



DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
2022 ANNUAL REPORT



**Leading the ENR Sector towards
Sustainable, Inclusive and Resilient Development**



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Secretary's Message

The Annual Report of the Department of Environment and Natural Resources highlights some of the Department's notable accomplishments from July 2022 to First Semester of 2023. These are anchored on President Ferdinand Romualdez Marcos, Jr.'s administration's pursuit of sustainable, resilient and inclusive department for all.

The Department's priorities are aligned with the President's pronouncement regarding the nexus between economic development, climate change, and the environment. This administration's 8-point agenda, particularly on "pursuing a green and blue economy and establishing livable and sustainable communities" has guided the DENR in achieving effective pathways to 1) fulfill our mandate to conserve, protect, manage, restore and regenerate our country's environment and natural resources and 2) manage risk and build resilience using an ecosystems-based ridge to reef approach.

These accomplishments were made possible by the commitment to integrity and excellence of the Biodiversity Management Bureau, Ecosystems Research and Development Bureau, Environmental Management Bureau, Forest Management Bureau, Land Management Bureau, Mines and Geosciences Bureau, Laguna Lake Development Authority, National Mapping and Resource Information Authority, National Water Resources Board, Natural Resources Development Corporation, and Palawan Council for Sustainable Development.

We are likewise grateful to our development partners in the academe and scientific community, civil society, private sector, as well as our international partners for their strategic investments and scientific technical support.

The DENR remains committed to pursuing our mandate to protect, conserve, restore and regenerate our country's environment and natural resources while advancing economic and social progress.

These accomplishments represent the beginning of transformation in our mission. They will enable us to chart and accelerate a new evidence-informed, inclusive, resilient and sustainable development trajectory for our country.

Mabuhay!



MARIA ANTONIA YULO LOZAGA
Secretary



About the DENR

MISSION

To mobilize our citizenry in protecting, conserving, and managing the environment and natural resources for the present and future generations.

VISION

A nation enjoying and sustaining its natural resources and clean and healthy environment.



MANDATE

The Department is the primary agency responsible for the conservation, management, development, and proper use of the country's environment and natural resources, specifically forest and grazing lands, mineral resources, including those in reservation and watershed areas, and lands of the public domain, as well as the licensing and regulation of all natural resources as may be provided for by law in order to ensure equitable sharing of the benefits derived therefrom for the welfare of the present and future generations of Filipinos. (EO 192, S. 1987)

To accomplish this mandate, the Department shall be guided by the following objectives:

- Assure the availability and sustainability of the country's natural resources through judicious use and systematic restoration or replacement, whenever possible;
- Increase the productivity of natural resources in order to meet the demands for forest, mineral, and land resources of a growing population;
- Enhance the contribution of natural resources for achieving national economic and social development;
- Promote equitable access to natural resources by the different sectors of the population; and
- Conserve specific terrestrial and marine areas representative of the Philippine natural and cultural heritage for present and future generations.

Executive Summary

This Report strives to articulate the notable accomplishments of the DENR for CY 2022 as well as the plans for 2023, all of which are anchored on the 8-point agenda of the President in the pursuit of a sustainable, inclusive, and resilient society.

This administration's 8-point agenda, particularly on the "creation of green jobs by pursuing a green and blue economy and establishing livable and sustainable communities," has guided the DENR in establishing better pathways to fulfill its mandate to conserve, protect, and manage the country's environment and natural resources; and manage risk and build resilience using a ridge-to-reef and ecosystems-based approach.

As one of its more significant achievements in 2022, the DENR adopted a risk-based approach to address climate change by building a national natural resource geospatial database. This platform supports strategic planning and actions and provides the physical basis for the natural capital accounting system and the valuation of ecosystem services. Foreign assistance amounting to over PHP 6.3 Billion was mobilized to implement environment-, nature-, and climate change-related programs and projects for the next six years. These include programs on reforestation, protected area management, and nature-based solutions to strengthen climate actions. This was made possible by the sustained partnership with and the department's participation in multilateral and bilateral discussions with UN agencies and countries such as the UK, France, USA, and Australia.

Intensive policy reviews and development were conducted for organizational streamlining and transformation, as well as process reviews in large- and small-scale mining, reclamation, water security and resource management, and land management. Further, the DENR continued to address emerging food security issues and to create green jobs. Enhancing environmental quality management of air, water, and solid waste was pursued and international cooperation was promoted to access financing, knowledge, and technology transfer between the department and other institutions around the globe.

On Biodiversity Conservation and Protected Areas and Coastal and Marine Environment Management, 11,505 corners of PAs were demarcated and nine (9) Marine Protected Area Networks were established for habitat conservation and fishery management. Under the Enhanced National Greening Program, 45,997 hectares of plantations were established with 34,357,275 seedlings of various commodities were distributed nationwide.

About 38,547 individuals were employed in reforestation programs and 2,373 estero and river rangers and Boracay Environmental Lawin Patrollers were hired to monitor, protect, clean, and rehabilitate the rivers, esteros, and other various water bodies of Manila and Boracay. Seventy-one (71) were assisted through Biodiversity-Friendly Enterprises (BDFE), and 44,019 beneficiaries of residential and agricultural patents were provided tenurial security.

Enforcement of environmental laws was intensified and compliance and monitoring were also improved through digital and satellite data tools (LAWIN Forest and Biodiversity Protection, Chainsaw Registration System, Forest Fire Danger Rating System). These helped us reduce illegal logging hotspots by 11%. A total of 109 Air Quality Monitoring Stations (AQMS) were operationalized; additional 47 waterbodies were classified in terms of best usage and water quality to be maintained (DMC 2022-15) and solid wastes managed through waste diversion (36,560 tons of solid waste per day).

These are among the many achievements of the DENR in 2022 which are vivid testaments to its broad support of the administration's priorities for economic recovery, climate resiliency, and inclusive development for the best interest of the Filipino people.

Accomplishments on the 8-Point Socioeconomic Agenda of President Ferdinand Marcos, Jr.

NEAR TERM

I. PROTECT PURCHASING POWER OF FAMILIES

A. ENSURE FOOD SECURITY

To help enhance the country's national productivity and consecutively the overall production of food and assist in providing opportunities for income generation, the DENR continued to implement the Enhanced National Greening Program (ENGP), Community-Based Forest Management Program-Comprehensive Agrarian Reform Program (CBFM-CARP), and the Coastal and Marine Ecosystems Management Program (CMEMP).

The ENGP and CBFM-CARP seek to ensure that food security is attained by developing forestland areas through agroforestry, which involves the planting of mixed commodities of fruit trees, timber trees, and agricultural crops. These plantations provide immediate sources of food in various forms, such as fruits and other forest products that can help our partner communities in their daily needs. Under the CMEMP, Biodiversity-Friendly Enterprises (BDFE) continue to be established and sustained by our partner communities, with funding support from the Department.




1. ENHANCED NATIONAL GREENING PROGRAM

The implementation of Enhanced National Greening Program (ENGP) is pursuant to Executive Order No. 193, s. 2015 otherwise known as “Expanding the Coverage of the National Greening Program,” which aims to cover all the remaining and unproductive, denuded, and degraded forestlands, with its period of implementation extended from 2016 to 2028. All sectors, particularly the private sector, are encouraged to actively participate in the program.

In 2022, a total of 45,997 hectares of open, denuded and degraded forestlands nationwide were rehabilitated and reforested. Also, 34,357,275 seedlings were planted, and 225,588 jobs and 38,547 persons have been generated and employed, respectively to conduct various activities in the given time period.

In support of the NGP, 41,992 seedlings and bamboo culms were also planted in various locations in the Laguna de Bay Region (LDBR), covering 41.59 hectares. Bamboo propagation and management training were also provided to 15 farmers and private lot owners in Brgy. Navotas, Cardona, Rizal (June 9-10, 2022).

To ensure the sustainable supply of water for the effective management and maintenance of established plantations, a total of 107 units of Small Water Impounding System (SWIS) were constructed with 3,130.625 cubic meters water-holding capacity.



*2-hectare of timber plantation in Pullaan, Lagawe, Ifugao
PO Name: Central Ambassador Women's Association, Inc.*

2. COMMUNITY-BASED FOREST MANAGEMENT

Community-Based Forest Management (CBFM) is a national strategy that aims to ensure sustainable development of the country's forestlands and its resources through the issuance of Executive Order No. 263, Series of 1995. The program also aims to improve the socio-economic condition of people in the uplands, whose livelihoods heavily depend on the forests.

For CY 2022, CBFM Agreements were issued to eight (8) People's Organizations (POs) with a total of 402 members covering a total of 6,529.21 hectares. To date, CBFMA was issued to a total of 1,968 CBFM POs with 170,240 members covering around 1.6 million hectares of forestlands. These CBFM POs are recognized as partners of the government in achieving sustainable forest management. Hence, for the past 25 years, they have received technical and financial support from different National Government Agencies (NGAs), Non-Government Organizations (NGOs), and Developmental Organizations (DOs), through various programs which include the Community-Based Forest Management-Comprehensive Agrarian Reform Program (CBFM-CARP).

The DENR was instituted to improve the land tenure systems of the country and the socio-economic status of the program beneficiaries in support of the Agrarian Reform initiative of the government. As provided in Section 15 of Executive Order no. 229 entitled "*Providing the mechanisms for the implementation of the Comprehensive Agrarian Reform Program*", the DENR is mandated to distribute all alienable and disposable lands of the public domain suitable for agriculture to qualified beneficiaries.



Plantation established by CBFM PO Alasasin Community-Based Forest Management Association, Inc.

Upon the completion of the land distribution scope under DENR-CARP, the DENR had initiated the provision of support services to agricultural workers which include land development and livelihood programs in CBFM areas. The provision of support services in the upland started in CY 2007 under the Program Beneficiaries Development (PBD) of CARP. There were already 1,867 funded/implemented projects under the Program Beneficiaries Development (PBD). Relative to this, the CBFM-CARP beneficiaries are also acknowledged as the Agrarian Reform Communities (ARC) in the uplands.

For CY 2022, financial assistance amounting to PhP79,648,000.00 was provided for the implementation of 83 agroforestry development projects, covering 2,591.50 hectares of upland and 49.50 hectares of mangrove areas benefitting 3,614 CBFM PO members. In addition, 13 enterprise livelihood projects were implemented benefitting 1,253 CBFM PO members. As a result, six (6) POs with 582 members gained income ranging from PhP6,000 to PhP30,000.00.

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Monitoring and inspection of planted mahogany (left) with fruit trees (calamansi and pineapple) (right) of the Tagbisay Multi-Purpose Association on August 23, 2022

Bamboo production of CBFM-PO Kauswagan nga Pederasyon San mga Parag-uma sa Matuguinan (KPPM) with CY 2022 Agroforestry-Based with Bamboo Plantation located in Brgy. Nagpapacao, Matuguinao Samar.



7/7/22
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Plantation establishment of CBFM-PO Cahan Bagamanoc Tree Planters Asso., Inc., (CBTPAI) in their Agroforestry Development Project located at Brgy. Cahan, Bagamanoc, Catanduanes



8/25/22



Capacity Building for CY 2022 CBFM-CARP Project beneficiaries under CENRO Palo on the Leadership and Vermicomposting Training conducted on August 26, 2022 in Brgy. Rizal, Babatngon, Leyte

3. COASTAL AND MARINE ECOSYSTEM MANAGEMENT PROGRAM

Coastal and Marine Ecosystem Management Program (CMEMP) aims to comprehensively manage, address and effectively reduce the drivers and threats of the degradation of coastal and marine ecosystems to achieve and promote sustainability of ecosystem services, food security, and climate change resiliency.

The development of Biodiversity-Friendly Enterprise (BDFE) is one of the seven (7) program components of the CMEMP. BDFEs are micro, small, and medium enterprises that promote the sustainable use of biological resources, create wealth and value, and open opportunities for the equitable sharing of benefits among stakeholders. The existing BDFEs of 71 People's Organizations were enhanced through providing technical assistance to increase their skills, knowledge, and resources in putting up BDFEs. The following workshops and orientation were conducted in 2022: BDFE Financial Assistance Screening Process Mainstreaming BDFE in the National Programs – Green Economic Development, and BDFE for Terrestrial PAs which provided the participants basic knowledge and technical know-how on the implementation of the BDFEs.



PO Lumad Moro Christian Women's Association (LCWA) located in Brgy. Pangyan, Glan, Sarangani Province under the Biodiversity-Friendly Enterprise

II. REDUCE VULNERABILITY AND MITIGATE SCARRING FROM THE COVID-19 PANDEMIC

As the Philippines is still plagued by the COVID-19 in 2022, the Department continued its efforts to support the government in mitigating institutional scarring from the COVID-19 Pandemic. It continually managed the wastes generated from the government's COVID-19 Vaccination Program with the monitoring of 208 Treatment, Storage, and Disposal (TSD) Facilities where hazardous wastes are stored, treated, recycled, reprocessed, or disposed of. Of the 208 TSDs monitored, 32 were identified as TSD facilities handling pathological or infectious wastes (M501). Notices of Violation (NOV) were issued to six (6) facilities found non-compliant with the rules and regulations on Hazardous Waste Management.

III. ENSURE SOUND MACROECONOMIC FUNDAMENTALS

In keeping with Secretary Yulo's pronouncement during the 2023 DENR budget deliberation, the DENR is currently evaluating its processes of procurement and work- and financial-planning systems to effectively utilize the Department's budget. The DENR's thrust towards rightsizing and enhancing government efficiency was laid down through the formulation of the agency's reorganization policies. Further, several measures were adapted to achieve a sound fiscal management.

A. IMPROVING BUREAUCRATIC EFFICIENCY

The DENR vigorously pursued rightsizing and enhancing government efficiency as it accomplished the following:

- Reconstituted the Change Management Team (CMT) designating an Undersecretary to handle organizational transformation of the Department. Initially, the working concept of the DENR's Organizational Transformation Roadmap was developed and organizational structures and functions of the DENR offices were reviewed.

- Initiated the establishment of a national natural resource geospatial database for prioritizing programs and projects as guide for future decision-making. DENR Administrative Order No. 2023-01 on the “Establishment of the National Environment and Natural Resources Geospatial Database Under the Office of the Secretary” was signed by the Secretary on 04 January 2023.
- Enhanced digitalization for online issuance of permits and other paperwork processing of the Department such as the Frontline Services Transaction Systems (FSTS). This System, which covers the entire cycle of permit issuance, from application to legal instrument delivery, was developed by the DENR in 2018, which features a multi-user, multi-role web-based application that keeps track of the application’s processing and acceptance at all Departmental level and provides online access to or browsing of all the applications.

With the changes to the process flows and level of document approval through the latest DAO 2022-10 or the Revised DENR Manual of Authority on Technical Matters, the enhancement of the FSTS with functions of improving the usability and user experience of the system and covering and adapting to changes in management and authority is needed.

- Designed and conducted a Department-wide process review to streamline DENR services resulting in a more timely and more efficient fulfillment of the Department’s mandate to manage the country’s environment and natural resources.

B. ENSURING SOUND FISCAL MANAGEMENT

The following measures were adopted by the Department to achieve a sound fiscal management:

- Ensuring stronger connections between strategic, scientific, and operational planning and budgeting to meet organizational, physical, and financial targets.
- Conducting early procurement activities short of the award upon arrival of the National Expenditure Program (NEP) authorized under Sections 7.6 and 20.1 of the Revised Implementing Rules and Regulations of Republic Act No. 9184 (Government Procurement Reform Act), and encouragement of creditors and suppliers for the timely submission of validated claims for payment of pending obligations.
- Addressing observed bottlenecks in the system as part of the Full-Time Delivery Unit (FDU), and to continuously monitor performance throughout the year. To undertake catch-up plan measures to recoup underperformance for the period covered.
- Sustaining the application of the Common Fund System to optimize the use of the available cash allocation for payment of obligations both for current and prior year's payables provided that mandatory items are fully-funded.
- Timely and accurate submission of reportorial requirements with due prudence, consistency, and accuracy on the information provided for an effective reporting, monitoring, and evaluation of the agency's performance as stated in Sections 98-99 of the General Provisions of FY 2022 General Appropriations Act (GAA) or Republic Act No. 11639.
- Generate income from lands, biodiversity, and forestry fees, of which about PhP978.6 Million worth of revenues were collected in 2022.

MEDIUM TERM

IV. CREATE MORE JOBS

As the DENR's contribution to the country's economic recovery, it endeavored to create more jobs by encouraging the various sectors of society to invest in ENR-related programs and projects. It has established partnerships with several organizations and networks, LGUs, academe, civil society organizations and the private sector with the conduct of the First Multi-Stakeholder Forum. In addition, it continued to delineate production forests for potential investment areas, issue mining permits and contracts to qualified individuals, and identify priority mining projects.

A. PROMOTE AND SUPPORT INVESTMENTS

The Department actively engages with several organizations and networks, LGUs, academic institutions, civil society organizations, private partner organizations, among others, in the implementation of the programs and projects of the DENR.

To make this materialize, the DENR conducted the First Multi-Stakeholder Forum in Quezon City for the Luzon cluster. The Forum primarily aims to enable inclusive dialogue across all the DENR's stakeholders, share knowledge and experiences on how different stakeholders can work together with the DENR, foster and strengthen partnerships among stakeholders, and identify multi-stakeholder initiatives and good practices. It also served as an avenue to bring investment opportunities to the attention of potential investors in the ENR sector.

Further, two (2) of the sectors of the Department, the Forestry and Mines Sector, also implemented projects that aid the government in promoting investments. These are the identification of potential areas for investment areas through ground delineation of production forests and issuance of mining contracts and permits that is expected to produce direct and indirect employment opportunities.

1. CREATION OF PARTNERSHIPS UNDER THE MULTI-STAKEHOLDER FORUM

The Multi-Stakeholder Forum aims to engage all sectors towards the fulfilment of the Department's mission. Natural, technological, and human-induced hazards due to climate change challenges us to be resilient and require whole-of-society and transdisciplinary approaches toward evidence-informed policy and action for protection, preservation, conservation, enhancement, and regeneration of the country's ecosystems.

During the forum, a Memorandum of Agreement (MOA) was signed between DENR and DOLE which will accelerate the creation of more "green jobs" in the area of forest protection. This will cover the implementation of DOLE's *Tulong Panghanapbuhay sa Ating Disadvantaged/Displaced Workers Program* (TUPAD) in identified areas in DENR's improved national forest protection program.

2. DELINEATION OF PROTECTION AND PRODUCTION FORESTS FOR POTENTIAL INVESTMENT AREAS

The ground delineation of production forests in the country is in support of the targets set in the Philippine Development Plan 2017-2022. It determines the metes and bounds of forest lands suited for production purposes which will be made available for investment purposes.

For CY 2022, a total of 4,788 kilometers of production forests were delineated on the ground. These can be accessed for investments such as timber and agroforestry production, range lands for grazing, and other special forest land uses such as ecotourism.

3. MINERAL INVESTMENT PROMOTION PROGRAM

The Mineral Investment Promotion Program (MIPP) involves the issuance of mining permits and contracts to qualified persons pursuant to Republic Act No. 7942 or the Philippine Mining Act of 1995. The issuance of mining contracts and permits is expected to produce direct and indirect employment opportunities in host and neighboring communities, investments and revenue in terms of taxes and royalties and other local taxes and fees paid to host local government units (LGUs).

A total of 4,826 mining rights/contract/permits and other mining-related permits were issued/endorsed.

Mining Rights/Contract/Permits and other Mining-Related Permits Issued/ Endorsed	No. of Permits Issued
Exploration Permit	49
Industrial Sand and Gravel Permit	68
Mineral Processing Permit	24
Ore Transport Permit	2,618
Ore Transport Certification	858
Declaration of Mining Project Feasibility	7
Accreditation	180
Certificate of Exemption	101
Certificate of Environmental Management and Community Relations Record	55
Mineral Ore Export Permit	866
TOTAL	4,826

On the development of Small-Scale Mining, six (6) Minahang Bayan (MB) sites were declared. Minahang Bayan sites are where small-scale miners can operate lawfully which enables the government to monitor and regulate their extractive activities while helping to promote the safety of the workers, protect the environment, and generate revenues for the government.

No.	Region	Minahang Bayan Petitioner	Commodity	Area (has.)	Location
1	CAR	Guina-ang Tribe Indigenous People Cultural Community (GTIPCC)	Gold, Copper	700	Bagtayan, Guina-ang, Galdang, Pugong, Malucsa & Dagtalan, Pasil, Kalinga
2	CAR	Reynaldo B. Bugnay	Gold		Manag, Conner, Apayao
3	CAR	Roman T. Austodillo	Gold	20	Ayayao, Eva Garden, Calanasan, Apayao
4	12	Dulaijan B. Nor	Gold	20	Sitio Marbol, Bai Saripinang, Bagumbayan, Sultan Kudarat
5	10	Impahanong-Amusig Higaonon Tribal Community Organization (IAHTCO), Inc.	Gold	52.85	Sitio Kagahaman, Brgy. San Luis, Malitbog, Bukidnon
6	10	Bukidnon Higa-onon Tribal Association (BUHITA)	Gold	81	Guitaan, Maligaya, Malaybalay, Bukidnon

Further, to contribute to the economic recovery of the country, the DENR, through the MGB, continues to identify several priority mining projects under three phases which are expected to significantly contribute to employment generation as well as investments and revenues to the government.

For Phase 1 Priority Projects, these are comprised of 29 mining projects which are ready to commence development or commercial operations and are expected to generate a revenue of Php3.57 Billion and 10,241 employees. Phase 2 projects on the other hand, include 50 mining projects which are expected to file the Declaration of Mining Project Feasibility (DMPF) or those with DMPF application or under the advanced exploration stage and are expected to generate a revenue of Php11.953 Billion and 17,657 employees. Phase 3 includes 37 mining projects which are still under exploration.

V. CREATE GREEN JOBS

The Department underscores the need for sustainable economic growth through the creation of jobs that will promote the sustainable management, conservation, development, and protection of our natural resources while preserving the quality of environment for future generations.

A. PURSUE A BLUE AND GREEN ECONOMY

1. BLUE ECONOMY

In promoting blue economy, a number of individuals were hired/employed for the management of our coastal and marine ecosystems, rehabilitation of Boracay Island, Manila Bay and Laguna de Bay, and priority beaches. These include the following:

- 2,373 estero/river rangers to monitor, protect, clean up, and rehabilitate the rivers/esteros/water bodies draining to the Manila Bay;
- 406 personnel, including river patrollers/environmental aides and trash boat operators, to facilitate the restoration and sustainable development of the Pasig River System making it conducive for propagation of aquatic life, transportation of people and goods, and tourism;
- 82 Boracay Environmental Lawin Patrollers (BELPS) for the implementation of the Boracay Action Plan (BAP);





(from left to right) Coastal Extension Officers in Region 8 conducted Protected Area and Suitability Assessment in Palompon Watershed Forest Reserve on August 2-5, 2022.

- 69 Coastal Extension Officers to support the Regional Offices/PENROs/CENROs in managing and implementing coastal and marine resources activities;
- 35 watch patrollers to ensure protection of the beaches in Puerto Galera, Coron, El Nido, Panglao, and Siargao (GEM sites), and to install signage for no build zones, and conduct easement clearing;
- 36 Environmental Armies during river cleanups in the Laguna de Bay Region.

2. GREEN ECONOMY

To enhance economic development in the “green” sector, the Department hired personnel to protect our forest ecosystem and biodiversity, minimize and avoid generation of wastes, and abate pollution. These included the following:

- 777 Forest Extension Officers (FEOs) and 202 Technical Support Staff for the implementation of the National Greening Program;
- 4,163 patrollers, which include Forest Protection Officers and PAMANA Forest Guards, to protect the forest and implement the LAWIN Forest Protection and Biodiversity System. They have conducted patrols covering 132,556 kilometers, where they have observed 8,622 threats such as kaingin, annual and perennial farming, presence of houses and other infrastructures, charcoal production, among others;
- 359 Environmental Monitoring Officers (EnMOs) to monitor and facilitate the cleanup of unclean sites, conduct monitoring and collect waste diversion data from Solid Waste Management (SWM) facilities, monitor compliance with RA 9003 and conduct IEC campaign on SWM;

*Apprehension of illegally sourced 40 pieces of Tanguile (*Shorea polysperma*) lumber, equivalent to 416 board feet, with an estimated market value of Php 24,960.00 laden on one (1) unit Mitsubishi L300 Van in Brgy. Tugatog, Bongabon, Nueva Ecija on July 25, 2022*



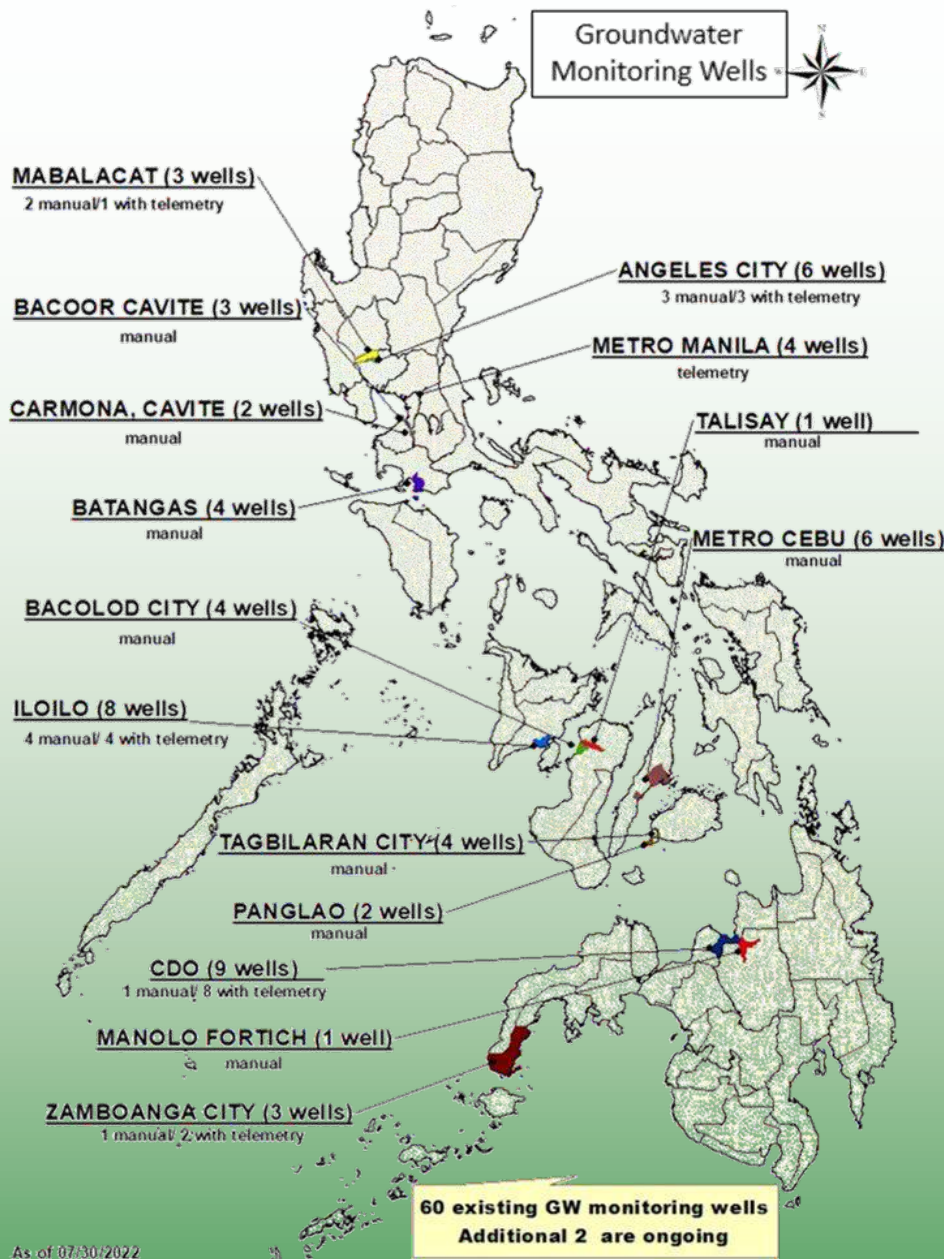
Apprehension of 25 pieces of Narra and 7 Teak lumber in Brgy. Uso, Suyo, Ilocos Sur on July 1, 2022





Apprehended 67 pieces of Mahogany, Gmelina and Santol logs with an estimated total volume of 970.96 bd ft. and 1 unit 3-Phase Seco induction motor 5-HP, blade and 2-ply wheel in Brgy. Caputol, Aloran, Misamis Occidental on August 10, 2022

- 23,430 persons to support the implementation of various foreign-assisted projects. Among their activities were to upcycle plastic wastes; monitor activities along mangrove rivers; implement biodiversity-friendly livelihood activities; operate and manage TSD facilities; collect electronic wastes; and implement site development contracts with different People's Organizations;
- 93 Geographic Information System (GIS) Specialists/Geodetic Engineers to support Digital Cadastral Database Cleansing (DCDB).



As of 07/30/2022

B. ESTABLISH LIVABLE AND SUSTAINABLE COMMUNITIES

As we aspire to achieve economic development in the environmental and natural resources sectors, we vigorously pursued programs and projects that seek to improve the economic well-being and quality of life of communities in the sectors within our purview. These include programs to address the scarcity of potable water in the country, improve air and water quality, manage the increasing volume of solid wastes, including toxic and hazardous wastes, provide security of land tenure, identify and map areas susceptible to geologic hazards, assess vulnerabilities and risks of communities, mitigate the effects of climate change and enhance resiliency, and effectively manage protected areas.

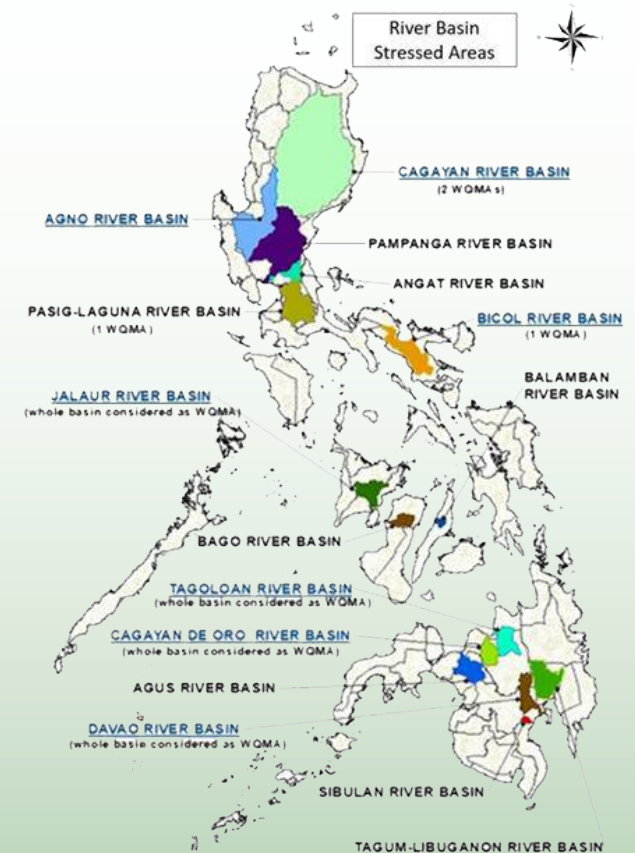
1. WATER SECURITY PROGRAM

Presentations to the President and the Cabinet have been conducted. As a result, the DENR Water Committee has so far reviewed the water security road map of 2021, the NEDA Philippine Water Supply and Sanitation Master Plan, and the NIA Irrigation Master Plan. The Water Committee also drafted Administrative Orders (AOs) and action plans related to water conservation and institutional reorganization of agencies. It is also currently reviewing a draft EO from the DOJ on the institutional reorganization of agencies with related functions.

Also, under this Program, the Department, through the NWRB, was able to complete the Comprehensive Water Resources Assessment (CWRA) of the seven (7) major river basins, namely, Agno Riverbasin, Panay Riverbasin, Davao Riverbasin, Jalaur Riverbasin, Bicol Riverbasin, Cagayan de Oro Riverbasin, and Tagoloan Riverbasin.

Pursuant to the urgency of protecting the groundwater resource of the groundwater constraint areas and recognizing groundwater as a reserve resource that may be tapped during extreme drought and disasters, the development of groundwater management plan (GMP) in groundwater constraints areas or highly urbanized water constraint cities was proposed in collaboration with LGUs, NGAs, private and academic institutions. It will provide a comprehensive picture of the groundwater aquifer not only in terms of defining their locations and areal extent, but also in terms of their hydraulic properties and internal characteristics.

As of 2022, 12 GMPs were developed for Cagayan de Oro City, Angeles City in Pampanga, Bacolod City, Iloilo, Baguio City, Metro Manila, Metro Cebu, Cavite, Zamboanga, Batangas, Tagbilaran City, and Masbate.



1.1 SUSTAINABILITY OF LISTAHANG TUBIG (WATER REGISTER) DATABASE

In ensuring the increased access to improved drinking water supply, the Department, also through the National Water Resources Board (NWRB), conducted Listahang Tubig or Water Register. This activity is a national survey of all water service providers covering all service levels - Level I or Point Source, Level II or Communal Faucets, and Level III or Piped Connections. The data collected from the survey can be used as bases to increase access to improved drinking water supply, particularly for the poor, to improve the performance of water utilities, and to also improve regulation of water resources in the country.

Based on the survey, a total of 28,334 water utilities were registered in the Listahang Tubig, Level I having 15,624, Level II with 6,285 and Level III with 6,425.

Moreover, the NWRB was able to issue 21 Certificates of Water Availability and Clearances as required by the Philippine Economic Zone Authority (PEZA), as follows:


- Balibago Waterworks Inc. Bauan, Batangas
- Balibago Waterworks Inc. Tuy, Batangas
- Provincial Government of Bacolod in E. Magalona, Negros Occidental (Malogo River Basin)
- EB Properties Commercial and Leasing Corp. San Jose del Monte Bulacan
- Balibago Waterworks System, San Pablo, Laguna
- Province of Negros for Malisbog, Hinilan River and Imbang River Negros Occidental
- Murcia Water District for Caliban River, Pula River and Puncian River, Murcia Negros Occidental
- Balibago Waterworks Cabaiao Branch for Pampanga River in Cabaiao, Nueva Ecija
- Visomil Inc. for Tanawan Falls in Dingala, Aurora
- Suntrust Properties, Brgy Santiago General Trias Cavite
- WHP Primne Master Holdings Inc., E Commerce Economic Park, Bo. Tigatto, Davao City, Davao del Sur
- Primewater Resources Inc. for Calinto River, Brgy Bugaan East, Laurel Batangas
- Primewater Resources Inc. for Dacanlao River, Brgy. Sumpagna, Balayan, Batangas
- Prime Water Resources Inc. for Lawaye River in Barangay Putting Kahoy, Rosario, Batangas

- Prime Water Resources Inc. (PWRI) for Lawaye River in Barangay Puting Kahoy, Rosario, Batangas
- Prime Water Resources Inc. (PWRI) for Malaking Tubig River in Barangay Pulo, San Antonio, Quezon
- Prime Water Resources Inc. (PWRI) for Lobo River in Barangay Pinaghawanan, Lobo, Batangas
- Prime Water Resources Inc. (PWRI) for Calumpang River in Barangay San Pedro, Batangas City, Batangas
- Prime Water Resources Inc. (PWRI) for Palsabangon River in Barangay Ilayang, Palsabangon, Quezon
- MLS-JC Construction for Manupali River in Barangay Lurugan, Valencia City, Bukidnon
- Megaworld Capital Town Inc. both in Barangay Sto. Nino, City of San Fernando

Eighteen (18) micro-water resources assessments on groundwater availability were conducted in the following cities, municipalities, and provinces:

- Camarines Norte
- Catanduanes
- Sorsogon
- Masbate
- Southern Leyte
- Bukidnon
- Mindoro Oriental
- Eastern Samar
- Abra
- Ifugao
- Davao del Norte
- Agusan del Sur
- Agusan del Norte
- Aklan
- Aurora
- Ilocos Norte
- Ilocos Sur
- Palawan (Batang-bata River, Iwahig River, Inagawan River, Aborlan River, and Malatgao River)

On the monitoring of Major Dams in the country, the Department through NWRB established the Automated Real-Time Monitoring System in Ambuklao Dam, Binga Dam, San Roque Dam, Magat Dam, and Pantabangan Dam. This activity is a joint project between the Mapua Institute (MIT), Philippine Council for Industry, Energy and Emerging Technology Research and Development – Department of Science and Technology (PCIEERD-DOST) and the NWRB. The overall objective of the project is to provide an automated real-time monitoring system of measured hydrological and operational parameters at the dam/reservoir for an accurate assessment of the situation to make critical crisis management decisions during emergencies.



Actual discharge measurement of the waterworks system of Wawa Libis Multipurpose Cooperative located in Binangonan, Rizal

Lastly, under the Water Security Program, the Department is currently completing four (4) Groundwater Monitoring Wells in Zamboanga City and its surrounding areas and three (3) in Batangas City and two (2) in Lipa City; enhancement of the Water Permit Management Information System (WPMIS); and review and revision of Dam Protocol in Angat Watershed in Bulacan.



Inspection of the waterworks system of Primewater Infrastructure Corporation located in Tarlac City



Data collection in Bolbok National High School located in Lipa, Batangas on June 6, 2022

2. CLEAN WATER PROGRAM

Clean Water Program aims to protect and improve the water quality of Priority Rivers and other critical water bodies against pollution from land-based sources such as industries, commercial establishments, and community/household activities through continuous massive cleanup pursuant to Republic Act No. 9275 or the Philippine Clean Water Act of 2004.

Under this Program, the activities such as continuous monitoring of the status of water quality, Classification of Waterbodies, Designation of Water Quality Management Area (WQMA), Implementation of Adopt-an-Estero Program, Compliance Monitoring of Firms, and Clean-up of water bodies, rivers systems and tributaries were conducted continuously by the Department to ensure and achieve the desired condition of water quality in the country. The following are the details of accomplishments under the Program:

2.1 CONTINUOUS MONITORING OF STATUS OF WATER QUALITY WHICH INCLUDE THE PRIORITY RECREATIONAL WATERS OR BATHING BEACHES, OTHER RECREATIONAL WATERS, PRIORITY AND OTHER WATERBODIES

Monitoring of Priority Recreational Waters (Bathing Beaches)

There are 44 Priority Recreational Waters monitored in CY 2022. 41 priority waterbodies were monitored for fecal coliform and pH. 46% of the priority recreational waters conform to the water quality guidelines (WQG) value of 100 MPN/100 mL for fecal coliform. For pH, all priority recreational waters monitored conform to the WQG value of 7.0–8.5.

Monitoring of Other Recreational Waters

A total of 107 bathing beaches were monitored throughout the Philippines. Out of the said number of waterbodies monitored, 42 beaches passed the water quality criteria for fecal coliform for Class SB waters (used for public bathing, swimming, skin diving, etc.) while 95 beaches passed the water quality standard for pH.

Monitoring of Priority Waterbodies

A total of 50 priority waterbodies were monitored. Based on the monitoring results, nine (9) waterbodies did not conform to both DO and BOD WQG, i.e., Marikina River, Marilao River, Meycauyan River, Obando River, Pansipit River, Calumpang River, Madugo River, Sagumayon River, and Guadalupe River. The Abra River, Salog River, Malihao River, Luyang River and Mercedes River did not pass the WQG for Dissolved Oxygen (DO) but conformed to Biochemical Oxygen Demand (BOD).

Monitoring of Other Waterbodies

In CY 2022, 137 rivers were monitored throughout the Philippines, while only 97 and 100 waterbodies were monitored and passed the WQG for Dissolved Oxygen and Biochemical Oxygen Demand, respectively.

2.2 CLASSIFICATION OF WATERBODIES

Water classification is a very important component of water quality management since the application of effluent standards are dependent on this classification. The classification of waterbodies helps water managers and planners to develop proper water quality management programs and enables the establishing of standards to protect aquatic life and sustain human use of specific water bodies.

For CY 2022, additional 49 waterbodies have been classified, two (2) of which were reclassified as Class C (for propagation and growth of fish and other aquatic resources) through DMC 2022-15 which was signed on 20 December 2022. These are the Butuanon River in Mandaue City, Cebu (Region 7) and Padada River in Davao del Sur (Region 11).

2.3 DESIGNATION OF WATER QUALITY MANAGEMENT AREA (WQMA)

There are 40 Designated WQMAs nationwide. The objective of the WQMA is to protect, through stakeholders' collaboration, the water body and its tributaries by keeping their water quality within the Water Quality Guidelines or Criteria conforming to the water body's classification (e.g. Class C or Class SC) or even improve the quality to higher classification (e.g. from C to B or SC to SB).

2.4 CONTINUOUS IMPLEMENTATION OF ADOPT-AN-ESTERO WATERBODY PROGRAM

The program provides positive, measurable change to both the communities and the environment by bringing together the Estero Community, Donor-Partner, Local Government Unit/s, other government agencies, and the DENR to clean the esteros of wastes, debris, and silt until all have been drained from the waterbody. It also intends to mobilize estero communities in cleaning the estero, to enlist their active participation in the actual cleanup, implementation, and preparing plans to sustain a clean estero in the future years. The program has maintained continuing partnerships with existing 885 donor partners for the maintenance and rehabilitation of adopted waterbodies and esteros.

In CY 2022, 293 esteros/waterbodies were monitored for Biochemical Oxygen Demand and Dissolved Oxygen. A total of 154 waterbodies exhibited significant improvement in terms of Biochemical Oxygen Demand while 158 waterbodies showed water quality improvement in terms of Dissolved Oxygen.

A total of 75,055 sacks or 103,333.66 kilograms of mixed solid waste were collected by the participants during the community cleanup of esteros who are composed of 5,465 individuals from partner adopters, LGUs, and communities within the adopted waterbodies.

In addition, the San Miguel Corporation adopted the Tullahan-Tinajeros River System under the Adopt-a-River Program and collected a total of 1.12 Million metric tons of solid wastes, including silt.

2.5 COMPLIANCE MONITORING OF FIRMS (WATER QUALITY)

In 2022, the compliance rate of firms to water quality standards markedly increased from 26% to 50%, as shown below. This is attributed to the strengthened IEC campaign and virtual trainings resulting in the extensive awareness for both the industries and LGUs on RA 9275 or the Clean Water Act of 2004.

Details	CY 2021	CY 2022
Discharge Permit issued	7,720	10,108
Monitored Firms	8,934	10,648
Notices of Violation Issued	6,607	5,346
Percentage of Compliance	26%	50%

2.6 CLEANUP ACTIVITIES IN MANILA BAY

A total of 192,210.31 cu m of solid wastes have been collected by the DENR through trash traps, trash boats, and cleanup activities done by volunteers and Estero Rangers as well as water hyacinth collection of the DENR-NCR and CALABARZON Region.

Region	Garbage Collected (in cu. m)
National Capital Region	65,019.95
Region 3	119,436.00
CALABARZON Region	7,754.36
TOTAL	192,210.31

Conducted cleanup activities on September 15-16, 2022



2.7 CONTINUOUS CLEANUP OF MAJOR RIVER SYSTEMS AND TRIBUTARIES IN LAGUNA DE BAY REGION

The DENR, through the Laguna Lake Development Authority (LLDA), supported different LGUs and public and private sectors in the cleanup of major river systems and tributaries in the Laguna de Bay Region. Through this initiative, 9.63 tons of various solid waste materials were collected and hauled from rivers and creeks by the 36 Environmental Armies during river cleanups.

Date	Location	Volume of wastes in tons
January 6, 2022	Paete River	0.245
January 17, 2022	Sampaloc Lake, Brgy. Concepcion, San Pablo City	1
January 28, 2022	Mabitac River	0.700
March 12, 2022	Sampaloc Lake, Brgy. San Lucas 1, San Pablo City	1.5
April 20, 2022	San Nicolas River Bay	2
June 11, 2022	Kasinay Creek, Brgy. Ithan, Binangonan, Rizal	0.1
September 23, 2022	Alabang-Cupang River, Muntinlupa City	2.1
September 30, 2022	Brgy. Diezmo, Cabuyao City	1
October 25, 2022	Brgy. Biliran, Binangonan, Rizal	0.18
November 22, 2022	Sampaloc Lake Brgy. 5A, San Pablo City	0.80
TOTAL		9.63

Fifteen water quality sampling stations in Laguna de Bay were continuously monitored in conformance with DAO 2016-08 (Water Quality Guidelines and General Effluent Standards of 2016) and DAO 2021-19 (Updated Water Quality Guidelines (WQG) and General Effluent Standards (GES) for Selected Parameters). Results showed that the BOD concentration in Laguna de Bay is 3mg/L, which is below the 7mg/L threshold.

Aside from this, 554 samples from 331 unique industries and commercial establishments within the region were monitored in compliance with the effluent standards which serves as the basis for the issuance of LLDA permits and/or legal sanctions if found non-compliant. Out of the 331 industries, 263 passed the effluent water quality standards for Biochemical Oxygen Demand which is less than 50mg/L.

2.8 INTENSIFICATION OF REHABILITATION WORKS IN MANILA BAY AND OTHER PRIORITY TOURIST DESTINATIONS NAMESLY: EL NIDO, CORON, PUERTO GALERA, PANGLAO, AND SIARGAO

The success of the rehabilitation work done in Boracay Island is intended to be replicated in Manila Bay and in five more ecotourism sites, namely, El Nido and Coron in Palawan, Panglao in Bohol, Siargao in Surigao del Norte, and Puerto Galera in Oriental Mindoro, to restore and protect their natural beauty.

The Manila Bay Rehabilitation expedites the efforts on slowing down/reversing the effects of climate change through infrastructure development and geo-engineering interventions that protect and sustain a more suitable and stable ecological balance for the biodiversity of the surrounding communities. Most of the geo-engineering projects along Manila Baywalk are already completed. As of December 2022, ongoing geo-engineering projects include 1) High Density Polyethylene (HDPE) pipers for Padre Faura outfall with 98% completion; 2) desilting, rehabilitation, and landscaping of the line drainage canal and center line in Baywalk with 99.81% completion; and 3) upgrade and rehabilitation of flood control structures/drainage system with 32% completion. For other parts within the Manila Bay area, ongoing projects include 1) construction of solar powered STP along Las Pinas River with 54% completion; 2) clearing, grubbing, desilting, and removal of submerged garbage in Pasig River System with 24% completion; and 3) construction of solar powered STP in San Juan River and Vitas River, both with 1% completion.

3. CLEAN AIR PROGRAM

The program covers the full implementation of the Clean Air Act. The objective of the Program is to achieve and maintain air quality that meets the National Air Quality Guidelines for Criteria Pollutants throughout the Philippines, while minimizing the possible associated negative impacts on the country's economy. Thus, in order to effectively monitor and regulate all sources of air emissions, the Clean Air Program is divided into three sub-programs: (1) Motor Vehicle Emission Management Program, (2) Industrial Emission Management Program, and (3) roadside ambient and general ambient air monitoring.

3.1 ROADSIDE AMBIENT AND GENERAL AMBIENT AIR MONITORING

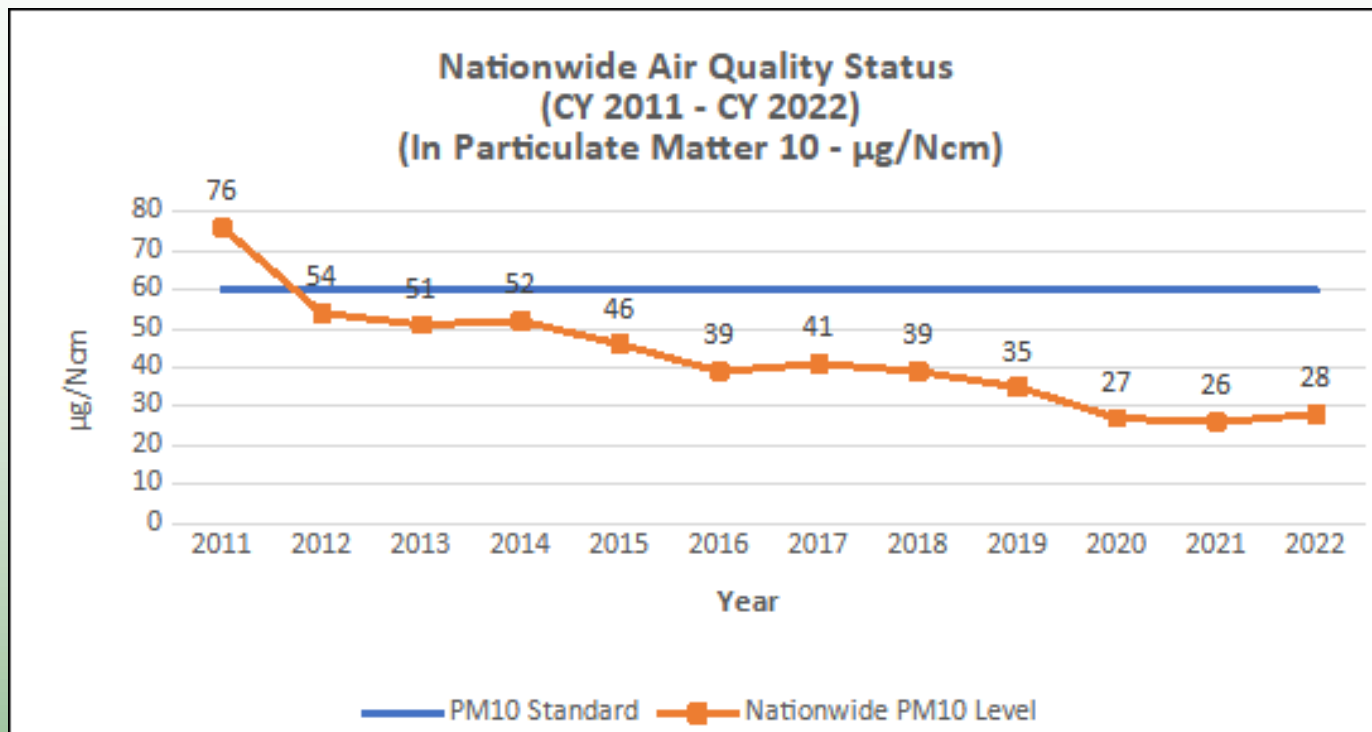
The monitoring of roadside and general ambient air quality is an essential activity accomplished by the agency. It enables agencies and local government officers to assess the air quality in their area of jurisdiction and formulate a comprehensive policy and maintain regulation of these policies for the improvement of air quality in their locality. As monitoring stations are established in Metro Manila and other highly urbanized cities, the status of air quality from different locations nationwide are monitored through the processing of real-time science-based air quality monitoring data. The installation of Real Time Continuous Ambient Air Quality Monitoring Stations capable of monitoring complete criteria pollutants (SO₂, NO₂, O₃, CO, BTX, and PM_{10/2.5}) and meteorological parameters are ongoing, to ensure the accessibility of air quality data for everyone through real-time updates through websites and LED Boards erected in public areas. The data are translated to language and terms easily understood by ordinary people so everyone can appreciate the information and its relevance to our everyday lives. This effort prompts local government units to provide necessary actions to mitigate pollution in their respective jurisdictions.

For CY 2022, the Department was able to ensure that the Particulate Matter 10 and Particulate Matter 2.5 are within the DENR guideline value of 60µg/Ncm and 25µg/Ncm, respectively. Below are the status reports of Nationwide and Metro Manila Air Quality.

3.1.1 NATIONWIDE AIR QUALITY STATUS

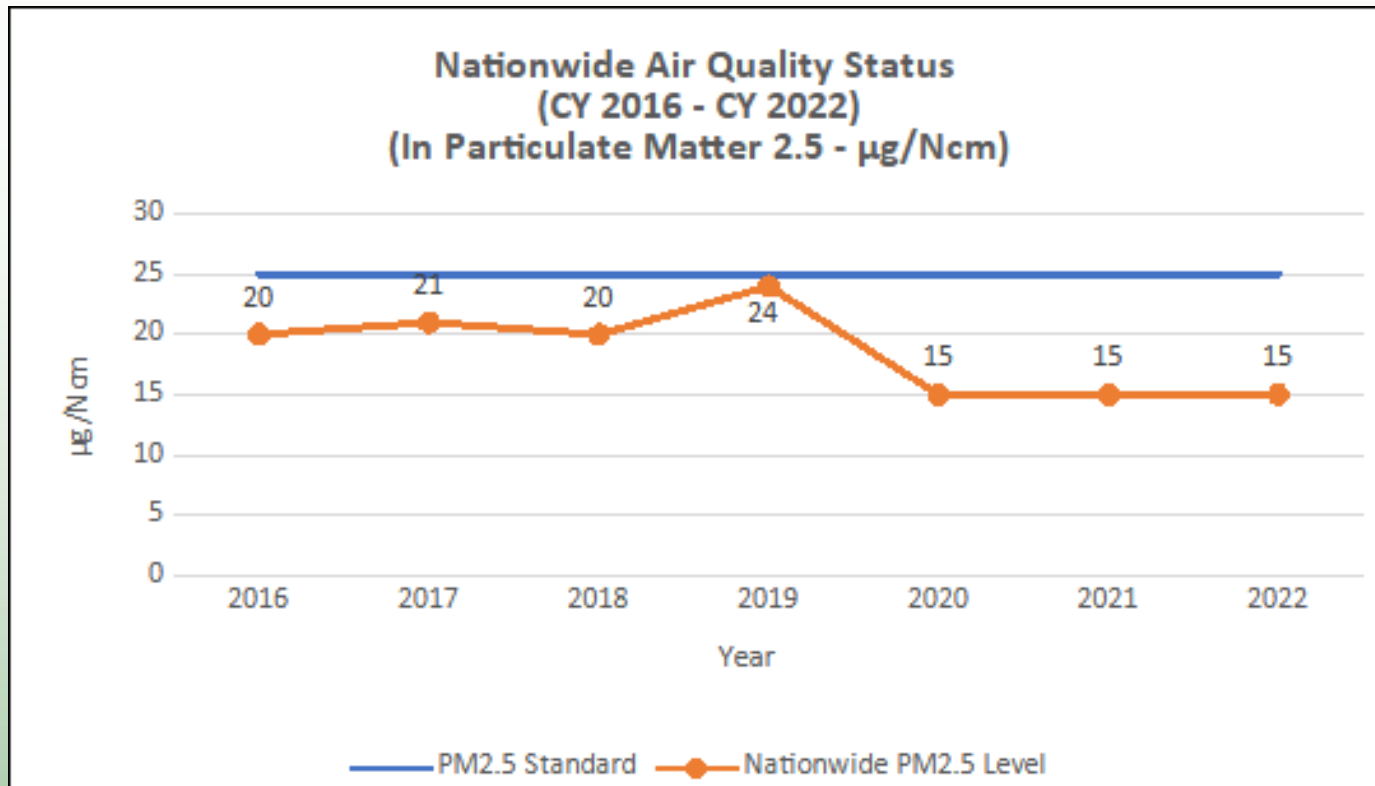
Particulate Matter 10 (PM_{10})

Nationwide concentration in PM_{10} has significantly improved by 63% compared to CY 2011 baseline data (from 76 $\mu\text{g}/\text{Ncm}$ to 28 $\mu\text{g}/\text{Ncm}$). However, as the country is easing the COVID-19 restrictions and alert levels nationwide, an increase in concentration was noted from CY 2021 to CY 2022 (From 26 $\mu\text{g}/\text{Ncm}$ to 28 $\mu\text{g}/\text{Ncm}$).



Particulate Matter 2.5 (PM_{2.5})

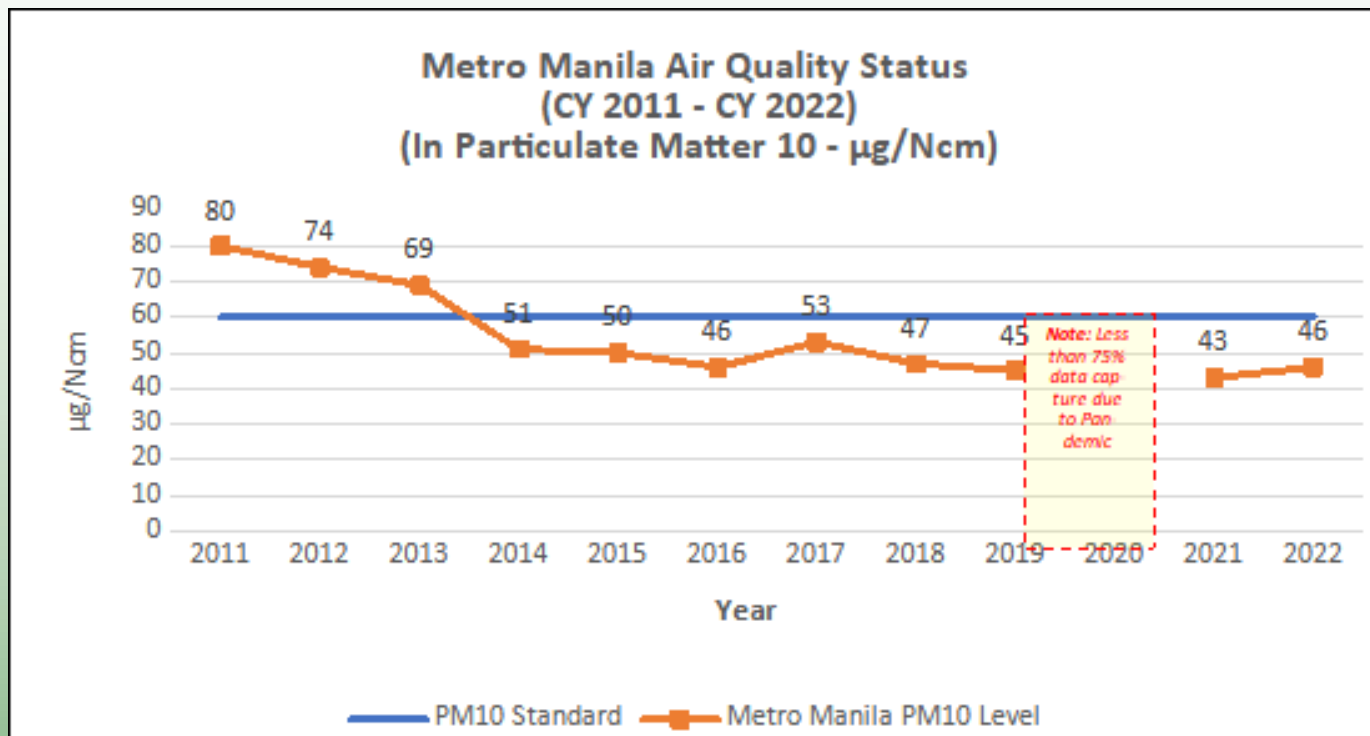
The data below shows the nationwide PM2.5 concentration from CY 2016 –2022.



3.1.2 METRO MANILA AIR QUALITY STATUS

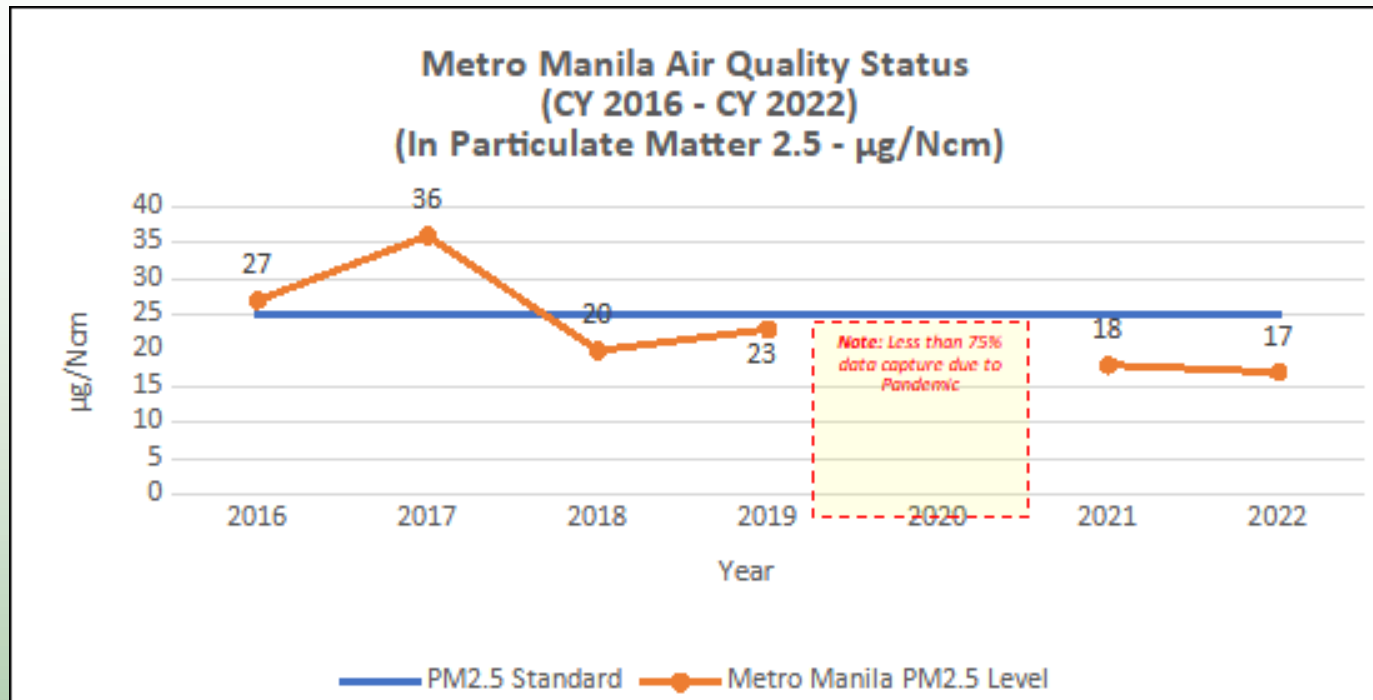
Particulate Matter 10 (PM_{10})

The air quality in terms of PM_{10} has improved from 80 $\mu\text{g}/\text{Ncm}$ in CY 2011 (baseline) to 46 $\mu\text{g}/\text{Ncm}$, as shown below. Based on the historical emission inventory in Metro Manila, mobile sources are found to be the major source of pollution. Increase in concentration may be attributed to opening of economic activities in the NCR, since private and public transportations are in full operation after a more relaxed COVID-19 restriction.



Particulate Matter 2.5 (PM2.5)

The air quality in Metro Manila in terms of PM2.5 is still within the DENR guideline value of 25 $\mu\text{g}/\text{Ncm}$. A 37% decrease in concentration was noted compared to CY 2016 baseline data.



3.2 ADOPT-AN-AMBIENT AIR QUALITY MONITORING STATION PROGRAM

A total of 109 Air Quality Monitoring Stations (AQMS) throughout the country, capable of measuring criteria for air pollutants, are maintained and operated by the EMB Regional Offices. Most of these stations are installed in urbanized cities/municipalities and some component cities. However, the existing number of AQMS of EMB is still not enough to cover all the urbanized cities/municipalities in the country.

In order to expand the air quality monitoring network in areas which still do not have AQMS while considering the cost of investment and operation, the EMB has implemented the “Adopt-an-Ambient Air Quality Monitoring Station Program” with the participation of 10 private firms as partner donors to put up an Air Quality Monitoring Station which will be connected to the respective Air Quality Monitoring Network and Operation Center (AQMNO) of the EMB Regional and Central Office. As of December 2022, there are seven (7) functional AQMS adopted installed in Regions 1 (La Union), MIMAROPA (Bataraza, Palawan), 7 (Toledo City, Cebu), 8 (Isabel, Leyte), 13 (Cabadbaran City), and CAR (Baguio City and Tuba, Benguet).

Air Quality Monitoring Stations (from left to right) San Fernando, Pampanga; Butuan City; and Davao City





DENR-EMB AQMS – Ambient Team conducted its very first Sampling using the High-Volume Sampler for Dioxins and Furans at Marikina City with the assistance of CEMO Marikina on August 31, 2022

3.3 MOTOR VEHICLE EMISSION MONITORING PROGRAM (BANTAY TAMBUTSO)

With regard to motor vehicle emission management, the regulation of the quality of vehicles being introduced into the Philippine market by virtue of DAO 2015-04 otherwise known as the “Implementation of Vehicle Emission Limits for Euro 4/ IV and In-use Vehicle Emission Standards” is in place.



3.3.1 ISSUANCE OF CERTIFICATE OF CONFORMITY (COC)

As mandated by Section 22 of the RA 8749 known as the Philippine Clean Air Act, any imported or locally-assembled new motor vehicle shall not be registered unless it complies with the emission standards set pursuant to this Act, as evidenced by a Certificate of Conformity (COC) issued by the Department. For FY 2022, a total of 443 certificates were issued.

3.3.2 ISSUANCE OF CERTIFICATE OF NON-COVERAGE FROM EMISSION STANDARDS (CNCEs)

As of December 2022, 97 Certificates of Non-Coverage from Emission Standards (CNCEs) were issued for Purely Electric Vehicles. There is a significant increase in the number of applications approved from 22 in CY 2020 (baseline) to 53 in CY 2022 which is attributed to several factors including growing demand, the competitive advantage among manufacturers, assemblers, and/or importers, and the utilization of government incentives for Electric Vehicles.

Triple-D or Dynamic Dashboard Display



3.4 INDUSTRIAL EMISSION MONITORING PROGRAM (BANTAY TSIMNEYA)

In compliance with Sections 8 and 38 of Republic Act No. 8749 (Philippine Clean Air Act of 1999) and Rule XLVII Section 2 (c) of DAO 2000-81 (Implementing Rules and Regulations of the Clean Air Act), the DENR through the EMB has established the Sampling Assessment Team (SAT) thru Special Order No. 2014-207, later amended thru SO No. 2018-296, to monitor the emissions from Air Pollution Source Installations (APSI) of industries nationwide. In view of the magnitude of APSIs installed nationwide, the Accreditation of Third-Party Source Emission Testing Firms (TPSETFs) through DAO 2013-26 was also established to aid in the above-mentioned mandate of the EMB. One of the major responsibilities of the SAT is to monitor, review, and accredit TPSETFs.



3.4.1 SAMPLING ASSESSMENT TEAM (SAT)

To monitor the emissions from Air Pollution Source Installations (APSI) of industries nationwide, the Department through the Environmental Management Bureau (EMB) has established the Sampling Assessment Team (SAT).

As of December 2022, a total of 23 firms with 53 teams have been accredited as per accreditation procedures as stipulated in DAO 2013- 26 otherwise known as “Revised Guidelines for DENR Accreditation of Third-Party Source Emission Testing Firms”.

EMB Data Center



3.4.2 STATUS OF CONNECTION OF CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) AND CONTINUOUS OPACITY MONITORING SYSTEM (COMS)

Another activity in relation to industrial emission management is the monitoring of CEMS whether it is calibrated through Relative Accuracy Test Audit (RATA) or Relative Accuracy Audit (RAA) or Cylinder Gas Audit (CGA). Calibration ensures that the data collected by the CEMS is accurate. Observation of such activities will pave the way in the formulation of a new policy which is the accreditation of third-party audit service providers to ensure that the service paid for by the industry is legitimate.

In relation to the monitoring of CEMS / COMS, major industries transmit emission data from industrial sources to the EMB Data Acquisition and Handling System (DAHS). As of December 2022, 46 firms are already connected to EMB DAHS, 26 of which are from coal-fired powerplants, 15 from cement plants, and five (5) from biomass, refinery, natural gas, smelting, sintering, and others.

3.4.3 COMPLIANCE MONITORING OF FIRMS (AIR QUALITY)

In 2022, the compliance rate of firms to air quality standards increased from 79% to 81%, as shown below. This is attributed to intensified efforts of the Bureau in monitoring of firms through online systems such as the Data Acquisition and Handling System (DAHS) and Online SMR System.

Details	CY 2021	CY 2022
Permit to Operate issued	11,239	12,452
Monitored Firms	18,143	18,982
Notices of Violation Issued	3,840	3,560
Percentage of Compliance	79%	81%

4. SOLID WASTE MANAGEMENT PROGRAM

The Philippines has endeavored to improve its management of solid waste through the passage of RA 9003 or the Ecological Solid Waste Management Act that provides for a systematic, comprehensive, and ecological waste management program to ensure the protection of public health and the environment. It mandates the bureau to provide secretariat support to the National Solid Waste Management Commission in the implementation of the solid waste management plans and prescribes policies to achieve the objectives of the National Ecology Center that is in charge of information dissemination, consultation, education, and training of various local government units on ecological waste management.

The ecological solid waste management program is expected to assist Local Government Units in implementing the Ecological Solid Waste Management Act particularly in the development of their 10-year SWM Plan, closure and rehabilitation of dumpsites, establishment of Materials Recovery Facilities, and an environmentally sound disposal system.

Regular monitoring and technical assistance are continuously being conducted by the EMB Regional Offices to LGUs for the operationalization of Sanitary Landfills (SLFs). The number of operational SLFs increased from 245 in CY 2021 to 287 in CY 2022 servicing 567 LGUs nationwide.

LGU Kauswagan Materials Recovery Facility (MRF) located at Barangay Bagumbayan, Lanao del Norte

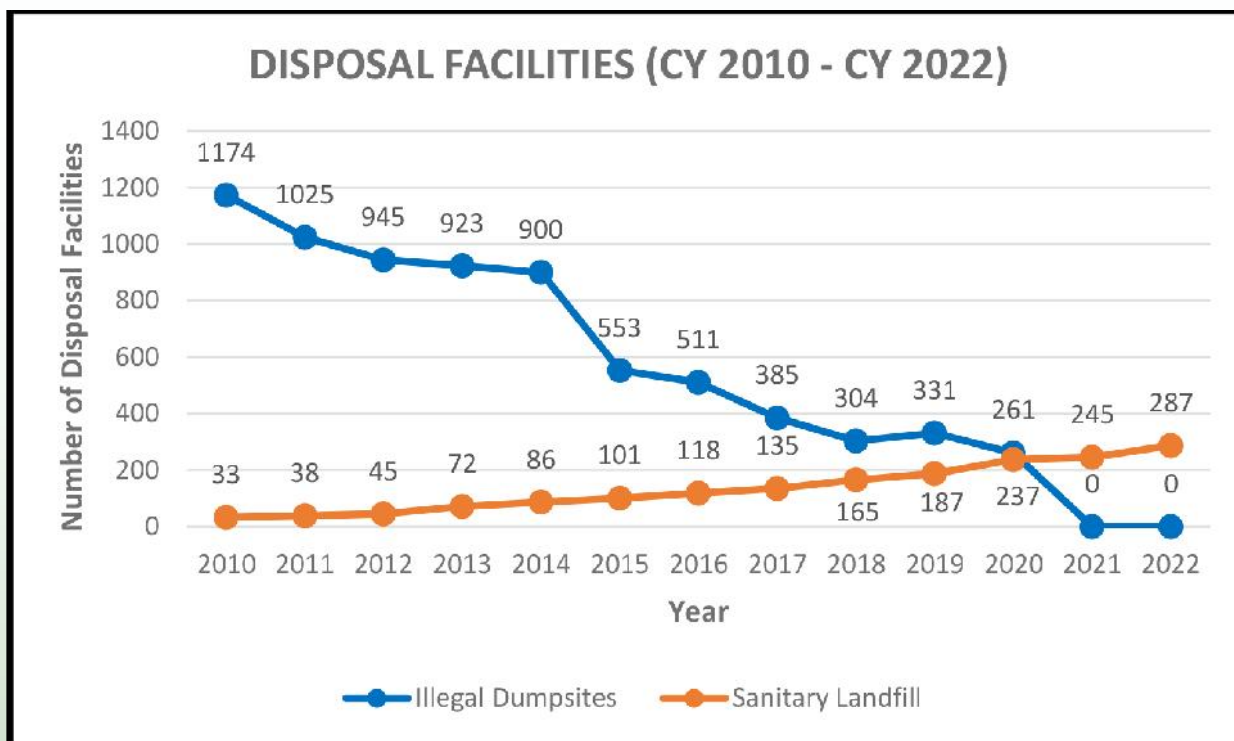


4.1 PASSAGE OF THE EXTENDED PRODUCER RESPONSIBILITY (EPR) ACT OF 2022

An Act Institutionalizing the Extended Producer Responsibility on Plastic Packaging Waste, otherwise known as EPR Act of 2022, was approved on July 23, 2022. The law adopts a practical approach to efficient waste management by focusing on waste reduction, recovery, and recycling. The law also includes the development of environment-friendly products that advocate internationally-accepted principles on sustainable consumption and production, circular economy, and producers' full responsibility throughout the life cycle of products.

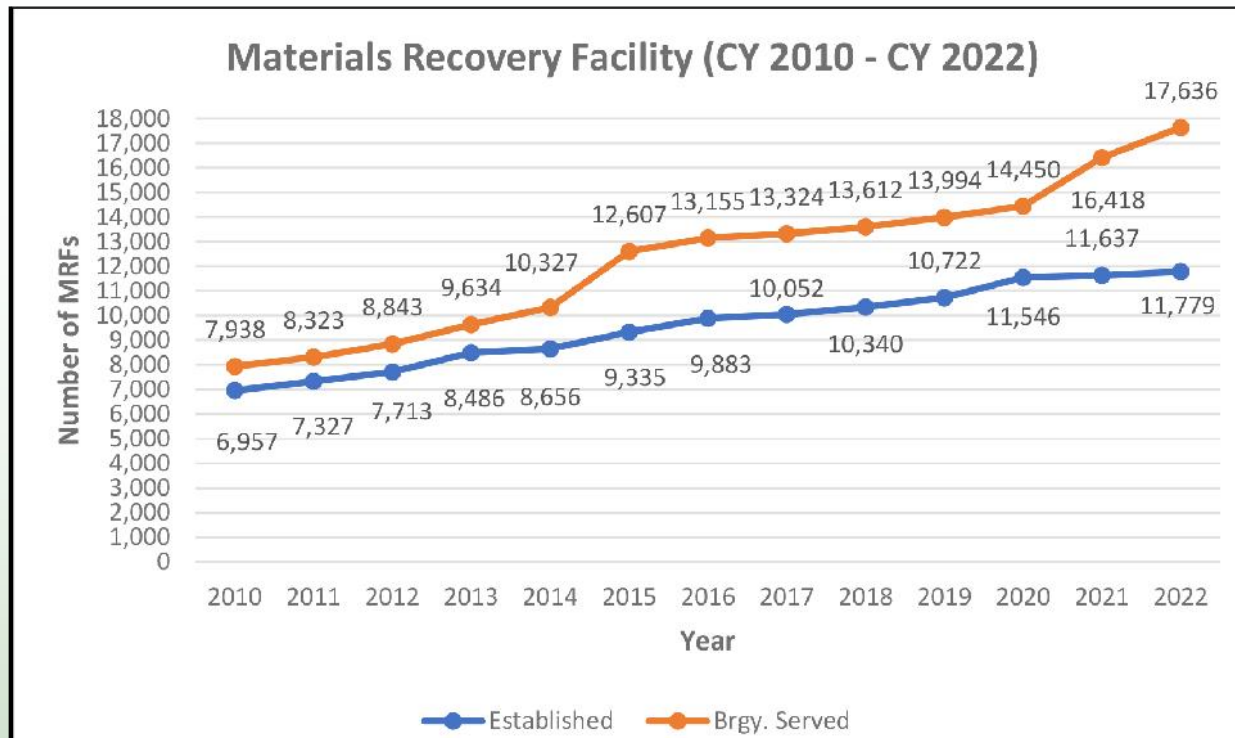
The EPR Act of 2022 requires enterprises to recover or offset their generated plastic product footprint by 20% in 2023 and up to 80% by 2028, resulting in the significant reduction of plastic waste. The law also provides for the expansion and simplification of fiscal incentive schemes to encourage stakeholder involvement in solid waste management and EPR activities.

Initially, a Preliminary Issues Map (PIM) was prepared that identified the provisions of the EPR law that need to be further elaborated, a number of issues and concerns, and possible stakeholders that need to be consulted. The draft's initial IRR and EPR framework were also prepared. Focus Group Discussions were conducted with various stakeholders such as the Congress of the Philippines, DTI, NEDA, DOST, and other Government Agencies, NGOs, Academe, Training Organizations, and other Groups, Waste/Pollution Management Groups, Industry Associations and Corporations, and other Development Partners through the assistance of the United Nations Development Program (UNDP).



Section 32 of the Republic Act 9003 mandates the establishment of a Materials Recovery Facility (MRF) in every Barangay or cluster of barangays to meet the mandatory waste diversion of solid waste from waste disposal facilities through re-use, recycling, and composting activities and other resource recovery activities.

In CY 2022, additional 142 MRFs were established which brings to the total of 11,779 MRFs servicing 17,636 barangays or 45% of the total barangays nationwide.



Section 16 of RA 9003 requires that “provinces, cities or municipalities, through their local solid waste management boards, shall prepare its respective 10-year Solid Waste Management Plans (SWMPs) consistent with the National Solid Waste Management Framework”. The SWMP shall contain all the components provided in Section 17 of the Act including the corresponding timetable for the implementation of the solid waste management program.

In CY 2022, of the 148 SWMPs that were initially reviewed, only 78 were endorsed to the National Solid Waste Management Commission (NSWMC) Executive Committee for deliberation. Of these, 58 were endorsed to the NSWMC En Banc for approval, and 20 of which were approved by the Commission. To date, a total of 1,147 Ten-Year SWMPs were approved out of the 1,592 cities, municipalities and provinces nationwide.



5. TOXIC SUBSTANCES AND HAZARDOUS WASTE MANAGEMENT PROGRAM (RA 6969)

The Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990 is concerned with the management of industrial chemicals in all aspects of its life cycle from importation, manufacture, distribution, use, and disposal. It also covers the management of hazardous wastes from its generation, handling, transport, treatment, and disposal. Complementary activities are the regulation of priority chemicals, the implementation of the Chemical Control Order, and the complete inventory and formulation of the National Implementation Plan for 12 persistent organic pollutants (POPs).

The Philippines is a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The overall goal of the Convention is to protect human health and the environment against the adverse effects which may result from the generation and transboundary movements and management of hazardous wastes. Pursuant to RA 6969, the table below is the summary of permits and clearances issued by EMB for CY 2021 and 2022. These permits and clearances are dependent on the number of applications submitted by the industries/stakeholders:

Central Office:

Certificates/ Clearances/ Permits	CY 2021	CY 2022
TSD registration/renewal/amendment	169	173
Transporter registration/renewal/ amendment	203	223
Importer registration/amendment	7	6
Importation Clearance	307	262
Notification	60	51
Export Clearance	45	22
Cement Kiln Co-processing (CKC) facility registration/renewal/ amendment	-	6
TOTAL	791	743

Regional Office:

Certificates / Clearances	CY 2021	CY 2022
Hazardous Waste Generators (HWGs)	8,459	9,043
Transport Permit	8,101	12,070
TOTAL	16,560	21,113

There were 14,506 facilities validated/inspected to determine their compliance with different environmental laws, particularly Title III (Hazardous Waste Management) of Republic Act 6969. These are combination of TSD and Co-Processing facilities and Importers of recyclable materials containing hazardous substances. Of the monitored facilities, 3,624 were found non-compliant, hence, issued with Notices of Violations (NOVs).

Details	CY 2021	CY 2022
Monitored Firms	13,581	14,506
Notices of Violation Issued	3,528	3,624
Percentage of Compliance	74%	75%

Environmental Impact Assessment

As of December 2022, 26 Environmental Critical Projects (ECPs) were issued with Environmental Compliance Certificates (ECC) and 7,751 ECCs issued for non-ECPs.

Activities necessary for the processing of ECC applications such as Project Screening, Public and Technical Scoping, Procedural Screening, EIA Review and Evaluation through the conduct of EIARC Meetings, and Public Hearing and process documentation have been conducted.

For the compliance monitoring of firms/projects, 17,936 firms/projects were monitored, 4,859 of which were issued with Notice of Adverse Findings/show cause orders for failure to comply with their ECC conditions.

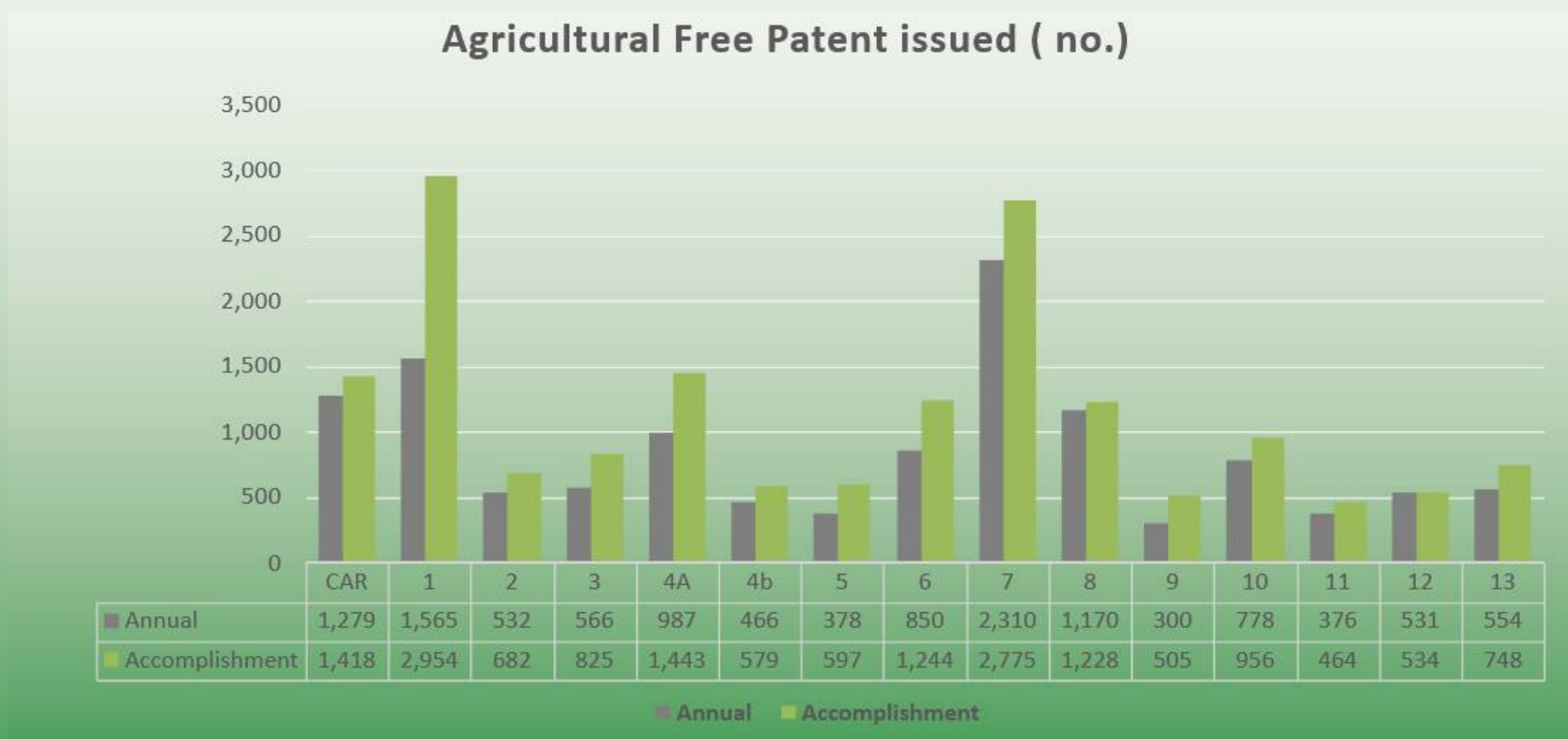
Details	CY 2021	CY 2022
ECC issued	6,204	7,777
<i>ECPs</i>	35	26
<i>Non-ECPs</i>	6,169	7,751
Monitored Firms	17,667	17,936
Notices of Violation Issued	4,676	4,859
Percentage of Compliance	74%	73%

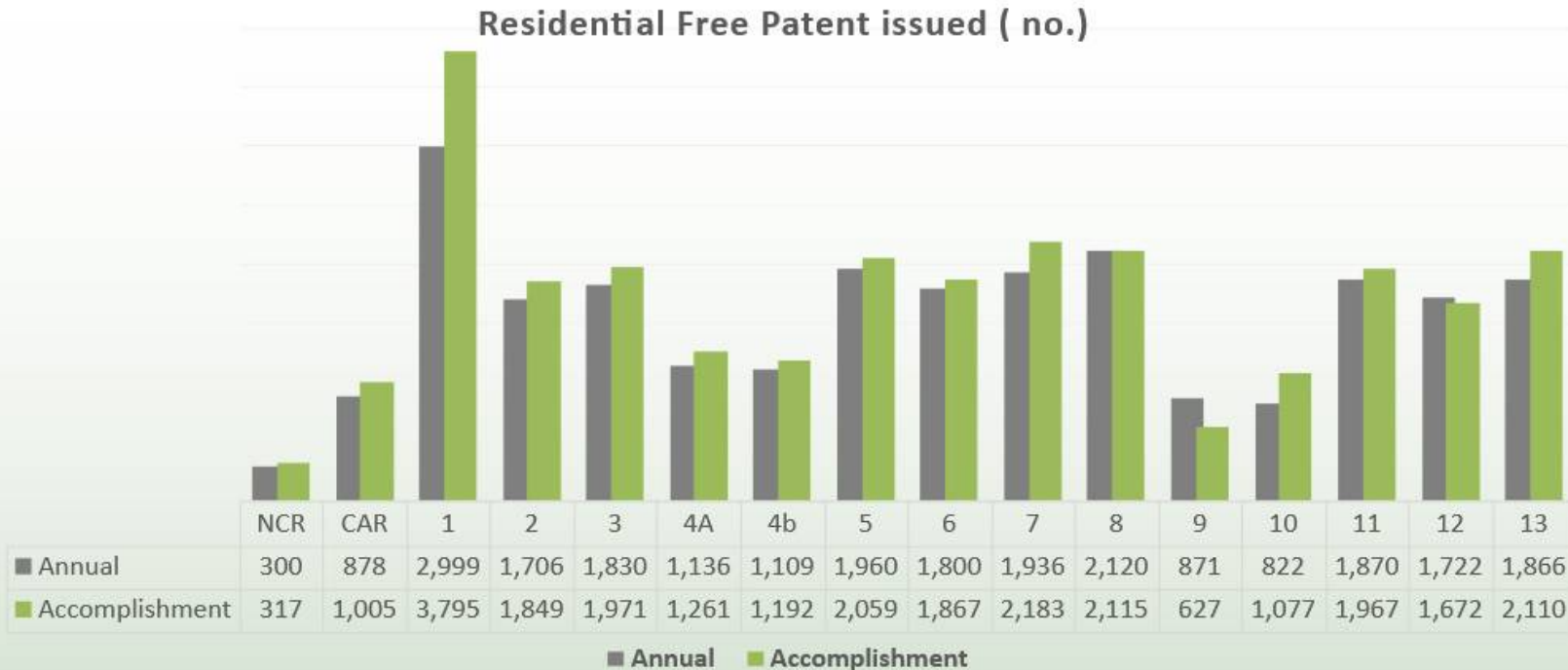
6. LAND DISPOSITION PROGRAM

Land disposition and management involves all activities related to the processing, approval, and issuance of concessions (homestead for agricultural lands and free patent for agricultural & residential lands) involving public lands in favor of qualified individuals, resolution of land cases, and titling of untitled government properties as well. The issuance of patents in public residential and agricultural lands are under RA 10023 (otherwise known as “An Act Authorizing the Issuance of Free Patents to Residential Lands”) and RA 11573 (otherwise known as an Act Improving the Confirmation Process for Imperfect Land Titles), respectively.

6.1 NATIONAL LAND TITLING PROGRAM

In accordance to the National Land Titling Program, a total of 27,067 Residential Free Patents and 16,952 Agricultural Free Patents were issued nationwide for FY 2022. Graphs below indicate the accomplishments and targets per region.





One of the strategies implemented to accelerate land titling is the Rapid Land Tenure Appraisal (RLTA). RLTA is a barangay-profiling activity designed to determine the workable lots that will undergo titling activities in each Region. It is set to be completed in 2026. For CY 2022, a total of 121 Memorandum of Partnership Agreements (MOPA) with LGUs were forged, of which 69 municipalities/cities were involved in training of field personnel for cascading activities, Consolidated Cadastral Maps (CCM) of 1,284 barangays were prepared and updated, and Land Tenure Profiles (LTP) of 1,313 barangays were prepared and produced. In addition, a total of 184,861 workable lots were identified.

In support to land titling is the implementation of the Land Administration and Management System (LAMS) Philippines. One of its major activities is the digitization of all land records across DENR offices nationwide. This involves data capture and the Digital Cadastral Database (DCDB) Cleansing.



Land titles given to beneficiaries in Davao de Oro on September 14, 2022

As of 2022, data capture of 94% percent of the total 101,986,480 plans and documents (per 2017 inventory) was already captured(scanned and encoded), leaving only around 6% of 6,393,188 plans and documents for data capture. The National Capital region (NCR) as one of the pilot regions completed this activity since 2016. Out of the sixteen (16) regions, 11 regions reported full accomplishment of their respective projected target for this activity, with some even exceeding 100%, while 5 regions were left with residual plans and documents which will be carried over to the activity for 2023. These regions are either with on-going data capture by contract/ out- sourcing or by administration.

The implementation of the LAMS resulted in the improved access to land records and information at reduced costs to the government, private and public clients, faster delivery of land-related services, and subsequently increased land-related transactions.

The Digital Cadastral Database (DCDB) Cleansing is the backbone of the LAMS Philippines as it contains all the spatial and textual databases of all survey records and public land records applications (PLA) filed in the different offices of the DENR. These records serve as the main reference of all land-related transactions on public and private lands within the DENR Offices. From CY 2015 to CY 2022, the regional offices have managed to complete Digital Cadastral Database (DCDB) cleansing of datasets of 529 cities/municipalities from LAMS, verified and corrected out of the total 1,516 cities/municipalities.

The LAMS-Inspection, Verification and Approval of Surveys (IVAS) is one of the main components of the LAMS-Philippines. It involves the computerized verification of all survey plans submitted, verified, and approved by the DENR Regional Offices. For CY 2022, a total of 66,004 survey plans were approved.



Land titles given to beneficiaries in Cabatuan, Iloilo on September 8, 2022

*Awarding of land titles to beneficiaries
in Taripan, Malibcong, Abra on September 17, 2022*



7. GEOHAZARD MAPPING, VULNERABILITY ASSESSMENT AND GROUNDWATER RESOURCES ASSESSMENT

The National Geohazards Assessment and Mapping Program (NGAMP) aims for the prevention and mitigation of the adverse impacts of the disasters by identifying areas in the country that are susceptible to different geologic hazards, particularly rain-induced landslide and flood, and providing this vital information to various stakeholders.

As a follow up to the activity, the Vulnerability and Risk Assessment (VRA) project was implemented to provide risk exposure information to the LGUs in the updating and revision of their respective Comprehensive Land Use Plans (CLUPs), as well as other project development plans, and disaster mitigation, preparedness, and management programs. Technical reports and Risk Exposure Maps (REMs) are produced in the VRA that focus on risk exposure of population, built-up areas, and road network to rain-induced landslide and flood. For 2022, VRA was conducted in 81 cities/municipalities.

In addition, VRA also entails the updating of 81 susceptibility maps of cities/municipalities with 1:10,000-scale. This activity is a critical component of the NGAMP, as it provides up-to-date hazard and risk information which are sensitive to the effects of climate change and recent extreme hydrometeorological events that could potentially modify the landscape and may not be reflected in previous assessments.

The NGAMP expanded to include the Karst Subsidence Mapping and Assessment. This project aims to assess karst hazards and focuses on cities and municipalities that are primarily underlain by carbonates that form karst landscapes. In this regard, 24 cities/municipalities were mapped and assessed for Karst Subsidence.



The overflowing of Mayapad River during the recent inundation resulted in a 0.5-meter-deep flood particularly on the bridge at Purok 4, Barangay Galingon. Installation of flood warning signage is highly recommended in the area.

The DENR, thru MGB, rolled out a six (6) year outcome-based plan (2022-2028) that sets a direction for increasing the preparedness, response, and resiliency of coastal communities in the country. Within this six-year period, the roadmap will be guided by a set of strategic objectives, as follows:

- Provide a science-based information for identifying and managing sources of coastal modifications;
- Enhance resiliency of coastal communities by making them understand the potential impact of coastal hazards on their lives, properties and livelihood and identify strategies to minimize the effects of these hazards;
- Work with the local government units, communities, business and other sectors on the integration of coastal resilience in their long-term land use and management sustainability plans;
- Provide guidelines based on common and best practices on the conduct of coastal hazards vulnerability (physical) for general practitioners and on the conduct of coastal impact study (CIS) related to offshore activities;

The Groundwater Resource and Vulnerability Assessment of the Philippines Project aims to produce valuable information and generate a database on the availability and vulnerability of groundwater resources in the country. For 2022, 50 cities/municipalities were assessed.



Measuring the water level of the private jetmatic pump, using ALFA WL 100 type-2B instrument located in Purok 5 of Barangay San Vicente, Madrid, Surigao del Sur.

8. ACTIONS AND INITIATIVES ON CLIMATE CHANGE MITIGATION, ADAPTATION AND RESILIENCY

The country's overall effort to address climate change is set to get a boost with the completion of resilience roadmaps and the corresponding Investment Portfolios for Risk Resilience (IPRR) designed for 16 vulnerable areas in the Philippines.

As part of the continuous implementation of the Risk Resiliency Program (RRP), the Government's convergence program under the Cabinet Cluster on Climate Change Adaptation, Mitigation, and Disaster Risk Reduction (CCAM-DRR), and the completed partnership of the DENR with the National Economic and Development Authority (NEDA) Public-Private Partnership (PPP) Center on the Project entitled "Strengthening Public-Private Partnerships in the Philippines", a series of consultations were conducted including focus group discussions, validation workshops, and one-on-one discussions with key stakeholders, in developing the resilience roadmaps with Investment Portfolios for Risk Resilience (IPRR) of selected provinces and major urban centers.

Resiliency Roadmaps with IPRRs were developed for 12 climate vulnerable provinces and 4 major urban centers, namely: Siquijor, Eastern Samar, Northern Samar, North Cotabato, Maguindanao, Sulu, Lanao del Sur, Catanduanes, Apayao, Kalinga, Mountain Province, Ifugao, and Metro Manila, Metro Iloilo, Metro Cebu, and Metro Davao.

The IPRR contains recommended actions to manage the risks and address climate and disaster vulnerabilities in the form of specific resilience measures. This will strengthen and scale-up province-based planning and budgeting of climate-resilient investments across the local and national levels.

8.1 DEVELOPMENT OF THE PROVINCIAL CLIMATE RISK DIAGNOSTICS (PCRD) TOOL

The DENR, in partnership with the Department of Human Settlements and Urban Development (DHSUD) and through the technical assistance of UN-Habitat, developed the Provincial Climate Risk Diagnostics (PCRD) tool. This initiative is part of our continued work on RRP and is a component of the partnership between the World Bank and the Philippine Government on Accelerating Climate Investment in the Philippines (ACIP).

Viewed as a crucial instrument to support LGUs in climate action planning and in building sustainable and resilient communities, the PCRD tool is a comprehensive, robust, and accessible data repository and analytics application for provincial local government units, which can be used in risk-based planning, decision-making, and investment programming.

On December 5-7, 2022, 78 individuals from the DENR Central and Field Offices (i.e., Southern Leyte, Bukidnon, Surigao del Norte, Surigao del Sur and Dinagat Islands), DHSUD, DILG, and Climate Change Commission (CCC) were trained on the use of the PCRD Tool.

8.2 ASSISTANCE TO HIGHLY URBANIZED CITIES IN THE IMPLEMENTATION OF THE ENVIRONMENT AND NATURAL RESOURCES (ENR) COMPONENT OF THE PHILIPPINES' NATIONALLY DETERMINED CONTRIBUTIONS (NDC)

To provide a platform for city representatives in charge of climate-related projects to learn, discuss, and act on local sustainability issues focusing on low carbon emission development, a capacity building webinar series was conducted to build LGU representatives' understanding and appreciation of relevant information on the concepts, methodologies, and tools for local climate change mitigation planning.

A total of 26 highly urbanized cities from the 16 target regions nationwide gained access to relevant and timely knowledge and tools, specifically on: 1) climate change mitigation action planning; 2) developing a city-level GHG emissions inventory; and 3) formulating City Promises and climate finance. These cities are: Manila, Valenzuela City, Caloocan City, Bataan, Calapan City (Oriental Mindoro), Baguio City, Sta. Rosa City (Laguna), City of San Fernando, Santiago City, Lapu-lapu City, Tacloban City, Davao City, Butuan City, Cagayan de Oro City, Legazpi City, Iloilo City, San Jose Del Monte City (Bulacan), Puerto Princesa City, Naga City, Biñan, Alaminos, Antipolo, Gingoog, Tagum City, City of Kidapawan and Surigao City.

8.3 DEVELOPMENT OF COMMUNITY AND ECOSYSTEM-BASED DISASTER RISK REDUCTION AND MANAGEMENT MANUAL

The DENR, in collaboration with experts on disaster risk reduction and management, developed training modules on Community- and Ecosystem-based Disaster Risk Reduction (CEBDRR). The undertaking primarily aims to enhance skills and capacities on implementing Community- and Ecosystem-based Disaster Readiness and Risk Resiliency Management among the DENR Bureaus/regional offices and other relevant agencies and local government units/communities, particularly the climate vulnerable provinces under the Risk Resiliency Project.

Ultimately, the manual intends to integrate lessons learned in developing regional and local action plans that are aligned with the DRRM core thematic areas of mitigation and prevention and recovery and rehabilitation that are mandated to DENR as a member agency of the National Disaster Risk Reduction and Management Council (NDRRMC).

8.4 DEVELOPMENT OF THE NATIONAL URBAN GREEN SPACES (UGS) ACTION PLAN 2022-2030 LEARNING COLLABORATION HUB

To develop a clear plan and approach on how to implement urban green spaces in the Philippines, the DENR Climate Change Service pushed forward the development of the Urban Green Spaces Framework Action Plan for the period 2022 to 2030.

The National Urban Green Spaces Action Plan anchors on the framework developed for Urban Green Spaces (UGS). The framework enumerates the challenges of urbanization, demand for UGS, natural and built environment factors, green growth strategies, and the 31 ultimate goals of improving the quality of life through Resilient Communities and Sustainable Development, Rich and Connected Biodiversity, Environmental Health Security, Job Creation and Livelihood, Active Mobility, and Social Inclusion.

The National UGS Action Plan incorporated the following: setting down the final priorities of the strategy, preparing the urban green spaces strategic map, and defining the ways and means to implement the priorities and goals. It also provided an opportunity to reflect on the framework and clarify objectives in order to set forth programs, plans, and activities to downscale and implement UGS. It builds on consensus and creates shared responsibility among key stakeholders.

9. BIODIVERSITY CONSERVATION

Improved habitat management and protected areas can help reduce the vulnerability of communities by maintaining essential natural resources and protecting ecosystem services.

In 2022, the DENR, through BMB, made substantial progress in terms of protected area management. Seven protected areas (PAs) were established and legislated under the National Integrated Protected Areas System (NIPAS), namely, Mt. Arayat Protected Landscape (Region 3), Mt. Pulag Protected Landscape (CAR), Naga-Kabasalan Protected Landscape (Region 9), Tirad Pass Protected Landscape (Region 1), Banao Protected Landscape in (CAR), Tugbo Natural Biotic Area (Region 5) and Sicogon Island Wildlife Sanctuary (Region 6). This brings to the total of 248 PAs nationwide covering 7.797 million hectares.

In addition, 93 PAs have established and maintained ecotourism facilities and amenities to promote ecotourism in these areas. A total of 103 PAs have also established the Integrated Protected Area Fund pursuant to the NIPAS Act.

In terms of cave management, the Department has already identified 3,432 caves, of which 464 are within PAs. Also, of the identified caves, 1,411 were assessed and 864 were classified according to their beneficial use.

By ensuring natural ecosystems are protected and wildlife conserved, the country's resiliency against climate change and disaster risks is strengthened.

10. ESTABLISHMENT OF BASELINE DATA ON THE ENVIRONMENT AND THE COUNTRY'S NATURAL RESOURCES, FORMULATION OF POLICY ON NATURAL CAPITAL ACCOUNTING AND CONTINUOUS PRODUCTION OF MAPS

Cognizant of the fact that the country's natural resources is one major factor that spurs economic growth, the DENR established the National Natural Resource Geospatial Database and Natural Capital Accounting System.

10.1 DEVELOPMENT OF A NATIONAL NATURAL RESOURCE GEOSPATIAL DATABASE, A PLATFORM FOR THE PLANNING AND IMPLEMENTATION OF INTEGRATED STRATEGIES OF THE DENR

On August 26, 2022, a technical session on portal-to-portal collaboration was conducted. As part of the way forward, a subsequent technical session was scheduled with the concerned offices to establish a connection from their portal to the DENR Control Map Portal. A total of 447 regional map layers were uploaded to the DENR Control Map Portal.

The Environment and Natural Resources (ENR) data holdings of NAMRIA (i.e., 2015 and 2020 land cover maps, 2016 and 2020 coastal resource maps, and existing land use maps of Davao and Catanduanes) are published in Geoportal Philippines (www.geoportal.gov.ph) and can be downloaded for free.

10.2 FORMULATION OF POLICY ON NATURAL CAPITAL ACCOUNTING (NCA)

The Department drafted an Administrative Order entitled "Adoption, Use, and Establishment of Natural Capital Accounting in DENR" and conducted a series of meetings with concerned agencies such as NEDA, PRC, DBM, DILG, CHED, PSA, among others, regarding their functions and implementation of NCA.

11. IMPLEMENTATION OF FOREIGN-ASSISTED PROJECTS

A total of PHP 6.3 Billion worth of foreign assistance is being mobilized/secured for major projects, to include nature-based solutions for climate action.

Grand Total (PhP '000)¹	6,322,184.00
Biodiversity and Coastal and Marine	4,648,590.00
Preservation and restoration of aquatic ecosystems and related landscapes. Biodiversity protection strategies considering climate change mitigation and adaptation also known as Living Lakes Climate & Biodiversity Program (LLCBP)	592,797.60
Protecting Priority Coastal and Marine Ecosystems to Conserve Globally Significant Endangered, Threatened, and Protected Marine Wildlife in Southern Mindanao, Philippines	168,360.00
Strengthening and Sustaining the Coastal Resource and Fisheries Management in the Leyte Gulf	112,240.00
Natural Capital Accounting and Assessment: Informing Development Planning, Sustainable Tourism Development and other Incentives for Improved Conservation and Sustainable Landscapes	196,420.00
Philippine Rise Integrated Conservation for Enduring Legacies through Ecosystem Support Services (PRICELESS)	233,459.20
Sustainable Management of Natural Resources towards Rehabilitation and Preservation of the Key Biodiversity Area along Bataan Province to Manila Bay	173,972.00
Effectively Managing an Ecological Network of Marine Protected Areas in the Large Marine Ecosystems the ASEAN Region (ASEAN ENMAPS) – ACB-PEMSEA Joint Proposal	524,160.80
The Philippines' Eastern Seaboard Coastal Resilience Project	2,125,830.00
Coral Reef Rescue: Resilient Coral Reefs, Resilient Communities (Regional Project)	440,542.00
Partnerships for Coral Reef Finance and Insurance in Asia and the Pacific (Regional Project)	80,812.80

Lands	119,535.60
Promotion of the Rule of Law in Mindanao	119,535.60
Forestry	54,997.60
Ensuring Functioning of Cultural Ecosystem Services in an Urban Setting: Assimilating Nature for Forest Healing Experiential Learning in Ninoy Aquino Parks (AFOCO FRESH)	54,997.60
Environment	1,024,180.80
Strengthening Reduce, Reuse, Recycle (3R) to Preserve Marine Biodiversity (PROMAR)	269,760.00
TA-Development of Mercury Material Flow in the Philippines (Study)	168.00
Reduction of POPs and UPOPs through Integrated Sound Management of Chemicals	368,147.20
Reduction of Unintentionally-Produced Persistent Organic Pollutant (U-POPs) and Mercury Through an Environmentally-Sound Approach on Health Care Wastes Management in the Philippines	273,865.60
Promoting Resource Efficiency and Circularity to Reduce Plastic Pollution for Asia and the Pacific (Regional Project)	112,240.00
Water	474,880.00
Reducing Pollution and Preserving Environmental Flows in the East Asian Seas	474,880.00

¹Project costs were converted using the following conversion rates: Japanese Yen (¥) to Philippine Peso (₱) = 0.42; US Dollar (\$) to ₱ = 56.12; Euro (€) to ₱ = 67.44.
Reference: BSP Financial Markets, Reference Exchange Rate Bulletin, 29 December 2022.

High-Level Local and International Meetings

In 2022, the DENR actively engaged in various local and international meetings and headed delegations. These include the following:



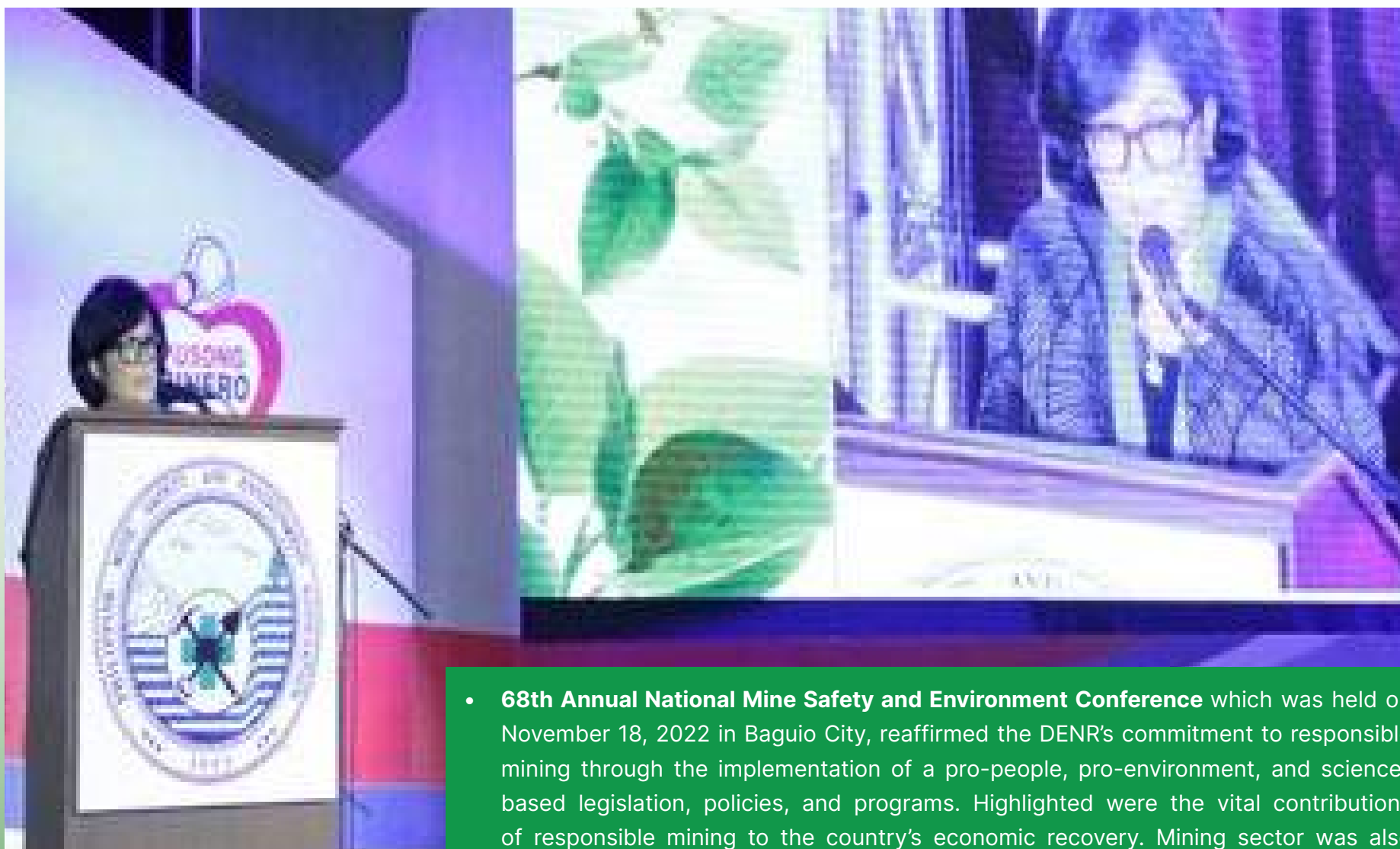
- **15th Conference of Parties (COP15) to the United Nations Convention on Biological Diversity** on December 14, 2022 in Montreal, Canada, which is considered as the largest conference in the world focusing on biodiversity. It has called for increased investments in science and technology to gain new insights and tools in the protection and restoration of the Philippine biodiversity.

- **“Sustainability Forum PH: United for Climate”** which was held in Manila on November 28, 2022. The private sector was urged to work closely together in accelerating their adoption of nature-based solutions that will result in co-benefits of climate action and disaster risk reduction.



- **Climate Investment Forum (CIF) 2022** which was held in Quezon City on November 21, 2022. Urged the private sectors to take up a greater role in the fight against climate change amid growing climate uncertainties and mounting financial requirements for climate change adaptation and mitigation. They could also close the gap in climate finance by investing in more sustainable projects that help reduce the country's carbon footprint.





- **68th Annual National Mine Safety and Environment Conference** which was held on November 18, 2022 in Baguio City, reaffirmed the DENR's commitment to responsible mining through the implementation of a pro-people, pro-environment, and science-based legislation, policies, and programs. Highlighted were the vital contributions of responsible mining to the country's economic recovery. Mining sector was also encouraged to work with the DENR towards a sustainable future where no ecosystem and no community are left behind.



- **27th Conference of Parties (COP27) to the United Nations Framework Convention on Climate Change in Sharm El-Sheikh, Egypt** on November 6-18, 2022.

Met with the Rt Hon Lord Zac Goldsmith, United Kingdom's Minister of State for Overseas Territories, Commonwealth, Energy, Climate and Environment on November 8, 2023, to discuss ways by which the UK can provide support for the Philippines, including through accessing the Blue Planet Fund. The UK's £500 million fund supports developing countries to protect the marine environment, tackle plastic pollution, and reduce poverty. The Secretary also met with the Director of the Environment and Society Programme of Chatham House, Professor Tim Benton, to discuss food security.

- **Comprehensive Disaster and Climate Risk Management Program of the United Nations Disaster Risk Reduction Event in Sharm el Sheikh, Egypt** on November 7, 2022. The program seeks to integrate risk-centered approaches into National Adaptation Plans (NAPs), and climate/forecast information into national and subnational disaster risk reduction strategies, aligning them better with the national adaptation goals.



- **DENR Secretary was one of the panelists in the forum “Delivering a Just Transition in Global Shipping”, organized by the International Labor Organization and United Nations Global Impact on November 9, 2022.** The Secretary emphasized the need for equitable consideration in planning the decarbonization of the global shipping industry. The forum highlighted key actions to fully decarbonize international shipping by 2050 in line with the agenda of COP27 to provide clear pathways for parties and stakeholders to meet the Paris Agreement in limiting global warming to 1.5 degrees Celsius.

Ambassador of the Philippines to Egypt H.E. Ezzedin H. Tago delivered the Philippine intervention during the **High-Level Ministerial Dialogue** on Climate Finance on November 14, 2022. During the Philippine intervention, the Philippine Ambassador to Egypt His Excellency Ezzedin Tago urged for the adoption of a transformational and operational definition of “climate finance” to include the principles or characteristics of the NCQG, covering both quantitative and qualitative elements, including effectiveness and sources of financing. Ambassador Tago relayed that the collective ambition of scaling-up climate action should be anchored on a transparent, accessible, predictable, and efficient mobilization of climate finance.

The Secretary emphasized the urgent need to scale up climate financing and make it more accessible to vulnerable countries.



- **One Planet Event initiated by French President Emmanuel Macron** on November 7, 2022. The event was also attended by the Philippine Ambassador to Egypt, H.E. Ezzedin H. Tago brought together heads or ministers of state/government from Africa, Asia and Latin America, as well as leaders of international and civil society organizations. It highlighted the issue of protecting and conserving vital carbon and biodiversity reserves to mitigate the effects of climate change.

The Philippines was one of only two Asian countries that signed the High Ambition Coalition (HAC) for Nature and People.

The HAC aims to protect over 30 percent of land and ocean by 2030 through financial assistance from the public and private sectors for the management and implementation of programs on nature.

- **Meeting with the Officials of the Office of the Civil Defense** in Camp Aguinaldo on October 30, 2022 on how the DENR may be able to help in how best to gather and analyze data that are crucial in the conduct of effective disaster risk and impact assessment, and to discuss ways to help affected communities recover from the storm brought by Tropical Storm “Paeng”. Cited during the meeting is the importance of “impact-based forecasting,” such as the projected rainfall, to enable anticipatory actions and help reduce the impacts of weather- and climate-related events.



- **“Boundless: Philippine Digital Convention 2022”** held in Pasay City on October 27, 2022, which is an annual event where global leaders from across all industries discuss new technologies and evolving strategies, will continue to digitize its data resources to improve its public service efficiency and delivery to help realize effective and timely environmental interventions.



- **2022 DENR Multi-Stakeholder Forum** which aims to provide a platform for collaboration and whole-of-society consultation that will serve as critical inputs to the Policy Reform Agenda, Systems and Collaboration Mechanisms, and Shared Programs, Actions and Plans with the following: San Miguel Corporation, JG Summit Holdings, Inc., First Philippine Holdings, SM Prime Holdings, Inc., Bank of Philippine Islands, Vista Land & Lifescapes, International Container Terminal Services Inc (ICTSI) on October 5, 2022. Underscored also during the forum is the creation of the Natural Capital Accounting System that will significantly support the development of strategies for a science-based, risk-informed, ethical, and equitable stewardship of the environment.

- **Meeting with the Director General of the United Nations Industrial Development Organization (UNIDO)** on the status of ongoing and upcoming UNIDO-assisted projects such as Manila Bay Rehabilitation, intensified environmental protection, and climate change mitigation measures on September 28, 2022.

- **Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR)** held on September 19–22, 2022 in Brisbane, Queensland, Australia. In conjunction with the APMCDRR, the following bilateral meetings with leaders and dignitaries of other countries and international organizations were held.
 - Special Representative of the United Nations Secretary-General (SRSG) and Head of the United Nations Office for Disaster Risk Reduction (UNDRR) Mami Mizutori and Chief of UNDRR Regional Office for Asia and the Pacific Mr. Marco Toscano Rivalta.
 - Australia Head of Delegation Senator Murray Watt, Minister of Emergency Management, and concurrently Minister of Agriculture, Fisheries and Forestry to discuss opportunities for collaboration between the two countries.
 - Delivered the Philippine Statement in the Ministerial Forum and was a panelist in the Plenary Session on Risk-Informed Investments and Scaling Up Financing for Disaster Risk Reduction.



- **United Nations Framework Convention on Climate Change (UNFCCC) 3rd Technical Expert Dialogue** on the New Collected Quantified Goal on Climate Finance (NCQG) in Asian Development Bank on September 9, 2022.
- **Meeting with Pilipinas Shell Petroleum Corporation** on September 9, 2022, regarding possible collaboration/replication of projects in Region 8 on climate change and implementation of environmental laws (air, water, and solid waste management).

- **Meeting with the Colombia Ambassador** to discuss opportunities for cooperation between the Philippines and Colombia and other environmental issues such as climate change. The meeting was held at the DENR Central Office on September 7, 2022.



- **Meeting with World Bank** on September 6, 2022, regarding the possible collaboration on the following: Country Safeguards Framework Assessment, Extended Producer Responsibility (EPR) implementation, scoping on geospatial platforms for baseline, thematic layers, and management for decision support, Framework Assessment of maximizing the benefits of the mining sector, Ecosystems and Ecosystems services/ natural capital accounting, Presentation of Country Climate Development Report (CCDR) highlights as part of the Assessment Report 6 Orientation.



- **Meeting with the United Nations Office for Disaster Risk Reduction Regional Office for Asia and the Pacific (UNDRR-ROAP) Chief and National Resilience Council (NRC) Executive Director** on the potential partnerships to strengthen disaster risk reduction and climate change mitigation in the Philippines on September 1, 2022.

- **Meeting with the United States Forest Service Asia Pacific Program Manager** on September 1, 2022 on the development of the Forest Reference Emission Level (FREL) in the Philippines. The FREL is required for the approval of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) strategy to help reduce the impacts of climate change by protecting and sustainably managing the country's forests.

- Collaboration with Asian Development Bank (ADB) on the DENR **geospatial database and climate financing** on August 12, 2022.
- **Meeting between GIZ** for the project entitled “Ensuring Sustainable Benefits from Peatland through Protection and Wise Use” (ESBenePEAT) under Work Area of Sustainable Use of Peatlands and Haze Mitigation in ASEAN (SUPA) Component 1, on which the Grant Agreement (GA) was signed on June 13, 2022 at Radisson SM North, Quezon City. The project aims to ensure provision of the ecological functions and services of the country’s peatland through protection and sustainable management, with pilot sites in Sab-a Basin in Leyte (Region 8) and peatlands in Agusan Marsh in Agusan del Sur (Region 13). The total project cost is EUR13,537.23 with funding sources from the European Union and the Federal Republic of Germany, and a project duration of 1.5 years (January 2022 to June 30, 2023).



- **Philippines-Japan Bilateral Environmental Policy Dialogue** in cooperation with the Ministry of the Environment Japan (MOEJ) towards a decarbonized and sustainable society on March 2, 2022 to ensure the reduction of greenhouse gas emissions and protection against the impact of climate change.

President's Report to the People 2022-2023

Paving the Way for Sustainable Progress Promoting the Sustainable Management of Natural Resources and Protecting the Environment

SAFEGUARDING THE INTEGRITY OF THE ENVIRONMENT

ADVANCING INTEGRATED MANAGEMENT OF WATER RESOURCES

The country's water-related functions are lodged in over 20 agencies resulting in challenges in supply, distribution and management of water resources at all levels and across all sectors.

The DENR is strengthening water governance through integrated water resources management (IWRM) by consolidating all agencies with water-related functions under the Water Resource Management Office (WRMO). This Office is created pursuant to EO 22 to promote integration and coordination among different departments and offices as a whole of government effort. WRMO is co-handling with DPWH and DILG the technical management of nationally funded water supply projects worth Php14.6B. Moreover, some of the Php276B worth of DPWH flood control projects will be repurposed to address multiple needs such as dams, water impoundment for irrigation, power generation, and domestic water use. To address the potential impact of climate change and extreme weather events such as shortage of water supply in the country due to El Niño, the WRMO proposed the issuance of Memorandum Circular 22 directing all government agencies to conserve water. The conservation program, in coordination with the two Metro Manila concessionaires, is currently working with the top six government agencies that use the most water to reduce their consumption. We target the savings of at least five million liters of water per day through pipe replacement and internal conservation measures, including leaks management of government agencies, in the next two months in order to assure additional supply for Metro Manila. The WRMO issues national bulletins as guidance for water conservation for public and private sectors.

PROTECTING AND CONSERVING THE COUNTRY'S RICH BIODIVERSITY

The Philippines is among the world's mega-biodiverse countries, with very high species endemism, and critical and varied habitats that support natural resources needs.

This Administration consistently aims to protect and conserve the integrity of our ecosystems in pursuit of SDGs 14 and 15 for the protection of life below water and on land. Under the National Greening Program (NGP), we sustained efforts to restore and regenerate 7.1 million ha of the remaining classified forestlands in need of critical rehabilitation.¹

From July 2022 to June 2023,
32,217,360 seedlings of various
species were planted in **43,607.11 hectares**
of new plantations were established under
the NGP, while **191,082 hectares** of existing
plantations are funded
to be maintained and protected.

Source: DENR-FMB

¹ Forest Management Bureau. (2023). DENR Forest Management Bureau Accomplishment Report as of June 2023. Quezon City: FMB.

There are 248 nationally managed Protected Areas in the Philippines and this administration remains steadfast in its commitment to the diligent and continued responsible management of roughly 4.6 million ha of land and 3.1 million ha of sea within the National Integrated Protected Areas System (NIPAS). It places utmost importance on ensuring the protection and preservation of these areas, safeguarding their ecological integrity for future generations.²

While we continue to protect and rehabilitate our forests, managing our coastal and marine ecosystems is equally as important. Thus, we have so far assessed the status of 38,230.41 ha of corals, 23,019.94 ha of seagrasses, and 20,686.40 ha of mangroves.³ This will ensure the continuous flow of ecosystem services including fisheries production, coastal protection, carbon sequestration, and sustainable tourism, among others. With these, we continue to deliver on the Philippine commitments to the Paris Agreement, Sendai Framework for Disaster Risk Reduction (SFDRR) and the landmark Kunming-Montreal global biodiversity agreement in 2022. The Philippines is part of the High Ambition Coalition for Nature and People which is committed to protect and conserve 30% of the global land and sea areas by 2030. We project an estimated 16% potential coverage of sea areas and of high biodiversity and conservation value to be under protection by 2030. These areas will be increased by the inclusion of other effective area-based conservation measures, including indigenous and traditional territories, with full respect to the rights of indigenous peoples and local communities.

To protect our genetic resources and associated traditional knowledge, we are advancing practical bilateral and multilateral arrangements that ensure benefit-sharing through fair access and utilization.

As of May 2023, a total income of Php 162,030,359.48 was generated from management of Protected Areas⁴. Ecotourism jobs have more than doubled in the last five years, promoting practices, products and services that enhance biodiversity. Regulations for Mainstreaming Biodiversity-Friendly Agricultural Practices have already been rolled out nationwide. Through the Green Economy Model, major tourist destinations that support green livelihoods of local communities and generate income for local government units are being catalyzed.

² Biodiversity Management Bureau. (2023). DENR Biodiversity Management Bureau Accomplishment Report as of June 2023. Quezon City: BMB.

³ Biodiversity Management Bureau. (2023). DENR Biodiversity Management Bureau Accomplishment Report as of June 2023. Quezon City: BMB.

⁴ Biodiversity Management Bureau. (2023). DENR Biodiversity Management Bureau IPAF Report as of May 2023. Quezon City: BMB.

EMPLOYING INNOVATIVE SCIENCE AND TECHNOLOGY IN ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

To account for nature's role in human well-being and the economy, we need to map and measure what we treasure – our natural resources and the ecosystem services that they provide – using the best science and technology.

The DENR is supporting the Natural Capital Accounting Program led by NEDA where natural capital is being identified, accounted and valued for the benefits that nature provides to human development and the economy.

The DENR established the Geospatial Database Office (GDO) to develop the National Natural Resources Geospatial Database (NNRGD) as a platform for environmental governance and the integrated planning and implementation of disaster risk reduction and climate-proof strategies. The GDO catalogs all our natural resources including land, forests, water and minerals using satellite images and drones to survey natural and man-made changes within our islands. The NNRGD serves as a critical decision support tool to monitor compliance, enforce rules and regulations, and conduct research on the use of our natural assets. Since its establishing in January 2023, GDO has uploaded over 1,300 maps and prepared 21 use cases, including NGP plantations, forest cover, river basins, mineralized areas and active mining sites, protected area buffers, mangrove areas, and the location of all permitted industries.⁵ Moreover, we identified priority areas for reforestation and other forestry investments for uploading in the NNRGD. Among the 2 million ha for reforestation, 1 million ha have been identified and mapped as suitable Potential Investment Areas.⁶

ENHANCING WASTE MANAGEMENT AND PROMOTING CIRCULAR ECONOMY THROUGH STRONG PRIVATE SECTOR PARTICIPATION AND SUPPORT TO INFORMAL WASTE SECTORS

With strong economic growth and increased consumer demand, the Philippines generates an enormous amount of plastic waste that puts ecosystems and development at risk.

With the passage of RA No. 11898, "An Act Institutionalizing the Extended Producer Responsibility on Plastic Packaging Waste" or the Extended Producer Responsibility (EPR) and the issuance of the implementing guidelines by the DENR, large private enterprises and MSMEs are obliged to undertake waste recovery schemes in pursuit of a circular economy. These obligations include the diversion, transportation and disposal of recovered waste and the clean-up in coastal and public areas. To comply with these obligations, enterprises are required to establish diversion or disposal facilities and partner with local governments, communities and informal waste sectors.

⁵ DENR. (2023). *Geospatial Database Office Accomplishment Report as of June 2023*. Quezon City: DENR.

⁶ Forest Management Bureau. (2023). *DENR Forest Management Bureau Report as of June 2023*. Quezon City: FMB.

The EPR law requires obliged enterprises to divert 20 percent of plastic waste they produced in 2022 by the end of 2023 and further to 80 percent by 2028. These initiatives promote sustainable consumption and production through effective waste management and support the development of green jobs and industries thereby reducing emissions and increasing efficient use of natural resources.

As of June 30, 2023
642 enterprises registered in the
Extended Producer
Responsibility Program
nationwide

Source: DENR-EMB

ACCELERATING CLIMATE ACTION AND STRENGTHENING DISASTER RESILIENCY

MOBILIZING CLIMATE FINANCE AND INVESTMENTS ON NATURE

The Philippines is among the countries highly at risk to the impacts of climate change and multiple hazards because of development choices in the past that have increased exposure and vulnerability of people, critical infrastructure, and ecosystems.

Between 2011 and 2021, the total amount of losses and damage incurred due to tropical cyclones is estimated at Php 672 billion⁷ To complement our efforts to fund climate action, the DENR and other government agencies are actively engaging our international partners and accessing international climate financing. Under these collaborations, the DENR has mobilized an estimated USD 91,396,151 or Php 5,138,245 billion to support the implementation of 12 environmental projects and enhance delivery of our international commitments.⁹

⁷ OCD. (2022). *Report on Damage and Losses as of 2021*. Quezon City: OCD Post Disaster Evaluation and Management Division.

⁹ DENR. (2023). *Foreign-Assisted and Special Projects Service Monitoring Report as of June 2023*. Quezon City: DENR.

These projects cover intersecting goals on forestry, land management, biodiversity, environment and climate change. In addition, an amount of USD 52.76 million or PhP 2.6 billion funding support was allocated to the Philippines under the eighth funding replenishment cycle of the Global Environment Facility, which is the country's largest allocation so far.⁹

A total of 18 Resilience Roadmaps with Investment Portfolio for Risk Resilience has been developed for 14 climate-vulnerable provinces and four major urban centers representing 40.2M of the country's population. These roadmaps recommend specific and contextualized resilience measures to address climate and disaster vulnerabilities and enable effective risk management at the local level.^{10, 11}

HAZARD MANAGEMENT THROUGH LOCAL AND INTERNATIONAL COLLABORATION

The country is building capacity to shift its risk paradigm by implementing an all-hazards approach.



*Residents of affected coastal areas in Oriental Mindoro prepare improvised spill booms made of locally available organic materials.
Source: DENR*

⁹ DENR. (2023). *Foreign-Assisted and Special Projects Service Monitoring Report as of June 2023*. Quezon City: DENR.

¹⁰ Siquijor, Eastern Samar, Northern Samar, North Cotabato, Maguindanao, Sulu, Lanao del Sur, Catanduanes, Apayao, Kalinga, Mt. Province, Ifugao, Southern Leyte, Bukidnon and Metro Manila, Metro Iloilo, Metro Cebu, and Metro Davao.

¹¹ DENR (2023). *Risk Resiliency Roadmap Investment Portfolios*. Quezon City: DENR

The Department played an active role in responding to environmental disasters such as the oil spill incident on February 28, 2023 as a result of the sinking of the MT Princess Empress off Naujan, Oriental Mindoro. Risk management began with the location of the hydrographic survey vessel of NAMRIA, *Barko ng Republika ng Pilipinas* (BRP) HYDROGRAPHER VENTURA, through multibeam survey. This led to the projections of oil spill trajectory by DENR partners including University of the Philippines- Marine Science Institute (UP MSI), US National Oceanic and Atmospheric Administration (NOAA), United States Agency for International Development (USAID) and the private sector. These scientific and technical collaborations supported the efforts of the Philippine Coast Guard, US NAVY and the Japanese Disaster Response Team. The DENR continues to pursue strong interagency and interdisciplinary collaboration for biodiversity and environmental impact assessments for the recovery, rehabilitation, regeneration, and restoration of damaged ecosystems.

In cooperation with various agencies, partners and local communities, 6,901 liters of oil waste and 367,512.90 liters of oil-contaminated waste have been collected.¹² As of June 16, 2023, after months of inter-agency response and recovery operations, the oil siphoning by the Singapore Dynamic Support Vessel (DSV) Fire Opal has been completed.¹³

The spill area is adjacent to the Verde Island Passage (VIP), the center of the center of marine shorefish biodiversity in the world.¹⁴ This area is particularly important for its coral reef habitats, with its strong currents and upwelling providing a refuge from ocean warming due to climate change. The DENR is supporting five provinces namely Oriental and Occidental Mindoro, Batangas, Romblon and Marinduque to consider seeking the declaration of VIP as a nationally managed marine protected area. Once established, the VIP would be the most expansive nationally-managed marine protected area in the Philippines, encompassing a vast 1.3 million hectares.

¹² DENR MIMAROPA. (2023). *Task Force Mt. Princess Empress Oil Spill Incident Final Situational Report No. 47 dated June 21, 2023*. Manila: DENR MIMAROPA.

¹³ Philippine Coast Guard (2023). *Situational Report as of 16 June 2023*. Manila City: PCG

¹⁴ Carpenter, K. E., & Springer, V. G. (2015). *The center of the center of marine shore fish biodiversity : The Philippine Islands*. *Environmental Biology of Fishes* 72, 467-480.

ENGAGING LOCAL GOVERNMENTS IN MULTI-STAKEHOLDER ENR GOVERNANCE

Integrated approaches enable local governments to achieve resilience in the face of complexity and uncertainty.

Adopting a comprehensive risk management approach to multi-stakeholder ENR governance, Project TRANSFORM (Transdisciplinary Approach for Resilient and Sustainable Communities) was launched with partner LGUs including Ormoc City, Leyte, Bataan, and select municipalities of Surigao del Norte, including the Siargao Islands. Resource networks provide LGUs with access to technical and financial assistance for ecosystem conservation and protection and development of resource-based enterprises enhancing community resilience. Project TRANSFORM is a replicable whole of government and whole of society partnership for environment and natural resource management, climate and disaster resilience and socio-economic development.

To advance nexus governance and as part of the Philippines' global commitments, we are actively participating in various international activities to strengthen our partnerships with international bodies. These include the 27th Conference of Parties to the UN Framework Convention on Climate Change (COP27) in November 2022; 15th Conference of Parties to the UN Convention on Biological Diversity (COP15) in December 2022; 2023 UN Water Conference in March 2023; and the High-Level Meeting on the Midterm Review of SFDRR in May 2023. The DENR led the delegation to the 2022 Asia Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) and will host the 2024 APMCDRR. This Conference will bring together around 3,000 delegates from the Asia-Pacific region to accelerate the implementation of the SFDRR and strengthen cooperation on DRR in Asia-Pacific.

ADVANCING LOW CARBON ECONOMY THROUGH CRITICAL MINERALS DEVELOPMENT

Critical minerals development is essential to achieving decarbonization targets and promoting a just transition towards a green economy.

The Philippines is recognized as the fifth most mineralized country in the world with estimated untapped reserves of approximately USD900 billion.¹ The DENR has identified nine million ha as highly mineralized areas². We are a major producer of gold, nickel³, copper and cobalt, and non-metallic minerals, which are essential for construction and infrastructure development. As of June 2023, the total production value of mining was Php 315 billion, which include large scale metallic mining, non- metallic mining, and gold sold to Bangko Sentral ng Pilipinas.⁴

The shift to renewable energy towards net zero by 2050 will drive the demand for metallic minerals especially copper and nickel for storage, turbine production, transmission and distribution among others. By 2040, global mineral demand is expected to rise at least four times.⁵ The DENR is designing a new critical minerals strategy and is committed to mitigating climate change impacts and accelerating the energy transition towards a low carbon future by prioritizing policies and initiatives on metals and minerals needed for clean energy technologies.

Minerals are part of our daily lives and are used in one form or another across all industries. They are needed to build a sustainable, industrialized and digital society. The DENR is pursuing a strategic convergence policy with NEDA, DOE, DOF and DTI. This will include creation of new opportunities and priorities in exploration, development and processing of mineral resources in order to accelerate production to participate and compete in regional and global supply and value chains.

¹ Australian Trade and Investment Commission, Government of Australia. *Mining to the Philippines Trends and Opportunities*. Available at <https://www.austrade.gov.au/australian/export/export-markets/countries/philippines/industries/mining>

² DENR. (2023). *DENR to Strengthen Mining Sector for PH Economic Growth*. Press Release on 9 November 2023. Available at <https://www.denr.gov.ph/index.php/news-events/press-releases/4604-denr-to-strengthen-mining-sector-for-ph-economic-growth>

³ Ernst and Young. (2022). *Top 10 business risks and opportunities for mining and metals in 2023*. Available at https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/mining-metals/ey-top-10-business-risks-and-opportunities-for-mining-and-metals-in-2023.pdf.

⁴ DENR. (2023). *Mining Industry Statistics CY 2020 to Q1 CY 2023*. Quezon City: Mines and Geosciences Bureau.

⁵ International Energy Agency. (2022). *The Role of Critical Minerals in Clean Energy Transitions*. World Energy Outlook Special Report. Available at <https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4e9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf>



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