



Hundred Islands National Park, Alaminos, Pangasinan
Photo by: Annbee G. Tiangson

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**Conservation,
Protection &
Rehabilitation of
the Environment
& Natural
Resources**

Conservation, Protection & Rehabilitation of the Environment & Natural Resources

The country is widely acknowledged as having an outstanding endowment of natural resources, which could provide essential ecosystem services to the population. Demands arising from development and utilization activities, population expansion, poor environmental protection, and external factors such as climate change, however, have placed the country's environment and natural resources under grave threat. For the medium-term, an environment that is healthy, ecologically balanced, sustainably productive, climate change resilient, and one that provides for present and future generations of Filipinos is envisioned. This vision will be pursued through an integrated and community-based ecosystems approach to environment and natural resources management, precautionary approach to environment and natural resources, sound environmental impact assessment (EIA) and cost-benefit analysis (CBA). These, then, are all anchored on the principles of shared responsibility, good governance, participation, social and environmental justice, intergenerational space and gender equity, with people at the core of conservation, protection and rehabilitation, and developmental initiatives.

Assessment

State of the Environment and Natural Resources

The degraded state of the country's environment and natural resources is felt most intensely by the poor, especially the rural communities given that they depend on these resources for their primary source of living. On the other hand, poverty frequently aggravates environmental stress as the marginalized population presses upon limited resources, such as unregulated activities and upland cultivation.

Major urban centers are polluted...

With regard to water pollution, the Biochemical Oxygen Demand (BOD) levels of 10 rivers (Bocaue, Anayan, Malaguit, Paniqui, Calapan, Iloilo,

Luyang, Sapangdaku, Cagayan de Oro and Balili) are already within standard and BOD levels of rivers have improved. However, waterways in major urban centers, especially *esteros*, are unfit for human activity, despite recent clean-up efforts. The cost of medical treatment and loss of income from water-borne diseases total PhP6.7 billion per year, according to a WB report (2007). At least six rivers in the NCR, Region 3 and Region 4-A fail in terms of both dissolved oxygen (DO) and Biological Oxygen Demand, namely: the Parañaque, San Juan, Marikina, Pasig, Meycauayan, and Ylang-Ylang rivers. The Supreme Court in December 2008 issued a continuing mandamus for the government to clean up the waterways, especially those emptying into Manila Bay, in order to improve

the water quality in the bay to “SB level”.¹

In Metro Manila, up to 58 percent of groundwater has been found to be contaminated with coliform.²

The problems posed by hazardous wastes are also beginning to be a priority concern due to the increasing number of large companies that generate wastes considered hazardous to health and the environment. Like most developing countries, the Philippines still has inadequate equipment and technical expertise to deal with these wastes despite steps to define the regulatory and enforcement responsibilities of various government agencies. Currently, the Philippines has no large-scale treatment and disposal facilities for hazardous wastes.

...solid waste remains a major source of pollutants

Uncontrolled dumping of raw sewage in coastal areas, particularly those that are thickly populated or used heavily by tourists, contributes to dangerous water contamination levels. The lack of point-source and nonpoint-source pollution controls are the main factors that contribute to the degradation of water quality in the Philippines.

The problem of solid waste disposal is most serious in urban centers, particularly Metro Manila, because of high population density, high consumption rates, and the concentration of packaged goods, and packaging materials, some of which are toxic and nonbiodegradable.³ The Philippines generates 30,000 tons of garbage per day. Metro Manila alone produces 8,000 tons per day, of which

only 70 percent is collected. For the whole country, only half of the garbage generated is collected. Uncollected garbage ends up mostly in rivers, *esteros*, and other water bodies, clogging the drainage system and leading to floods and the pollution of major water bodies.

Water is becoming scarcer...

The country is endowed with abundant water resources. It experiences an average annual rainfall of 2,400 mm. and has 421 river basins, of which 20 are major river basins ranging from 990 to 25,000 sq. km. The country's watersheds and aquifers, if fully functional, could supply 146 billion cubic meters (BCM) of water annually for domestic, industrial and agricultural uses. Total water availability is estimated at 126 BCM per year from surface water such as rivers or streams, and an estimated 20 BCM per year groundwater potential (NWRB 1998).

Although water is still abundant in certain areas, the country faces the threat of emerging water scarcity. Lack of urban planning, indiscriminate urban development, lack of investment in water, problems of water resource management, and the impact of climate change threaten water security and sustainability. Deforestation and lack of effective management of forest and freshwater ecosystems have led to the further deterioration of watersheds, limiting aquifer recharge and increases water runoff and soil erosion. Around 267 watersheds with a total area of 10.6 million hectares have been identified as needing immediate rehabilitation. These priority watersheds support national irrigation systems and are the major source of domestic water supply. Storage and distribution of water to deficient areas and proper water-resources management are also areas of concern.

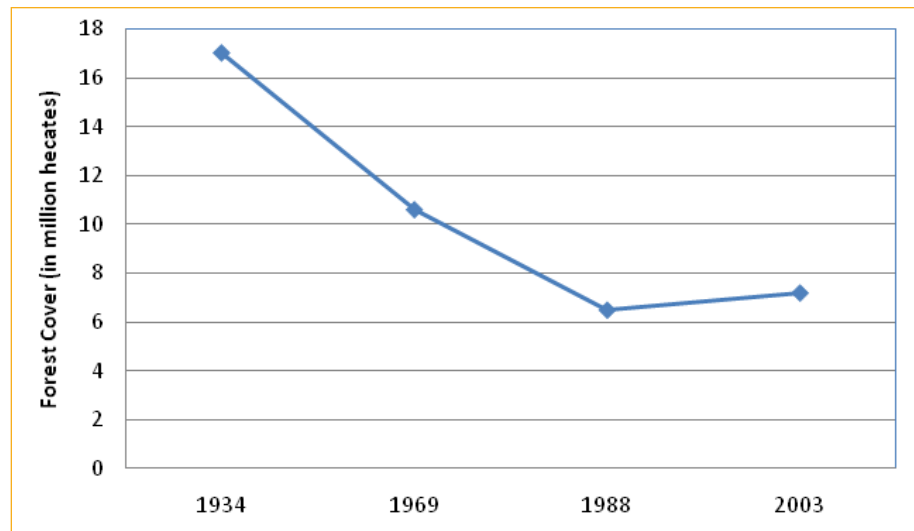
The Philippines generates 30,000 tons of garbage per day. Metro Manila alone produces 8,000 tons per day, of which only 70 percent is collected.

¹ SB-areas regularly used by the public for bathing, swimming, skin diving, etc.

² European Commission (EC), Country Environmental Profile, 2005.

³ DENR, National State of Brown Environment, 2009.

Figure 10.1 Philippine Forest Cover, 1934-2003



Source: World Bank (2009) and Forest Management Bureau (2010)

The quality of land resources has deteriorated steadily because of erosion, pollution and land conversion. Twenty-one percent of the country's agricultural lands and 36 percent of nonagricultural lands are moderately or severely eroded.

Increasing water demand has resulted in a number of regions and at least nine key urban centers experiencing water stress (NWRB 1998). These include Metro Manila, Metro Cebu, Davao, Baguio, Cagayan de Oro, Bacolod, Angeles, Iloilo, and Zamboanga. These highly urbanized cities rely mostly on groundwater for water supply, resulting in uncontrolled withdrawal from groundwater aquifers in recent years. Rapid and uncontrolled urban development has reduced aquifer recharge and has eventually resulted in the decline of groundwater levels as well as saltwater intrusion.

The 2010 Philippines' MDG Progress Report shows the proportion of the Philippine population with access to safe water has risen at a moderate rate, increasing from 73.8 percent in 1991 to 81.4 percent in 2008. If the trend continues, the 2015 target (86.9%) may be attainable. These favorable results, however, hide the fact that almost one in five (or 15.73 million) persons is still unable to access safe water despite abundant water resources.

...quality of farm land is deteriorating and forested lands are shrinking

The quality of land resources has deteriorated steadily because of erosion, pollution and land conversion. Twenty-one percent of the country's agricultural lands and 36 percent of nonagricultural lands are moderately or severely eroded.⁴ Soil erosion has affected the productivity of land, limited the rehabilitation or restoration of degraded lands, lowered the quality of surface water, and modified hydrologic conditions by changing land resources and land management. Moreover, the changing weather patterns have brought about prolonged droughts and excessive rains. Farmers have to endure lower yields and lower income from farming.

Of the country's total land area of 30 million hectares, 47 percent (14 million hectares) has been classified as alienable and disposable (A&D)

⁴ ADB, Country Environmental Analysis: Philippines, 2009

lands while 15.9 million hectares (52%) are classified as forestlands. Some 2.7 million hectares of total classified forestlands have been either established or considered as protected areas, making up a total of 238 protected areas. Of the 15.9 million hectares of forestland, only 6.43 million hectares or 41 percent were still forested in 2003, a significant decline from the 17 million hectares recorded in the 1930s.⁵ Figure 10.1 shows the decline in forest cover from 1934 to 2003.

An analysis of satellite-based maps elaborated by the EU's Joint Research Centre (JRC) in 2007 revealed that possibly, only 19 percent of the country's land area remains forested.

The main threats to Philippine forests come from the collection of fuel wood, settlements in forestlands, conversion to agricultural uses, *kaingin* and forest fires, and illegal logging. There are approximately 20 million people living in upland watershed areas, half of whom are dependent on shifting cultivation for their livelihood⁶. Inequitable land distribution, insecure tenure and rural poverty are often cited as causes of deforestation and forest degradation in the Philippines, linked to increases in rural populations both as a result of high fertility and in-migration⁷. Deforestation has made many poor communities more vulnerable to natural calamities such as typhoons, flash floods and landslides⁸.

The country's unique biodiversity is under severe pressure...

The Philippines is rich in biological and genetic resources or biodiversity and is one of the 18 megadiverse countries in the world. The majority of plant and animal species in the country are unique and cannot be found anywhere else. The country's species are among the world's top 10 in terms of endemism. Given the land density and the density of both flora and fauna, the Philippines may even be considered to be the world's most megadiverse country.

The country's forests and coastal and marine ecosystems, inland water bodies, wetlands and caves are also home to a wide variety of flora and fauna. The wetlands are home to one of the largest assemblies of microorganisms, reptiles, amphibians, fish, birds, and mammals that live within or near waters. Over 1,500 caves have been recorded in the country since 1994 with a significant number yet to be discovered and mapped. These caves are considered unique, natural and nonrenewable resources with important scientific, economic, educational, cultural, historical and aesthetic values.

Biodiversity in the Philippines, however, is also among the most endangered in the world. As of 2008, 221 species of fauna and 526 species of flora have been included in the list of threatened species. The continually increasing demands for food, energy, and other goods, coupled with the pressures exerted by rapid development and economic growth, have put much stress on the country's natural environment resulting in the destabilization of ecosystems, destruction of natural habitats and an alarming rate of biodiversity loss. The introduction of invasive alien species (IAS) has threatened biodiversity and destabilized ecosystems.

Located within the Coral Triangle, at the center of high marine diversity, the country's vast, rich and diverse coastal and marine resources are composed of coral reefs, sea grass beds, mangrove and beach forests, fisheries, invertebrates, seaweeds, marine mammals and many others.

⁵ DENR-FMB estimate based on 2003 satellite images

⁶ Cruz and Zosa-Feranil, 1998.

⁷ Kummer, 1992; Liche, 1997.

⁸ EC CEP, 2009

...coastal and marine resources are under threat

The Philippines has one of the world's longest coastlines, a total of 36,289 kilometers. The country's marine jurisdiction extends up to 200 nautical miles from the baseline (Exclusive Economic Zone) and up to the limits of the continental margin where it extends beyond 200 miles (Extended Continental Shelf). Located within the Coral Triangle, at the center of high marine diversity, the country's vast, rich and diverse coastal and marine resources are composed of coral reefs, sea grass beds, mangrove and beach forests, fisheries, invertebrates, seaweeds, marine mammals and many others. About 60 percent of the total Philippine population live in the coastal zones and depend on these coastal resources for livelihoods.

Some unsustainable human activities, however, cause great stress to coastal and marine resources. Coastal development and climate change impacts such as sea-level rise and increasing sea-surface temperature add to the stress on these resources. Sedimentation in coastal areas due to unsustainable land use in upland areas continues to threaten coastal ecosystems. The productivity of the country's coral reefs, mangrove forests, sea grass, and algal beds and fisheries is declining at an alarming rate. Of the 27,000 sq km. of coral reef, over 70 percent are of poor or fair quality and only five percent are in excellent condition.⁹ The Philippine reefs may already be in a steady state of decline from 5 percent to 3 percent to less than 1 percent (Nanola et. al., 2004). The country's coral reefs are considered to be one of the highly threatened reef areas in the world.¹⁰

Major distributions of seagrass beds in the Philippines are found in Bolinao

Bay in Luzon, Palawan, Cuyo Islands, the Cebu-Bohol-Siquijor area, Zamboanga, and Davao. About half of the country's seagrass beds have been lost due to coastline development and blast fishing. The mapping of seagrass bed distribution remains limited, and the management of seagrass resources has not received priority.

Mangroves protect the coast from waves, tidal currents, and typhoons and provide habitats, shelter, breeding sites, and food sources to various groups of fish and other coastal wildlife. The ecological functions of mangroves as land builder and coastline stabilizer are also widely known. Mangrove cover, however, has declined from 450,000 hectares in 1918 to only about 140,000 hectares in 2008.¹¹ The development of mangrove swamps into aquaculture ponds, salt beds, reclamation areas and other agricultural activities has extensively degraded this resource. A total of 62,834 hectares of mangrove forest area were issued Fishpond Lease Agreements (FLAs) between 1973 and 2002. Logging concessionaires generally have not left behind mother trees to replenish the area, and several cases of illegal logging cutting occur even in protected reserves.

... mineral resource development is delivering mixed results

The mining industry in the Philippines has rebounded due to the promotion and revitalization of responsible mining and recognition of the industry's possible contribution in inducing economic growth, attracting investments and reducing poverty in the countryside. Challenges remain on the emerging framework of

⁹ Gomez et. al., 1994.

¹⁰ Burke et al., 2002

¹¹ WB, 2009

responsible mining specifically on corporate accountability, voluntary compliance among companies and giving of due recognition to local autonomy and indigenous peoples' rights.

Of the country's 30 million hectares of land area, 9 million hectares (30%) is considered as having high mineral potential. Only 2.7 percent of this high-potential area is covered by mining permits or contracts and only 0.32 percent is in the development or operating stage. The mining industry's potential as a driver of economic growth has led to the revitalization of the sector in the last six years.¹²

As a result, investments in priority mineral exploration, development and processing projects from 2006-2009 have reached US\$2.2 billion, and the production of gold, copper, and nickel has also increased. Nickel production increased by 651 percent, buoyed by favorable prices, while copper production rose by 141 percent in the same period. The value of mineral production increased by 46.34 percent from PhP72.5 billion in 2006 to PhP106.1 billion in 2009. Mining contributed 1.3 percent to GDP, or a gross value added of PhP97.1 billion in 2009 (at current prices). With the expected operation of five metallic mines and one cement plant, output value is projected to increase by 30 percent to PhP138.5 billion in 2010. For the period 2006 to 2009, employment in mining and quarrying increased from 141,000 to 166,000 (0.50 %), while taxes, fees and royalties from the minerals industry rose by 93.7 percent, from PhP6.39 billion in 2006 to PhP12.38 billion in 2009.

Data show that the share of mining in GDP and employment is increasing and there are considerable potentials. However, target investments and excise tax from mining in 2004-2010 have not been fully achieved due to the financial crisis, among others. In addition, an assessment report of a mining project has indicated that the fair share of the government from mining has not been achieved due to the existing incentive mechanism.¹³ Issues have been also raised on sharing of the mining industry with regard to foreign companies as well as the undesirable environmental conditions which the Filipino communities will have to deal with.

In separate researches, it was found that mining permits or contracts were within half the number of titled and claimed ancestral domains.

A number of mining projects, however, have been alleged to have caused environmental degradations, physical displacement of indigenous peoples, and cultural dislocations. In 2005, a European Union (EU)-commissioned study reported that legal and illegal mining operations posed serious threat to the forest and to local rivers because of forest clearing and the release of toxins.¹⁴ Metallic mine waste generated from 1990 to 1999 amounted to 131 million metric tons (MT), while mine tailings were about 136 million MT.¹⁵ Many of these concerns stem from the failure of many small and large-scale mining companies to adhere to stringent, globally-defined standards for responsible mining.

Ensuring the equitable and just distribution of benefits from extracted mineral resources remains to be a challenge.

¹² DENR-MGB, Mining Industry Statistics, 2011

¹³ DENR, Assessment of the Rapu-Rapu Polymetallic Project, 2006.

¹⁴ EU, Commission Country Environment Profile, 2005

¹⁵ EU, Commission Country Environment Profile, 2005

The country's vulnerability to natural hazards cost the government an average of PhP15 billion annually in direct damages, or more than 0.5 percent of GDP. The indirect and secondary impact of disasters further increases this cost.

Currently, there is no standard resource and environment valuation. There is a need to have a cost-benefit analysis and standard parameters that will consider all relevant values (including nonmarket values).

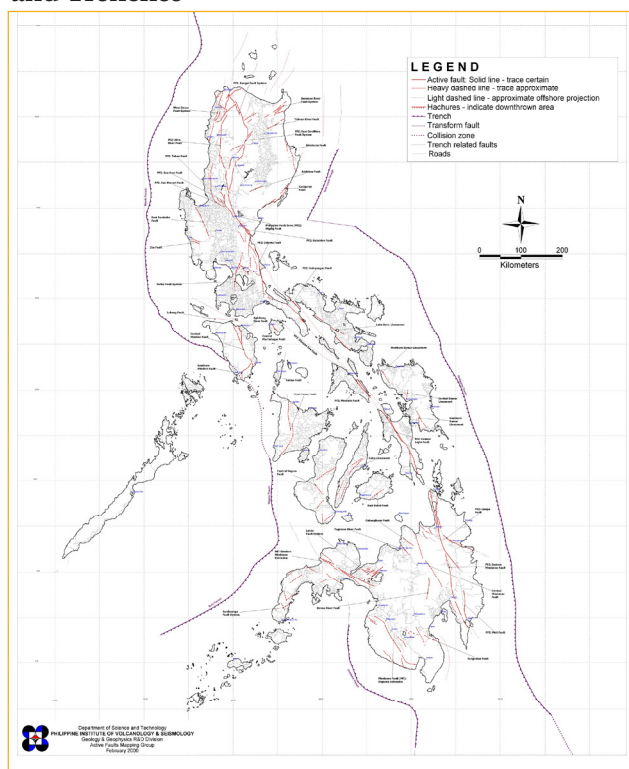
Extreme vulnerability to environmental hazards and climate-related risks...

Owing to its location and natural attributes, the country is prone or vulnerable to natural hazards such as tropical cyclones, floods, earthquakes and volcanic eruptions. Active faults and trenches line the country (Figure 10.2). The longest of these, the Philippine Fault, is one of the major active faults in the world. On the average, the Philippine Institute of Volcanology and Seismology (PHIVOLCS) records 20 earthquake occurrences every day, but damage is normally caused by shallow-focus

earthquakes with Magnitude 6 or more and when the associated ground shaking is at Intensity 6 or higher. The country has 300 volcanoes, of which 22 are active.

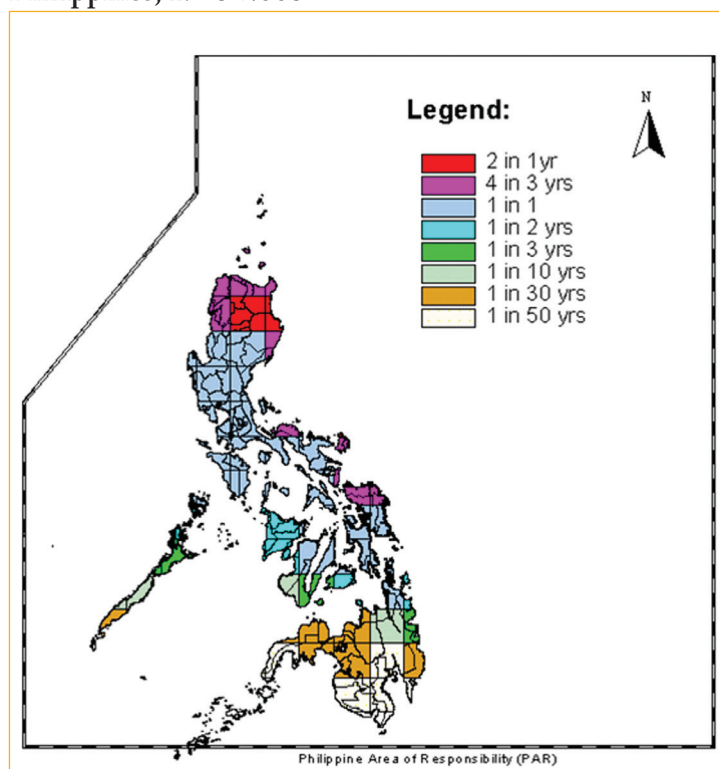
The country also lies along the typhoon belt of the Western North Pacific where 66 percent of tropical cyclones originate. About 20 tropical cyclones enter the Philippine Area of Responsibility (PAR) every year, of which seven to nine make a landfall. Tropical cyclone season is from May to December; peak months are July to September with an average of three or more occurrences. Their movements follow a northwesterly direction, frequently hitting northern Luzon and provinces in the eastern seaboard (Figure 10.3). Mindanao is usually spared from being directly hit by majority of the typhoons that cross the country.

Figure 10.2 Distribution of Active Faults and Trenches



Source: PHIVOLCS

Figure 10.3 Frequency of Tropical Cyclones in the Philippines, 1948-2006



Source: PAGASA

Table 10.1 Top 20 Provinces Susceptible to Floods

Provinces	Rank	Area Susceptible to Flooding (%)
Pampanga	1	79.5
Nueva Ecija	2	51.2
Pangasinan	3	48.1
Tarlac	4	47.1
Maguindanao	5	42.5
Bulacan	6	39.9
Metro Manila	7	33.2
Cotabato (North Cotabato)	8	30.1
Oriental Mindoro	9	28.7
Ilocos Norte	10	27.9
Iloilo	11	26.7
La Union	12	26.3
Cagayan	13	25.5
Sultan Kudarat	14	24.4
Ilocos Sur	15	23.4
Bataan	16	23.1
Leyte	17	20.8
Davao Del Norte/Compostela Valley	18	20.2
Compostela Valley/Davao Del Norte	19	20.2
Camarines Sur	20	19.2

Source: DENR-Mines and Geosciences Bureau (MGB), 2010.

Table 10.2 Top 20 Provinces Susceptible to Landslides

Rank	Provinces	Estimated Area Susceptible to Landslide (%)
1	Benguet	90.3
2	Mountain Province	87.1
3	Nueva Vizcaya	86.7
4	Kalinga/Apayao	84.7
5	Southern Leyte	82.6
6	Abra	82.1
7	Marinduque	78.6
8	Cebu	77.6
9	Catanduanes	77.4
10	Ifugao	77.3
11	Antique	74.5
12	La Union	74.4
13	Quirino	72.9
14	Batanes	71.5
15	Bukidnon	70.9
16	Davao Oriental	70.1
17	Samar (Western Samar)	68.9
18	Aurora	67.9
19	Ilocos Sur	67.4
20	Sarangani	67.0

Source: DENR-MGB, 2011

Data from the DENR-Mines and Geosciences Bureau (MGB) show that in eight provinces, at least 30 percent of provincial land area are susceptible to floods (Table 10.1). The same report shows 68 provinces are more susceptible to rain-induced landslides, affecting at least one-third of the total land area of each province (Table 10.1).

Aside from the direct impact of natural disasters on human lives, their properties,

and communities, disasters have also derailed social and economic development. A WB 2005 study reported that the country's vulnerability to natural hazards cost the government an average of PhP15 billion annually in direct damages, or more than 0.5 percent of GDP.¹⁶ The indirect and secondary impact of disasters has further increased this cost. This was surpassed in 2009 when typhoons Ondoy and Pepeng inflicted damage equivalent to 2.7 percent of GDP.¹⁷

¹⁶ WB, Natural Disaster Risk Management in the Philippines: Enhancing Poverty Alleviation through Disaster Reduction, 2005.

¹⁷ WB, Typhoons Ondoy and Pepeng Post-Disaster Needs Assessment, 2009.

Table 10.3 Hazard Susceptibility of Selected Provinces by Poverty Incidence

Province/Region	2006 Pov. Inc		Susceptibility to hazards (% of area)		Typhoon frequency
	%	Rank	Flood	RIL	
Tawi-Tawi	78.9	1	0.8	5.7	1 in 50 yrs
Zamboanga Del Norte	63.0	2	3.2	50.1	1 in 50 yrs
Maguindanao	62.0	3	42.5	23	1 in 50 yrs
Apayao	57.5	4	7.2	84.7	4 in 3 yrs
Surigao Del Norte	53.2	5	9.8	35	1 in 1 yr
Lanao Del Sur	52.5	6	7.6	41.4	1 in 30 yrs
Northern Samar	52.2	7	14.9	49.6	4 in 3 yrs
Masbate	51.0	8	5.7	28.8	1 in 1 yr
Abra	50.1	9	7.6	82.1	4 in 3 yrs
Misamis Occidental	48.8	10	3.5	50	1 in 30 yrs
Agusan Del Sur	48.7	11	15.3	51.4	1 in 10 yrs
Oriental Mindoro	47.1	12	28.7	54.6	1 in 1 yr
Sulu	46.5	13	no data	10.4	1 in 50 yrs
Occidental Mindoro	46.5	13	18.3	63.5	1 in 1 yr
Kalinga	45.8	15	7.2	84.7	2 in 1 yr
Surigao Del Sur	45.4	16	11.1	48.3	1 in 3 yrs
Mountain Province	45.0	17	0.8	87.1	2 in 1 yr
Sarangani	44.8	18	5.3	67	1 in 50 yrs
Lanao Del Norte	44.1	19	11.7	54.9	1 in 30 yrs
Negros Oriental	43.7	20	5.6	51	1 in 3 yrs
Sorsogon	43.5	21	13.7	47	4 in 3 yrs
Antique	43.0	22	13.6	74.5	1 in 2 yrs
Eastern Samar	42.7	23	8.5	62.1	4 in 3 yrs
Aklan	42.6	24	18.3	66.5	1 in 2 yrs
Romblon	41.9	25	10.7	58	1 in 1 yr
Camarines Sur	41.2	26	19.2	38	1 in 1 yr
Davao Oriental	40.8	27	7.9	70.1	1 in 30 yrs
Palawan	40.8	27	10.3	43.7	1 in 3 yrs
Marinduque	40.8	27	10.6	78.6	1 in 1 yr
Sultan Kudarat	40.7	30	24.4	52.1	1 in 50 yrs
Leyte	40.5	31	20.8	49.5	1 in 1 yr
Samar	40.2	32	6.2	68.9	1 in 1 yr

Sources: NSO, NSCB, MGB, PAGASA, UNDP

The degradation of the environment aggravates the impacts of disasters and climate change. Deforestation increases the chances of landslides. The risk of drought and poor availability of water are aggravated by the loss of forest cover.¹⁸ Depleted mangrove reserves deprive coastal communities of natural protection from storm surges. Uncontrolled urban growth coupled with poor land use planning results in encroachment on protected forests or danger zones like riverbanks. Together with shortfalls in basic services such as proper waste disposal and decent housing, these result in clogged waterways and increased flood risk.

Of the 32 provinces with poverty incidence of at least 40 percent, 16 are hit by typhoons at least once a year (Table 10.3). Provinces in extreme Northern Luzon (Apayao, Abra, Kalinga, and Mt. Province) and on the eastern seaboard (Surigao del Norte, Northern Samar, Masbate, Agusan del Sur, and Surigao del Sur), where typhoons are more frequent, are among the 20 poorest provinces.

Climate change has exacerbated these hazards. In the last six decades, the annual mean temperature has increased by about 0.57°C. Extreme events and severe climatic anomalies have been recorded, such as heat waves, intense rains and floods, droughts, and an increasing frequency of typhoons and tropical storms. The Department of Science and Technology-Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) scenarios for 2020 to 2050 project widespread warming in most parts of the country, with longer hot days and shorter cold days. The number of days

with maximum temperature in excess of 35°C is expected to increase in all parts of the country within the said period.¹⁹ Projected seasonal mean temperatures in the Philippines are expected to rise by about 0.5°C to 0.9°C for 2020 and 1.2°C to 2.0°C by 2050. Extreme rainfall is also projected to increase in Luzon and Visayas, while a decreasing trend is projected in Mindanao.

Challenges

Policy Responses

In line with RA 9003 or the Ecological Solid Waste Management Act of 2000, technical assistance was provided to 1,325 LGUs for the closure and rehabilitation of open or controlled dumps, while technical assistance for the establishment of sanitary landfills was extended to 236 LGUs. Despite closure orders and technical assistance, there were still 838 open dumpsites and 396 controlled disposable facilities that need to be closed or rehabilitated. Only 338 of 1,610 cities and municipalities (20.9%) have completed their solid waste management plans. In Metro Manila, only eight out of 17 cities and municipalities have complete plans.

Hazardous wastes have been an increasing concern because of the increasing number of transnational companies that generate hazardous wastes. A core inventory of 38,000 legally allowable substances under the Philippine Inventory of Chemicals and Chemical Substances (PICCS) has been prepared. The Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990 (RA 6969) already bans the consumption, storage or transport of toxic or nuclear waste into or within the country. However, the country lacks adequate

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¹⁸ OCD-NDCC, Strengthening Disaster Risk Reduction of the Philippines: Strategic National Action Plan (2009-2019)

¹⁹ MDGF-1656, PAGASA GCM Scenarios, 2010

A cost-benefit analysis is required that considers all relevant (including nonmarket) values pertinent to the project. While some case studies present examples of economic valuation of the environment and natural resources, other sectors contest the validity of the parameters used.

equipment and technical expertise to deal with these wastes, although steps are being taken to define the regulatory and enforcement responsibilities of various government agencies.

With respect to mining, several environmental safeguards and social development programs have been installed in mining projects, including the 97 Environmental Protection and Enhancement Program (EPEP), 23 Final Mine Rehabilitation and/or Decommissioning Program (FMR/DP), 387 Social Development Management Program (SDMP) and IEC Campaigns. Mining companies have committed to inculcate the following in their environmental and social programs:

- a. the implementation of some 400 approved five-year SDMPs for the host and neighboring communities amounting to PhP1.89 billion benefitting over 700 barangays nationwide;
- b. the implementation of environmental management and protection activities through the EPEP amounting to PhP25 billion and for mine closure through the FMR/DP worth PhP600 million;
- c. a mining forest program with 79 participating companies reforesting or afforesting 10,319 hectares of mine affected and nonmining disturbed areas with 9.3 million seedlings; and
- d. payment of royalties to indigenous peoples of at least PhP330 million between 2007-2009.

The assessment and rehabilitation of abandoned or inactive mines have also been started. The rehabilitation of Bagacay

Mines in Western Samar included the implementation of interim structural measures, phytoremediation and revegetation of disturbed areas. Rapid risk assessment of other abandoned and inactive mines has also been conducted by the following companies: Basay Mining Corp (Negros Oriental); Thanksgiving Mine-Benguet Exploration, Inc. (Benguet); Black Mountain (Benguet); Consolidated Mines, Inc. (Marinduque); Palawan Quicksilver Mines (Palawan); Western Mine Corp (Benguet); and Dizon Mines (Zambales).

While some case studies²⁰ present examples of economic valuation of the environment and natural resources, other sectors contest the validity of the parameters used. Issues of transparency have also cropped up, with some sectors and support groups pointing to difficulties in accessing information on mining contracts.

As for forest lands, approximately 78,000 hectares were reforested during the period 2004-2010 although this only 60 percent of the total target of 130,000 hectares. More than 14 million hectares of untenured forestlands have been protected. As of end of 2009, 41 of the 78 target provinces for forest boundary delineation²¹ have completed boundary surveys. Seventeen of these are ready for legislation. A total of 336 municipalities were also covered by public land survey (partial cadastre only) while 770,835 hectares were covered by patents issued from 2004 to 2010. As of 2010, both government and nongovernment sectors reforested a total of 1,958,928 hectares²². The government, through projects of the DENR, contributed a total of 1,368,645 hectares or 70 percent,

²⁰ Galang, Angelina P., *The Philippine Environment in the Ecozoic Age*, 2009.

²¹ The delineation of forestland boundary is the first and an important step in the management of the country's forest areas. Section 4, Article 12 of the Constitution provides that the congress, shall, as soon as possible, determine by law the specific limits of forest lands and national parks marking clearly their boundaries on the ground.

²² DENR-Forest and Management Bureau

while the nongovernment sector accomplished 590,283 hectares or 30 percent. As of 2010, approximately 11.6 million hectares of forestlands were covered by some form of community forest management under various government programs (Table 10.4). Despite the rise in the distributed number of these tenurial instruments, few protected areas have been declared, while deforestation continues.²³

Biodiversity conservation and protection measures have been taken in the form of cave and wetland management, proclamation of protected areas and critical habitats, and establishment of protected areas and zones. An Updated National Wetlands Action Plan for the Philippines (NWAPP) to be implemented from 2011-2016 has been prepared. RA 9072, otherwise known as the National Caves and Cave Resources Management and Protection Act of 2001, provides the backbone for managing and protecting caves in the country. The DENR Memorandum Circular 2007-04 or the Procedure in Cave Classification has been issued to assess the status and values associated with a particular cave and assign its most beneficial use. A Cave Strategic Action Plan has been developed with cave stakeholders for implementation within the period 2011-2016 to guide the priority actions on cave management and conservation.

Biodiversity protection has been expanded and intensified. A total of 111 protected areas (terrestrial and marine) have been proclaimed since the passage of the National Integrated Protected Areas System

Table 10.4 Forest Tenurial Instruments Implemented

No.	LTI Type	Number/ ^a	Area (has)
1	Timber License Agreement	4	252,510
2	Integrated Forest Management Agreement	145	1,017,654
3	Socialized Industrial Forest Management Agreement	1,822	36,941
4	Agroforestry Farm Lease Agreements	17	4,776
5	Tree Farm Lease Agreement	88	9,742
6	Forestland Grazing Management Agreement	364	97,019
7	Special Land Use Permit	198	2,063
8	Special Land Use Lease Agreement	18	98
9	Forest Land Use Agreements for Tourism Purposes	31	967
10	Special Forest Land Use Agreement	11	2,580
11	Community-Based Forest Management Program CBFM Agreement Other CBFM Tenure	1,790 3,314	1,633,892 3,200,024
12	Approved CADT and CALT	414	4,276,639
13	PACBRMA	58	22,240
14	Areas under Management Arrangements Philippine National Oil Corporation National Power Corporation National Irrigation Administration Co-Management Agreement with LGUs	153	266,326 337,721 22,243 485,536
TOTAL		8,427	11,668,974

(Footnotes)

^a Accumulated from the start of the implementation of each tenurial instrument.
Source: DENR- Forest Management Bureau (2010)

(NIPAS) Act in 1992, covering 3.53 million hectares. Terrestrial areas cover 2.16 million hectares or 7.2 percent of the land area, and marine areas cover 1.371 million hectares or 0.69 percent of the total sea area of the country. Of these, 13 protected areas covering 894,262.16 hectares have been established through specific laws, namely: (a) Batanes Protected Seascape, (b) Northern Sierra Madre in Isabela, (c) Bangan Hill National Park in Isabela, (d) Mts.

²³ Caucus of Development NGO Networks (CODE-NGO), The Freedom from Debt Coalition (FDC) and United Nations Development Program (UNDP). Citizen's Roadmap for Poverty REDuction and Achieving the MDGs, Recommendations for the 2010-2016 MTPDP, and Kalikasan People's Network for the Environment. Philippine Environmental Situation 2001-2009.

The Philippines passed the Climate Change Act of 2009 (RA 9729) to incorporate climate change in government policy formulation and establish the framework strategy for climate change. The National Framework Strategy on Climate Change was formulated in 2010 to ensure and strengthen the adaptation of the country's natural ecosystems and human communities to climate change, charting a cleaner development path for the country in the process. This is reinforced by the enactment of RA 10121, the Philippine Disaster Risk Reduction and Management Act of 2010.

Box 10.1 Women and the Environment and Natural Resources

Women, especially the poor, are most vulnerable to changing environmental conditions and economic shifts. The roles of women in the management of the environment and natural resources management have not been duly recognized. Women's initiatives that include establishment of women-managed areas illustrate women's enhanced role in effective implementation of coastal resources management. Yet, women are still less recognized particularly in existing policies. One of the critical challenges is the implementation of the Magna Carta of Women (RA 9710), of which an increase in the number of women participating in Fisheries and Aquatic Resources Management Councils and other bodies are mandated. In terms of access to productive resources, women enjoy less benefits than their male counterparts. There is differential access among men and women to forest resources. DENR data in 2002/2003 show that women beneficiaries make up only 30 percent of the total holder of community-based forest management agreements (CBFMAs).

Source: Philippine Council for Women and Women Network of Aksyon Klima, 2010

Banahaw-San Cristobal in Quezon and Laguna, (e) Tubbataha Reefs in Palawan, (f) Mt. Kanlaon and Sagay in Central Visayas, (h) Mt. Malindang, Misamis; (i) Mt. Mimbilisan, Misamis, (j) Mt. Apo, Davao, (k) Mt. Hamiguitan Range, Davao, (l) Mt. Kitanglad, Bukidnon. There are also protected areas outside the NIPAS such as those proclaimed by LGUs and People's Organizations (PO). Unfortunately, most of these protected areas do not have sufficient budgets, staff or capacity for effective self-management.

The operating policies and strategies for these laws are provided in various issuances. EO 578 established the national policy for protecting, conserving and sustainably utilizing biological diversity. It also revitalized the management of rich fishing grounds like the Sulu-Celebes Seas and Verde Island Passage, which are considered the center of marine shore fish diversity in the world. The Philippines has signed an agreement with Indonesia, Malaysia, Papua New Guinea, Solomon Islands and Timor Leste on the protection and sustainable management of the Coral Triangle. Through EO 533, the government adopted integrated coastal

management as a national strategy to ensure the sustainable development of the country's coastal and marine resources. The protection of the whale shark has been intensified with the issuance of AO 282 (March 16, 2010), providing for the following added protection for whale sharks: mapping of their migratory pathways, mandatory rescue, intensified investigation and prosecution, and provision of rewards. EO 797, on the other hand, adopts the Coral Triangle National Plan of Action, which contributes to the attainment of the goals and targets agreed by the six Coral Triangle countries under the Regional Plan of Action. During the Ministerial Meeting held in the Solomon Islands in December 2009, the six countries officially recognized the Sulu-Sulawesi Marine Ecoregion as the First Priority Seascape under the Coral Triangle Initiative-Regional Plan of Action.

These initiatives have contributed to the protection and conservation of threatened species and their habitats. Among others, the tamaraw population in the wild has increased

from 187 in 2001 to 314 heads in 2010. In 1999, only about 20 cockatoos were observed in the wild; at present about 239 cockatoos have been recorded in Raza Island, Palawan alone. To date, 48 new species of plants and animals have been discovered in the Philippines, including new species of bats, birds, rodents, frogs, and *rafflesia* (world's largest flower). The new species were discovered in the mountains of Cagayan, Camiguin, Cordilleras, Quezon, Palawan, Mindoro, among other places.

Various actions have been taken to address threats to coastal resources. Several initiatives led to the establishment of marine protected areas (MPAs) covering around 22,540 sq km. Of more than 1300 existing and proposed MPAs, however, only 10-15 percent are effective. Many MPAs are either unmanaged or nonfunctioning. Sixty percent are located in the Visayas Seas region, in the most heavily-fished waters in the country. It is estimated that 4.9 percent of coastal municipal waters are protected as MPAs, but only 0.5 percent are within no-take areas. One study shows that marine corridors are also not well represented by the current MPAs.²⁴ Four of the nine identified corridors (namely, Babuyan Corridor, Mindoro-Calavite Tablas Triangle, Balabac Strait Corridor, Sibutu Passage-Sulu Archipelago Corridor, Ticao Pass-San Bernardino Strait-Samar Sea Corridor, Panay Gulf Guimaras Strait Corridor, Philippine Sea Corridor and Tapiantana Corridor) have designated no MPAs. This implies that the development of MPAs has largely been dominated by local initiatives rather than through

a national strategy. Small MPAs are unlikely to provide protection for larger, more mobile species²⁵ and contribute little to regional conservation objectives. Smaller MPAs must therefore be scaled up to become MPA networks and made resilient to climate change by developing or redesigning them into “climate-smart” MPAs.

Effective and sustained enforcement of fishery and relevant environmental laws have also been a major challenge. There are notable achievements in community-based law enforcement by local *Bantay-Dagat* groups and networks in Verde Island Passage and in the Visayas, working as composite teams in cooperation with enforcement agencies and LGUs. Still there is an urgent need to strengthen, expand, replicate, and sustain these successful interventions.

As long as coastal resources continue to be threatened by both human-induced and natural disasters, the poor, particularly women, who are dependent on these ecosystems for their subsistence will likewise be further disadvantaged (Box 10.1).

To deal with disasters and extreme events, the country has adopted legislation and policy dealing with DRRM and CCA. Since the signing of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, the country has passed several laws and localized various international environmental commitments. Its policy responses have evolved from approaches focusing on greenhouse gas emissions to one that integrates mitigation and adaptation in practically all sectors. Its policy and institutional reforms are implemented through broad-based platforms on sustainable development

²⁴ Weeks, R; Russ, GT; Alcala, AC; White, AT. Effectiveness of Marine Protected Areas in the Philippines for Biodiversity Conservation. Conservation Biology, Volume 24 Issue 2 p. 531-540. April 2010

²⁵ Sale, PF, et al, 2005. Critical science gaps impede use of no-take fishery reserves. Trends in Ecology & Evolution 20:74-80.

Box 10.2 Environmental Education

In 2008, the Philippines enacted RA 9512 or the “National Environmental Awareness and Education Act of 2008”. This legislation concretized the country’s support to the United Nations Decade of Education for Sustainable Development (2005-2014) and the ASEAN Environmental Education Action Plan for Sustainable Development (2008-2012). This law has reiterated the policy of the State to protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature. The law has further recognized the vital role of the youth in nation building, and the role of education to foster patriotism and nationalism, accelerate social progress and provide total human liberation and development.

In the DENR, the Environmental Education and Information Division (EEID) and the 16 Regional Environmental Education and Information Sections of the EMB has been the agency’s lead arm in creating environmental awareness. It has spearheaded year-round environmental events from World Water Day (March 22) and Philippine Water Week (third week of March), International Earth Day (April 22), Philippine Earth Month (April), World Environment Day (June 5), Philippine Environment Month (June), National Clean Up Month, and National Ozone Protection (September), International Ozone Day (September 16), International Coastal Clean Up Weekend (third weekend of September), National Clean Air Month, and National Environmental Awareness Month (November), Global Warming and Climate Change Consciousness Week (November 19-24).

EEID’s activities which include distribution of IEC materials, recyclables collection, tree planting and environmental exhibits have contributed to the increasing awareness of Filipinos in caring for the environment and natural resources of the country.

Source: DENR-EMB, 2009

such as multisector national plans and strategies, and special environmental management agenda. The Philippines passed the Climate Change Act of 2009 (RA 9729) to incorporate climate change in government policy formulation and establish the framework strategy for climate change. The National Framework Strategy on Climate Change was formulated in 2010 to ensure and strengthen the adaptation of the country’s natural ecosystems and human communities to climate change, charting a cleaner development path for the country in the process. This is reinforced by the enactment of RA 10121, the

Philippine Disaster Risk Reduction and Management Act of 2010.

The National Disaster Risk Reduction and Management Council (formerly NDCC) has been given the mandate to protect the wellbeing of people and safeguard the national economy and environment through more concrete financial investment in DRR. This paradigm shift is also in consonance with the country’s international commitment to the Hyogo Framework for Action (HFA) of 2005, which seeks to build the resilience of nations and communities in the face of disasters. The National DRRM Framework and Plan utilizes the multihazard approach in managing the impact of natural and human-induced disasters. It calls for building the disaster resilience of communities and institutionalizing arrangements and measures for reducing disaster risks, and enhancing disaster-preparedness and response capabilities at all levels. Since DRR is closely linked to poverty alleviation and development, it is necessary to link it firmly to development planning at all levels.

Before the passage of RA 10121, the government already initiated the development of a long-term master plan for disaster mitigation known as the Strategic National Action Plan on DRR or SNAP. This document proactively serves as a road map for the next 10 years and was formulated through an inclusive participatory process of all stakeholders. SNAP was approved on June 17, 2010 through EO 888 (Adopting the SNAP on DRR). EO 888 explicitly adopts the 18 priority programs/projects on DRR and identified agencies with primary responsibility. The consistency of SNAP with RA 10121 however still has to be reviewed and reevaluated.

The GAA allocates specific amounts annually (PhP5 billion in 2011) for the calamity fund, for use in aid, relief and rehabilitation services to communities or areas affected by man-made and natural calamities, repair and reconstruction of permanent structures, including other capital expenditures for disaster operation, and rehabilitation activities, although it has a special provision allowing its use for predisaster activities. On the other hand, Section 22 of the Philippine DRRM Act of 2010 (RA 10121) also enumerates permissible uses of the annual calamity fund, generally allowing support for a wider range of activities. There is a need to reconcile differences and arrive at a common interpretation of what DRR measures can be charged against the calamity fund. Moreover, a big financing gap exists between the annual budget reserve of government for calamities (average of PhP2 billion a year) and the damage typically incurred in times of disasters.

Risk transfer mechanisms such as microinsurance/finance, although available, need to be made more accessible. Health insurance is also being made more widely accessible, but the uptake by poor rural communities, which are the most affected in terms of disaster, remains low.²⁶

The government has initiated various programs and projects to provide more up-to-date scientific and technical information and data scales to be used in decision making. The DENR- Ecosystems Research and Development Bureau (ERDB) has completed vulnerability assessments of 43 priority watersheds nationwide with the aim of highlighting areas vulnerable to soil erosion, landslide, biodiversity loss, and forest fire. Such information is critical for LGUs

Box 10.3 Devolution of ENR Functions

The Local Government Code of 1991 placed LGUs at the forefront of environment and natural resources management. According to the League of Municipalities of the Philippines (LMP), the following ENR functions were devolved to LGUs in 2005:

- a. Regulation of environmental impacts of SMEs under *Kalakalan* 20 Law;
- b. Regulation of fishing in municipal waters;
- c. Regulation of minor mineral extraction like small-scale mining and certain scales of quarrying and sand and gravel gathering;
- d. Regulation of nuisance and pollution under the Clean Air Act;
- e. Solid waste management under the Ecological Solid Waste Management Act; and
- f. Antismoke belching program.

Likewise, the Code assigns municipalities the task of establishing a solid waste disposal system or environmental management system and services or facilities related to general hygiene and sanitation. Meanwhile, provinces are tasked to enforce forestry laws limited to community-based forestry projects, pollution control law, small-scale mining law, and other laws on the protection of the environment; and minihydro electric projects for local purposes.

Source: WB Country Environmental Analysis, 2009

in the development of their disaster risk management programs, their local climate change action plans and in the formulation of their land use plans. Vulnerability assessments, adaptation tools and downscaling climate change scenarios and projections are being developed to equip decision makers and planners on how to adapt to climate change and disasters. IEC campaign materials and knowledge management products are also being created to increase public awareness of climate change, its impacts and attendant risks, and DRR.

²⁶ SNC

For CCA, putting in place adaptation measures also requires financial resources. The Philippines continues to uphold the UNFCCC principle of common and differentiated responsibilities to hold on to the agreement that Annex I countries will extend financial assistance over and above the level of development assistance. Developed countries are required under the Convention to provide new and additional resources, either through bilateral, multilateral or regional funding mechanisms, to meet the agreed costs of developing countries in complying with their obligations as well. The country, however, cannot be dependent on these funds.

Institutional Issues

Despite government efforts at sustainably managing the country's environment and natural resources, environmental degradation continues. The plethora of laws and policies, as well as the established agencies to manage, protect, and preserve the country's environment and natural resources have not sufficed or worked effectively enough to address the threats to ecological integrity. Institutional issues need to be addressed to ensure the sustainability of the country's fragile environment and natural resources. Policies, programs and existing institutional arrangements must be revisited in order to move forward and deliver the promise of sustainable development.

Implementation is confused by overlapping and conflicting policies

There is a need to review and harmonize a number of conflicting and overlapping policies. A case of policy conflict is that between forest protection laws, on the one hand, and the Agriculture and Fisheries Modernization Act (AFMA), on the other. AFMA encourages agriculture expansion into the uplands including forestlands through the creation of Strategic Agriculture and Fisheries Development Zone (SAFDZs) that promote the production of high value crops such as coconut, pineapple and sugarcane. While there is a need to improve the income of upland farmers, the identification of suitable upland areas for commercial high-value crop production should be given priority and closely undertaken together with DENR to avoid onsite and offsite negative externalities. The NIPAS Act is also in conflict with the Fishery Code on the municipal water income of municipalities within protected areas, as well as the LGC on the matter of the jurisdiction of LGUs within protected areas. Conflicts also exist

in the implementation of various laws such as the Mining Act, NIPAS Act, IPRA and the LGC, among others. These conflicts, overlaps, or divergent interpretations have led to the delay or suspension of some projects.

Government capacity for resource management is wanting

Overlapping jurisdictions. Due to the large number of players in the environment and natural resources sector, governance issues are inevitable. In some instances, conflicts arise between national and local governments in terms of the protection and utilization of natural resources. This is apparent when LGUs initiate the reversion of abandoned fishponds, while it is the DENR who should lead the process, following the Philippine Fisheries Code of 1998 and several joint administrative orders. Another concern is the national-local conflicts in mining projects, specifically when LGUs pass local legislation rejecting or opposing the entry or expansion of large-scale mining projects. This contravenes the DOJ opinion that local ordinances cannot undo a law and should not run counter to national policy; DENR memoranda also order its regional offices to continue implementing their mandate.²⁷

To ensure compliance in incorporating CCA and DRRM management in the development process, the roles of agencies and their respective mandates as provided by law must converge and synchronize. The Climate Change Act and the Philippine DRRM Act of 2010 are significant strides to include climate change and DRR management in the planning process. Sectoral plans, including the Environment and Natural Resources Framework Plan, must be updated to include these concerns.

²⁷ DOJ Opinion No. 8, Series of 2005

Technical expertise. Environment and natural resources management requires a skilled and competent workforce to implement professional standards of operation in environment, but technical experts and trained personnel at the national and local levels are in short supply. Some implementing agencies have the capacity to implement provisions of environment and natural resources laws requiring the application of new and sophisticated technologies (e.g., highly technical LAMTM technologies – geographic information system (GIS), global positioning system (GPS), valuation, databases and online connectivity of information systems). Still others, however, particularly LGUs, still have to develop the competence to implement their mandated tasks and to properly assume environment and natural resources functions.

Information systems. Integrated, updated and quality information for ENR and climate change is necessary for planning, management and decision making. The lack of a participatory and science-based baseline data creates discrepancies that can cause uncertainty and lead to serious errors in carrying out the policy and planning functions of ENR stakeholders.

A better system for gathering, processing, storing, and sharing information needs to be put in place. The DENR is currently implementing the Information Systems Strategic Plan (ISSP) which aims to provide a coherent, integrated and decentralized set of data to every office, making information to stakeholders available anytime. ISSP also aims to develop information systems that will address the integration, collaboration and

consolidation of data/information to deliver quality and timely statistics in spatial and digital form. (Box 10.2 summarizes current government efforts on environmental education.)

Enforcement of environmental laws and policies is inadequate

Full and effective implementation of environmental laws, policies and programs continues to be a challenge. Governance issues, including corruption, are among the reasons for low compliance in these laws. The incomplete devolution of mandates to LGUs has also hampered their full implementation (see Box 10.3 for devolved functions). A DILG-commissioned study in 2005²⁸ called the state of environment and natural resource devolution “partial and at worst, minuscule and insignificant”. Devolved functions were mainly peripheral, unattractive to private investors, and were costly to perform. Among these functions were watershed regulation, greenbelt and treepark development, farmer-level integrated social forestry, and small-scale mining, all of which do not attract significant investments from the private sector or are limited to certain LGUs. The control of smoke-belching vehicles, the management of solid wastes, and coastal zone regulation and protection are devolved functions requiring substantial investments from LGUs. In 2007, ADB also commissioned a study on the devolution of DENR functions, to help identify responsibilities in the Integrated Coastal Resources Management Project (ICRMP). The study pointed out the institutional weaknesses in most of the 206 Protected Area Management Boards (PAMBs) revealed by a 2003 UNDP study. Of these PAMBs, only five were fully constituted boards backed by specific laws; the rest became interim boards.²⁹

²⁸ DILG/ADB, 2005. Local Government Financing and Budget Reform.

²⁹ ADB, Country Environmental Analysis, 2008.

In order to improve the conservation, protection, and rehabilitation of the country's natural resources, the sector shall pursue their sustainable use and integrated management. Natural resources management activities shall be directed at enhancing the state of the different ecosystems and the natural resources within them to provide resource-dependent communities with sustainable livelihoods.

Contributing to poor enforcement and compliance is the lack of knowledge of environmental laws, policies, and programs among LGUs, specifically in communities or barangays. There are still rural communities which depend on resource extraction for their livelihood. Relevant environmental laws, specifically those regulating the utilization of natural resources, e.g., NIPAS, Wildlife Act, etc. are poorly implemented. There is a need to intensify information and advocacy campaigns on existing environmental laws and policies among communities.

Absence of a financing strategy for environment and natural resources programs and CCA

Government programs are hobbled by financial constraints. Funding support for watershed management has been insufficient to cover all important watersheds. It will take 280 years to reforest given the average budget allocation of about PhP300 million for reforestation in the past 10 years.³⁰ Thus, more funds should be allocated, to prioritize watersheds that support irrigated lands. The implementation of National Sewerage and Septage Management Program by the DPWH has also been slow due to lack of funds to meet the large investment needed for infrastructure development.

As for CCA, putting in place adaptation measures also requires financial resources. The Philippines continues to uphold the UNFCCC principle of common and differentiated responsibilities to hold on to the agreement that Annex I countries will extend financial assistance over and above the level of development assistance. Developed countries are required under the Convention to provide new and additional resources, either through bilateral, multilateral or regional funding mechanisms, to meet the agreed costs of developing countries in complying with

their obligations as well. The country, however, cannot be dependent on these funds.

The National Environmental Economic and Development Study (NEEDS) 2010 on the inventory of financial flows showed that grants to the environment, agriculture, biodiversity, energy, CCA, health, and water supply and sanitation address only a given problem or requirement, like solid waste management, resource conservation, production constraints, biodiversity loss, Greenhouse Gas (GHG) emissions, institutional capacity, outbreak of infectious diseases, and water shortages. The grants received have moreover been limited in scope and geographic coverage. The restricted project scale, for instance, could be seen in an integrated area project covering at most only one or few cities or municipalities, a watershed or ecosystem, or of a nationwide scale but focused only on a few provinces or interregional areas. Limited geographical coverage result in project benefits being confined to particular area niches, a project piloting mode of introducing change, an inability to scale up, and turfing among country donors and multilateral agencies (EMB-DENR, 2010).

The NEEDS study concluded the budgetary resources set aside by the Philippine Government for CCA have been inadequate. The larger budgetary share of disaster management from 2003 to 2008 did not represent proactive efforts to mitigate the expected damages and risks from natural disasters but merely reflected the postdisaster relief and rehabilitation expenditures.

The budget for DRR, particularly those appropriated as Calamity Fund in the GAA, still reflects the response-oriented

³⁰ DENR-FMB

perspective of traditional disaster management. The DRRM Act (RA 10121) already explicitly provides for the change in the nature of the calamity fund making it more appropriate for DRR use as the NDRRMF. Government budget allocations for DRR should be clearly delineated so that aid from international financial institutions can be directed to where it is really needed. It is also critical to determine the extent and manner of obtaining funding from other stakeholders and partners in order to finance DRR activities, especially costly structural measures.

While good results from DRR projects and activities have provided opportunities for sound practices to take root, existing organizational and societal structures do not necessarily allow positive values to thrive. Sustaining mechanisms such as making DRR a regular budget item, strengthening PPP, creating incentives for disaster risk-reducing behaviour, recognizing and replicating best practice, instilling risk awareness at all levels of government, in households, firms and workplaces should be part of a general strategic plan.

The inadequacy of financing for the enforcement of laws and policies is an important continuing concern. Several studies and initiatives have been undertaken to measure the costs of user's activities on natural resources, assessing the feasibility of generating funds for their management. ENR agencies however continue to rely largely on administrative services for regulation rather than on market-based instruments.

Strategic Framework

Consistent with Philippine Agenda 21 and its enhanced version and the country's commitments to multilateral environmental agreements, the Environment and Natural Resource Sector shall pursue the following goals and strategies:

Goal 1. Improved Conservation, Protection and Rehabilitation of Natural Resources

In order to improve the conservation, protection, and rehabilitation of the country's natural resources, the sector shall pursue their sustainable use and integrated management. Natural resources management activities shall be directed at enhancing the state of the different ecosystems and the natural resources within them to provide resource-dependent communities with sustainable livelihoods. Priority shall be given to the implementation of national action plans on forest, biodiversity, coastal and marine resources and wetlands. Mechanisms and policies will be pursued to rationalize the use of the country's land and mineral resources. In line with the National Framework Strategy on Climate Change, integrated ecosystem-based management will continue to be adopted as a major strategy for sustainable natural resource management as well as a means to adapt to climate change scenarios. As a safeguard for all undertakings with a potential impact on the environment and natural resources, a mechanism for third party cost-benefit analysis³¹ and monitoring shall be enforced that takes environmental and social costs and benefits into account.

The PNRPS aims to empower forestland managers and support groups that sustainably and equitably managing forestlands and ancestral domains with enhanced carbon stock and reduced greenhouse gasses emission. Besides reducing forest degradation and deforestation, the strategy alleviates poverty, conserves biodiversity, and improves governance.

³¹ WB, 2009

PES is a mechanism in environment and natural resources management that corrects the flaw in current economic system whereby the users of ecosystem/environment services are made to pay the managers.

Sustainably manage forests and watersheds

Targeting to have 15 million hectares of forested land, 50 percent of which may be production forest, the following will be implemented to increase forest cover by 600,000 hectares by 2016;

a. Continue and enhance the protection of forest and reforested areas (especially in critical watersheds) and sustain the productivity of agroforestry areas:

- Manage, protect, and develop natural forest, established plantation, and economically important nontimber forest products and species;
- Encourage communities to enhance protection and sustain productivity of reforestation areas and upland areas for livelihood and poverty alleviation;
- Transform open, denuded and degraded areas into protection forests and/or economically-productive assets; and
- Encourage communities to develop multipurpose forests in open, denuded and degraded areas;

b. Complete the delineation of forestland boundaries and develop plans for forest land use and watershed management:

- Delineate and assess forestland boundaries and push for the enactment of relevant bills, placing all untenured /open access areas under management regimes;
- Carry out collaborative watershed management planning cum vulnerability assessment

and implementation among DENR, LGUs and other watershed stakeholders towards responsible forest management; and

- Develop a portfolio approach for forest investment in collaboration with the LGUs and the National Commission on Indigenous Peoples (NCIP), which shall jointly prepare a forest land use plan identifying areas for protection and areas for investment and provide the necessary permits and clearances prior to development;

c. Improve baseline information, and conduct valuation and accounting of forest resources:

- Conduct monitoring and evaluation using common criteria and indicators, third-party monitoring, and forest certification, among others; and
- Strengthen the decision-support system through an inventory of forest resources, baseline data generation and GIS mapping, and forest valuation and natural resource accounting;

d. Implement the Philippine National REDD³² + Strategy (PNRPS). The PNRPS aims to empower forestland managers and support groups that sustainably and equitably manage forestlands and ancestral domains with enhanced carbon stock and reduced greenhouse gasses emission. Besides reducing forest degradation and deforestation, the strategy alleviates poverty, conserves biodiversity, and improves governance.

³² REDD is an acronym for Reducing Emissions from Degradation and Deforestation.

Improve protection and conservation of biodiversity

a. Conserve, preserve, and manage protected areas, wildlife, and their habitats:

- Assess the effectiveness of management and implement adaptive management in all protected areas proclaimed under the NIPAS;

- Establish and manage critical habitats to reduce habitat loss and enhance ecosystem services that play important roles in addressing climate change impacts;

- Establish and effectively manage additional protected areas focused on identified KBAs through Presidential Proclamation to sustain ecological goods and services of the area;

- Strengthen management of protected areas in partnership with local communities through issuance of security of tenure and provision of alternative livelihood;

- Manage significant caves for their socioeconomic and ecological values;

- Rehabilitation of important habitats such as wetlands; and

- Facilitation of significant increases in the population threatened and endangered species;

b. Prepare protected area management plan incorporating vulnerability and adaptability of the sector to disaster risk and climate change

- Complete the boundary delineation and demarcation of protected areas;

- Preparation/ updating of management plan for protected areas and ecologically important habitats to include CCA; and

- Manage priority wetlands for food production, water conservation and disaster mitigation;

c. In protected areas, institute and operationalize the concept of Payment for Environmental Services (PES). PES is a mechanism in environment and natural resources management that corrects the flaw in current economic system whereby the users of ecosystem/ environment services are made to pay the ENR managers;³³

d. Continue implementing international commitments on biodiversity conservation, protection and rehabilitation:

- Implement EO 514 (Establishing the National Biosafety Framework, Prescribing Guidelines for its Implementation, Strengthening the National Committee of the Biosafety of the Philippines, and for Other Purposes) particularly the provisions on environmental and health risk assessment in the field-testing and regulated propagation of genetically-modified organisms (GMO) following the precautionary principle;

- Implement the Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from their Utilization (e.g., capacity building and formulation of relevant policies); and

- Implement the Updated National Wetland Action Plan for the Philippines (NWAPP) as part of

³³ Memorandum of Understanding on PES, 2010

the country's commitment to the Convention on Wetlands or Ramsar Convention.

Enhance coastal and marine resources management

a. Develop and implement the national integrated coastal management (ICM) program to include principles, strategies and action plans in accord with EO 533 (Adopting Integrated Coastal Management as a National Strategy to Ensure the Sustainable Development of the Country's Coastal and Marine Environment and Resources and Establishing Supporting Mechanisms for Its Implementation);

b. Prioritize the protection and management of mangroves, sea grasses, coral reefs and beaches as a management unit to derive maximum benefits resulting in synergistic interactions of these four ecosystems that enhance marine productivity;

c. Apply the ecosystem approach to the management of fisheries and other marine resources, addressing transboundary policy and regulatory concerns;

d. Evaluate management effectiveness of all MPAs proclaimed under NIPAS;

e. Implement the Coral Triangle Initiative National Plan of Action and the Sulu-Sulawesi Marine Ecoregion (SSME) Conservation Plan which includes designating priority seascapes across the Coral Triangle as geographic focus of sustainable management;

f. Update nautical charts for safety at sea and protection of the marine environment;

g. Pursue claims for an extended continental shelf and delineate various maritime jurisdictions such as internal

waters, archipelagic waters, territorial sea and exclusive economic zone;

h. Conduct inventory and status of foreshore lands to identify and clarify impacts of privatization and commercialization to the environment and the fishing communities;

i. Revert abandoned, underutilized and unproductive fishponds to mangroves;

j. Revise policies on the management of mangrove areas in order to increase mangrove cover;

k. Integrate coastal and marine water use plans into the comprehensive land use plans of LGUs;

l. Complete the delineation of municipal waters; and

m. Improve the status of coastal and marine biodiversity by safeguarding coastal ecosystems, species, and genetic diversity.

Improve land administration and management

a. Fast track the cadastral survey to delineate boundaries of all municipalities/cities, provide economic data for land-based development studies and projects and facilitate land disposition and titling;

b. Accelerate the titling of agricultural and residential lands and ancestral lands in partnership with DAR, NCIP, LRA and LGUs to improve the socio-economic condition of beneficiaries and provide security of land tenure;

The development of environment-friendly enterprise and livelihood opportunities for local communities is envisioned to address the prevailing poverty of resource-dependent communities. This will also motivate communities to protect natural habitat and wildlife.

c. Rationalize land policies and laws towards a harmonized and effective Land Administration laws;

d. Incorporate environmental safeguards in the issuance of foreshore leases taking into account the likely effect of climate change;

e. Intensify a more vigorous nationwide campaign against the proliferation of fake or fraudulently-issued certificates of land title;

f. Strengthen the management of land resources information and cadastral information through computerization and in partnership with other land-related agencies, local governments, and the private sector for improved land administration services and revenue collection;

g. Enhance the capacity and competence of professionals, practitioners and workers in the land sector, supporting them with modern technology and land-resources information made available at national and local levels and in the private sector; and

h. Develop a national country program to combat land degradation and poverty in marginal areas and rural communities and mainstream issues of sustainable land management (SLM) and desertification, land degradation and drought in agriculture and environment planning and policy formulation.

Manage a more equitable utilization of mineral resources

a. Review and harmonize mining policies and other related policies (e.g., IPRA, NIPAS, LGC, etc.);

b. Ensure the mining industry's compliance with laws and policies on conservation, protection and rehabilitation:

- Institute comprehensive resource valuation of mining operations (including environmental and social costs);

- Safeguard the ecological and environmental integrity of areas affected by mining operations;

- Strictly enforce compliance of mining companies within environmental and social development commitment;

- Implement noncapital intensive and short-term remediation measures; and

- Develop mine viability and environmental assessment guidelines for the remediation/rehabilitation or redevelopment of viable projects.

c. Rationalize the extraction and use of minerals for national development:

- Determine the actual minerals and metal needs of the country that will contribute to the realization of industrialization;

- Promote the development of downstream industries to maximize the benefits or value-added from mining;

- Rationalize resource assessment for both metallic and mineral commodities; complete an accurate and realistic inventory of actual

In order to provide communities with a healthier environment, the quality of the air, land and water must improve.

mineral reserves, indicating specific locations, types and values of the minerals to be potentially extracted;

- Strictly implement the “use-it-or-lose-it” policy to cleanse inactive mining applications and nonperforming mining contracts;

- Determine untapped offshore mineral resources by actively pursuing characterization and assessment surveys; and

- Pursue new mining technology and research and development of mining techniques in mining planning, scheduling, and design to raise the level of mine productivity and make the local mining industry globally competitive. This should be supported by capability-building programs and the establishment of laboratory facilities with state-of-the art equipment.

d. Guarantee the equitable distribution of benefits from minerals through good governance in the mining sector:

- Protect public investments through government oversight over mining companies to ensure transparency and accountability, stimulating more investment as a result;

- Review, monitor and evaluate existing large-scale mining contracts with respect to their compliance with existing rules and regulations;

- Reaffirm ordinances and resolutions issued by LGUs to protect their environment to the extent these are consistent with national laws and policies;

- Sign on to the Extractive Industry Transparency Initiative (EITI) in order to practice and

implement transparency and accountability among mining companies operating in the country;

- Ensure the timely and accurate release of the legitimate share of local governments in the extraction of national wealth;

- Improve the government share in taxes; and

- Rationalize the incentives granted by the government to mining companies.

Develop and implement environment-friendly enterprise and livelihood opportunities.

The development of environment-friendly enterprise and livelihood opportunities for local communities is envisioned to address the prevailing poverty of resource-dependent communities.

This will also motivate communities to protect natural habitat and wildlife. This includes among others:

- a. Well-regulated ecotourism areas;

- b. Livelihood activities (income and food-based) designed for women; and

- c. Development and intensification of markets for products out of waste such as organic composts and reusable items.

The DA-DAR-DENR National Convergence Initiative (NCI) intends to help provide more jobs and livelihood in identified convergence sites for productive management and sustainable utilization of forestlands. The programs of the three agencies will be integrated to promote

increased investment in rural areas, increased and sustainable food production, good governance and efficiency in proper implementation.

Goal 2. Improved Environmental Quality for a Cleaner and Healthier Environment

In order to provide communities with a healthier environment, the quality of the air, land and water must improve. Vital to the improvement of environmental quality is the full implementation of laws and other regulatory measures. Measures to reduce pollution and waste generation will also be pursued. The promotion of green jobs and the greening of industry are win-win solutions that should be pursued.

Reduce air pollution in Metro Manila and other major urban centers

Achieve a 30-percent reduction of 2009 levels of pollution by 2011 and a 5-percent annual reduction thereafter by 2016 in Metro Manila and other major urban centers through the following:

- a. Intensify enforcement on stationary and mobile sources of pollution, instilling discipline and improving compliance with emission-testing and mandatory vehicle inspection and maintenance, and promoting conversion to fuel-efficient engine;
- b. Monitor industry compliance with environmental standards;
- c. Establish the full number of monitoring stations as provided under the Clean Air Act (CAA) in Metro Manila and other major urban centers;

d. Promote the use of clean fuel and use indigenous resources to the fullest as sources of clean energy;

e. Establish a financial mechanism to jump-start a massive electric vehicle (EV)-based public transportation system by supporting either new EV production or the conversion of existing fossil-fuel vehicles; and

f. Revise emission standards and update emission limits for motor vehicles.

Reduce water pollution to improve water quality in priority rivers and other economically and ecologically important water bodies

a. Establish, and operationalize the Water Quality Management Fund and water quality management areas and their governing boards;

b. Establish in Metro Manila the required number of monitoring stations provided under the Clean Water Act;

c. Undertake a massive clean-up and rehabilitation of esteros in partnership with DILG, LGUs, and other government agencies through partnership agreements such as the Adopt-an-*estero* program;

d. Undertake the massive cleaning and rehabilitation of Manila Bay using funds collected from identified polluters to bring water quality to SB classification through an effective Operational Plan for the Manila Bay Coastal Strategy Goal 2020;

e. Implement river rehabilitation and protection using bio-eco-engineering technology; and

f. Include other priority rivers for clean-up, including Laguna de Bay, Boracay, and Pasig Rivers, with funds collected from identified polluters.

Reduce wastes generated and improve waste disposal

a. Ensure compliance with RA 9003 or Ecological Solid Waste Management Act of 2000, the overall principle of which is that all waste should be brought to where they can be converted into resources;

b. Reduce land-based pollution by cutting back on waste generation;

c. Implement environmentally sound management and disposal of toxic and hazardous waste, including electronic waste (“e-waste”);

d. Immediately close or rehabilitate dumpsites and waste disposal facilities in environmentally critical areas;

e. Publish the list of nonenvironmentally acceptable packaging and products;

f. Regulate or ban consumer products containing chemicals of concerns;

g. Promote clean production and extended producer responsibility as part of corporate social responsibility;

h. Institute healthcare waste management systems in health facilities by investing in training and communications; encourage schools to include healthcare waste management processes in their technical curricula;

i. Engage LGUs in PPP options and financial schemes for the establishment of large-scale waste treatment technologies; BOT projects for cooperative waste treatment facilities and sanitary landfills are viable options;

j. Promote private sector research, development and manufacture of nonmercury-based devices and technologies used in health facilities and for health care; and

k. Encourage the development and manufacture of local waste-treatment technology and ensure their availability in the market.

Specific strategies, programs and projects as well as activities on the hard components of waste management are discussed in detail in Chapter 4, Accelerating Infrastructure Development.

Establish a healthier and livable urban environment

a. Establish urban parks with dense greenery to minimize heat island effects in town and cities

b. Adopt green architecture with rooftop gardens in central business districts; promote climate change-resilient building designs in new urban centers for a cool and refreshing environment;

c. Intensify ecological solid waste and wastewater management;

d. Promote waste recycling technologies to reduce green house gas emissions (CO₂ and methane) and groundwater pollution in sanitary landfills;

e. Encourage industries to use cleaner technologies and practice extended producer responsibilities through provision of tax incentives;

f. Establish a pollution release and transfer registry and the “pay-as-you-pollute” scheme; and

g. Promote Green Industry and greening the supply chain.

Goal 3. Enhanced Resilience of Natural Systems and Improved Adaptive Capacities of Human Communities to Cope with Environmental Hazards Including Climate-Related Risks

Strengthen institutional capacities of national and local governments for CCA and DRRM

- a. Mainstream and integrate DRR and CCA in national, sectoral, regional and local development plans, including integration of hazard and climate change vulnerability maps in the updating of CLUPs by LGUs and enforcement of zoning regulations; and encourage more provinces to mainstream DRR in their plans, and build capacities of national and local agencies assigned to lead the effort;
- b. Support the initiatives for mainstreaming DRR and CCA in by granting it priority in budget allocation;
- c. Adopt a responsive national and local legal and policy framework through multistakeholder dialogues that will create an enabling environment for all Filipino citizens and the government to guide them towards an integrated DRR and CCA approach;
- d. Enhance the self-reliance of local DRRM councils and their ability to implement the program through responsible DRRM offices;
- e. Devise cost-effective means to offset socioeconomic losses from disasters; prepare for disaster recovery by establishing an enabling environment for both

public and private sectors to increase their contribution to risk reduction activities; develop a common understanding of resource needs and include DRR and CCA in the regular business, policies, and actions of organizations;

f. Enhance national and local capacities for monitoring, forecasting, hazard identification, early warning, and risk evaluation and management;

g. Complete the geological mapping of hazards using a larger scale (1:10,000);

h. Improve the postdisaster rehabilitation and development process;

i. Make the newly established national DRRM fund more accessible to resource-poor LGUs; explore new mechanisms to expedite fund releases during emergencies; provide information on possible funding sources; and

j. Harmonize the implementation of the DRRM Act and the Climate Change Act.

Enhance the resilience of natural systems

- a. Conduct vulnerability assessment and mapping on the different ecosystems;
- b. Issue guidelines for the review and approval of design proposals and projects that are climate change-resilient under the EIA and risk assessment system of the EMB; and
- c. Establish a network of protected areas in coordination with other LGUs based on ecological, social and economic considerations (ecosystem resiliency and biological connectivity) to address the impacts of human-induced factors and climate change.

Improve adaptive capacities of communities

- a. Conduct geohazard mapping, vulnerability and risk assessments especially for highly susceptible communities and areas for the formulation and implementation of disaster risk reduction and management plans;
- b. Integrate CCA and DRRM in all education levels and in specialized technical training and research programs;
- c. Raise public awareness of DRR and mitigating the impacts of natural disasters through the formulation and implementation of a communication plan for DRR and CCA;
- d. Conduct gendered vulnerability assessment, recognizing the differing vulnerabilities and capacities of poor women and men across economic sectors and geographic locations;
- e. Use science-based tools and technologies to support decisions in identifying, preventing and mitigating potential disaster impacts; collect and disseminate data according to risk knowledge needs and develop information systems to support decision makers and apprise stakeholders;
- f. Enhance disaster-preparedness through multistakeholder coordination; and
- g. Conduct an extensive IEC campaign for an increased public awareness of DRR.

Crosscutting Strategies

In order to achieve the three goals and to realize an environment that is healthy, ecologically-balanced, sustainably productive, climate-change resilient, the following crosscutting strategies will be pursued:

Effective environmental governance

- a. Encourage multistakeholder partnership through enabling mechanisms that encourage greater stakeholders' participation and commitments, including:
 - Community-based natural resources management efforts in forestry, biodiversity conservation, protected area management, coastal resource management and integrating resilience especially among vulnerable groups (women, children, elderly, etc);
 - Partnership with the business sector in cleaning the environment, natural resource management, DRR and CCA;
 - Devolution of relevant ENR mandate to LGUs accompanied by capacity development;
 - Mandatory creation of Environment and Natural Resources Offices for LGUs;
 - Provision of effective mechanisms that will empower marginalized groups as important partners for the sustainable development and management of natural resources;
 - Tenurial security both in upland and coastal areas and recognition of indigenous

peoples' rights to their ancestral domain;

- Stewardship agreements and/or contracts between government and community; and

- Improved multistakeholder's effectiveness in enforcing environmental law.

b. Reduce graft and corruption:

- Curbing graft and corruption in the natural resources sector is crucial to improving environmental governance. Transparency in decision-making and in the disposition of revenues raised from extraction, processing, and sale of natural products must be ensured. Philippine participation in the EITI is also important. The "greening" of the judiciary should also be pursued. The desired end is a vigorous and consistent enforcement of environmental laws and policies.

c. Harmonize and streamline efforts in protection and conservation:

- Environmental governance should be emphasized in the local level. There should be clear delineation of duties and responsibilities of stakeholders. ENR management strategies should also be harmonized horizontally and vertically. Furthermore, harmonization and strengthening of DENR's policies, plans and programs related to the different ecosystems and natural resources will be pursued. Relatedly, requirements for environmental permits (e.g., ECC) will be streamlined and simplified.

d. Implement Convergence Initiative:

- Facilitate complementation of different agencies to ensure that resources are maximized by achieving synergy and institutional efficiency;

- Build partnerships between and among the local communities, LGUs, and government agencies to ensure that all development interventions are based on the actual needs and aspirations of the community; and

- Achieve spatial integration within the different ecosystems to ensure environmental integrity and sustainability.

Continued institutional strengthening and capability building

a. Strengthen institutions for environment and natural resources management at various levels (i.e., insufficient manpower for ENR);

b. Improve and institutionalize various multistakeholder coordination mechanisms as mandated by the different ENR laws for greater transparency and accountability is important in environmental governance;

c. Provide assistance to LGUs to develop and implement local environment and natural resources management plans and programs (i.e., ICM plans, forest and watershed management plans, etc.) in accordance with the national programs, thereby facilitating the achievement of economic and environmental sustainability priorities and targets through relevant on-the-ground strategies and action plans; and

In order to sustainably finance environment and natural resources activities, government will pursue the use of appropriate valuation methods in the computation of applicable fees and taxes for the use the country's natural resources and enhance its collection.

d. Support women's enhanced roles in ENR through policy development, capacity-building and strengthening of gender mainstreaming mechanisms.

Research, Development, Extension and Knowledge Management

a. Pursue research, development and extension to:

- Demonstrate, develop and replicate low-cost technologies to optimize the recycling, reuse, and recovery of solid waste, including the conversion of residual organic materials into clean renewable energy;
- Establish valuation of resources and develop a system of natural resources accounting;
- Determine the values and potential benefits of the natural resources.
- Conduct gender-aware resource-use studies to recognize roles, impacts and opportunities among women in ENR ecological profiling;
- Develop DRR and CCA technologies;
- Develop clean and energy efficient technologies;
- Rehabilitate mines to ensure that abandoned/inactive, current and future mines are effectively rehabilitated;
- Obtain the most benefits and value-added from mineral resources;
- Geologically assess and explore of undiscovered mineral resources;
- Determine forest-based industrial requirements;

- Develop resource-based management technologies;

- Provide clear guidelines to minimize environmental impacts of existing technologies (e.g., incinerators) and new technologies (GMOs, e-waste, nano technology, etc.);

- Develop and propagate low-cost noncombustion technologies for infectious and hazardous wastes;

- Develop risk and vulnerability assessments using gendered tools and generating gender-disaggregated data; and

- Assess metallic and nonmetallic minerals, both onshore and offshore;

b. Make available timely, accurate and updated science-based information on the environment through an effective knowledge management system:

- Establish the National Spatial Data Infrastructure (NSDI);

- Establishment of baseline information on the environment and natural resources through ecosystem profiling;

- Establish strategic organization structure for information systems sharing;

- Update the national topographic and nautical chart databases, including electronic charts;

- Develop a National Coastal and Marine Resource Information Management System to support research, policy formulation and implementation and public

education and communication on coastal resources and the environment;

- Rationalize mapping activities; and
- Establish a monitoring and evaluation mechanism to measure and push performance to a high-level.

c. Establish National Wildlife Research Center pursuant to the Wildlife Act (RA 9147).

Environment and Natural Resource Financing

In order to sustainably finance environment and natural resources activities, government will pursue the use of appropriate valuation methods in the computation of applicable fees and taxes for the use the country's natural resources and enhance its collection. Likewise, PES shall be institutionalized at the national and local levels and shared with communities to encourage natural resource protection and management as well as increase household income.

a. Ensure rightful share of ENR activities and priorities in national and local government budgets;

b. Enhance collection of taxes/revenues including pollution and exploitation fees from industries (i.e., mining companies including small-scale mining);

c. Retain the LGU share of taxes and revenues, specially those pertaining to environment activities;

d. Utilize disposable public and government land assets and resources, balancing economic, environmental, and social development objectives;

e. Strengthen LGU revenues through local real property tax to achieve better local tax efficiency, a wider tax base, and greater equity;

f. Promote and roll out the adoption of the Philippine Valuation Standards and compatible valuation methodologies in the public and private sector;

g. Develop local capacities to generate revenues to finance activities in the control of polluting vehicles;

h. Increase the value of natural resources by adopting resource valuation techniques in determining rates of users' fees for use of forest land such as telecom, power, water utilities and others;

i. Increase Government share from the use of the country's mineral wealth through thru the establishment of mineral reservations and greater value adding;

j. Formulation of policies on accessing carbon credits;

k. Exploring further innovative sources of finance, both for environment and natural resources activities and climate change adaptation; and

l. Increase value-added from natural resources (e.g., users fee and payment for environmental services) to generate revenues for protection and conservation

m. Implement a national communications strategy particularly for pollution concerns (air, water and solid waste). This is due to the fact that people themselves contribute to the pollution and they need to be made responsive on how pollution affects their wellbeing.

Legislative Agenda

In order to push forward sustainable management of the country's environment and natural resources, the passage of the following pieces of priority legislation should be pursued:

1. National Land Use Bill – to provide a rationalized land use planning in the country and put in order the national laws on land uses (such as agrarian reform, protected areas, ancestral domain, fisheries, forestry, agriculture agricultural modernization, mining and housing) that are sector specific and do not address the cross cutting land use issues;

2. A Sustainable Forestry Bill - to provide the clear policy for the sustainable management of the country's forest resources;

3. Land Administration Reform Bill – to address the pervading multi titling problems through the rationalization of the various agencies responsible in land titling and related activities and address this concern through the adoption of the one stop concept;

4. Land Administration Code - update and harmonize land administration laws enacted at different dispensations to support the future roles of key agencies towards addressing cadastral information requirements and land administration services for sustainable development;

5. Marine Pollution Bill – to respond to the pressing need of reducing risks and preventing disasters caused by trade and other economic activities in the marine environment and its resources;

6. Permanent Forestline Bills – to provide the specific boundaries limits of forestlands per province delineating areas in which no other land use may prevail;

7. Bills on Enactment of Priority Protected Areas – to cover areas that are among the Key Biodiversity Areas in the country which are globally significant and considered as actually manageable for biodiversity conservation;

8. Integrated Coastal Management Bill – to institutionalize the Integrated Coastal Management in the Philippines as a national strategy to ensure the sustainable development of the country's coastal and marine environment and resources and establishing supporting mechanisms for its implementation;

9. Improvement and enhancement of Small-Scale Mining Law to make it more responsive to present and emerging needs on environmental, safe-time health and social concerns;

10. Enactment of legislation recognizing access to clean water and sanitation as a human right;

11. People's Survival Fund (PSF) Bill - to amend the Climate Change Act of 2009 and put up a fund that will finance adaptation programs and projects that are directly supportive of the objectives enumerated in the local climate change action plans (LCCAP) of LGUs and communities;

12. Archipelagic Principle Bill - to amend Section 4 of RA 8550 or the Philippine Fisheries Code of 1998 that provides guidelines on the delineation of municipal waters using the archipelagic principle;

13. Extended Producers Responsibility Bill - to compel industries, manufacturers, importers and sellers to take-back the waste and end-of-life of their products or goods;

14. Formulation of the Electronic Waste (e-waste) policy framework to provide a mechanism on how to dispose, reuse and/or recycle waste coming from electronic equipment;

15. Environmental Code for LGUs - to provide LGU budget appropriations for localized environmental activities;

16. Marine Protected Area Bill - to mandate local government units to establish marine protected areas in their respective municipal waters;

17. PAG-ASA Modernization Law - to allocate funds for the needed reforms of the agency; and

18. Bill on Hazardous and Radio Active Waste Management - to provide penalties for violation thereof and for other purposes.

The following pieces of proposed legislation need further discussion and deliberation:

19. Minerals Management Bill - This bill pushes for the conservation of nonrenewable mineral resources for the benefit of both present and future generations of Filipinos by adopting a sustainable, rational, needs-based minerals management, geared towards effective utilization of mineral resources for national industrialization and modernization of agriculture; and

20. Ratification of the Basel Ban Amendments. The Basel Convention is an international treaty seeking to reduce movements of hazardous wastes between nations, and specifically preventing the transfer of hazardous waste from developed to less developed countries (LDC). The country has yet to ratify its position on the said Convention.