CLIMATE CHANGE COMMISSION

National Climate Change Action Plan

2011-2028

FOREWORD

The manifestations of climate change in the form of rising temperature, variability of precipitation, frequency and intensity of typhoons, sea level rise, and the risks of more droughts, floods, heat waves, and forest and grassland fires have impacts on the economy, environment and communities. Given its geographical location, archipelagic formation in the tropical Pacific, and population distribution, the Philippines is greatly vulnerable to the impacts of climate change, and has already experienced noticeable adverse effects in recent years. Without concerted global and local action, the challenges the country will face as a result of climate change are expected to intensify in the medium or long term.

In response to what has essentially become a global crisis, the government has enacted the Climate Change Act (Republic Act 9729) that provides the policy framework with which to systematically address the growing threats on community life and its impact on the environment.

The Climate Change Act establishes an organizational structure, the Climate Change Commission, and allocates budgetary resources for its important functions. These functions include:

- the formulation of a framework strategy and program, in consultation with the global effort to manage climate change,
- the mainstreaming of climate risk reduction into national, sector and local development plans and programs,
- the recommendation of policies and key development investments in climate-sensitive sectors,
- the assessments of vulnerability and facilitation of capacity building.

The national climate change framework strategy has recently been translated into a National Climate Change Action Plan (NCCAP), which prioritizes food security, water sufficiency, ecological and environmental stability, human security, climate-smart industries and services, sustainable energy, and knowledge and capacity development as the strategic direction for 2011 to 2028.

This document assesses the current situation of the country with regard to climate change risk and outlines the NCCAP's strategic direction for 2011 to 2028 as a response to the current situation and projected impact.

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Acronyms & Abbreviations

AMORE	Alliance for Mindanao Off-grid Renewable Energy
CASS	Climate Adaptation Support Service
CC	Climate Change
CCA	Climate Change Adaptation
CCC	Climate Change Commission
CCVI	Climate Change Vulnerability Index
CEPALCO	Cagayan Electric Power and Light Company, Inc.
CFI	Commercial Financial Institutions
CHED	Commission on Higher Education
CRM	Climate Risk Management

DA	Department of Agriculture
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DepED	Department of Education
DFI	Development Finance Institutions
DILG	Department of Interior and Local Government
DOE	Department of Energy
DOF	Department of Finance
DOH	Department of Health
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction and Management
DSM	Demand Side Management
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
ECHA	European Chemicals Agency
Ecotown	Ecologically-Resillient and Economically Sustainable Town
EDC	Energy Development Corporation
ENRA	Environmental and Natural Resource Accounting
EST	Environmentally Sound Technologies
GDP	Gross Domestic Product
GHG	Greenhouse gases
HUDCC	Housing and Urban Development Coordinating Council
HVAC	Heating, Ventilation and Air-Conditioning
IEC	Information and Education Campaign
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
IPCC	Intergovernmental Panel on Climate Change
KBA	Key Biodiversity Area
KtOe	Kilo ton of Oil equivalent
LDCs	Least Developed Countries
LG	Local Government
LGU	Local Government Unit
LUCF	Land Use Change and Forestry
LWUA	Local Water Utilities Administration
MDFO	Municipal Development Finance Office
MDGF	Millenium Development Goal Achievement Fund

MBFOE	Millions Barrels of Fuel Oil Equivalent
MW	Megawatt
NCCAP	National Climate Change Action Plan
NCIP	National Commission on Indigenous People
NDRRMC	National Disaster Risk Reduction and Management Council
NEDA	National Economic and Development Authority
NEDO	New Energy and Industrial Technology Development Organization
NFSCC	National Framework Strategy on Climate Change
NG	National Government
NGO	Non-Government Organization
NREL	National Renewable Energy Laboratory
NRPS	National REDD Plus Strategy
NWRB	National Water Resources Board
P3W	President's Priority Program on Water
PA	Protected Area
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PBE	Philippine Business for the Environment
PES	Payments for Environmental Services
PFM	Public Finance Mechanism
PIA	Philippine Information Agency
PNOC	Philippine National Oil Company
PPP	Public-Private Partnership
R & D	Research and Development
RA	Republic Act
RE	Renewable Energy
SHS	Solar Home Systems
SIDS	Small Island Developing States
SME	Small and Medium Enterprise
TESDA	Technical Education and Skills Development Authority
TPES	Total Primary Energy Supply
UNCRD	United Nations Centre for Regional Development
UNDP	United Nations Development Program
UNEP	United Nations Environmental Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development

National Climate Change Action Plan

2011-2028

Introduction

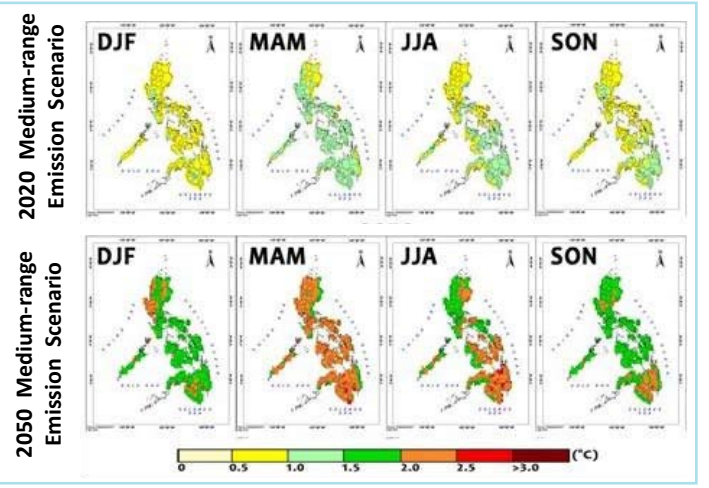
The global and local climate is changing. Current climate trends show that the Philippines, like the rest of the world, has exhibited increasing temperatures, with observed mean temperature increase of 0.64 °C or an average of 0.01 °C per year-increase from 1951-2010. In the last 59 years, maximum (daytime) and minimum (nighttime) temperatures are also seen to have increased by 0.36 °C and 0.1 °C, respectively. Moreover, the analysis on tropical cyclone passage over Luzon, Visayas and Mindanao using a 30-year running mean shows that there has been a slight increase in the number of cyclones in the Visayas during the 1971-2000 period as compared with the 1951 to 1980 and 1960-1990 periods (PAGASA 2011).

Using a mid-range emissions scenario, the climate projections done by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) for 2020 and 2050 indicate that all areas of the Philippines will get warmer, with largest increase in temperatures in the summer months of March, April and May (MAM). Mean temperatures in all areas in the Philippines are expected to rise by 0.9 °C to 1.1 °C in 2020 and by 1.8 °C to 2.2 °C in 2050.

The climate projections further indicate that, generally, there is reduction in rainfall in most parts of the country during the summer (MAM) season. However, there is likely increase in rainfall during the southwest monsoon season in June, July and August (JJA) until the transition months of September, October and November (SON) in most areas of Luzon and Visayas. Increase in rainfall is also likely during the northeast monsoon months of December, January and February (DJF), particularly in provinces/areas characterized as Type II climate. There is, however, a generally decreasing trend in rainfall in Mindanao, especially by 2050 (PAGASA 2011).

These scenarios thus indicate that the Philippines will not be spared from the impacts of climate change. Even if the world will drastically decrease its greenhouse emissions, stabilizing the greenhouse gases already in the atmosphere will take some time and the impacts of changing climates will continue for years to come. The Philippines, being archipelagic and because of its location, is one of the most vulnerable to these impacts. The country ranked highest in the world in terms of vulnerability to tropical cyclone occurrence and third in terms of people exposed to such seasonal events. A recent Climate Change Vulnerability Index (CCVI)[1], released by the global risks advisory firm Maplecroft, ranked 16 countries out of 170 as extremely vulnerable to climate change. Of the 16, the Philippines is ranked sixth (Maplecroft 2010).

For this reason, the Philippines formulated its framework strategies and actions towards adaptation and mitigation. Being an insignificant emitter of greenhouse gases, the country puts greater emphasis on adaptation as necessary to complement measures that reduce greenhouse gas emissions. It is a mechanism to manage risks, adjust economic activity to reduce vulnerability and to improve business certainty.



Maps showing the projected seasonal temperature increase (in °C in the Philippines in 2020 and 2050.

1 The Climate Change Vulnerability Index is a global ranking instrument, calculating the vulnerability of 170 countries to the impacts of climate change over the next 30 years. CCVI evaluated 42 social, economic and environmental factors to assess national vulnerabilities. These include exposure to climate-related natural disasters and sea-level rise; human sensitivity, in terms of population patterns, development, natural resources, agricultural dependency and conflicts; and assessment of future vulnerability by considering the adaptive capacity of a country's government and infrastructure to combat climate change (Maplecroft 2010).

Legal Mandate

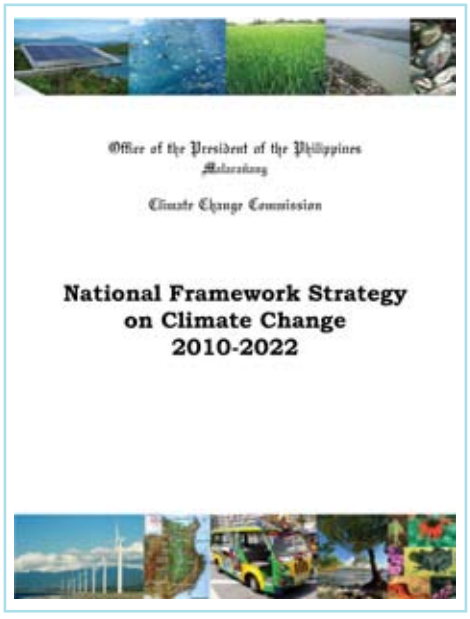
In response to the urgency for action on climate change, the Philippines passed Republic Act 9729, also known as the Climate Change Act of 2009, anchored on the constitutional provision which states that "it is the policy of the State to afford full protection and the advancement of the right of the people to a balanced and healthful ecology… to fulfill human needs while maintaining the quality of the natural environment for current and future generations."[2] RA 9729 provides, among others the following:

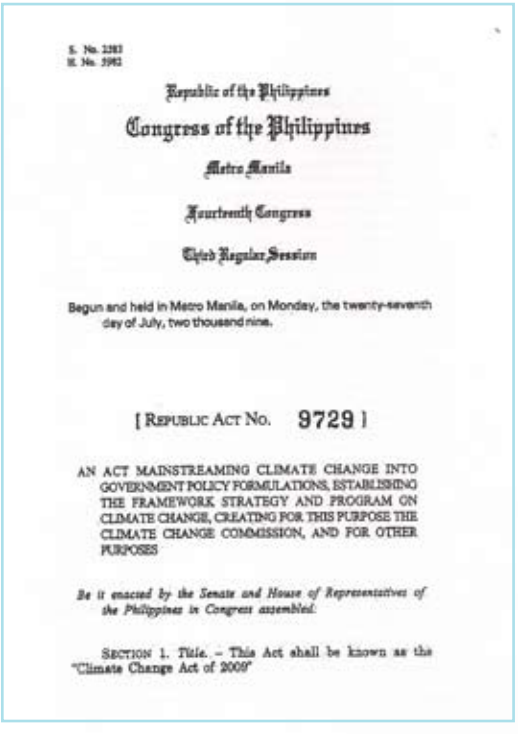
- Establishment of a Climate Change Commission, an independent and autonomous body that has the same status as that of a national government agency. The CCC is under the Office of the President and is the "sole policy-making body of the government which shall be tasked to coordinate, monitor and evaluate the programs and action plans of the government relating to climate change pursuant to the provisions of this Act." (Section 4).

- The Commission shall be composed of the President of the Republic of the Philippines who shall serve as the Chairman, and three (3) Commissioners to be appointed by the President, one of whom shall serve as the Vice Chairperson of the Commission. (Section 5)

- The LGUs as frontline agencies in the formulation, planning and implementation of climate change action plans in their respective areas, shall formulate their Local Climate Change Action Plan, consistent with the provisions of the Local Government Code, the Framework, and the National Climate Change Action Plan. (Section 14)

- Inter-local government unit collaboration shall be maximized in the conduct of climate- related activities. (Section 14)




Republic of the Philippines
Congress of the Philippines
Metro Manila
Fourteenth Congress
Third Regular Session

Begun and held in Metro Manila, on Monday, the twenty-seventh day of July, two thousand nine.

[REPUBLIC ACT No. 9729]

AN ACT MAINSTREAMING CLIMATE CHANGE INTO GOVERNMENT POLICY FORMULATIONS, ESTABLISHING THE FRAMEWORK STRATEGY AND PROGRAM ON CLIMATE CHANGE, CREATING FOR THIS PURPOSE THE CLIMATE CHANGE COMMISSION, AND FOR OTHER PURPOSES

Be it enacted by the Senate and House of Representatives of the Philippines in Congress assembled:

SECTION 1. *Title.* – This Act shall be known as the "Climate Change Act of 2009"

2 Section 2 of Republic Act 9729.

The Framework

The National Framework Strategy on Climate Change (NFSCC) was adopted in April 2010 with the following Guiding Principles (Office of the President-Climate Change Commission 2010):

1. The Framework envisions a climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems.

2. The goal is to build the adaptive capacity of communities and increase the resilience of natural ecosystems to climate change, and optimize mitigation opportunities towards sustainable development.

3. The Philippines, as a State Party to the United Nations Framework Convention on Climate Change (UNFCCC), is committed to its core principle of common but differentiated responsibilities and respective capabilities.

4. The precautionary principle guides the State's climate change framework and shall take precautionary measures to anticipate, prevent or minimize the causes of climate change and its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures.

5. The Framework is risk-based, and strategies/ activities shall be formulated, with decisions made based on the causes, magnitude and impact of risks.

6. Climate change knowledge is science-based, and shall draw from scientific contributions and best practices from communities taking into considerations local circumstances.

7. The national priorities, and therefore, the pillars, of the National Framework Strategy on Climate Change shall be adaptation and mitigation, with an emphasis on adaptation as the anchor strategy. Whenever applicable, mitigation actions shall also be pursued as a function of adaptation.

8. Adaptation measures shall be based on equity, in accordance with common but differentiated responsibility; special attention must be given to ensure equal and equitable protection of the poor, women, children and other vulnerable and disadvantaged sectors.

9. Even with inadequate scientific information, anticipatory adaptation measures should be undertaken to prevent or minimize the causes and potential impacts of climate change, whenever necessary.

10. The Framework adopts the Philippine Agenda 21 for Sustainable Development, to fulfill human needs while maintaining the quality of the natural environment for current and future generations.

11. The principle of complementation shall be observed to ensure that climate change initiatives by one sector do not restrict the adaptation of other sectors.

12. The Framework recognizes the roles of agencies and their respective mandates as provided by law. The Framework also recognizes the principle of subsidiarity and the role of local governments as front-liners in addressing climate change.

13. The Framework recognizes the value of forming multi-stakeholder participation and partnerships in climate change initiatives, including partnerships with civil society, the private sector and local governments, and especially with indigenous peoples and other marginalized groups most vulnerable to climate change impacts.

14. Policy and incentive mechanisms to facilitate private sector participation in addressing adaptation and mitigation objectives shall be promoted and supported.

The Action Plan

Following the adoption of the Framework in April 2010 and its guiding principles, the National Climate Change Action Plan (NCCAP) was formulated outlining the country's agenda for adaptation and mitigation for 2011 to 2028.

In drafting the NCCAP, the multi-sectoral processes conducted ensured that the concerns of various sectors are heard and considered.

The NCCAP comprehensively addresses the challenges of climate change. Public financing will prioritize adaptation to reduce vulnerability and risks of communities particularly the marginalized poor. At the same time, this plan will provide a policy environment that will encourage the participation of the private sector to optimize mitigation opportunities towards sustainable development.

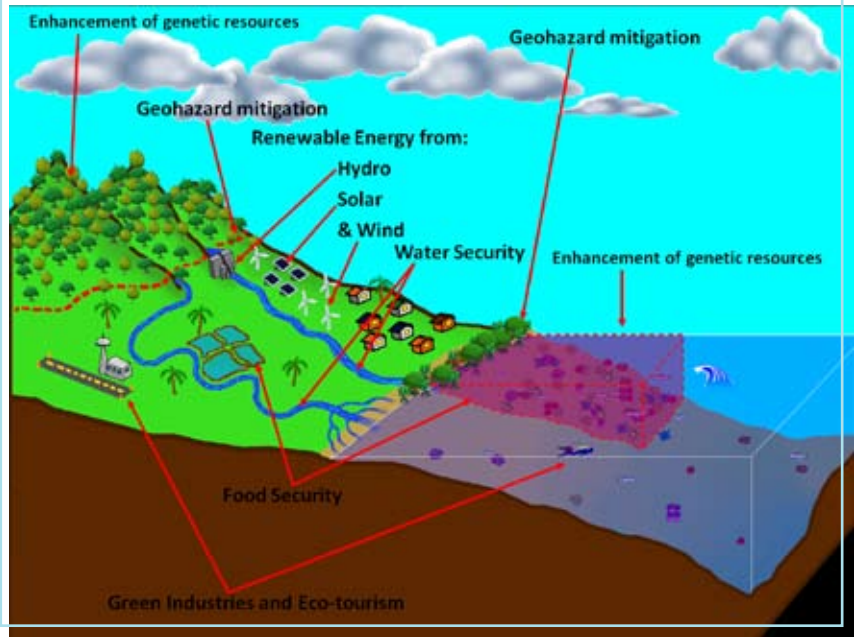
The NCCAP outlines the specific programs and strategies for adaptation and mitigation for 2011 to 2028. It is a comprehensive plan that provides key actions that:

- enhances adaptive capacity and resilience of communities and natural ecosystems to climate change.
- adopts the total economic valuation of natural resources while ensuring biodiversity conservation.
- recognizes the competitive advantage of putting value on the direct use, indirect use, option to use and non-use of environment and natural resources, as a short to long-term sustainable development goal.

Consistent with the Framework, the ultimate goal is to build the adaptive capacities of women and men in their communities, increase the resilience of vulnerable sectors and natural ecosystems to climate change, and optimize mitigation opportunities towards gender-responsive and rights-based sustainable development.

PRIORITIES	OUTCOMES
1. Food security	The objective of the national strategic priority on food security is to ensure availability, stability, accessibility, and affordability of safe and healthy food amidst climate change.
2. Water sufficiency	In light of climate change, however, a comprehensive review and subsequent restructuring of the entire water sector governance is required. It is important as well to assess the resilience of major water resources and infrastructures, manage supply and demand, manage water quality, and promote conservation.
3. Ecological and Environmental stability	Ecosystem resilience and environmental stability during the plan period is focused on achieving one immediate outcome: the protection and rehabilitation of critical ecosystems, and the restoration of ecological services.
4. Human security	The objective of the human security agenda is to reduce the risks of women and men to climate change and disasters.
5. Climate-friendly industries and services	NCCAP prioritizes the creation of green and eco-jobs and sustainable consumption and production. It also focuses on the development of sustainable cities and municipalities.
6. Sustainable energy	NCCAP prioritizes the promotion and expansion of energy efficiency and conservation; the development of sustainable and renewable energy; environmentally sustainable transport; and climate-proofing and rehabilitation of energy systems infrastructures.
7. Knowledge and capacity development	The priorities of the NCCAP on knowledge and capacity development are: • Enhanced knowledge on the science of climate change; • Enhanced capacity for climate change adaptation, mitigation and disaster risk reduction at the local and community level; and • Established gendered climate change knowledge management accessible to all sectors at the national and local levels.

The NCCAP recognizes that certain activities cut across strategic priorities and sectors. These include gender and development, technology transfer, research and development, information, education and communication (IEC), and capacity building.



Implementation of the NCCAP involves looking at two very important aspects: national and local implementation mechanisms, and financing. Convergence planning among national agencies is an important aspect in the implementation of the action plan since the strategic priorities are defined along thematic outcomes rather than sectors; thus, would need sectoral agencies to plan and work together.

Monitoring and evaluation are important aspects of the NCCAP to be set annually and evaluation every three years. Annual monitoring provides information that sets directions in setting priorities and budgets every year. Evaluation will focus on efficiency, effectiveness and impacts.

Food Security 1

The Philippines, being highly vulnerable to climate change risks and natural hazards, has to seriously address climate change risks to food security. Approximately 50.3 percent of the country's total land area and 81.3 percent of its population are vulnerable to natural disasters (World Bank 2008). In 2010, the agriculture sector produced 15.77 million metric tons of rice, 6.37 million metric tons of corn, 60.9 million metric tons of other crops, and 4.20 thousand metric tons of livestock and poultry (BAS, 2010). Agriculture remains the country's backbone for sustainable attainment of food security. It employs about one-third of the total employment in the sector, and contributes about 18 percent to gross domestic product (NEDA, UNDP, and ECHA 2008). However, a large proportion of damages from disasters, which are generally climate-related, are borne by agriculture every year. From 1990 to 2006, for instance, data shows that of the P12.43 billion average annual value of damages to agriculture for the period, 70.3 percent were caused by typhoons, 17.9 percent by drought, and 5 percent by floods (Figure 1). In 2009, from typhoon Ketsana (local code name *Ondoy*) alone, the initial estimated farm losses reached about Php3.2 billion, with 126,271 hectares of farms inundated and wasted (Office of the President, 2009). The final estimates of damages made by the World Bank placed the total cost of Ketsana to crops, property and infrastructure at US$4.3 billion or Php207 billion, which was 2.7% of the gross domestic product for that year. Losses to farmers reached US$849.3 million or Php40.8 billion.

Seasonally, data from 1980 to 2010 show that the worst typhoons usually occur from July to December, with peak numbers from September to November. Damages to agriculture caused by typhoons during these months reach as high as Php5.9 billion annually on the average (Figure 2). Given this trend, we know that food production will be adversely affected at certain periods of the year and securing food supplies will be critical. For instance, top food producing provinces will need attention amidst climate change: a) the provinces of Cagayan Valley, Pangasinan, Isabela, Nueva Ecija, Iloilo, and Camarines Sur, which are top rice producers and are exposed to greater risks of flooding and typhoons; and b) North Cotabato and Maguindanao, which are the food baskets in Mindanao and more prone to drought and El Niño (Concepcion 2010).

While we know with certainty that extreme events will continue to occur, the vulnerability of our food production sector, i.e., agriculture and fisheries, is not well studied in order to provide adaptation measures

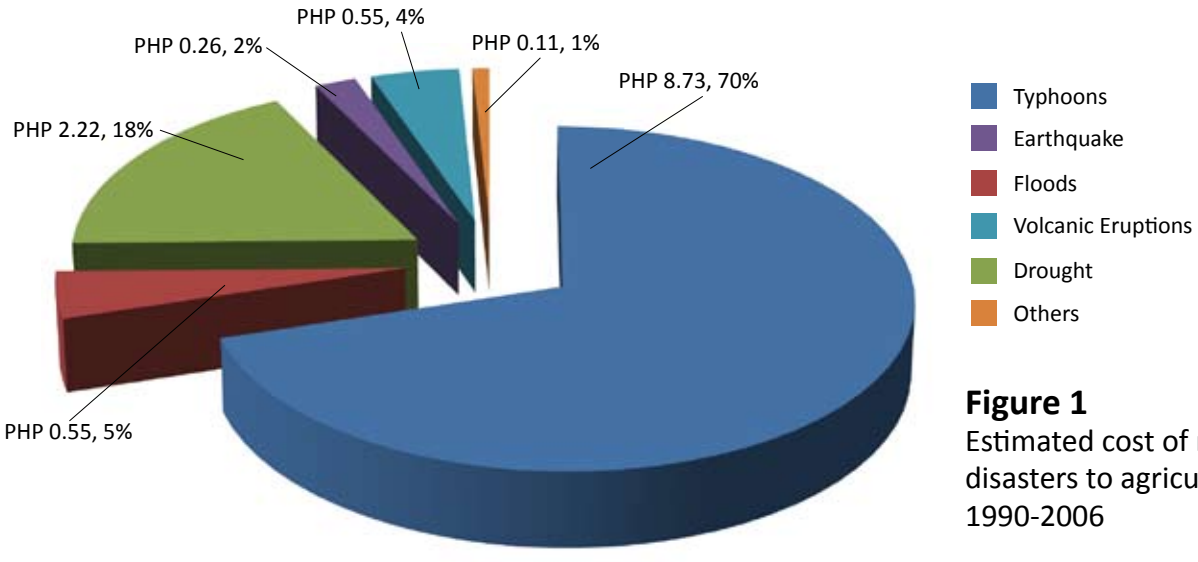


Figure 1
Estimated cost of natural disasters to agriculture, 1990-2006

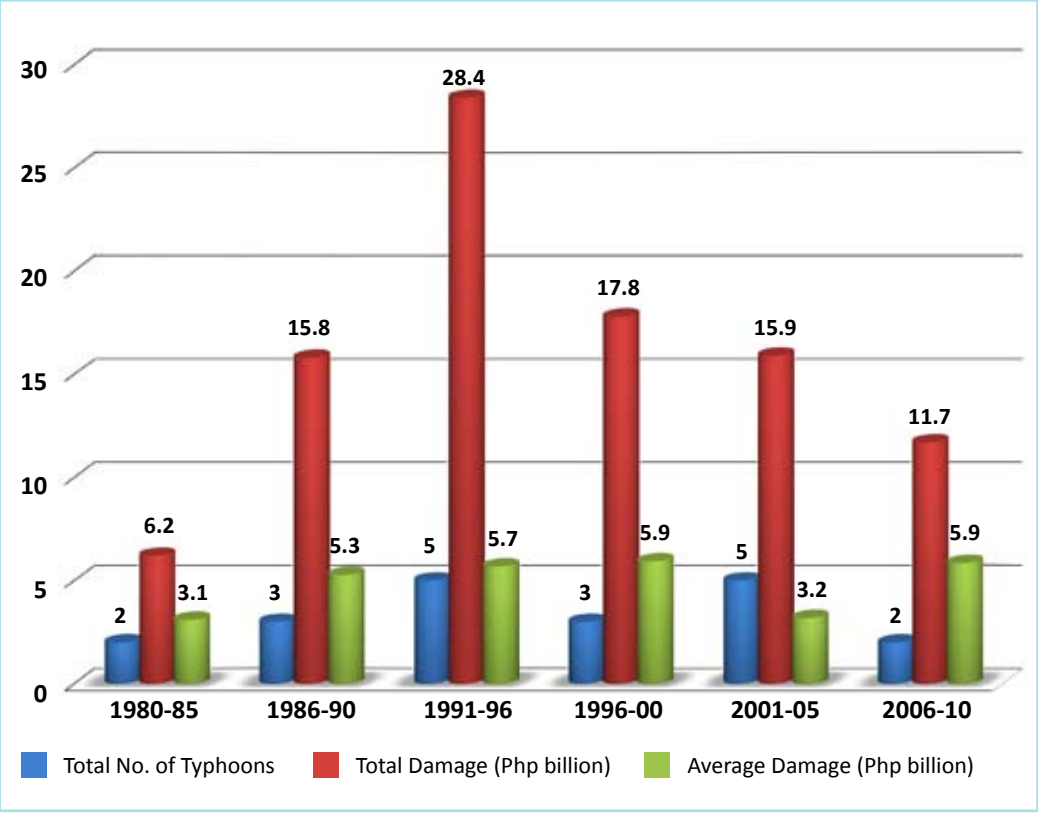


Figure 2
Estimated agricultural damages from worst typhoons within the months of July to December, 1980-2010

that are well targeted and site-specific. In general, there is currently a lack of institutional actions for site-sensitive adaptation; the reason may be traced back to the lack of scientific information on vulnerability and adaptation technologies. There may exist, however, autonomous adaptation by farmers and indigenous technologies based on local knowledge of "signs and signals" of climate risks that remain undocumented or are not recognized as adaptation measures. Therefore, actions towards building a food secure society amidst climate change will need to address some underlying drivers such as poverty and sustainable livelihoods, human and institutional capacities, and advancement in scientific knowledge on climate change risks and adaptation technologies in the food production sector.

The objective, therefore, of the National Strategic Priority on **Food Security** is

to ensure availability, stability, accessibility, and affordability of safe and healthy food amidst climate change.

It will focus on two immediate outcomes:

1. **Enhanced CC resilience of agriculture and fisheries production and distribution systems;**

2. **Enhanced resilience of agricultural and fishing communities in the midst of climate change.**

To achieve these planned outcomes, summarized in Figure 3 are the planned outputs and major activities for 2011 to 2028. To date, there are on-going efforts to provide timely information to farmers on climate so that adjustments in the cropping can be done to avoid losses. In the fisheries sector, coastal area management is being vigorously pursued.

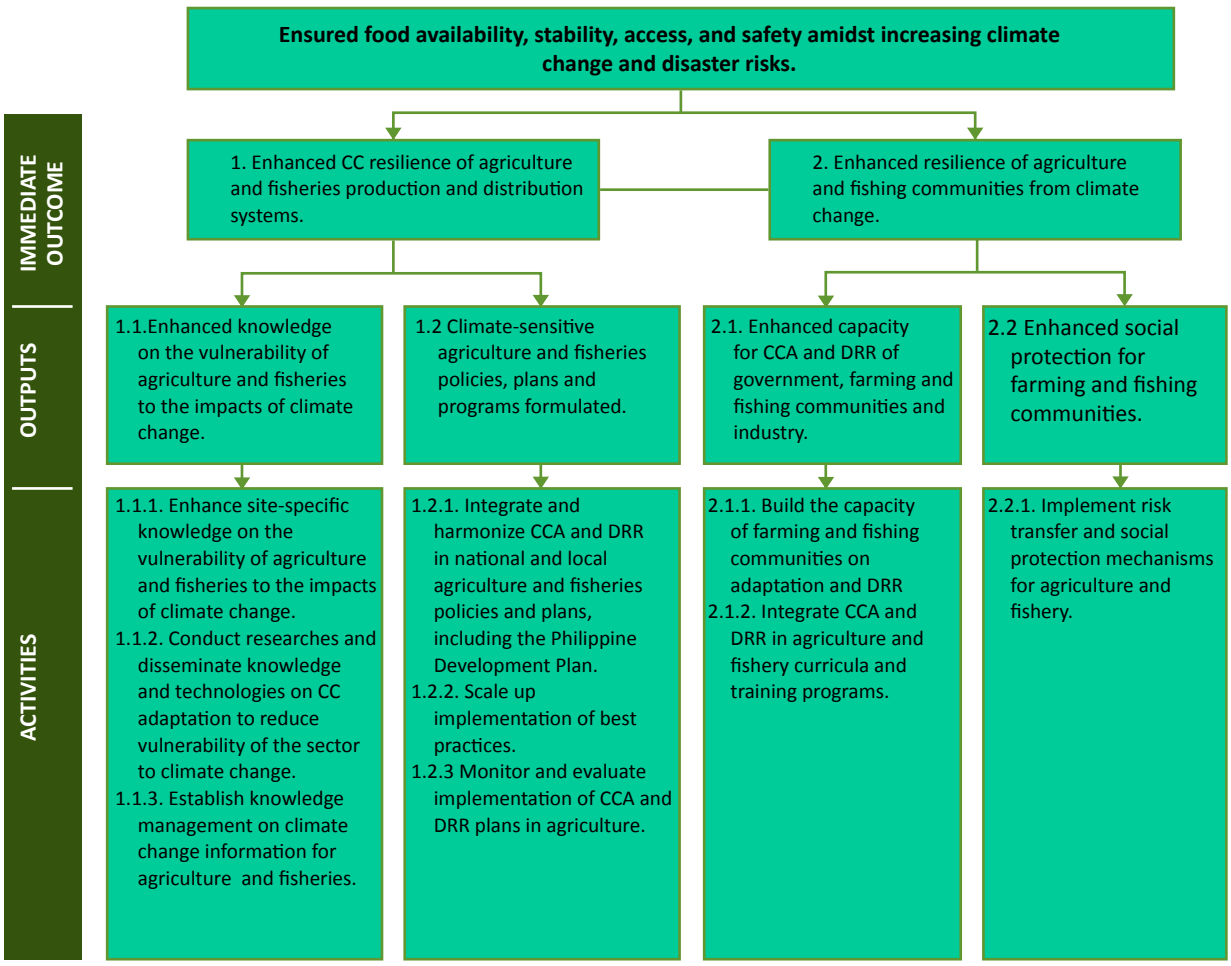


Figure 3
Strategic Actions on Food Security for 2011-2028

For 2011 to 2016, specific activities will focus on the following:

1. **To enhance site-specific knowledge on the vulnerability of agriculture and fisheries;**

   a. Conduct of provincial level vulnerability and risk assessments for agriculture and fisheries. The assessment will lay the foundation of site-specific adaptation and mitigation interventions, including the research and development agenda to test technologies and measures. The assessment is also expected to provide information on the differentiated impacts of climate change on women and men in farming and fishing communities;

   b. Conduct of studies and simulation models, based on the vulnerability assessments and down-scaled climate scenarios, on the impacts of changing climates on major crops, livestock and fisheries production;

   c. Develop the research and development agenda of the sector on climate change, which will be the basis for short and long term studies on appropriate climate-smart crop, livestock and aquaculture technologies, production systems, climate resilient crop varieties, livestock management, and best practices;

   d. Conduct of specific studies on climate-resilient crop varieties and livestock production systems;

e. Conduct and testing of best adaptation practices in fisheries and coastal management;

f. Develop and disseminate gendered and accessible knowledge products on climate change risks and impacts on the sector based on science;

g. Establish climate information system and database for agriculture and fisheries;

h. Establish a resource network that can provide technical assistance on adaptation planning to local communities and appropriate adaptation approaches to both women and men farmers and fishers.

2. **To establish gender-responsive, climate-smart policies, plans and budgets, the priority activities will be to;**

   a. Integrate gender-responsive CC adaptation and mitigation in agriculture and fisheries plans, programs, and budgets;

   b. Prioritize and enact a national land use law;

   c. Complete the delineation of municipal waters to enable better planning at the local level;

   d. Develop and implement a policy for the reversion of abandoned fishponds to mangroves; and

   e. Regulate commodity shifting and agricultural land conversion.

3. **To build adaptive capacity of farming and fishing communities taking into account the differentiated impacts of climate change on women and men;**

   a. Improve and expand the agriculture and fisheries extension service especially to highly vulnerable communities;

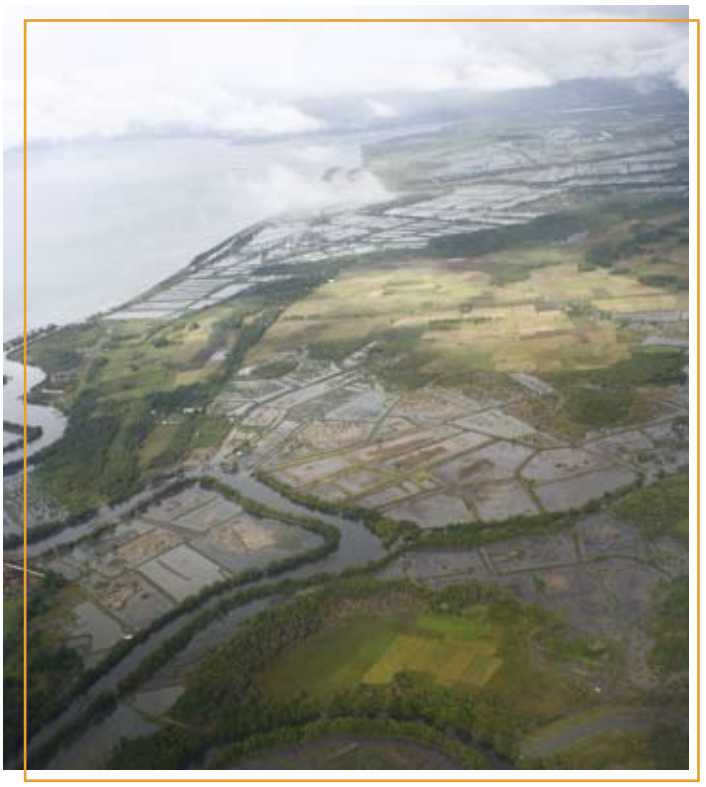
   b. Conduct training on adaptation and disaster risk reduction for farming and fishing communities;

   c. Establish field schools to demonstrate best adaptation practices in agriculture and fisheries; and

   d. Integrate CC in formal and non-formal or customized training programs on agriculture and fisheries.

4. **Finally to build the resilience of men and women in agriculture and fishing communities, study, design and develop appropriate climate risk transfer and social protection mechanisms.**

Activities for 2017 and beyond should be focused on updating scientific information and database, reviewing the sector plans, scaling up the implementation of adaptation measures and technologies, and evaluating progress towards resilience to climate change.



Water Sufficiency 2

The Philippines, given its geography and location, has abundant freshwater resources obtained from three sources: rainfall, surface water (rivers, lakes and reservoirs) and groundwater. The mean annual rainfall varies from 965 to 4,064 mm due to the geographic location and orographic barriers, while the annual average rainfall is 2,440 mm. The dependable surface supply from rivers, lakes and reservoirs is estimated at 125.8 billion cubic meters. Groundwater potential is 20.2 billion cubic meters and the reservoir has an aggregate area of 50,000 sq km (DENR 2010). Theoretically, therefore, the Philippines should have sufficient water supply. However, due to geographic and seasonal variations, water availability has become time and site-specific.

The problem of water scarcity is already felt in many areas of the country at certain seasons. This problem is aggravated by the deterioration of water quality due to pollution from untreated domestic sewage, industrial wastewater, agricultural run-offs, and urban run-offs. In some highly urbanized areas, high water demand has resulted in over extraction of groundwater and salt water intrusion.

Climate change will likely exacerbate the water problems. Climate projections of wetter climates during the wet season and drier climate during the dry season will most certainly impact on streamflow, dam operation and water allocation, domestic water supply, irrigation, hydro power generation, depth and recharge of aquifers, water quality, watersheds, and fishery. The changes in water supply and quality due to changing climates are expected to affect food and human security and the economy if water governance and adaptive measures are not robust enough to cope with the risks and impacts of climate change. Recent extreme events, such tropical storm *Ondoy* and typhoon *Pepeng*, internationally designated as *Ketsana* and *Parma* respectively, have demonstrated that current water infrastructures and disaster management systems in the country cannot satisfactorily cope with extreme climate variability.

The sector's inability to respond to issues is rooted in the fragmented and weak institutional and water governance environment. Currently, water management is lodged in over 30 government offices, with the National Water Resources Board limited to economic regulation, while the management of water sources (including watersheds), supply and distribution are done by different agencies. As a consequence, there is uncoordinated sector planning and monitoring in the absence of a national government agency responsible for translating policies and strategies into a comprehensive climate-smart water program.

As a consequence, protection of vital water resources is weak, access to financing to protect supply and improve distribution is low, performance of water service providers is wanting, and support for rural water planning and infrastructures is inadequate. The sector is also faced with dated water resources information needed for planning. These weaknesses compromise the country's ability to respond to the additional challenges posed by climate change; consequently widening the adaptation deficit[3].

Tropical storm *Ketsana* demonstrated that our water infrastructures and management systems are designed for less variable climate conditions. The water pumping stations throughout Metro Manila, many of which are over 30 years old, proved useless in pumping flood waters out into Manila Bay.

3 The adaptation deficit is characterized by insufficient knowledge and lack of timely action to offset the growth in vulnerability and damage potential that results from the growth of population, the increase of material wealth or the persistence of poverty, and the expansion of human settlement in high hazard zones. Increases in the adaptation deficit can be directly related to climate change and are resulting in high levels of both insured and economic loses (Burton as cited in the Water Sector Climate Change Adaptation Strategy).

Their pumping facilities built over 30 years ago were designed to handle only up to 100mm of rainfall per hour. Ketsana, likewise, destroyed more than Php820 Million worth of irrigation facilities, including dikes and canals that serviced over 53,000 hectares of farmland in Central Luzon. Two days after the typhoon left the country, the water supply capability was down by 92%, leaving over 100,000 households without piped-in water (Greenpeace n.d.). With no climate-proofing of water infrastructures, the Philippines will continue to spend a large portion of its meager resources on relief and rehabilitation efforts.

The Philippines has privatized water distribution in Metro Manila, which greatly improved distribution infrastructures and access. However, rural water supply continues to be a problem. In 1995, the government implemented the President's Priority Program on Water (P3W) to provide water supply infrastructure to 432 waterless municipalities outside Metro Manila. Despite meager resources and implementation issues, the rate of return of P3W in terms of infrastructure cost as against avoided water-borne diseases was high at approximately 200 percent (NEDA 2011). Providing water to waterless communities continues to date with government funding of Php1.5 billion a year. Complementary efforts to improve water supply governance are on-going under the Millennium Development Goal Achievement Fund (MDGF), particularly under MDFG 1919, to improve economic regulation and increase the capacity of local and community-based water service providers.

In light of climate change, however, a comprehensive review and subsequent restructuring of the entire water sector governance is required. The Water Code of the Philippines (Presidential Decree 1067) was enacted in 1976 and will need to be reviewed in light of other laws affecting water resources and climate change. In addition, it is important as well to assess the resilience of major water resources and infrastructures, manage supply and demand, manage water quality, and promote conservation.

The objective, therefore, of the National Strategic Priority on **Water Sufficiency** is

Water resources sustainably managed and equitable access ensured.

It will focus on three immediate outcomes:

1. **Water governance restructured towards a climate and gender-responsive water sector;**

2. **Sustainability of water supply and access to safe and affordable water ensured;**

3. **Knowledge and capacity of the water sector to adapt to climate change enhanced.**

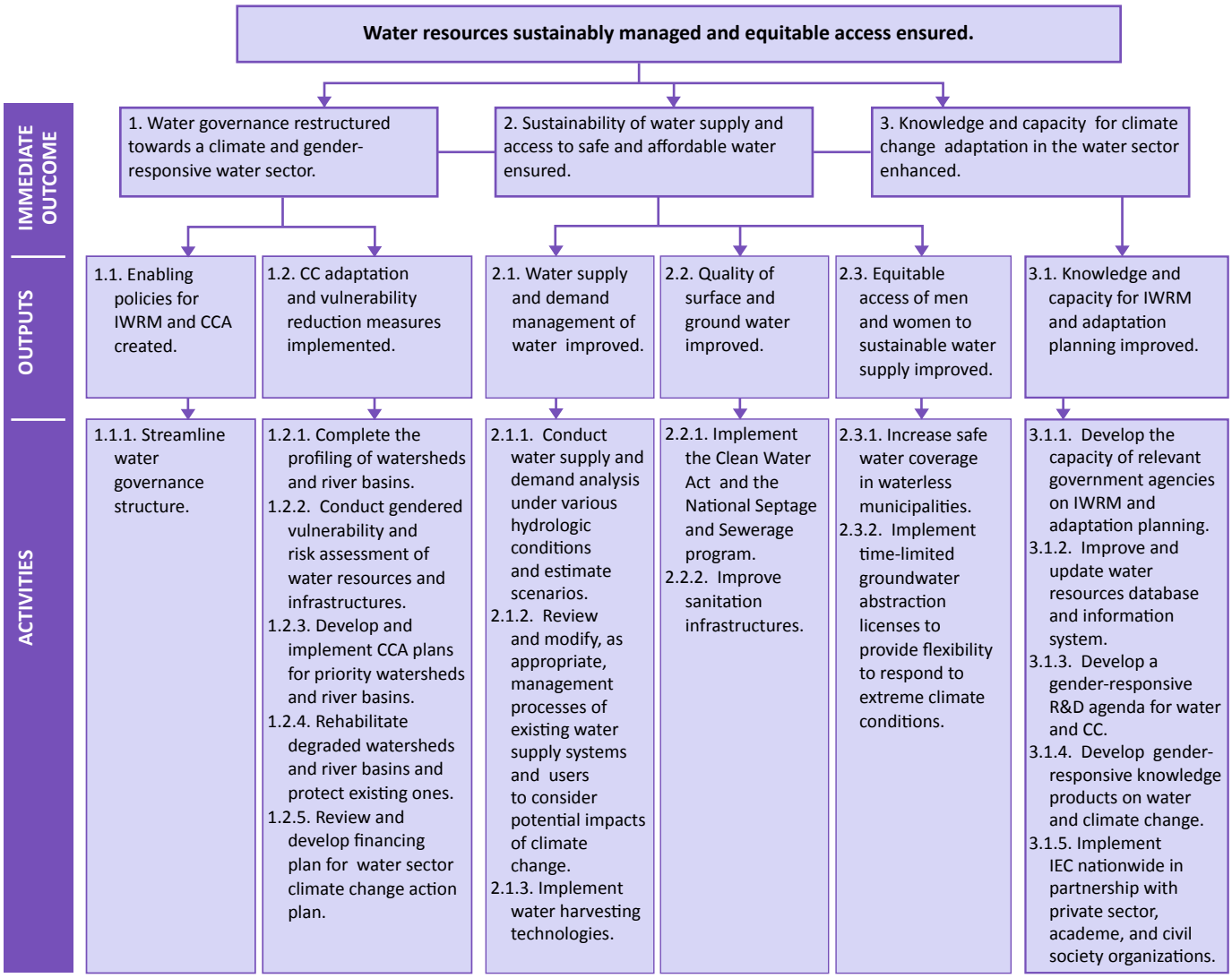


Figure 4
Strategic Actions on Water Sufficiency Actions for 2011-2028

For 2011 to 2016, specific activities will focus on the following:

1. All activities pertaining to restructuring water governance to be better responsive to climate change. These will include the review of the Water Code and other water resources laws and regulations, streamlining and structuring government institutions responsible for water, and building the capacity of relevant agencies by 2016.

2. Conduct of vulnerability and risk assessment of water resources, infrastructures and communities, including analysis of the differences in vulnerabilities of men and women to the impacts of climate change by 2013.

3. Formulation of a roadmap for climate-proofing critical water infrastructure based on the results of the vulnerability and risk assessments by 2013 and implementation thereafter.

4. Rehabilitation of water distribution infrastructures to avoid leakages and contamination by 2016.

5. Completion of the characterization of watersheds and river basins by 2012.

6. Conduct of water supply and demand analysis under various hydrologic conditions and scenarios by 2012.

7. Review and modifications to the processes and supply/demand management of existing and new water supply systems by 2016.

8. Through the coordinative effort among DENR, DA, DOE and DPWH, establish flood plain zones and develop flood plain management and hazard reduction operating plans as a modular or incremental adaptation measure.

9. Update and improve water resources database and monitoring systems by 2014.

10. Develop of gendered knowledge products and materials, and their dissemination using media, outreach and other means to target audiences by 2013.

3 Ecological & Environmental Stability

Human well-being is highly dependent on ecosystems and the benefits they provide. Ecosystem services are the benefits people obtain from ecosystems. These services include provisioning such as genetic resources, food, fiber and water; regulating such as regulation of climate, flood and disease control; cultural such as spiritual, recreational, and cultural benefits; and supporting such as nutrient cycling, water cycling, soil formation and retention, and other services that maintain the conditions for life on Earth (GreenFacts 2011). Maintaining healthy and stable ecosystems is therefore, a necessity especially amidst changing climates.

Virtually almost all of the country's ecosystems have been significantly transformed or degraded. Philippine ecosystems have changed more rapidly, through large scale conversion of forests and grasslands into cropland, settlements and mining areas, diversion and storage of freshwater behind dams, pollution of rivers and lakes from domestic and industrial effluents, and the loss of mangrove and coral reef areas. In fact, the country has often been cited as an example for the worst-case-scenario in environmental degradation. Mass-scale logging has deforested three-fourths of the Philippine forests and forest decline continues at 1.9 percent annually. Scientists believe that only 6 to 8 percent of the country's primary forest remains. In the face of poverty, forested and logged-over areas are converted to agriculture, fishery resources are over-fished, and destructive fishing practices like poisoning and dynamiting, have caused great harm to the rich coral reefs. To date, only 5 percent of the Philippines' coral reefs have 75 to 100 percent of live coral cover. This widespread environmental degradation has caused many endemic species to go extinct and others to become greatly endangered. According to the IUCN, 21 percent of the Philippine vertebrates and over half of the known plant species are already threatened (Posa, et al. 2008).

With climate change, we expect additional adverse impacts to ecosystems. For example, the El Niño episode in 1997 to 1998 had caused coral bleaching on massive scales never seen before in the Philippines. The El Nido reefs, despite being one of the better managed reefs in

the country, are down from 60 to 70 percent coral cover to 5 to 10 percent after the devastating coral bleaching event and have not recovered to date. Nationwide, the 1998 coral bleaching event decreased live coral cover by as much as 49 percent (Ocean Heritage Philippines 2011).

While ecosystems have the inherent capacity to resist and adapt, climate change coupled with destructive human activities put tremendous pressures on this capacity.[4] When exceeded, ecosystems can change irreversibly in ways that may not be socially and ecologically acceptable. That is why there is a need to adjust human activities, reduce the vulnerability of ecosystems to climate change, and strengthen its ecological resilience through mitigation and adaptation. Without any consequential action, the impacts of climate change are going to be more severe in the coming years.

The objective, therefore, of the National Strategic Priority on **Ecological and Environmental Stability** is

enhanced resilience and stability of natural systems and communities.

It will focus on one immediate outcome:

1. **Ecosystems protected, rehabilitated and ecological services restored.**

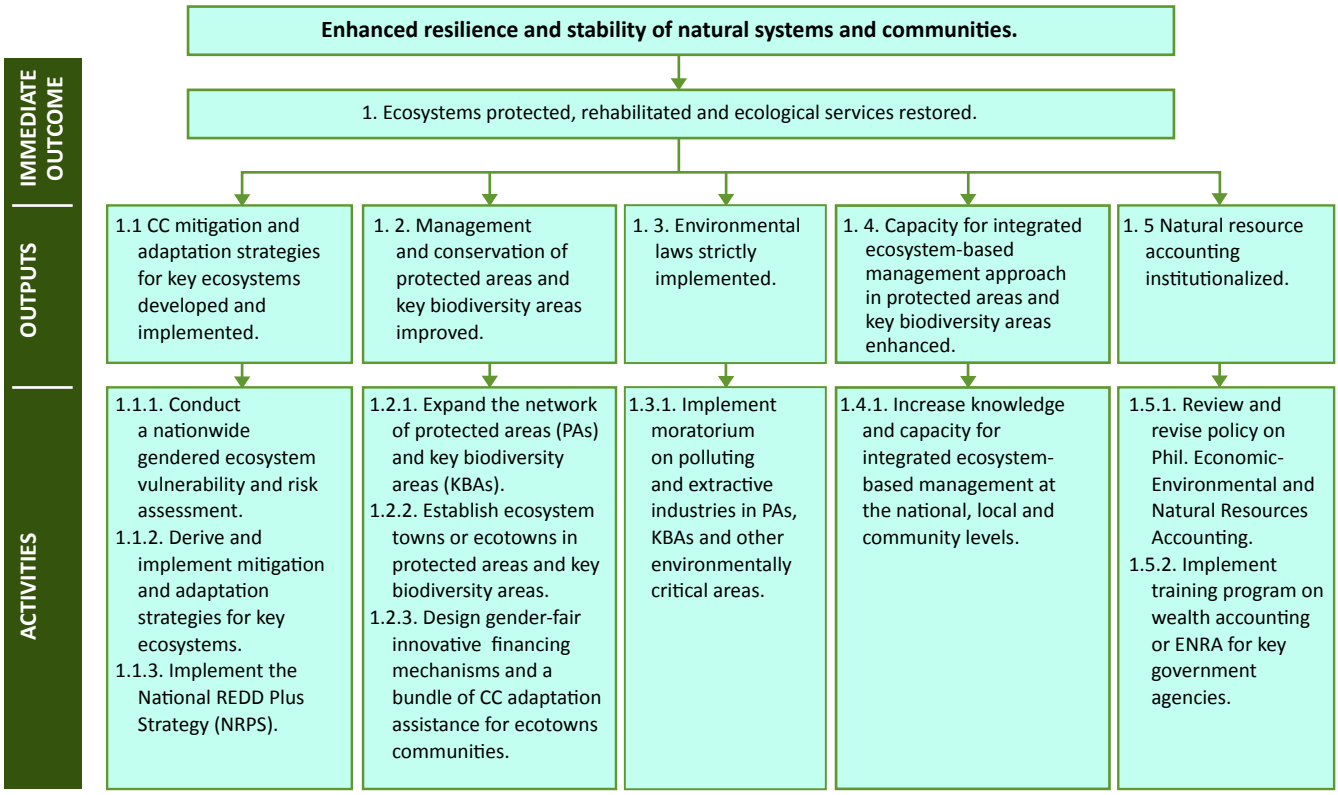


Figure 5
Strategic Actions on Ecological and Environmental Stability for 2011-2028

4 Ecosystems' ability to adapt and resist is called ecological resilience – a measure of the amount of change or disruption that is required to transform a system from being maintained by one set of mutually reinforcing processes and structures to a different set of processes and structures (Peterson, Allen and Holling 1998).

For 2011 to 2016, specific activities will focus on the following:

1. CC mitigation and adaptation strategies for key ecosystems developed and implemented;
2. Management and conservation of protected areas and key biodiversity areas improved;
3. Environmental laws strictly implemented;
4. Capacity for integrated ecosystem-based management approach in protected areas and key biodiversity areas enhanced;
5. Natural resource accounting institutionalized;

For 2011 to 2016, ecosystem and environmental stability agenda will be one of two top priorities. The other is sustainable energy. This is because there is wide consensus that without stable and resilient ecosystems, the impacts of climate change on communities and the ecosystem are expected to be more severe as demonstrated by recent events in the country. Priority will be given to the establishment of ecosystem towns or Ecotowns, an implementation vehicle for the convergence of adaptation and mitigation actions, as well as a demonstration of integrated ecosystem-based management approach.

4 Human Security

The Philippine Development Plan defines human security as the state where the rights of the Filipino family and individuals, especially the poor and vulnerable, are protected and promoted through access to education, health, housing, and social protection, while ensuring environmental sustainability. Security concerns associated with climate change include the potential for conflict over natural resources, population displacement and migration as the result of sea-level rise or other large-scale biophysical, ecological or social disruptions, and the prospect of increasingly frequent humanitarian disasters as the result of extreme climate events. The notion of human security amidst climate change risks, therefore, considers a state or condition where individuals and communities have the options necessary to end, mitigate or adapt to threats to their human, environmental and social rights; have the capacity and freedom to exercise these options, and actively participate in pursuing these options (O'Brien, et al. 2008).

The growing recognition that there may be an increasing number of disasters linked to floods, droughts and other climate influenced events calls for a much deeper and broader assessment of the connections between disaster risk reduction, climate change adaptation and human security (O'Brien, et al. 2008). Consequently, there is a call for a common framework in approaching the reduction of vulnerability to disasters, climate variability and long-term climate change. Climate- and weather-based hazards, with or without climate change, can lead to large scale disasters if processes and communities

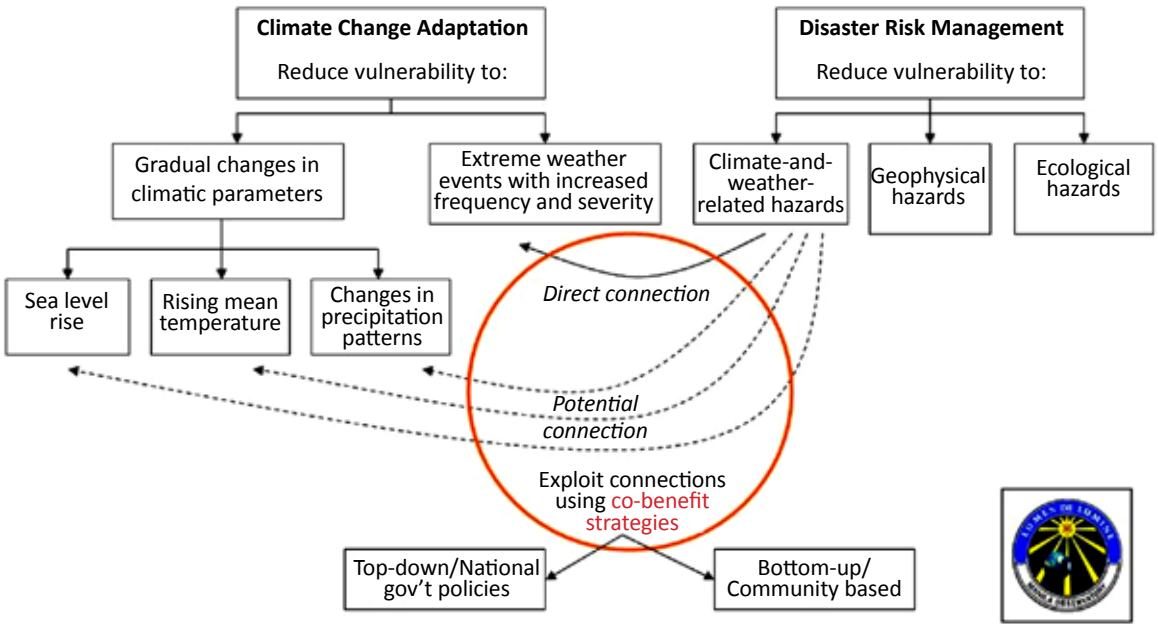


Figure 6

Conceptual Linkages of Climate Change adaptation and Disaster Risk management

Source: Castillo, Charlotte Kendra G, 2007

are not prepared and the risks are not reduced. With climate change and the expected increase in the severity and frequency of extreme weather, disaster risk management will not be sufficient. Climate change adaptation should be a complementary action to disaster risk management to reduce the risks and impacts of additional hazards brought by extreme climate events, as well as the creeping long-term effects of sea level rise, rising temperatures, and changes in the pattern of precipitation (Figure 6). Using a complementary framework, therefore, exploits potential co-benefits and efficiencies of convergent and coordinated actions where CCA and DRM overlap emphasizing the need for climate risk management (CRM).

The Human Security agenda of the National Climate Change Action Plan (NCCAP) provides key strategic actions that give importance to coordinated efforts on disaster risk reduction and climate change adaptation to minimize the threats to human security.

The objective, therefore, of the National Strategic Priority on the **Human Security Agenda** is

to reduce risks of men and women and other vulnerable groups (children, elderly and persons with disability, etc.) from climate and disasters.

It will focus on three immediate outcomes:

1. Climate change adaptation and disaster risk reduction implemented in all sectors at the national and local levels.

2. Health and social protection delivery systems are responsive to climate change risks.

3. CC–adaptive human settlements and services developed, promoted and adopted.

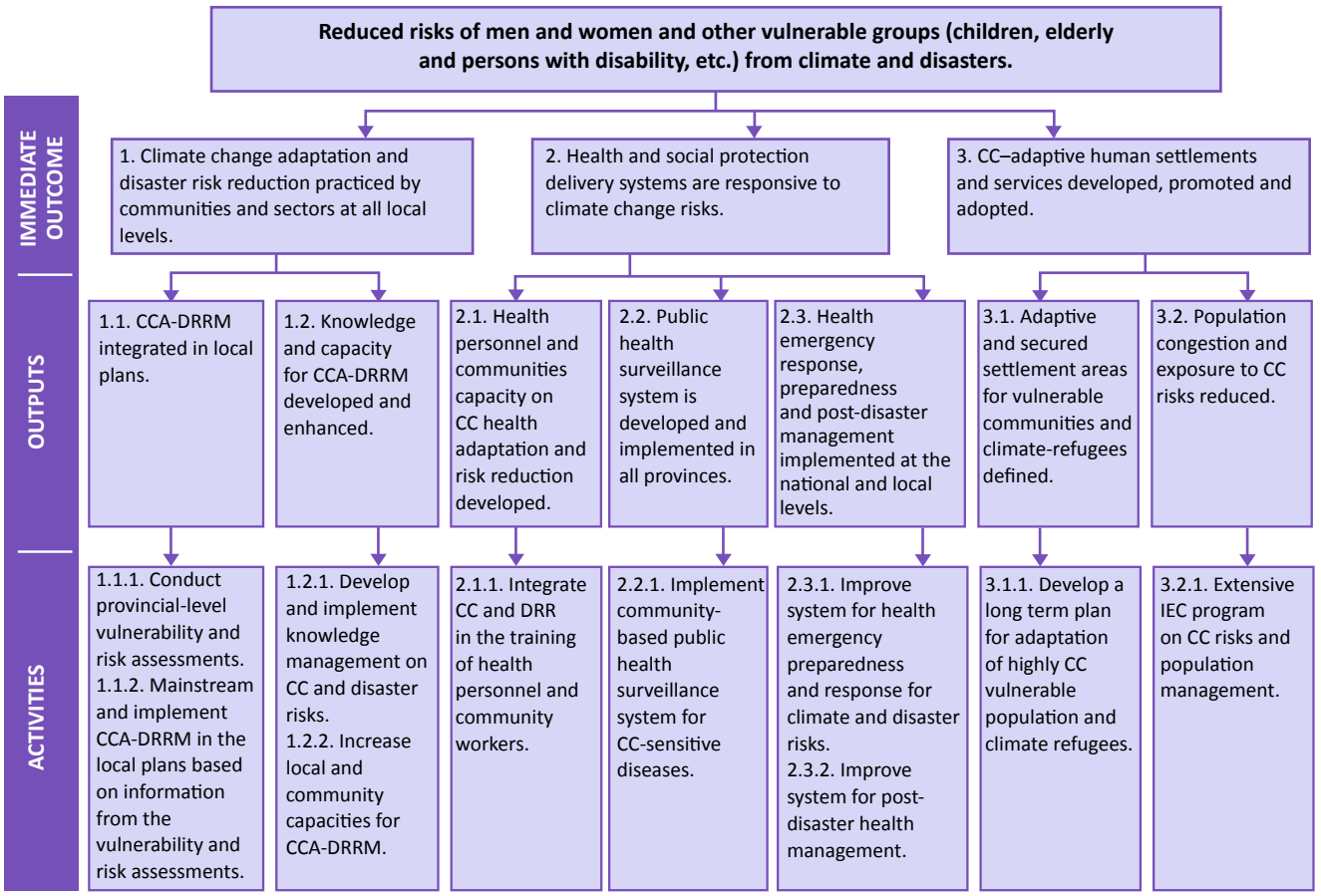


Figure 7
Strategic Actions on Human Security for 2011 to 2028

For 2011 to 2016, specific activities will focus on the following:

1. Climate change adaptation and disaster risk reduction practiced by communities and sectors at all local levels. This entails that:
   a. CCA-DRRM are integrated in local plans, and
   b. Knowledge and capacity for CCA-DRRM are developed and enhanced.
2. Health and social protection delivery systems are responsive to climate change risks.
   a. Health personnel and communities develop capacity for CC health adaptation and risk reduction,
   b. Public health surveillance system are developed and implemented in all provinces, and
   c. Health emergency response, preparedness and post-disaster management are implemented at the national and local levels.
3. CC-adaptive human settlements and services are developed, promoted and adopted.
   a. Adaptive and secured settlement areas for vulnerable communities and climate-refugees are defined, and
   b. Population congestion and exposure to CC risks are reduced.

The next four to five years up to 2016 will focus on activities that will lay the foundation or inform more

long-term actions to enhance human security in ways that will reduce risks to climate change and disasters. The priorities, therefore, will be on:

1. Conduct provincial level gendered vulnerability and risk assessments
2. Mainstreaming and implementation of gender-responsive CCA-DRRM in local plans based on information from the vulnerability and risk assessment
3. Development of gender-based knowledge products
4. Organizing and mobilizing national and local networks of CC practitioners and resources that can provide assistance to LGUs and communities on CCA-DRRM
5. Training health professionals and community workers on climate change adaptation and disaster risk reduction management through customized programs, and integration of CCA-DRRM in health curricula
6. Implementation of community-based monitoring and surveillance system for CC-sensitive diseases
7. Improve national and local emergency response and post-disaster management system
8. Intensify gender-sensitive IEC using various media and outreach to increase awareness on climate and disaster risks reduction and population management to avoid conflicts in case of resettlement and climate refugees.

Climate-Smart Industries & Services 5

In September 2009, the Green Industry Conference for Asia was organized by United Nations Industrial Development Organization (UNIDO) in cooperation with the UN Environmental Programme (UNEP) and UN Economic and Social Commission for Asia and the Pacific (ESCAP) in Manila. Almost 1,200 representatives of 21 developing countries, including the Philippines, drafted and signed the Manila Declaration on Green Industry in Asia which is the first regional promulgation on the said developmental matter. The Manila Declaration, a non-binding agreement, recognized that the greening of industries and the mainstreaming of green growth strategies on government policies and programs are integral measure in addressing the dangerous consequences of climate change. It also emphasized the need for local and international fiduciary support, technology transfer and capacity development to least developed countries (LDCs), Small Island Developing States (SIDS) and economies in transition in order to facilitate the fulfillment of international commitments and the realization of sustainable development (Manila Declaration on Green Industry 2009).

Among the agreements stipulated in the Manila Declaration are the adoption of the Green Growth Strategy integrated in the Green Growth Initiative of the UNESCAP, which harmonizes economic growth with sustainable development; the transfer of cleaner production technology and practices through stronger bilateral, regional and international cooperation; the mainstreaming of policies and formulation of action plans on green growth including sustainable consumption and production; the conduct of research and development on green innovations; promotion of renewable energy and energy-efficient processes in industries, and; the forging of partnerships among the public, private, academe and civil society (Manila Declaration on Green Industry 2009).

Despite the fact that the Philippines is not a significant emitter of greenhouse gases globally, it recognizes that green growth is a relevant approach to sustainable economic growth for the country to reduce poverty, achieve social progress, protect the environment and diminishing natural resources, and adapt and mitigate the impacts of changing climates. For the NCCAP, the long term goal is the sustainable transition towards green growth by developing climate-smart industries and services. Priorities will focus on promoting climate-smart industries in partnership with the private sector, creating green jobs and sustainable livelihoods especially in the rural areas and the most vulnerable men and women in these communities, and promoting climate-resilient and sustainable cities and municipalities.

The first focus is on promoting climate-smart industry. Green industry is defined differently by different people and organizations. Perhaps the most common definition is businesses and enterprises that provide products and/or services that are aimed at utilizing resources more efficiently, providing renewable sources of energy, lowering greenhouse gas emissions, or otherwise minimizing environmental impact. Other definitions include businesses that help other businesses and individuals lower their carbon emissions and avoid toxic chemicals. Green services, on the other hand, may pertain to consumed and produced goods and rendered services for environmental benefits. These type of services can be derived from the creation of environment-friendly businesses and facilities, and the jobs generated thereof.

Clearly, these definitions put heavy emphasis on low-carbon strategies and mitigation efforts. Strategically, the NCCAP uses the term "climate-smart" to emphasize the need for "adaptive mitigation", i.e., to use mitigation measures as integral part of adaptation and to integrate adaptation and mitigation in core business policies and operation.

The second focus of the NCCAP is the creation of green jobs. The plan adheres to the United Nations Environment Program and International Labor Organization's definition of *Green jobs* as decent jobs, which help protect the environment, ensure a shift to a low carbon development and adapt to the effects of climate change. These include jobs that reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable; protect ecosystems and biodiversity or combat desertification; reduce the use of energy, raw materials, and natural resources including water, through high efficiency strategies, techniques and technologies; and minimize or altogether avoid generation of all forms of wastes and pollution (ILO).

Thirdly, the NCCAP focuses on the development of sustainable cities and municipalities. An ecotown, is a city/town designed in consideration of (a) environmental impacts and protection of ecosystems, (b) efficient in use of land, energy, water and food (i.e., eco-efficient), (c) minimizing waste outputs, and (d) creating sustainable jobs. The cruxes, therefore, of ecotowns are the creation of the smallest possible ecological footprint, reduction of its overall contribution to climate change, and building resilient communities and ecosystems.

The objective, therefore, of the National Strategic Priority on the **Climate-Smart Industries And Services** is

climate resilient, eco-efficient and environment-friendly industries and services developed, promoted and sustained.

It will focus on three immediate outcomes:

1. **Climate-smart industries and services promoted, developed and sustained.**

2. **Sustainable livelihood and jobs created from climate-smart industries and services.**

3. **Green cities and municipalities developed, promoted and sustained.**

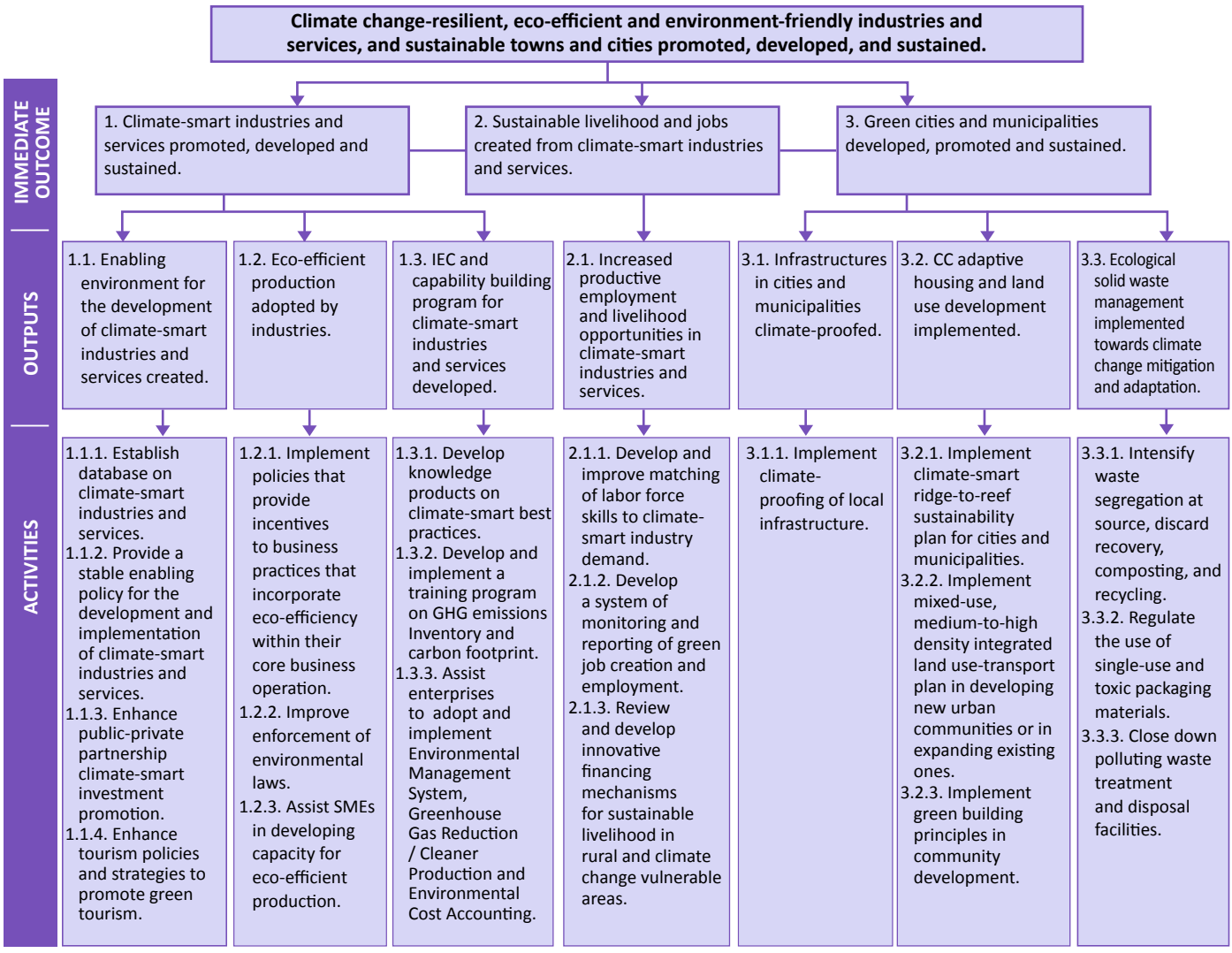


Figure 8
Strategic Actions on Climate-Smart Industries and Services for 2011-2028

In the next 17 years (2011 to 2028), these strategic priorities are expected to result in the following (Figure 8):

1. Creation of policies and stable policy environment for the development of climate-smart industries and services;

2. Adoption of eco-efficient production;

3. Development of capacity building programs and knowledge for promoting climate-smart industries and services;

4. Development of productive employment and livelihoods from these industries;

5. Climate-proofing of infrastructures in ecotowns;

6. Development of CC-adaptive housing and land use; and

7. Full implementation of ecological waste management.

For 2011 to 2016, specific activities will focus on the following:

1. Review and harmonize policies (on trade, investment, environment, tourism, agriculture, etc.) to provide a stable and unified policy environment for the development and expansion of climate-smart industries and services;

2. Conduct gendered vulnerability and risk assessments of vital local infrastructures and develop short and medium term plan to rehabilitate and retrofit those found to be vulnerable, or to build new ones when retrofitting will be found relatively more expensive;

3. Review city and municipal land use and comprehensive development plans and delineate management zones (i.e., strict protection to mixed development zones) based on the risk and vulnerability assessment result.

4. Develop updated baseline information on climate-smart industries, services and green jobs. This will require the development and implementation of a system of collection, analysis and reporting of baseline and new data on climate-smart industries, green jobs and employment (e.g., Green Jobs Mapping);

5. Develop a monitoring and reporting system for greenhouse gas emissions from various activities and sectors within the ecotowns that will feed into the local and national databases on GHG. This will systematize the monitoring and reporting of national GHG emission monitoring and facilitate (among other requirements) natural resource and environmental accounting or wealth accounting and green gross provincial income accounts. To encourage industry compliance and participation, the development of a monitoring and reporting system should build on the experiences and explore the expansion of the voluntary Philippine GHG Accounting and Reporting Program of the DENR, DOE, Manila Observatory, and Philippine Business for the Environment (PBE) and their international partners and other similar relevant initiatives;

6. Build public-private and civil society organization partnerships in the following areas:

   a. Development of social protection and risk transfer mechanisms;
   b. Assistance to small and medium enterprises in becoming climate-smart and resilient;
   c. Creation of jobs in the rural areas;
   d. Development of an accreditation system for green building assessors;
   e. Implementation of a system of payment for ecosystem services.

7. Enforce RA 9003 in every barangay and local government unit;

8. Develop gendered knowledge products and implement information, education and

communication activities on climate change adaptation, mitigation, and disaster risk reduction;

9. Build capacity development programs on climate-smart best practices; and

10. Implement the concept of ecotowns in key biodiversity areas (KBAs), identified based on agreed upon criteria for prioritization as well as on the convergence of actions of the seven strategic priorities.

Sustainable Energy 6

The Philippines is facing a formidable challenge of developing sustainable clean energy options to support the requirements of economic and social development with minimal adverse effects on the environment. While energy demand has gone down at an average of 0.03 percent annually from 1999 to 2009, the country continues to rely on importation to meet energy demand. In 2009, 41% of the total primary energy supply (TPES) comes from imported oil, coal and ethanol (Figure 9). On the average, the country imports over 300,000 barrels per day of crude oil and petroleum products and more than three quarters of its coal consumption (Department of Energy 2010).

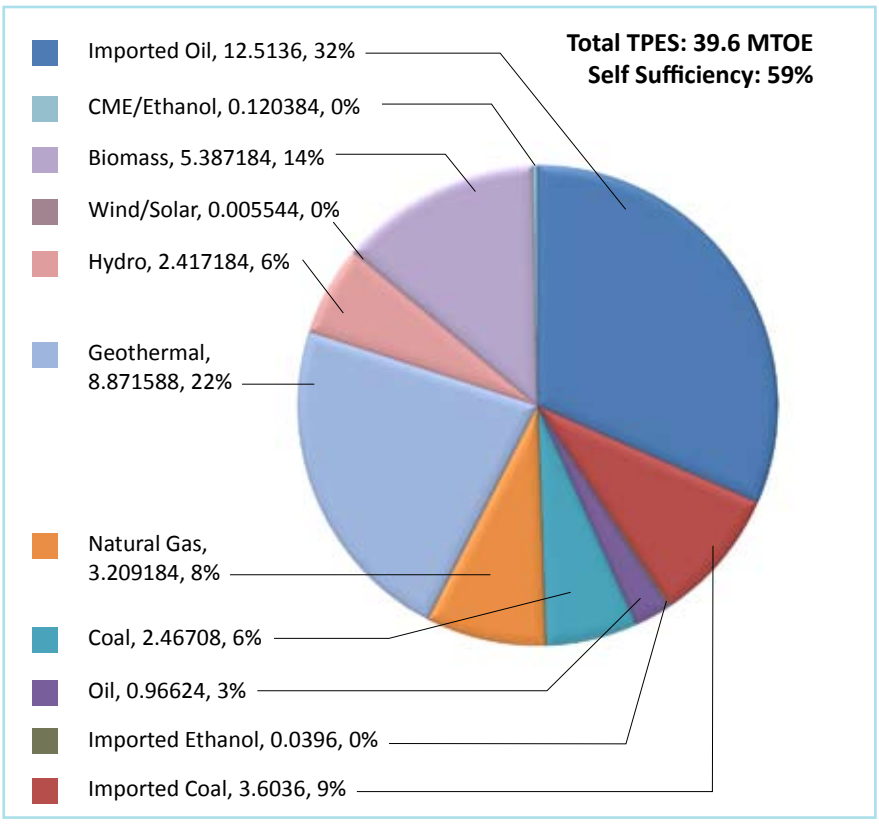


Figure 9
Total Primary Energy Supply (MTOE), 2009
Source of basic data: DOE, Philippine Energy Situationer, 2010.

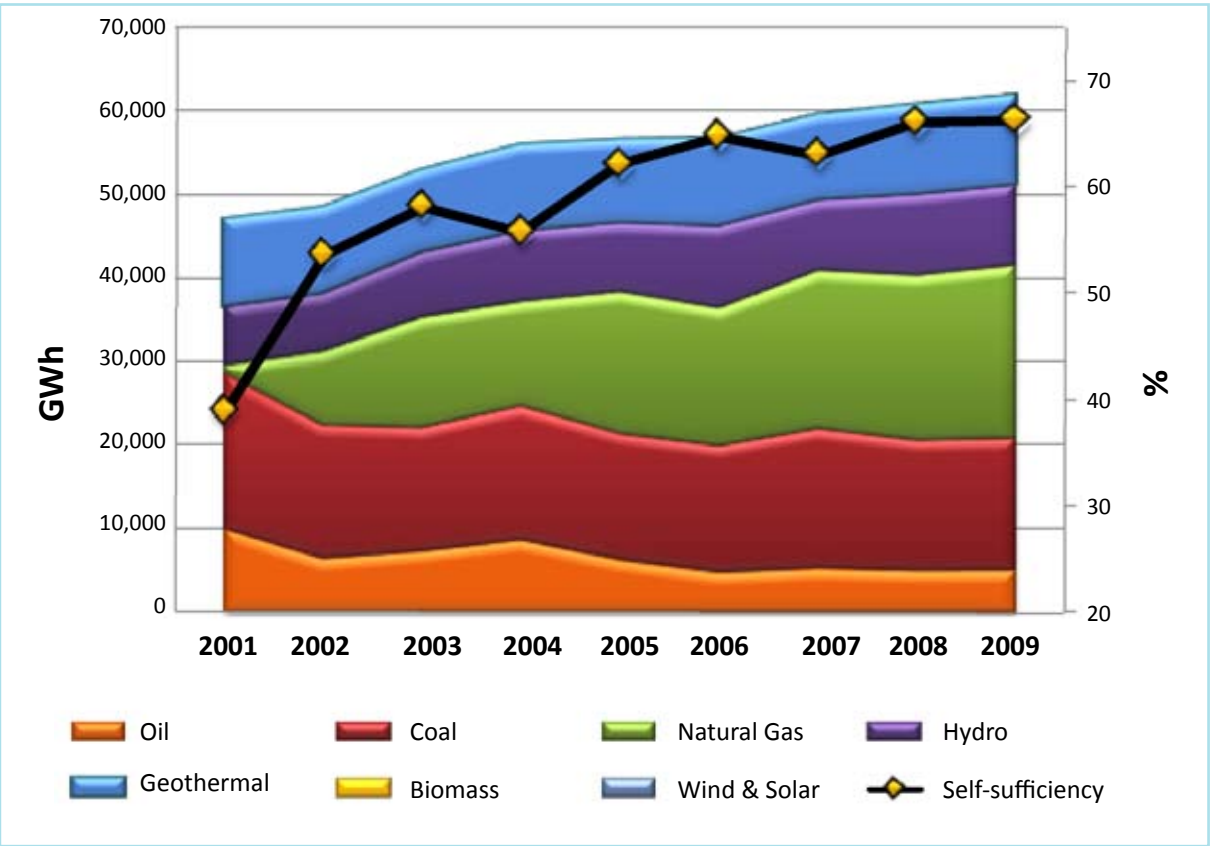
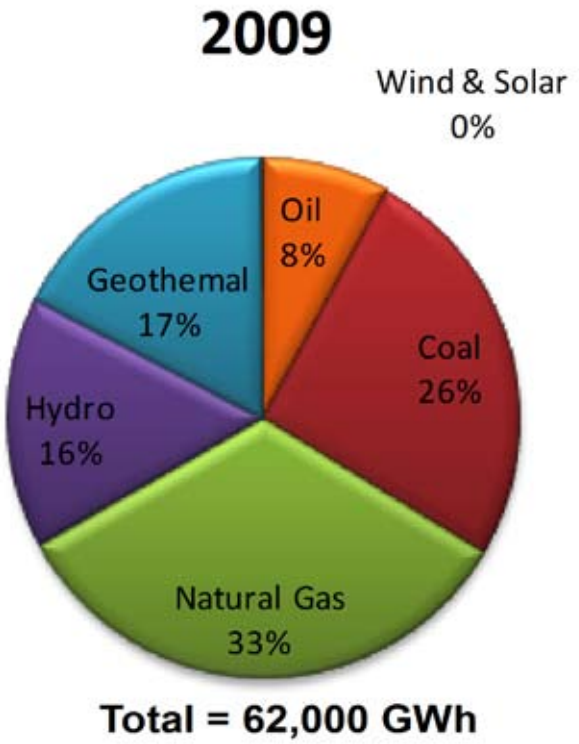


Figure 10
Self-sufficiency and Fuel Diversification in Power
Source: Department Of Energy 2010



Energy self-sufficiency, however, has been increasing from 48% in 2001 to 59% in 2009 due to the increase in renewable energy production. The success of the energy diversification program is most pronounced in the power generation sector which registered a 27 percentage increase in energy self-sufficiency, improving from 39% in 2001 to about 66% by end 2009. Power generation in the country is now largely provided by cleaner indigenous fuels, such as natural gas, hydro and geothermal (Figure 10). During the period, the country also saw the entry of power generation from wind and solar (Department of Energy 2010).

The pattern of changes in the total primary energy supply (termed as energy elasticity), in the last decade is mainly driven by the trend in oil demand. Energy elasticity is a term used with reference to

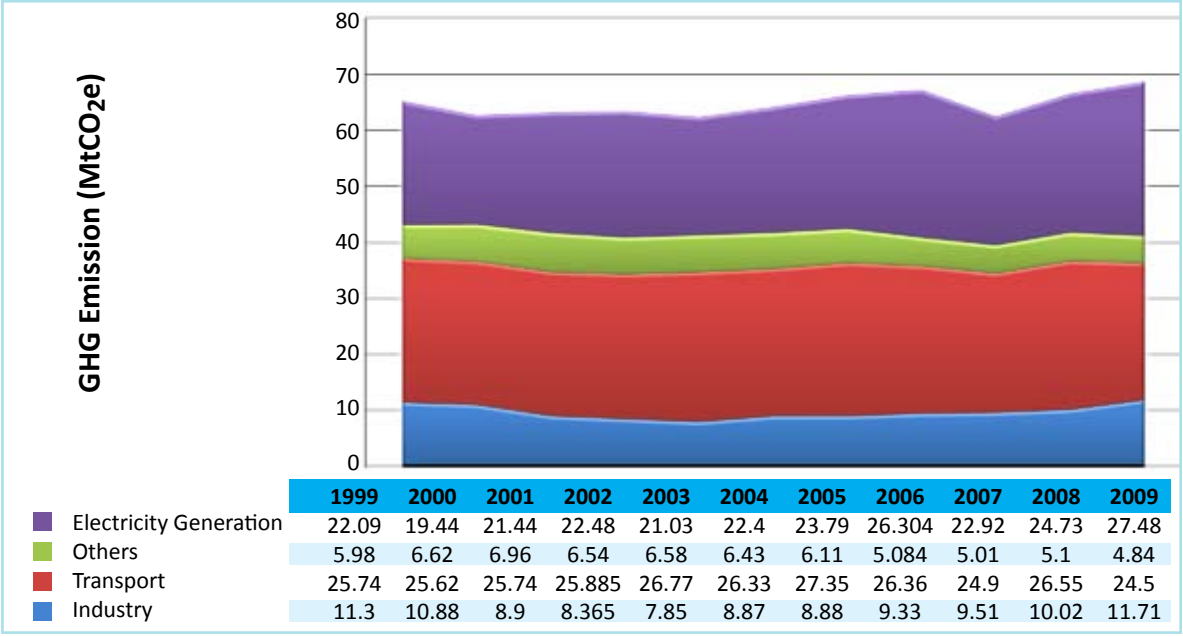
the energy intensity of gross domestic product (GDP). It is the percentage change in energy consumption to achieve one per cent change in national GDP. The energy elasticity in 2009 was 1.7 compared to 1.0 in 2008. In the case of electricity-to-GDP and oil-to-GDP, the energy elasticities were 2.0 and 2.3, respectively, for 2009. The figures imply that the country has not yet de-linked energy consumption from economic growth (Department of Energy 2010).

Table 1
Total GHG Emission ($GgCO_2e$), 2000

Sector	GHG Emission ($GgCO_2e$)
Energy	69,667.24
Industrial Processes	8,609.78
Agriculture	37,002.69
Land Use Change and Forestry (LUCF)	-105,111.37
Waste	11,599.007
Total GHG Emission	21,767.41

Source: NFSCC

Economic growth and rapid urbanization have led to twin energy challenges in the region: environmental sustainability and energy security. Metro Manila is one of the most polluted cities in Asia and the world. With a business as usual scenario, many other highly urbanized cities may go the same route. The energy sector is a major source of greenhouse gas emissions in the country – about 69,667 gigagrams of carbon dioxide equivalent ($GgCO_2e$). Within the energy sector, the transport and electricity generation subsectors are the biggest GHG emitters (Figure 11). For instance, the contribution of the electricity generation, has slightly increased for the years 1999 to 2009 at a rate of 2.2 percent annually on the average. The transport subsector's emissions have decreased by approximately 0.5 percent annually for the same period. The GHG emission of industry increased at a rate of 0.8 percent annually. Overall however, GHG emission for the energy sector has increased at a rate of 0.6 percent annually. With the continued increase in dependence on imported coal for power generation,



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Electricity Generation	22.09	19.44	21.44	22.48	21.03	22.4	23.79	26.304	22.92	24.73	27.48
Others	5.98	6.62	6.96	6.54	6.58	6.43	6.11	5.084	5.01	5.1	4.84
Transport	25.74	25.62	25.74	25.885	26.77	26.33	27.35	26.36	24.9	26.55	24.5
Industry	11.3	10.88	8.9	8.365	7.85	8.87	8.88	9.33	9.51	10.02	11.71

Figure 11
Energy Sector Greenhouse Gas Emission ($MtCO_2e$), 1999-2009
Source: Department Of Energy

the emissions from the power sector will likely increase from 26 $MtCO_2e/y$ in 2007 to 140 $MtCO_2e/y$ in 2030 (>400% increase). For the transport subsector, if the dependence on petroleum continues to rise, emissions will escalate from 37 $MtCO_2e/y$ in 2007 to 87 $MtCO_2e/y$ in 2030, or an increase by >200% (World Bank 2010).

In addition to the challenges of energy security and environmental sustainability, the sector has to respond to significant changes in demand due to fluctuations in temperature and weather condition and ensure that energy systems are able to adapt to the impacts of climate change. To address climate change issues for the sector, the NCCAP prioritizes the following (Figure 12):

- Promotion and implementation of energy efficiency and conservation nationwide
- Enhancement in the development of sustainable and renewable energy
- Promotion and adoption of environmentally sustainable transport
- Climate-proofing and rehabilitation and improvement of energy systems infrastructures

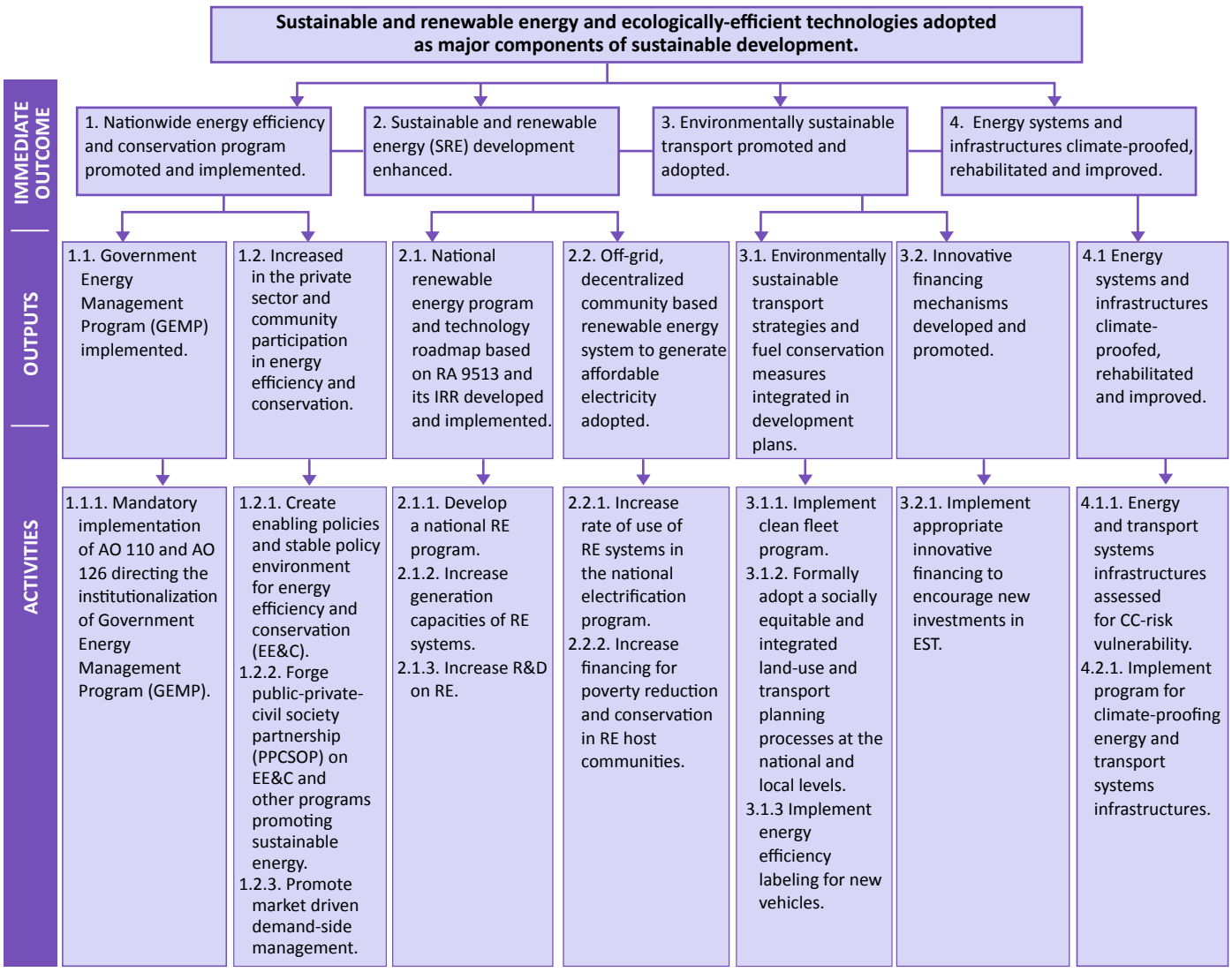


Figure 12
Strategic Actions on Sustainable Energy for 2011-2028

Energy Efficiency & Conservation

There are several drivers for energy efficiency and conservation, namely:

- High and variable energy prices
- Vulnerability to imported oil and petroleum products
- Deregulation of the energy sector in 1988, which reduced the subsidies for energy
- Climate change considerations

The implementation of demand-side management (DSM) programs, based on the Philippine Energy Plan, is expected to result in a cumulative energy savings of over 15.3 million barrels of fuel oil equivalent (MMBFOE), with an investment of P1.9 billion (about US$ 47.5 million) by the year 2005. Peak demand savings will range from 20 megawatts (MW) to 450 MW in 1996 and 2005, respectively.

Studies commissioned by the International Finance Corporation (IFC) in 2008 showed that switching to energy efficient equipment could reduce consumers' electricity bills by as much as 20%, improving profit margins for firms, and freeing up cash that could be used for profitable activities. An analysis of the energy consumption and efficiency of 52 buildings in the Makati Commercial Business District, for example, showed a total potential savings of US $ 4.5 million annually if all 52 buildings would shift to more efficient heating, ventilation, air-conditioning (HVAC) and lighting systems. The energy saved would be equivalent to avoided power generation by a 12-megawatt power plant -- enough to energize 57,000 households in rural areas.

On the supply side, there is as well a large potential to improve efficiency in the power sector by rehabilitating power plants, fuel switching from coal to gas, and reducing transmission and distribution losses.

For 2011 to 2028, the priority activities will cover the (a) full implementation of the Government Energy Management Program, which sets 10% energy savings on the total annual energy demand of all government institutions as part of the energy conservation program, and (b) increase private sector and community participation in energy efficiency and conservation programs (Figure 12 on page 26).

The Philippine Energy Plan targets a 10% energy savings across all sectors. This is expected to result in total CO_2 reduction of 8,959,035 kilo ton of oil equivalent (KtOe) by 2020 and 12,446,357 KtOe by 2030 (Tamang 2011).

Table 2
Estimated potential total CO_2 emission reduction from 10% energy savings from all sectors.

Energy Unit	2010	2015	2020	2025	2030
KTOE	2,402	2,898	3,457	4,085	4,798
MW Deferred Capacity	212	266	333	417	522
TCO_2 Emission Reduction	6,197,162	7,495,673	8,959,035	10,596,463	12,446,357

Source: Department of Energy

Although many energy efficiency measures have short payback periods, they often face financing barriers. Individual consumers usually demand very short payback time and are unwilling to pay higher upfront costs for energy-efficient products. Financial institutions usually are not familiar with or interested in energy efficiency financing, because of the small size of the deal, high transaction costs, and high perceived risks. For this reason, within the medium term, the NCCAP prioritizes the following activities for 2011 to 2016:

1) Set policies that encourage investments and shifts to energy efficiency and conservation measures. This will specifically target sectors where shifts will result in the highest energy savings, such as in the industrial and commercial sectors;

2) Create partnerships with private sector and civil society organizations to promote sustainable energy, including energy efficiency and conservation. Partnerships are expected to result in voluntary shifts when savings are demonstrated, provide venue for policy dialogues and experiences, and create awareness on sustainable energy;

3) Promote demand-side energy management.

Renewable Energy

1) The Philipines is blessed with abundant natural resources that could be developed and utilized as potential energy sources to address energy security, energy sufficiency and greenhouse gas emission reduction. The passage of the Renewable Act of 2008 or Republic Act No. 9513 highlights the policy of the state to accelerate the development and exploration of the Philippines' renewable energy resources.

2) A study conducted by the Renewable Energy Coalition states that the Philippines has the following renewable energy potential:

a. Geothermal - 4,531 MW
b. Hydro electric - 13,097 MW
c. Wind -76,600 MW
d. Wave - 170,000 MW
e. Biomass - 277 Million Barrels Fuel Oil equivalent per year (MBFOE/y)
f. Solar Power - 5 ~ 5.1 KwH per square meter per day.

Geothermal. The Philippines is currently the second largest producer of geothermal energy in the world and first in terms of the share of the resource to total power generation capacity. Much of the known economic potential of geothermal has already been exploited. However, the Department of Energy plans to double the installed capacity of around 1,972 MW in 2010 to 3,447 MW in 2030 (Table 3). In addition, the Department is also promoting the development of low enthalpy geothermal areas for non-power or direct use, such as health and spa applications.

Hydropower. The Philippines has abundant hydro power resources and has exploited a significant percentage of the known potential. Currently, there are 134 hydropower plants in operation in the country, with 21 large hydropower plants, 52 mini-hydro and 61 micro-hydro power plants. Under the Philippine Energy Plan, the updated target is to increase hydropower capacity from 3,478 MW in 2010 to 4,434 MW by 2015 and 7,534 MW by 2030. The indicative capacity addition is roughly 30 to 31 percent of the estimated potential (see Table 3).

Wind. An assessment of the Philippine wind power potential by the US-based National Renewable Energy Laboratory (NREL) projects that the Philippines has over 10,000 square kilometers of areas that have good to excellent wind source potential. This implies a resource potential of 76,000 MW with 47 provinces having at least 50 MW wind potential and 25 provinces with about 1,000 MW each (DOE, 2006, pp 22). The World Wildlife Fund conducted a similar study and found that the country has 1,038 wind sites that could generate about 7,404 MW of electricity. The biggest wind project

Table 3
Renewable energy expansion under the Climate Change strategy of the Department of Energy

Cumulative Installed Capacity (MW)	2010	2015	2020	2025	2030
Hydropower	3,477.81	4,433.51	6,432.21	6,615.19	7,533.84
Wind	33.00	199.00	903.00	953.00	1,018.00
Solar	6.74	11.75	36.27	60.65	85.00
Biomass	75.50	93.90	93.90	93.90	93.90
Geothermal	1,972.07	2,382.07	3,037.07	3,177.07	3,447.07
TOTAL	**5,565.12**	**7,120.23**	**10,408.55**	**10,805.91**	**12,083.91**

Source: Tamang, J., Energy Sector's Framework Strategy on Climate Change, 2011.

so far, the 25 MW Northwind power project in Ilocos Norte, was commissioned in 2006. Some 345 MW of capacity from 16 additional wind power sites is expected to be added, including the 40 MW Northern Luzon Wind Power Project of PNOC-EDC. The DOE plans to expand wind energy installed capacity to 1,018 MW by 2030, which is roughly 1.3 percent of the total estimated potential (cf. Table 3).

Solar. Solar energy has a niche market in rural electrification, whether grid connected, distributed generation or off-grid, and also for water pumping, lighting, and other domestic applications. In 2005, a total of 894 solar home systems (SHS) were installed through the Solar Home Systems Distribution Project of the Philippine National Oil Company. The USAID-funded AMORE project has energized 224 rural villages using PV systems. The biggest solar PV installation so far is CEPALCO's 1 MW PV, which is operated in tandem with a hydro power plant; the PV output is used in lieu of hydropower during the daytime, while the water required to produce the 1 MW equivalent output is stored and released for hydropower generation during peak hours (USAID-Asia 2007). The Rural Electrification Program of DOE funded by the World Bank also provided solar powered systems to off-grid, non-electrified barangays. The DOE plans to expand the solar power installed capacity from 6.74 MW in 2010 to 11.75 MW by 2015 and 85 MW by 2030 (cf. Table 3).

The Philippines aims to become the solar technology manufacturing export hub of the ASEAN region. The US$300 million Sunpower Solar Water Fabrication plant in Sta. Rosa Laguna is expected to supply about 6% of the world market for PV cells – 20% of which shall be sold to the local market at a discount to encourage the establishment of a downstream solar industry in the country (USAID-Asia 2007).

Biomass. An estimate of the Department of Agriculture and the Department of Environment and Natural Resources shows that the country's agriculture sector has the potential of producing 39.23 metric ton of oil equivalent (Mtoe) of biomass in 2003, increasing moderately by 1.9 percent annually. By 2012, biomass supply potential could reach the equivalent of 46.66 Mtoe (DOE 2003, p. 23). Moreover, based on the study Power Switch and Strategies for Clean Power Development in the Philippines, the country has a potential installed capacity of 235.7 MW from bagasse resources. PNOC, with 30 percent equity participation, is planning to develop a 30 MW bagasse cogeneration project with Bronzeoak Philippines Inc. and Talisay Bioenergy Inc. (USAID-Asia 2007). The DOE plans to increase the installed capacity for biomass energy from 75.5 MW in 2010 to 93.90 MW by 2015 up to 2030 (cf. Table 3).

Expanding the use of renewable energy also implies

lower costs. Table 4 shows that the generation costs of RE, except solar power, are US$ 0.014 to 0.03 lower than oil-based energy.

Table 4
Competitiveness of renewable energy (As of May 2007)

TYPE OF PLANT	INVESTMENT (in US$ per kW)	GENERATION COST (in US cents per kWh)
Oil-based	991	7.8
Renewable Energy:		
Mini-hydro	2,000	4.8
Geothermal	2,000	6.4
Biomass	1,900	6.2
Wind	2,000	5.8
Solar		
Centralized, off-grid	10,500	29.0
Solar Home Systems, off-grid	10,400	43.0
Solar (Grid-connected)	5,000	14.0

Source: Tamang, J., Energy Sector's Framework Strategy on Climate Change, 2011.

Considering the on-going programs of DOE to expand the installed capacities for renewable energy, the NCCAP priorities are the following:

1. For 2011 to 2028, the strategic priorities will be the implementation of the National Renewable Energy Law. For 2011 to 2016, the priority actions would be to:
   a. develop the research and development program in support of expanding the RE agenda; and
   b. develop and implement a renewable energy roadmap.

The RE roadmap includes the adoption of off-grid, decentralized, community-based, renewable energy system to generate affordable electricity. Specifically for 2011 to 2016, the priority will be:

2. Increase in the rate of use of RE systems in the national electrification program.
3. Increase financing for poverty reduction and conservation in RE host communities.

Environmentally Sustainable Transport

Economic growth is critical in creating employment, alleviating poverty and making available resources for infrastructure and human resource development, and for increasing access to basic amenities. However, rapid economic growth has also led to increased demand for transport facilities and supplies resulting in significant environmental consequences. In many cities in the Philippines, typified by Metro Manila, expansion has occurred without appropriate development planning and the provision of required infrastructure and services has fallen behind. Many cities are plagued with vehicular air pollution and associated public health and environment impacts, noise pollution, traffic congestion and associated economic loss, inefficient use of energy resources, greater use of non-renewable fossil fuel, and loss of potential natural habitats and land resources. In fact, data shows that 36% of GHG emissions from the energy sector comes from transport. Addressing the problems on transport, therefore, is important in addressing the potential impacts of climate change.

Environmentally sustainable transport concept is centered on transportation systems and activities that meet social, economic and environmental objectives (UNCRD 2010). It includes all the key facets of transport, such as:

- Vehicle emission control, standards and I/M
- Cleaner fuels
- Strengthening road side monitoring and assessment
- Land-use planning
- Public transport planning and travel demand management
- Environment and people-friendly infrastructure development
- Road safety and maintenance
- Traffic noise management
- Public health
- Social equity and gender perspectives
- Strengthening roadside air quality monitoring and assessment
- Strengthening knowledge base, awareness, and public participation

Table 5
Biodiesel blend targets and potential savings.

YEAR	Diesel Demand (In million liters)	Biodiesel Blend (Targets)	Fuel Displacement (In million liters)	Potential Savings (In million Pesos)
2009	5,144.54	2%	102.89	3,124.77
2010	5,379.42	2%	107.59	3,617.18
2015	6,632.36	10%	663.24	22,298.13
2020	7,805.75	15%	1,170.86	39,364.31
2025	8,768.48	20%	1,753.70	58,959.39
2030	9,427.89	20%	1,885.58	63,393.20

Note: 2015 to 2030 estimates use the average price of diesel for 2011= P33.62
Source of basic data: Tamang, J., Energy Sector's Framework Strategy on Climate Change, 2011.

The Philippines has started a program on cleaner fuel for the transport sector with the implementation of the Clean Air Act, such as the removal of lead in gasoline and the promotion of clean alternative fuels, particularly liquefied petroleum gas and biofuel. Biodiesel blends of 2 to 20% provide potential savings from fuel displacement or reduced diesel demand in the range of Php22.3 billion to Php63.4 billion in 2015 to 2030 (Table 5). While this will definitely reduce demand for regular diesel, what needs to be looked at is the availability of biodiesel raw materials.

The NCCAP takes on two broad priorities for 2011-2028 to promote EST, namely: (a) integration of environmentally sustainable transport strategies and fuel conservation measures in development plans and programs; and (b) development of innovative financing mechanisms to promote EST. In particular, activities that will be prioritized in 2011 to 2016 will be:

1. Climate-proofing, rehabilitation and improvement in the country's energy systems and transport infrastructures. In particular, the activities for 2011 to 2016 will prioritized the conduct of vulnerability and risk assessment for energy and transport systems, and the development of a program to climate-proof (rehabilitate or retrofit) energy and transport systems infrastructures;

2. Implementation of a clean fleet program.
   a. There are already experiences in the private sector that demonstrates savings with clean fleet program. To encourage other firms, the government will have to be aggressive in its information drive through partnerships with those that already has the experience;
   b. Government will also need to implement the same for its fleet and conduct baseline measurements;
   c. Conduct studies (economics, adaptability, impacts, etc.) on the use of hybrid transport systems such as electric and hydrogen-fueled vehicles.

3. Formally adopt a socially equitable and integrated land-use and transport planning processes at the national and local levels.
   a. Development and implementation of a policy requiring mixed-use, medium-to-high density development with integrated transport master plan that include non-motorized transport component and other transportation demand management measures;
   b. Development of guidelines on integrated land-use transport plan.

4. Implement energy efficiency labeling for new vehicles;

5. Study potential financing schemes to encourage EST;

Knowledge And Capacity Development 7

Having enough knowledge on the science, issues and risks as well as appropriate capacity to address the issue of climate change are critical components to building climate resilient communities and ecosystems.

Strategic knowledge

Climate change is a complex issue and in order to effectively address the issue, it is important to have enough knowledge about it. Good policy decisions should rely heavily on the basic science as to the causes and impacts of climate change. The following are the key issues that should be addressed under strategic knowledge:

- **Having access to relevant information and localizing it from the Philippine perspective**

There is a lot of scientific information about climate change in the global level. Furthermore, some of the information needed to better understand the climate system entails cost such as purchasing the equipment and even accessing important researches. Climate change impacts vary from one place to another and so researches on the local impacts are important. Identifying financial sources that could be tapped to acquire and access data is needed and how this information could be used to come up with localized researches on the science and impacts of climate change.

- **Creating a good data management and reporting system**

A good system for managing data information would maximize time and resources for conducting research and data gathering. It would enable us to see what data is there and what data needs to be gathered. It would also show which sector or agency is doing what. The Philippines has yet to come up with a data management system that would centralize at least the major information on climate change to help researches, the public and private sectors what information is currently there and what they should do. In the Capacity Assessment on Climate Change report conducted by NEDA, agencies or units and agencies included in the study "….have been accumulating general experiences on climate change mitigation and adaptation, however, substantially, these are not systematically documented as reported" (NEDA 2010).

- **Disseminating relevant information**

Developing communication materials is an important tool to increase public awareness about climate change. Development of these communication materials should consider who the target is and what type of materials are suitable to them.

Capacity Development

Capacity Development is defined by the UN as "the process by which individuals, organizations, institutions and societies develop abilities (individually and collectively) to perform functions, solve problems and set and achieve objectives" (UNDP 1997). It is about leadership and human resources, institutional arrangements, knowledge access and learning, and state-society accountability mechanisms that push for and lead to greater human development. The NCCAP emphasizes these elements to underpin its strategic priorities. What this means is to invest in fundamental capacities to manage and deliver climate change related services and invest in communities to create innovative state-citizen partnerships towards effective adaptation and mitigation.

While knowledge and capacity development is a cross-cutting issue, the NCCAP saw it fit to highlight this as a strategic priority for the following reasons: First, there exist large human resources that can be tapped or developed to deliver services. In fact, a large proportion of government budget goes to personnel services. Based on the MDGF Cap Assessment report, the national average is 2.53 implying that a CCA policy is in its advanced stage of being the major development direction of the country in response to the adverse impacts of climate change. Overall national rating is 2.51, with the highest of 2.69 for the functional capacity to engage in multi-stakeholder dialogue and the lowest, 2.34 for the functional capacity to assess a situation and create a vision and mandate. For government, the need is to develop the core cross-cutting capacities to dialogue and negotiate, to plan and design, to manage and implement, to monitor and evaluate.

NEDA study, conducted through the MDGF 1656: Strengthening the Philippines' Institutional Capacity to Adapt to Climate Change project, found three core issues that have to be addressed (NEDA 2010):

- the need for the participating institutions to formulate their CCA Policy which would serve as a guide for them to effectively address climate change adaptation and mitigation;
- the need for "relevant, timely and accessible data and information" is critical for the planning and implementation of climate change adaptation and mitigation;
- the need to build knowledge and capacities of staff and officers of agencies on climate change adaptation and mitigation.

Second, building communities' capacities for climate adaptation also builds their ability to cope with the impacts of climate change. Where these capacities have been destroyed due to economic failure and natural disasters, the focus of capacity development is on retaining existing capacity assets and motivating a return of capacity. The basic principle during times of crises is to 'building back better' capacities so that communities are able to recover faster from the crises.

The priorities of the NCCAP on knowledge and capacity development are: (1) to enhanced knowledge on the science of climate change; (2) to enhance capacity for CC adaptation, mitigation and disaster risk reduction at the local and community level; and (3) to establish gendered CC knowledge management accessible to all sectors at the national and local levels (Figure 13).

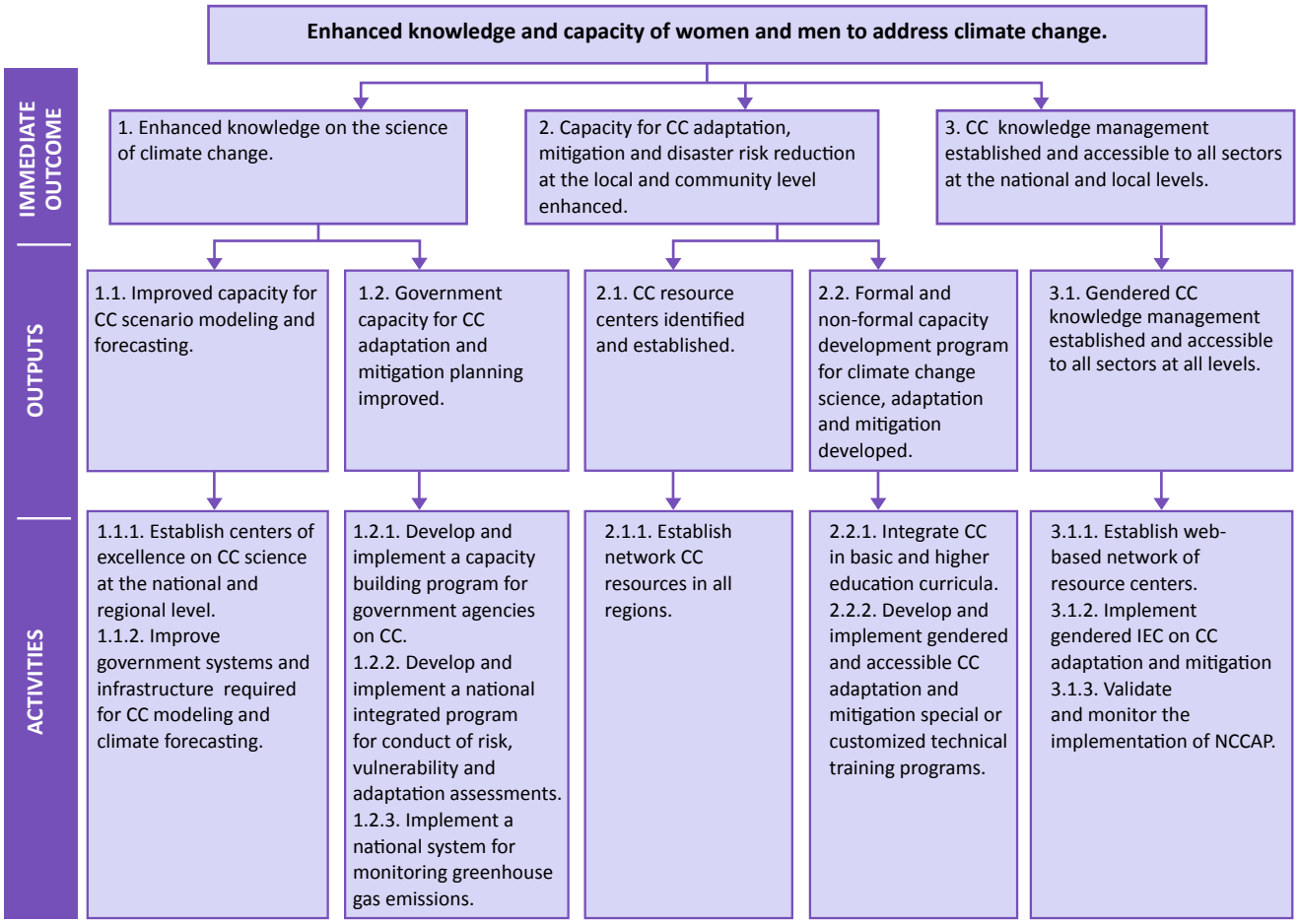


Figure 13
Strategic Actions on Knowledge and Capacity Development for 2011 to 2028

8 Cross-Cutting Actions

The NCCAP recognizes that certain activities cut across strategic priorities and sectors. These include gender and development, technology transfer, research and development, information, education and communication (IEC), and capacity building, which should be integrated in all strategic six priorities. Capacity development, while cross-cutting, is in itself a strategic priority to provide emphasis on the need to focus on the issue at the national, local and community levels.

Gender Mainstreaming

One of the guiding principles of the NCCAP is that adaptation measures should be based on equity and is in accordance with differentiated responsibility, and accords special attention for the protection of the poor, women, children, and other vulnerable groups. Gender mainstreaming in the NCCAP is about ensuring that the concerns and experiences of women and men are an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes so that women and men benefit equally and inequality is not perpetuated. Mainstreaming a gender perspective is, therefore, a process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels (United Nations Department for Economic and Social Affairs 1997).

The term "gender" refers to socially ascribed roles, responsibilities and opportunities associated with women and men, as well as the hidden power structures that govern relationships between them. Gender is ". . . a term used to emphasize that sex inequality is not caused by the anatomic and physiological differences that characterize men and women, but rather by the unequal and inequitable treatment socially accorded to them" (Riquer 1993).

Agriculture, fishery, and forestry continue to compose 18 percent of the economy and serve as the foundations for the country's agro-industrial and agro-services sectors. Agriculture is the main livelihood base for 35 percent of the country's labor force, while some 60 percent of the country's coastal population relies on marine resources for a living. The World Bank calculates that 85 percent of the country's gross national product comes from sectors at risk from rising temperatures and weather variability (Garcia Rincón and Virtucio 2008).

Women comprise 25% of those employed in agriculture based on the 2006 statistics of the Bureau of Agricultural Statistics. However, majority of these women also form part of unpaid family labor. Women non-agricultural operators who were engaged in agricultural activity outnumber the men by 1.1 million. There were around 3.2 million female non-operators engaged in agricultural activity (Leyesa 2008). Leyesa (2008) citing a survey on women in agriculture, covering 1,194 women respondents across six major crops - rice, corn, coconut, sugar, vegetables and onion, conducted by the Philippine Center for Rural Development Studies or Centro Saka[5] shows that:

- Women dominate the planting and harvesting activities, especially in the production of staple crops (rice and corn);
- Women also participate in land clearing and harrowing activities, often spending longer periods of time than the men
- Despite the unpaid character of their labor, they are left in charge of finance related activities, i.e.

5 Centro Saka is a Philippine nongovernment organization engaged primarily in policy research, policy advocacy, networking, capability building and economic interconnections of agrarian reform and rural development issues, in partnership with people's organizations.

the accessing of production capital and marketing the farm's produce

- At the household level, women's reproductive activities span an average of 1 to 3 hours each for the following activities: preparation of food and tools for the farm workers, foraging for food, gathering of wood for fuel, raising livestock and poultry, fetching water and engaging in non-farm income generating activities

- Despite all these roles, women have lesser control of the land, with only 18% as title holders among land owners

- While women have high participation in decision making, these are being made under conditions of scarce resources and with little access to services, i.e. only around 33% of women in agriculture have access to farm animals, only 19% have access to seeds, only 13% have access to calamity assistance and pest management, 17% have access to social services, and less than half have access to water and electricity.

- Few rural women have access to capacity-building services, i.e. only 45% have access to communication, 29% have access to women's organizations, and only 18% have access to training and calamity insurance.

Citing studies on rural poverty in the Philippines, Peralta (2008) argues that social hierarchies such as gender and ethnicity further shape the experience of poverty of women. She notes that more than three out of 10 Filipinos live below the poverty line, and poverty incidence rose from 30% in 2000 to 32.9% in 2006, some 75 percent of the rural population is considered poor, and there are slightly more Filipino women and women-headed households that are poor as compared to men. Not only do poor people, including women, tend to inhabit disaster-prone and environmentally precarious areas, but also their heavy reliance on pastures, fishing grounds, and forests for their livelihoods and other basic needs make them particularly susceptible to the degradation and depletion of natural resources (Peralta 2008).

For poor and rural women in the Philippines, the observed impacts of climate change are exacerbated by the fact that (Peralta 2008):

- Women manage, control and own lesser resources – especially land – than men. Thus, when harvests collapse either because of floods or droughts, women have fewer assets to sell to cope with the situation.

- Women are the main borrowers in agricultural households because they have greater access to micro-credit and are under stronger pressure to bridge resource gaps. Hence, more women than men fall into chronic indebtedness related to climate-induced crop failures.

- When food shortages arise from poor harvests linked to weather problems, women are the last to eat in their households, prioritizing the food needs of male household members and children over their own.

Women's vulnerability to different climate-related events arise from their roles, location of these roles, and their positions and capacities to influence how decisions are made, how rules are changed, and how resources are allocated. Women's exposure to climate-related risks is a result of (a) area of residence of poor women, especially in coastal and upland areas, (b) nature of productive work (livelihoods/ employment), location of these activities, (c) natural resource degradation, and (d) looming water scarcity in the next decades. Women's sensitivity to climate change is a function of their childbearing/lactation and other reproductive roles and their productive roles (DENR 2010).

Within the NCCAP, the gender is a cross-cutting issue and

will be particularly highlighted in the following areas:

1. Research and Development: To improve the understanding of gender and climate change, the plan will ensure the following:

    a. conduct gender impact analyses to identify gender-specific needs and protection measures related to floods, droughts and other climate change-related disasters particularly those that enhance food security along the framework of sustainable agriculture and organic farming; and

    b. conduct of gendered vulnerability and adaptation assessments, which require that the assessments integrate gender analyses to identify specific vulnerabilities of men and women.

2. Planning and Policy Making: Gender mainstreaming is done at all levels of planning and programming for climate change adaptation and mitigation as well as in disaster risk reduction management, and financial instruments and mechanisms.

3. Knowledge and Capacity Development: The NCCAP recognizes that planned activities on capacity and knowledge development must enhance the roles and status of women as participants and agents of change, build on their strengths and experiences, knowledge and coping capacity, and ensure women's access to information.

4. Enhancing Women's Participation in Climate Change Adaptation: Actions on food security, green jobs, and integrated ecosystem-based management should be able to strengthen women's participation, ensure poor women's access to livelihood opportunities, and ensure women's access to assets.

Research and Development and Technology Transfer

The IPCC Special Report on Methodological and Technological Issues on Technology Transfer defines transfer as "a broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, non-governmental organizations (NGOs) and research/education institutions" (IPCC 2000).

Technology plays a crucial role in the context of climate change. It can either contribute to the increased concentration of greenhouse gases in the atmosphere or it can help curb the increase of greenhouse gas emissions. It is therefore important for a country to have climate-friendly, low-carbon and environmentally-sound technologies if it wants to contribute to the attainment of the ultimate objective of the UNFCCC which is to stabilize the concentration of greenhouse gases in the atmosphere. Technology can also be seen as something that could be used to enable for the Philippines to adapt to climate change impacts. It would entail research, development, deployment, diffusion and transfer of necessary technologies which would depend largely on the cost and availability of technologies. This would require developing human capacity (knowledge and skills) and having an enabling environment for developing appropriate institutional mechanisms; and acquiring, accessing and ability to operate hardware and software of climate-friendly technologies.

Technology Transfer in the Philippine context

Republic Act 8293, more commonly known as the Intellectual Property Code of the Philippines provides for the establishment of an Intellectual Property Office. It includes a detailed outline of its powers and functions.

One of the key provisions of this law is the establishment of the Documentation, Information and Technology Transfer Bureau under the Intellectual Property Office and some of its key functions are the following: provide technical, advisory, and other services relating to the licensing and promotion of technology; carry out an efficient and effective program for technology transfer; and register technology transfer arrangements.

Republic Act 10055 or the Philippine Technology Transfer Act which aims to address technology transfer issues in the Philippines by providing a mechanism to facilitate smooth flow of soft and hard technologies among government, private sector and research institutions.

A number of legislations were passed by the Philippine congress for renewable energy such as:

- **RA 9513 – Renewable Energy Act of 2008**
- **RA 9367 – Biofuels Act of 2008**
- **RA 7156 – Act Granting Incentives to Mini-Hydro Electric Power Developers**

In 2003, NEDA conducted a study entitled "Needs Assessment of Technology Transfer for the Mitigation of Global Warming in the Republic of the Philippines". The main objective of the study is to identify technologies that would reduce GHG emissions and needed to be transferred to the Philippines with high priority. A prioritization of technologies was provided in the study. Several national government agencies are involved in implementing programs and activities that promote the development and transfer of climate-friendly technologies to address adaptation to climate change impacts and mitigation of greenhouse gas emissions. The private sector also plays a key role in the development and transfer of these technologies through investments in R&D. Research institutions are also important as they are the ones conducting relevant researches on climate-friendly technologies.

Gaps and Priority Needs on Technology Transfer

Lack of Capacity. Although there are a number of legislations, Executive Orders and Department Administrative Orders relating to technology transfer, policy implementation remains weak. A large part of the problem lies in the lack of institutional resources and human capacity to execute these policies. There is therefore the need to build the capacities of these executing agencies.

Lack of financing. Development and transfer of technologies is heavily dependent on financing. Various mechanisms are needed to enable the development and deployment of technology along the technology innovation pathway (Figure 14). In developing countries, public finance mechanisms (PFM) have mostly been used to support technologies that are in the later stages of innovation but are still facing significant market barriers that inhibit their deployment. If well managed, PFMs can bring down market barriers, bridge gaps and share risks with the private sector (Maclean, et al. 2008).

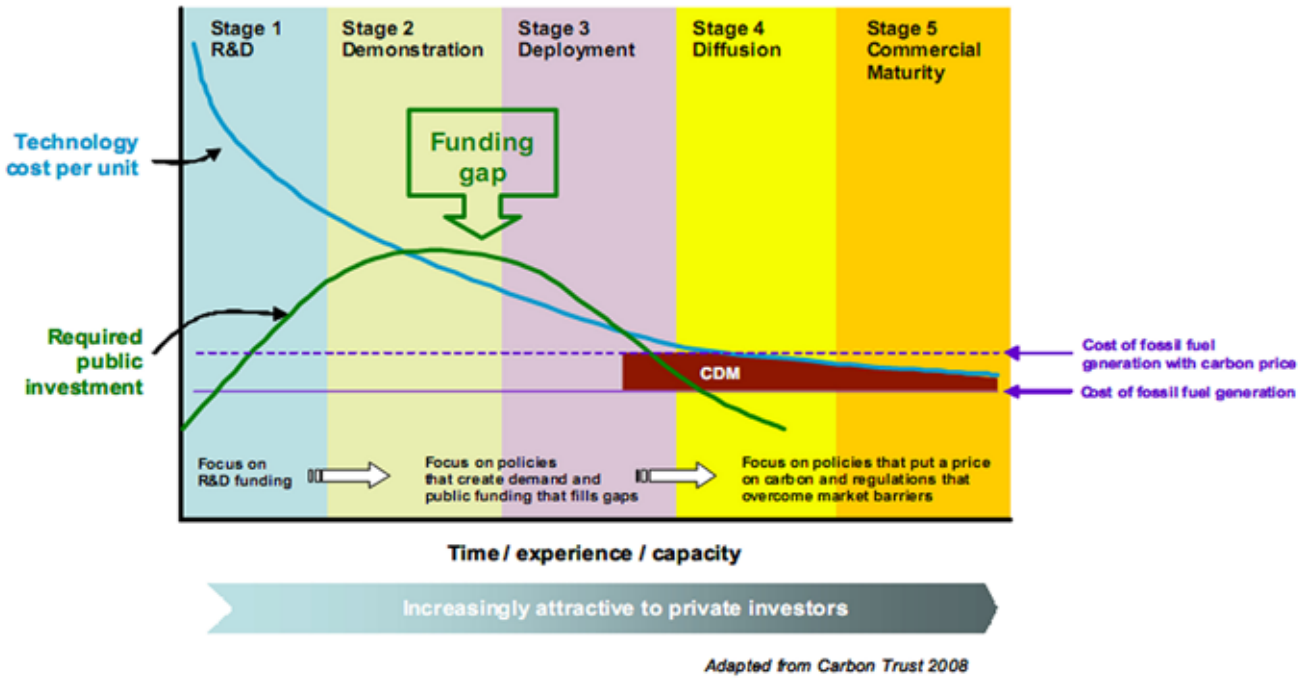


Figure 14
Funding gap in technology development (Maclean, et al. 2008)

Under the NCCAP, PFMs is a complementary measure to national policy instruments, such as regulations, taxes and market mechanisms. Their role is to help commercial financiers act within a national policy framework, filling gaps and sharing risks where the private sector is initially unwilling or unable to act on its own. PFMs will have to be structured to act along the entire chain of financial intermediation, which can include development finance institutions (DFIs), commercial financial institutions (CFIs), investors, manufacturers and technology delivery companies. Technical assistance will be an important component of R&D and technology transfer to build the capacities of these market actors to create a pipeline of investment-ready projects, a pre-condition for leveraging commercial funding.

Based on an assessment of experience with a number of different models of PFMs, it is shown that typical leverage ratios range from 3 to 15:1. Therefore, it is estimated that if a concerted programme of PFMs were scaled up, USD10 billion in public monies could potentially leverage USD50-150 billion in total investment in the climate mitigation sectors (Maclean, et al. 2008). However, the amount of funds that can be leveraged from PFMs depends on the supply of capital needs a corresponding demand for financing. For this reason, PFMs should be able to support multiple generations of investments and help create markets that continue to grow after the public funds are expended.

In most cases, however, the direction of technology transfer is from a developed country to a developing country simply because public financing for R&D in the developing country is limited. In such cases, it is important to assess the viability of these technologies in the country's policy and development context –

including their cost, appropriateness, and the capacities and skills to apply these technologies.

Given the role of technologies in addressing the impacts of climate change, having an effective framework strategy for research and development is imperative. In the context of the NCCAP, priority will be given to the following:

- Preparation of the R&D Agenda on Climate Change. Many of the researches and studies are already articulated in the different strategic priorities and sectors. What is needed is to put this together into a coherent agenda within the time frame and priorities of the NCCAP. This will include:
    - o Identification of priority researches that are critical in addressing climate change impacts
    - o Data management – including mechanisms for sharing and collaboration among relevant government institutions
    - o Monitoring and evaluation of existing researches on climate change and to identify research areas that need to be studied more.
- Conduct of study on public finance mechanisms and complementary policies to encourage R&D in the private sector and the commercialization of technologies, as well as in leveraging funding international development institutions and private sector.
- Study on indigenous technologies and how their effectiveness in climate change adaptation and mitigation.

9 Means of Implementation

Implementation of the NCCAP involves looking at two very important aspects: national and local implementation mechanisms, and financing. Convergence planning among national agencies is an important aspect in the implementation of the action plan since the strategic priorities are defined along thematic outcomes rather than sectors; thus, would need sectoral agencies to plan and work together.

Substantial public investments are being made in various national and local programs for poverty reduction and economic development. Climate change and disaster risk management are two additional aspects that need immediate and serious attention. However, current government programs can already contribute to achieving climate change adaptation and mitigation goals if efforts are optimized through inter-sectoral approaches. The convergence of different programmes will enable better planning and effective investments in climate change adaptation and mitigation at the national and local levels. It will also bring in synergies between different government programmes/schemes in terms of planning process and implementation.
Convergence can result in:

- Increase in social capital through collective planning and implementation among different stakeholders;
- Increase in physical capital by helping create durable assets as a result of collective planning;
- Facilitate ecological synergies and natural resource base regeneration through different activities such as afforestation, drought proofing, flood proofing, and watershed protection implemented by various government agencies;
- Mitigating the effects of climate change as all sectors coordinate in addressing issues on GHG emissions; and
- Enhancing economic opportunities such as climate change finance and debt relief.

Ecotowns

At the local level, implementation of the action plan will be packaged using the concept of ecologically stable and economically resilient towns or ecotowns. An ecotown is a planning unit composed of municipalities or a group of municipalities located within and in the boundaries of critical key biodiversity areas (forest, coastal/marine and fishery, or watersheds), highly vulnerable to climate change risks due to its geography, geographic location, and poverty situation. In the absence of vulnerability and risk assessments, the ecotown concept initially assumes the following:

a. Despite the uncertainty in the timing and magnitude of climate changes, the risks are real;

b. Ecosystems provide valuable goods and services that build and strengthen the resilience of communities and local economy from climate change risks and shocks;

c. Healthy and stable ecosystems are in themselves

adaptation to changing climate;

d. Reducing poverty through sustainable livelihood increases the adaptive capacity of men and women in communities; and

e. Inter-sectoral convergence of government programs is a more efficient use of public funds and optimizes results.

The implementation strategy, therefore, follows the precautionary principle and assumes a pro-active stance by building the adaptive capacity of men and women in historically high risk areas. Because the poor are generally less able to cope and recover from shocks, be it climate-related or economic, then increasing the adaptive capacity of the poor should be a priority.

For the short to medium term actions with long-term goals, protected areas and key biodiversity areas can be declared as ECOTOWNS, incorporating all the best practices that need scaling up. Providing incentive, alleviating poverty, and generating jobs will be very vital. The goal is to build climate change resilient communities and local economy through poverty reduction and ecosystem protection (Figure 15). Local economies and rural population are generally natural resource dependent and ecosystems provide goods and services need for economic resilience. For this reason, maintaining a healthy and stable ecosystem and natural resource base sustains livelihoods and the local economy; therefore, ensuring that ecosystem goods and services are protected and restored is a strategic move towards climate change adaptation and mitigation, as well as in disaster risk reduction.

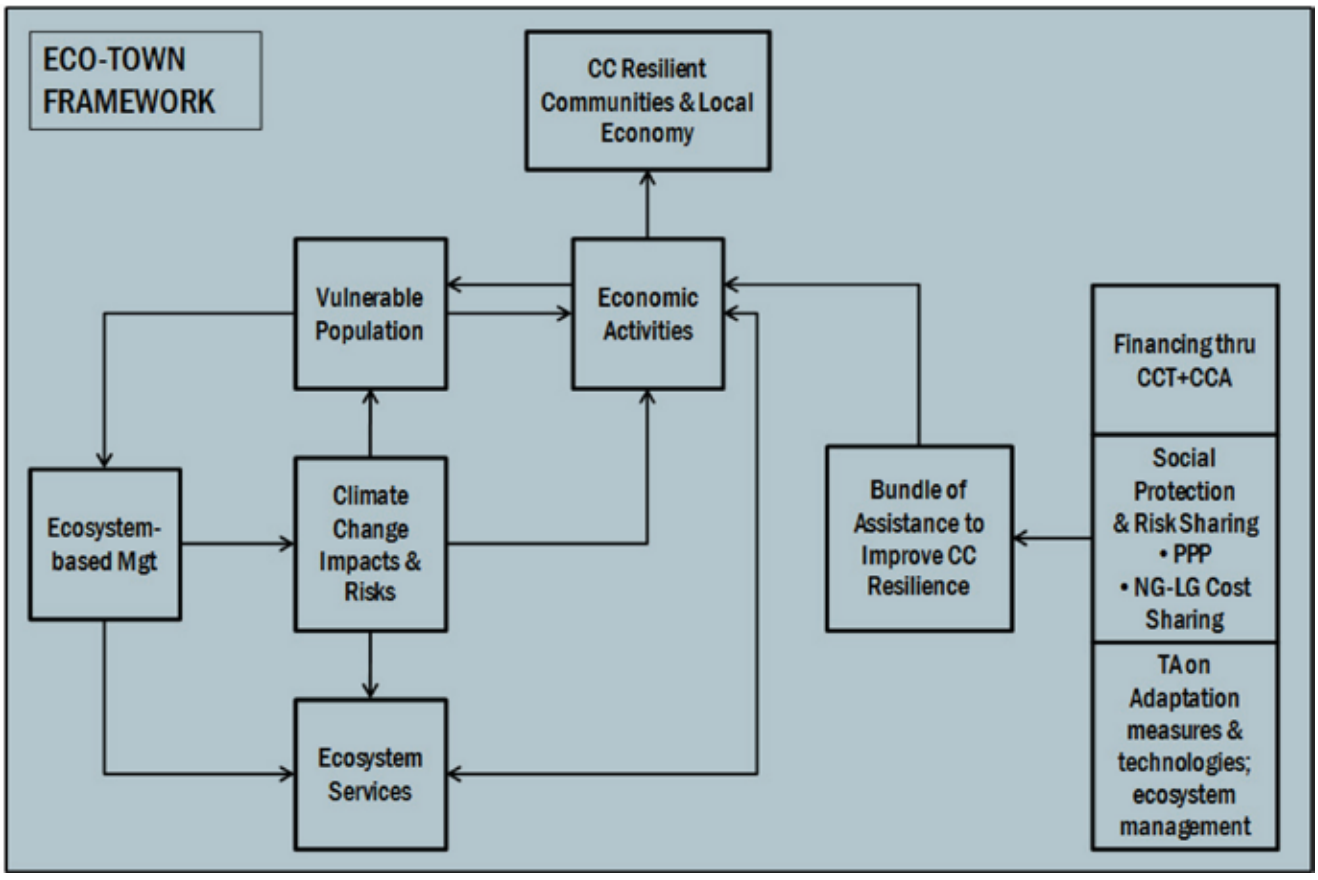


Figure 15
Ecotown Framework

Figure 15 also illustrates that climate change poses risks to the population, some of whom are more vulnerable to the risks than others. Climate change can also affect the goods and services provided by ecosystems. Degraded ecosystems will be less resilient to climate change and extreme events. Conversely, healthy and stable ecosystems can lessen the impacts of climate change. The ecotown, therefore, targets assistance to vulnerable men and women in communities, ensure that a package of assistance is provided for sustainable livelihood activities, ecosystems (such as forests, coastal areas, fisheries, and urban/built up systems) are protected.

The package of assistance will require a poverty reduction scheme through Climate Adaptation Support Service (CASS), which provides immediate income to the poor within target ecosystems based on certain conditions. The conditionality of CASS includes unemployed family members from communities living below the poverty line that are high risk to impacts of climate change plus the conditionality of protecting the critical ecosystems, in general. Depending on where the poor communities are, the specific conditionality for protection can vary. For example, CASS beneficiaries living in forest zones may be required to protect forest against illegal tree cutting, practice appropriate farming practices, and participate in reforestation/rain forestation activities. CASS beneficiaries in coastal or fishing communities may be asked to protect marine protected areas and manage their household wastes. Informal settlers or those living along river banks and estuaries may have solid waste management and sanitation as part of the conditionality for the CASS. Applying a "ridge-to-reef" approach implies that all ecosystem services get protected and poor communities from the upland to the coastal areas can participate in the protection activities.

The challenge, however, is on how poor households are weaned from the CASS. A convergence of national government programs is a mechanism to ensure that required technical assistance is provided to transform micro livelihood activities into sustainable and viable economic enterprises. CASS and the convergence of government programs in the ecotown can be used to leverage financing from international development agencies, financing institutions, and private sector.

Climate Financing

A study on the financial needs assessment of the Philippines revealed that it has been substantially spending for its own climate related activities. The external flows from both bilateral and multilateral sources for direct and indirect climate change adaptation and mitigation may be adjudged limited when compared to the budgetary appropriations by the national government for climate change. Data from 2004 – 2009 (see Table 6), for example, shows that the Philippine government appropriated US$1.576 billion dollars for direct and indirect climate change programs in various sectors while the external multilateral and bilateral sources gave US$0.509 billion dollars in (direct and indirect) grants and US$0.354 billion in (direct and indirect) loans or a total of US$0.863 billion. However, the Philippine figure may even be underestimated by as much as US$0.354 plus interest since loans are actually internally provisioned resources because they will have to be paid at some future time (Resources, Environment and Economics Center for Studies 2010).

Table 6

National government budget allocations for direct and indirect climate change adaptation and mitigation, in USD

SECTOR	2003/ 2004	2005/ 2006	2007	2008	2009
Agriculture	111,499,114	73,230,418	162,317,397	27,653,476	2,809,630
Biodiversity	7,569,465	8,998,284	14,558,654	10,495,298	17,903,435
Climate Change	22,380	24,309	40,675	278,065	1,074,457
Disaster Management	27,370,923	108,797,145	212,052,315	120,982,587	39,560,304
Energy	2,180,018	12,258,564	18,354,608	5,824,319	4,722,783
Environment	18,558,100	32,475,436	32,131,740	9,452,328	38,315,848
Fisheries, Coastal & Marine Resources	32,094,041	8,066,836	5,921,398	18,371,834	12,472,826
Forestry	23,409,317	24,169,309	39,509,587	52,622,452	78,824,022
Land Use	12,356,882	36,364	36,846	10,270,101	5,691,065
Science and Technology	33,210	22,844,818	17,192,125	1,410,011	18,438,326
Water Supply and Sanitation	130,443	32,727	38,944	23,847	4,645,391
TOTAL (As % of Total PH Budget)	235,223,893 (1.59%)	290,934,212 (1.76%)	502,154,288 (1.96%)	257,384,319 (0.93%)	224,458,087 (0.7%)

Source: National Environmental, Economic and Development Study (NEEDS) for Climate Change, EMB-DENR and REECS, 2010

The study also revealed that multilateral and bilateral financing for climate change related activities are biased towards mitigation despite the Philippines not being a major GHG emitter. There probably was no intention to prioritize mitigation in the Philippines at the expense of adaptation, but merely an absence of a clear and coherent policy on climate financing.

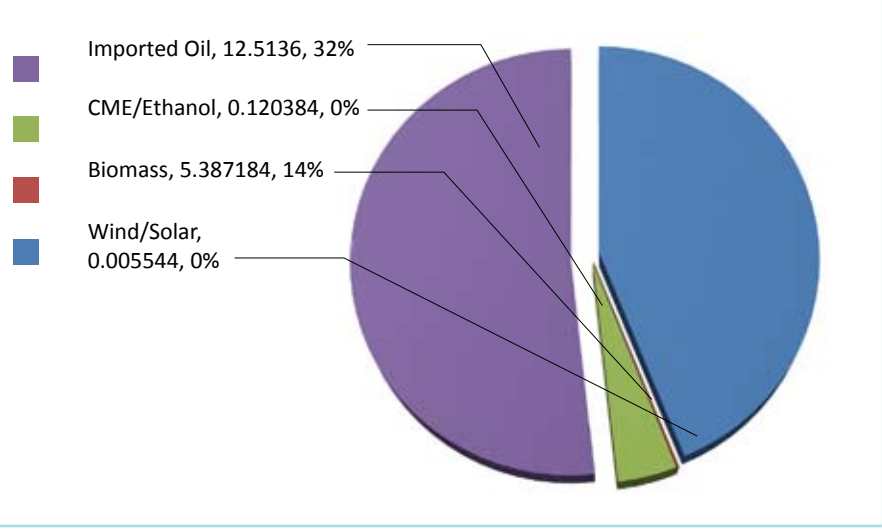


Figure 16
Comparative Flows of Total Direct Grants & Loans by Major Measure, by Funding Category,1992-2018 (In US $)

Despite the global consensus on the urgency of a response, the global action did not reflect this sense of urgency. The Cancun talks failed to produce a strong mitigation action from developed countries, as it is now merely a 'pledge and review' system, which is non-binding and not necessarily responsive to what science requires. A weak pledge for example from the top GHG emitter will mean a continuous greenhouse gas accumulation in the atmosphere, an activity considered by scientists as the main cause of global warming. This makes adaptation for the Philippines more imperative than ever.

Adaptation Financing

The World Bank estimates that financing needs for mitigation could grow to US$265–565 billion per year. In addition, about $75–100 billion could be required annually over the next 40 years to support adaptation to the inevitable impacts of climate change in developing countries. The bulk of available and emerging resources dedicated to climate action, however, relates to mitigation (at about $8 billion per annum), mainly through transactions under the Clean Development Mechanism (CDM) on the carbon market and through the recently launched Climate Investment Funds (CIF). Resources for adaptation are just being mobilized in modest proportions (at about $1 billion per annum), mostly through bilateral and multilateral donor funds and through the Adaptation Fund (World Bank 2010).

In the Philippines, however, mitigation is also an adaptation approach – i.e., adaptive mitigation measure that has a twin goal of mitigation and adaptation. Reforestation, for example, is technically a mitigation measure. Since most vulnerable communities live in the forests and other critical ecosystems, forest protection and rehabilitation also protects the assets of the poor thereby increasing their ability to cope with natural and economic shocks. Forest protection and rehabilitation also protects water sources, prevents landslides, flooding, erosion and sedimentation, and protects vital infrastructures and livelihoods. For this reason, mitigation is an essential component of the adaptation strategy; thus, the carbon market and REDD Plus, presents opportunities for adaptation financing as well.

Financing climate change activities for the Philippines will have to revolve around the protection of ecosystem resources. Financing as a means of implementation must be applied to promote the following:

- Food Security
- Water Sufficiency
- Human Security
- Ecological and Environmental Stability
- Green Industries and Services and;
- Sustainable Energy
- Knowledge and Capacity Development

Innovative Climate Financing

There are a number of potential sources of international and domestic financing for climate change.

- **Settlement of Climate Debts.** At the international level, the country can negotiate for debt-for-nature swap with monies raised to be used for integrated ecosystem-based management within the ecotowns. This augments funding of technical assistance package to ecotown beneficiaries.

- **Disaster Management Assistance Fund (DMAF).** The DMAF is a lending facility to LGUs offered at very low rates (3% to 5%) whose objectives are to provide timely financial support to disaster risk and damage management initiatives. It includes disaster prevention and mitigation projects, response and relief related projects, and recovery and rehabilitation projects.

- **Public Finance Mechanisms.** GOP may enunciate public finance measures to generate funds for climate change adaptation, such as committing of 0.5% to 1% of GDP, setting levies on GHG emitters, road and port users, airline and shipping services, designing BOI tax and other fiscal incentives.

  Aside from the budget of the national government that is passed annually, other financial mechanism for adaptation strategies and plans of the communities can be created to support multi-year activities. A clear and stable local government policy can also enable financing from the private sector and foreign donors.

  Another low hanging fruit is the 25% quota of the total loan portfolio of banks to be allocated to the agriculture and agrarian sector. The AGRI-AGRA law as it is commonly called, mandates all banks to set aside 25% of their loans to the sector, subjecting the banks to a stiff penalty for non-compliance. For 2009 alone, this 25% quota was estimated to be around 500 Billion pesos, heretofore remaining an untapped domestic financing potential.

- **Payments for environmental services.** The basic idea behind payments for ecosystem services (PES) is that those who provide ecosystem services should be compensated for the cost of doing so. PES was developed to incentivize land users to properly manage and conserve their natural environment. Appropriate mitigation actions that have carbon credit potential can also be applied in the protected area, provided that international climate financing supports this.

The Climate Change Act of 2009 also requires government financial institutions to provide preferential financial loan packages for local government units. These loans are not tied to the IRA (internal revenue allotment) and can be over and above the 5% allotted for the local Disaster Risk Reduction and Management (DRRM) fund, formerly the calamity fund. These can be coupled with a performance based rating system of LGUs as a form of improving good governance.

Addressing climate change however requires a cross-sectoral response. It needs a coordinative effort amongst the national government agencies, local government, civil society and the local communities. It is for these reasons that the Climate Change Act placed the President as the Chairperson of the Climate Change Commission to highlight the importance of climate change, not only in the context of disaster but also on the economic opportunities it provides.

A holistic approach of financing climate change activities to benefit the poor, will not only build their economic resiliency but also their resiliency against the impacts of a changing climate. As the priorities are already reasonably identified, financing the needs of today is actually financing the needs of the future.

10 Monitoring And Evaluation

Monitoring and evaluation are important aspects of the NCCAP. These will be led by the Climate Change Commission aimed at learning from the activities – what were done and how they were done – by focusing on efficiency, effectiveness and impact. While the NCCAP is set for long term, the strategies and plans are not totally fixed. If they are not working, or if the circumstances change, then NCCAP will need to change as well. Monitoring and evaluation informs government decision makers when plans are not working, and when circumstances have changed; therefore, they provide information needed to make decisions about changes that are necessary in the plan or in the implementation mechanisms.

Since monitoring and evaluation are based on the targets and planned activities during the various phases in the implementation of the action plan, setting the appropriate key performance indicators and targets are crucial. While indicators at the program level are identified at the start, ecotown performance indicators will need to be set together with local government units and other stakeholders.

For monitoring to be effective, NCCAP will need to set up systems of:

- collecting and recording the information;
- analysing the information; and
- using information to inform decision makers

NCCAP monitoring is set annually and evaluation every three years. Annual monitoring provides information that sets directions in setting priorities and budgets every year. Evaluation will focus on efficiency, effectiveness and impacts.

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NCCAP Acknowledgment

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Cluster: FOOD SECURITY

AGENCY/ ORGANIZATION
National Government Agencies
Department of Agrarian Reform – Special Programs
Department of Agriculture – Bureau of Fisheries and Aquatic Resources
Department of Agriculture – Bureau of Plant Industry
Department of Environment and Natural Resources – Environmental Management Bureau
Department of Environment and Natural Resources – Protected Areas and Wildlife Bureau
Department of Health - EOHO
Department of Health – Infectious Disease Office
Department of Science and Technology - Philippine Council for Agriculture, Forestry and Natural Resources Research and Development
National Council on Disability Affairs
National Economic Development Authority
Non-Governmental Organizations/ Civil Society Organizations
Philippine Movement for Climate Justice/ TFFS
Philippine Rural Reconstruction Movement
Sibol ng Agham at Teknolohiya
Tambuyog Development Center
World Fish Center
Private Sector
Philippine Chamber of Commerce and Industry/ APRRDC

Cluster: WATER SUFFICIENCY

AGENCY/ ORGANIZATION
National Government Agencies
Department of Agrarian Reform – Special Programs
Department of Environment and Natural Resources – Forest Management Bureau
Department of Environment and Natural Resources – National Water Resources Board
Department of Environment and Natural Resources – River Basin Coordinating Office
Department of Health
Department of Health - SHPO
Department of Public Works and Highways
National Council on Disability Affairs
National Economic Development Authority
National Irrigation Administration
Non-Governmental Organizations/ Civil Society Organizations
Conservation International
Philippine Movement for Climate Justice/ Freedom from Debt Coalition
Philippine Network on Climate Change
Philippine Watershed Management Coalition

Cluster: HUMAN SECURITY

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Department of Agrarian Reform
Department of Education
Department of Environment and Natural Resources– Mines and Geosciences Bureau
Department of Health
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Department of National Defense – Office of Civil Defense
Department of Science and Technology - Philippine Council for Industry, Energy and Emerging Technology Research and Development
Department of Social Welfare and Development
DRRNet Philippines/ World Vision
National Council on Disability Affairs
National Economic Development Authority
National Security Council
Philippine Commission on Women
Non-Governmental Organizations/ Civil Society Organizations
Institute for Climate and Sustainable Cities
NGOs for Fisheries Reform
Pambansang Koalisyon ng Kababaihan sa Kanayunan (PKKK)
Plan International
Private Hospitals Association of the Philippines

Cluster: ECOLOGICAL AND ENVIRONMENTAL STABILITY

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Department of Agriculture – Bureau of Fisheries and Aquatic Resources
Department of Energy
Department of Environment and Natural Resources – Ecosystems Research and Development Bureau
Department of Environment and Natural Resources – Environmental Management Bureau
Department of Environment and Natural Resources – Protected Areas and Wildlife Bureau
Department of Environment and Natural Resources – Protected Areas and Wildlife Bureau – Coastal and Marine Management Office
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EcoWaste Coalition
Haribon Foundation
Institute for Climate and Sustainable Cities
Philippine Movement for Climate Justice/ LRC-CNO
PTFCF
Sibol ng Agham at Teknolohiya
Tambuyog Development Center

Cluster: CLIMATE-SMART INDUSTRIES AND SERVICES

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Department of Environment and Natural Resources - National Solid Waste Management Commission
Department of Labor and Employment
Department of Labor and Employment – Institute for Labor Studies
Department of Tourism
Department of Trade and Industry – Bureau of Micro, Small and Medium Enterprise Development
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Non-Governmental Organizations/ Civil Society Organizations
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EcoWaste Coalition
GAIA
GreenPeace
International Labour Organization
Philippine Movement for Climate Justice
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United Architects of the Philippines/ Green Architecture Movement
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Philippine Chamber of Commerce and Industry
Philippine Chamber of Commerce and Industry Environment Committee/ Philippine Plastic Industry Association
Philippine Chamber of Commerce and Industry/ American Power Conversion
Philippine Chamber of Commerce and Industry/ MISCC/ Press
Philippine Chamber of Commerce and Industry/ PhilExport
Philippine Chamber of Commerce and Industry/ San Miguel

Cluster: SUSTAINABLE ENERGY

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Department of Transportation and Communication
National Economic Development Authority
National Electrification Administration
Non-Governmental Organizations/ Civil Society Organizations
Biomass Alliance
GreenPeace
Greenresearch/ Green Convergence
Land Transportation Organization of the Philippines, Inc.
Land Transportation Organization of the Philippines, Inc./ APRRRDC
NCR TODA
Renewable Energy Association of the Philippines
Sibol ng Agham at Teknolohiya
WWF Philippines
Private Sector
Philippine Chamber of Commerce and Industry
Philippine Chamber of Commerce and Industry/ APRRDC
Philippine Sugar Millers Association
Victory Liner

Cluster: KNOWLEDGE AND CAPACITY DEVELOPMENT

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Department of Agrarian Reform – Special Program
Department of Agriculture – Bureau of Soils and Water Management
Department of Education
Department of Energy
Department of Environment and Natural Resources – Environmental Management Bureau
Department of Interior and Local Government - Office of Project Development
Department of Interior and Local Government – Local Government Academy
Department of Public Works and Highways - ESSO
Department of Science and Technology - Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) - AWSC
Department of Trade and Industry – Bureau of Micro, Small and Medium Enterprise Development
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Technical Education and Skills Development Authority
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CEnergy
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Department of Budget and Management
Department of Finance - IFG
Department of Foreign Affairs
National Economic Development Authority
Non-Governmental Organizations/ Civil Society Organizations
Freedom from Debt Coalition
Institute for Climate and Sustainable Cities
La Liga Policy Institute
Partido Kalikasan
Philippine Movement for Climate Justice
Plan International
PTFCF
Sibol ng Agham at Teknolohiya
WWF Philippines
Private Sector
Price Waterhouse Coopers

Cluster: GENDER MAINSTREAMING

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Sarilaya, Inc.
Philippine Movement for Climate Justice
Freedom from Debt Coalition
DAWN
Tambuyog Development Center
Pambansang Koalisyon ng Kababaihan sa Kanayunan (PKKK)
WWF Philippines

Annex - A

Outcomes, Outputs & Activities for 2011-2028

The National Climate Change Action Plan: Goals & Outcomes

Title	**National Climate Change Action Plan**	**Agency**	**Climate Change Commission**
Country/ Region	**Philippines**	**Planning Period**	**2011-2028**

Situation	The Philippines, being archipelagic and because of its location, is ranked highest in the world in terms of vulnerability to tropical cyclone occurrence and third in terms of people exposed to such seasonal events. A recent Climate Change Vulnerability Index (CCVI) released by global risks advisory firm ranked 16 countries out of 170 as extremely vulnerable to climate change based on 42 social, economic and environmental factors. Of the 16 extremely vulnerable countries, the Philippines is ranked sixth. Adaptation is, therefore, a necessary complement to measures that reduce greenhouse gas emissions. It is a mechanism to manage risks, adjust economic activity to reduce vulnerability.
Resources	NCCAP outlines the roadmap for adaptation and mitigation for 2011 to 2028. It will use existing government budgets and new sources of financing from the private sector and international community by aligning programs along the national framework strategies and actions for climate change. It will also take advantage of the huge human resources in government by mobilizing and building their capacities.

GOAL	To build the adaptive capacities of women and men in their communities, increase the resilience of vulnerable sectors and natural ecosystems to climate change, and optimize mitigation opportunities towards a gender-responsive and rights-based sustainable development.

Ultimate Outcomes	**1.0** Enhanced adaptive capacity of communities, resilience of natural ecosystems, and sustainability of built environment to climate change.				**2.0** Successful transition towards climate-smart development.		
Strategic Priorities	100 Food Security	200 Water Sufficiency	300 Ecosystem and Environmental Stability	400 Human Security	500 Climate-smart Industries and Services	600 Sustainable Energy	700 CC Knowledge and Capacity Development
Intermediate Outcomes	Availability, stability, accessibility, affordability, safe and healthy food ensured amidst climate change.	Water resources sustainably managed and equitable access ensured.	Enhanced resilience and stability of natural systems and communities.	Reduced risks of the population from climate change and disasters.	Climate-resilient, eco-efficient and environment-friendly industries and services developed, promoted and sustained.	Sustainable renewable energy and ecologically efficient technologies adopted as major components of sustainable development.	Enhanced knowledge on and capacity to address climate change.
Immediate Outcomes	1000.1 Enhanced CC resilience of agriculture and fisheries production and distribution systems.	2000.1 Water governance restructured towards integrated water resources management in watersheds and river basins.	3000 Ecosystems protected, rehabilitated and ecological services restored.	4000.1 CCA and DRR practiced by all sectors at the national and local levels.	5000.1 Climate-smart industries and services promoted, developed and sustained.	6000.1 Nationwide energy efficiency and conservation promoted and implemented.	7000.1 Knowledge on the science of climate change enhanced.
	1000.2 Enhanced resilience of agricultural and fishing communities from climate change.	2000.2 Sustainability of supplies and access to safe water ensured.		4000.2 Health and social sector delivery systems are responsive to climate change.	5000.2 Sustainable livelihood and jobs created from climate-smart industries and services	6000.2 Sustainable renewable energy development enhanced.	7000.2 Capacity for CC adaptation and mitigation at the national and local level enhanced.
		2000.3 Knowledge and capacity for CC adaptation in the water sector enhanced.		4000.3 CC-adaptive human settlements and services developed, promoted and adopted	5000.3 Green cities and municipalities developed, promoted and sustained.	6000.3 Environmentally sustainable transport promoted and adopted.	7000.3 CC knowledge management established and accessible to all sectors at the national and local levels.
						6000.4 Energy systems and infrastructures climate-proofed, rehabilitated and improved.	

1 Food Security

Ultimate Outcome

1.0 Enhanced adaptive capacity of communities and resilience of natural ecosystems to climate change

Intermediate Outcome

Ensured food availability, stability, access, and safety amidst increasing climate change and disaster risks.

Immediate Outcome

1. Enhanced resilience of agriculture and fisheries production and distribution systems from climate change.

Output Area

1.1. Enhanced knowledge on the vulnerability of agriculture and fisheries to the impacts of climate change.

Indicators

1100.1.1	Provincial level agriculture and fishery sector vulnerability and risk assessment conducted nationwide.
1100.1.2	National and provincial agriculture and fisheries climate information and database established.
1100.1.3	No. of researches conducted on agriculture and fisheries adaptation measures and technologies developed.
1100.1.4	No. of appropriate CC adaptation technologies identified and implemented.

Institutions Involved

Lead Government Agencies: Department of Agriculture, LGUs
Coordinating Government Agencies: DENR, DOST, CCC, DAR, DILG, DOH, DTI

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.1.1. Enhance site –specific knowledge on the vulnerability of agriculture and fisheries to the impacts of climate change.				
a. Conduct of provincial-level vulnerability and risk assessments for the agriculture and fisheries.	Provincial-level vulnerability and risk assessment studies and maps produced and disseminated.	■		
b. Conduct of studies and simulation models on the impacts of climate change on major crops and livestock based on the VA and climate change scenarios.	Vulnerability of the sectors to different CC scenarios conducted.	■	■	■

1.2.1. Conduct researches and disseminate knowledge and technologies on CC adaptation to reduce vulnerability of the sector to climate change				
a. Develop and/or update climate change R&D agenda for agriculture and fisheries sectors	R&D agenda formulated, updated and translated to R&D programs.	■	■	■
b. Develop appropriate technologies and adaptation measures, including indigenous knowledge and autonomous adaptation practices.	Technologies and adaptation measures developed, promoted and implemented.	■		
c. Develop climate-resilient crop and livestock production systems and technologies	Technologies on crop and livestock production systems, including CC-resilient crop varieties and animal breeds developed.	■	■	■
c. Conduct researches on best practices in fisheries and coastal climate change adaptation, technologies, and tools.	CC- adaption tools and best practices in fisheries developed.	■	■	■
1.3.1. Establish knowledge management on climate change information for agriculture and fisheries				
a. Develop accessible and gendered knowledge products on climate change risks, adaptation, and DRR for agriculture and fisheries	No. of gender-sensitive knowledge products developed.	■		
b. Establish a resource network on climate change -agriculture and fisheries	Resource network on climate change -agriculture and fisheries created and established to include managers, development workers, technology generators, academe, agri and fisheries-based NGOs, and peoples' organizations, at the national, regional, and provincial levels.	■		
c. Establish climate information system and database for agriculture and fisheries sectors	Climate change information system at the national and local levels established.	■	■	
d. Conduct IEC on CC to promote best practices and developed technologies through multi-media, outreach, and other means of disseminating information.	No. of persons / communities reached by IEC activities.	■	■	■

Output Area

1.2. Climate-sensitive agriculture and fisheries policies, plans and program formulated.

Indicators

1200.1.1	Climate change responsive agriculture and fisheries policies, plans and budgets developed and implemented.
1200.1.2	No. of CC-responsive agriculture-fisheries policies formulated and implemented.
1200.1.3	CLIMATE CHANGE ACTIONS-DRR Performance Monitoring Indicators developed and implemented.
1**200.1.4**	No. and type of risk transfer (e.g., weather-based/index insurance) and social protection mechanisms developed for agriculture and fisheries.

Institutions Involved

Lead Government Agency: Department of Agriculture

Coordinating Government Agencies: DENR, DOST, CCC, LGUs, DILG, NEDA

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.2.1. Integrate and harmonize CLIMATE CHANGE ACTIONS and DRR (Disaster Risk Reduction or Disaster Risk Management or Disaster Risk Reduction & Management) in national and local agriculture and fisheries policies and plans, including the Philippine Development Plan				
a. Review and harmonize existing policies on food production and distribution	Existing policies reviewed and harmonized. (climate-responsive PDP, AFM Plan)	■		
b. Lobby for congress to enact a national land use policy	National land use bill enacted.	■		
c. Conduct of annual CC adaptation planning and budgeting.	Annual CCA plans, targets and budgets for agriculture and fisheries formulated.	■	■	■
d. Complete the delineation of municipal water	Delineation of municipal waters completed	■		
e. Formulate guidelines on reversion of abandoned fishponds back to mangroves	Guidelines formulated and approved.	■		
f. Conduct climate sensitizing/proofing and gender-responsiveness of the Comprehensive National Fisheries Industry Development Plan	Climate- and gender-sensitizing of the CNFIDP conducted and implemented.	■	■	
g. Harmonize climate change adaptations plans in local resource management and local fisheries development.	CC adaptation in local resource management and local fisheries development harmonized.	■		
h. Regulate commodity shifting and agricultural land conversion	Policy formulated and approved.	■		

1.2.2. Scale up implementation of best practices				
a. Implement climate-responsive and gender-sensitive Comprehensive National Fisheries Industry Development Plans	No. of climate-responsive and gender-sensitive CNFIDP programs implemented.	■	■	■
b. Scale up implementation of best practices on fisheries climate change adaptation	No. of best practices adopted by farming and fishing communities and industries.		■	■
c. Establish early warning systems for fisheries and agriculture	No. of farming and fishing communities adopting early warning system.	■		
d. Repair and rehabilitate national and communal irrigation systems	No. of national and communal irrigations systems repaired and rehabilitated.	■	■	
e. Implement agricultural and fisheries waste recycling and composting	Waste recycling and composting implemented	■	■	
1.2.3. Monitor and evaluate implementation of CCA and DRR plans in agriculture				
a. Develop key performance indicators and rating system to monitor CCA-DRR implementation in the sector	Performance monitoring indicators developed and utilized.	■	■	■
b. Conduct regular evaluation of adaptation practices	Regular review and evaluation of adaptation practices conducted.		■	■

Immediate Outcome

2. Enhanced resilience of agriculture and fishing communities from climate change.

Output Area

2.1. Enhanced capacity for CCA and DRR of government, farming and fishing communities and industry.

Indicators

1100.2.1	No. of farmers and fisherfolk communities trained on adaptation best practices and DRR.
1100.2.2	No. and type of formal curricula and non-formal training programs developed and implemented for agriculture and fisheries.

Institutions Involved

Lead Government Agency: Department of Agriculture
Coordinating Government Agencies: DENR, DOST, CLIMATE CHANGE COMMISSION, DILG, DepEd, CHED, TESDA,
Other Partners: Academic and training institutions

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.1.1. Build the capacity of farming and fishing communities on adaptation and DRR				
a. Improve and expand extension service and agricultural support to highly climate change vulnerable communities and areas	No. of farming and fishing communities reached by extension service.	■	■	■
b. Conduct CLIMATE CHANGEA and DRR training for farming and fishing communities	No. of fishing and farming communities implementing DRR and CCA		■	■
c. Establish farmers' field school to demonstrate best adaptation practices.	No. of field schools established.	■	■	
2.1.2. Integrate CCA and DRR in agriculture and fishery curricula and training programs				
a. Review agriculture and fisheries education and develop climate change -responsive curricula	Climate change -responsive agriculture and fisheries curricula developed.	■		
b. Develop non-formal training programs on CCA best practices	No. of short courses and non-formal training programs developed and implemented.	■	■	

Output Area

2.2. Enhanced social protection for farming and fishing communities.

Indicators

1100.1.1	No. farming and fishing communities with weather-based insurance
1100.1.2	Increase in the no. of small farmers and fisher folk who are credit worthy.

Institutions Involved

Lead Government Agency: Department of Agriculture
Coordinating government Agencies: DOST, DSWD, DOF-MDFO, LGUs
Other partners: rural banks and financial institutions, NGOs

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.2.1. Implement risk transfer and social protection mechanisms for agriculture and fishery				
a. Conduct policy study on climate change risk transfer and social protection mechanisms for agriculture and fisheries	Policy studies conducted.	■		

b. Design and implement climate change risk transfer and social protection mechanisms for agriculture and fisheries	Social protection and risk transfer mechanisms designed and implemented	■	■	■
c. Develop innovative financing mechanisms to provide seed capital for the implementation of CCA among farmers and fisherfolk organizations	Appropriate financing mechanisms developed and implemented	■		
d. Organize and train farmers and fisher folk organizations on organizational development and fund management.	Farmers' and fisherfolk organizations trained.	■	■	

2 Water Sufficiency

Ultimate Outcome

1.0 Enhanced adaptive capacity of communities and resilience of natural ecosystems to climate change

Intermediate Outcome

Water resources sustainably managed and equitable access ensured.

Immediate Outcome

1. Water governance restructured towards a climate and gender-responsive water sector.

Output Area

1.1. Enabling policy environment for IWRM and CCA created

Indicators

2100.1.1	Existing water resources management laws reviewed and harmonized
2100.1.2	100% of licensing of water users
2100.1.3	Water governance structure streamlined.

Institutions Involved

Lead Government Agency: Department of Environment and Natural Resources - NWRB
Coordinating Government Agencies: CCA, DA, DOE, NEDA, DOST, DOH, DPWH, NCIP

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.1.1. Streamline water governance structure				
a. Review and streamline existing water resources management and institutional structure and policies.	A national policy on harmonized and streamlined water resources management and institutional structure and policies formulated and passed.	■		
b. Review of the Water Code for possible amendment	Water Code reviewed and bill filed in Congress.	■		
c. Explicit policy issuance from heads of agencies	DAO issued by key institutions or a NEDA Board Resolution or an EO	■		
d. Enact a national land use act (NLUA)	NLUA enacted by Congress.	■		
d. Create a Water Regulatory Commission (WRC) for regulation of water resources supply and quality management	WRC created.	■		

Output Area

1.2. CC adaptation and vulnerability reduction measures for water resources and infrastructures implemented.

Indicators

2100.1.1	Existing water resources management laws reviewed and harmonized
2100.1.2	100% of licensing of water users
2100.1.3	Water governance structure streamlined.

Institutions Involved

Lead Government Agencies: DENR, DPWH
Coordinating Government Agencies: DA, DOE, NEDA, DOST, DOH, DSWD

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.2.1. Complete the profiling of watershed and river basins				
a. Identify and delineate priority watersheds and river basins for IWRM implementation	Watersheds and river basins delineated and mapped.	■		
b. Conduct groundwater resource vulnerability and recharge areas assessment in water stressed cities	Groundwater resources assessed and mapped	■		
c. Define areas not suitable for large water infrastructure development and settlements based on the V&A.	High risk areas from extreme climate events not suitable for infrastructure and settlement development identified and mapped.	■		
1.2.2. Conduct gendered vulnerability and risk assessment of water resources and infrastructures (such as water impoundments, dams, water and wastewater treatment facilities, distribution systems, etc.) and identify adaptation measures.				
a. Conduct risk and vulnerability assessment of identified watersheds, river basins, and infrastructures	Risk and vulnerability assessments in all critical watersheds and river basins conducted e.g. Angat Reservoir etc.	■		
b. Identify and adopt CCA measures and "low cost, no regrets" technologies based on the V&A.	No. of CCA measures implemented in watersheds and river basins.	■	■	■
1.2.3. Develop and implement CCA plans for priority watersheds and river basins.				
a. Develop guidelines for implementing IWRM and CCA at the local, watershed and river basin level.	IWRM implementation guidelines developed	■		
b. Conduct participatory IWRM planning at the local level for the critical watersheds and river basins	IWRM with CCA-DDR integrated in local comprehensive land and water use plans.	■		

c. Design and implement integrated water management structure at watershed and river basin levels.	IWR management structure in place in all the identified critical watersheds and river basins.	■	■	■
1.2.4. Rehabilitate degraded watersheds and river basin areas and protect existing ones.				
a. Identify and prioritize rehabilitation of degraded watersheds.	Degraded watersheds identified and rehabilitated	■	■	■
b. Conserve and protect existing watershed and protected areas.	Existing watersheds protected	■	■	■
c. Rehabilitate degraded rivers and lakes.	Degraded rivers and lakes rehabilitated	■	■	■
c. Identify financing options for rehabilitation activities.	Financing options for rehabilitation identified.	■	■	■
1.2.5. Review and develop financing plan for water sector climate change action plan.				
a. Study, design and implement financing mechanisms for IWRM and CCA implementation in critical watersheds and river basins, including risk transfer mechanisms (insurance and catastrophe (CAT) bonds) and innovative conservation financing like payments for environmental services or PES.	Innovative public and private finance mechanisms designed and implemented.	■		
c. Study, develop and implement a system of incentives to encourage private investment in IWRM-CCA.	Private investments in the water sector CCA increased (including public private partnership)	■	■	■

Immediate Outcome

2. Sustainability of water supply and access to safe and affordable water ensured.

Output Area

2.1. Water supply and demand management of water systems improved.

Indicators

2100.1.1	No. of site-specific water supply-demand (water balance)studies conducted
2100.1.2	No. of water supply infrastructures assessed and climate-proofed
2100.1.3	No. of modifications in the processes and demands for water supply systems and users implemented

Institutions Involved

Lead Government Agencies: DENR-NWRB

Coordinating Government Agencies: DA, DPWH, NEDA, DOST, LGUs, DOH, LWUA

Other Partner Institutions: Civil society organizations, private sector

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.1.1. Conduct water resource supply and demand analysis under various hydrologic conditions and climate scenarios.				
a. Analyze application in Philippine conditions of simulation and decision tools for assessing water resource adaptations to climate change, focusing on water supply and demand analysis. (Mapping of water users, licensing of water users, availability assessment)	Water resources supply and demand (water balance) in critical watersheds and river basins conducted.(this include water available and water use plans that was one of the instructions of the President) Training for modeling	■		
b. Study "low cost, no regrets" adaptation measures and technologies under various hydrologic conditions, supply-demand conditions, and policy scenarios for surface and groundwater systems.	"Low cost, no regrets" CCA measures and technologies identified and studied.	■	■	
2.1.2. Review and modify, as appropriate, management processes of existing water supply systems and users to consider potential impacts of climate change.				
a. Develop policy and guidelines for water conservation, allocation, recycling and reuse.	Policies and guidelines developed and implemented.	■		
b. Study and adopt centralized wastewater treatment systems to improve quality in highly urbanized and densely populated areas.	Centralized wastewater treatment facilities built.	■	■	■
c. Rehabilitate infrastructures (water leaks)	Non Revenue Water (NRW) and water losses reduced	■		
d. Identify alternative water sources (surface water) and demand management especially for urbanized areas that rely on reservoirs and are prone to recurrent and severe drought events.	Alternative sources of water identified and implemented (e.g., mandatory rainwater harvesting, water conservation and rationing during drought periods, etc.)	■	■	
e. Review of NWRB standards for water allocation	NWRB water standards revised considering climate change impacts to water and CC projections	■		
f. Adopt flood plain management and flood hazard reduction by establishing flood plain zones and new operating rules during flood periods as modular or incremental adaptation measure.	Adaptive and integrated flood plain zone management developed and implemented.	■		
g. Develop and implement monitoring networks for hydrologic trend analysis, forecasting, and detecting shifts in trends of precipitation and streamflow.	Monitoring networks established and implemented.	■		

2.1.3. Implement water harvesting technologies. (DPWH, LGU, DA)				
a. Develop and implement guidelines for rain water collection, such small water impoundments, retarding basins, mini dams, to address water shortage and flooding.	Guidelines for rain water collection, such small water impoundments, retarding basins, mini dams, to address water shortage and flooding developed and implemented.	■		
b. Implement and expand program to strengthen the capability of LGUs comply with RA6717, the construction of rain water collectors.	Capacity enhancement program for LGU implementation of RA6717 implemented.	■		
c. Review and expand RA6717 for possible inclusion of storm water collection	RA 6717 reviewed and expanded			
d. Develop and implement programs and incentive system for CC-proofing and retrofitting water infrastructures at the household level/ community-level	Programs and incentive system for CC-proofing and retrofitting water infrastructures at the household level/ community-level developed and implemented	■	■	
e. Integrate in the National Building Code a requirement for all water-intensive facilities to have water recovery system.	Provision for water recovery system for water-intensive facilities integrated in the National Building Code.	■		
f. Conduct a policy study to promote eco-efficient water infrastructures, water conservation, reuse and recycling for water-intensive industries	Study on eco-efficient water infrastructures, water conservation, reuse and recycling for water-intensive industries conducted and policy recommendations adopted.	■	■	■

Output Area

2.2. Water quality of surface and groundwater improved.

Indicators

2200.2.1	Incidence of water-borne CC-sensitive diseases.
2200.2.2	No. of highly urbanized cities with sewerage infrastructure
2200.2.3	No. of household with access to safe water and with sanitary toilets
2200.2.4	No. of cities/ municipalities served by sewerage system/ septage system

Institutions Involved

Lead Government Agencies: DENR, DOH, NAPC

Coordinating Government Agencies: MWSS, DPWH

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.2.1. Implement the Clean Water Act and National Septage and Sewerage Program				
a. Assess gaps in the implementation of the two laws and needs for full implementation.	Assessment on the status of implementation of the Clean Water Act and National Septage and Sewerage Program conducted.	■		
b. Develop and implement a comprehensive ground water management program that includes vulnerability assessment, database management, monitoring, water quality management, and licensing	Comprehensive ground water management program developed and implemented	■	■	■
c. Review, revise, and implement program to improve the capacity of key regulatory agencies to fully implement the two laws.	Capacity building program reviewed, revised and implemented.	■	■	
d. Evaluate impacts of command-and-control vs. user fee system on improvements in compliance and water quality.	Impact evaluation of the user fee system on industry compliance and water quality improvements conducted.	■		
e. Revise, as necessary, current approaches to institutionalize the polluters' pay principle in pollution management.	Approaches to institutionalize the polluters' pay principle in pollution management reviewed, revised, and implemented.	■		
f. Establish monitoring stations to include water discharges, water level and water quality	Monitoring stations established in priority areas.	■		
2.2.2. Improve sanitation infrastructures.				
a. Implement monitoring and surveillance of water-borne disease incidence and other health risks due climate change	Monitoring and surveillance of water-borne disease incidence related to climate change implemented.	■	■	■
b. Expand the establishment of alternative micro-water purification systems especially to areas that cannot be reached by safe water supply.	Establishment of alternative micro-water purification systems expanded	■	■	
c. Conduct water quality survey of groundwater sources of drinking water.	Water quality survey of groundwater sources of drinking water conducted.	■		
d. IEC on sanitation and diseases on communities				

Output Area

2.3. Equitable access of men and women to sustainable water supply improved.

Indicators

2300.2.1	100% water supply coverage of waterless communities
2300.2.2	Reduction in climate-related water-borne health risks.

Institutions Involved

Lead Government Agencies: DOH, NWRB
Coordinating Government Agencies: DILG, DPWH, NAPC

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.3.1. Increase safe water supply coverage for waterless communities				
a. Update survey of waterless communities and households	Survey of water supply coverage updated.	■		
b. Construct new and expand existing water supply infrastructures for waterless communities	100% water supply coverage for waterless communities and mechanisms for sustainability in place.	■	■	
c. Review financing, tariffs, and system of incentives to reflect the full cost of providing safe water	Water infrastructure financing, water tariffs, and system of incentives reviewed.	■		
c. Review financing, tariffs, and system of incentives to reflect the full cost of providing safe water	Water infrastructure financing, water tariffs, and system of incentives reviewed.	■		
d. Increase capacity of community-based water associations to managed water supply infrastructures	Capacity building programs community-based water associations implemented.	■	■	■
e. Develop public financing mechanism for water supply infrastructures rehabilitation and development	Public financing mechanism for water supply infrastructures developed		■	
2.3.2. Implement time-limited groundwater abstraction licenses to provide flexibility to respond to changing climate conditions, e.g., prolonged drought and El Niño, as it happens.				
a. Evaluate, through a multi-stakeholder consultation process, the most appropriate approach of introducing time-limited abstraction permits.	Approaches for introducing time-limited abstraction permits identified through a multi-stakeholder consultation process.	■		
b. Conduct cost-benefit analysis for introducing time limiting.	CBA of time-limiting conducted.	■		
c. Develop and implement policy and guidelines on time-limited licensing and monitoring	Policy and guidelines developed and implemented.	■		

Immediate Outcome

3. Knowledge and capacity for CC adaptation in the water sector enhanced.

Output Area

3.1. Knowledge and Capacity for IWRM and water sector adaptation planning enhanced.

Indicators

2100.3.1	No. of staff from key institutions trained as pool of trainers/resources on IWRM and CCA-mitigation
2100.3.2	No. of government-academe-CSOs partnerships working on knowledge-sharing
2100.3.3	Appropriate technologies on IWRM, CCA and mitigation
2100.3.4	Knowledge products produced and accessed by IWRM practitioners at the national and local level
2100.3.5	Updated water resources and users database accessible to various users.

Institutions Involved

Lead Government Agencies: DENR-NWRB, PIA
Coordinating Government Agencies: DILG, DA, DOH, LWUA, PWP
Other Partner Institutions: CSOs working on water, academe

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.1.1. Develop the capacity of relevant government agencies on IWRM and climate change action planning.				
a. Conduct government capacity assessment for IWRM	Capacity assessment report for government agencies involved in water governance at the national and local levels	■		
b. Develop capacity building plan and training modules	Capacity building plan and training modules developed	■	■	■
c. Conduct training of trainers in key government agencies at the national and provincial level	No. of IWRM/CCA trainers trained from DENR-NWRB, DA, DILG and DOH.	■		
d. Conduct IWRM-CCA/DRR training for vulnerable communities (watershed and river basins)	No. of river basin communities trained on IWRM and adaptation measures.	■	■	■

3.1.2. Improve and update water resources database and information system				
a. Develop CC R&D agenda for the water sector	Water sector CC R&D plan developed and implemented	■		
b. Develop and network government databases on water resources (supply and quality) and users.	Management information system developed (Knowledge Management Center on CC at different department and linked to CCC.	■		
c. Develop system for regular updating of database	System for database updating developed and implemented.	■	■	■
3.1.3. Develop gendered knowledge products on water and climate change				
a. Develop comprehensive gender-sensitive communication strategy to raise awareness on CC impacts on water resources	Communication strategy developed.	■	■	■
b. Develop gendered and accessible knowledge products and IEC materials that include local and indigenous knowledge on water resources management and adaptation best practices.	No. of knowledge products and IEC materials developed for various audiences.	■	■	■
c. Conduct IEC using multi-media campaign, outreach programs, timely reporting of monitoring results, etc.	No. of communities reached through by the IEC through various means	■	■	■

3 Ecological And Environmental Stability

Ultimate Outcome

1.0 Enhanced adaptive capacity of communities, resilience of natural ecosystems, and sustainability of built environment to climate change.

Intermediate Outcome

Enhanced resilience and stability of natural systems and communities.

Immediate Outcome

1. Ecosystems protected, rehabilitated and ecological services restored.

Output Area

1.1. CC mitigation and adaptation strategies for key ecosystems developed and implemented

Indicators

3100.1	Hazard, vulnerability and adaptation maps produced for all ecosystems
3100.2	No. and types of CC mitigation and adaptation measures in key ecosystems implemented

Institutions Involved

Lead Government Agencies: Department of Agriculture, LGUs
Coordinating Government Agencies: DENR, DOST, CCC, DAR, DILG, DOH, DTI

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.1.1. Conduct a nationwide ecosystem vulnerability and risk assessment				
a. Develop and implement policy and technical guidance for a nationwide conduct of ecosystem vulnerability and risk assessment.	Policy and technical guidance for a nationwide conduct of ecosystem vulnerability and risk assessment developed and implemented	■	■	■
b. Develop implementation and financing and resource mobilization plan	Financing and resources mobilization plan developed and implemented.	■	■	■
c. Organize and train multi-disciplinary vulnerability and risk assessment teams at the national and regional levels	Regional multi-disciplinary vulnerability and risk assessment teams organized and trained.	■	■	■

1.1.2. Derive and implement mitigation and adaptation strategies for key ecosystems				
a. Identify mitigation and adaptation strategies for key ecosystems from the vulnerability and risk assessment	Mitigation and adaptation measures for key ecosystems identified.	■	■	■
b. Develop institutional mechanism for implementation of identified measures	Institutional mechanism developed and implemented.	■	■	■
c. Design and implement payments for environmental services and other innovative conservation financing mechanisms to support ecosystem-based adaptation and mitigation	PES and other appropriate innovative financing schemes designed and implemented	■	■	■
1.1.3. Implement the National REDD Plus Strategy (NRPS).				
a. Establish enabling policies on REDD+, integrating lessons-learned from previous legislation and aligning conflicting laws and policies among different sectors.		■		
b. Establish national and sub-national institutional mechanisms for the implementation of REDD+ that build on existing structures.		■	■	
c. Leverage REDD+ resources and projects to deliver social benefits and contribute poverty alleviation		■	■	■
d. Establish a system of monitoring, reporting and verification of REDD+ related policies and processes.		■	■	
e. Develop and implement R&D agenda on REDD+		■	■	■
Output Area				
1.2. Management and conservation of protected areas and key biodiversity areas improved				

Indicators	
3200.1	No. and hectares of PA/KBAs protected
3200.2	No. of ecosystem towns or eco-towns established
3200.3	Management plans and

Institutions Involved

Lead Government Agencies: DENR, LGUs
Coordinating Government Agencies:

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.2.1. Expand the network of protected areas (PAs) and key biodiversity areas (KBAs)				
a. Update status of PAs and KBAs from results from the vulnerability and risk assessment	Status of resources, biodiversity, etc. updated	■	■	■
b. Establish expand PA network through multi-stakeholder collaboration (LGUs, communities, private sector, NGOs, etc.)	PA network expanded.	■	■	■
c. Establish zoning guidelines for different ecosystems based on the vulnerability and risk assessment results				
d. Identify CC vulnerable sites and adaptation measures	CC vulnerable sites and adaptation measures identified.	■	■	■
e. Identify and delineate ecological management zones	Ecological management zones delineated	■	■	■
f. Integrate CCA-DRR through multi-stakeholder approach in PA management plans	CCA-DRR integrated PA management plans.	■	■	■
1.2.2. Establish ecosystem towns or ecotowns in protected areas and key biodiversity areas				
a. Establish criteria for the prioritization PAs/KBAs and the establishment of ecotowns	Prioritization criteria established	■		
b. Delineate boundaries of priority eco-towns and municipalities through a multi-stakeholder process	Boundaries of priority eco-towns and municipalities delineated.	■	■	■

c. Delineate "ridge-to-reef" ecosystem-based management zones for the eco-towns through a multi-stakeholder process	"Ridge-to-reef" ecosystem-based management zones for the eco-towns	■	■	■
d. Establish baseline information and publicly-accessible databases of ecotowns	Baseline information and publicly accessible databases of eco-towns established	■	■	■
e. Develop and implement a results-based monitoring system to track eco-town progress	Results-based monitoring system to track eco-town progress developed and implemented.	■	■	■
1.2.3. Design gender-fair innovative financing mechanisms and a bundle of CC adaptation assistance for ecotown communities				
a. Identify the bundle of assistance and resources required to establish and sustain an eco-town	Bundle of assistance and resources required to establish and sustain an eco-town identified.	■		
b. Develop policy for the implementation of PES for PA protection, poverty reduction, and CCA measures in eco-towns	PES policy developed and implemented.	■		
c. Design PES scheme and pilot test in identified eco-towns	PES scheme designed and pilot tested	■		
d. Study and establish other innovative climate financing mechanisms, e.g., REDD+, debt-for-nature swaps, etc., to expand and sustain the implementation of CCA in eco-towns	Innovative climate financing mechanisms established.	■	■	■
e. Establish partnership with the private sector and civil society organizations in the delivery of services (e.g., technical assistance, micro-financing, social protection mechanisms, etc.)	Partnership with the private sector and civil society organizations in the delivery of services established.	■	■	■

Output Area

1.3. Environmental laws strictly implemented

Indicators

3300.1	No. of mining operations in protected areas reviewed and temporarily suspended.
3300.2	Solid waste disposal sites in environmentally critical areas (ECA) closed
3300.3	

Institutions Involved

Lead Government Agencies: DENR, LGU
Coordinating Government Agencies:

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.3.1. Implement moratorium on polluting and extractive industries in PAs, KBAs and other environmentally critical areas				
a. Document contaminated sites nationwide	Contaminated sites identified and documents	■	■	■
b. Rehabilitate abandoned mines	Abandoned mine sites rehabilitated	■	■	■
c. Identify and implement a moratorium of mining operations in protected areas pending vulnerability and risk assessment and economic valuation studies.	Moratorium of mining operations in protected areas implemented			
d. Close solid waste management sites in environmental critical areas.	Waste management facilities in ECA closed.	■		
e. Review permit issuances of mining and other highly pollutive industries in ECAs and PAs	Issuances of mining permits in ECAs and PAs reviewed	■		
f. Establish "polluters pay principle" for pollution management.	"Polluters pay principle" established.	■		

Output Area

1.3. Capacity for integrated ecosystem-based management approach in protected areas and key biodiversity areas enhanced

Indicators

3400.1	No. of staff in key government agencies trained and implementing integrated ecosystem-based management approaches.
3400.2	No. of Eco-town communities trained on integrated ecosystem-based management
3400.3	No. of gendered and accessible knowledge products developed and disseminated through various means and audiences (e.g., multi-media, outreach, reports of monitoring, technical reports, policy papers, etc.)

Institutions Involved

Lead Government Agencies: CCC, DENR-PAWB
Coordinating Government Agencies: LGUs, PAMBs, All NGAs

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.4.1. Increase knowledge and capacity for integrated ecosystem-based management at the national, local and community levels				
a. Assess capacity of key national agencies, LGUs and communities on integrated ecosystem-based management approach	Capacity assessment conducted	■		
b. Develop and implement a gendered capacity building plan	Capacity building plan developed and implemented	■	■	■
c. Establish management information system for different ecosystems that link various data sources	MIS developed and accessible to the public	■	■	■
d. Develop and disseminate gendered and accessible knowledge products	Accessible and gendered knowledge products developed and disseminated	■	■	■
e. Document, share and institutionalize best practices, including CC-responsive indigenous best practices	Compendium of best practices prepared and disseminated	■	■	■

Output Area

1.5. Natural resource accounting institutionalized

Indicators	
3500.1	Wealth accounts or ENRA integrated in the national income accounts
3500.2	Policy on ENRA developed and implemented

Institutions Involved

Lead Government Agencies:

Coordinating Government Agencies:

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.4.1. Increase knowledge and capacity for integrated ecosystem-based management at the national, local and community levels				
a. Review PEENRA policy and revise as necessary	Policy creating PEENRA reviewed and revised.	■		
b. Designate lead agency for wealth accounting	Lead agency for wealth accounting designated	■		
c. Implement greening of the national income accounts	ENRA implemented	■		
1.5.2. Implement training program on wealth accounting or ENRA for key government agencies				
a. Develop and implement workplace training program on ENRA and uses of ENRA in policy development	Develop and implement workplace training program on ENRA and uses of ENRA in policy development	■		

4 Human Security

Ultimate Outcome

1.0 Enhanced adaptive capacity and resilience of communities and natural ecosystems and sustainability of built environment to climate change.

Intermediate Outcome

Reduced risks of women and men to climate change and disasters.

Immediate Outcome

1. CCA-DRRM implemented in all sectors at the national and local levels.

Output Area

1.1. CCA-DRRM integrated in local plans

Indicators

4100.1.1	Vulnerability and risk assessments conducted in all provinces.
4100.1.2	No. of LGUs with CCA-DRRM plans implemented

Institutions Involved

Lead Government Agencies: CCC, NDRRMC, LGUs
Coordinating Government Agencies: All agencies

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.1.1. Conduct provincial-level vulnerability and risk assessments				
a. Identify provincial level climate and geologic risks	Provincial level risk information and maps.	■		
b. Identify most CC vulnerable provinces, sectors and population.	Provinces ranked according to the risks and vulnerability.	■		
c. Identify gendered adaptation and risk reduction measures	CC adaptation and risk reduction approaches identified.	■		
1.1.2. Mainstream and implement CCA-DRRM in the local plans based on information from the vulnerability and risk assessments.				
a. Conduct local multi-stakeholder CCA-DRRM planning to based on the assessment results with active participation of women	Local multi-stakeholder planning on CCA-DRRM conducted	■		

b. Mobilize various sectors and communities toward CCA-DRRM	CCA-DRRM plans adopted by all sectors	■		

Output Area

1.2. Knowledge and capacity for CCA-DRRM developed and enhanced

Indicators

4200.1.1	No. of local and community implementing CCA-DRRM
4200.1.2	No. of CCA-DRRM resource networks mobilized
4200.1.3	No. of communities reached by IEC program

Institutions Involved

Lead Government Agencies: CCC, NDRRMC, PIA
Coordinating Government Agencies: All NGAs, LGUs
Other Partner Institutions: CSOs, academic organizations on health

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.2.1. Develop and implement knowledge management on CC and disaster risks				
a. Organize and mobilize national and local networks of CC practitioners and resources that can provide assistance to LGUs and communities on CCA-DRRM	Resource networks on CCA-DRRM mobilized.	■	■	■
b. Develop accessible and gendered knowledge products on CC and disaster risks.	Accessible and gendered knowledge products on CC and disaster risks developed.	■	■	■
c. Develop and implement an IEC program	IEC program developed and implemented.	■	■	■
1.2.2. Increase local and community capacities for CCA-DRRM				
a. Increase capacity for forecasting, early warning and disaster risk communication	Upgrading of skills, equipment, and infrastructure for forecasting, early warning and risk communication implemented.	■	■	■
b. Identify indigenous early warning systems on disasters for potential replication in other areas.	Indigenous early warning systems for DRR identified, assessed, and replicated.	■	■	■
c. Conduct training of trainers to respond to the needs of communities for CCA-DRRM.	Pool of trainers at the local level organized.	■	■	■

Immediate Outcome

2. Health and social protection delivery systems are responsive to climate change risks.

Output Area

2.1. Health personnel and communities capacity on CC health adaptation and risk reduction developed.

Indicators

4100.2.1	No. of LGUs with trained health personnel trained on CC health adaptation and DRR from the provincial down to the barangay level.
4100.2.2	No. of academic and training institutions with medical and allied health programs integrating CC and DRR in their curricula.

Institutions Involved

Lead Government Agencies: CHED, DOH, DepEd
Coordinating Government Agencies: DSWD, TESDA

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.1.1. Integrate CC and DRR in the training of health personnel and community workers				
a. Develop CC-sensitive curricula and instructional materials for the training of health personnel and health workers (community, school, industrial, etc.).	CC-sensitive curricula and instructional materials developed.	■		
b. Develop and implement policy requiring integration of CC and DRR concepts and approaches in medical and allied health training courses	Policy requiring integration of CC and DRR concepts and approaches in medical and allied health training courses developed and implemented.	■		

Output Area

2.2. Public health surveillance system developed and implemented in all provinces.

Indicators

4200.2.1	No. of community-based public health surveillance system implemented.

Institutions Involved

Lead Government Agency: DOH
Coordinating Government Agencies: DSWD, LGUs, DILG

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.2.1. Implement community-based public health surveillance system for CC-sensitive diseases				
a. Develop and implement community-based public health monitoring and surveillance system	Community-based system for public health monitoring and surveillance system developed and implemented.	■	■	■
b. Conduct training of communities on the public health monitoring and surveillance system	Capacity building for communities implemented.	■	■	■
c. Develop reporting system for early warning and timely response	Reporting system developed and implemented.	■	■	■

Output Area

2.3. Health emergency response, preparedness and post-disaster management implemented at the national and local levels.

Indicators

4300.2.1	Health emergency preparedness and response for climate change and disaster risks in place at the national and local levels.

Institutions Involved

Lead Government Agencies: DOH, NDRRMC
Coordinating Government Agencies: All NGAs, LGUs
Other Partner Institutions: Red Cross, professional associations

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.3.1. Improve system for health emergency preparedness and response for climate and disaster risks				
a. Assess capacity of health facilities and personnel for emergency preparedness and response at the national and local level	Capacity assessment conducted.	■		
b. Develop and implement a program to increase capacity for health emergency preparedness and response	Health emergency preparedness and response capacity development programs implemented	■	■	■
c. Implement program for community health emergency preparedness and response	Community health emergency preparedness and response implemented.	■	■	■

2.3.2. Improve system for post-disaster health management.				
a. Develop and implement a post-disaster epidemic outbreak management and disease surveillance system	Post-disaster epidemic outbreak management and disease surveillance system developed and implemented			
b. Develop and implement monitoring health infrastructure damage and rehabilitation plan	Monitoring health infrastructure damage and rehabilitation plan developed and implemented			
c. Develop and implement post-disaster resettlement and counseling of displaced families and communities	Post-disaster resettlement and counseling of displaced families and communities developed and implemented			

Immediate Outcome

3. CC-adaptive human settlements and services developed, promoted and adopted

Output Area

3.1. Adaptive and secured settlement areas for vulnerable communities and climate-refugees defined

Indicators

4100.3.1	No. of fisherfolk, farmers, indigenous communities, and informal settler communities in highly CC vulnerable and disaster prone areas resettled.
4100.3.2	No. of resettlement areas for climate refugees secured from CC-induced conflicts

Institutions Involved

Lead Government Agencies: LGUs, HUDCC
Coordinating Government Agency:

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.1.1. Develop a long term plan for adaptation of highly CC vulnerable population and climate refugees				
a. Identify, map and profile highly disaster prone areas and communities	Highly disaster prone areas and communities identified, mapped and profiled.	■		
b. Develop and implement a settlement adaptation and resettlement plan in consultation with affected communities, private sector, and civil society organizations	Settlement adaptation and resettlement plan in consultation with affected communities, private sector, and civil society organizations developed and implemented.	■	■	■

c. Develop and implement a financing plan	Financing plan implemented.	■	■	■
d. Develop and implement plan to secure and manage conflict-affected resettlements	Plan to secure and manage conflict-affected resettlements developed and implemented	■	■	■
e. Identify and implement gender-responsive sustainable livelihood and social protection programs for resettled and vulnerable poor families.	Gender-fair sustainable livelihood and social protection programs for resettled and vulnerable poor families implemented	■	■	■

Output Area

3.2. Population congestion and exposure to CC risks reduced

Indicators

4200.3.1	No. of LGUs adopting CC-responsive population management to reduce congestion and exposure to CC risks
4200.3.2	No. of LGUs implementing a settlement plan

Institutions Involved

Lead Government Agencies: DOH, Population Commission
Coordinating Government Agency:

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.2.1. Extensive IEC program on CC risks and population management				
a. Conduct a study on population carrying capacity of areas and CC adaptive capacity of various communities – with special attention to the differences in the capacities of women and men	Study on population carrying capacity of areas and CC adaptive capacity of various communities conducted.	■		
b. Develop and implement a CC-proofed integrated settlement that considers CC-risks and carrying capacities.	CC-proofed integrated settlement that considers CC-risks and carrying capacities developed and implemented.	■	■	■
c. Develop and conduct IEC program on CC and population management in coordination with LGUs, local health organization and community organizations.	IEC program on CC and population management in coordination with LGUs, local health organization and community organizations developed and conducted	■	■	■
d. Increase access to population management information and services	Access to population management information and services increased	■	■	■

5 Climate-Smart Industries and Services

Ultimate Outcome

1.0 Adaptive capacity of communities, resilience of natural ecosystems, and sustainability of built environment to climate change enhanced.

Intermediate Outcome

Climate-resilient, eco-efficient and environment-friendly industries and services developed, promoted and sustained.

Immediate Outcome

1. Climate-smart industries and services promoted, developed and sustained.

Output Area

1.1. Enabling environment for the development of climate-smart industries and services created.

Indicators

4100.1.1	Clear national and local policies promoting the climate-smart industries and services formulated and implemented by 2012.
4100.1.2	Percent increase in the no. of green businesses/enterprises developed and created.

Institutions Involved

Lead Government Agencies: CCC, DTI, LGU
Coordinating Government Agencies: Cabinet Cluster on Economic Development, DENR
Other Partner Institutions: Chambers of commerce, industry associations, civil society organizations

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.1.1. Establish database on climate-smart industries and services				
a. Conduct baseline inventory of climate-smart industries and services and best practices in the country.	Baseline inventory of climate-smart industries and services in the country conducted.	■		
b. Integrate monitoring of existing and new climate-smart industries and services within existing business registration system.	Monitoring of existing and new climate-smart industries and services within existing business registration system integrated.	■		

1.1.2. Provide a stable enabling policy for the development and implementation of climate-smart industries and services.				
a. Review and harmonize policies (on trade, investment, environment, tourism, agriculture, etc.) to provide a stable and unified policy environment for the greener operation of existing businesses/enterprises and the expansion/development of climate-smart industries and services, such as green manufacturing, green tourism, LOHAS (lifestyle of health and sustainability), organic agriculture, sustainable forestry, and renewable energy.	National policies reviewed and harmonized.	■		
b. Review, develop and implement a system of incentives to encourage the use of climate-smart technologies and practices, local sustainable materials and supply chain, R&D, and commercialization of such technologies.	System of incentives developed.	■		
c. Implement stable local policies (regulatory and development) to encourage and retain climate-smart businesses and enterprises, including measures that support "just transition" of existing industries and enterprises from resource-intensive to eco-efficient operations	Stable local regulatory and development policies implemented.	■		
1.1.3. Enhance public-private partnership climate-smart investment promotion.				
a. Promote PPP to increase investments in the development of climate-smart technologies, products, and services.	PPP forged to support investments in climate-smart technologies, products and services.	■		
b. Forge partnerships with industry, academe, and research organizations on R&D of climate-smart technologies and products in the country.	Partnerships on R&D of climate-smart technologies and products forged.	■		
1.1.4. Enhance tourism policies and strategies to promote green tourism.				
a. Establish the carrying capacity of tourism areas.	Carrying capacity of tourism sites established.	■		

b. Review and implement the ASEAN Tourism Strategic Plan for 2011-2015	ASEAN Tourism Strategic Plan for 2011-2015 implemented.	■		
c. Adopt the 2007 Davos Declaration (Climate Change and Tourism Responding to Global Challenges)	2007 Davos Declaration adopted.	■		

Output Area

1.2. Eco-efficient production adopted by industries.

Indicators

5100.2.1	Percent increase in the no. of businesses whose production processes are more environmentally friendly or efficiently using natural resources.
5100.2.2	No. of companies participating in the SMART Award.

Institutions Involved

Lead Government Agencies: DTI, DENR, DOLE
Coordinating Government Agencies: DOF, NEDA, DOST
Other Partner Institutions: Chambers of commerce, industry associations, NGOs, workers' organizations

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.2.1. Implement policies that provide incentives to business practices that incorporate eco-efficiency within their core business operation (e.g., extended producer responsibility, sustainable life cycle management, product stewardship, resource recovery, etc.).				
a. Establish PPP in promoting end-of-life management, especially for electronic and electrical wastes, vehicles, and other special wastes.	PPP promoting end-of-life management, especially for electronic and electrical wastes, vehicles, and other special wastes established.	■		
b. Review, develop and implement economic instruments to encourage climate-smart business practices such as producing products designed for sustainability or designed for extended life, life cycle management, environmental management systems, cleaner production/ greenhouse gas reduction (G2R), climate-smart supply chain, and environmental cost accounting.	Economic instruments to encourage climate-smart best practices developed and implemented.	■		

c. Establish and promote "sustainable mitigation and adaptation risk techniques" or SMART and SMART Awards.	SMART award established.	■		
1.2.2. Improve enforcement of environmental laws.				
a. Update baseline data on GHG emissions from industry and other sources	Baseline data on GHG emissions from industry and other sources updated by 2013	■		
b. Develop partnership programs between industry-government to encourage self-regulation.	Partnership program to assist SMEs developed.	■		
c. Design and implement economic instruments following the polluter-pays-principle to reduce pollution and GHG emissions from manufacturing, agriculture, tourism, and transport sectors.	Economic instruments following the polluter-pays-principle designed and implemented to reduce GHG emissions from manufacturing, agriculture, and transport sectors.	■		
d. Develop and implement an industry pollutants release transfer registry for GHG emissions and other pollutants.	Industry pollutants release transfer registry for GHG emissions and other pollutants developed and implemented.		■	
e. Review the pertinent environmental laws to establish air sheds and emissions limits particularly under the Clean Air Act.	Pertinent environmental laws reviewed.	■		
f. Increase the capacity of relevant government agency for environmental compliance monitoring.	Government capacity for environmental compliance monitoring increased.	■	■	
1.2.3. Assist SMEs in developing capacity for eco-efficient production.				
a. Undertake national needs assessment on the state of eco- efficiency (i.e., environmental/resource and economic efficiency) in SMEs.	National needs assessment on the state of resource efficiency in SMEs conducted.	■		

b. Review and develop integrated tool-kit packages and identify training providers/knowledge partners to assist in building the capacity of SMEs to cope with resource efficiency issues related to water, energy, chemicals, wastes and other materials.	Tool-kit packages reviewed and services providers identified.	■		
c. Develop incentive mechanisms for industry-to-industry partnerships and collaborative approaches in assisting SMEs attain eco-efficiency (e.g., big enterprise-small enterprise program, supply chain upgrading initiatives, resource recovery/by-product exchange thru business-to-business arrangements, etc.).	Incentive mechanisms developed and partnerships forged.	■	■	

Output Area

1.3. IEC and capability building program for climate-smart industries and services developed.

Indicators

5100.3.1	Capacity building program for climate-smart SMEs developed and implemented.
5100.3.2	Capability building program on GHG emissions inventory and carbon footprint implemented in at least 20% of large and medium industries by 2016.
5100.3.3	At least 10% increase in the no. of large and medium enterprises adopting climate-smart best practices such as Environmental Management System (EMS), Greenhouse Gas Reduction (G2R), Cleaner Production and Environmental Cost Accounting by 2016

Institutions Involved

Lead Government Agencies: DTI, DENR
Coordinating Government Agencies: DOF, DOST
Other Partner Institutions: Private sector, industry associations, chambers of commerce, civil society organizations (PBE, PBSP, etc.)

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.3.1. Develop knowledge products on climate-smart best practices				
a. Undertake a survey on climate-smart business practices and enterprises with climate-smart practices integrated in their core business in the country.	National survey on climate-smart practices of business enterprises conducted.	■		
b. Establish partnerships with industry associations and NGOs in the development and dissemination of knowledge products on climate-smart business practices	Partnerships with industry associations and NGOs in the development and dissemination of knowledge products on climate-smart business practices established	■		
c. Gather and disseminate market and product trends on climate SMART industries to facilitate market access and creation of jobs and livelihood opportunities	Market and product trends on climate SMART industries to facilitate market access and creation of jobs and livelihood opportunities gathered and disseminated.	■	■	■
1.3.2. Develop and implement a training program on GHG emissions Inventory and carbon footprint				
a. Review existing modules or develop training module to capacitate industries to conduct GHG emissions inventory and carbon footprint	Modules identified or developed	■		
b. Identify training providers that can assist industry to establish their own GHG emissions inventory and carbon footprint	Training providers that can assist industry to establish their own GHG emissions inventory and carbon footprint identified.	■		
c. Conduct training program on GHG emissions inventory and carbon footprint	Training program conducted	■	■	

1.2.3. Assist enterprises to adopt and implement Environmental Management System, Greenhouse Gas Reduction / Cleaner Production and Environmental Cost Accounting				
a. Review existing modules or Develop training module to capacitate industries to adopt and implement Environmental Management System, Greenhouse Gas Reduction/ Cleaner Production and Environmental Cost Accounting	Modules identified or developed	■		
b. Identify training providers that can assist industries to adopt and implement EMS, G2R/ CP and ECA	Training providers that can assist industries to adopt and implement EMS, G2R/ CP and ECA identified.	■		
c. Conduct training program on EMS, G2R/ CP and ECA	Training program conducted	■	■	

Immediate Outcome

2. Sustainable livelihood and jobs created from climate-smart industries and services.

Output Area

2.1. Increased productive employment and livelihood opportunities in climate-smart industries and services.

Indicators

5100.2.1	Percent increase in the no. of jobs from businesses that produce goods or provide services that benefit the environment or conserve natural resources.
5100.2.2	Percent increase in the no. of jobs from businesses that involve making their establishment's production processes more environmentally friendly or conserve natural resources.
5100.2.3	No. of livelihood opportunities and productive employment created from climate-smart industries and services in the rural areas and highly vulnerable communities.

Institutions Involved

Lead Government Agencies: DOLE, CCC
Coordinating Government Agencies: All NGAs, TESDA, LGUs, academic and training institutions
Other Partner Institutions: Chambers of commerce, NGOs, industry associations, workers' organizations, micro-financing institutions

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.1.1. Develop and improve matching of labor force skills to climate-smart industry demand.				
a. Conduct study, in coordination with the private sector and workers' groups, on current trends and emerging technical skills requirement of the climate-smart industry sector.	Study on current and projected demand for green jobs conducted.	■		
b. Develop and implement capacity development program to respond to current and projected local and international demand for green jobs.	Capacity development program on green jobs developed and implemented.	■		
2.1.2. Develop a system of monitoring and reporting of green job creation and employment.				
a. Develop a nationally acceptable operational definition of "green jobs."	Definition and components of "green jobs" developed.	■		
b. Develop and implement a system of collection, analysis and reporting of baseline and new data on green jobs and employment (e.g., Green Jobs Mapping)	System of mapping, monitoring and reporting on green jobs and employment developed and implemented.	■		
c. Regularly update green labor supply and demand projections to provide timely information for investment promotion and skills development.	Annual reporting of labor supply and demand in climate-smart industry.	■	■	■
d. Gather and disseminate market and product trends on climate-smart industries to facilitate market access, jobs creation, and livelihood opportunities.	Annual reports on green markets and jobs.	■	■	■
2.1.3. Review and develop innovative financing mechanisms for sustainable livelihood in rural and climate change vulnerable areas.				
a. Integrate payments for environmental services in government's social fund mechanisms (such as the Conditional Cash Transfers and Peoples' Survival Fund bill) to promote investments in conservation, environmental protection and sustainable livelihood while reducing poverty in highly CC vulnerable areas and communities.	Payments for environmental services (PES) scheme integrated in the government's social fund mechanisms.	■		

b. Develop and implement risk transfer mechanisms for MSMEs and CC vulnerable communities and livelihood to strengthen the capacity to cope with extreme weather events and impacts of climate change	Risk transfer mechanisms for CC vulnerable communities and livelihood developed and implemented.	■	■	
c. Establish partnership with private sector in micro financing sustainable livelihood activities and identifying communities for corporate social responsibility programs.	Partnership with private sector in promoting CSR and micro-financing programs in poor and CC vulnerable communities.	■		

Immediate Outcome

3. Green cities and municipalities developed, promoted and sustained.

Output Area

3.1. Infrastructures in cities and municipalities climate-proofed.

Indicators

5100.3.1	No. of critical local infrastructures assessed and retrofitted.
5100.3.2	No. of local government units implementing CCA-DRR in the issuance of building permits and location clearances.

Institutions Involved

Lead Government Agencies: LGU, DILG, DPWH
Coordinating Government Agencies: All NGAs
Other Partner Institutions: Industry associations, green building professionals, NGOs

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.1.1. Implement climate-proofing of local infrastructure				
a. Conduct risk and vulnerability assessment of local infrastructures.	Vulnerability and risk assessment conducted.	■		
b. Review existing physical framework and infrastructure plan based on the risk and vulnerability assessment conducted.	Local plans reviewed and CC adaptive development integrated.	■		
c. Review and integrate CCA-DRR in the National Building Code and guidelines at the national level.	National Building Code and guidelines reviewed and "greened."	■		

d. Implement the new building code and integrate CCA-DRR in the issuance of building permits and location clearances.	New building code implemented in issuance of building permits and location clearances.	■		
e. Retrofit adaptation measures in existing CC vulnerable critical infrastructures	Critical infrastructures found to be CC vulnerable retrofitted.	■	■	■

Output Area

3.2. CC adaptive housing and land use development implemented.

Indicators

5200.3.1	No. of cities and municipalities adopting a CC adaptive mixed-use, medium-to-high density, and transit-oriented development.
5200.3.2	No. of mixed-use, medium-to-high density transit-oriented real estate / community development for urban poor and working families.
5200.3.3	No. of local governments adopting design for sustainability and green architecture.
5200.3.4	No. of municipal and city climate-smart sustainability plan developed.

Institutions Involved

Lead Government Agencies: LGUs, HUDCC
Coordinating Government Agencies: NEDA, DILG

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.2.1. Implement climate-smart ridge-to-reef sustainability plan for cities and municipalities.				
a. Conduct risk and vulnerability assessment.	V&A conducted and adaptation measures identified.	■		
b. Review city and municipal land use and comprehensive development plans and delineate management zones (i.e., strict protection to mixed development zones) based on the risk and vulnerability assessment result.	Ridge-to-reef management zones identified and delineated.	■		
c. Develop municipal or city sustainability plan focusing on sustainable production and consumption, green workforce, transit-oriented development, and CC adaptation and building retrofits.	Municipal and city sustainability plan developed, implemented, and integrated in the comprehensive development plan.		■	

3.2.2. Implement mixed-use, medium-to-high density integrated land use-transport plan in developing new urban communities or in expanding existing ones.				
a. Develop national and local policies implementing a mixed-use, medium-to-high density and integrated land use-transport planning urban development.	Mixed-use, medium-to-high density and integrated land use-transport urban development policy developed and adopted.	■		
b. Implement an integrate land use-transport plans to reduce average travel distance and time between work and residence, and promote energy conservation.	Integrated land use-transport plan implemented.	■		
c. Adopt mixed-use, medium-to-high density, climate-proof housing for poor and working families built around mass transit and green workforce development.	Transit-oriented, climate-proof housing development for poor and working families adopted.		■	■
3.2.3. Implement green building principles in community development.				
a. Develop green building rating scheme, specifications and criteria	Green Building Rating System, Specifications and Criteria developed.	■		
b. Implement a system of green building certification and CC-adaptive community development certification for new development and retrofitted buildings.	Certification system developed and implemented at the local level.	■	■	
c. Develop an accreditation system for green building assessors.	Green building assessors accreditation system developed.			
d. Develop a system of incentives to encourage green building and community development.	Policy on incentives formulated, approved and implemented.	■		
e. Develop knowledge products and conduct IEC on green building and climate-adaptive community development.	Knowledge products developed and regular IEC conducted.	■	■	■
f. Integrate "design for environment" in the engineering, building, and urban planning curricula.	"Design for Environment" integrated in formal engineering and building curricula.	■		

g. Codify at the LGU level a green building rating system focusing on achieving carbon neutrality, water balance, local sustainable materials and sources, indoor environmental quality, and climate change adaptive designs.	Green building rating system codified.	■		

Output Area

3.3. Ecological solid waste management implemented towards climate change mitigation and adaptation.

Indicators

5300.3.1	Ecological Solid Waste Management (ESWM) programs established and implemented in all LGUs in accordance with Republic Act 9003 by 2016.
5300.3.2	Percentage reduction in the volume of and toxicity of wastes disposed.
5300.3.3	No. of waste disposal facilities located in environmentally-critical areas closed.

Institutions Involved

Lead Government Agencies: DENR-NSWMC
Coordinating Government Agencies: DILG, DA, DepEd, MMDA, LMP, LCP, Ligangmga Barangay

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.3.1. Intensify waste segregation at source, discard recovery, composting, and recycling.				
a. Enforce RA 9003 in every barangay and local government unit.	RA 9003 complied with by all LGUs.	■		
b. Conduct intensive IEC on waste reduction, segregation and composting.	IEC on waste reduction, segregation and composting conducted.	■		
c. Establish at-store recycling programs, especially for electronic wastes (e-waste) and low-value recyclables	At-store recycling program established.	■		
d. Organize informal waste workers–small/medium recyclers-business partnership program to support intensified waste recovery and recycling.	Partnership program between informal waste workers and small/medium recyclers organized.	■	■	■

e. Design and implement incentive mechanisms to strengthen the local recycling industry and expand waste markets.	Incentive mechanisms studied, designed and implemented to strengthen the local recycling industry and expand waste markets.			
3.3.2. Regulate the use of single-use and toxic packaging materials.				
a. Identify and create an inventory of toxic and non-environmentally acceptable packaging materials.	Toxic and non-environmentally acceptable packaging materials identified.	■		
b. Conduct a study and develop a policy, as appropriate, on regulating single-use and toxic packaging materials.	Policy study on regulating single-use and toxic packaging materials conducted.	■		
c. Develop and implement a system of incentives for the use of reusable bags and containers.	System of incentives for the use of reusable bags and containers developed and implemented.	■		
d. Conduct, in partnership with the private sector and civil society organizations, an intensive IEC program on re-usable bags and "bring-your-own-bag" (BYOP) system.	Intensive IEC program on re-usable bags and "BYOB" system conducted.	■	■	■
e. Ratify the Basel Convention Ban Amendment, which bans hazardous wastes exports for final disposal and recycling from what are known as Annex VII countries (Basel Convention Parties that are members of the EU, OECD, Liechtenstein) to non-Annex VII countries (all other Parties to the Convention).	Basel Convention Ban Amendment ratified by Congress.		■	
3.3.3. Close down polluting waste treatment and disposal facilities.				
a. Close down all dumpsites and waste disposal facilities located in environmentally-critical areas.	Dumpsites and waste disposal facilities located in environmentally-critical areas closed.	■		
b. Implement policy for non-dumping of organic wastes in sanitary landfills.	Policy for non-dumping of organic wastes in sanitary landfills implemented.	■		

6 Sustainable Energy

Ultimate Outcome

2.0 Successful transitions toward a climate-smart development.

Intermediate Outcome

Sustainable and renewable energy and ecologically-efficient technologies adopted as major components of sustainable development.

Immediate Outcome

1. Nationwide energy efficiency and conservation program promoted and implemented.

Output Area

1.1. Government Energy Management Program (GEMP) implemented.

Indicators

6100.1.1	Percentage reduction in government electricity and fuel consumption and expenditure.
6100.1.2	Percentage reduction in GHG emissions from electricity and fuel consumption in the government sector.

Institutions Involved

Lead Government Agencies: DOE, DENR, DOST
Coordinating Government Agencies: All

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.1.1. Mandatory implementation of AO 110 and AO 126 directing the institutionalization of Government Energy Management Program (GEMP)				
a. Develop and implement GEMP guidelines in all government institutions (national, local, academic)	Guidelines developed and implemented in all government institutions.	■		
b. Update benchmark information on fuel and energy consumption and GHG emissions of all government institutions	Benchmark created and updated for all government institutions.	■		
c. Develop and implement a system of monitoring and reporting compliance and results of GEMP	Monitoring and reporting system developed and implemented.	■		
d. Develop web-based reporting system	Web-based reporting system developed and implemented	■	■	

Output Area

1.2. Increased in the private sector and community participation in energy efficiency and conservation.

Indicators

6200.1.1	No. of industries implementing Energy Management Standards under ISO 50001.
6200.1.2	No. of real estate development adopting green building standards and design for environment concepts.
6200.1.3	Percentage reduction in energy consumption in the transport, industrial, commercial, and residential sectors

Institutions Involved

Lead Government Agencies: DOE, CCC
Coordinating Government Agencies: All
Other Partner Institutions: Chambers of Commerce, industry associations, civil society organizations

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.2.1. Create enabling policies and stable policy environment for energy efficiency and conservation (EE&C)				
a. Conduct a study on energy efficiency and conservation to determine the energy use reduction potential by sector and identify appropriate interventions and policies to encourage and sustain EE&C adoption.	Study conducted and policy recommendations forwarded to concerned agencies.	■		
b. Develop a system of incentives for voluntary adoption of energy efficiency labeling, green building rating, and ISO 50001 certification.	Energy efficiency labeling policy and guidelines developed.	■		
c. Update baselines, database and management information system on energy supply demand/consumption by industry sector, including household sector.	Baselines and databases developed and updated.	■		
d. Develop monitoring system of EE&C results and impacts.	Monitoring system developed.	■		

1.2.2. Forge public-private-civil society partnership (PPCSOP) on EE&C and other programs promoting sustainable energy.				
a. Conduct mapping and profiling of potential partners and partnership programs.	Memorandum of Understanding on PPCSOP signed.	■		
b. DOE and CCC to provide support to partnership-building and strengthening the PPCSOP	Partnership building and strengthening of PPCSOP supported by DOE and CCC	■		
c. Conduct PPCSOP planning and programming.	PPCSOP programs, activities and commitments developed and implemented.	■		
d. Develop system of monitoring and reporting.	System of monitoring and reporting developed and implemented.	■		
1.2.3. Promote market driven demand-side management				
a. Develop IEC campaign materials on EE&C measures and technologies.	IEC campaigns on EE&C developed and implemented.	■		
b. Study market-driven DSM technologies (applicability, impacts, and costs and benefits) for adoption	Market-driven DSM technologies adopted.	■	■	■
c. Increase coverage of EO 123 – Power Conservation and Demand Management	Power conservation and demand management coverage expanded.		■	■

Immediate Outcome

2. Sustainable and renewable energy (SRE) development enhanced.

Output Area

1.1. National renewable energy program and technology roadmap based on RA 9513 and its IRR developed and implemented

Indicators

6100.2.1	Percentage increase in sustainable renewable generation capacity.
6100.2.2	No. of sustainable renewable energy development projects implemented.
6100.2.3	A national sustainable renewable energy program and technology roadmap developed and adopted.

Institutions Involved				
Lead Government Agencies: DOE **Coordinating Government Agencies:** DTI, DOST, DOTC, DOF				
Activities	**Outputs**	**2011-2016**	**2017-2022**	**2023-2028**
2.1.1. Develop a national RE program				
a. Develop SRE Technology Roadmap	SRE technology roadmap developed.	■		
b. Develop guidelines for the implementation of RE market development mechanisms (e.g., Renewable Portfolio Standard or RPS, Feed-in-Tariff, net metering, green energy option, RE market, production incentives, public finance mechanisms, etc.)	Guidelines on market development mechanisms developed.	■		
c. Integrate SRE Policy Framework of 2003 in the national RE program.	SRE policy framework reviewed and harmonized.	■		
d. Review and integrate the national biofuels program.	National biofuels program reviewed and integrated in the national SRE program.	■		
2.1.2. Increase generation capacities of RE systems				
a. Conduct SRE resource assessments (e.g., hydro, geothermal, biomass, wind, ocean, and solar)	SRE resource assessments conducted.	■		
b. Develop SRE project-based and service contracts-based portfolios to encourage potential investors in identified sites.	SRE investment portfolios developed.	■		
c. Review requirements and streamline processes for licensing, permitting, and approval of RE projects.	Requirements and processes reviewed.	■		
2.1.3. Increase R&D on RE				
a. Develop R&D agenda on sustainable energy and RE technologies	R&D agenda developed.	■		

b. Conduct study (such as standards, vehicle performance, and accreditation system) on increased biodiesel blend beyond B5.	Studies on increased biodiesel blend beyond B5 conducted.		■	
c. Conduct study on feasibility (performance and safety) of biofuels blends in other transport systems, e.g., air and sea transport.	Studies on biofuels application to other transport systems conducted.		■	■
d. Conduct studies on hybrid systems, e.g., fuel cells and electric vehicles.	Studies on hybrid systems, e.g., fuel cells and electric vehicles, conducted.		■	■

Output Area

2.2. Off-grid, decentralized community-based renewable energy system to generate affordable electricity adopted.

Indicators

6200.2.1	Increased percentage of households in off-grid areas using RE systems.
6200.2.2	Increased no. of off-grid, decentralized RE systems constructed

Institutions Involved

Lead Government Agencies: DOE
Coordinating Government Agencies: DILG, DOF
Other Partner Institutions: Electric cooperatives, independent power producers, industry associations

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.2.1. Increase rate of use of RE systems in the national electrification program.				
a. Conduct survey of RE potential in off-grid areas	Survey of RE potential in off-grid areas conducted			
b. Install RE systems to electrify at least 4,000 households from those targeted under the household electrification program	RE systems installed in 4,000 households qualified under the national household electrification program.	■		
c. Conduct of capacity building of community-based RE organizations on RE system maintenance, EE&C, organizational development, tariff setting, and management systems	Community-based RE organizations organized and provided training.	■	■	

2.2.2. Increase financing for poverty reduction and conservation in RE host communities				
a. Design and implement system of incentives for RE host communities and LGUs that can be used for sustainable livelihood programs and CCA measures	Incentive schemes designed and implemented in RE host communities and LGUs.	■	■	

Immediate Outcome

3. Environmentally sustainable transport promoted and adopted.

Output Area

3.1. Environmentally sustainable transport strategies and fuel conservation measures integrated in development plans

Indicators

6100.3.1	Percentage increase in fuel efficiency and economy of existing and new vehicles.
6100.3.2	No. of cities and urban municipalities with formally developed integrated land use-transport plans.
6100.3.3	No. of new land developments using integrated mixed-use, medium-to-high density land-use and transport demand management measures.
6100.3.4	No. of public transport projects achieving transit-oriented development (TOD).

Institutions Involved

Lead Government Agencies: DOTC, HADC, DILG
Coordinating Government Agencies: All, LGUs through the leagues.

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.1.1. Implement clean fleet program				
a. Forge partnership with the private sector group working on CC and clean fleet program	MOU signed.	■		
b. Conduct baseline measurements of all government vehicles	Baseline measurements for all government vehicles conducted.	■		
c. Conduct studies (economics, adaptability, impacts, etc.) on the use of hybrid transport systems such as electric and hydrogen-fueled vehicles	Studies (e.g., economics, adaptability, impacts, etc.) on the use of hybrid transport systems such as electric and hydrogen-fueled vehicles conducted		■	

d. Develop and implement a clean fleet management strategy in all government institutions	Clean fleet strategy developed and implemented.	■		
e. Conduct IEC and capacity building program on clean fleet for public mass transport (i.e., bus fleet, taxi fleet)	Capacity building plan developed and implemented.	■		
f. Design incentive system, e.g., regulatory relief from the Clean Air Act and Pollution Law, for mass transport fleet and company fleet implementing a clean fleet program.	Incentive system designed and implemented.	■		
g. Develop monitoring and reporting system and database.	Monitoring system and database management implemented.	■		
3.1.2. Formally adopt a socially equitable and integrated land-use and transport planning processes at the national and local levels				
a. Develop policy and guidelines on integrating land-use and transport planning in local development	Policy and guidelines developed and implemented.	■		
b. Develop and implement policy requiring mixed-use, medium-to-high density development with integrated transport master plan that include non-motorized transport component and other transportation demand management measures.	Policy and guidelines on mixed-use, medium-to-high density development developed and implemented.	■		
c. Conduct capacity building at local level on integrated land-use and transport planning in the local comprehensive development plan	Capacity building plan developed and implemented.	■		
d. Conduct public awareness campaign to all levels of government and public through outreach, promotional campaigns, timely reporting of monitored indicators, and participatory processes	Widespread IEC campaign conducted.	■	■	

3.1.3. Implement energy efficiency labeling for new vehicles				
a. Conduct technical study on the development of standards on energy efficiency labeling for vehicles	Study on energy efficiency standards and labeling conducted.	■		
b. Review current standards for fuel quality (appropriateness and affordability) to support clean fleet program and fuel efficiency labeling for vehicles.	Current standards reviewed and revised, as necessary.	■		
c. Establish and implement fuel economy standards on both imported and locally assembled vehicles in partnership with the private sector.	Energy efficiency standard established and implemented.		■	
d. Conduct public awareness campaign to all levels of government and public through outreach, promotional campaigns, timely reporting of monitored indicators, and participatory processes	Multi-media campaign implemented.	■	■	

Output Area

3.2. Innovative financing mechanisms developed and promoted.

Indicators

6200.3.1 | Percentage increase in new investments on EST.

Institutions Involved

Lead Government Agencies: DOF, DOTC
Coordinating Government Agencies: All
Other Partner Institutions: Chambers of commerce, industry associations

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.1.1. Implement clean fleet program				
a. Conduct study on various financing mechanisms such as parking levees, fuel pricing, time-of-day automated road user charging, and others	Studies on various innovative financing mechanisms conducted and implemented	■		

b. Forge public-public partnership, such as land value capture and carbon markets, wherever feasible	Public-private partnership agreements forged.	■		

Immediate Outcome

4. Energy systems and infrastructures climate-proofed, rehabilitated and improved.

Output Area

3.1. Energy systems and infrastructures climate-proofed.

Indicators

6100.4.1	No. of energy and transport system infrastructures assessed for vulnerability to climate change and disaster risks
6100.4.2	No. of CC-risk vulnerable energy and transport system infrastructures retrofitted, rehabilitated and improved

Institutions Involved

Lead Government Agencies: DOE, DENR, DOST
Coordinating Government Agencies and Institutions: All

Activities	Outputs	2011-2016	2017-2022	2023-2028
4.1.1. Energy and transport systems infrastructures assessed for CC-risk vulnerability				
a. Conduct of risk and vulnerability assessments of energy and transport systems.	Risk and vulnerability assessments of energy systems conducted.	■		
b. Develop guidelines for climate-proofing of existing and new energy systems.	Guidelines developed.	■		
c. Review energy systems and transport infrastructure safety standards to respond to new risks from CC and other disasters.	Transport infrastructure safety standards reviewed and revised, as necessary.	■		
4.1.2. Implement program for climate-proofing energy and transport systems infrastructures.				
a. Develop a program to climate-proof (retrofit, rehabilitate and improve) existing energy and transport infrastructures	Program to climate-proof (retrofit, rehabilitate and improve) existing energy and transport infrastructures developed	■		

b. Climate-proof critical power generation, transmission and distribution network infrastructures	Critical energy system infrastructures rehabilitated and climate-proofed.	■	■	■
c. Climate-proof fuel production and distribution systems.	Fuel supply infrastructure improved and climate-proofed.	■	■	■

7 Knowledge & Capacity Development

Ultimate Outcome

1.0 Enhanced adaptive capacity of communities, resilience of natural ecosystems, and sustainability of built environment to climate change

Intermediate Outcome

Enhanced knowledge and capacity of women and men to address climate change.

Immediate Outcome

1. Enhanced knowledge on the science of climate change.

Output Area

1.1. Improved capacity for CC scenario modeling and forecasting.

Indicators

7100.1.1	No. of centers of excellence on CC science established and capacity enhanced.
7100.1.2	Percentage increase in financing for established centers of excellence.

Institutions Involved

Lead Government Agencies: DOST, CHED
Coordinating Government Agencies: CCC, All NGAs, LGU Leagues

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.1.1. Establish centers of excellence on CC science at the national and regional level.				
a. Develop criteria for designating centers of excellence.	Criteria for establishing CC centers of excellence developed.			
b. Identify and designate centers of excellence for CC research and development	Centers of excellence at the national and regional level designated.	■	■	
c. Develop capacity building plan for the identified centers.	Capacity building plan and program developed	■	■	
d. Implement capacity building plan.	Capacity building plan for CC centers of excellence implemented.	■	■	■

e. Develop financing plan.	Financing mechanism for capacity development established.	■	■	
1.1.2. Improve government systems and infrastructure required for CC modeling and climate forecasting.				
a. Review and rationalize systems and infrastructure requirements to improve CC modeling and weather forecasting	Infrastructure, systems and equipment requirement for CC modeling and weather forecasting identified and rationalized.	■		
b. Upgrade skills, infrastructure and equipment for CC modeling and weather forecasting	Infrastructure and equipment for CC modeling and forecasting at the national and local level upgraded.	■	■	

Output Area

1.2. Government capacity for CC adaptation and mitigation planning improved.

Indicators

7200.1.1	No. of vulnerability and risk assessments conducted.
7200.1.2	No. of gendered capacity building programs implemented.
7200.1.3	Percentage increase in the no. of trained personnel in key agencies at the national and local level.
7200.1.4	No. of government agencies complying with GHG emissions reporting requirement.

Institutions Involved

Lead Government Agencies: DOST, CCC
Coordinating Government Agencies: All agencies

Activities	Outputs	2011-2016	2017-2022	2023-2028
1.2.1. Develop and implement a capacity building program for government agencies on CC				
a. Review and update gender-disaggregated capacity assessment of government and partner institutions on CC	Gender-disaggregated CC capacity assessment reviewed and updated.	■		
b. Develop and integrate gendered and accessible capacity building program of government agencies on CC adaptation and mitigation assessment and planning	Gendered and accessible capacity building program developed and implemented.	■		
c. Develop and implement a skills monitoring and evaluation system	Skills monitoring system developed.	■		

1.2.2. Develop and implement a national integrated program for the conduct of risk, vulnerability and adaptation assessments.				
a. Integrate all planned sectoral plans for risk, vulnerability and adaptation assessments		■		
b. Develop guidelines for the conduct of these assessments		■		
c. Develop and implement prioritization criteria for the local for vulnerability and adaptation assessments.		■		
1.2.3. Implement a national system for monitoring greenhouse gas emissions.				
a. Develop a system of national GHG inventory from various sectors	System to inventory GHG emissions developed and implemented.	■		
b. Develop a policy for government agencies' reporting of GHG emissions from sectors within their mandates	Policy on government agencies' monitoring and reporting of GHG from sectors within their mandate developed and implemented.	■		
c. Develop an integrated data and information system on greenhouse gas with the Climate Change Commission	Integrated database and information system of GHG developed.	■	■	

Immediate Outcome

2. Capacity for CC adaptation, mitigation and disaster risk reduction at the local and community level enhanced.

Output Area

2.1. CC resource centers identified and established

Indicators

7100.2.1	No. of resource centers identified and networked
7100.2.2	No. of CC resource networks accessed by LGUs and local communities

Institutions Involved

Lead Government Agencies: CICT, DILG, CCC
Coordinating Government Agencies: All government agencies
Other Partner Institutions: Academic institutions, professional associations, service organizations, non-government organizations

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.1.1. Establish network CC resources in all regions.				
a. Develop a roster of CC resources (individual experts, non-government organizations, private institutions, financial institutions) that could provide services to local governments and communities on CCA and DRRM.	CC resource network created.	■		
b. Establish web-based network linking CC resource networks and centers of excellence.	CC resource networks and centers of excellence we-based link established and expanded.	■	■	
c. Organize regular fora and regular exchange of information on CCA and DRRM among the resource centers	Annual and bi-annual forum or conference conducted.	■		

Output Area

2.2. Formal and non-formal capacity development program for climate change science, adaptation and mitigation developed.

Indicators

7200.2.1	No. of textbooks for pre-elementary, elementary, high school and alternative learning system with CC concepts integrated.
7200.2.2	No. of higher education curricula with CC subjects integrated.
7200.2.3	No. of specialized non-formal training programs on CC adaptation and mitigation developed.

Institutions Involved

Lead Government Agencies: DepED, CHED, TESDA, DILG, LGA
Coordinating Government Agencies: All NGAs, academic and training institutions

Activities	Outputs	2011-2016	2017-2022	2023-2028
2.2.1. Integrate CC in basic and higher education curricula				
a. Review and revise, as necessary, current textbooks, modules and exemplars for pre-elementary, elementary, high school, and alternative learning system for CC content and gender-sensitivity.	Textbooks for pre-elementary, elementary, high school and alternative learning systems reviewed for CC content and revised as necessary.	■		
b. Develop CC college and graduate curricula and courses	Undergraduate and graduate CC curricula and courses developed.	■		

c. Provide training for pre-elementary, elementary, high school, and mobile teachers on integrating CC in basic courses.	Pre-elementary, elementary, high school and mobile teachers trained.	■		
2.2.2. Develop and implement gendered and accessible CC adaptation and mitigation special or customized technical training programs				
a. Develop and implement gendered and accessible specialized or customized training program on CC adaptation and mitigation to upgrade skills of engineers, architects, health and emergency professionals, urban planners, transport planners, and other professionals	Gendered and accessible special training courses on CCA and mitigation for professionals developed and implemented	■		
b. Conduct study to establish fee-based training and financial aid program.	Study on fee-based training program conducted.	■		
c. Forge partnership with private sector and industry associations in setting customized training agenda.	Public-private partnership on customized training and skills upgrading on CC adaptation and mitigation established.	■		
d. Implement formal and customized training programs in partnership with various educational and training institutions, resources centers, and centers of excellence on CC.	Training programs implemented.	■		

Immediate Outcome

3. Gendered CC knowledge management established and accessible to all sectors at all levels.

Output Area

3.1. Gendered CC knowledge management established

Indicators

7100.3.1	No. of government institutions, centers of excellence and CC resource centers linked to a national web-based CC information hub.
7100.3.2	No. of gendered and accessible knowledge products for various audience and vulnerable groups developed and disseminated.
7100.3.3	No. of local institutions and communities accessing gendered knowledge products.

Institutions Involved

Lead Government Agencies: CICT, DILG, CCC
Coordinating Government Agencies: All agencies
Other Partner Institutions: Civil society organizations, private sector and industry associations

Activities	Outputs	2011-2016	2017-2022	2023-2028
3.1.1. Establish web-based network of resource centers				
a. Conduct study on infrastructure and management system required for a web-based CC information network	Study on infrastructure and management system requirement for a web-based information hub conducted.	■		
b. Coordinate with various government agencies and resource centers in harmonizing systems for networking.	System for networking harmonized.	■		
c. Develop and implement guidelines on network access and types of information to be shared.	Guidelines on access and information-sharing developed and agreed to.	■		
3.1.2. Implement gendered IEC on CC adaptation and mitigation				
a. Develop and implement gendered IEC plan and program	IEC plan and program developed.	■		
b. Develop gendered and accessible IEC materials and knowledge products, including indigenous adaptation best practices, addressed to various audiences and vulnerable groups	Gendered knowledge products developed.	■		
c. Conduct gender-sensitive IEC through multi-media campaigns, outreach, timely reporting of monitored indicators, and participatory processes.	Widespread gender-sensitive IEC on climate change conducted.	■		
3.1.3. Validate and monitor the implementation of NCCAP				
a. Develop and implement gender-sensitive validation tools for effectiveness of CC capacity building materials and approaches	Gender-sensitive validation tools for effectiveness of CC capacity building materials and approaches developed and implemented	■		
a. Refine gender-sensitive performance indicators on CCA and mitigation and integrate in existing performance monitoring framework of government agencies	Gender-sensitive performance indicators on CCA and mitigation and integrate in existing performance monitoring framework of government agencies refined and integrated	■		
a. Develop and implement a gender-sensitive performance monitoring system for NCCAP	Gender-sensitive performance monitoring system for NCCAP developed and implemented	■	■	■

National Climate Change Action Plan

2011-2028

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