs assessment tools" Conduct of comprehensive disaster risk management plan

3.6 Concluding Activity

Towards the end of the second day, the team solicited valuable remarks from selected participants primarily to secure commitments from the sector they represent and to gather feedback on the overall conduct of the consultation.

Mr. Ronando F. Gerona, the City ENRO gave a testimonial on how the LGU is addressing environmental concerns. According to him, the assumption to Office of Mayor Dioneda gave direction to the environmental programs of the City Government. His Office, in fact, submitted proposals to the Mayor which gained positive reception. Among these are the improvement in the implementation of SWM Program in Sorsogon City, particularly, in capacitating the barangays, the coming up with a master plan of the reforestation program, the establishment of a city nursery, where at present 50,000 seedlings are planted in target areas, 50 hectare mangrove project, an existing project in Talisay and Bitan-o which are being monitored and taken care of, reforestation of Cawayan river banks, tree planting along the roadsides and in school sites (22 school sites were piloted and completed in March of this year and the expansion of said project to happen this year), and IEC on environmental awareness for students. He admitted that the current structural organization of CENRO is very unstable; it has two technical personnel and needs engineers, sociologists, etc. There is also a plan to tap solar and wind resources as source of energy. Lastly, he gave an assurance that together with the stakeholders, the City Government will continue to look for means to improve on its environmental management approaches as well as to address existing and emerging issues.

Mr. Romeo Leona from the economic sector began with an acknowledgement of the LGU and the UN Habitat. Thru this, according to him, his sector, as well as the other sectors, was able to realize how

Sorsogon fares when it comes to climate change. “Caucuses like this one generate high spirits for it yields solutions” he remarked. Our sector, of fisher folks and farmers, which has long endured difficulties, believe that in due time, all of these emerging solutions will be implemented and will bring in positive results.

Ms. Shirley Bolaños of Coastal CORE was at that juncture the voice of the NGO’s. Grateful to the City Government for the initiative and the support given to them, she affirmed that a City alone could not carry out such huge responsibility (of saving the environment); because huge resources are needed, various NGOs are also doing what they feel they have to do to. Initiatives are now being undertaken at all levels; the City, the whole province, the LGUs, the barangays, local, Manila-based, and international NGO’s. The NGO where she belongs, for instance, is currently implementing projects in Gubat and in Bacon District. One example of a project is the construction of an evacuation center which has a multi-purpose design to cater to other community events and activities. They believe that mitigation is way economical when compared to repair and damages and hence, must be treated seriously. She was also happy to announce that Coastal CORE is a member of Philippine NGO’s for Disaster Risk Reduction which presently lobbies for the revision of the “old” disaster code, to revise the framework of budgeting in the government and accordingly increase the budget of the local government for disaster management. They also lobby for the City to create special committees too in harmony with the efforts being done at the national scene.

Mr. Boboy Duana represented the private sector in the plenary. He recounted his first encounter with climate change. It was in Jaro, Leyte where he had witnessed how a tidal wave claimed hundreds of lives. “That was how I saw the first sign of climate change” he narrated. “It’s about time that we realign our thinking” he added. Overall, he has positive feelings about the consultation and remarked that forums of this kind are very good especially in guiding investors who are coming in. “This consultation should involve all private sectors, to create awareness because we still need to educate a lot of people…we are like that turtle in boiling water” he remarked. He believed in a little way, everyone can contribute. He finished by thanking all guests who have come all the way to attend he consultation.

For the closing stages, General Ireneo Manaois, City Coordinator for the UN Habitat Program gave his Closing Remarks. He expressed, on behalf of the City Mayor and all members of the UN Habitat Program, deep appreciation to all participants of the two-day consultation on climate change actions; giving assurance to all partakers that the efforts and time they have unselfishly spent with the City will not be wasted. He reiterated that the inputs shared on four areas of concerns are crucial in the City’s improving or fine-tuning of whatever existing plans it has and will considered in the future programs and activities of the City Government. It is to be expected that in the days to come, several consultations will again be carried out, which may not be of the same magnitude as this consultation, perhaps in smaller groups. Nevertheless he solicited the help of stakeholders and partners in any related undertaking with a promise that the voices of the former in the forthcoming activities, their desires and dreams of an alternative future and their aspirations to be able to adapt to existing Climatic Change will be heard and realized.

“The recent typhoon that hit the City although not one of those two or three typhoons to hit the province in 20 years as we have seen during the presentations yesterday, has sent the message for us to be awaken or to be aware that Climate Change as we hear it (in the multi-media) is real and is now here in our midst. We have to do something to be able to adapt to it and survive. THE TIME IS NOW AND THE PLACE IS HERE IN SORSOGON”. These were his closing remarks as he finally thanked the UN HABITAT officials for choosing the City as one of the four pilot cities in the world. “…we temporarily close this consultation. It’s not the end of our partnership, it is only the beginning.”

As Ms. Eden Garde took over the platform, she only has commending remarks for everybody for working very hard as individuals and as institutions, adding that the UN Habitat is here to support the City in all its endeavors. “We will still see a lot of each other” she winds up.

4.0 DEMONSTRATION PROJECTS

4.1 Executive Summary

Sorsogon City and UN-Habitat are partners in implementing the "Strengthening Philippine City Capacities to Address Climate Change Impact (XB-PHI-X01)" with agreed terms stipulated in the signed Agreement of Cooperation (AoC). The project is not only focused on the science of climate change but primarily is working towards enhancing the capacity of the local government to address the issues brought by climate change especially in protecting the gains and in further achieving the city's Millennium Development Goals (MDG) and target. In view of the initiative, the city has drawn out a project workplan that would lead to the demonstration of social and physical infrastructure development/strategies to increase resilience of urban coastal communities of the city in the face of changing global climate.

The city has undergone vulnerability and adaptation assessment to analyse the different concerns brought about by climate change such as sea level rise, storm surges, increased precipitation, strong typhoons and warmer temperatures and how these would affect city development and the lives of the people. Part of the assessment results was the identification of critical areas or barangays which are highly at risk or are "hot-spots areas" vis-a-vis their current and projected future conditions. With the aim to showcase demonstrable actions towards climate change impact resiliency, five barangays among the hotspots were selected to be pilot areas for climate change adaptation projects. Several activities at the community level were done to engage them in planning climate change adaptation and mitigation actions. Moreover, a city multi-stakeholder consultation was conducted to further define focus areas where actions would be critical to increase people's resilience to CC impacts and four areas have been agreed namely: Housing and Basic Infrastructure, Livelihoods, Environmental Management and CC Mitigation, and Climate and Disaster Risk Reduction.

Following the gains achieved so far in project implementation and the finalization of agreements on the focus areas, demonstration project plans have been developed by the city Issue Working Groups on CC. Funding assistance is therefore now being solicited by the city from UN-Habitat as agreed in the AoC to support showcasing/demonstrating of social and physical infrastructure development strategies that would increase the city's resilience to climate change impacts and in developing responsive actions on climate change mitigation.

The demonstration project (focusing on four components) expects to accomplish the following:

<u>Housing and basic infrastructure</u>

(i) Local minimum standards for CC resilient (socialized) housing structures developed and agreed for adoption of the city government
(ii) The community based house/structure evaluation scheme vis-a-vis the said standards for climate change and disaster resilient housing for the poor developed and applied
(iii) Communities and local leaders aware of the agreed minimum standards and developed community action plans on house structure retrofitting
(iv) Retrofitting of vulnerable housing structures of the poor based the locally agreed minimum standards demonstrated in select/pilot urban CC hotspot Barangays

<u>Livelihood</u>

(i) Communities aware of the vulnerability of their livelihood activities, especially women, to projected CC impacts and developed livelihood baseline (vis-a-vis seasonal impact of CC of select communities) using UN-Habitat developed tool
(ii) Select/pilot community livelihood adaptation strategy/plans developed

(iii) Select members of vulnerable households introduced to and trained on new CC adaptive skills and activities through partnerships with TESDA, on the job training (i.e. house retrofitting, etc), and start-up kit provision

Environmental Management

(i) The city government with increased knowledge on implementing CC mitigation responsive projects with focus on efficient energy use and transport policy evidenced through the adoption of a local policy and /or program on CFL use and tricycle motor conversion
(ii) Lighting in public buildings and streets converted to energy efficient bulbs through a city Executive Order
(iii) Local scheme/policy/programme on the conversion of 2-stroke tricycle motors to the more efficient and emission reducing 4-stroke motors developed and adopted by the city government

Climate and Disaster Risk Reduction

(i) CBDRRM and CCA knowledge of select/pilot community increased through social artistry programs/initiatives
(ii) Ideal design (structural and facilities) of schools used as evacuation center (EC) developed and agreed amongst key local stakeholders
(iii) Community-Government partnerships on the care and retrofitting of school buildings used as evacuation centers agreed in view of the ideal design for school cum EC
(iv) A school cum EC retrofitted in view of the agreed Ideal design.

4.2 Origin of the project/request for support

Sorsogon City is working with UN-Habitat for the project "Strengthening Philippine City Capacities to Address Climate Change Impacts." The project is not only focused on the science of climate change but primarily is working towards enhancing the capacity of the local government to address the issues brought by climate change especially in protecting the gains and in further achieving the city's Millennium Development Goals (MDG) and target. UN-Habitat and the city signed a Agreement of Cooperation (AoC) in view of the initiative and has drawn out a project workplan that would lead to the demonstration of social and physical infrastructure development/strategies to increase resilience of urban coastal communities of the city in the face of changing global climate.

In line with the above, the city has undergone vulnerability and adaptation assessment to analyse the different concerns brought about by climate change such as sea level rise, storm surges, increased precipitation, strong typhoons and warmer temperatures and how these would affect city development and the lives of the people. Part of the assessment results was the identification of critical areas or barangays which are highly at risk or are "hot-spots areas" vis-a-vis their current and projected future conditions. With the aim to showcase demonstrable actions towards climate change impact resiliency, five barangays among the hotspots were selected to be pilot areas for climate change adaptation projects. Several activities at the community level were done to engage them in planning climate change adaptation and mitigation actions. Moreover, a city multi-stakeholder consultation was conducted to further define focus areas where actions would be critical to increase people's resilience to CC impacts and four areas have been agreed namely: Housing and Basic Infrastructure, Livelihoods, Environmental Management and CC Mitigation, and Climate and Disaster Risk Reduction.

As agreed in the existing AoC between the city and UN-Habitat, the latter through the MDG-F 1656 grant will be providing the city with technical and funding support for demonstration projects that would showcase innovative social and physical infrastructure strategies/development. Following this and given the conclusion of preparatory activities, the city has developed demonstration project proposals for the focus areas mentioned above and is now seeking UN-Habitat's support.

4.3 Context

The Province of Sorsogon where the City is located has been identified by a study of the Manila Observatory and the Department of Environment and Natural Resource to be at a Very High Risk category relative to *combined Climate Disasters*[1]. Sorsogon is fourth in the top ten list provinces which are highly at risk to combined factors.

Based on recorded and unrecorded local observations, the impacts of climate change in the city given its location and previous stresses are seen to be associated with the climate-driven phenomena on changes in extremes (i.e. tropical cyclones, storm surge, and extreme rainfall/flooding) and changes in means (i.e. increased in temperature, increased precipitation, saline intrusion, and sea level rise).

City climate change hotspots were identified based on exposure of the area to multiple hazards and risks projected to be brought climate change and based on actual risk/hazard maps produced by the city disaster coordinating council based on previous disaster events and assessments. There are 12 villages which were identified to be the city climate change hotspots considering their exposure to multiple climate risks and hazards (i.e. tropical cyclone/storm surge, SLR, flooding, landslide). Of the hotspots identified, 8 are urban villages, 1 is urbanizing, and the last 3 villages are rural in classification.

4.4 Problem definition/analysis and justification

The population in the urban hotspots on the average are growing annually at the rate of 1.7%. Cabid-an registers the highest annual growth rate at 3.23% while four more areas are noted to have growth rates higher than the average and these areas are Bitan-O Dalipay (2.12%) Sirangan (2.02%), Cambulaga (2%), and Sampaloc (1.74%). Projecting that the growth rate remains the same for these areas more people would become vulnerable to impacts of climate change. Risks will be higher and the costs for relief and rehabilitation should climate-induced disaster happen, would also considerably cost more if anticipatory plans for climate adaptive social and physical infrastructures are not put in place.

Apart from population growth, the climate change vulnerabilities of the urban hotspots are mainly accounted to the fact that these villages are home to poor households with limited capacities to cope with projected impacts of climate change; structures (houses and community facilities like health centers) are exposed or at risk to tidal flooding; seawalls are already damaged; inundation/erosion of coastlines; settlements are not planned in view of climate hazards especially their flood drains; livelihoods are sourced from weather sensitive activities such as fishing/vending a tourism services; commercial establishment where wage earners source their income are at risk to flooding and SLR; public infrastructures (schools, bridges & roads) were not engineered to withstand extreme events as evidenced by previous disaster reports; and, people in general have limited knowledge on climate change thus knows insufficient information on possible adaptation options. These vulnerabilities were all substantiated by city data and community accounts as gathered in site validation and focus group discussions.

The city vulnerability to climate change related disasters are evidenced by damages and disruptions it experienced during the last quarter of 2006 when two super typhoons passed through Sorsogon and when Typhoon Dante (with only the lowest warning signal) devastated the city during the last few days summer of 2009.

Super Typhoon Milenyo affected more than 27,000 families in the City and totally damaged more than 10,000 houses. Main lifelines (electricity and water) infrastructure were severely damaged leaving the City out of electric power services for more than a month. Major bridges connecting the city were heavily devastated in that 2006 extreme event with 1 major bridge linking Sorsogon City to the next municipality finally collapsing just recently when Typhoon Dante lashed Sorsogon with extremely heavy rains.

[1] sum of the normalized, provincialized risks to typhoon, drought caused by El Niño, projected rainfall change and projected temperature increase

During the multi-stakeholder city consultation activity held May 2009, it has been agreed that there are four key areas which must be prioritized to increase the city's resilience to climate change impacts while enhancing stakeholder's capacity in local climate change action planning. These focus areas are a) Housing and Basic Infrastructure, b) Livelihoods, c) Environmental Management and CC Mitigation, and d)Climate and Disaster Risk Reduction.

4.5 Housing and Basic Infrastructure

Sorsogon City is situated in the country's geographical Zone 6 where 3 typhoons/cyclones pass in two years. The city, based on historical records, is also prone to storm surge as revealed by data gathered from the Natural Disaster Reduction Branch of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (NRDB- PAGASA). Stronger typhoons and storm surges because of the changing global climate are foreseen to create further stress to the city's settlements especially housing and basic infrastructure in settlements.

House structure reinforcement and new technology to adapt to stronger winds, heavier rain fall, and the increasing sea level are not yet popular to the general public. With about 5000 housing structures in the city being damaged yearly by typhoons, about Php 150 million is spent for housing reconstruction each year assuming a Php 30,000 cost of reconstruction for each. For example reports, Super typhoon Milenyo alone caused total damage to more than 10,000 housing structures in the City in the last quarter of 2006 alone. Damages remain to be high as most of the houses in poor urban communities are either made of makeshift materials or light materials which cannot withstand stronger tropical winds and heavy rains. Strengthening housing structures of the poor is definitely crucial to increase the cities resilience to projected climate change impact. Not only would infrastructure strengthening initiatives help ensure people's safety in the event of strong typhoons but also save the family assets and lessen household and government costs for recovery and reconstruction.

4.6 Livelihoods

Sorsogon City is the administrative, commercial, and educational center of the Province of Sorsogon. Given these role, the trade and services sector of the city is fast growing and is supporting families living in urban areas. The natural endowments of city still provides for its people the opportunity to engage in farming and fishing as products are in demand and therefore easily tradable in the market while urbanization in the city is fast happening.

Agriculture plays a major role in the economy of Sorsogon City. Rice production covers a total land area of 2,482.4 hectares, where 23.42% or 581.4 hectares are cultured through rain-fed system. Based on city data, there are some 3,300 farmers who are primarily engaged in rice farming. City baselines further reveal that a total area of 9,930 hectares of land is devoted to coconut farming, in which there are 2,964 coco farms tended by 7,272, coco farmers.

On the fishery side, the city is endowed with a wide array of fishery and aquatic resources as it is bounded by the Pacific Ocean in Bacon District and China Sea in Sorsogon District. Major fishing grounds include marine waters of Albay Gulf and Sugod Bay for Bacon District and Sorsogon Bay for Sorsogon District. Both Districts other than the above marine waters are rich in rivers and inland fisheries where freshwater and brackish water aquacultures are tapped to supplement fishery production. There are 4,304 fisherfolks in the city. These fisherfolks are using small fishing boats- using motorized and non-motorized boats. Average daily fish catch is low - recorded at 2.75 kilos and the average number of boats unloading on a daily basis in the whole city is 1,530. This means that not all of the fisherfolks have their own or individual fishing boats. Most of the fishing households are below the poverty threshold, making them more vulnerable to day-to-day shocks and to climatic-induced hazards. Extreme events such as strong typhoons (e.g. Sisang, Milenyo & Herming) and storm surge for instance in the past, greatly affected the fishing activities in the city.

Agriculture producers (fishing and farming) in view of climate change are highly vulnerable given that their activities are greatly dependent on the weather conditions. Projected climate change which is foreseen to

bring extreme rainfall, increased precipitation, increased temperature, stonger typhoons and storm surges will definitely alter and disrupt production patterns in Sorsogon.

The poor marginal fishing and farming dependent families are seen to be most vulnerable in the agriculture sector. When disaster strikes or disruptions happen the damage they sustain in their physical assets (i.e. housing structure) are further aggravated by the fact that their livelihood activities are disrupted during the day of the weather disturbance itself and in the after event as their livelihood implements like fishing gears and farm inputs are damaged if not totally destroyed/lost too. While in such state, households would have time to repair houses and their other assets while waiting for their economic activities/sector's return to normal state again. Moreover, those who are engaged in the informal vending/selling (majority are believed to be women) of fish catch and other agri produce are likewise heavily affected. There is therefore a need to define a strategy that will find ways to safeguard the assets of the poor while also providing them alternative livelihood sources that could sustain them in times of disasters and in view of climate change.

4.7 Environmental Management and Climate Change

Among of the identified emerging issues on environmental management in Sorsogon City in relation to climate change is the City's carbon emission profile wherein the identified highest contributors are the residential electricity users and the public transport sector (mainly tricycles). The total emission of the City in 2007 sum up to 21,090.83 tCO2 from energy/electricity usage and fuel combustion of the City's major mode of transport.

The table below shows the breakdown of electricity consumption of the different energy consumer types with the corresponding carbon dioxide emission.

Total Electricity Consumption in the City, 2007 (source: Soreco) and CO2 emissions[2]

Energy Consumer Type	Consumption (KwH)	EF (tCO2/KWH)[3]	Total emission (tCO2)
Residential	15,567,752.00	0.000594	9,247.24
Commercial	7,758,177.00	0.000594	4,608.36
Industrial	1,018,440.00	0.000594	604.95
Public street/highway lighting	373533.58	0.000594	221.88
Public Buildings	3,122,848	0.000594	1,854.97
TOTAL	**27,840,750.58**	0.000594	**16,537.41**

Computation of tricycle CO2 emissions in Sorsogon City

Tricycle in Sorsogon City	Gas Consumed in 2007*	Emission Factor (tCO2/liter)	Total tCO2 emissions in 2007
3114	2005914.24	0.00227	4553.425

Households still use incandescent bulbs and are not fully conscious on efficient energy use that would not only help them lower their energy cost but also lessen their carbon footprint. Relative to transport, about 40% of the total 3114 registered tricycle, the dominant transport vehicle in the city, still uses 2 stroke engines with high pollutant emissions.

Given these, it is deemed that tangible solutions which could facilitate lowering the City's carbon emission would be the promotion of the use of CFLs for lighting and the conversion of 2-stroke engines to 4-stroke engines of tricycles. Admittedly, however, it is quite ambitious yet to target the residential areas of

[2] City GHG Emissions, Sorsogon City Climate Change Vulnerability and Adaptation Assessment, pp.84

[3] Used the national power mix emission factor.
(http://www.klima.ph/resources/MO/08_LearningModules/ghg_calculator/primer/primer.html)

Sorsogon City. As a demonstration project, the City Government would address first and demonstrate on the public facilities and streetlights which has nine percent (9%) and one percent (1%) share on the City carbon emission respectively, as shown in the Table above. For transport, a crucial initial step seen to be needed is the development of a local viable scheme (partnerships and financing) to encourage the conversion of outdated tricycle engines to four stroke motors.

4.8 Climate and Disaster Risk Reduction

Disaster preparedness is at the core of the city's development agenda. It is in the hands of the City Disaster Coordinating Council (CDCC). In times of natural catastrophe and other man-made hazards, the city carries out its disaster preparedness plans and contingencies through the City Disaster Coordinating Council or CDCC headed by the City Mayor. The CDCC is mirrored at the barangay/village level with the existence of the BDCCs headed by the Punong Barangay. Assisting also are the volunteers of the Sorsogon Emergency and Rescue Team and the Philippine National Red Cross for relief operations. It has been noted that the City DRR scope is focused on rescue and emergency situation and oftentimes preparedness is anchored on the same scope. The climate change scenario of Sorsogon City would require a more pro-active stance and anticipatory planning and contingency measures.

In line with National Disaster Coordinating Council's strategy to minimize the impact of hazards and reduce disaster risks for the various types of hazards, the Sorsogon CDCC started implementing the pre-emptive evacuation strategy. The strategy necessitates the evacuation of people before the hazards hit specified areas. Most of the evacuation centers utilized are schools, mostly public schools either elementary, high school or colleges. These schools double up as educational institutions and as evacuation centers. 59 of the 64 barangays of the city rely on public schools as their evacuation centers.

In disaster events, most school buildings in the city are not spared from damages brought by strong typhoons, flooding, or landslides and the damages are further exacerbated when the school facilities are used as evacuation center for disaster- stricken families in the community they serve. The pressure on the school therefore doubles both during and after disaster events. From the previous disasters, schools used as EC still need to enhance their infrastructure not only to restore it but also to retro-fit it to make it adaptive to climate stresses and natural hazards as well as in performing its function as temporary refuge for disaster stricken families

4.8 Stakeholder analysis, participation and ownership

The key stakeholders in this project is the city government and the communities who have been identified as CC hotspots and identified as a priority area. The city government, in its partnership with UN-Habitat has learned from the V&AA about their key climate vulnerabilities that they need to address. The city government technical people and staff has been closely working with UN-Habitat on project planning hence the development of this proposed demonstration project.

The priority hotspot communities/barangays have been continuously enjoined in the climate change events especially during the V&AA and asset and needs assessment activities. As such the communities were already involved and have been consulted in the proposed actions in this proposal.

4.9 Project Description and Implementation Strategy

"Sorsogon City with enhanced social and physical infrastructure for climate change resilience and responsiveness"

4.10 Expected Accomplishments

The demonstration project (focusing on four components) expects to accomplish the following:

Housing and basic infrastructure

(i) Local minimum standards for CC resilient (socialized) housing structures developed and agreed for adoption of the city government
(ii) The community based house/structure evaluation scheme vis-a-vis the said standards for climate change and disaster resilient housing for the poor developed and applied
(iii) Communities and local leaders aware of the agreed minimum standards and developed community action plans on house structure retrofitting
(iv) Retrofitting of vulnerable housing structures of the poor based the locally agreed minimum standards demonstrated in select/pilot urban CC hotspot Barangays

Livelihood

(i) Communities aware of the vulnerability of their livelihood activities, especially women, to projected CC impacts and developed livelihood baseline (vis-a-vis seasonal impact of CC of select communities) using UN-Habitat developed tool
(ii) Select/pilot community livelihood adaptation strategy/plans developed
(iii) Select members of vulnerable households introduced to and trained on new CC adaptive skills and activities through partnerships with TESDA, on the job training (i.e. house retrofitting, etc), and start-up kit provision

Environmental Management

(i) The city government with increased knowledge on implementing CC mitigation responsive projects with focus on efficient energy use and transport policy evidenced through the adoption of a local policy and /or program on CFL use and tricycle motor conversion
(ii) Lighting in public buildings and streets converted to energy efficient bulbs through a city Executive Order
(iii) Local scheme/policy/programme on the conversion of 2-stroke tricycle motors to the more efficient and emission reducing 4-stroke motors developed and adopted by the city government

Climate and Disaster Risk Reduction

(i) CBDRRM and CCA knowledge of select/pilot community increased through social artistry programs/initiatives
(ii) Ideal design (structural and facilities) of schools used as evacuation center (EC) developed and agreed amongst key local stakeholders
(iii) Community-Government partnerships on the care and retrofitting of school buildings used as evacuation centers agreed in view of the ideal design for school cum EC
(iv) A school cum EC retrofitted in view of the agreed Ideal design

4.11 Implementation Strategy

The demonstration project to increase city resilience and responsiveness to climate change will be implemented through four components (Housing, Livelihoods, Environmental Management, and Climate and DRR) as discussed above. Each of the components will have an IEC program to increase stakeholder participation, ownership, and acceptance of the initiatives. It is planned that the demonstration actions will run for 15 months with each component having its own workplan/strategy as required by the set of expected accomplishments while in full consideration of synchronized/harmonized

approach to operations. All components shall be implemented following consultative and participatory approaches to development. The general delivery strategy of each components are presented below:

4.11.1 Housing: "Developing Local Minimum Standards for CC Resilient Housing for the Poor and Retrofitting Demonstration"

The activities for this are planned to be as follows:

- The city would first organize a practitioners and stakeholders forum/workshop to discuss, develop, and agree on a localized minimum standards for CC resilient socialized housing structure. The take-off point in the discussion will be the existing national policy (BP 220) that governs construction and development of socialized and economic housing projects.
- Following the results of the forum workshop a tool on how the agreed minimum standards could be applied using a simple evaluation matrix (for community use) will be developed.
- Capacity of local leaders will be built through trainings and coachings such that they could use the template to evaluate the structures within their covered area and through community meetings develop Community Actions Plans (CAP).
- A prioritization scheme will be developed by the city government together with the community leaders to identify which houses/families would be assisted under the project.
- Upon selection of priority houses/families to be assisted, retrofitting implementation plans based on evaluation results and the CAP/s developed shall be finalized for execution.

A scheme that is initially planned (but still for validation and agreement during the CAP process) is the use of **community contracting** to execute the retrofitting project while the LGU would remain as the technical lead. The scheme likewise plans to include the strategy to recover part of the grant assistance (depending on later agreement) from the beneficiaries where the repayments would rolled-over to assist more families later on. Acknowledging that the city is not structured for this, it is planned that a partnership with a viable NGO that is structured to collect repayments on a daily/weekly/monthly basis would be established through partnership agreements.

Moreover, in line with the livelihoods demonstration, the trainees (who are community members themselves) of the house retrofitting modules will be hired to do the actual retrofitting work. This shall be processed with the communities and made part of the CAP.

The project lead for this component shall be the Urban Poor Affairs Office or UPAO with the support from City Engineering Office for Technical Works, City Social Welfare and Development Office (CSWD) for social preparation, and PIO for information dissemination.

4.11.2 Livelihood: "Construction Trades and Livelihood Skills Training"

The activities for this component of the demonstration project will include:

- profiling or baselining of community livelihoods in view of the impacts climate change especially on the vulnerability women's economic activities.
- The City Government as the proponent of the project will conduct consultation with communities and other partners, specifically TESDA[4], to develop the project implementation

[4] TESDA or the Technical Education and Skills Development Authority is the government agency tasked to manage and supervise technical and skills development in the Philippines. Currently TESDA closely works with the City Government for skills development projects of farmer beneficiaries of the city in its agriculture development initiatives. Also, TESDA has been working with the city government in its climate initiatives including the V&AA and demo project development. With this snf further assessments and dialogues of the City Government with TESDA, the said government agency is found to be the most appropriate partner.

policies and guidelines which would include the criteria for beneficiary selection that is commonly agreed.

- Community mobilization to result to long listing of participants that shall be drawn in consultation with community partners and each in the list would have to be screened and approved by a selection committee.
- Drafting and signing of MoA between the City Government, TESDA and the participating individuals to ensure clarity of commitments, roles and responsibilities. To date, TESDA agreed to be the training provider and the LGU shall provide them necessary support to facilitate the planned activities/trainings. In the TESDA and LGU agreement, a provision shall be explicitly stated that UN-Habitat as the LGU direct partner for the over-all project, will be provided with TESDA reports and that UN-Habitat in coordination with the LGU will be part of the monitoring team.

- Groups of trainees will be organized according to their preferred priority skills to be learned. But the number of trainees will be limited to 25 participants per class/group. One hundred twenty-five (125) participants will be selected from the five pilot barangays, 25 from each barangay. The project will involve skills training in occupation within the construction sector together with livelihood skills training in the following trade namely:

  Carpentry – 162 hours(21 days)
  Masonry -258 hours (33 days)
  Building wiring installation – 402 hours (51 days)
  Reinforced steel bar installation -162 hours (21 days)
  Food Processing and value adding for fishery products including labeling and packaging – 568 hours (71 days).

  The trainee-participants will not only be trained in the above-mentioned courses but likewise in the module which will be provided by the IWG on shelter – the evaluation and basic house retrofitting in view of new technologies for climate change adaptation which will be will be incorporated in the training module/course offered by TESDA. Enhancement of traditional skills on identified fishery product value addition will also be ensured/explored.

  Moreover, all courses will have also a separate module about climate change, what is it all about, what are the causes and other important factors with relation to climate change, this will serve as an avenue for IEC on climate change.

  Participants will be given transportation and meal allowance while attending the training, this will serve as their support fund.

- The demo project will also include the On- the – Job- Training (OJT) of Participants . But it will be properly coordinated with the housing demo project lead so that the time of OJT on carpentry or masonry will coincide with their implementation of retrofitting and construction of houses so that trainees can apply their learnings while also promoting additional income/livelihood. Before graduation, participants will undergo the competency assessment to be given by TESDA and those who will qualified will be given Competency Certificates .

- Successful graduates of this initiative will be provided with tool kits which they could use on their real-life adaptation initiatives that will help upgrade their living conditions in their communities. Such effort on sustainable livelihoods development will also be coordinated and linked with other IWGs working on shelter, DRR and environment towards the overall harmonization of the entire initiatives of the city on building community resiliency on climate change impacts.

- To ensure sustainability, the entire process shall be adequately documented such that learnings and knowledge from the project implementation could be formally adopted by the

city government and made part of its regular program should it be found successful and viable.

As in all of the components, the Sorsogon City Governemnt shall be accountable to UN-HABITAT. For this component, the city government will have as technical support team the IWG on livelihoods lead by the City Agriculture Office, with support from TESDA (for the training), Coastal Core[5] (to assist on social preparation), DTI (to assist on job placement), and UPAO & CSWD (to assist on social preparation and beneficiary selection).

4.11.3 Environmental Management: "Developing Local CC Mitigation Responsive Programmes: Energy and Public Transport"

This project takes-off from the initial emission profiling done for energy use and transport (tricycle) fuel consumption. As such, activities for this component shall work on the following aspects:

- Survey of lighting fixtures in public buildings and street lights has been conducted to identify the magnitude of need for conversion to efficient lighting such as CFL.
- Issuance of Executive Order directing conversion of existing lights with energy efficient lights and fixtures. Such would signal the demonstration of emission reduction in the energy usage in the city and would be documented in order to eventually develop a campaign on the same initiative at the household level.
- Actual conversion to energy efficient lighting and fixtures in five Barangays

On the transport side, the demo project will focus on initiating/developing a scheme to engage tricycle operators and owners to convert their motors to 4-stroke motors with the end view of efficiency and CC emission reduction. Activities would include:

- Research and city-to-city sharing in order to learn the most efficient, effective, and sustainable way of locally implementing projects on motor conversion. The city will engage with Puerto Princesa City for the city to city sharing given that the said City has successfully implemented a project on the same. The focus shall be how to mobilize and engage local transport groups in the initiative as well as possible financing mechanisms/sources that could be used and tapped by those who will convert their motors.

- Continuous dialogue amongst stakeholders in view the initiatives shall be instituted in order to come up with agreed recommendations on schemes for the tricycle motor conversion
- Passage of local policy issuance to lower emissions of tricycles in the city.

Component lead shall be the City Environment and Natural Resources Office with support from PIO (for IEC), City Mayors Office (for Executive Order issuance), City Engineering Office (during project implementation), City Council Committee on Transportation.

4.11.4 Climate and Disaster Risk Reduction: "Schools Mitigating and Adapting to Risks and Threats to Disasters and Climate Change (SMART DCC)"

Barangay Balogo and the Balogo Elementary School has been identified as the pilot area for the demonstration project. To implement and achieve the objectives under this component, the following activities will be conducted:

[5] Coastal Core is a Sorsogon-based non-stock non-profit NGO focused on organizing of resource management cooperative, advocacy and networking for community-based coastal resource management, assisting partners in livelihoods development, and various IECF and community capacity-building activities. Coastal Core has been strongly working with the City in the CC initiatives it is currently engaged with especially in the works of the livelihood Issue Working Group. The City assessed that Coastal Core is best fit to be their partner in social preparation given its ground experience and organizational capacities.

- Community mobilization and social preparation activities to increase community awareness and ownership of the initiative.

- Along side the community mobilization and social preparation shall be the conduct of **research on ideal structural design for a school cum EC**. Technical people (architects, engineers, Department of Education personnel, etc) would be consulted as part of the research.

- Development of an ideal school set-up/structure to cater both its role as an education center and as an evacuation center. For purposes of budgeting, the city government has already conducted an evaluation of the Balogo Elementary school to assess its basic need for retrofitting. An amount was pegged based on basic EC development cost (per square meter development) which shall be used to address the needs that will surface during community consultations, as planned this would be used for new fixtures, additional comfort room for women and persons with disabilities, stock room and wash area/kitchen.

- Dialogues and consultations shall be conducted to enjoin communities to discuss with technical people the demand they have from evacuation centers such that the needs of women and children during disaster events and in view of climate change will highlighted and be made part of the design.

- Conduct of social artistry activities (e.g. Teaching aids reproduction, storytelling, stage plays, and poster making contest, lecture discussion) will be used as the key medium to facilitate community mobilization and establish partnerships. Key area that will be focused on shall be the communities understanding of responsible use of school facilities when utilized as evacuation center and their knowledge on climate change.

In implementing this component, the city shall use as reference the "Safer Schools" concept promoted by the United Nations. Component lead shall be the City Disaster Coordinating Council Action Officer with support from the City Engineering Office (technical/structural input), CSWD (social preparations), Coastal Core (social artistry), and DepEd City Division Superintendent.

4.12 Governance/Management Structure

The City Government shall be the implementing party responsible for the demonstration project in line with its role stipulated in the AoC to coordinate, implement, monitor and evaluate the conduct of activities on ground. Each of the demo project components shall have assigned project lead and support partners as discussed in the implementation strategy above. Financial management shall follow the same requirements as agreed in the AoC with the additional funding support hereto requested following the timeframe as presented in the revised Annex C given the demo project workplan.

4.13 Key Assumptions and Risks

- Funding would be timely released
- Communities, practitioners, and other stakeholders agree to partner and work with the City
- Time availability of technical experts provided by UN-Habitat
- Typhoons/storm and disasters events to possibly lag project implementation
- National government agencies to partner with the city government
- Puerto Princesa City willing to do city-to-city learning exchange with Sorsogon City
- Acceptance of stakeholders especially the communities on the schemes, methodologies, and standards to be developed

4.14 Indicative Budget and Funding Sources

These total budget amount of the project is Php 8,564,858.40 where Php 7,896,704.50 is proposed for UN-Habitat funding while the city government of Sorsogon will counterpart Php 668,153.90 in line with technical supervision (costed service) of key technical staff who will directly implement/supervise/monitor the projects. 2 budget summaries are presented below: (a) is the consolidated budget based on activities/line items and b) budget summary per demo project component. Moreover, detailed budget per component including reference design and bill of materials is made part of the Annexed documents.

Budget Summary A:

Activities/Line Items	UN-HABITAT/MDGF	Sorsogon City Government
IEC	551,100.00	
Consultations/Meetings/Workshops	403,260.00	
Survey/Profiling/Research	363,000.00	
Tech Training (alternative livelihood)	1,061,500.00	
Direct Cost of demo projects	5,517,844.50	
Personnel/Technical Supervision*		668,153.90
Sub-total	*7,896,704.50*	*668,153.90*
Project Total Cost	8,564,858.40	
** LGU officers and tech staff costed time*		

Budget Summary B:

	BUDGET	SOURCE
	PHP	
Housing		
IEC	104,500.00	UN-Habitat
Consultations (practitioners etc)	87,450.00	
Community Meetings and Trainings	206,910.00	
Actual Retrofitting	4,517,099.73	
Technical Supervision	255,000.00	Sorsogon City Govt
	5,170,959.73	
Livelihood		
Community Consultations and Meetings	38,500.00	UN-Habitat
Community Profiling/Baseline Development	33,000.00	
Training	1,061,500.00	
Personnel/Project Supervision (LGU Costed Service)	264,000.00	Sorsogon City Govt
	1,397,000.00	
Environmental Management		
IEC	83,600.00	UN-Habitat
Community Meeting and Training	38,500.00	
Rewiring Expenses	11,000.00	
Installation Cost incl. CFL pruchase	325,385.50	
Learning Exchange	330,000.00	
Personnel/Project Supervision (LGU Costed Service)	49,500.00	Sorsogon City Govt
	837,985.50	
Climate and DRR		
IEC	363,000.00	UN-Habitat
Community Meetings and Dialogues	31,900.00	
School CCA and DRR retrofitting	664,359.27	
Technical Supervision and Monitoring	99,653.90	Sorsogon City Govt
	1,158,913.16	
Total Project Cost	**8,564,858.39**	

4.15 Monitoring, Evaluation and Reporting

The project shall be regularly monitored following the agreed project monitoring scheme developed together with UN-Habitat. The city CC Technical Working Group lead by the City Project Coordinator shall manage and oversee the monitoring activities of the different project components. Quarterly monitoring reports as well as mid project and end project reports including financial reports duly certified by the City Mayor shall be submitted to UN-Habitat.

Real time documentation will be ensured to be part of the monitoring reference and capture of learnings.

An end project evaluation will be conducted to assess project implementation against the action plans and measure the impact and replicability of the demonstration projects.

The project will be subject to the auditing requirements of UN-HABITAT and Philippine Government's accounting rules and regulations as implemented by the Commission on Audit.