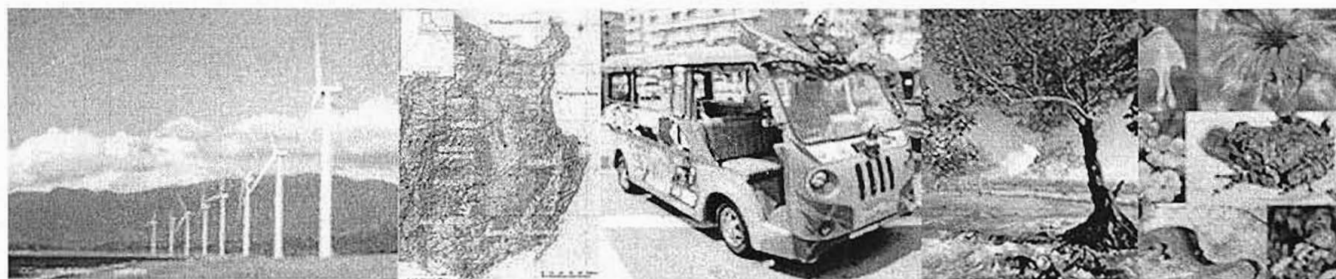


Office of the President of the Philippines  
Malacañang

Climate Change Commission

# **National Framework Strategy on Climate Change 2010-2022**





## Preface

Climate Change is the most serious and most pervasive threat facing humanity today. The Intergovernmental Panel on Climate Change (IPCC), the highest scientific body responsible for evaluating the risk of climate change, affirmed in its Fourth Assessment Report that the “warming of the earth’s climate system is unequivocal” and that this warming is attributed to the dramatic rise in human-induced greenhouse gas emissions since the mid 20th-century.

The Philippines, an archipelagic nation of over 90 million people, now faces threats from more intense tropical cyclones, drastic changes in rainfall patterns, sea level rise, and increasing temperatures. All these factors contribute to serious impacts on our natural ecosystems—on our river basins, coastal and marine systems, and their biodiversity—then cascading to impacts on our food security, water resources, human health, public infrastructure, energy, and human settlements.

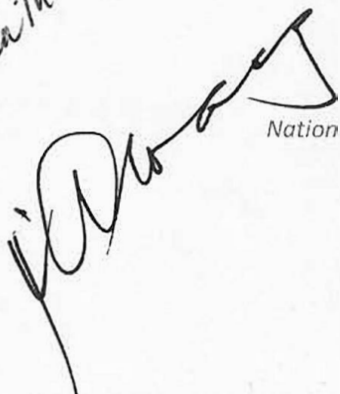
Indeed it is unequivocal that climate change will have serious implications on the country’s efforts to address poverty and realize sustainable development for current and future generations—ultimately making climate change an issue of intergenerational equity.

The National Framework Strategy on Climate Change is committed towards ensuring and strengthening the adaptation of our natural ecosystems and human communities to climate change. In the process, the Framework aspires to chart a cleaner development path for the Philippines, highlighting the mutually beneficial relationship between climate change mitigation and adaptation. As a matter of principle, the Framework aggressively highlights the critical aspect of adaptation meant to be translated to all levels of governance alongside coordinating national efforts towards integrated ecosystem-based management which shall ultimately render sectors climate-resilient.

As the world stands at the threshold of an important juncture in the history of the planet and the international community grapples for a lasting global solution to the climate crisis, the threats to humans and nature have become unprecedented.

The international community stands at a point where even the most aggressive and immediate actions to mitigate climate change will not stop the impacts at least for the next half of this century. While deep cuts in greenhouse gas emissions may buy time for human and natural systems to adapt in the decades ahead, human and natural systems have begun to reel from the unfolding impacts.

The aim of this national process is to build a roadmap that will serve as the basis for a national program on climate change and establish an agenda upon which the Philippines would pursue a dynamic process of determining actions through the National Climate Change Action Plan process.



*National Framework Strategy on Climate Change, 2010-2022*



## 1. LEGAL MANDATE

- 1.1 “The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.” – Section 16, Article II, The Philippine Constitution
- 1.2 “The Congress shall give the highest priority to the enactment of measures that protect and enhance the right of the people to human dignity...” – Section 1, Article XIII, The Philippine Constitution
- 1.3 “It is the policy of the State to afford full protection and the advancement of the right of the people to a healthful ecology... to fulfill human needs while maintaining the quality of the natural environment for current and future generations.” – Section 2, Republic Act 9729 (The Climate Change Act of 2009)

*Gloria M. Arroyo*

*Marcelino S. Dela Cruz*

*Alfredo M. Lim*

*Armando M. Reyes*

## 2. GUIDING PRINCIPLES

The State adopts the following Guiding Principles in formulating the National Framework Strategy on Climate Change, referred to as the Framework:

- 2.1 The Framework envisions a climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems.
- 2.2 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.
- 2.3 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.
- 2.4 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.
- 2.5 The Framework is risk-based, and strategies/activities shall be formulated, with decisions made based on the causes, magnitude and impacts of risks.
- 2.6 Climate change knowledge is science-based, and shall draw from scientific contributions and best practices from communities taking into considerations local circumstances.
- 2.7 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.
- 2.8 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.
- 2.9 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.
- 2.10 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.

- 2.11 The principle of complementation shall be observed to ensure that climate change initiatives by one sector do not restrict the adaptation of other sectors.
- 2.12 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.
- 2.13 The Framework recognizes the value of forming multi-stakeholder participation and partnerships in climate change initiatives, including with civil society, private sector and local governments, and especially with indigenous peoples and other marginalized groups most vulnerable to climate change impacts.
- 2.14 Policy and incentive mechanisms to facilitate private sector participation in addressing adaptation and mitigation objectives shall be promoted and supported.

*Glenn M. Araya*

*John M. Law*

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### 3. FRAMEWORK CONTEXT

- 3.1 This Framework takes into consideration and complies with the commitments of the Philippines in multilateral environmental treaties, specifically the United Nations Framework Convention on Climate Change (UNFCCC).
- 3.2 Addressing adaptation needs, capitalizing on mitigation potential and complying with UNFCCC obligations require systematic analysis, strategic planning and determined implementation. Section 11 of Republic Act No. 9729 mandates the Climate Change Commission (CCC) to formulate the Framework Strategy and Program on Climate Change six (6) months from the effectivity of the Law. This Framework was developed based on the country's climate change vulnerabilities, adaptation needs and mitigation potential, all in accordance with international agreements.<sup>1</sup>
- 3.3 The Intergovernmental Panel on Climate Change (IPCC), in its Fourth Assessment Report (AR4), concluded that anthropogenic warming over the last three decades has affected many physical and biological systems all over the world. As a result, the resilience of many ecosystems is likely to be breached this century. As mean global temperatures rise and climate change impacts intensify, the Philippines will encounter serious stresses in food production, health, and economic security.
- 3.4 The Philippines is a country endowed with a plethora of species and ecosystems, making it one of the 18 mega-biodiversity countries in the world. However, there is currently an increasing threat to the country's wealth of biodiversity because of the pressure brought upon by human-induced threats, which are further compounded by the adverse impacts of climate change on terrestrial and aquatic plant and animal communities as manifested in increasing temperature and extreme variability in rainfall.
- 3.5 The country 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.<sup>2</sup> An average of 20 typhoons traverse the country yearly, causing physical and economic devastation. Climate variability increasingly induces drought during El Niño episodes and floods during La Niña. Consequently, the Philippines faces increasing disaster risks with geologic/seismic dangers closely interacting with such meteorological hazards.
- 3.6 Climate change also threatens the ability of the country's ecosystems to provide life-support services. In coastal areas, problems like flooding and inundation are expected to increase due to accelerated sea level rise, in addition to cyclones and storm surges. With coastal and marine ecosystems already suffering from anthropogenic problems like pollution, over-exploitation and uncontrolled development, the country can ill afford to cope with the additional stresses.
- 3.7 Climate change can provide opportunities that would allow the Philippines to capitalize on its greenhouse gases (GHG) mitigation potential for cleaner, indigenous and optimized energy and transport bases, as well as enhanced sinks. Leveraging recently-passed policies like the Renewable

<sup>1</sup> Refers to the obligations of the Philippines under the UNFCCC and other related international agreements.

<sup>2</sup> 2004 UNDP Global Report on Disasters

Energy Act and the Biofuels Law, the Philippines could address its energy insecurity while providing much-needed co-benefits such as pollution prevention.

3.8 This Framework shall guide the national and sub-national development planning processes, specifically the formulation of the Medium-term Philippine Development Plan (MTPDP), Medium-term Public Investment Program (MTPIP) and sectoral plans; at the sub-national level, the Medium-term Regional Development Plan (MTRDP), Medium-term Regional Development Investment Program (MTRDIP), Provincial Development Plans (PDPs) and Provincial Physical Framework Plan (PPFPs); and at the local level, the Comprehensive Land Use Plans (CLUPs) and Comprehensive Development Plans (CDPs).

3.9 Within one (1) year upon the adoption of the Framework, the National Climate Change Action Plan (NCCAP) shall be developed to provide the details of the herein proposed strategies. The NCCAP shall then guide local government units in the preparation of their respective Local Climate Change Action Plans (LCCAP). A consultation process shall be initiated by the Climate Change Commission to seek the consensus of stakeholders on the provisions of this Framework, and seek their meaningful participation in the formulation of the NCCAP.

*Gloria M. Arroyo*

*Frederick S. Lopez*

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*Gloria M. Rungs*

#### 4. PHILIPPINE CLIMATE CHANGE SCENARIOS: 2020 and 2050<sup>3</sup>

The projected climate change scenarios are shown as bases for the indicative macro-level vulnerability assessment. Significantly, these scenarios are presented as a macro-analysis of changes in climate parameters: precipitation, temperature, and the use of statistical averages in the data presented. Prepared by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), these scenarios are culled from possible extreme events that would arise from average scenarios.

##### Changes in Annual Mean Temperature

Based on the downscaling made by PAGASA of the Hadley Center's global climate model PRECIS, significant warming will occur in the Philippines by the middle of the current century.

The country's average annual mean temperature is projected to increase by 0.9°C -1.2°C by 2020 and 1.7°C -3.0°C by 2050. Higher temperatures are generally expected for all regions of the country by 2050, the rates doubling compared to 2020 levels. Warming will be worst in Mindanao, supposedly the country's food basket. The changes in mean annual temperature by region relative to the baseline period of 1970-2000, are provided in Figure 1 below:

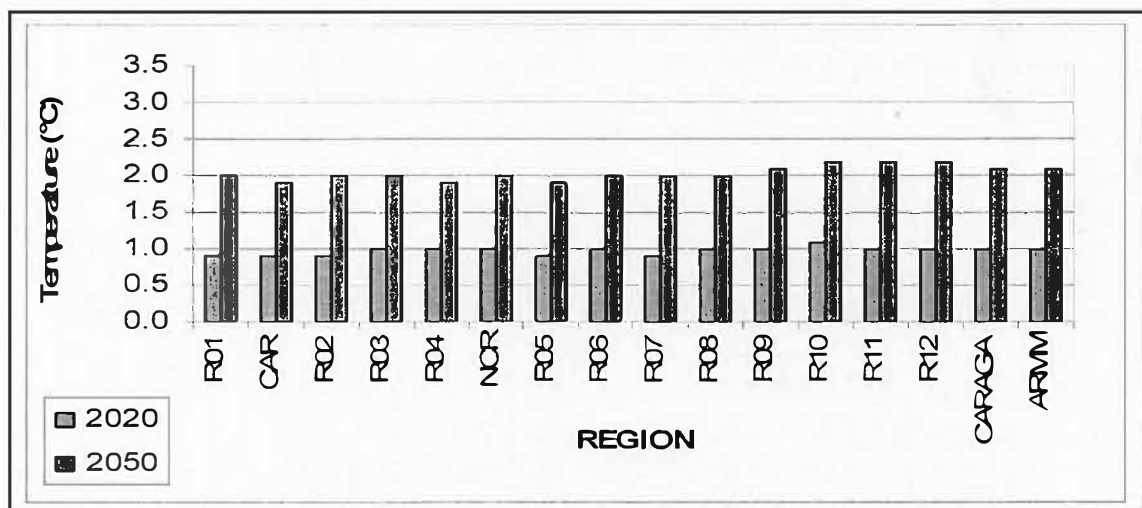


Figure 1: Projected Changes in Annual Mean Temperature for 2020 and 2050, relative to the Baseline 1971-2000 by Region (PAGASA, 2010)

<sup>3</sup> Prepared by PAGASA for the Philippines' Second National Communication on Climate Change (SNC), due for submission to the UNFCCC Secretariat as part of its commitments.

*Gloria M. Araya*

## Changes in Annual Mean Rainfall

The PRECIS simulation exercise projects a change in annual precipitation from -0.5 to 17.4 % in 2020 and -2.4 to 16.4 % in 2050. Increases in rainfall are particularly evident in most areas of Luzon and Visayas, while Mindanao is projected to undergo a drying trend. Average annual rainfall increase over most parts of Luzon and the Visayas is expected to be 2 to 17 % by 2020 and 1 to 16 % by 2050. In contrast, there is a general reduction in regional annual average rainfall in Mindanao (~ 0.5 to 11 % by 2020; 2 to 11% in 2050).

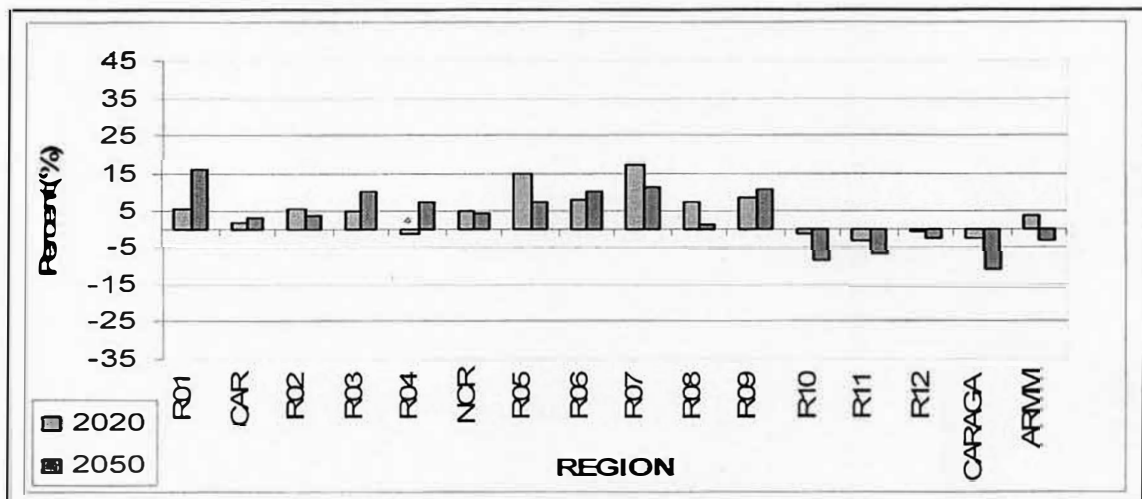


Figure 2: Projected Changes in Annual Mean Rainfall for 2020 and 2050, relative to the Baseline 1971-2000 by Region (PAGASA, 2010)

## Sea level Rise

Sea level rise will increase the risk of flooding and storm damage. Projected impacts of 1 meter sea level rise in many areas of the country show vast portions being inundated, affecting coastal settlements and livelihood.

According to estimates of the National Mapping and Resource Information Authority (NAMRIA), a one meter sea level rise can translate to an estimated land loss of 129,114 ha.

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## 5. IMPACTS AND VULNERABILITIES

### 5.1 Bio-Physical Vulnerabilities

For purposes of the Framework and its corollary action plan, what are considered of primary relevance are the natural meteorological or meteorologically-influenced hazards faced by the Philippines, which stand to be aggravated by climate change. Other physical vulnerabilities that are considered as underlying drivers of risks are likewise taken into consideration in assessing the country's indicative vulnerabilities. These are primarily the state of ecosystems such as the status of forest cover, the quality and extent of coastal resources, the overall state of biodiversity, the level of environmental pollution, etc., which are determinants of the extent of impacts from climate change and the magnitude of adaptation capacity that need to be put in place.

### Meteorologically-Influenced and Related Natural Hazards

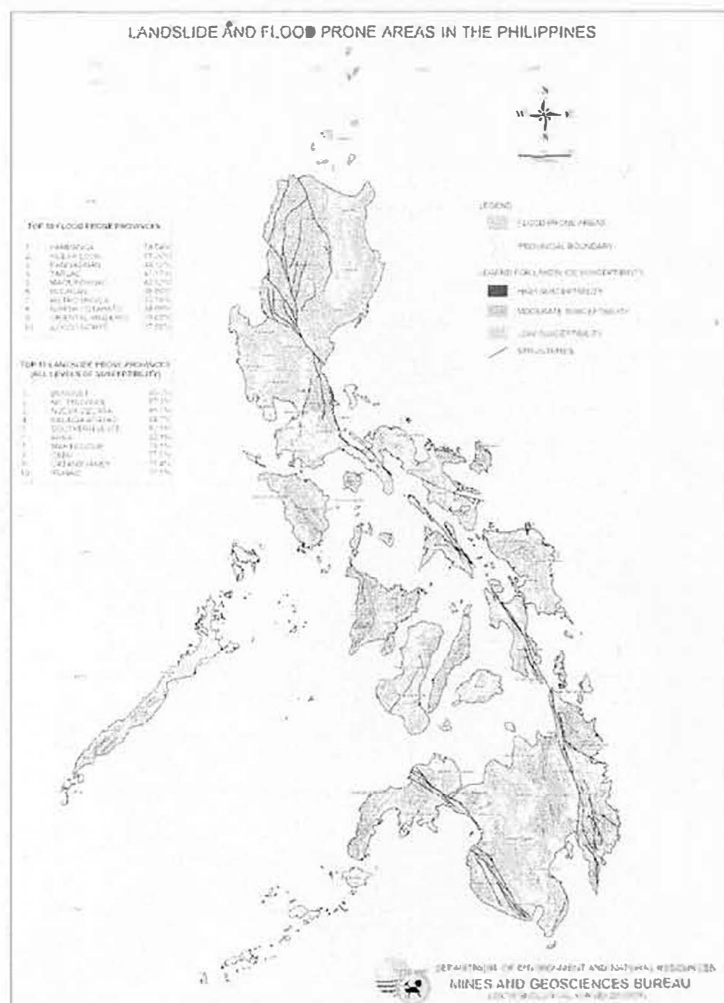


Figure 3: Map of landslides and flood prone areas

National Framework Strategy on Climate Change, 2010-2022

Figure 3 depicts the indicative landslide and flood prone areas of the Philippines that stand to be further impacted adversely by increased precipitation or rainfall brought about by climate change. The top 10 flood-prone and landslide-prone areas are also indicated. Overlaid with the climate scenarios for 2020 and 2050, the result would give the “first layer” of indicative physical vulnerability. It can be seen that a major portion of the country are susceptible to landslides as well as flooding.

## 5. 2 Underlying Risk Drivers

### 5.2.1 Ecosystems Degradation

Two of the key underlying risk drivers of climate change are the loss of forest cover and degradation of coastal and marine resources.



Figure 4: Area of forest cover, 1920-2004

Of the 27.5 million hectares in the late 1500s, the country's forest lands currently stand at 7.2 million hectares or only 24.27 % of the country's total land area. This has been attributed to the combined ill effects of indiscriminate logging, inadequate forest protection, incoherent policies, expansion of upland agriculture, fires, pests and diseases, and unplanned land conversion. Of the current remaining forests,

only 0.8 million hectares of primary forests remain. This is alarming as these remaining pristine areas are the repository of the country's gene pool. The Philippines is one of the 17 mega-diverse countries in the world with more than 65% of the species found nowhere else. Its being a critical hotspot with more than 800 of its plant and animal species threatened with extinction is of great concern because the Philippines is also globally important in terms of biodiversity-dependent adaptation.

The Philippines' diverse coastal zone comprise a variety of tropical ecosystems, including sandy beaches, rocky headlands, sand dunes, coral reefs, mangroves, sea-grass beds, wetlands, estuaries, and lagoons. Unfortunately, Over 80 percent of original mangroves in the country have been cleared, increasing sediment outflow onto reefs (Chou, 1998). Mangrove areas continue to be cleared and converted to fish ponds, a change that allows more sediment to reach reefs (DENR, 2001). Domestic and industrial wastes discharged into the sea further aggravate the vulnerabilities of the coastal ecosystems. The Philippine coral reefs, the second largest in Southeast Asia, are estimated to cover an area of 26,000 square kilometers and hold 2,177 species of fish. Much of these are significantly critical to the survival of the coastal poor. Fisheries account for about 4% of the country's GNP. The fisheries sector employs an estimated million people—26% in aquaculture operations, 6% in commercial fishing and 68% in marine and freshwater municipal fishing.

### 5.2.2 Agricultural

Agriculture represents 1/5 of the total economy (18 % of GDP) and generates 1/3 of the country's total employment and provides food and livelihood to our people as follows:

- Rice, 16.82 million mt;
- Fish, 4.97 million mt,
- Corn, 6.93 million mt,
- Other food and industrial crops, 57.75 million mt, and
- Livestock & Poultry, 4.04 thousands mt

Climate change in the country triggered the rise in temperature and the increases in variability and pattern of rainfall and super typhoon events, as well. The climate change and variability combined their weather modifying impacts with El Nino, which occurs in almost every two years and resulted into more complex and unpredictable changes in patterns and intensity of temperatures and extreme rainfall events close to their tipping points. The country has been traditionally exposed to the many hazards and risks from typhoons and droughts even before the on-set of climate change. The outstanding threat of climate change, however, is the undefined shifting of rainfall patterns and rising temperatures. Without proper scientific guidance, this creates confusion to many farmers in terms of when to plant and what to plant. Moreover, the concentration of climate-vulnerable dams and irrigation in Luzon, which is the location of 60 percent of national irrigated rice production, will definitely weaken the overall resiliency of the country's national food security and self-sufficiency to climate change, including the increasing problems on water allocation and prioritization for water supply for irrigation, domestic water and energy.

### 5.2.3 Biodiversity

The existing human-induced threats to biodiversity are compounded by the adverse impacts of climate change on terrestrial and aquatic flora and fauna communities. Even slight increases in temperature would affect the survival of plants and animals with narrow tolerance range for temperature and those which are presently living at the upper limit of their tolerance level. Most vulnerable are those species that have difficulties in migrating as a form of survival. A substantial increase in temperature in the range of 30°C to 40°C may possibly cause the migration of plant and animal species with narrower temperature tolerance to other more suitable areas as their form of adaptation. Such temperature level rise may also disrupt species interactions like plants and pollinators relationship that may affect the survival of plant species. Further increase in temperature to 50°C or 60°C may cause a number of animals and plant species to die out and become extinct while critical habitats may be lost.

### 5.2.4 Infrastructure

Infrastructure facilities are threatened by climate change as they are directly exposed to oftentimes prolonged and frequent rainfall, strong winds, and higher waves; temperature variations - that can lead to accelerated structural fatigue and materials failure for example in power transmission structures, and road pavements; and places greater demands on the construction and operation and maintenance of flood control and drainage structures, seawalls and port structures; and public buildings such as schools, and health care facilities. The impacts could be severe in areas where infrastructures are not designed to fully cope with the effects of climate change. Thus, these impacts have potential implications for where we locate and how we build our new infrastructures, as well as make existing infrastructure robust or resilient to the effects of climate change.

### 5.2.5 Energy

Energy technologies, particularly on power generation from renewable sources, rely greatly on the climate for its resource. With projected changes in precipitation, humidity, wind speed and cloudiness, energy technologies will be affected, resulting in changes in the quantity and timing of the renewable resource, in its operational performance and energy production. Changes in the mean potential and altered variance of a renewable resource will result in the changes in the resource, with climate change seemingly enhancing seasonal differences. In general, the relationship between the renewable resource potential and the driving climate variables such as precipitation and wind speed will dictate the extent of changes.

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### 5.2.6 Population, Health and Demography

Population growing exponentially and migrating into areas where they should not be contribute to the overall vulnerability of the country to additional external threats like climate change. The latest national population count by the National Statistics Office (NSO) placed the Philippine population at 88,574,614 persons as of August 2007.

Of the total population, 62.7% live in urban areas (2005) with an urban annual growth rate of 3.45%, much higher than the annual population growth rate of 2.28%. Since 1995, there has been more migration towards urban areas with increasing population numbers. Urban growth rates peaked in the late 1980s to early 1990s. From 2000 onwards, there has been a negative growth rate in rural areas. These trends have contributed to the increasing deteriorating conditions in the urban centers and upland areas where migrants have tended to drift to.

Age distribution and economic status also influence level of vulnerability of people which, in turn, determine the overall level of vulnerability of the country. More young and older people in the population would be critical in disaster situations. Poverty limits the concerned population's capacity to bounce back immediately in the face of disasters or to shift rapidly to new adaptation modes that require financial resources to materialize.

Rural poverty incidence was estimated at 41.5% in 2006, accounting for about 75% of total poverty in the country. It is also a driver of rural-to-urban migration. Rural poor in lowland agricultural areas have also been migrating upwards to forest lands for better agricultural opportunities. This has further contributed to the precarious situation of the forests in the country's watersheds.

The health sector also stands to bear the brunt of climate change, brought about mainly by the country's high vulnerability to climate change-related hazards. As diseases, disabilities and deaths are consequences of these hazards, the health sector is usually left to handle the management and rehabilitation of victims. Among the most likely impacts of climate change on the health sector include increases in endemic morbidity and mortality due to diarrheal disease, exacerbation of the abundance and/or toxicity of cholera due to increases in coastal water temperature, and an expansion of the natural habitats of vector-borne and water-borne diseases.



## 6. PHILIPPINE CLIMATE CHANGE FRAMEWORK

The State hereby promotes the following Vision and Goal for Climate Change, the achievement of which is operationalized in the succeeding Framework diagram:

### Vision

*"A climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems."*

### Goal

*"To build the adaptive capacity of communities and increase the resilience of natural ecosystems to climate change, and optimize mitigation opportunities towards sustainable development."*

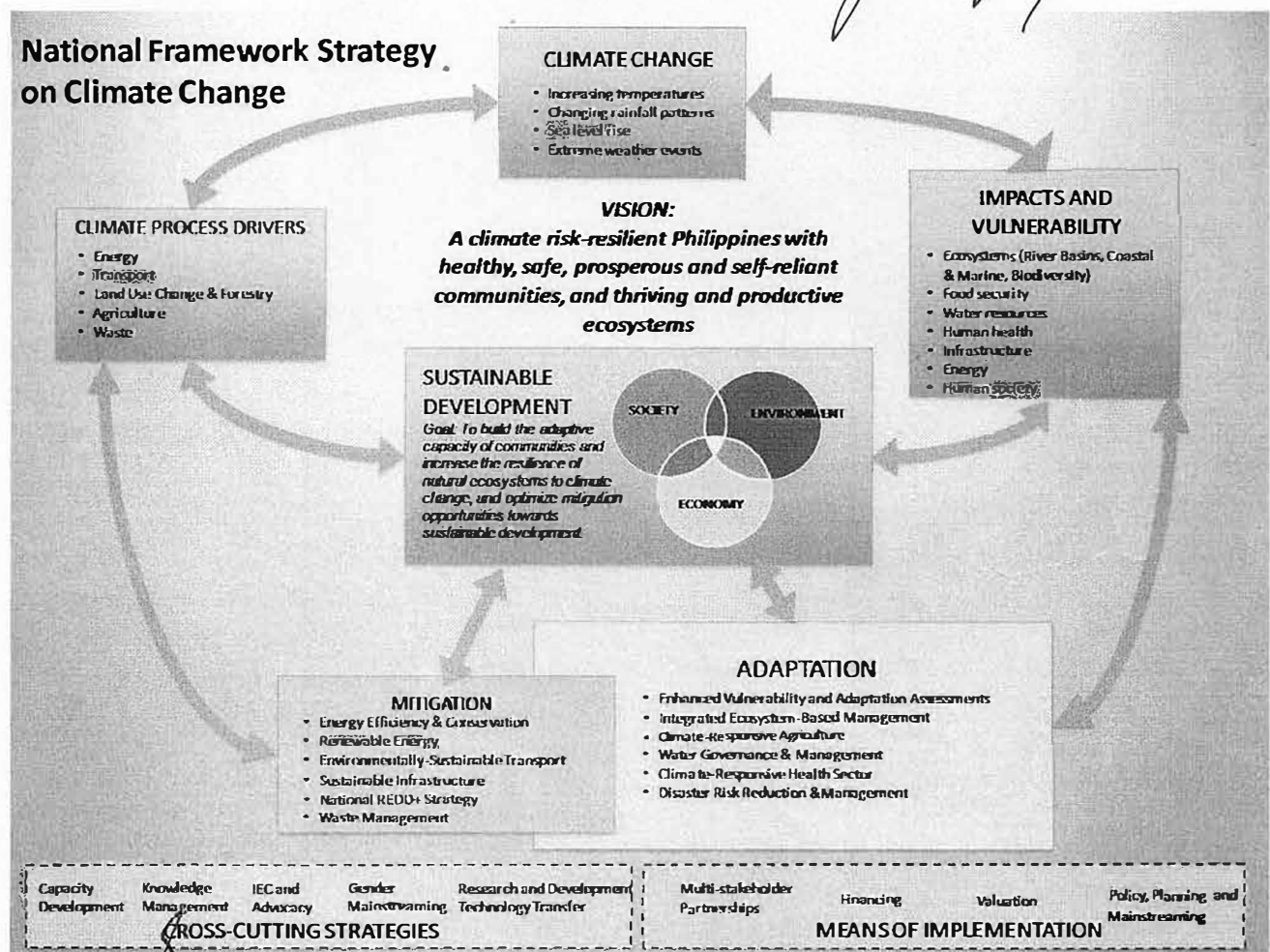


Figure 5: Climate Change Framework

National Framework Strategy on Climate Change, 2010-2022

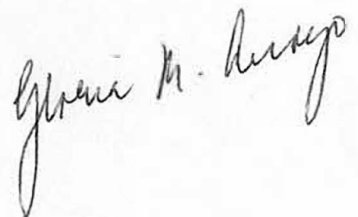


The national framework is formulated within the context of the country's sustainable development goals and governance/institutional factors that affect the country's ability to respond to climate change. The changing climate conditions will have a myriad of impacts and underscore the vulnerabilities in all sectors of society and the economy. Adaptation will require resources and the cooperation of all sectors. Addressing climate change, therefore, moves beyond the environmental challenges and will have to be closely linked with economic targets and social sustainability.

This Framework Strategy provides a basis for the national program on climate change. It identifies Key Result Areas to be pursued in key climate-sensitive sectors in addressing the adverse effects of climate change both under adaptation and mitigation. The framework is based on the fundamental principles of sustainable development and treats mitigation as a function of adaptation, cognizant of the vulnerability of key sectors that include energy.

Increasing temperatures, changing rainfall patterns, sea level rise, and extreme weather events form the backdrop upon which the Philippines endeavors to pursue its development goals. Such factors affect key sectors such as ecosystems, food, water, human health, infrastructure, energy, and human society. The ability of the country to address such impacts and vulnerabilities of these sectors affect the facility by which sustainable development is pursued. Sustainable development, on the other hand, greatly impinges on the capacity of the country to adapt to the impacts and address vulnerabilities to climate change.

In order to achieve the key result areas, it is important to ensure that cross-cutting strategies are likewise given attention. As means of implementation, the framework puts forward multi-stakeholder partnerships, financing, valuation, and policy planning and mainstreaming.



The following diagram illustrates a more specific aspect of the Climate Change Framework, taking into account how climate change impacts and vulnerabilities shall be addressed by adaptation, mitigation and cross-cutting strategies and supported by the means of implementation—which would eventually lead to achievement of the National Goal.

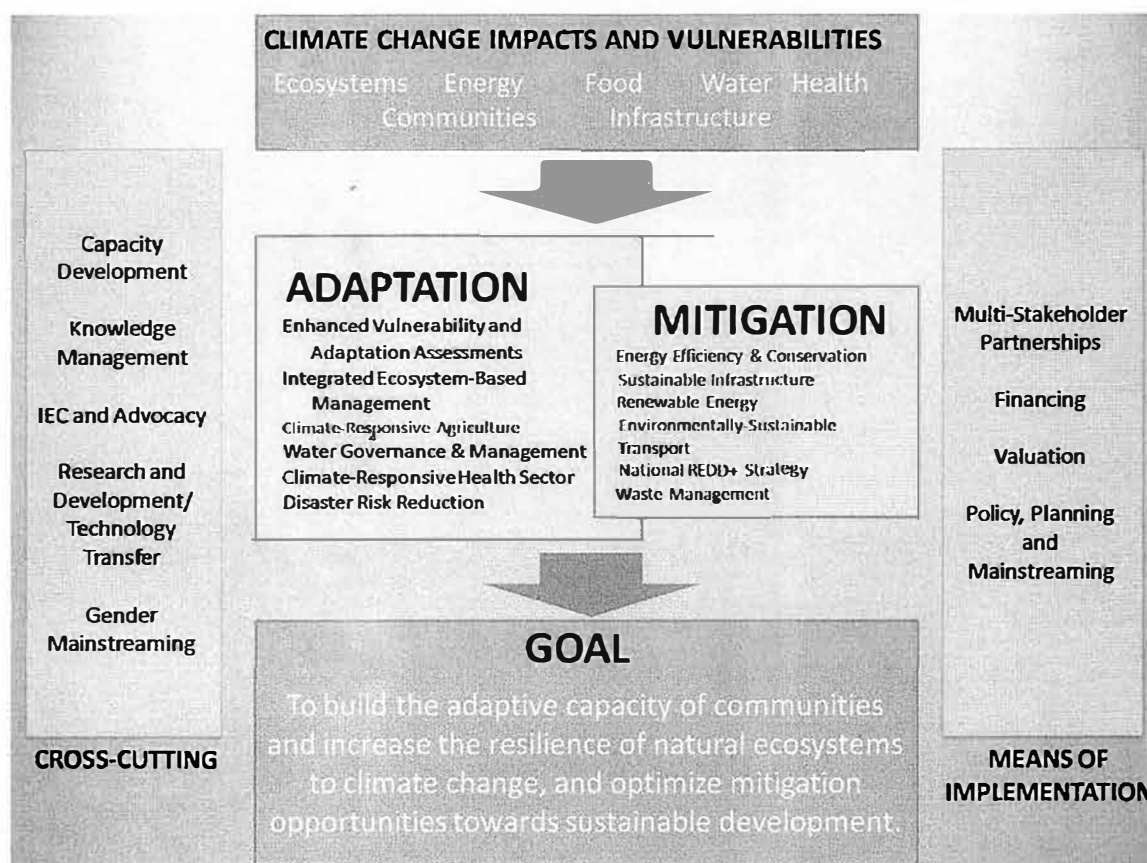


Figure 6: Operational Diagram

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## 7. SYNERGY OF ADAPTATION AND MITIGATION

The increasing concentration of GHGs in the atmosphere has started to and will continue to influence changes in the global climate system in the coming decades. The Fourth Assessment Report (AR4) of the IPCC and the international imperatives drawn in the Bali Conference in 2007 establish the urgency of adaptation especially for developing and vulnerable countries like the Philippines. This Framework recognizes the mutually beneficial relationship between climate change mitigation and adaptation, particularly in the context of Philippine development. Cognizant of the impacts of a changing climate on sectors that are also sources of GHG emissions, which include energy, transport, agriculture, and industry, this framework endeavors to integrate mitigation with adaptation and take into account the circumstance

Mitigation strategies in the Philippine development context offer opportunities for enhancing development and boosting the adaptation capacity of communities. In the same vein, adaptation is as much a development concern as mitigation. With the context of global-scale shifts in the climate system, development can only succeed if mitigation strategies such as energy efficiency and conservation, renewable energy development, environmentally-sustainable transport, sustainable infrastructure, and Reduction of Emissions from Deforestation and Forest Degradation (REDD+) are undertaken in the context of adaptation. The development of a framework that integrates adaptation within the development process is deemed to ensure sustainability and success (WRI, 2007).

An integrated approach builds on mitigation measures as a part of adaptation in order to provide necessary mechanisms to respond to the realities of climate change and contribute to attaining the twin objectives of the UNFCCC and create an enabling policy environment for strengthening the country's pursuit of sustainable development and the fulfillment of its Millennium Development Goals (MDG) targets.

*Gloria M. Arroyo*

## 8. THE MITIGATION PILLAR

The principal objective of the UNFCCC is the stabilization of GHG concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference of the global climate system. Mitigation as a response plays a key role in pursuing the UNFCCC objective, particularly in the context of historical emissions of industrialized countries. Achieving this objective would involve limiting or reducing anthropogenic GHG emissions by sources and preserving or, as appropriate, enhancing sinks and reservoirs of GHGs. However, the complexity of prevention and mitigation stems from the fact that the atmosphere is part of the global commons and as such, no single country, region, or economic sector can, reverse the trend of increasing GHG emissions by itself.

Like most developing countries, the Philippines' contribution to the total global GHG emissions is insignificant compared to the rest of the world. Nonetheless, the Philippines embarks on a mitigation strategy to contribute to the global effort to reduce emissions, pursuing cost-effective measures to reduce GHG emissions, including increased energy efficiency and conservation, development and increased utilization of appropriate low carbon and renewable energy technologies, and reducing emissions from deforestation and forest degradation. The strategy shall take the form of nationally-appropriate mitigation actions, which reflects the recognition of the key role that developing countries play in ensuring that the global community can achieve the long-term objectives of mitigation, taking into account the rising emissions growth rates of developing countries including the Philippines. Such an approach to mitigation, anchored on the pursuit of sustainable development, gives the country the opportunity to leapfrog into the future and avoid harmful emissions as the economy grows.

It is important to understand the mitigation potential of the Philippines although greenhouse gas mitigation will not be the primary driver of the country's mitigation strategies as enshrined in this Framework and the subsequent Action Plan. This potential should be transformed strategically into mitigation options that will offer the most co-benefits to fuel sustainable developments.

*Gloria M. Araya*

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## The Philippines 2000 Greenhouse Gas (GHG) Inventory

The Philippine's mitigation potential can be gleaned from the GHG inventory, which is summarized in the following figure and table:

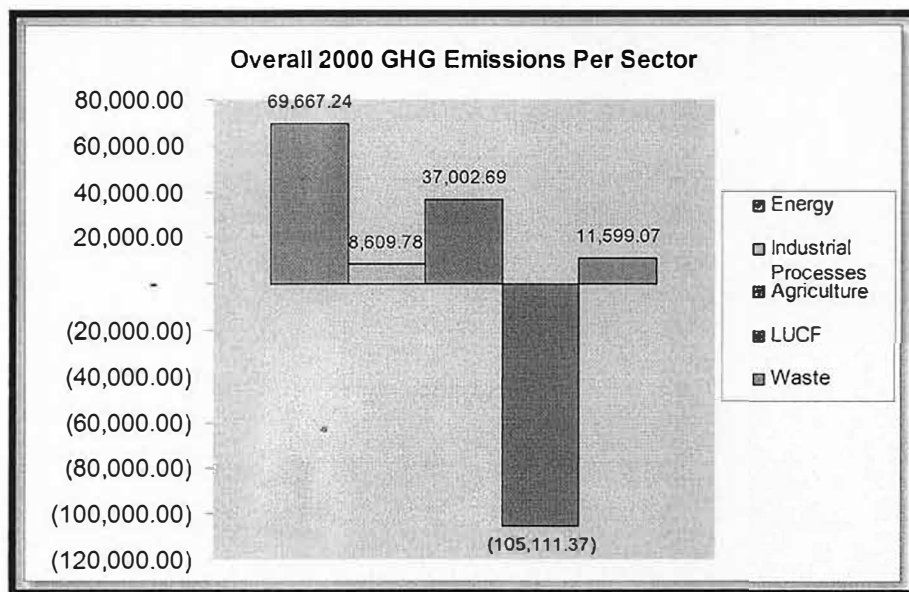


Figure 7: Overall 2000 GHG Emission per Sector

Table 1: Overall 2000 GHG Emission per Sector (in Gg CO<sub>2</sub> e)

Sector	CO <sub>2</sub> , Gg	CH <sub>4</sub> ,Gg	N <sub>2</sub> O, Gg	*CO <sub>2</sub> e Emission, Gg
Energy	62,499.10	304.14	2.52	69,667.24
Industrial Processes	8,604.74	0.24	-	8,609.78
Agriculture	-	1,209.79	37.41	37,002.69
LUCF	(104,040.29)	(46.28)	(0.32)	(105,111.37)
Waste	-	500.67	3.50	11,599.07
<b>Totals</b>	<b>(32,936.45)</b>	<b>1,968.56</b>	<b>43.11</b>	<b>21,767.41</b>

CH<sub>4</sub> GW Potential = 21; N<sub>2</sub>O GW Potential = 310; \* = CO<sub>2</sub>+(CH<sub>4</sub>\*21)+(N<sub>2</sub>O\*310)

This is the second GHG inventory conducted by the Philippines, to be contained in its Second National Communication (SNC) on Climate Change for submission to the UNFCCC Secretariat. This inventory and the first one have been adjusted in view of new information on the LUCF. Based on the inventory conducted for the different sectors, the Philippines emitted 21,767 Gg of GHG in the year 2000, net of sequestered carbon by LUCF Comparing the 1994 Initial National Communication (INC) and the 2000

GHG Inventory for the SNC, a decrease of 78% in GHG emissions for the Philippines has been registered, notably due to the adjustment in the amount of emissions sequestered by the LUCF sector.

Total emissions from non-LUCF sectors amounted to 126,879 Gg CO<sub>2</sub>e as seen in the above figure and table. The energy sector still contributed the highest at 69,667.24 Gg CO<sub>2</sub>e or 55% of the total. This was followed closely by the Agriculture sector with 37,003 Gg or 29% of the total. Emissions from industrial processes was registered at 8,610 Gg or 7% of the total, while the waste sector released 11,599 Gg or 9% of the total GHG emissions for 2000.

These total can be further adjusted based on sectoral refinements of estimations. These then can be translated into possible mitigation measures, which should emphasize the co-benefits of pollution prevention, energy security and improving the stability & productivity of ecosystems containing the country's sinks like its forests. The translation into specific mitigation measures in the various sectors can guide mitigation opportunities that can be pursued in the context of incrementality under the Convention and its Kyoto Protocol processes.

### Key Result Areas (KRAs) for Mitigation

**Long-term Objective:** *Facilitate the transition towards low greenhouse gas emissions for sustainable development.*

To achieve this long-term objective, the following KRAs, from which the national, sectoral and local action plans shall be drawn, are adopted. A list of strategic priorities is provided under each KRA to serve as initial guide for action planning:

#### 8.1 Energy Efficiency and Conservation

The energy sector is considered as one of the most vulnerable sectors that need to adapt to changing demand and supply conditions resulting from climate change. One major challenge for energy is the adaptability of infrastructure such as power plants, refineries, depots, power transmission and distribution systems, and fuel distribution systems to cope with these changing climatic conditions. Most energy infrastructure are located along coastal areas, where the direct impacts of sea level rise and coastal storm surges will be felt.

**Objective:** *Develop and enhance clean energy sources, uses and other efficiency measures towards a low carbon economy in the energy sector.*

### Strategic Priorities

- a. Enhance energy efficiency and conservation, and put in place long-term reliable power supply through reinforcement of energy infrastructure, diversification of energy sources and research and development (R&D) in new technologies.
- b. Maintain a competitive energy investment climate.
- c. Reduce GHG emissions from the energy sector, particularly those that contribute or forecast to contribute the most, through increased use of alternative fuels and other energy conservation programs.

## **8.2 Renewable Energy**

While the country is promoting the use and development of renewable and alternative energy sources, the Philippines still relies heavily on thermal electric power generation, particularly gas-fired, oil-fired and coal-fired power plants. Thermoelectric generation is water-intensive. If changing climatic conditions alter historical patterns of precipitation and runoff, they may complicate operations of existing thermoelectric power plants.

About 56 percent of the country's energy demand is met by indigenous resources including coal, natural gas, hydropower and traditional biomass energy. The Philippines is one of a few countries in the world where renewable energy (sourced from geothermal and hydropower plants) accounts for the largest share (43 percent) of total primary energy supply. The Philippine government targets to double its current renewable energy capacity from 4,500 MW to 9,000 MW in the next 20 years.

Objective: *Realize the full potential of the country's renewable energy capacity so as to further contribute to energy security and promote low-carbon growth in the energy sector*

### Strategic Priority

- a. Intensify the development and utilization of renewable and environment-friendly alternative energy resources/technologies.

## **8.3 Environmentally Sustainable Transport**

The transport sector's contribution to GHG emissions has increased significantly both in absolute and relative terms since 1990. Based on the current growth rates in motorization of about 6 percent, and the projected increase in urban population by 35 million by 2030,<sup>4</sup> emission contributions from road

<sup>4</sup> Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2007 Revision, <http://esa.un.org/unup>.



transport, estimated at 24 MtCO<sub>2</sub>e in 2007, are projected to increase to 37 and 87 MtCO<sub>2</sub>e by 2015 and 2030 respectively under a business as usual (BAU) scenario. This would result in a rapid enlargement of the country's carbon footprint, further exacerbating pollution in urban areas.

A low-carbon path in the transport sector is thus essential. This Framework promotes models to improve the transport sector's efficiency and modal shifts as compressed natural gas (CNG) and liquefied petroleum gas (LPG) becomes the primary fuel of the public transport, and support the expansion/shift to more efficient mass transport systems such as metro rail transit (MRT), light rail transit (LRT) and bus rapid transit (BRT).

*Objective: Improve the efficiency of the transport sector through increased uptake of alternative fuels and expansion of mass transport systems*

#### Strategic Priorities

- a. Promote models to improve the transport sector's efficiency and modal shifts
- b. Convert of public utility vehicles to LPG and renewable energy sources, and the expansion of/shift to more efficient mass transport systems.
- c. Integrate climate change to the formulation of energy and transport policies, e.g., formulation of a national Environmentally Sustainable Transport (EST) strategy.

#### **8.4 Sustainable Infrastructure**

The Philippines' residential and commercial sectors - human settlements – are major producers of GHG. They consume 50% of primary electric energy: 27% is consumed by households, while 23% is consumed by the business sector. Of all structures built for various human activities, high-rise buildings consume most (72%) of electric supply and 17% of fresh water.

Moreover, buildings contribute 33% of the carbon dioxide emission of human settlements. Making these buildings energy- and water-efficient would, therefore, be critical component mitigation. The full implementation of a standard for green buildings would minimize the release of GHGs by as much as 2,400,000 tons a year.

*Objective: Reduce carbon footprint through energy-efficient design and materials for public infrastructure and settlements*



### Strategic Priorities

- a. Institutionalize guidelines for the construction of innovative climate-resilient and energy-efficient human settlements.
- b. Promote green infrastructure practices through climate-smart technologies, climate proofing processes and construction of energy-efficient buildings.
- c. Install energy-efficiency and climate-proofing mechanisms for public infrastructure, cultural facilities, and socio-economic infrastructure (including telecommunications facilities) through appropriate standards and inventory mechanisms.
- d. Develop energy-efficient and climate-resilient human settlements through government and private sector housing programs, and public awareness campaigns.

## **8.5 National REDD+ Strategy**

The Philippines' Second National Communication to the UNFCCC highlights the potential of the country's forestry sector to serve as a "carbon sink," effectively mitigating the country's overall greenhouse gas emissions via the absorption of carbon dioxide by the sector. However, an assessment of the country's forestry sector reveals several gaps in governance, extension services, research and development, capacity building, and financing, among others.

A National REDD+ Strategy does not only leverage the country's participation in a prospective international REDD+ mechanism, but also boosts domestic efforts towards the reduction of emissions from deforestation and forest degradation and the enhancement of forest carbon stocks in the country. It can also create an opportunity to strengthen the forestry sector's capacity to adapt against the impacts of climate change by enhancing ecosystem services and establishing safeguards towards the realization of multiple environmental and social benefits.

*Objective: Reduce emissions from deforestation and forest degradation through the sustainable management of forests and the protection and enhancement of carbon stocks in watersheds, forests and other terrestrial ecosystems*

### Strategic Priorities

- a. Review, harmonize, and where necessary formulate, enabling policies towards enhancing the forestry sector's ability to reduce emissions from deforestation and forest degradation and enhance forest carbon stocks, in the process, identifying and ensuring social and environmental safeguards are observed in the implementation of REDD+.
- b. Strengthen governance mechanisms in REDD+ coordination and implementation by establishing appropriate institutional arrangements with which to meaningfully engage stakeholders and ensure equitable benefit sharing with local government units and communities.

- c. Promote a watershed approach towards REDD+ planning, implementation, and enforcement, pursuing options to improve the protection and sustainable management of forests, and the enhancement of forest carbon stocks and biodiversity.
- d. Collaboratively establish a broad science-based REDD+ research and development (R&D) agenda which, among others, identifies relevant national baselines, the drivers of deforestation and degradation in the country, and the social, policy, and carbon-cycle aspects of REDD+ in the Philippines.
- e. Establish and implement a subnational REDD+ measurement, reporting, and verification (MRV) system, scaling up to a national-level system commensurate with the improvement of capacities and resources.
- f. Formulate and implement a national REDD+ communication plan and capacity building program with which to facilitate engagement, dialogues, and training for stakeholders towards REDD+ development.
- g. Explore and capitalize on opportunities for financing REDD+, establishing long-term financial sustainability and resilience by seeking multiple funding sources, establishing contingencies and investing in self-sustaining local-level programs.

## 8.6 Waste Management

Acknowledging that unmanaged waste aggravates the emission of methane, a greenhouse gas 20 times more lethal than carbon dioxide, it is imperative that the Philippines paves a way towards the more effective implementation of waste management laws of the Philippines.

Objective: *Full implementation of proper waste management*

### Strategic Priorities

- a. Enhanced implementation of the Ecological Solid Waste Management Act
- b. Promotion of best practices in waste management, involving all categories of waste
- c. Strengthen the advocacy of proper waste management as a tool towards better communicating and mobilizing the public to address climate change

*Gloria M. Araya*

## 9. THE ADAPTATION PILLAR

Adaptation refers to the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. The Delhi Declaration on Climate Change and Sustainable Development highlights the importance of adaptation as “high priority for all countries.” With the Philippines’ geophysical and socio-economic characteristics, more emphasis is given on adaptation to risks associated with current climate variability and extremes.

### Key Result Areas (KRAs) for Adaptation

Long-term Objective: *To build the adaptive capacity of communities and increasing the resilience of natural ecosystems to climate change.*

To achieve this long-term objective, the following KRAs, from which the national, sectoral and local action plans shall be drawn, are adopted. A list of strategic priorities is provided under each KRA to serve as initial guide for action planning:

#### 9.1 Enhanced Vulnerability and Adaptation Assessments

The development of a science-based approach to climate change adaptation requires the establishment of a comprehensive knowledge system which has, as its components, the rigorous collection, warehousing, and publishing of country-specific data towards the generation of methods, tools and assessments for better decision-making. Vulnerability assessment is the process of identifying, quantifying, and prioritizing (or ranking) the vulnerabilities in a system. It means assessing the threats from potential hazards to the population and to existing infrastructure.

Vulnerability and adaptation assessments need to be generated to serve as the country’s scientific basis towards quantifying and prioritizing climate-related vulnerabilities and refining adaptation strategies in both national and local settings. As a matter of principle, such assessments shall be iterative as they will be subject to constant methodological and data enhancement.


Objective: *Enhance the availability and quality of vulnerability and adaptation assessments to serve as the country’s scientific basis for formulating appropriate climate change adaptation strategies.*



#### Strategic Priorities

- Ensure the formulation of effective and efficient vulnerability, impact and adaptation assessment tools that are relevant to target sectors and implementers.
- Improve mechanisms for addressing gaps and limitations of existing assessment and vulnerability approaches, in relation to the needs and objectives of climate change plans.
- Increase access to climate change adaptation knowledge products and support services for the purpose of guaranteeing that the needs of the marginalized and vulnerable sectors are addressed.

*National Framework Strategy on Climate Change, 2010-2022*



## 9.2 Integrated Ecosystem-based Management

Addressing the country's multiple vulnerabilities to climate change requires an integrated ecosystem-based management approach which not only acknowledges the interrelationships across the country's ecosystems, but also strengthens the integrity of decision-making processes towards the formulation of comprehensive adaptation strategies from ridge-to-reef.

Integrated Ecosystem-based Management in the Philippines shall be achieved through, but not limited to, the following approaches and systems:

### 9.2.1 River Basin Management

Objective: *Manage watershed ecosystems and multi-polar environments through the River Basin Management (RBM) approach.*

#### Strategic Priorities

- a. Rehabilitate and develop watershed resources through resource use improvement and governance improvement.
- b. Enhance vulnerability and adaptation assessments.
- c. Enhance ecosystem services to control droughts, floods and landslides.
- d. Institute a comprehensive river basin management governance strategy.
- e. Establish appropriate and participatory institutional arrangements with local government units, private sector, and civil society organizations.
- f. Reduce climate change risks and vulnerability of watershed ecosystems and biodiversity through ecosystem-based management approaches, conservation efforts, and sustainable ENR-based economic endeavors such as ecotourism.

### 9.2.2 Coastal and Marine Systems

Objective: *Build up and improve the resilience of coastal and marine ecosystems and communities, including tourism industries, to climate change.*

#### Strategic Priorities

- a. Establish marine reserve networks through active participation of local communities to serve as sources of marine propagules to replenish biodiversity in shallow water habitats.
- b. Determine optimal clustering and locations of marine reserves according to "source and sink".
- c. Prioritize protection/management of mangroves, estuaries, sea grasses, coral reefs and beaches as a management unit to derive maximum benefits from synergistic interactions of these five ecosystems that result in enhanced marine productivity.

- d. Strengthen sustainable, multi-sectoral and community-based coastal resource management mechanisms and ecotourism endeavors.
- e. Manage and expand the sink potential of marine ecosystems such as coral reefs and mangroves. (Mitigation)

### 9.2.3 Biodiversity

Objective: *Mainstream biodiversity adaptation strategies to climate change in policies, plans and programs of national and local government agencies.*

#### Strategic Priorities

- a. Establish national baselines, standards and indicators for monitoring progress in implementing biodiversity conservation programs.
- b. Strengthen vertical and horizontal coordination among government agencies, civil society groups, academe and other organizations in implementing biodiversity conservation and adaptation strategies to climate change.
- c. Protect vulnerable ecosystems and highly threatened species from climate change impacts;
- d. Develop institutional capacities in biodiversity conservation and climate change adaptation at the national, regional and local levels.
- e. Establish scientific basis for measuring the impacts of climate change scenarios on ecosystem and species diversity.
- f. Mobilize sustainable funding support to climate change adaptation programs

## 9.3 Water Governance and Management

The success of the country's adaptation efforts are seriously dependent on how the country's water resources are governed and managed. Therefore, appropriate mechanisms must be established towards protecting and enhancing the integrity of our water resources towards environmental flows for biodiversity, agriculture, energy, and consumption of settlements and industries.

Objective: *Reduce water sector vulnerability to climate change through participative water governance, resource management and sectoral policy reform.*

#### Strategic Priorities

- a. Reduce climate change vulnerability of water resources through improved water governance and resource management mechanisms.
- b. Mainstream climate change adaptation in water resources policies and development planning
- c. Promote water sector reforms that will address the weak and fragmented institutional and regulatory framework

- d. Study, design, and implement innovative financing and incentive systems to stimulate water sector climate change adaptation investments and encourage community participation in water resource management
- e. Climate-proof water-related infrastructures such as dams and impoundments for domestic water supply, irrigation, and energy generation.
- f. Test and adopt “low-cost, no regrets” water sector climate change adaptation technologies
- g. Enhance institutional and community capacity for Integrated Water Resources Management (IWRM)
- h. Establish science-based water resources information, climate projections, climate change impacts on major water resources and infrastructure, and adaptation technologies at scales relevant to communities, decision makers and water resources managers.

#### 9.4 Climate-Responsive Agriculture

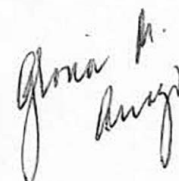
The sensitivity of the country’s agricultural sector to the impacts of climate change cannot be overstated. The increasing frequency and intensity of extreme weather events affecting the country continue to devastate and threaten the country’s food and water resources. Addressing these vulnerabilities in both the short and long-term requires building the resilience of our food production systems through the mainstreaming of sustainable agriculture and aquaculture and related developments in the sector.

*Objective: Protect and enhance ecosystems and ecosystem services to secure food and water resources and livelihood opportunities.*

##### Strategic Priorities

- a. Reduce climate change risks and vulnerability of natural ecosystems and biodiversity through ecosystem-based management approaches, conservation efforts, and sustainable ENR-based economic endeavors such as ecotourism.
- b. Increase the resilience of agriculture communities through the development of climate change-sensitive technologies, establishment of climate-proof agricultural infrastructure and climate-responsive food production systems, and provision of support services to the most vulnerable communities.
- c. Improve climate change resilience of fisheries through the restoration of fishing grounds, stocks and habitats and investment in sustainable and climate change-responsive fishing technologies and products.
- d. Expand investments in aquaculture and in other food production areas.
- e. Strengthen the crop insurance system as an important risk sharing mechanism to implement weather-based insurance system.
- f. Strengthen sustainable, multi-sectoral and community-based resource management mechanisms.





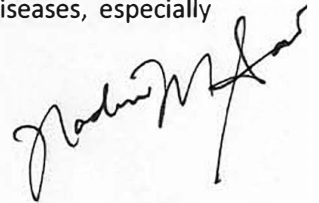
## 9.5 Climate-Responsive Health Sector

The global climate is now changing faster than at any point in human civilization, and one of its main impacts on human health is increasing morbidity and mortality rates especially due to vector-borne diseases. Climate change profoundly impacts communicable index diseases as its vectors adapt, resulting in greater vulnerability of the marginalized sectors. The health sector must formulate proper climate-sensitive interventions in ensuring a healthy citizenry, and a disease-resilient community.

*Objective: Manage health risks brought about by climate change.*

### Strategic Priorities

- a. Assessment of the vulnerability of the health sector to climate change.
- b. Improvement of climate-sensitivity and increase in responsiveness of public health systems and service delivery mechanisms to climate change.
- c. Establishment of mechanisms to identify, monitor and control diseases brought about by climate change; and improve surveillance and emergency response to communicable diseases, especially climate-sensitive water-borne and vector diseases.



## 9.6 Climate-Proofing Infrastructure

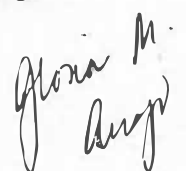
The impacts could be severe in areas where infrastructures are not designed to fully cope with the effects of climate change. Thus, these impacts have potential implications for where we locate and how we build our new infrastructures, as well as make existing infrastructure robust or resilient to the effects of climate change.

Infrastructure in the country has not kept pace with the requirements of a growing economy, and the increase in population and urbanization. The Philippines has not provided infrastructure that is sufficient in quantity and quality to meet global economic challenges as well as poverty reduction goals under such international commitments as the Millennium Development Goals (Llanto, 2007). This will be further exacerbated by climate change and the need for urgent adaptation actions is increasing by the day.

*Objective: Render the infrastructure sector resilient to the escalating impacts of climate change*

### Strategic Priorities:

- a. Establish baseline data and benchmarks for climate change as basis for adaptation actions in the infrastructure sector
- b. Collaborate and integrate climate change adaptation plans for infrastructure with other stakeholders.
- c. Rationalize climate change adaptation in infrastructure policy, planning and programming.





## 9.7 Disaster Risk Reduction

In the overall effort of combating the effects of climate change, disaster risk reduction (DRR) shall be the first line of defense. Thus, beyond normal relief operations, the Framework Strategy shall expand and upgrade the country's capacity to address and anticipate disasters such as typhoons, floods, and landslides. This would bring a renewed focus on science-based early warning systems and capacity-building for local government units and organizations for disaster preparedness and risk management. This would also entail vulnerability assessment of communities as well as prioritized disaster planning and management for areas in the typhoon-path and flood-prone areas.

*Objective: Reduce disaster risks from climate change-induced natural hazards.*

### Strategic Priorities

- a. Adoption of a responsive policy framework to serve as an enabling environment for reducing losses from natural disasters, including climate change-related risks.
- b. Use of the best available and practicable tools and technologies from the social and natural sciences as decision aids and support systems to stakeholders in preventing, reducing and managing disaster risks.
- c. Enhancement of institutional and technical capacity to facilitate the paradigm shift from disaster response to disaster preparedness and mitigation.
- d. Enhancement of national monitoring, forecasting and hazard warning systems; and improve effectiveness of early warning systems available to communities.
- e. Mainstreaming of climate and disaster risk-based planning in national and local development and land use planning thru the application of disaster risk assessment and by further supporting capacity development, including the preparation/ gathering and dissemination of appropriate data and maps necessary for national. Regional, provincial and city/municipal planning.



## 10. CROSS-CUTTING STRATEGIES

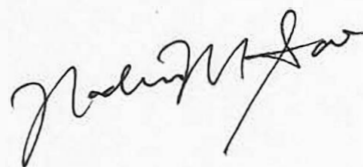
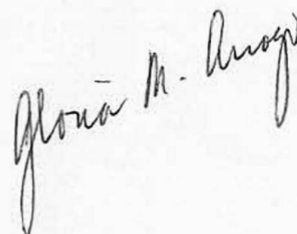
Several cross-cutting areas are identified by the Framework as crucial to the achievement of the National Goal: Capacity Development, Knowledge Management, Information, Education and Communication (IEC), Research and Development (R&D), and Technology Transfer. The succeeding sections outline the priority strategies that would be undertaken under these critical areas of concern.

### 10.1 Capacity Development

Capacity development objectives in the area of policy formulation, organizational development and systems improvement shall be pursued for national government agencies, local government units and stakeholder groups. At the individual level, specialized capacity (training) needs in the areas of adaptation and mitigation have to be addressed to enable the full, effective and sustained implementation of the Framework and Action Plan. Overall, these strategies are aimed at strengthening the capacity of local, regional and national institutions and individual stakeholders for undertaking climate change initiatives.

#### Strategic Priorities

- a. Review and develop policy instruments at all levels of government to facilitate the implementation of the National Framework Strategy on Climate Change.
- b. Enhance the capacity to plan, prepare, implement, monitor and report on climate change actions, including the integration of such actions into relevant national strategies and plans;
- c. Enhance systematic observation, research and knowledge management, which includes strengthening and using data for systematic observation, early warning, national and regional downscaling and modelling, disaster preparedness, vulnerability assessment and other climate services.
- d. Strengthen climate change communication, education, training and public awareness at all levels, including at the local and community levels, taking into account gender issues;
- e. Encourage and strengthen participatory and integrated approaches taking climate change considerations into account to the extent feasible in relevant social, economic and environmental policies and actions.
- f. Enhance systems and procedures to strengthen institutional arrangements in addressing climate change mitigation and adaptation.
- g. Develop appropriate assessment tools such as carrying capacity assessment incorporating an appropriate environmental valuation methodology to inform decision-making, policy development, research and development (R&D), payment and incentive mechanisms, and other climate change-related endeavors.



## 10.2 Knowledge Management and Information, Education and Communication (IEC)

Under knowledge management, mechanisms and protocols shall be installed for a well-coordinated climate change information and data management and reporting system. The information management system includes distillation and dissemination of country experiences and lessons in addressing climate change adaptation and mitigation, including assessments/evaluations. This knowledge management mechanism shall then feed into the development of communication materials and the introduction of innovative tools and approaches for increasing public awareness on Climate Change.

### Strategic Priorities

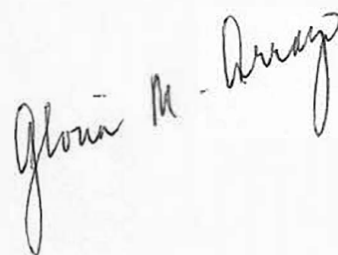
- a. Educate the public and private sectors to secure broad public awareness, support and cooperation in disaster risk-reduction, mitigation and adaptation programs.
- b. Mainstream climate change into all levels of formal education.
- c. Provide socio-economic and cross-sectoral climate change impacts and vulnerability assessment and decision-making tools at all levels of development.
- d. Maximize utility of forecasts, research, and climate change knowledge through a nationwide behavior change communication (BCC) and IEC campaigns.
- e. Establish a functioning network of government and non-government specialist institutions and professionals to provide the country with necessary tools, observations and information in dealing with climate change.

## 10.3 Research and Development (R&D) and Technology Transfer

Currently, three of the five sectoral councils of the Department of Science and Technology (DOST) have formal statements of varying depth and scope concerning climate change – related to Research and Development as well as Technology Transfer. It is observed that some activities cut across sectors and could benefit from the participation of multiple disciplines to ensure success from basic research to development to application. The seeks the rationalization and enhancement of the existing sectoral R&D and Science & Technology agenda to ensure mainstreaming of the country's climate change requirements.

### Strategic Priority

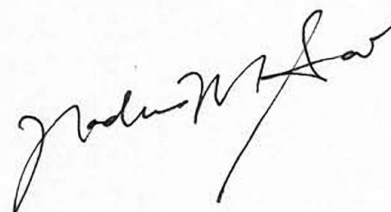
- a. Develop and implement a national, comprehensive, multi-sectoral climate change research and development (R&D) and science and technology (S&T) agenda based on the initial inputs of research and science agencies and institutions.



## 11. MEANS OF IMPLEMENTATION

The following Strategies in the areas of governance, coordination, financing, valuation and partnerships are adopted to facilitate the implementation of the Framework. Other mechanisms that may be appropriately identified during the formulation of the Action Plan shall be included.

- 11.1 Establish appropriate management and institutional arrangements and coordination mechanisms for climate change at the national, sub-national and local levels.
- 11.2 Maximize government financing instruments at the national and local levels as source of funds for the National Framework Strategy.
- 11.3 Install policy and incentive mechanisms to facilitate and leverage private sector investments in climate change.
- 11.4 Provide and access scaled-up, new and additional financial resources to support the requirements of the National Framework, including sectoral and local financing requirements.
- 11.5 Development of appropriate assessment tools such as carrying capacity assessment incorporating an appropriate environmental valuation methodology to inform decision-making, policy development, research and development (R&D), payment and incentive mechanisms, and other climate change-related endeavors.
- 11.6 Establish partnerships among national and local government agencies, business, professional and other private groups, community-based organizations, academic and scientific organizations, and civil society organizations.



## 12. MONITORING AND EVALUATION OF THE FRAMEWORK

The Climate Change Commission, in coordination with concerned agencies and stakeholder groups, shall install a monitoring and evaluation (M&E) system to track the implementation progress of the provisions of this Framework and the resulting National Climate Change Action Plan and Local Climate Change Action Plans.

As per Rule VIII, Sec.1 of the Implementing Rules and Regulations of the Climate Change Act of 2009, review the provisions of this Framework every three (3) years using a participatory evaluation process.

*Gloria M. Araya*

*Radmisa*

*2017*

### 13. TRANSITORY PROVISION

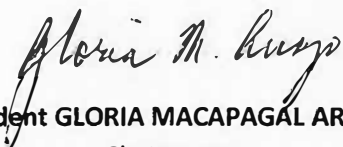
The National Framework Strategy on Climate Change is a dynamic and living document that shall continue to evolve as new challenges and opportunities emerge and as the level of consensus continues to develop among stakeholders in all sectors of Philippine society. All stakeholder groups shall pursue more concrete strategies and actions and work towards enhancing the Framework, as national government agencies and local government units continue to refine the processes, as Filipinos endeavor to deepen and enrich their understanding of the consequences of climate change, and as the nation matures in its understanding of the interdependence of individuals, groups, cultures, and ecosystems to pave the way for new modes of collaboration—all in a concerted national effort to realize the Vision of *“a climate risk-resilient Philippines with healthy, safe, prosperous and self-reliant communities, and thriving and productive ecosystems.”*

Gloria M. Araya

2017/11/15

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**President GLORIA MACAPAGAL ARROYO**

Chairperson



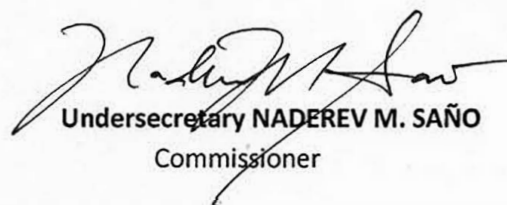
**Secretary HEHERSON T. ALVAREZ**

Vice Chairman



**Undersecretary MARY ANN LUCILLE L. SERING**

Commissioner



**Undersecretary NADEREV M. SAÑO**

Commissioner