20 Ensuring Ecological Integrity, Clean and Healthy Environment

CHAPTER 20

ENSURING ECOLOGICAL INTEGRITY, CLEAN AND HEALTHY ENVIRONMENT

Recognizing the vital role and contribution of the natural environment in sustaining economic growth and empowering local communities, the government continues to implement initiatives for ensuring ecological integrity and a clean and healthy environment in the midst of a changing climate and intensifying disaster risks.

The country is beginning to reap the results of investments in the environment and natural resources (ENR) sector, particularly on enhancing the management of forests, inland wetlands, and caves; rehabilitating priority abandoned mines; and formulating local plans for climate change and disaster risk reduction and management. This is evident in the livelihood generated from ecotourism and sustainable resource-based industries, which further encouraged the conservation of natural ecosystems. However, the lack of standards and limited resources and capacities to effectively monitor and evaluate the sector's performance are preventing the proper accounting of its contribution to local and national development. Opportunities arising from the implementation of sustainable tourism and sustainable consumption and production nationwide should be optimized to promote resource and energy efficiency across sectors and foster a better quality of life without causing irreversible damage to the environment. The policies and plans already in place to enhance the country's adaptive capacity against the risks of a changing climate should be translated into concrete actions and implemented through fully-capacitated and empowered institutions.

Assessment

Sustaining biodiversity and functioning of ecosystem services

Continuing efforts on forest and watershed management reduced the area of denuded and degraded forestlands, while initiatives on the delineation of production and protection forests and other water assessment encountered setbacks. Based on the recent land cover data reported by the National Mapping and Resource Information Authority (NAMRIA), forest cover has increased from 6.8 million hectares in 2010 to 7.03 million hectares in 2018. This is due to the National Greening Program (NGP) that began in 2011, which was later expanded (Expanded NGP or ENGP) and will be sustained until 2028. It covers all the remaining unproductive, denuded, and degraded forestlands. The existing forest and reforested areas are under protection through the issuance of appropriate management agreements/arrangements, such as Community-based Forest Management Agreements and Protected Area Community-based Resource Management Agreements. All of these efforts led to the increase in areas of forestlands under effective management from 8.2 million hectares in 2017 to 8.51 million hectares in 2018. Moreover, there were 5,749,000 mangrove propagules planted in 2018 covering 1,916 hectares, intended to contribute in the rehabilitation of the abandoned, underutilized, and undeveloped fishponds through the National Aquasilviculture Program. These initiatives are expected to contribute to increasing the country's forest cover.

However, in order to further institutionalize and continuously increase forest cover as well as secure the livelihood of resource-dependent communities, the delineation of protection and production forests needs to be completed. In 2018, forest delineation fell short of the target due to conflicting land claims (e.g., existence of pending applications for Certificates of Ancestral Domain Titles and /Certificates of Ancestral Land Titles) within forestlands. While comprehensive water assessment for Jalaur River Basin was completed in 2018, the formulation of groundwater management plans and establishment of monitoring wells in two groundwater critical areas remain constrained by issues in procurement of qualified experts and availability of data (e.g., hydrological data).

Granting of Certificate of Ancestral Domain Titles exceeded the target, while issuance of residential free patents remained low. Land titling plays an important role in fostering responsible management of land resources by indigenous peoples and private individuals. In 2018, there were 14 Certificates of Ancestral Domain Titles (CADTs) issued by the National Commission on Indigenous Peoples (NCIP), exceeding the target of six CADTs. This accomplishment was facilitated through the titling component activities of government programs, such as the Cordillera Highland Agricultural Resource Management Project2 Scale-up Project and the *Payapa at Masaganang Pamayanan* (PAMANA). Increased budget coming from the 2018 General Appropriations Act also enabled the NCIP to provide assistance in the formulation of nine Ancestral Domain Sustainable Development and Protection Plans under the Ancestral Domain/Land Security and Development Program, surpassing the six plans targeted for 2018.

However, the target of 45,000 residential free patents (RFPs) was not achieved, with only 28,283 RFPs (63%) issued in 2018. The lower accomplishment is due to the lesser number of applicants interested to secure RFPs, perhaps due to the tedious process and absence of zoning in some local government units (LGUs). Limited funds for conducting on-ground Rapid Land Tenure Appraisals that determine potential lots for titling also contributed to the low issuance of RFPs. Some LGUs were also unable to provide the manpower counterpart and thus, could not participate in the Department of Environment and Natural Resources (DENR)-LGU Partnership on Land Titling. Despite these, the end-of-plan target of 360,000 RFPs is still expected to be achieved with the implementation of the computerized verification and approval of surveys and land transaction tracking system, which would enhance efficiency in the management of land records information.

Programs to manage protected areas are being implemented. However, measuring their effectiveness in improving the condition of ecosystems remains a challenge. The effective management of protected areas is critical given these areas' crucial role in sustaining biodiversity and functioning of ecosystem services. The implementation of the Protected Area Development and Management Program, which includes the operationalization of the Protected Area Management Boards and implementation of Protected Area Management Plans, ecotourism development, cave management, and wetland conservation activities, are continuously being carried out. Moreover, the legislation of additional 94 marine and terrestrial protected areas covering an area of 3.1 million hectares, through the passage of the Expanded National Integrated Protected Areas System Act[1] in 2018, is expected to facilitate mechanisms to sustainably manage the protected areas in the country.

In addition, the declaration of a portion of Philippine Rise as a Marine Resource Reserve[2] contributed to the increase in coverage of marine protected areas (MPAs) with respect to the country's total marine area (220 million hectares), from the baseline of 0.64 percent to 1.4 percent in 2018, exceeding the end-of-plan target of 0.76 percent. Noting this, a review and recalibration of end-of-plan target is deemed necessary

[1] *Republic Act No. 11038: An Act Declaring Protected Areas and Providing for their management, amending for this purpose RA 7586 otherwise known as the "National Integrated Protected Areas System Act of 1992" and for other purposes*

[2] *Presidential Proclamation No. 489: Declaring a Portion of the Philippine Rise Situated within the Exclusive Economic Zone of the Philippine Sea, North Eastern Coast of Luzon Island as Marine Resource Reserve Pursuant to Republic Act No. 7586, or the National Integrated Protected Areas System Act of 1992, to be known as the Philippine Rise Marine Resource Reserve*

considering the potential to further expand the coverage of MPAs through legal and executive issuances. However, while there is notable expansion in terms of coverage of our terrestrial and MPAs, continuous support initiatives to improve their management should be prioritized given their vital role in maintaining and generating goods and services for different sectors.

In terms of managing priority inland wetlands, around 79,492.37 hectares improved from "poor" to "fair"[3] management, while another 49,679.78 hectares improved to "satisfactory"[4] in 2018. On the management of caves with high conservation value, 11 out of 20 caves already improved from "poor" to "fair" management, while three caves are already reported to have "good"[5] management from being poorly managed. The improved management of these ecosystems may be attributed to the implementation of wetland and cave management plans, and capacity building of DENR field units.

There remains a challenge, however, to harmonize and standardize various methodologies available to assess effectiveness of managing the country's ecosystems and evaluate the overall condition of ecosystems for regular monitoring. As of December 2018, an updated assessment of the quality of coastal and marine habitats (e.g., coral reefs) is yet to be completed. Opportunities to address this include the continuing implementation of the Coastal and Marine Ecosystems Management Program, which will update and complete the assessment of the condition of the country's coral reefs and other habitats.

Resource-based industries, including ecotourism, continue to support the livelihood of resource-dependent communities. The implementation of the ENGP and Community-Based Forest Management generated a total of 393,903 jobs, equivalent to 62,375 persons employed in reforestation and non-timber/agroforestry enterprises. In addition, there were 2,943 persons employed in ecotourism activities within protected areas (e.g., tour guiding, transport, souvenir making, etc.) and other sustainable resource-based enterprises. However, there is still no standard guideline across reporting agencies (e.g., DENR, Department of Tourism, Department of Trade and Industry) to fully account the livelihood generated from sustainable resource-based industries and biodiversity-friendly enterprises.

The delineation of municipal waters that will help ensure preferential access of municipal fisherfolk to resources as well as the establishment and operationalization of Community Fish Landing Centers (CFLCs) to reduce post-harvest losses are yet to be completed to optimize and sustain livelihood opportunities. In 2018, the delineation of the 80 target coastal cities/municipalities was completed by NAMRIA, while 160 out of the existing 525 CFLCs were made operational by Department of Agriculture-Bureau of Fisheries and Aquatic Resources. However, only 182 additional CFLCs were established in the same period, falling short of the target 200 additional CFLC units. Constraining factors include the difficulty in identifying available and suitable sites and challenges in the development of land prior to construction.

Improving environmental quality

Implementation of air and water policies and programs was sustained, but quality assessments were persistently hounded by recurrent malfunctioning of monitoring stations and equipment. With the continuing compliance of stationary sources (e.g., factories, establishments) with regulatory policies and programs, the ambient air quality in 20 out of the 21[6] assessed highly-urbanized and other major urban centers passed the PM_{10} standard. Meanwhile, air pollutants from mobile sources were being managed through the implementation of various programs such as the Transport Modernization Program, Vehicle

[3] *Fair management indicates that a site has a management plan and body established. Biophysical and socioeconomic assessment has also been conducted.*

[4] *Satisfactory management indicates that a site has a management plan and body established, biophysical and socioeconomic assessment has been conducted, and effective communication and enforcement of policies are being observed.*

[5] *Good management indicates that a site has adequate and sustainable human and financial resources.*

[6] *Pasay City failed the ambient quality standard for PM10.*

Emission Limits for Euro IV and In-Use Vehicle Emission Standards, and Biofuels Act of 2006. Unfortunately, the notable increase in the number of vehicles is expected to affect the ambient air quality in areas. However, other areas have no complete data to assess the quality of ambient air due to lack of technical personnel to monitor and interpret the data, and poor maintenance of the monitoring stations and equipment.

All assessed priority water bodies passed the guidelines for dissolved oxygen (DO) and phosphate, while more than 80 percent passed the standards for pH, biochemical oxygen demand (BOD), nitrate, and temperature. However, only 29 percent of the assessed priority water bodies passed the standard for fecal coliform.

Table. 20.1 Water Quality Parameters and Assessed Priority Water Bodies within Standards (in percent)

WATER QUALITY PARAMETERS	ASSESSED PRIORITY WATER BODIES WITHIN STANDARDS (IN PERCENT)
DO	100%
Phosphate	100%
pH	95%
BOD	92%
Nitrate	90%
Temperature	83%
Fecal coliform	29%

Ideally, standards for the seven parameters have to be passed in each priority water body to be rated as good quality. Unfortunately, the quality of some priority water bodies deteriorated due to pollutants from point (e.g., domestic and industrial wastes) and nonpoint sources (e.g., agricultural runoff). These pollutants reached water bodies due to lack of proper sewerage systems for domestic and industrial wastes, waste water treatment facilities, and) programs to address nonpoint pollution sources from urban and agricultural runoff that directly discharge wastewater or effluents to drainage systems. Moreover, accurate assessment to conclude the overall quality of each water body is still lacking. The more advanced (i.e., automatically operated) monitoring equipment and stations were not properly maintained, while the manually operated ones were not regularly used in all areas.

Compliance with land and waste management policies has improved. The target decrease in the area of land degradation hotspots has been achieved (2,027,893 hectares) as against the 2,200,000 hectare-target for 2018. This was done through the implementation of the: (a) National Organic Agriculture Program, which implements activities that contribute to enhancing soil fertility and farm biodiversity and reducing pollution; (b) Program on Sustainable Corn Production in Sloping Areas, which introduces conservation approaches and technologies applicable in sloping areas cultivated with corn; and (c) Integrated Upland Conservation Guided Farm, which aims to promote sustainable land management in order to provide agricultural livelihoods while maintaining environmental sustainability in the upland areas of the country, among others.

A total of 1,589 provinces, cities, and municipalities have already submitted their 10-year Solid Waste Management Plan in compliance with the Ecological Solid Waste Management Act of 2000 (RA 9003). From the submission and implementation of plans, the DENR-Environmental Management Bureau estimated that in areas outside Metro Manila, the solid waste diversion rate (SWDR)[7] is at 62 percent, exceeding its annual target of 60 percent. While the monitoring and reporting scheme to determine the actual SWDR

[7] *Waste diversion refers to activities that reduce or eliminate the amount of potentially recyclable material or solid wastes diverted out from the waste disposal stream and therefore do not go into the landfills. The SWDR is computed by dividing the total recovered and recycled waste by the total waste generation. (Guidebook for the Formulation of Solid Wastes Management).*

outside Metro Manila is yet to be realized, there is an increase in the number of materials recovery facilities (MRFs), and the access to sanitary landfills has improved. On the other hand, based on actual monitoring by Metro Manila Development Authority, only 41 percent of wastes in Metro Manila[8] cities were actually diverted for reuse and recycling. This was attributed to insufficient garbage collection facilities, sanitary landfills, and MRFs.

Interim rehabilitation of priority abandoned mines has been progressing. The interim rehabilitation in three (Palawan Quicksilver Mines, Inc., Romblon Marble Mines, and Silica Sand Mines) out of the four priority abandoned mines are within the annual target. The Bagacay Mines rehabilitation contract has been officially terminated due to unsettled management issues with the Department of Finance-Privatization Management Office. In view of this, the budget allocated for Bagacay Mines will be transferred to complete the rehabilitation of Palawan Quicksilver Mines, Inc. The government has also adopted an evidence-based approach in reinventing the country's mining industry operations to ensure more responsible and sustainable practices.

Efforts to change consumption and production patterns are underway. The government initiative to promote green procurement paved the way for increased awareness and intent of companies to be certified through the National Ecolabelling Program -Green Choice Philippines. While no Seal of Approval for green products was granted in 2018, 12 companies signified interest to be certified and two (2) companies have already submitted requirements. However, the voluntary and demand-driven nature of the certification process and pending criteria development for particular product categories pose a challenge to the wider uptake of the initiative. On the other hand, continuing implementation of policies and programs (e.g., Government Energy Management Program) to promote energy efficiency among government agencies resulted in accumulated savings of approximately PHP82.2 million in 2018.

Despite current efforts to promote sustainable consumption and promotion (SCP), irresponsible and unsustainable consumption and production practices that undermine the capacity of our environment to assimilate wastes persist. This exacerbates air and water pollution, affecting the health of the immediate host community. For instance, unregulated tourism developments coupled with an influx of tourists commonly generates a large volume of solid waste. The improper disposal of these wastes due to the absence of appropriate sewerage systems often cause water pollution, thereby compromising the proper function of ecosystems.

Increasing adaptive capacity and resilience of ecosystems

Preparatory efforts to increase adaptive capacity against climate change and disaster risks have been strengthened. A total of 807 local disaster risk reduction and management plans (LDRRMPs) of provinces, cities, and municipalities have been reviewed in 2018, while 1,073 LGUs have submitted their local climate change action plans (LCCAPs) for evaluation. Additionally, 196 Comprehensive Land Use Plans have been reviewed in terms of their climate change adaptation (CCA) and disaster risk reduction (DRR)-responsiveness. The government has been preparing and enhancing existing tools to review the CCA and DRR-responsiveness of local plans, including standardization of the content of LDRRMPs, and development of the quality assurance tool for LCCAPs. While a monitoring tool is already in place to ascertain the number of LGUs with risk-informed Comprehensive Development Plans (CDPs),[9] the mechanism to validate these is yet to be institutionalized. The Seal of Good Local Governance introduced a more stringent standard on the establishment of disaster risk reduction and management (DRRM) operations centers and early warning

[8] *Excluding Pateros because it had not submitted data on SWDR monitoring.*

[9] *Based on the Department of the Interior and Local Government's records, a total of 78 LGUs have risk-informed CDPs as of December 2018. It should be clarified, however, the determination whether a CDP is risk-informed or not rests with the LGU.*

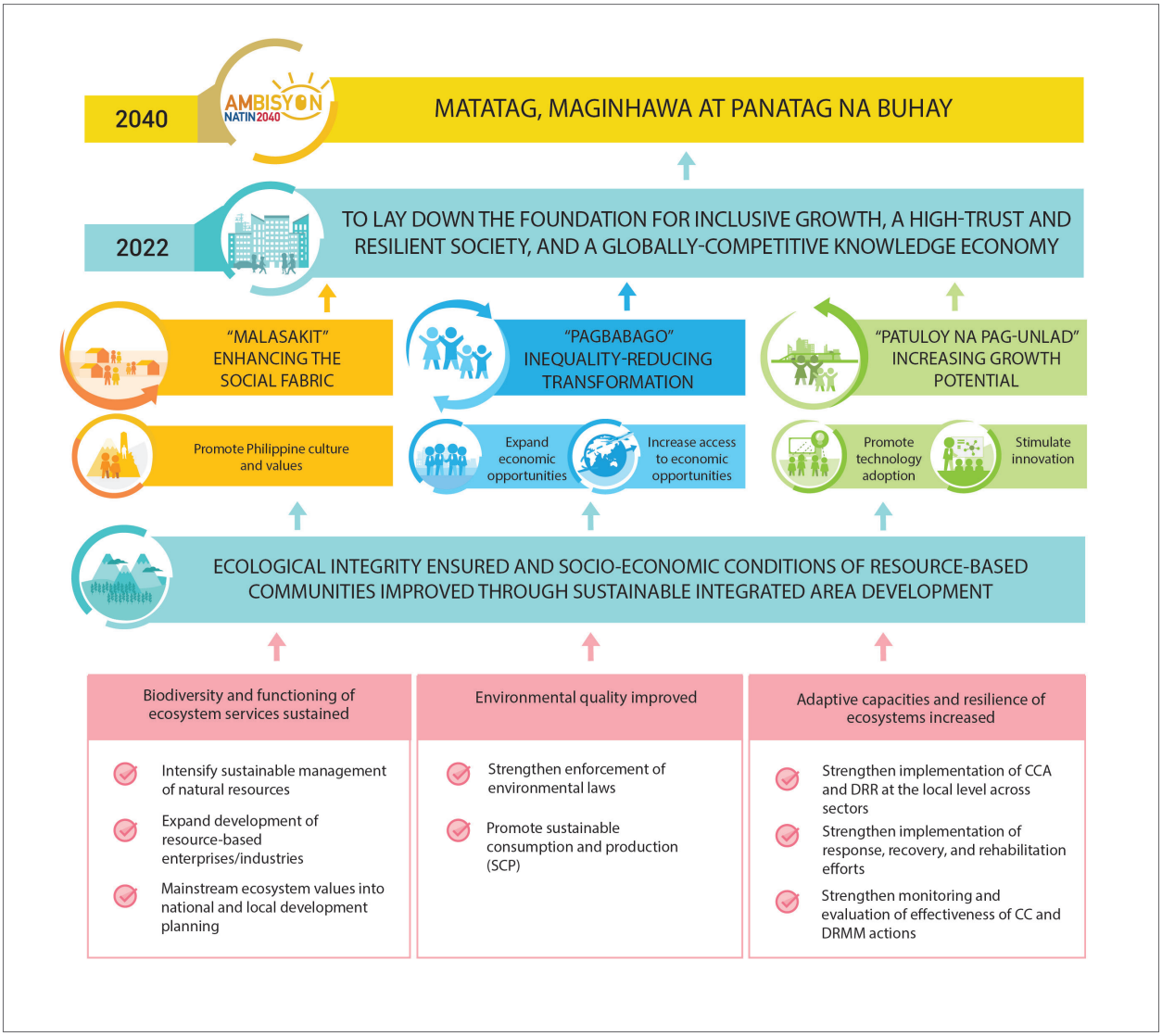
systems, which were adhered to in 1,406 and 1,292 LGUs, respectively. A new methodology to measure disaster resilience at the regional level is also being developed. The tool may be expanded and enhanced to cover climate risk parameters and more updated socioeconomic data.

However, limited technical and absorptive capacity of national and local governments and private institutions and difficulty in accessing available financial resources continue to impede the effective implementation of climate change adaptation and mitigation (CCAM) and DRRM activities. Despite the existence of policies and plans necessary to operationalize the country's disaster and climate resilience agenda, translating such directives into actions and activities on the ground is yet to be fully realized. For instance, many LGUs still prioritize response measures instead of disaster mitigation, prevention, and preparedness in dealing with disasters. This is evident in the poor allocation and utilization of their budgets for resilience-building, including local DRRM funds. Moreover, many LGUs lack appreciation of risk data and information needed for local planning and programming. Communities need to implement more proactive actions, based on up-to-date data and information and using available technology in response to the increasing risks of disasters and climate change.

Moving forward

To facilitate the conservation of ecosystems and realize improvements in environmental quality and resilience of communities and ecosystems, the following are the empowering strategies that need to be implemented in the near- to medium-term.

Figure 20.1 Strategic Framework to Ensure Ecological Integrity, Clean and Healthy Environment



Increase investment in innovative technologies and harmonize and adopt standards to enhance ENR management and monitoring. Available technologies could be tapped, where appropriate, for environmental management and monitoring. In particular, increasing investments to acquire innovative technologies (e.g., environmental sensors, satellite imagery, unmanned aerial vehicles) to monitor air, land, and water quality and condition of critical habitats will help facilitate timely and accurate provision of environmental data/information. To complement these technologies, there is a need to: (a) review, harmonize, and adopt standards to assess the quality of terrestrial, coastal, and marine ecosystems, and account economic gains from ecosystem services, such as employment from ecotourism and sustainable resource-based industries; (b) ensure proper maintenance and upgrading of existing monitoring stations and equipment; and (c) regularly review and build competencies of national and local governments on data analysis and handling of monitoring equipment and other relevant technologies for monitoring and evaluation of the state of ENR. These strategies are expected to facilitate consistency and robustness of ENR-related data and information to effectively inform management of the sector with due consideration of existing financial and absorptive capacities.

Enact the Final Forest Limits Bill. Overall performance of the ENR sector remains constrained by competing and conflicting land requirements of various sectors. The absence of an enabling policy that defines the actual boundaries of forests has resulted in inappropriate land use and management, as well as boundary conflicts and encroachment. The delineation of the specific limits of forest lands will provide the government a clear and solid basis to execute its mandate on proper management, development, supervision, and protection of the country's remaining forests and forest resources. This will also facilitate conflict resolution among competing uses of forest lands, agricultural lands, and national parks, and provide security of tenure to upland dwellers or actual tillers of forest lands or agricultural lands. Defining the exact scope and location of forests will provide a more stable policy environment that would encourage private sector participation in production forest development. However, pending enactment of the final forest limit and other land use bills (e.g., land use, land administration reform), issuance of an executive policy is deemed necessary to strengthen land governance among relevant agencies (e.g., DENR, DA, NCIP, and Department of Agrarian Reform) and provide guidance to LGUs on land use planning and management within their territorial jurisdictions.

Finalize action plan on sustainable consumption and production. Promotion of sustainable consumption and production will be intensified to achieve economic growth within environmental limits, minimize damage to the natural environment, and make use of natural resources in a sustainable way. To ensure more cohesive implementation of SCP in the country, an overarching framework and action plan on SCP implementation is currently being developed. Concrete strategies and mechanisms to promote resource conservation and efficiency, sustainable business and lifestyles, and waste and chemicals management, among others, as well as their means of implementation (e.g., financing, capacity building, and partnership, among others), including monitoring framework are being identified. The government is also expected to scale up its policies, programs, and projects on SCP (e.g., National Eco-labelling Program-Green Choice Philippines, Green Public Procurement, and Sustainability Reporting of Private Companies, among others) to facilitate transformative reforms and interventions, and enabling mechanisms for the business sector to integrate the greening of their business processes and products.

Conduct carrying capacity studies to ensure sustainable tourism. To ensure that beaches, mountains, and other ecotourism sites meet the needs of tourists and host regions while protecting the rights and opportunities of future generations, carrying capacity studies (e.g., physical, population, ecological, economic) should be undertaken to inform sustainable tourism development planning. Results of carrying capacity studies should be translated to appropriate interventions and legal instruments to manage tourism areas, such as on zoning, infrastructure development, fees or penalties, and allowable activities and enterprises.

Box 20.1 Boracay Island Rehabilitation

Boracay Island is one of the country's top tourist destinations. It has a rich ecosystem covering mangroves, coral reefs, marshlands, wetlands, lagoons, forestland, and caves. However, the influx of foreign and domestic tourists and unregulated increase in business establishments and vehicles worsened the condition of the Islands' ecosystems, as manifested in the: high concentration of fecal coliform in the Bulabog beaches; degradation of coral reefs and the decline in coral cover of Boracay; magnitude of uncollected wastes in the Island, damaged or destroyed natural habitats of Puka shells that serve as the nesting grounds of marine turtles and roosting grounds of flying foxes or fruit bats; and loss of wetlands that serve as natural water catchment areas, thus aggravating the flooding problem. Hence, through Proclamation No. 475, issued on April 26, 2018, the President placed Boracay Island under a State of Calamity and subsequently ordered its temporary closure to tourists from April 26 to October 26, 2018.

To ensure that the re-opening of the Island to tourism activities will not compromise the state of its ecosystem, the government strictly enforced national laws and local ordinances, particularly on wastewater treatment, solid waste management, and easement areas. The DENR spearheaded the conduct of a carrying capacity study, which identified Boracay Island's thresholds and limitations and guided the formulation of the Boracay Action Plan.

The study revealed that the resulting population carrying capacity of the Island is 55,000 people, including both tourists and residents. This implies an exceedance of approximately 15,000 persons, based on Boracay's 2017 total population. The recommendations of the study include the promotion of wetlands utilization for filtering out wastes, improvement of wastewater treatment facilities to account for all wastes generated, stopping/minimizing point-source pollution, and development of information and education communication materials to improve waste management and address coastal erosion, among others. The carrying capacity study is intended to be reviewed periodically to take into account changing socioeconomic and environmental conditions and ensure sustainable development of the Island.

Strengthen capacities and structures of agencies addressing climate change adaptation and mitigation and disaster risk reduction and management. National and local efforts to implement CCAM and DRR-related policies and plans need to be harmonized and unified. Agencies concerned should be further capacitated and empowered to carry out rapid and efficient implementation of the country's disaster and climate resiliency priorities. The creation of a full-fledged government line agency is necessary to ensure a holistic, comprehensive, and integrated approach to CCAM and DRRM. Moreover, LGUs should be continuously capacitated in accessing and employing accurate relevant information and data on the development, updating, and implementation of their respective LCCAP and LDRRMP; and in preparing project proposals and other necessary requirements to make use of available financing facilities (i.e., People's Survival Fund, Official Development Assistance). Furthermore, to optimize the growing interest of various institutions in providing support on national and local CCAM and DRRM-related initiatives, a framework/guideline on Green Finance Policy should be developed and implemented.

The programs and projects (PAPs) listed under the Public Investment Program 2017-2022 shall continue to be pursued to achieve the targets for the sector. In addition, policies and PAPs that will directly contribute to the attainment of the Sustainable Development Goals shall also be prioritized.