

20

Ensuring
Ecological Integrity,
Clean and Healthy
Environment

Ensuring Ecological Integrity, Clean and Healthy Environment

The environment and natural resources (ENR) sector plays a critical role in the country's development. It provides the following ecosystem services: (a) *provisioning* (e.g., food, raw materials, freshwater); (b) *regulating* (e.g., local climate and air quality, carbon sequestration and storage, erosion prevention); (c) *supporting* (e.g., habitats for species, maintenance of genetic diversity); and (d) *cultural* (e.g., recreation, tourism). These ecosystem services support the growth and performance of other sectors, including agriculture, fisheries, industry and services, and provide livelihood, especially to resource dependent communities.

Provision of these indispensable services, including the maintenance of a healthy and good quality environment, has been increasingly compromised due to mismanagement, misuse, and overexploitation of the country's ENR. It is critical that environmental health is improved and integrity ensured to support the accelerated economic growth that the administration aims to achieve, strengthen resilience against the impact of climate change (CC) and disasters (natural and human induced), and improve the welfare of the poor and marginalized members of society.

The Philippine Development Plan (PDP) 2017-2022 includes more aggressive strategies to rehabilitate and restore degraded natural resources, and protect the fragile ecosystems while improving the welfare of resource-dependent communities.

Assessment and Challenges

The country's rank in environmental management performance dropped between 2006 and 2014 but improved from thereon. Over the past decade, the country's Environmental Performance Index (EPI) ranking² dropped from 55th in 2006 to 114th in 2014, but recovered to rank 66 out of 180 countries in 2016 (*Figure 20.1*). The Philippines' performance is poorer

compared with Singapore and Malaysia but is consistently much better than Indonesia and Vietnam.

Management of natural resources has been improving. Several improvements were noted in the management of the country's ENR, particularly in the reduction of open and denuded forest lands in the

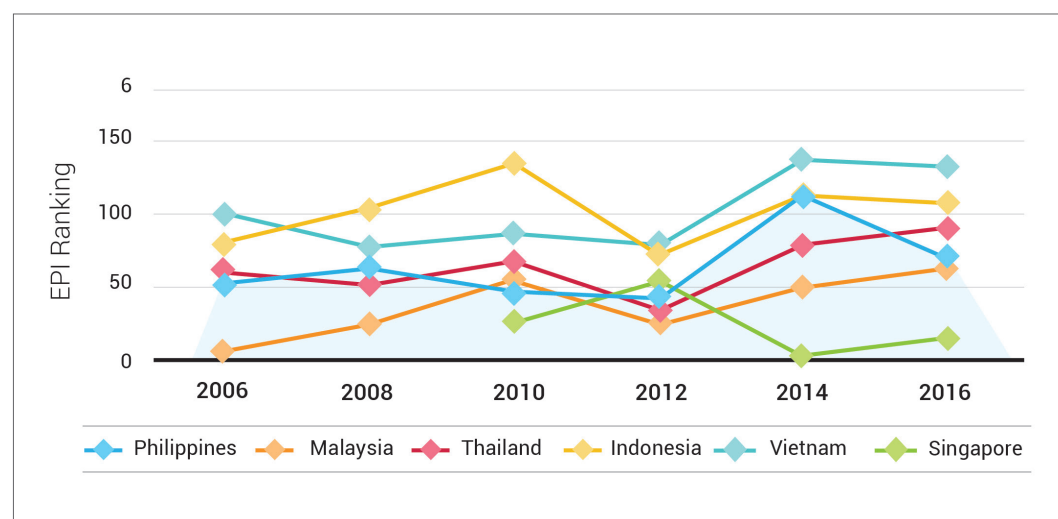
¹ Environmental, geological, human-induced and hydro-meteorological hazards

² The EPI is a global metrics for the environment which ranks countries' performance on high-priority environmental issues related to health impact, air quality, water and sanitation, water resources, agriculture, forests, fisheries, biodiversity and habitat, and climate and energy.

country as well as the effective management of key terrestrial and marine protected areas. This resulted in the improvement of critical habitats thereby arresting the extinction of threatened flora and fauna. These accomplishments were facilitated by the implementation of key environmental laws and policies such as: (a) Executive Order No. 23 on the Moratorium on Logging in Natural Forest and Executive

Order No. 26 on the Implementation of the National Greening Program; (b) National Integrated Protected Area System Act; (c) Wildlife Resources Conservation and Protection Act; (d) Amended Fisheries Code; and (e) other governance modality in establishing conservation areas such as the local conservation areas and Indigenous Community Conserved Areas.

Figure 20.1 Environmental Performance Index Ranking of ASEAN-6 (2006-2016)



Source: 2016 Environmental Performance Index, A. Hsu et al, 2016, Yale University

Progress was also noted in the issuance of patents and certificates of land ownership. In fact, of the 14.1 million hectares (ha) of alienable and disposable lands, only around 400,000 ha remain untitled. The issuance of land titles and residential patents incentivizes the beneficiaries to make their land more productive so that it can generate higher income.

On mining rehabilitation, only four mine sites remain abandoned, thus requiring government intervention to prevent further damage to the environment and nearby communities.

Slight improvements in environmental quality have been noted but monitoring of environmental compliance remains weak.

National ambient air quality for particulate matter measuring 10 micrometers in diameter or smaller (PM_{10}) has improved over the last five years, from 76 micrograms per normal cubic meter ($\mu\text{g}/\text{Ncm}$) in 2011 to 46 $\mu\text{g}/\text{Ncm}$ in 2015. This is due to more effective management of air quality in strategic areas in the country, including close monitoring of industries and stricter implementation of anti-smoke belching campaign. However, pollutant sources continue to increase, in particular, the rapidly growing number of privately owned vehicles (44% increase from 2006 to 2015), which remains the largest contributor of emissions in the country.

In terms of water quality, many of the classified water bodies are now unfit for

their intended uses (e.g. public water supply, food production, and recreation) due to rapid population growth and expansion of residential and industrial areas. Untreated domestic wastewater discharges (33%), agriculture and livestock (29%), industrial sources (27%) and non-point sources such as agricultural farms (11%) constituted the sources of water pollution. In fact, only about five percent of households are connected to sewerage network and treatment facilities.

The waste management problem has persisted despite 38 percent compliance of local government units (LGU)³ with the provisions of the Ecological Solid Waste Management Act or RA 9003 (*see also Chapter 19*). The greater majority have yet to comply and the reason cited is the lack of funds among LGUs to put up the infrastructure facilities required by RA 9003. In addition, only few households practice 3Rs (reduce, reuse, and recycle) in waste management.

Efforts on disaster risk reduction (DRR) and climate change adaptation (CCA) remain inadequate. Measures that help prevent and mitigate the impact of disasters and prepare for these events have come in various forms, including: (a) mainstreaming CCA and DRR into policies, plans, programs and budget; (b) risk and vulnerability analysis and assessments, including the development of multi-hazard maps; (c) strengthening institutional and financial mechanisms; (d) improving early warning systems; and (e) continuing information, education and communication (IEC) campaigns. However, not all LGUs have mainstreamed CCA and DRR measures in their comprehensive land use and development plans (CLUP and CDP) due to: (a) lack of capacity to use the available geospatial information; (b) unavailability of appropriately-scaled probabilistic multi-hazard maps; and (c) coarse spatial resolutions of available maps. Moreover, available funds are used primarily

for relief and recovery activities and not for adaptation and mitigation measures. There is also a lack of IEC campaigns to increase adaptive capacity of communities, especially vulnerable groups (i.e., women, children, older persons, indigenous peoples, and persons with disabilities).

The existing protocols for relief and rehabilitation are not appropriate for long-gestating events such as El Niño. For instance, the quick response fund is intended for repair of infrastructure damaged due to a calamity, but El Niño does not result in damage in infrastructure but rather, loss of livelihood.

The socio-economic and environmental landscape is changing. Between 2017 and 2022 there will be additional 8.3 million Filipinos. In fact, Metro Manila will remain as the densest region, further exceeding the national population density average. More people translate to higher demand for food and houses that can put more pressure on ENR. Increasing concentration of people in urban areas will also likely increase demand for food, social services, infrastructure and transport facilities, electricity and power, and other basic needs, all of which could exacerbate air and water pollution and generate more waste. Together with the proliferation of inefficient industries, this could hasten the conversion of prime lands in urban fringes, and increase greenhouse gas (GHG) emissions, thus further aggravating the impact of CC.

Impact of climate extremes and variability are felt with increased intensity and frequency. With CC, Philippines is already experiencing increased intensity and frequency of extreme weather events. Adapting to CC, which now defines the new normal, and mitigating its impact, is a big challenge and efforts have to be heightened to a level that would safeguard not only lives but also economic gains. Transitioning to

³ as of December 2016

a low carbon pathway by adhering to the principle of common but differentiated responsibilities to address CC adds to the challenge.

ENR laws are weakly enforced. There are sufficient rules and regulations in the country that compel the protection, proper management, and sustainable use of resources. Their implementation and enforcement, however, are constrained by weak and fragmented institutional arrangements. For instance, while Laguna Lake Development Authority is responsible for the protection and development of Laguna Lake, regulation of other sources of pollutants such as household and industrial wastes fall under the mandate of LGUs or other agencies.

There is a lack of sustainable financing and limited access to available funding facilities. Funding for ENR management including CC and disaster risk reduction and management (DRRM) initiatives largely depends on public finance. Especially in local government units, funding for ENR, CC, and DRRM competes with other development priorities. This has limited the initiatives for environmental management, CCA and DRRM. Moreover, stakeholders have difficulty accessing available funds, such as the People's

Survival Fund, debt-for-nature swap, and risk transfer mechanisms due to: (a) lack of information about the financing facility; (b) tedious fund disbursement procedure; (c) weak institutional preparedness to meet requirements; (d) limited institutional capacity to prepare acceptable and bankable technical proposals; (e) inability to utilize science-based information; and (f) affordability of insurance products particularly for low income LGUs and farmers.

Private sector engagement is limited in ENR management, including investment in CC and DRRM actions. The potential of private sector investing in ENR management, including risk transfer mechanisms, remains largely untapped due to the lack of a clear mechanism to guide the private sector in complementing government efforts. For instance, the private sector can provide support in product development and improving the export potential of forest (timber and non-timber) and marine-based products by investing in processing technology that will add value to the product. This policy gap has undermined the sector's potential to significantly contribute to employment creation, poverty reduction, and climate change adaptation and mitigation (CCAM) and DRRM.

Strategic Framework

Ensuring ecological integrity and a clean and healthy environment is an important foundation supporting the three main pillars of the PDP: enhancing the social fabric, reducing inequality, and increasing

potential growth. The key outcome under this chapter is to ensure ecological integrity and improve the socio-economic conditions of resource-based communities through sustainable integrated area development.

Targets

Table 20.1 presents the medium-term targets corresponding to each of the major outcomes under this chapter. To sustain biodiversity and functioning of ecosystem services, the forest cover will be increased and the quality of coastal and marine habitats will be improved. Improved environmental quality will be assessed using quality standards for air, water and soil, among others. For increased adaptive capacity and resilience of the ecosystem, a resilience index will be developed using existing technical studies.

Table 20.1 Plan Targets to Ensure Ecological Integrity, Clean and Healthy Environment, 2017-2022

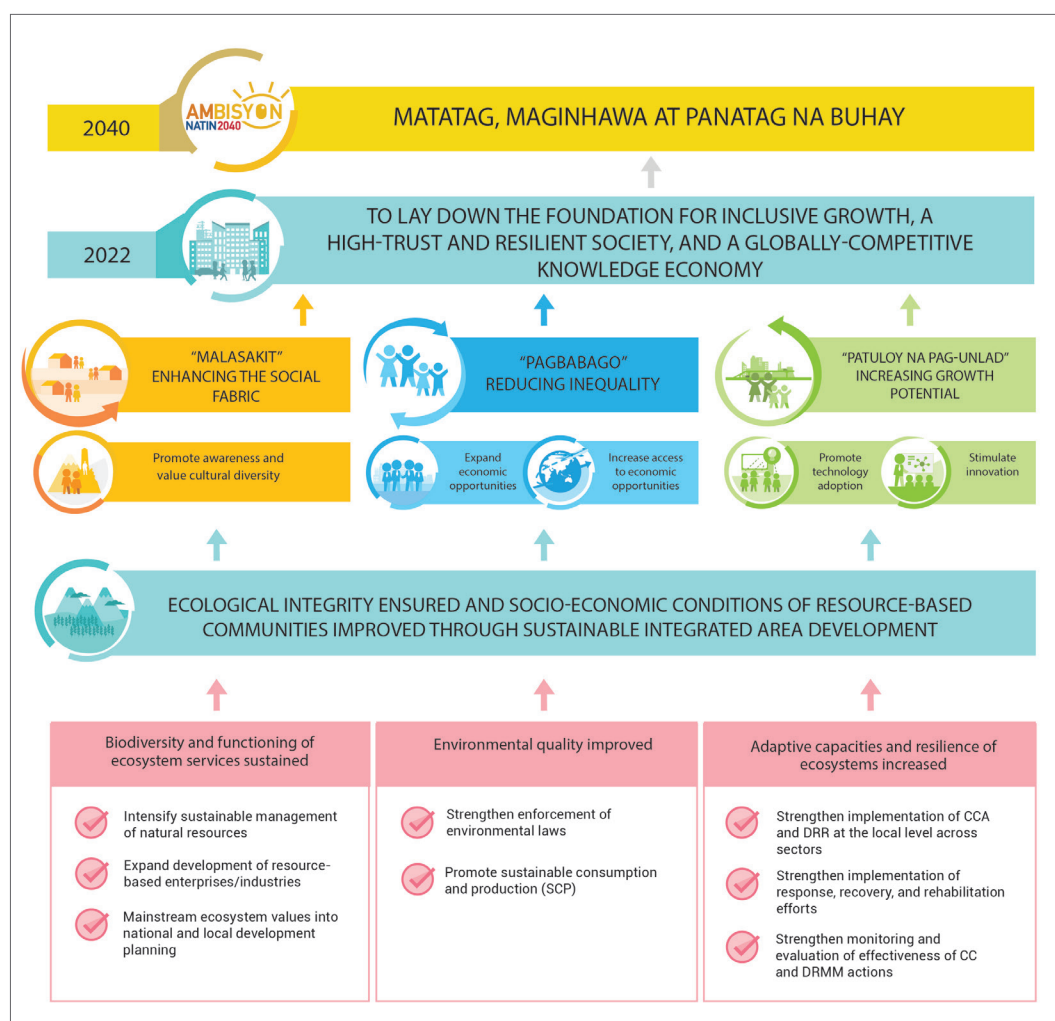
INDICATORS	BASELINE YEAR	VALUE	END OF PLAN TARGET
Chapter Outcome: Ecological integrity ensured and socioeconomic condition of resource-based communities improved			
Subsector Outcome: Sustained biodiversity and functioning of ecosystem services			
Forest Cover (SDG 15)	2010	6.8 M ha	Increasing
Quality of coastal and marine habitats	2016	Coral reef: • Excellent: 12,957.51 ha • Good: 1,717.62 ha • Fair: 171,762 ha • Poor: 1,235,488.73 ha	Improving quality
Number of residential free patents issued	2016	To be determined	72,000
Employment from ecotourism and sustainable community resource-based enterprises		To be determined	Increasing
Subsector Outcome: Improved environmental quality			
Percentage of highly urbanized and other major urban centers within ambient air quality standard	2015	47% HUCs and major urban centers within ambient air quality standard for PM10 & PM2.5	Increasing
Percentage of priority water bodies within water quality guidelines	2016	• Food production: 70%	Increasing
	2016	• Recreational: 80%	Increasing
Area in (ha) assessed and mapped for soil fertility status and soil fertility management	2016	1,000,000 ha	2,700,000 ha
Area of land degradation hotspots	2016	2.3M ha	2.0M ha
Solid waste diversion rate	2015	Metro Manila: 48% Outside Metro Manila: 46%	80%
Subsector Outcome: Increased adaptive capacity and resilience of ecosystems			
Resilience index		To be determined	Increasing
Number of reviewed CC/DRRM-enhanced plans	2016	• 552 CLUPs • 37 CDPs • 1522 LDRRMPs • 1114 LCCAPs	Increasing

Strategies

Sustainable integrated area development (SIAD) and participatory environmental governance will be an overarching principle in implementing the various strategies to achieve the outcomes. SIAD will be adopted to address ecological, economic, political, cultural, societal, human, and spiritual

challenges and opportunities in a specific area. It will be implemented in an integrated manner to ensure social justice and in order to improve the quality of life of the people. Specific subsector strategies consider CC and DRRM actions, and they are discussed in the succeeding sections.

Figure 20.2 Strategy Framework to Ensure Ecological Integrity, Clean and Healthy Environment, 2017-2022



Subsector Outcome 1: Biodiversity and functioning of ecosystem services sustained

To sustain the provision of ecosystem services and meet both the present and future demand, the following key strategies will be implemented: (a) intensify sustainable management of natural resources through the adoption of ridge-to-reef approach and SIAD; (b) expand sustainable resource-based enterprises; and (c) mainstream ecosystem values into national and local development planning.

Intensify sustainable management of natural resources through adoption of ridge-to-reef approach and sustainable integrated area development. Conservation, protection, and management of natural resources will be strengthened to ensure that the ecosystem services are adequate. The ridge-to-reef and integrated area development approach will be adopted to ensure that the interconnectivity of the different ecosystems is considered. This will involve participation of different stakeholders and convergence of different strategies.

Forest and Watershed

- *Complete delineation of final forest limits including production and high value conservation areas as protection forest.* Forestland boundary delineation and demarcation will be undertaken to clearly mark the extent of forestlands that need proper management. This will provide the basis for identifying the areas for private sector investment (production zones) and for government and private sector protection and conservation activities (protection zones).
- *Reverse the loss of forest cover through sustained rehabilitation of degraded forestlands including critical watersheds and strengthened protection of remaining natural forests.* Rehabilitation of the remaining unproductive, denuded, and degraded areas (7.1 million ha) will be accelerated and prioritized. In addition, the protection of remaining natural forests as well as the forest established from previous reforestation activities will be ensured.
- *Effectively manage Protected Areas (PA).* Ecosystem restoration will be implemented, especially for degraded habitats (e.g., mangroves, wetlands, forest, coral reefs) as well as demarcation and zoning of PAs to avoid encroachment on boundaries of the PAs. Policy gaps, including institutional and technical capacities on PA management will be addressed.
- *Strengthen law enforcement against illegal trade of wildlife species.* Efforts to combat illegal trade of wildlife species will be strengthened through more policing activities, including designation of more forest rangers to guard against illegal collection, possession, and trade of wildlife. Regulations on bio-prospecting and other economic activities involving the country's biodiversity will also be strictly enforced.
- *Strengthen sustainable management through the issuance of appropriate tenure and management arrangement.* Tenurial instruments⁴ will be issued to clearly establish the accountability of communities in the management of forestlands and PAs. This will provide local communities the rights to develop

⁴ Tenurial instruments include the following: IFMA, forest land grazing lease agreement, CBFMA, certificate of ancestral domain title and protected area community-based resources agreement

the forest resources and enjoy the economic returns.

- *Improve land administration and management.* Strengthened partnership between land-related agencies and local governments in the formulation of CLUPs and zoning of residential areas will be prioritized. This will be supported by a legislation or proclamation for the adoption of the cadastral survey results. Enhancement of modern technology, land-resource information, as well as the capacity and competence of practitioners and workers in the land sector will be pursued. In addition, delineation of ancestral domains and its waters will be accelerated, including provision of economic and cultural services to IPs/indigenous cultural communities and local communities within the framework of IPs' socio-cultural integrity and ecological balance.
- *Strengthen research and development on forest, watershed and biodiversity.* Research studies to assess the carrying capacity of ecosystem and to determine factors that threaten important native and endemic species including their habitats will be undertaken to identify appropriate conservation measures. Surface and groundwater resources nationwide will also be assessed to ensure water supply sustainability. Also a critical area of research will be the identification of the country's genetic resources and their economic potentials.

Mineral Resources

- *Strengthen environmental and social safeguards for mineral resources development.* Compliance of mining industry to existing laws, rules and regulations will be strictly enforced to safeguard the integrity of the environment and mining-affected communities. This will be done by

strengthening the environmental impact statement system and guaranteeing a just and equitable distribution of mining benefits. Resource valuation studies (e.g., cost-benefit analysis) will be conducted to identify the most beneficial and sustainable use of land in support of national development.

Coastal and Marine

- *Enforce complete delineation, delimitation and zoning of municipal waters.* Delineation and delimitation of municipal waters will be completed, especially in LGUs with overlapping water boundaries (i.e., adjacent and opposite cities and municipalities). This will ensure that municipal fisherfolk of coastal cities and municipalities are given preferential use and exclusive access to the resources. This will also facilitate a more effective apprehension of violators. In addition, foreshore areas will be mapped and zoned into production and protection areas to ensure fisheries sustainability.
- *Strengthen law enforcement and the management of coastal and marine areas.* Stricter implementation and enforcement of national and local laws, policies, and plans will be pursued. Strategic policing and patrolling activities against illegal, unreported, and unregulated fishing and other extractive activities will be conducted in management areas, including marine protected areas (MPAs), and fish refuge and sanctuaries.

- *Rationalize the identification of MPAs and their networks.* Coastal and MPAs are important components of integrated coastal management (ICM) and ecosystems approach to fisheries management. They will help ensure the continued supply of seafood, underpin ecotourism, and

enhance climate resilience. Network of MPAs, fish refuge and sanctuaries and managed access areas will be pursued to improve ecological connectivity⁵ and management efficiency.

- *Intensify research on coastal and marine habitats and resources.* There is a need to enhance data availability and accessibility to monitor the status and productivity of coastal and marine resources, including vulnerability to natural hazards and CC. Improved and regular data collection, scientific assessment, and identification of spawning areas for priority fish species will be conducted.

Inland Wetlands and Caves

- *Improve the management of priority inland wetlands and caves.* Management of priority inland wetlands and caves with high conservation value will be strengthened. This will include effective communication of sustainable practices and enforcement of biodiversity regulations.

Urban Biodiversity

- *Enhance green spaces in urban areas.* A policy promoting green spaces in cities as well as a monitoring metric will be developed and tested.

Expand the development of sustainable resource-based industries. Recognizing the number of poor households in the upland and coastal communities that are dependent on natural resources for their livelihood, value addition of the products derived from forests, coastal and marine resources as well as development of ecotourism products and services will be pursued.

- *Promote sustainable forest-based (timber and non-timber) industries including agroforestry.* To meet the projected demand for round wood and to reduce threats in the remaining natural forests, development of commercial forest plantations within integrated forest management agreement (IFMA), community-based forest management agreements (CBFMA), and applicable areas in ancestral domains vis-à-vis the region's comparative advantage for timber production will be supported. In addition, a registry and forest certification system will be developed and instituted to promote the sustainable management of forest and ensure the competitiveness of the country's forest-based products in the international market. Upland communities will be further assisted in developing agroforestry farms, including the use of traditional crop varieties, indigenous livestock, and biodiversity-friendly enterprises aligned with the needs of the market.
- *Promote sustainable fish- and marine-based industries.* Sustainable marine-based industries that contribute to the development of the blue economy will be pursued by using eco-friendly technologies and practices. These industries include (a) sustainable fisheries and aquaculture; (b) ocean energy, offshore and gas exploration; (c) shipping/marine transportation and ship building; (d) eco-tourism; and (e) marine biotechnology and bio-prospecting⁶, among others. The identification and designation of areas for community fish landing centers will also be pursued, as these centers will enable municipal fisherfolk to have access to cold storage facilities and

⁵ Results of study under the *Strengthening MPAs to Conserve Marine Key Biodiversity Areas in the Philippines* project

⁶ Bioprospecting of marine resources in accordance with the Nagoya Protocol on Access and Benefit Sharing (ABS).

improve the quality and value of fish and other marine products.

- *Develop a system for access and benefit sharing (ABS) of wealth from genetic resources.* A national policy framework on ABS will be developed to enhance regulatory measures and to protect genetic resources as well as the traditional knowledge of indigenous communities. An ABS system will be developed to monitor and optimize the utilization of genetic resources, ensure equitable sharing of revenues between government and product developers, and protect the rights of communities where the resources are found.
- *Promote and develop ecotourism and cultural sites.* Promotion and development of ecotourism and cultural sites will be pursued, particularly in key upland and coastal destinations, including wetlands and cave systems. In particular, the following will be conducted: (a) identification of ecotourism and cultural tourism destinations and products and promoting them in the domestic and international markets; (b) diversification of existing destinations and creation of new tourism areas and products; (c) encouraging development tourism-related products and services using community-based approaches; and (d) creating an environment conducive for ecotourism investment.

Mainstream ecosystem values into national and local development planning. With the range of services and products sourced from natural resources, mainstreaming accounting and valuation in the development planning is necessary to ensure that due importance and appropriate management will be given to these finite resources.

Identifying the true value of the resources will: (a) facilitate informed decision making of political leaders and local communities; (b) provide better alternatives and trade-offs; and (c) generate income and employment in the rural areas and create wealth for the nation.

- *Institutionalize ecosystem valuation and natural resource monitoring system.* Ecosystem service indicators will be included in forest, watershed, coastal and marine monitoring systems to help track the health and benefits of ecosystems, including the impact of threats and drivers, such as CC, to these ecosystems.⁷
- *Develop a policy for Payments for Ecosystem Services.* A policy to institutionalize payment for ecosystem services that will provide incentives in the management of ENR will be developed. This will also provide an alternative source of income to the local communities.

Subsector Outcome 2: Environmental quality improved

Stricter implementation of existing legal frameworks will be pursued to promote a clean and healthy environment. Strategies will focus on strengthening compliance with environmental standards and safeguards as well as developing, promoting, and adopting sustainable consumption and production (SCP) practices. These strategies will mitigate the negative environment and health impact of economic activities.

Strengthen enforcement of environmental laws. The enforcement and monitoring of compliance to existing laws and regulations will be intensified to achieve the desired

⁷ Watershed ecosystem service indicators include: (a) total water yield (m³/ha/yr.); (b) sediment retention capacity (t/ha/yr.); (c) avoided potential floodwater (m³).

quality of the environment. The following are the strategies on air, water, and land quality management:

Air Quality Management

- Increase the number of upgraded air quality monitoring stations and improve the procurement process
- Strengthen the enforcement of the anti-smoke belching campaign and vehicle emission testing
- Promote environmentally-sustainable transport, including the mass transport system, use of cleaner fuels, and conversion to fuel-efficient engines (*see also Chapter 19*)
- Enforce the creation of airshed governing boards and ensure that they are functional
- Strengthen the enforcement of air quality standards among industry players

Water Quality Management

- Strengthen water quality monitoring by maintaining the number of water monitoring stations, establishing, and operationalizing the required number of water quality management areas, and enhancing capacity for laboratory analysis
- Improve wastewater management by increasing the number of domestic, commercial and industrial wastewater treatment facilities in water districts, LGUs, and sites maintained by the private sector (*see also Chapters 9 and 19*)
- Identify pollutants, including persistent organic pollutants and heavy metals in priority water bodies and determine the appropriate management interventions
- Formulate guidelines to access the National Water Quality Management Fund and Area Water Quality Management Fund

- Develop and enhance modeling tools for water quality scenario-building
- Implement the National Sewerage and Septage Management Program (*see also Chapter 19*)

Land Quality Management

- *Promote sustainable land management (SLM) to arrest land degradation*
 - Integrate SLM practices into sectoral, national, and local development plans and natural resources management plans
 - Improve local capacities and skills for planning and management of land resources, and strengthen awareness and advocacy campaigns
 - Scale up and promote SLM in production landscapes and within multiple-use zones in PAs
 - Implement soil erosion control in sloping areas and water impounding technologies in flood-prone areas within major river basins
 - Develop and implement the National Soil and Water Conservation Program to improve soil fertility and vegetative cover
 - Promote integrated nutrient management based on soil tests and balanced application of appropriate fertilizers
- *Improve management of solid, toxic, and hazardous wastes including electronic wastes*
 - Enforce the compliance of LGUs to RA 9003 in relation to the establishment of material recovery facilities and treatment facilities; closure and rehabilitation of remaining dumpsites; and formulation of local solid waste management (SWM) plans
 - Promote the practice of 3Rs and proper waste management
 - Promote strategic clustering

- of sanitary landfills and SWM technologies to address their large capital requirement, and allow low-income LGUs to pool their resources to finance such facilities
 - Provide alternative livelihood activities for waste pickers in the remaining dumpsites identified for closure
 - Improve the management and disposal of electronic, hospital and toxic wastes
- *Transform abandoned mines and mined-out areas into land use that is beneficial to communities*
 - Implement and monitor the rehabilitation of remaining abandoned mines, namely, Bagacay, Palawan Quicksilver, Romblon, and Silica Sand mines, as well as the smooth turnover of management to LGUs
 - Continue monitoring and auditing the progressive rehabilitation of operating surface metallic mines to ensure the environmental compliance of mining companies
- Promote green procurement in the public and private sectors
- Strengthen the promotion, development, transfer, and adoption of eco-friendly technologies, systems, and practices in the public and private sectors by increasing access to incentives and facilitating ease of doing business and other related transactions, among others (*see also Chapters 9, 10, 14 and 19*);
- Intensify the use of renewable energy and increase its share in the energy mix (*see also Chapter 19*)
- Promote the conduct of a GHG inventory in the public and private sectors

Subsector Outcome 3: Adaptive capacities and resilience of ecosystems increased

Strategies will be geared toward strengthening the implementation of CCA and DRR actions across sectors, including ENR. Response, rehabilitation and recovery efforts will be continuously pursued, with emphasis on strategies to rehabilitate affected natural resources, rebuild infrastructure facilities, and allow communities to recover losses and continue their livelihood and business operations.

Strengthen the implementation of CCA and DRR across sectors, particularly at the local level. Because preparatory activities for building adaptive capacity and resilience are limited, the following specific strategies will be pursued:

Promote sustainable consumption and production. The government will develop and implement SCP policies and initiatives, particularly practices and technologies that will facilitate the attainment of both economic goals and environmental standards. In particular, the following strategies will be pursued to strengthen SCP promotion:

- Formulate a “polluters pay” policy and implement corresponding measures
- Establish a sustainable market for recyclables and recycled products
- Strengthen the certification and establish information systems for green products and services
- Strengthen the implementation of Philippine Green Jobs Act
- Strengthen existing inter-agency bodies that serve as venues for improving policy making and implementation of CC and DRRM. Horizontal and vertical integration of climate-resilient planning, programming and budgeting on CC and DRRM will be ensured.

The Memorandum of Understanding between the Climate Change Commission and National Disaster Risk Reduction and Management Council will be operationalized to provide an enabling environment for mainstreaming DRR and CCA with regard to: (a) setting standards and requirements to integrate local DRRM and CC action plans; (b) ensuring the interoperability of databases to develop a decision support system; (c) implementing appropriate DRRM and CC actions; and (d) establishing coordinated monitoring, reporting and evaluation system. *See Chapter 5.*

- *Develop, maintain, and ensure the accessibility of climate and geospatial information and services.* This includes the following activities: (a) completing the coverage and ensuring access to large scale (1:10,000) probabilistic hazard maps; (b) conducting a nationwide geo-referenced mapping of exposed elements; (c) developing risk estimation models to determine the value of potential loss and damage for different scenarios; (d) improving the loss and damage database to generate disaggregated information about vulnerable and affected groups; (e) identifying and mapping natural ecosystems that contribute to resilience; and (f) standardizing definition and methodologies to measure DRRM and CC variables.
- *Develop a data protocol to facilitate access and sharing of available scientific researches and studies, geospatial information, and climate projection.* A clear policy on accessing and sharing CCAM and DRRM data will be formulated consistent with the provisions of Executive Order No. 02 on Freedom of Information. *See Chapter 5.*
- *Continue to mainstream CCAM and DRRM in national and local development plans and policies.* Government at all levels will be informed of the latest CC projection and risk and vulnerability assessment to identify appropriate interventions and avoid maladaptation. Existing financing schemes and auditing systems will also be revisited to support CCAM and DRRM priorities. *See Chapter 5.*
- *Promote climate and disaster-resilient structures and designs following established measures and standards.* Retrofitting and construction of climate-smart and disaster-resilient infrastructures and facilities will be pursued, especially in hazard-prone areas and environmentally-critical areas. *See Chapters 3, 9, 12 and 19.*
- *Identify technological and research priorities and capacity needs on CCAM and DRRM.* This strategy includes but is not limited to: (a) development of methodologies/tools for national-level risk informed planning and programming; (b) scenario development and modelling of sectoral climate impact; (c) cost-benefit analysis of implementing CCAM and DRRM alternatives; (d) low carbon innovations to address CCA and DRR; (e) approaches and tools to address impact of slow onset events such as sea level rise and ocean acidification; and (f) improved weather detection, forecasting and monitoring. *See Chapters 14 and 19.*
- *Maximize access to CC and DRRM financing and risk transfer mechanisms.* Information on available international and national CC and DRRM financing facilities will be widely disseminated. Technical assistance to stakeholders, particularly LGUs will be provided to

comply with the requirements of such facilities. On risk transfer mechanism, CC considerations will be incorporated in the design of financing packages and insurance products.

- *Promote business continuity planning.* Businesses, especially micro, small and medium enterprises and cooperatives, will be encouraged to prepare business continuity plans for dealing with disaster risks. See Chapters 9, 10 and 12.

Strengthen institutional response to disasters. Priority will be given to activities that will further improve the timely delivery of response, recovery, and rehabilitation efforts, and contribute toward increasing resilience level. See Chapters 11 and 12.

- *Strengthen mechanism to conduct a post or rapid disaster needs assessment (P/RDNA).* Nationwide vulnerability and risk assessment will be completed to provide the bases for a P/RDNA. In addition, there will be capacity-building programs for concerned agencies in the conduct of P/RDNA, including inventory and assessment of damaged natural resources.
- *Revisit existing policies on post-disaster housing and resettlement programs, including those related to land development.* Housing, procurement and land development policies and process, particularly in areas affected by disasters, will be reviewed and amended as needed. The identification of housing and resettlement areas should be in appropriate land-use and will not encroach on environmentally-critical areas and conservation sites. See Chapters 11 and 12.

Strengthen the monitoring and evaluation of the effectiveness of CC and DRRM actions. This includes activities related to the identification of indicators and development

of monitoring systems to measure the implementation and effectiveness of CC and DRRM initiatives vis-à-vis Sustainable Development Goals (SDG), Sendai Framework for Disaster Risk Reduction, and United Nations Framework Convention on Climate Change Commitments.

- *Identify appropriate indicators to measure adaptive capacity and resilience.* Indicators linked to vulnerability vis-à-vis interventions provided will be identified and integrated in existing monitoring systems. This includes ecosystem service indicators that help assess conditions of natural resources.
- *Develop a database to measure emission reduction per sector.* Pursuant to EO 174, there is a need to conduct GHG inventory for agriculture, forestry, energy, transport (i.e., land, maritime and aviation), waste, and industry. This will assist the monitoring, reporting and verification of the country's GHG emissions.

Cross-cutting Strategy

Review, codify and streamline existing ENR policies, rules and regulations to improve compliance, address conflicting provisions and promote transparency and accountability. Sustainable financing mechanisms for ENR, CCA and DRRM efforts will also be determined and operationalized to ensure continuity of activities. But still, strongly motivating behavioral change at the national, community and individual levels regarding ENR preservation and management will be the most effective strategy.

Legislative Agenda

To strengthen the effectiveness of the strategies, legislative action is needed in the following:

Table 20.2 Legislative Agenda to Ensure Ecological Integrity, Clean and Healthy Environment, 2017-2022

LEGISLATIVE AGENDA	RATIONALE
Subsector Outcome: Biodiversity and functioning of ecosystem services sustained	
Delineation of the Specific Forest Limits	Provide a clear and solid basis on the limits of the forest line.
Comprehensive Forestry Law	Institutionalize the development of an effective and sustainable forest management strategy based on the allocation of forestland uses (i.e. production and protection zones). This will also enhance private sector participation and develop systems on Forest Certification and Forest Monitoring, Assessment and Reporting.
Integrated Coastal Management Strategy	Institutionalize ICM as a strategy for the sustainable development of coastal and marine areas.
Land Administration Reform Act	Streamline standards, processes and regulations for property rights, valuation and taxation.
Amendment of Water Code	Provide a legal framework for the institutionalization and operationalization of Integrated Water Resources Management to respond to current trends and challenges such as climate variability affecting water supply and availability, as well as address institutional gaps and weaknesses.
Expanded National Integrated Protected Areas System Act	Finalize/hasten establishment of around a hundred national protected areas since only 13 have been established since 1992.
Subsector Outcome: Environmental quality improved	
Electronic waste (e-waste) recycling	Address improper disposal of e-waste and facilitate the advancement of existing efforts to strengthen solid waste management.
Amendment to RA 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act)	Address the emerging toxic and hazardous wastes which are not covered by the current provisions of the law.
Subsector Outcome: Adaptive capacity and resilience of ecosystems increased	
Further strengthening the Philippine DRRM system and institutionalizing the Framework Plan	Create a National Disaster Risk Reduction and Management Authority and integrate new policies on disaster preparedness, response, mitigation/prevention and rehabilitation/recovery to address existing implementing gaps and challenges.
Cross-cutting	
National Land Use Act	Address the urgency to provide rationalized land use planning in the country, consolidate national laws on land uses and address long-standing land use conflicts.
Philippine Environmental Assessment System	Ensure that possible environmental consequences of policies, plans and programs are fully-accounted at the earliest stage of decision-making consistent with economic and social considerations. This will also strengthen the use of Environmental Impact Statement System as a planning and monitoring tool.

