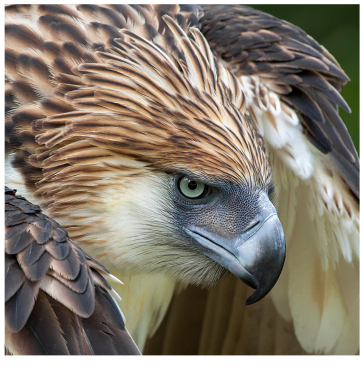
REPUBLIKA NG PILIPINAS

Republic of the Philippines









United Nations Decade on Biodiversity

Philippine Biodiversity Strategy and Action Plan 2015-2028

Bringing resilience to Filipino Communities

Message

The Philippines is a party to the Convention on Biological Diversity (CBD), which was adopted in the 1992 Earth Summit in Brazil and has since become international law. Our ratification of this multilateral treaty is only proper, given that the Philippines is one of the world's 17 most biodiverse countries, as affirmed by Conservation International (CI) in 1998.

As a party to the CBD, we have accepted certain time-bound obligations, in return for a more sustainable future. In compliance with these obligations, we formulated the 1997 National Biodiversity Strategic Action Plan (NBSAP), which under Article 6 of the Convention is the principal instrument for implementing the Convention at the national level.

Now, we have updated the 1997 NBSAP, with this publication of the *2015-2028 Philippine Biodiversity Strategy and Action Plan* (PBSAP). This updated plan builds on the achievements thus far made in fulfilling our CBD obligations, particularly the commitment to implement the CBD Strategic Plan for Biodiversity 2011-2020, including the 20-point Aichi Biodiversity Targets.

The 2015-2028 PBSAP integrates and mainstreams CBD objectives into the national development and sectoral planning framework that includes measurable targets for CBD commitments. The participative stocktaking process in biodiversity planning, plus its focal on new thematic areas like agrobiodiversity and urban biodiversity, will strengthen national government initiatives to involve local governments to perform greater role in biodiversity conservation.

The 2015-2028 PBSAP is just the latest manifestation of our firm resolve to preserve our heritage of biodiversity. This plan, painstakingly crafted as it was, demands and deserves corresponding implementing actions, participated in by all stakeholders. Let us now proceed to rise up to the challenge.

Mabuhay!

(Sig.)
DR. RAMON J.P. PAJE
Secretary of Department of Environment
and Natural Resources

Message

A recent study released by Stanford scientists state that we are living in the "early stages of the earth's sixth mass extinction". More than 300 large terrestrial species have disappeared from the face of the earth since the 1500s, and "populations of the remaining species show 25 percent average decline in abundance. Invertebrate patterns are equally dire: 67 percent of monitored populations show 45 percent mean abundance decline". And along with these extinctions are the loss of habitats and ecosystem services, which they are associated with.

In the Philippines, we have lost almost 93 percent of our original forest cover since the 1900's (Philippine Biodiversity Conservation Priorities [PBCP], 2002). In 2008, 58 out of the 206 then known mammal species native to the Philippines were included in the International Union for the Conservation of Nature (IUCN) Red Data List of Threatened Species (IUCN, 2008). This is a number that is significantly large, considering that more than half of our native mammalian species are found only in the country and nowhere else in the world.

The updating of the NBSAP comes at an opportune time when there is a need to re-examine the Philippines' roadmap in conserving and managing its biodiversity resources that would be beneficial for the country's economic development. The PBSAP 2015-2028 is not only our compliance to the Convention on Biological Diversity but also our opportunity to strongly support national interests and biodiversity conservation priorities.

In order to meet the changing needs of the biodiversity sector, the Department of Environment and Natural Resources took structural reforms and invested threefold increase in the 2014 budget of the department's Biodiversity Management Bureau (BMB), formerly the Protected Areas and Wildlife Bureau (PAWB), compared to its budget last year. We have institutionalized marine biodiversity conservation into our mandate, with the creation of the coastal and marine division in our Agency structure, embodied in the DENR's approved rationalization plan. Later on, more development partners, such as the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the United States Agency for International Development (USAID), have joined us in implementing our sectoral roadmap, and eventually we hope to have all of you as partners as well, towards the implementation of a more responsive and adaptive Philippine Biodiversity Strategy and Action Plan.

Through successful collaborations, new information of rediscovered species has allowed us to reevaluate our protected area system and our conservation priorities. One significant milestone in the last five years is the inclusion of the Upper Marikina River Basin Protected Landscape (UMRBPL) in our list of protected areas, covering a total area of 26,125.64 hectares in the city of Antipolo and in the municipalities of Baras, Rodriquez, San Mateo and Tanay, all in the province of Rizal, proclaimed by President Benigno S. Aquino III in November of 2011.

Although we may have had significant gains in terms of protecting and conserving Philippine biodiversity for the past years, there are still challenges ahead. We must continue working with different partners in the conservation of biological diversity and the sustainable use of its components for fair and equitable sharing for all.

(Sig.)
DR. THERESA MUNDITA S. LIM
Director of Biodiversity Management Bureau
Department of Environment
and Natural Resources

Acknowledgement

The BMB of the Department of Environment and Natural Resources (DENR) is pleased to present the *PBSAP 2015-2028* that serves as the country's framework in conserving biodiversity to improve human well-being thus contributing to the attainment of the Philippine Development Plan (PDP) goals and the President's 10-point Agenda.

The PBSAP 2015-2028 is the third in a series of iterations since the Philippines' ratification of the CBD. The first iteration of the PBSAP was done in 1997 and was followed by an updated plan in 2002. This latest iteration is a result of extensive and participatory consultations from February 2013 to March 2015 among more than 800 individuals representing nearly 200 agencies and organizations from the government, private sector, media and academe including non-government agencies and people's organizations both at the local and international levels. Annex 4 contains the full list of the participating agencies.

The PBSAP 2015-2028 was funded by the United Nations Development Programme (UNDP) Global Environment Facility (GEF) and Government of the Philippines.

BMB-DENR would like to express its deepest gratitude to the organizations and individuals who are behind the successful formulation of the updated PBSAP 2015-2028:

ASEAN Centre for Biodiversity (ACB); BirdLife International; Haribon Foundation, Inc.; GIZ through the Protected Area Management Enhancement in the Philippines (PAME) Project; UNDP through the Biodiversity Partnership Programme (BPP); FishBase Information and Research Group, Inc. (FIN) and USAID through the Philippines Biodiversity and Watersheds Improved for Stronger Economy and Ecosystem Resilience (B+WISER) Program

The core group of individuals who worked through the 34-month process of formulating the plan utilizing accurate and up-to-date information from a vast and diverse pool of sources to ensure a quality and robust plan. These people are:

Lead expert discussants: Enrica Aquino, Margarita Lavides, Christine Casal, Eduardo Queblatin, Elpidio Peria, and Marivic Pajaro

Co-discussants and technical advisers: Cristi Nozawa, Sheila Vergara, Rodolfo Santos, Corazon Sinha, Felix Gaschick, Jean Caleda, Elena Javier, and Kent Tangcalagan

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Table of Contents

i. List of Acronyms

ABS	Access and Benefit-Sharing
ACB	ASEAN Centre for Biodiversity
ADSDPP	Ancestral Domain Sustainable Development and Protection Plan
AMS	ASEAN Member States
AO	Administrative Order
ARMM	Autonomous Region of Muslim Mindanao
ATM	Alyansa Tigil Mina
B+WISER	Biodiversity and Watersheds Improved for Stronger Economy and Ecosystem Resilience
BAI	Bureau of Animal Industry
BCM	Billion cubic meters
BFAR	Bureau of Fisheries and Aquatic Resources
BMB	Biodiversity Management Bureau
BMS	Biodiversity Monitoring System
BPI	Bureau of Plant Industry
BPP	Biodiversity Partnership Programme
BSWM	Bureau of Soils and Water Management
CBD	Convention on Biological Diversity
CCC	Climate Change Commission
CCD	Convention to Combat Desertification
CCMRD	Committee on Conservation and Management of Resources for Development
CEPA	Communication, Education and Public Awareness
CH	Critical Habitat
CHED	Commission on Higher Education
CHM	Clearinghouse Mechanism
CI	Conservation International
CITES	Convention on the International Trade of Endangered Species of Flora and Fauna
CLUP	Comprehensive Land Use Plan
CMS	Convention on Migratory Species
COA	Commission on Audit
CoP	Conference of Parties
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
CTI	Coral Triangle Initiative
DA	Department of Agriculture
DAO	Department administrative order
DAR	Department of Agrarian Reform
DBM	Department of Budget Management
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DFA	Department of Foreign Affairs
DILG	Department of the Interior and Local Government
DOE	Department of Energy
DOH	Department of Health
DOST	Department of Science and Technology
DOT	Department of Tourism
DOTC	Department of Transportation and Communication

DPWH	Department of Public Works and Highways
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
EAAF	East Asian-Australasian Flyway
ECC	Environmental Compliance Certificate
EEZ	Exclusive Economic Zone
EMB	Environmental Management Bureau
ENRO	Environment and Natural Resources Office
EO	Executive Order
ERDB-	Ecosystems Research and Development Bureau
EU	European Union
FAO	Food and Agriculture Organization
FASPO	Foreign-assisted and Special Projects Office
FCCC	Framework Convention on Climate Change
FGD	Focus Group Discussion
FIN	FishBase Information and Research Group
FMB	Forest Management Bureau
FPA	Focal Point Agency
FPIC	Free, Prior and Informed Consent
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIAHS	Globally Important Agricultural Heritage Sites
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMO	Genetically modified organism
Ha	Hectare
HLURB	Housing and Land Use Regulatory Board
IAS	Invasive Alien Species
ICC	Indigenous Cultural Communities
ICCA	Indigenous Community Conserved Area
ICM	Integrated Coastal Management
ICRMP	Integrated Coastal Resources Management Project
IEC	Information, Education and Communication
IP	Indigenous Peoples
IPB	Institute of Plant Breeding
IPCC	Intergovernmental Panel on Climate Change
IPRA	Indigenous Peoples' Rights Act
IRR	Implementing Rules and Regulations
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUUF	Illegal, Unreported and Unregulated Fishing
IUCN	International Union for the Conservation of Nature
KBA	Key Biodiversity Area
Km	Kilometer
LCA	Local Conservation Area
LCP	League of Cities of the Philippines
LGA	Local Government Academy
LGU	Local Government Unit
LLDA	Laguna Lake Development Authority
LMB	Lands Management Bureau
LMP	League of Municipalities of the Philippines
LPP	League of Provinces of the Philippines

M	Meter
M&E	Monitoring and Evaluation
MEA	Multilateral Environmental Agreements
METT	Management Effectiveness Tracking Tool
MDG	Millenium Development Goal
MEAT	Management Effectiveness Assessment Tool
MGB	Mines and Geosciences Bureau
MICC	Mining Industry Coordinating Committee
MMDA	Metropolitan Manila Development Authority
MOA	Memorandum of Agreement
MPA	Marine Protected Area
MSI	Marine Science Institure
MSU-TCTO	Mindanao State University-Tawi-Tawi College of Technology and Oceanography
MW	Megawatt
NAMRIA	National Mapping and Resource Information Authority
NAPWC	Ninoy Aquino Parks and Wildlife Nature Center
NBF	National Biosafety Framework
NBSAP	National Biodiversity Strategy and Action Plan
NCB	Non-Carbon Benefit
NCC	National Cave Committee
NCCA	National Commission on Culture and the Arts
NCCAP	National Climate Change Action Plan
NCIP	National Commission on Indigenous Peoples
NDRRMP	National Disaster Risk Reduction Management Plan
NEDA	National Economic and Development Authority
NFRDI	National Fisheries Research and Development Institute
NGO	Non-government Organization
NGP	National Greening Program
NHC	National Historical Commission
NIPAS	National Integrated Protected Areas System
NISSAP	National Invasive Species Strategic Action Plan
NM	National Museum
NNC	National Nutrition Council
NSO	National Statistics Office
NTCC	National Technical Coordinating Committe
NWRB	National Water Resources Board
ODA	Official Development Assistance
PA	Protected Area
PACBRMA	Protected Area Community-based Resource Management Agreement
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PAMB	Protected Area Management Board
PAME	Protected Area Management Effectiveness
PAR	Philippine Area of Responsibility
PAWB	Protected Areas and Wildlife Bureau
PBCP	Philippine Biodiversity Conservation Priorities
PBSAP	Philippine Biodiversity Strategy and Action Plan
PCAARRD	Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development
PCG	Philippine Coast Guard
PCSD	Palawan Council for Sustainable Development

PD	Presidential Decree
PDC	Provincial Development Council
PDP	Philippine Development Plan
PES	Payment for Ecosystem Services
PGS	Philippine Guarantee System
PIA	Philippine Information Agency
PIDS	Philippine Institute for Development Studies
PNP	Philippine National Police
PNRPS	Philippine National REDD+ Strategy
PO	Peoples Organization
PPA	Philippine Ports Authority
PPSO	Planning and Policy Service Office
PRA	Philippine Reclamation Authority
RA	Republic Act
RBCO	River Basin Coordination Office
RCC	Regional Cave Committee
RDC	Regional Development Council
REDD	Reducing Emissions from Deforestation and Forest Degradation
RPM-P/RPA/ ABB-TPG	Rebolusyonaryong Partido ng Manggagawa Pilipinas/Revolutionary Proletarian Army/Alex Boncayao Brigade – Tabara Paduano Group
SEA	Strategic Environmental Assessment
TIPHA	Turtle Islands Heritage Protected Area
TNA	Training Needs Assessment
TWG	Technical Working Group
USC	University of San Carlos
UN	United Nations
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UP	University of the Philippines
USAID	United States Agency for International Development
WB	World Bank
WDPA	World Database on Protected Areas
WQMA	Water Quality Management Area

ii. List of Tables

iii. List of Figures

iv. List of Annexes

v. Executive Summary

The Philippine Biodiversity Strategy and Action Plan (PBSAP) is the country's roadmap to conserve its biodiversity and achieve its vision - *"By 2028, biodiversity is restored and rehabilitated, valued, effectively managed and secured, maintaining ecosystem services to sustain healthy, resilient Filipino communities and delivering benefits to all."*

The PBSAP covers seven major chapters with Chapter 1 providing an overview on the status and trends of Philippine biodiversity. In this chapter, the country's biodiversity and its corresponding ecosystem services, the economic gains derived from conserving biodiversity and its impact on Philippine development are all discussed. The four main ecosystems are also introduced: forest, inland wetlands, caves and cave systems and coastal and marine, with infographics featuring quick facts for each of the ecosystems. These are supplemented with stories on major initiatives to demonstrate best practices. The marine and terrestrial species were also discussed in this chapter including newly discovered species. The urban and agricultural biodiversity which are two additional themes included involves water and solid waste issues as well as food security and genetic diversity of crops, livestock and poultry. Other crosscutting concerns on invasive alien species (IAS), Philippine experience in Reducing Emissions from Deforestation and Forest Degradation + (REDD), key biodiversity areas (KBA), Protected Areas (PA) and land use are also part of this chapter.

Chapter 2 describes how the PBSAP is anchored in the Philippine Development Plan (PDP). While the PDP adopts the framework for inclusive growth, the PBSAP articulates the same direction of pursuing economic growth while protecting the environment. This emphasizes that people are at the core of conservation, protection and rehabilitation, and developmental initiatives.

Chapter 3 focuses on the policy, governance and financing of biodiversity in the Philippines with key environmental laws, technical agencies with resource management functions and programs on biodiversity and the country's commitments to international conventions.

Chapter 4 deals with the principal pressures of biodiversity loss - habitat loss and degradation, overexploitation, pollution, climate change and IAS – that were captured from series of regional and national consultations which were later analyzed by experts using mind mapping that subsequently classified the direct and indirect pressures.

Chapter 5 examines how the current PBSAP was formulated, the regional and national consultations for PBSAP updating process and the Project Steering Committee behind this. The gaps in the previous PBSAP iterations are also discussed in this chapter.

Chapter 6 identifies the Biodiversity Strategy and Action Plan with nine priority strategies developed from the regional and national consultations. These actions are translated into national targets with respective indicators that conform to the global Aichi Biodiversity Targets (see Annex 1). These are a set of 20, time-bound, measureable targets agreed by the Parties to the CBD in Nagoya, Japan, in October 2010, that are now being translated into revised national strategies and action plans by the 193 Parties to the Convention. Achievement of the targets will contribute to reducing, and eventually halting, the loss of biodiversity at a global level by the middle of the twenty-first century.

Chapter 7 discusses the implementation needs of the PBSAP and the learning from previous PBSAP implementation. This chapter also provides recommendations on the coordination management, implementation planning at the agency levels, peer support networks and individual local government units (LGU). This also covers the program assessment and knowledge management including monitoring and reporting, capacity building support to implementation and highlights on emerging good practices.

vi. Introduction

The Philippines started formulating its NBSAP in 1994 with the preparation of the Philippine Strategy for the CBD. In 1995, the Philippines undertook an assessment of the country's biodiversity through the United Nations Environment Programme (UNEP) - assisted Philippine Biodiversity Country Study. As a result, the first NBSAP was developed and published in 1997. This identified six strategic actions based on the comprehensive assessment of the status of the Philippine biodiversity, principal problems, threats, issues, and gaps confronting biodiversity conservation.

Five years later, in 2002, a review of the NBSAP was undertaken that identified 206 conservation priority areas and species conservation priorities, collectively known as the Philippine Biodiversity Conservation Priorities (PBCP), which is considered the second NBSAP revision and incorporates six major strategies and immediate actions. Finally, the PBCP was reinforced in 2006 with 228 KBAs identified covering an estimated 10,560,000 hectares (ha).

The Philippines has submitted five national reports to the CBD, the preparation of which was through a consultative process across the country. This assessed the progress towards meeting the 2010 biodiversity target of achieving a significant reduction in the current rate of biodiversity loss at the global, regional and national levels, consistent with the strategic plan of the CBD.

Among the major achievements toward the 2020 Aichi Biodiversity Targets is the extension of the terrestrial protected areas (PA) network from 8.5 percent in 1992 to 12.8 percent of the total land area in 2008 (2007 Millennium Development Goals [MDG] report), along with 1,169 marine protected areas[1] (MPA) in the form of reserves, sanctuaries and parks, and improvement in management effectiveness of these sites, which rose from 10-15 percent in 2000 to 20-30 percent in 2007. In addition, threatened flora and fauna were given further protection through various species conservation programs and executive and administrative issuances (with positive trends recorded for marine turtles and mangroves); the number of confiscations of illegally traded wildlife species regulated under the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) increased from 513 heads in 2005 to 11,124 heads in 2011[2]; measures such as fish farming and ecotourism in PAs are being implemented to promote sustainable use and benefits for local livelihoods; indigenous knowledge and the practices of 16 tribes were documented by the National Commission on Indigenous Peoples (NCIP) between 2005 and 2008 and policy-making and access and benefit-sharing have been institutionalized through the process of free and prior informed consent (FPIC) from indigenous and local communities.

The national implementation of the first and second NBSAP relied on governance mechanisms for resource use and management of natural resources. An example is Presidential Memo Order 289 issued in 1995, directing the integration of the NBSAP, as was Executive Order (EO) 578 (2006) as a national policy on biodiversity and directing all concerned government agencies and offices and LGUs to integrate and mainstream the protection, conservation and sustainable use of biodiversity into their policies, rules and regulations, programs and development planning processes.

Since then, several initiatives have been launched, notably in terms of integrated watershed management. Moreover, EO 533 (2006) mandated the adoption of integrated coastal management (ICM), with a recent review indicating that significant resources had been invested into ICM, with the participation of various stakeholders,

[1] Aliño P. M., Cunanan P. M. Q., Juinio-Meñez M. A., et al. (2011) Lessons from the Philippines: achieving synergies through marine protected area networks, Philippine Environmental Governance Project (EcoGov), 1–35.

[2] Convention on Biological Diversity (Accessed on 20 July 2014) *Philippines Country Profile: Actions taken to achieve the 2020 Aichi Biodiversity Targets*. Retrieved from http://www.cbd.int/countries/profile/default.shtml?country=ph

and that several concerns were taken into account, ranging from poverty alleviation to food security and sustainable development.

Finally, enhanced cooperation on biodiversity management is promoted through the formalization of partnerships, either through EOs, as in the case of the Bicol River Basin and the Watershed Management Councils in Lake Lanao and Bukidnon Watershed, or through a Memorandum of Agreement (MOA) or Understanding, such as in the case of the Kabulnan Watershed Multi Sectoral Council. Under said councils, multi-sectoral and multi-disciplinary task forces, committees, and technical working groups (TWG) are organized to address specific policy decisions or implementation problems or issues, either at the local, provincial or regional level, depending on the extent of coverage of the river basin and watershed. However, both the first NBSAP and its second iteration lacked specific targets and a mechanism that defines tasks, sources of funds, institutional arrangements, indicators for monitoring, and monitoring schemes.

Several biodiversity monitoring tools have been developed but sustaining the effort remains a challenge, especially after donor exit. In 1999, the Protected Area Management Board (PAMB) introduced the Biodiversity Monitoring System (BMS) as a tool to collect data on priority species and resource use and to guide decision-making. This was institutionalized through policy. For a time, monitoring efforts yielded promising results and resulted in management interventions. In some PAs, the BMS was sustained through local efforts but, in general, monitoring ceased due to lack of funds.

To address the need for updating the NBSAP and to comply with the commitments to the CBD, the current NBSAP updating process is implemented by a Project Steering Committee composed of a Department of Environment and Natural Resources (DENR) Undersecretary as Chair, a National Economic and Development Authority (NEDA) Deputy Director General as the Co-Chair and representatives from the United Nations Development Programme (UNDP), Department of Social Work and Development (DSWD), Department of Budget and Management (DBM), Department of Agriculture –Bureau of Fisheries and Aquatic Resources (DA-BFAR), Climate Change Commission (CCC), NCIP, Haribon, DENR-Biodiversity Management Bureau (BMB), DENR-Forest Management Bureau (FMB), DENR-Mines and Geosciences Bureau (MGB), DENR-Policy and Planning Service Office (PPSO), DENR-Foreign-Assisted and Special Projects Office (FASPO) as members. A key contributor of policy and technical inputs within the PBSAP Project Steering Committee representing indigenous communities roles and traditional knowledge in biodiversity planning is the NCIP.

The process builds on the current status and achievements of the Philippines with respect to biodiversity planning and reporting. Through a renewed and participative 'biodiversity planning' and strategizing process which involved six regional and national consultations and multiple focus group discussions (FGD), it aims to integrate the Philippines' obligations under the CBD into its national development and sectoral planning frameworks.

This third iteration of NBSAP recognizes measurable targets for biodiversity conservation and sustainable use. Gender concerns have been integrated into the content of this plan. Apart from the updated PBSAP, separate action plans will be prepared on raising awareness on biological diversity, implementing the Programme of Work on Protected Areas, preventing extinctions of globally and nationally threatened species, strengthening ecosystem resilience and the contribution of biodiversity to carbon stocks, mobilizing resources necessary to accomplish each target or action and a framework agreement among key institutions on information sharing that contribute to national reporting and monitoring of the status of Philippine biodiversity.

The PBSAP also identifies the need for ecosystem approach in biodiversity management where appropriate implementation activities are adapted with local, national, and, as appropriate, regional conditions. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems. This balances the values of conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. Acknowledging that management should be decentralized to the lowest

appropriate level, adaptive responses to uncertainties containing elements of "learning-by-doing" or research feedback are needed. This document has also considered all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.

The PBSAP included five additional themes as part of the action plan scope: agrobiodiversity, urban biodiversity, access and benefit-sharing (ABS), IAS, and PAs. The CBD defines agrobiodiversity as all of the components of biological diversity relevant to food and agriculture, including agricultural ecosystems. It therefore encompasses the variety and variability of animals, plants and microorganisms at the genetic, species and ecosystem levels that are necessary to sustain agricultural production. By including urban biodiversity, this document presents the essential role of national and local government to protect urban biodiversity through management and restoration of public open space areas and corridors, improvement of waterways and wastewater management. The gains from the implementation of these are useful to identify areas of protective measures. The fair and equitable sharing of the benefits arising out of the utilization of genetic resources is one of the three objectives of the CBD. It aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable way, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies. As one of the pressures of biodiversity loss, there is cognizance of the urgent need to address the impact of IAS and as far as possible and as appropriate, prevent their introduction and control or eradicate those alien species which threaten ecosystems, habitats or species. PAs are identified portions of land and/or water set aside by reason of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploration. The establishment and management of PAs are part of the international commitments signed by the Philippine Government such as the CBD, Ramsar Convention, World Heritage Convention, Convention on Migratory Species (CMS), and the ASEAN Agreement on the Conservation of Nature and Natural Resources.

Chapter 1. Philippine Biodiversity: Overview of Status and Trends

More than 7,100 islands fall within the borders of the Philippines hotspot, identified as one of the world's biologically richest countries. The country's terrestrial and marine habitats contain some of the richest bio diversities of flora and fauna, and its waters are considered a part of the Coral Triangle. Despite of these, the Philippines ranks among the top ten globally with the largest number of species threatened with extinction (CI, 2013).

Over a hundred ethno-linguistic groups comprise the ancestry of the Philippines, mirroring to a great extent the precious biological and ecological variety that the country's 7,000-strong islands boast. Also like the diverse flora and fauna of the archipelago, indigenous peoples (IP) and cultural communities make their home in different ecological territories, from the coasts to the highlands.

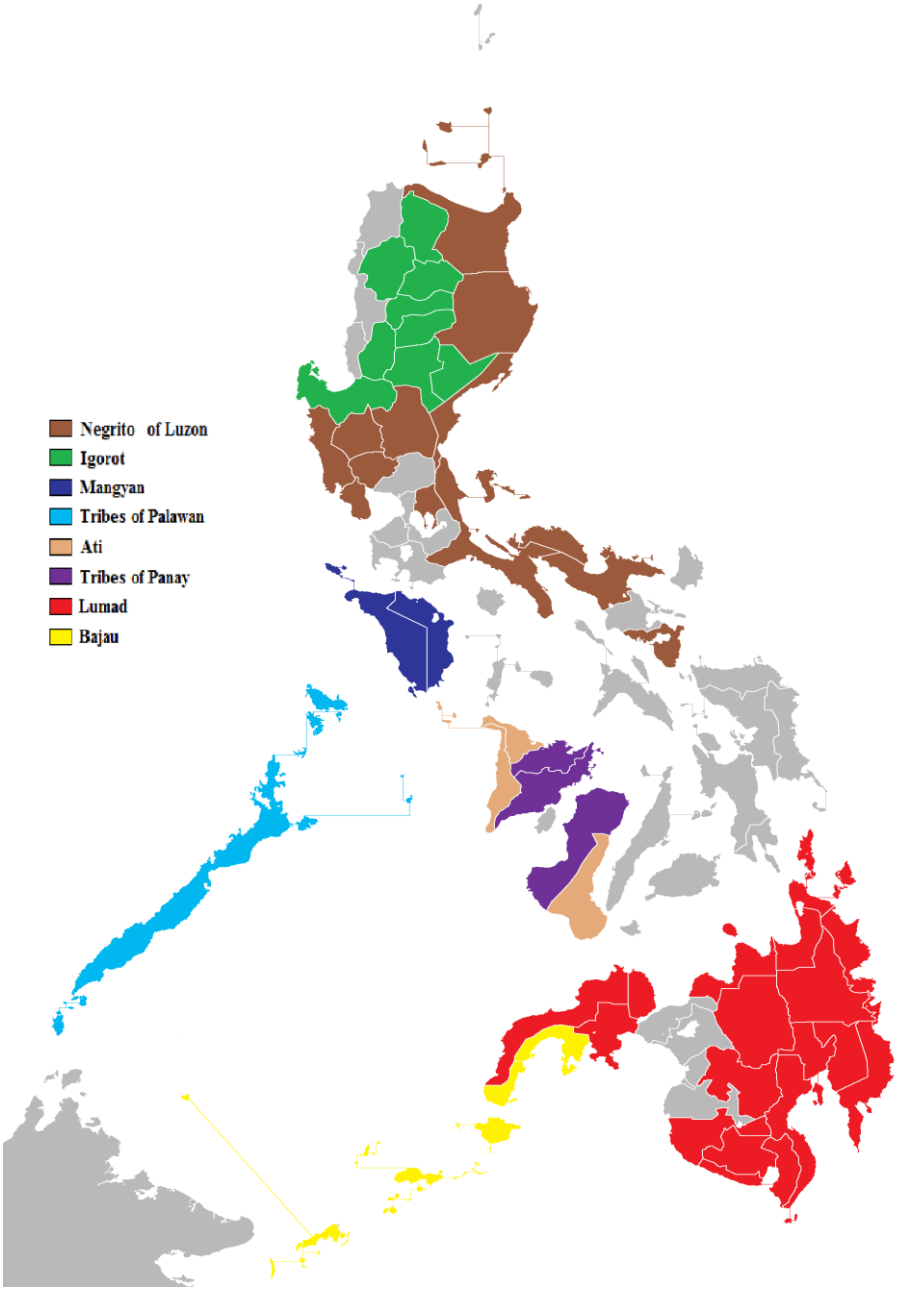


Figure 1. Territorial distribution of the major ethnographic classifications of Philippine indigenous peoples

Source: Foundation for the Philippine Environment or FPE (2014) Indigenous Peoples and Community-Conserved Areas

To some indigenous communities, some biological resources or sites are sacred and a source of cultural identity. The cultures and survival of indigenous cultural communities (ICC)/ IP and local communities traditionally depend on the natural environment. Over the years, they have applied traditional knowledge and means in using and conserving nature's resources. Member governments to the United Nations (UN) CBD are compelled to respect and preserve such knowledge and practices, to promote their wider application with the approval of the communities, and to ensure that these communities share in the benefits derived from their use.

The FPIC Guidelines of 2012 (NCIP Administrative Order [AO] No. 03) ensures fair and equitable sharing of benefits between the community and the proponent whenever a project or program is introduced in an ancestral domain area. As of 2007, NCIP records show that ICCs/IPs have benefited from royalties, infrastructure development and social programs generated by 199 projects such as mining, mini-hydro/dam, forestry, small scale sand and gravel, and biodiversity research (NCIP, 2007).

Out of the 101 terrestrial KBAs of the Philippines, approximately 96 of these sites are part of the ancestral land and/ or domains of IPs. In these areas, there are many ancestral domains and ancestral lands claims of IPs. Some of these claims have been granted ancestral domain/land certificates/ titles.

The Indigenous Peoples Rights Act (IPRA) provides IPs with a legal mandate to utilize and manage resources within their ancestral lands and domains. It also provides IPs with an opportunity to forge partnerships with the government in programs and projects on natural resources management, particularly in areas within their ancestral domains.

Please refer to Annex 2.1 for the School of Living Traditions among Talaandig in Lantapan, Bukidnon. The School of Living Traditions is one where a living master/culture bearer or culture specialist imparts to a group of people from the same ethno-linguistic community the skills and techniques of doing a traditional art of craft. The mode of teaching is usually non-formal, oral, and with practical demonstrations. The site may be the house of the living master, a community social hall, or a center constructed for the purpose (NCCA, 2015).

A. Overview of Philippine Biodiversity

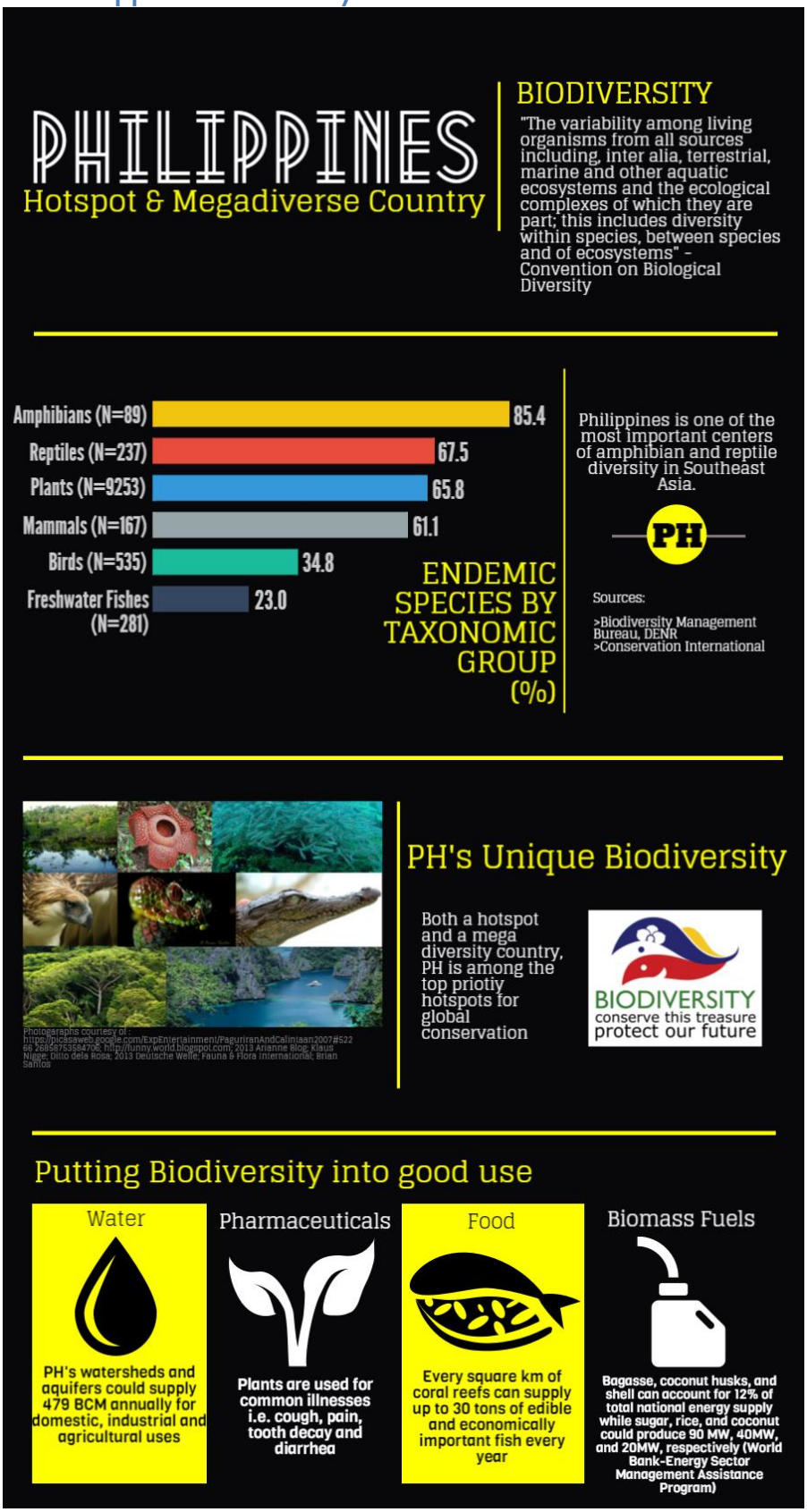


Figure 2. Infographic on Philippine biodiversity

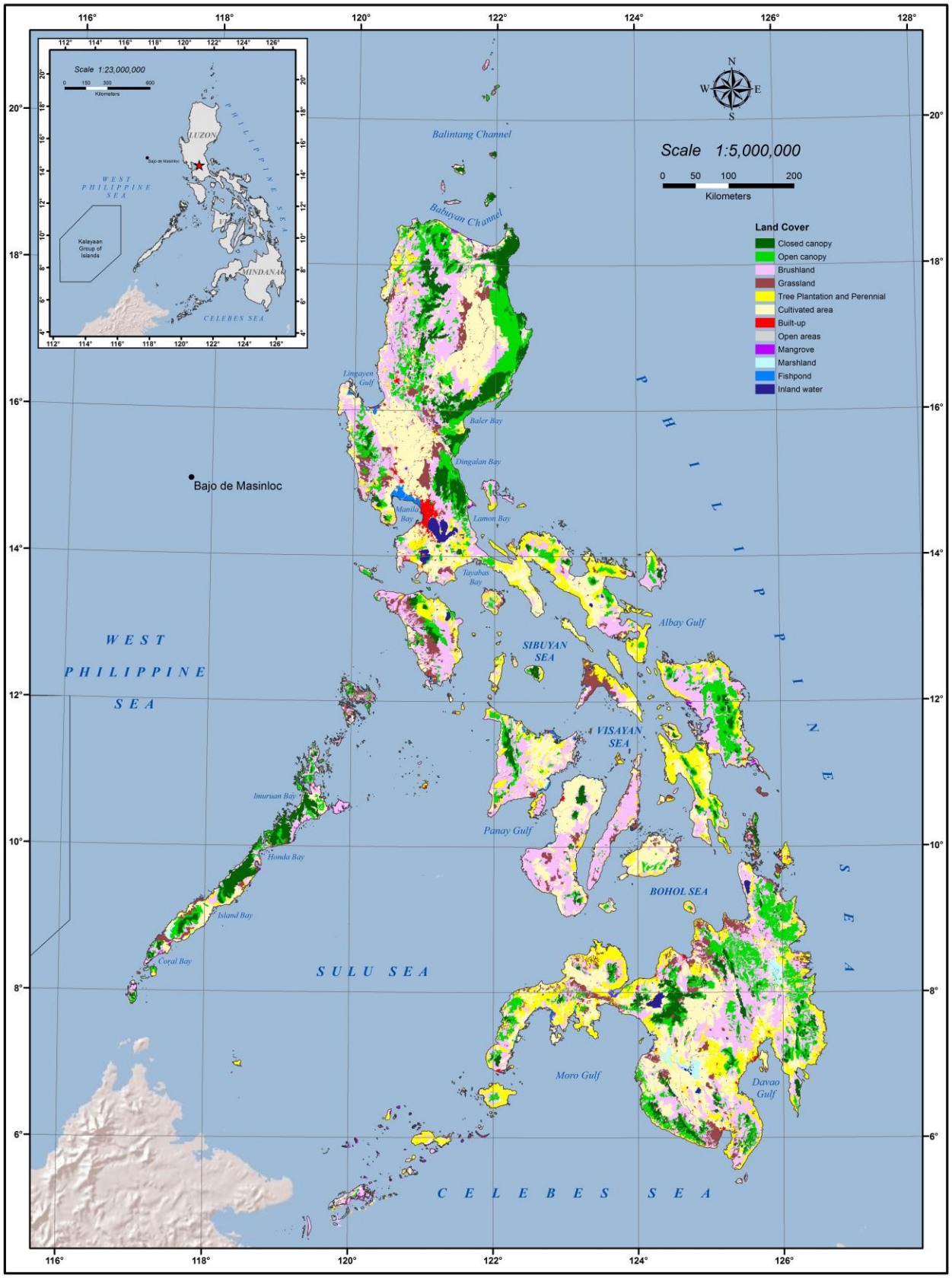


Figure 3. Land cover map: Philippines, 2003

Data source: Land cover - National Mapping and Resource Information Authority (NAMRIA)

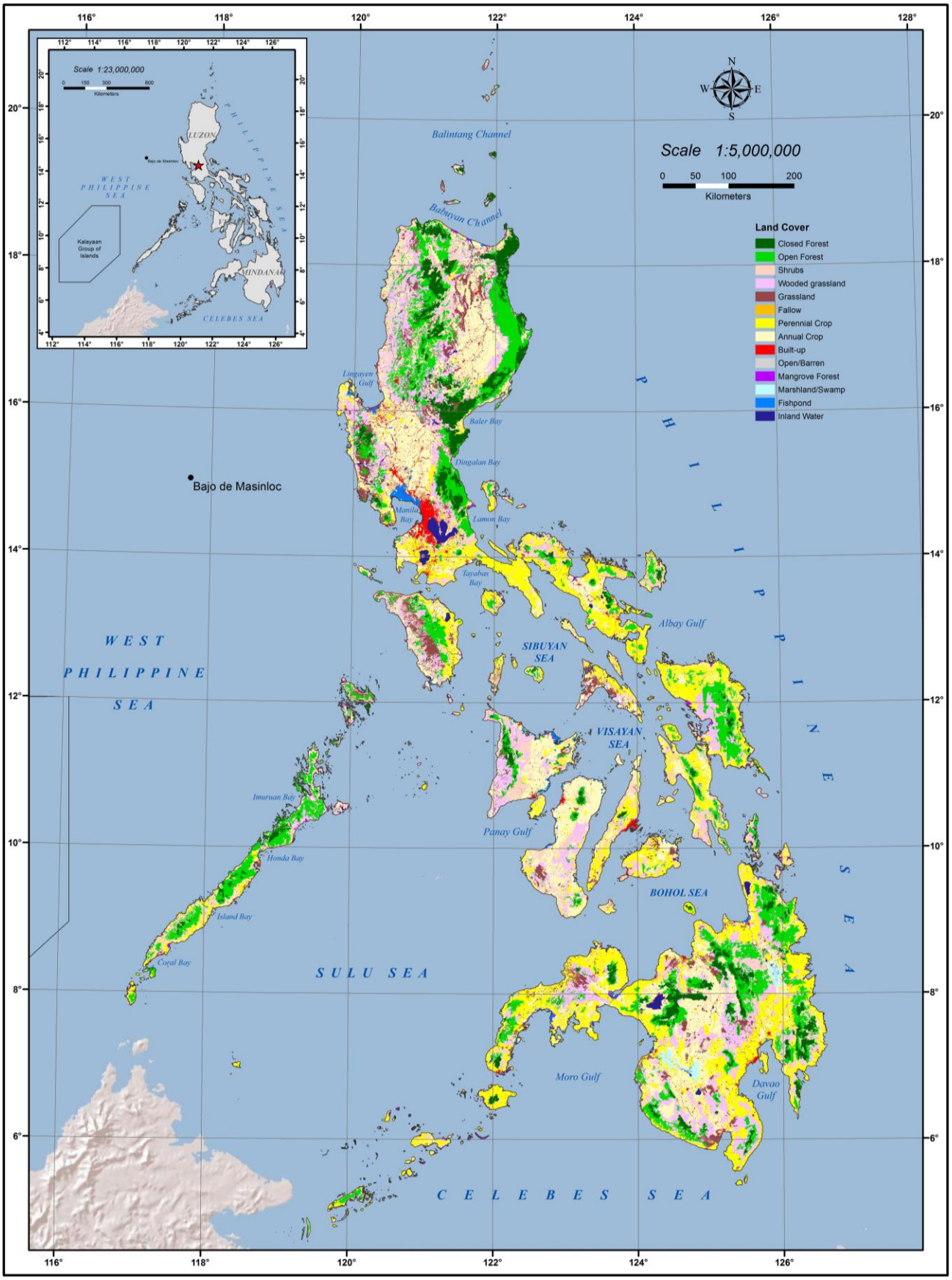


Figure 4. Land cover map: Philippines, 2010

Data source: Land cover - National Mapping and Resource Information Authority (NAMRIA)

1. Biodiversity and Ecosystem Services

Why Biodiversity Matters to Philippine Development?

The Philippines has a population of 100 million, with a poverty rate of nearly 25 percent. Biodiversity and ecosystems are key to lifting people out of poverty, contributing to our economy, and strengthening our resilience to climate change. Over the decades, Philippines has experienced rapid environmental degradation. Between 1934 and 1990, the country lost 10.9 million ha of forest cover or an average annual loss of 194,000 ha. Of this area, 10.37 million ha or 95 percent were converted to other uses while 0.52 million ha were damaged by logging. Over the last 100 years, the deforestation rates have fluctuated with an average of about 150,000 ha per year (Rebugio, Cruz, Carandang, Tolentino, de la Cruz, Lasco, Visco, Dizon, Pulhin, Dalmacio, Bantayana, Calderon & Camacho, 2005). Figures 3 and 4 show the land use cover change between 2003 and 2010.

On the other hand, fisher overcapacity has resulted in major overexploitation of Philippine reef fisheries. Demersal fish stocks are biologically and economically overfished in almost all areas other than Eastern Luzon, Palawan, and the Southern Sulu Sea (BFAR, n.d.) Studies show an increasing trend in the poor conditions of the Philippine reef. From four percent of Philippine reef in excellent condition in 1997, it went down to 2 percent in 2010 to less than one percent of Philippine reef in excellent condition (Magdaong, Yamano, and Fujii, 2012). The Visayas have experienced the most significant decline in coral cover exhibiting an average of only 11 percent hard coral cover (BFAR, n.d.)

The ability of policy makers to address the key challenge of reducing poverty in the country is dependent on building the capacity to appropriately manage and conserve ecosystems and the services they provide. The opportunities for integrating economic values of ecosystem services into the country's national plans such as the PDP, national accounting, comprehensive land use plans (CLUP), sustainable resource use and protection plans impact not only on ecosystems, but above all on people. These plans are likely to affect people's access to ecosystem services, the governance context in which they live, the ways in which they create and sustain livelihoods for themselves and their families, and on the options open to them and the choices they can make about the future.

The Philippines derives services from biodiversity which include:

a. Water

There are 421 principal river basins, 19 of which are considered major with each draining watersheds of at least 140,000 ha. This is aside from the thousands of small coastal basins with their own outlets to the sea. There are 59 freshwater lakes, including some of Southeast Asia's biggest. Groundwater resources are substantial along these rivers and lakes. Proven deposits alone are in the order of 50 billion cubic meters (BCM) and covers 5,000,000 ha. These water resources can supply 479 BCM to the country annually (6,000 m^3 per person) or seventeen times what is being actually used (Coulby, 2009).

b. Food

- Root crops, which include cassava, sweet potato, taro, yam, yam bean, arrowroot are promoted by the Philippine Root Crop Research and Training Center, a government research, development and training institution responsible for planning, implementing, coordinating, monitoring and evaluating research and development/extension programs in support to the rootcrop industry.
- Fish is second most important staple food of Filipinos. Every square kilometer (km) of coral reefs can supply up to 30 tons of edible and economically important fish every year (Alcala, 1988). Fifteen percent of the fisheries production in the country came from inland waters (BFAR, 2011).
- Philippine mangroves can produce about US$538 worth of fish/ha/year (Primavera, 2000).

c. Pharmaceuticals

The National Integrated Research Program for Medicinal Plants found solutions to the most common problems such as cough (*lagundi [Vitex negundo]*), pain (*yerba buena [Clinopodium douglasii*), renal stones (*sambong [Blumea balsamifera]*), diarrhea (*bayabas [Psidium guajava]*), intestinal worms (*niyog-niyogan [Quisqualis indica]*), high blood pressure (*bawang [Allium sativum]*), high blood sugar (*ampalaya [Momordica charantia]*), fungal infections (*akapulko [Cassia alata]*), tooth decay (*tsaang gubat [Carmona retusa]*) and arthritis and gout (*ulasimang bato or pansit-pansitan [Peperomia pellucida Linn.]*). Eighty three (83) plants have already passed rapid-screening tests and are awaiting more exhaustive chemical and clinical examination. The Philippine Institute of Traditional and Alternative Health Care, created under the Traditional and Alternative Medicine Act or Republic Act (RA) 8423, promotes additional lists of pharmaceuticals, cosmeceuticals and nutraceuticals in the country.

d. Biomass Fuels

The resources available in the Philippines can generate biomass projects with a potential capacity of around 200 megawatts (MW) (Zafar, 2015).

e. Carbon Sequestration and Climate Regulation

- A 2005 study by the World Bank (WB) and National Disaster Coordinating Councilof the Philippines reported that the country's vulnerability to natural hazards cost the government an average of US$338 million annually in direct damages, or more than 0.5 percent of gross domestic product (GDP).
- The sampling for the study to estimate the carbon storage of the Caimpugan peatland was done in the peat forest from May 24-28, 2010. In Tall Pole Forest, Intermediate Forest, and the Pygmy Forests in two locations in the peatland, the aboveground carbon stocks were measured in standing trees, understorey, herbaceous vegetation, and litter. With the assumption that the three vegetation zones sampled in this study were similar in other portions of the peatland, the 5,487-ha Caimpugan peatland was estimated to store 22.9 M tons of carbon. The Caimpugan peatdome was found to be a substantial and space efficient carbon store compared to other forest types in the country. Considering its role as a significant carbon sink, stringent measures must be done to protect and conserve these areas (Alibo & Lasco, 2012)[3].

f. Crop pollination - Economic value of insect pollination in the Philippines is valued at US$710 million for 2009 as assessed by the Food and Agriculture Organization or FAO (Ngo, Gemmill-Herren, & Packer, 2012).

g. Cultural, Intellectual and Spiritual Inspiration – Scientists and researchers benefit from the use of natural sites for scientific research on the natural world, education and development of technology. Increasing numbers of Filipinos have been finding peace and spiritual enhancement from nature. Nature based tourism, a fast-growing industry, provides economic and social benefits through recreation, leisure and education (Sinha & Heaney, 2005). DENR AO 2013-19 defines ecotourism as a "form of sustainable tourism within a natural and cultural heritage area where community participation, protection and management of natural resources culture and indigenous knowledge and practices, environmental education and ethics as well as economic benefits are fostered and pursued for the enrichment of host communities and satisfaction of visitors".

[3] Journal of Environmental Science and Management, Carbon Storage of Caimpugan Peatland in Agusan Marsh, Philippines and its Role in Greenhouse Gas Mitigation, Van Leeah B. Alibo and Rodel D. Lasco, December 2012

2. Economic Benefits from Philippine Biodiversity

a. Agriculture and fisheries contributed an average of 18.4 percent to GDP and the sector grew at an average rate of 2.6 percent annually. (PDP 2010-2016). See Table 1 and Figure 5.
b. Agriculture employed an average of 11.8 million people. These account for almost 35.1 percent of the total work force (NEDA, 2011)
c. Between 2004 and 2010, agriculture and fisheries sector exports rose from US$2.5 billion to US$4.1 billion. The top agricultural exports, in terms of value are coconut oil, fresh banana, tuna, pineapple, tobacco, and seaweeds (NEDA, 2011)

Table 1. Fishing Grounds in the Philippines

Commercial	Municipal
West Palawan waters	Visayan Sea
South Sulu Sea	Bohol Sea
Visayan Sea	East Sulu
Moro Gulf	Moro Gulf
Lamon Bay	Guimaras Strait
Bohol Sea	South Sulu Sea
East Sulu Sea	West Palawan waters
Samar Sea	Lamon Bay
Guimaras Strait	Leyte Gulf
Manila Bay	Samar Sea
Tayabas Bay	Davao Gulf
Sibuyan Bay	Cuyo Pass
	Tayabas Bay

Source: FAO, 2000

d. Ecotourism - In 2010, foreign tourists - 3 million arrivals in 2009 - spent an average of US$83.93 per day and stayed an average of eight nights during their visit (NEDA, 2011). Domestic tourism is also rising with an estimated 25.7 million Filipinos (15 years old and above) who had traveled to any place within the country from April to September 2012 based on 2012 Household Survey on Domestic Visitors by the National Statistics Office (NSO). Table 2 lists the ecotourism sites in the Philippines, which are presented in Figure 6 along with the above and below-ground biomass carbon discussed in section 1E of this Chapter.

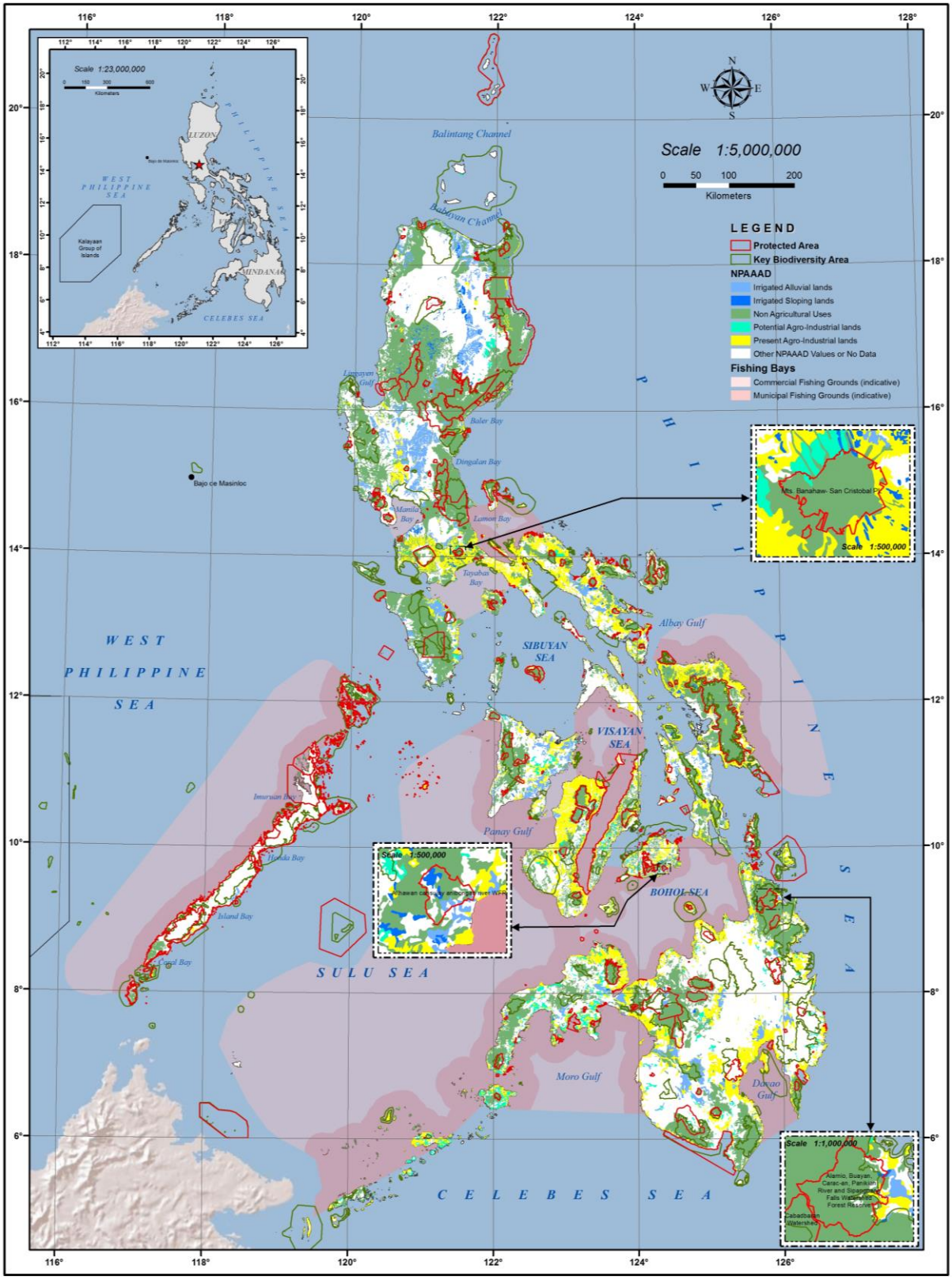


Figure 5. Protected areas, fishing grounds and network of protected areas for agricultural and agro-Industrial development in the Philippines

Data sources: Fishing grounds- FAO; NPAAAD- Bureau of Soils and Water Management (BSWM) - Department of Agriculture; and BMB-DENR

Table 2. Tourism Development Areas

No.	Name of TDA	No.	Name of TDA
1	Batanes Island	40	Boracay Island-Northern Antique-Kalibo
2	Babuyan Island	41	Capiz
3	Cagayan Coast	42	Northern Cebu-Bantayan- Malapascua
4	Laoag-Pagudpud	43	Metro Cebu-Mactan-Olango Island
5	Vigan	44	Southern Cebu
6	Tuguegarao-Tabuk	45	Negros Oriental-Dumaguete- Siquijor
7	Ilagan & Isabela Coast	46	Tagbilaran-Panglao
8	Quirino	47	Northeastern Leyte-Basey-Marabut
9	Central Cordillera	48	Northeastern Leyte-Biliran
10	Benguet-Baguio-Mt. Province	49	Southern Leyte
11	Nueva Vizcaya	50	Western Samar
12	La Union Coast	51	Eastern Samar
13	Western Pangasinan Loop	52	Northern Samar
14	East Pangasinan Circuit	53	Dinagat-Siargao Islands
15	Lingayen Coast & Islands	54	Surigao City-Lake Mainit
16	Subic-Clark-Tarlac Corridor	55	Butuan City-Cabadbaran
17	Nueva Ecija	56	Agusan Marsh
18	Pampanga	57	Agusan Sur-Hinatuan
19	Bulacan	58	Agusan Sur-Bislig
20	Zambales Coast	59	Camiguin Island
21	Bataan Coast and Inland	60	Cagayan de Oro-Misamis Oriental Coast
22	Aurora	61	Iligan City/Lanao del Norte
23	Metro Manila & Environs	62	Misamis Occidental Coast (Tangub Bay/Ozamis-Oroquieta)
24	Nasugbu-Looc-Ternate-Cavite Coast	63	Bukidnon
25	Laguna de Bay	64	Zamboanga Sibugay
26	Batangas Peninsula	65	Zamboanga City-Sta Cruz- Isabela
27	Quezon Coast & Islands	66	Pagadian City-Zamboanga Del Sur
28	Camarines & Catanduanes	67	Dapitan
29	Albay-Sorsogon-Masbate	68	Dipolog
30	Marinduque Island	69	Davao City-Samal Island-Davao Del Norte
31	Romblon Island	70	Davao Del Sur
32	Puerto Galera	71	Compostella Valley – Davao Oriental
33	Southwest Mindoro Coast	72	Cotabato Province – Mt. Apo
34	San Vicente-El Nido-Taytay	73	South Cotabato – Lake Sebu
35	Puerto Princesa	74	Sultan Kudarat
36	Southern Palawan	75	General Santos – Sarangani
37	Busuanga-Coron-Culion Islands	76	Cotabato City
38	Metro Iloilo-Guimaras	77	Lanao Del Sur - Maguindanao
39	Bacolod-Silay	78	Basilan - Tawi Tawi – Jolo

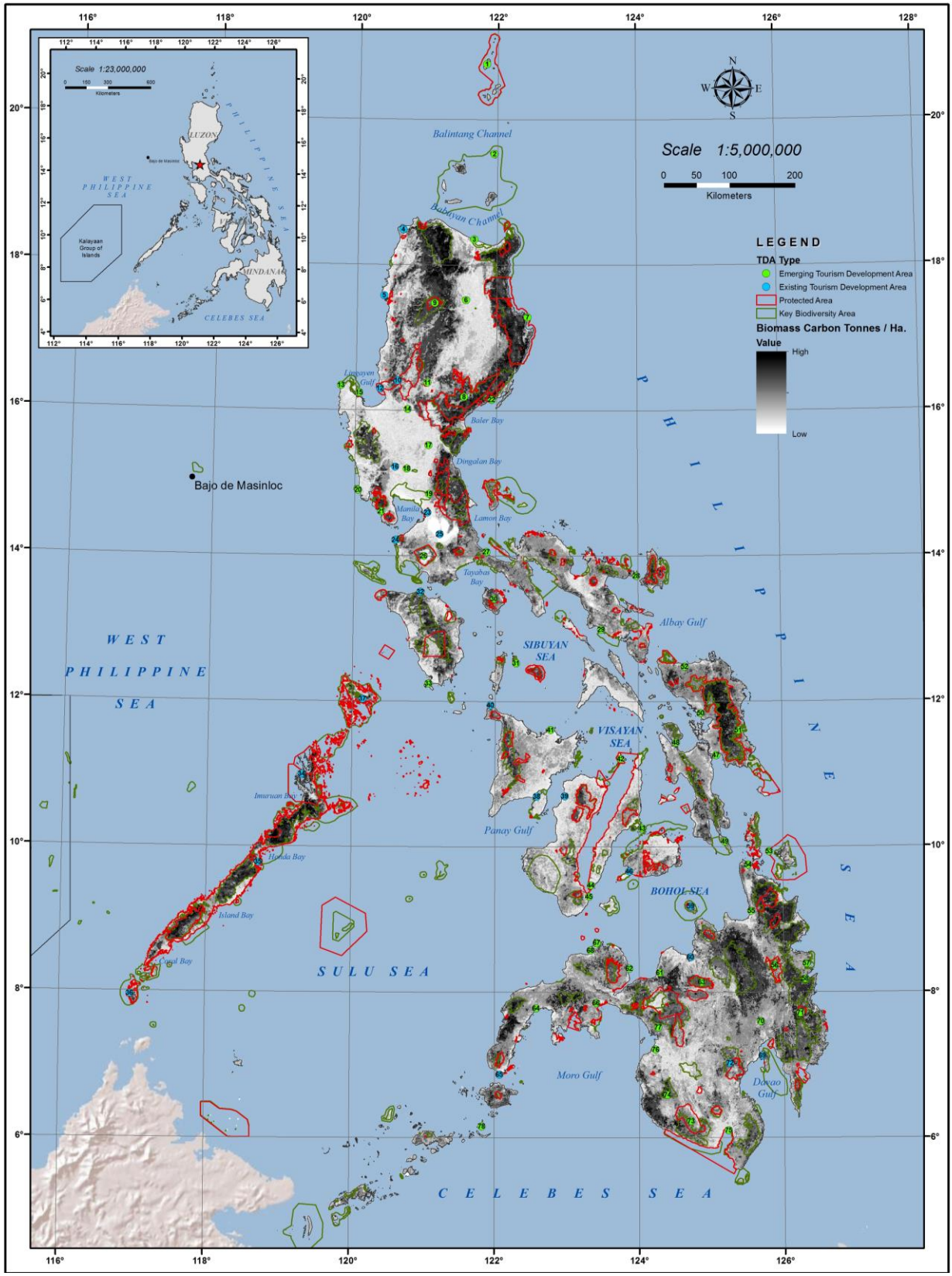


Figure 6. Protected areas, ecotourism sites, and biomass carbon (above and below-ground) in the Philippines[4]

Data sources: TDAs - Department of Tourism's National Tourism Development Plan 2011-2016;
PAs – BMB-DENR; Carbon stocks – Saatchi et al., 2011 as cited in Osti et al., 2014

[4] Refer to Table 2 for the name of ecotourism areas

Valuing ecosystem services provision, use and flow

Combining information on the biophysical mechanisms of ecosystem services provision together with the economic implication of the use of ecosystem services could allow better management and governance (MA, 2005). However, the quantitative understanding of ecosystem service provision and use has not sufficiently evolved to allow the productive use of spatial mapping, economic valuation and related tools to inform accurate decision and policy making (Boyd & Banzhaf, 2007; Wallace, 2007; Turner & Fisher, 2008).

There are many site-specific studies of marine ecosystem services, looking at issues of subsistence fishing, shoreline protection, tourism, and recreation. It remains difficult to combine the values of different sectors, and there are issues around adding up the different ecosystem service values ('stackability') at a single site or type of site. However, creating aggregated bodies of information from multiple sites must be conducted by a range of researchers, across a range of ecosystem types in order to give policy makers some information so that they can begin to include the values of ecosystem services into their decision making.

3. The Continuing Degradation of Philippine Biodiversity

The continuing habitat degradation and forestland conversion are major threats to Philippine biodiversity. These are attributed primarily to the following:

- **Indiscriminate logging** changes the forest landscape. Although there has been a decline in logging activities – due to the combined effects of a ban on logging old growth forests – illegal logging activities persist. Based on the 2010 satellite imageries, the total forest cover of the Philippines is estimated at 6.840 million ha. Of the total forest cover, open forest was accounted with an area of 4.595 million ha (DENR-FMB, 2012).

- **Mining claims and rights overlap with defined areas for PAs, ancestral lands including those planned for conservation areas** that threaten ecological sustainability. The Philippines is a significant producer of gold, copper, nickel and chromite and is also abundant in non-metallic and industrial minerals such as marble, limestone, clay, feldspar and aggregates. Since the Supreme Court upheld key provisions of the Mining Act in 2004, there has been a heavy influx of mining activity and investment; as of 2013, about 339 Mineral Production Sharing Agreements within 602,012 ha had been issued (DENR-MGB, 2013). Since most of the country's priority conservation areas sit on top of huge mineral reserves, many significant biodiversity areas are in conflict with prescribed land uses and management objectives.

- **The burgeoning human population** against a limited land base causes forestland conversion. With the country's annual population growth rate of 1.9 percent from 2000 to 2012 (Philippine Statistics Authority [PSA], 2010), poverty, landlessness and absence of secure tenure rights over secondary forest areas or logged-over areas have become attractive for conversion into agricultural land and settlements.

- **Unsustainable production and consumption** of medicinal and ornamental plants and wild animals for trade and domestic use have contributed to habitat degradation and dramatic reductions in species populations. Among the most highly prized ornamental plants are the jade vine (*Strongylodon macrobotrys*), giant staghorn fern (*Platycerium grande*), waling waling (*Euanthe sanderiana*) and many tree fern species. A significant number of animals, such as the Palawan peacock pheasant (*Polyplectron emphanum*), Philippine cockatoo (*Cacatua haematuropygia*), talking mynah (*Gracula religiosa*), blue naped parrot (*Tanygnathus lucionensis*), and Asian small-clawed otter (*Amblonyx cinereus*), are also overharvested. The exploitation of some by-products of wildlife species also endangers their survival, such as the nests produced by the edible-nest swiftlets (*Collocalia fuciphaga*).

- Narrowing of food base/Simplification of diets or less complex and high energy diets (Frison, Smith et al, 2010) as gleaned from the results of the Philippine National Nutrition survey. Food consumption data from 1978-2003 shows the dietary pattern of Filipinos remains to be comprised of rice, fish and vegetables. Alongside with this, there is a downward trend in the consumption of fruits and vegetables. On the other hand, there is increased consumption of meat, fats and oil, milk and sugars. It is called the nutrition transition (Popkin, 2001). Recent diet diversity studies among Filipino children also reflect simplified diets as diet diversity score results are found below cut-off points (Kennedy et al., 2007; Talavera, Felix and Narciso, 2011). It should be noted low scores indicate unsatisfactory nutrient adequacy (Hoddinott and Yohannes, 2002; Ruel et al., 2004; Steyn et al., 2006). This lack of diet diversity is multi-factorial (i.e. lack of purchasing power, unavailability in the markets, unfamiliarity with certain food items, lack of know-how to prepare/consume them). Nutrition transition, together with intensive agriculture and environmental pressures are also attributed to reduction in dietary diversity and the accompanying loss in agrobiodiversity and associated traditional knowledge (Gold and McBurney, 2010).

- Introductions of invasive alien species have also taken a toll, particularly in wetlands. The following groups have had a particularly negative impact on wetland biodiversity: fish such as the janitor fish (*Pterygoplichthys spp*.), the knifefish, (*Chitala sp*.), giant catfish and black bass; toads and frogs, including the marine toad (*Bufo marinus*), the American bullfrog (*Rana catesbeiana*) and leopard frog (*Rana tigrina*); and aquatic plants like the water hyacinth and water fern. Another IAS that poses destruction to the natural habitat is *Buyo-buyo (Piper aduncum),* a highly aggressive shrub that invades agricultural areas and natural forests.

- Degradation from climate change. Several direct impacts of climate change have been identified, among them: changes in the timing of biological events, changes in species distribution and behavior in plants and animals, and increased frequency and intensity of pests and diseases. Potential impacts include increased vulnerability of species to extinction and potential losses of net productivity of ecosystems.

- Weak capacities on natural resources management. The weakness of institutional and legal capacities can be traced to a basic lack of information on the country's biodiversity and strategic management options. There is still a need to improve awareness and demonstrate the long-term benefits of conservation actions and sustainable management of natural resources. A preference for short-term financial gains over long-term economic and environmental benefits is still driving many local communities, in particular, to engage in illegal and unsustainable harvesting of resources.

- Under-valuation of ecosystem services from natural resources. Economists measure the value of ecosystem services to people by estimating the amount people are willing to pay to preserve or enhance the services. However, this is not always straightforward, for a variety of reasons. While some services of ecosystems, like fish or lumber, are bought and sold in markets, many ecosystem services, like a day of wildlife viewing or a view of the ocean, are not traded in markets. Thus, people do not pay directly for many ecosystem services. Additionally, because people are not familiar with purchasing such goods, their willingness to pay may not be clearly defined.

- Weak integration of biodiversity concerns in landscape planning. The integration of biodiversity concerns in landscape planning and development also remains inadequate resulting in land use plans which are not environmentally sensitive, uncontrolled land development and conversion of fragile uplands and important biodiversity-rich areas into agricultural zones and other uses. LGUs are gradually recognizing this weakness, however, there is a need to promote more widely, the available conservation tools to broaden the impact of such programs. The main governmental response to these threats and their underlying causes has been the establishment of a system of PAs in habitats known to harbor unique and

important biological resources. Other types of conservation tools include critical habitats, indigenous community-conserved areas (ICCA), local conservation areas (LCA) and private reserves[5].

The municipality of Buguey found in the northern province of Cagayan hosts the Buguey wetlands, a KBA. The LGU recently updated its CLUP which recognizes the need to balance environmental protection and development objectives (see Figure 7). The land use maps are the basis of zoning ordinances enacted by LGUs. These ordinances contain specific management prescriptions per land use. In 2014, the Housing and Land Use Regulatory Board (HLURB) has incorporated the mainstreaming of biodiversity in its enhanced CLUP guidelines with the assistance of the BPP, a UNDP-funded project implemented by the BMB.

[5] New Conservation Areas in the Philippines Project primer: Threats to Philippine Biodiversity, DENR, UNDP-GEF, undated

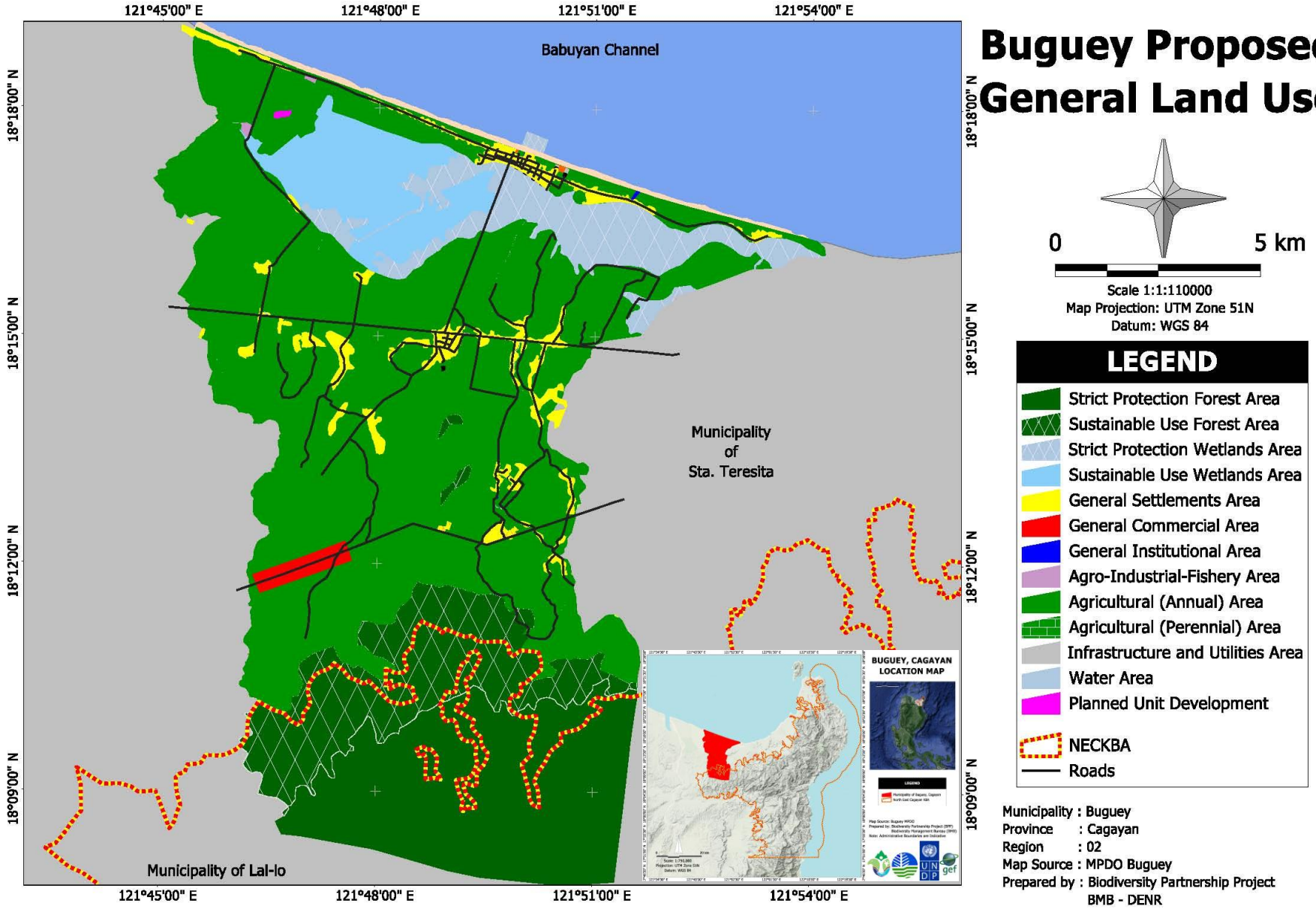


Figure 7. Location and land use map of Buguey
Source: Biodiversity Partnerships Project,
BMB0DENR & UNDP

B. Philippine Ecosystems

1. Forests

According to 2011 FAO data, the forestry sector contributed USD 528.7 million to the economy in 2011, which is appoximately 0.2 percent of the GDP. At least forty-nine thousand people are directly employed by the forestry sector.

The aggregate external trade in all forest goods for 2012 of the Philippines amounted to US$114.229 billion. Of this total, the forest-based products shared US$3.898 billion or 3.41 percent. Plywood; non-timber forest products; pulp and waste paper; and paper and articles of paper and paperboard suffered cutbacks in exportation while all other forest-based products exhibited increments in exportation.

The country has 663 million metric tons of carbon stocks in living forest biomass. The land use change and forestry sequestered 1.3 percent of this country's greenhouse gas emissions in 2011 (Global Forest Watch, n.d.). On February 26, 2011, President Benigno S. Aquino III issued EO 26 ordering and declaring the implementation of the National Greening Program or NGP (NGP, n.d.) as a government priority. The NGP aims to plant 1.5 billion trees covering 1,500,000 ha of public lands by the year 2016 and is the main strategy for reforestation of the Philippine government (see Annex 2.2). Figure 8 shows the accomplished and potential NGP sites (Osti, Thorley, Väänänen, Goodman, Woroniecki, Coroza, De Alban, Rico, Monzon, Liss, Estomata, Uychiaoco, Diaz & Mant, 2014).

The changes of forest cover in the country from 2003 to 2010 (see Figures 3, 4 & 9) provide vital information across all scales of governance, for improved, more holistic management. Such knowledge can help spur international agreements (both regional and global) as well as transboundary cooperation (bilateral and others). Information on the stock changes on forest ecosystem services could promote creation of new sources of conservation and management funds through Payments for Ecosystem Services (PES), providing opportunities for private sector investment to complement public sector management.

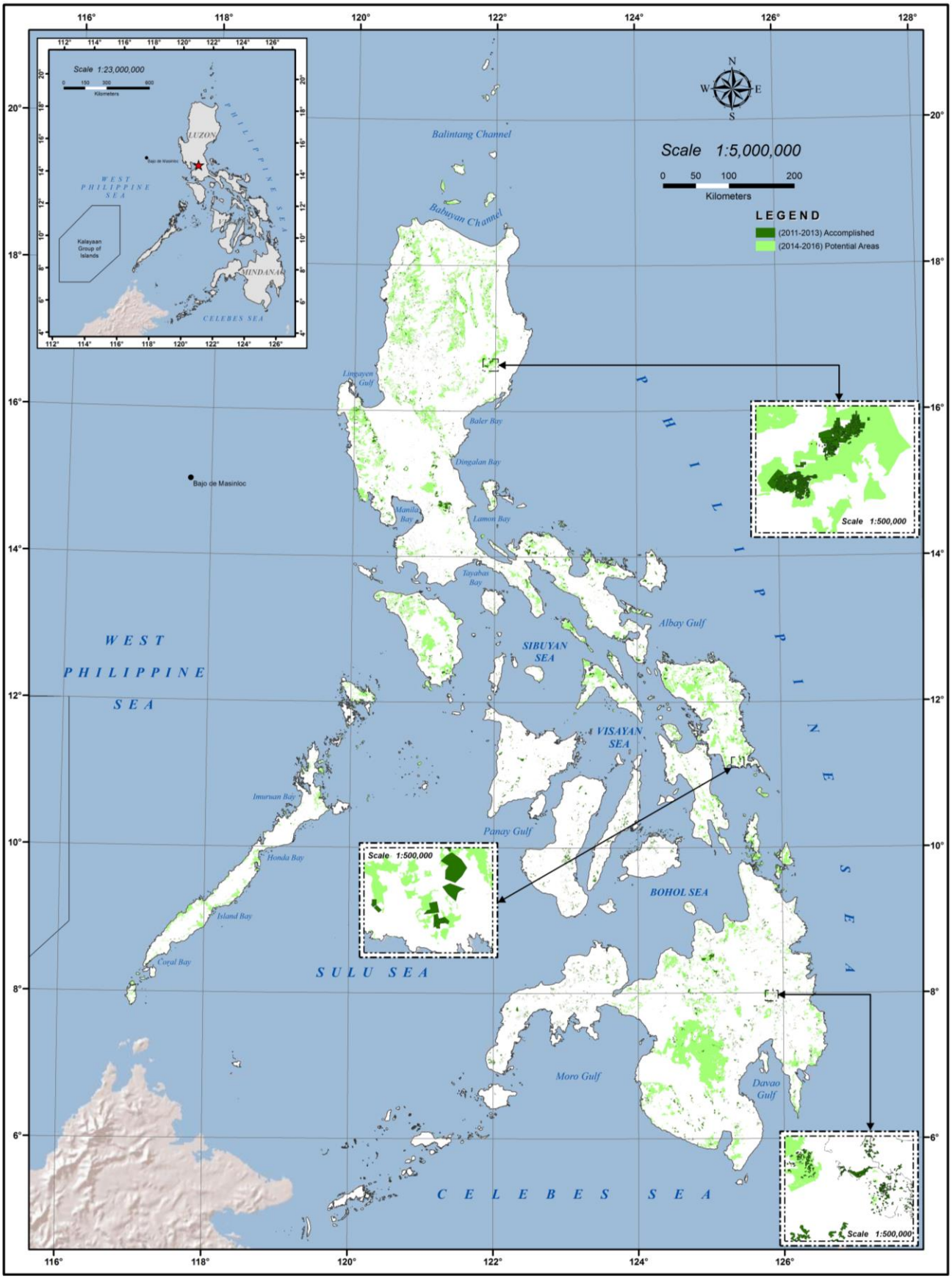


Figure 8. Accomplished and potential National Greening Program sites

Data sources: Accomplished and Potential – FMB DENR as cited in Osti et al., 2014

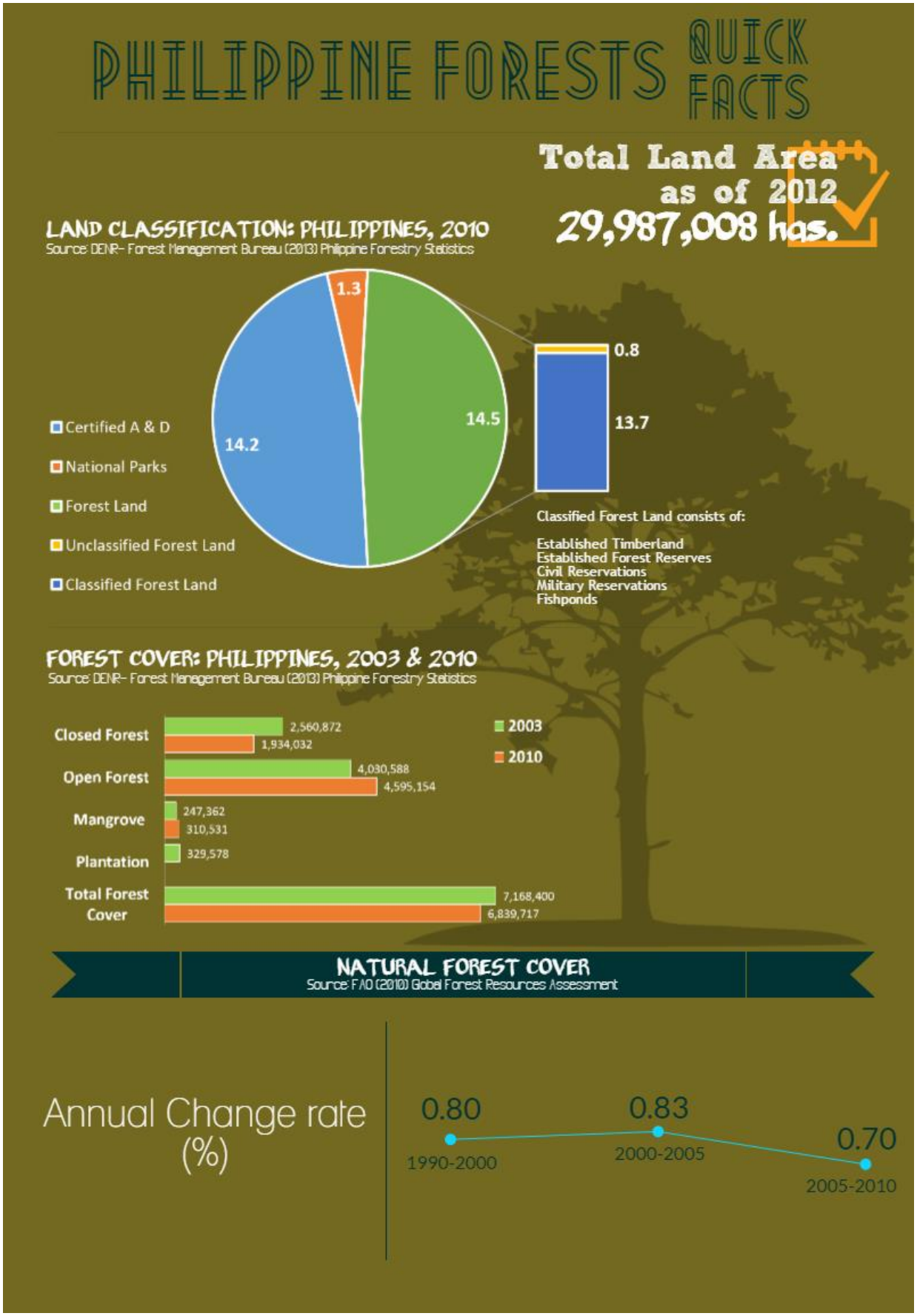


Figure 9. Infographic on Philippine forests

2. Inland Water/Wetlands

Wetlands are areas of marsh, peat swamp or water, whether natural or artificial, permanent or temporary with water that is static, flowing, fresh, brackish or salt, including area of marine water, the depth of which at low tide does not exceed six meters (m). They have three broad categories, namely: 1) inland wetland which includes springs, creeks, rivers, streams, waterfalls, swamps, marshes, ponds, wet caves and lakes; 2) coastal wetland which includes bays, straits, seagrass beds, coral reefs, sand bars, mud, sand or salt flats, mangrove swamps, estuaries, marine shores and saline lagoons; and 3) human-made wetland which includes fish and shrimp ponds, farm ponds, salt pans, dams, small water impounding areas, reservoirs, irrigated agricultural lands and canals.

Inland water/wetlands harbor 316 fish species, 121 (38%) of which are endemic and 76 (24%) are threatened species. It hosts several species of aquatic plants, resident and migratory birds, amphibians and reptiles like the endemic and threatened Philippine Freshwater Crocodile *(Crocodylus mindorensis).*

The PBCP identified 216 lakes, 421 principal rivers and 22 marshes, swamps and lakes all over the country. The BMB has (2014, unpublished report on the Inventory of Inland Wetlands in Luzon, Philippines) identified 756 inland wetlands with 651 (86%) river systems, 83 (11%) lakes, 16 (2%) water storage/reservoirs, four ponds and two marshes/pools (1%).

Inland water/wetlands, a freshwater source, become a congregating point for human settlements. They are the most accessed but least accorded conservation attention. Major government agencies have commonly related wetland concerns but no committee to synergize or oversee these.

Rivers, Waterfalls, Creeks, Streams and Estuaries

In 2011, DENR initiated the Adopt an Estero (Creek) Program (see Annex 2.3). Business and civil society groups adopted creeks and committed to clean and rehabilitate them. After 15 months of implementation, visible signs of improvement were observed in the different creeks adopted by 250 various LGUs, civil society organizations (CSO) and business sector.

Cagayan River is the longest, largest and widest river in the country and traverses the provinces of Nueva Vizcaya, Quirino, Isabela and Cagayan. The river's mouth covers the Babuyan Channel and Cagayan and empties into the Aparri estuary. It is where the most expensive and threatened lobed river mullet (*Cestraeus plicatilis*) or *ludong* can be found. It is also the habitat of three (3) species of eels, *Anguilla marmorata*, *Anguilla pacifica* and *Anguilla celebenensis*. The elvers (young eels) are banned for exportation.

Many waterfalls are found in the country. Known in terms of height are the Aliwagwag Falls in Davao Oriental (approximately 335 m), Limunsudan Falls in Lanao del Norte (approximately 260 m) and Busay Falls in Albay (approximately 240 m).

Lakes

Some major lakes are Laguna de Bay, Lake Lanao, Taal Lake, Lake Buhi and Naujan Lake with a total area of 159,400.48 ha. Laguna Lake is the largest lake which provides various products and services to more than 13 million people which live in the lake basin. Lake Lanao in Lanao del Sur is the second largest freshwater lake in the country which is a reservoir for the Agus hydroelectric power plants which generate 55-65 percent of Mindanao's power.

Taal Lake National Park is the home of the endemic *tawilis* (*Sardinella tawilis*) and the freshwater snake, *duhol* (*Hydrophis semperi*). Lake Buhi National Park is habitat for the smallest commercial fish, *sinarapan* (*Mistichthys luzonensis*).

Naujan Lake National Park in Oriental Mindoro is an important staging and wintering area for more than 10,000 individuals of tufted ducks (*Aythya fuligula)*. It is both a Ramsar and an East Asia Australasian Flyway Site (EAAF).

In 2013, the Laguna Lake Development Authority (LLDA) implemented the Public Disclosure Program for Laguna de Bay Region Good Environmental Performance. It compelled businesses to reduce their pollution and fulfill their environmental and legal obligations. Compliant establishments were awarded and recognized while non-compliant ones were named and shamed.

Swamps and Marshes

Swamps and marshes are water-logged areas with inadequate drainage. Swamps are dominated by shrub, woody plants and trees while marshes are dominated by soft-stemmed vegetation like reeds and sedges and the water is not as deep as swamps.

The Agusan Marsh Wildlife Sanctuary in Agusan del Sur is one of the key biodiversity sites in the country and an important peatland area. It is comprised of a vast complex of freshwater marshes and water courses that collectively act as holding water basin for floodwaters that regularly inundate the Agusan Valley during the northeast monsoon. It is where, in 2011, the biggest and largest saltwater corcodile (*Crocodylus porosus*) was caught with a weight of 1,000 kilograms. It was designated as a Ramsar site in 1999.

Designation and Operationalization of Water Quality Management Framework

Section 5 of RA 9275 or the Philippine Clean Water Act of 2004 tasked the DENR in coordination with the National Water Resources Board to designate certain areas as Water Quality Management Areas (WQMA) using appropriate physiographic units such as watersheds, river basins or water resource regions. The objective of the WQMA is to protect, through stakeholder 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 or even improve the quality to higher classification. A WQMA Action Plan will be prepared in order to address water quality issues and problems in the area and later result to the improvement or better water quality of the said water body. As of 4 August 2014, there are nineteen (19) officially – designated WQMAs, including the areas within the jurisdiction of LLDA, which was designated as one management area by virtue of the Clean Water Act. Figure 10 presents an infographic on wate resources.

Caves and Cave Ecosystems

More than 1,500 caves have been recorded nationwide with still a significant number of caves yet to be discovered, assessed, surveyed and classified. Class 1 caves have delicate and fragile geological formations, threatened species, archeological and paleontological values, and extremely hazardous conditions. Allowable use may include mapping, photography, educational and scientific purposes. Class 2 caves include sections that have hazardous conditions and contain sensitive geological, biological, archeological, cultural, historical, and biological values or high quality ecosystem. It may be necessary to close sections of these caves seasonally or permanently but may be open to experienced cavers or guided educational tours/visits. Class 3 caves are generally safe to inexperienced visitors and have no known threatened species, archeological, geological, natural history, cultural and historical values. These caves may also be utilized for economic purposes such as guano extraction and edible birds nest collection.

After cave classification is the participatory preparation and partnership implementation of a 5-year management

plan for each cave. Partnerships may involve DENR with interested groups like the LGUs, peoples organizations (PO) and/or land owners.

The Capisaan cave system (Class 1 and 2) in Nueva Vizcaya is the fourth longest cave, surveyed at 4.2 km. It is a geologist's paradise because of the abundance and beauty of its cave formation.

The Puerto Princesa Subterranean River National Park (Class 2) in Palawan, a World Heritage and Ramsar Site, features a 20-million year old Sirenia fossil in its wall and an 8.2 km navigable underground river that empties into Honda Bay.

Sagada, in Mt. Province has deep caves with rich lime formation and ancestral burial sites

Source: http://phfirsttravel.com.ph/wp-content/uploads/2014/03/304484_509905142360989_1083405561_n.jpg

Despite the country's cave biodiversity and significance, most of these are in danger due to increased demand for recreational sites, vandalism, treasure hunting, mining, pollution, illegal collection of cave resources and rapid urbanization.

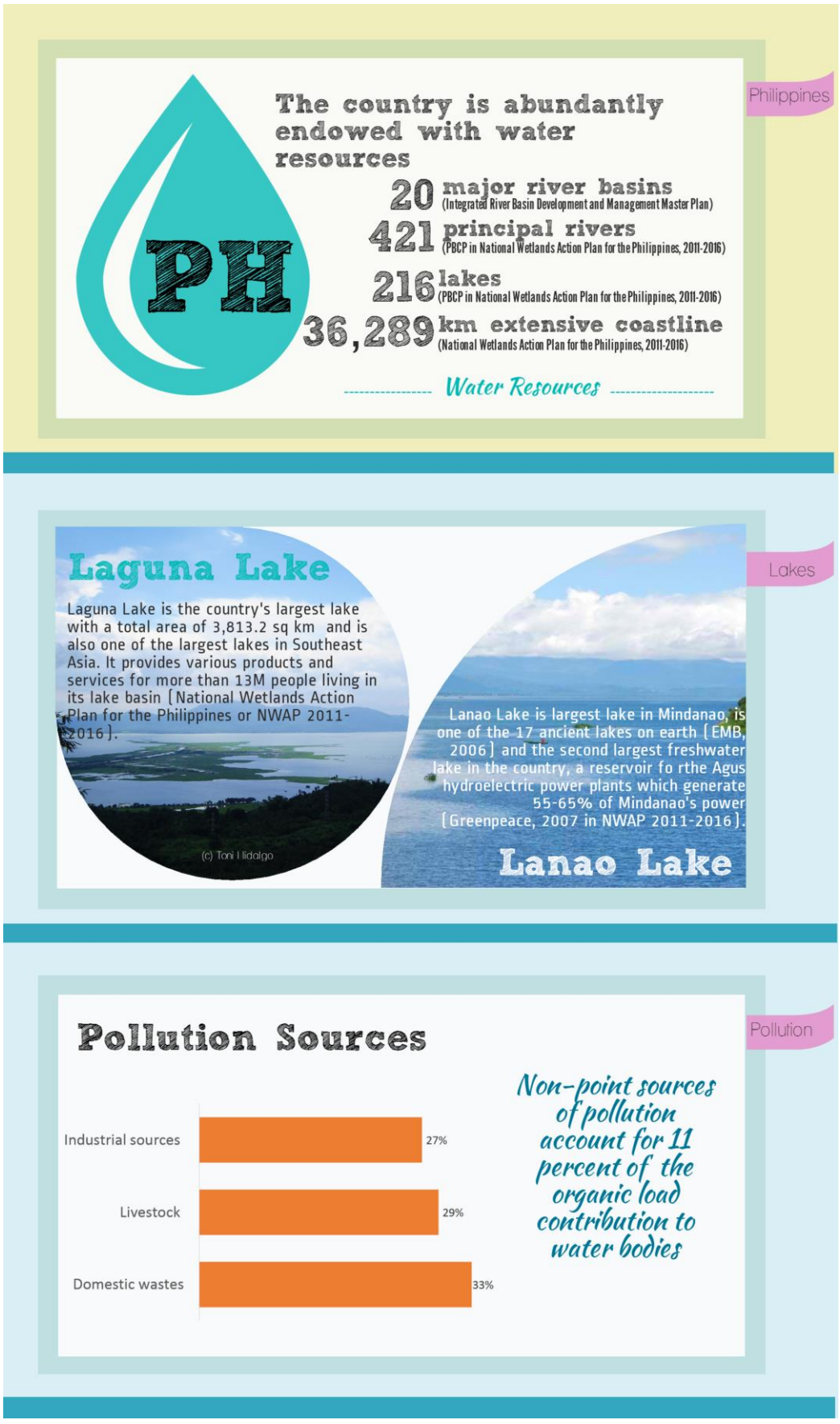


Figure 10. Infographic on water resources

3. Coastal and Marine Ecosystems

Coastal systems generate a variety of seafood products such as fish, mussels, crustaceans, sea cucumbers, and seaweeds. Many commercially important marine species, like salmon, grouper, snapper, striped bass, and invertebrates (such as shrimp, lobster, crabs, oysters, clams, mussels), use coastal nursery habitats. To ensure continuous production of these marine resources, effective management is essential. Establishment of MPAs is an important component of coastal resource management (Alcala, 1998).

Marine Protected Areas

In the Philippines, MPAs can be categorized into two governance levels: nationally established MPAs under the National Integrated Protected Area Sytsem or NIPAS Act (33) and locally established MPAs (1,620) under the Local Government Code and the Fisheries Code. MPAs in general take four forms: 1) Marine sanctuary or no-take marine reserve, where all forms of extractive activities are prohibited; 2) Marine reserve, where extractive and non-extractive activities are regulated; 3) Marine parks, where uses are designated into zones; and 4) Protected landscape and seascape, where protection may include non-marine resources (Miclat and Ingles 2004 in Arceo, Campos, Fuentes, & Alino, 2004; White et al. 2014). The most common objectives for MPA establishment are biodiversity conservation, fisheries sustainability, and tourism and recreation, among others. 1,620 locally managed MPAs have been established as of 2011[6] (see Annex 2.4).

Coral Reefs and Seagrasses

The Philippines, being situated at the apex of the Coral Triangle, is considered to be the richest marine eco-region in the world or the Center of Marine Shorefish Diversity (see Figure 11). The Coral Triangle region is located along the equator at the confluence of the Western Pacific and Indian Oceans. Using coral and reef fish diversity as the two major criteria, the boundaries of this region are defined by scientists as covering all or part of the exclusive economic zones of six countries: Indonesia, Malaysia, Papua New Guinea, the Philippines, the Solomon Islands and Timor-Leste.

[6] National Coral Triangle Initiative (CTI) Coordinating Committee 2013

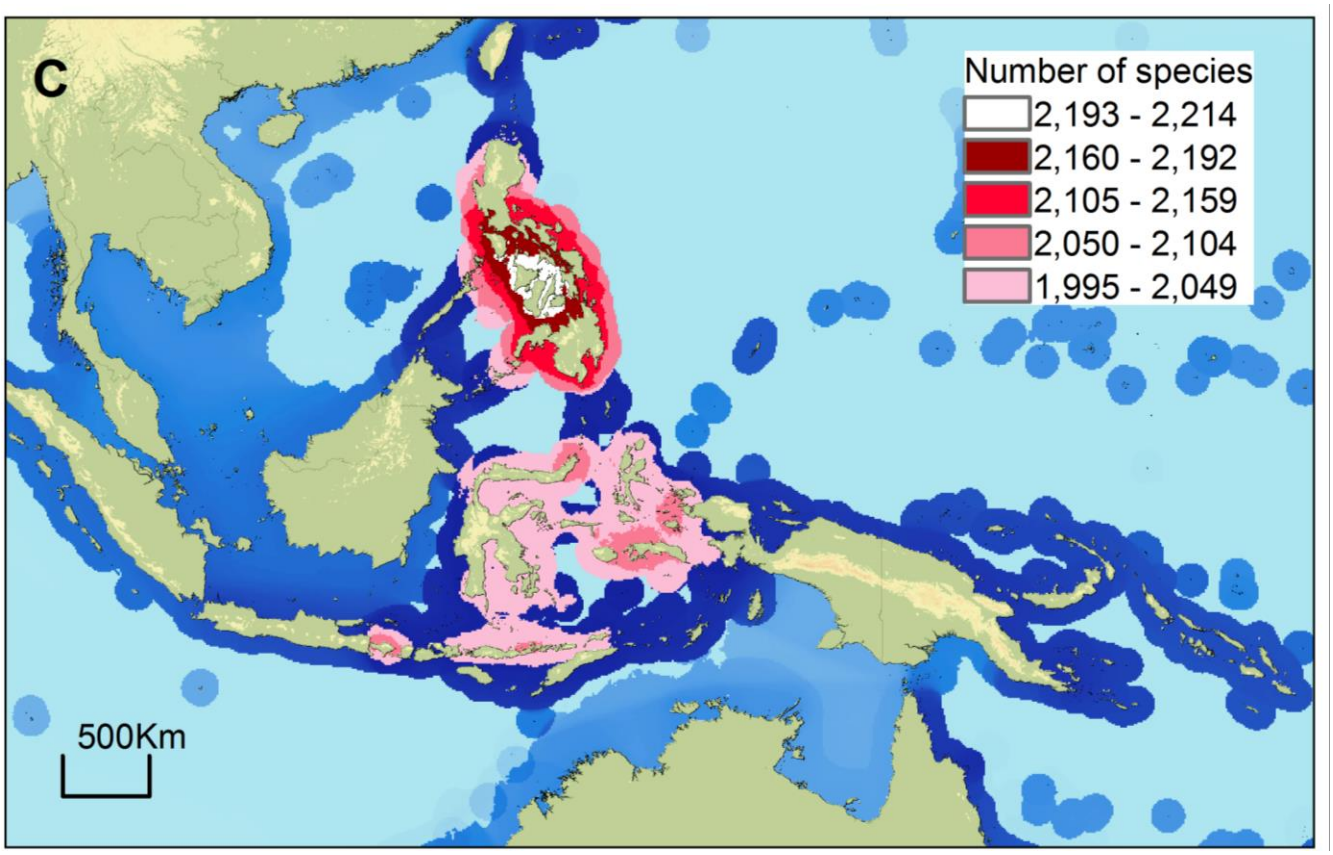


Figure 11. Patterns of species richness from range overlap raster data from 10,446 species[7]

Source: Sanciangco, Carpenter, Etnoyer, & Moretzsohn (2013) Habitat Availability and Heterogeneity and the Indo- Pacific Warm Pool as Predictors of Marine Species Richness in the Tropical Indo-Pacific

The Philippines adopted the CTI target of having at least 20 percent of each major marine and coastal habitat type across the region to be placed in strictly protected "no-take, replenishment zones". However, the Philippines under the CTI National Plan of Action (2009-2020) used an interim target of at least 10 percent for each marine and coastal habitat type. As for coral reefs and mangroves, the 10 percent target is estimated to be around 80,000 and 156,900 ha, respectively (ACB, 2010).

Mangroves are permanent or temporary habitats for many aquatic animals, and provide hatching sites and nursery grounds for many marine fishes. Loss of mangrove and seagrass leads to increased sediment and nutrient input to coral reefs, leading to degradation and loss of coral and potentially negative impacts on fisheries, which may in turn threaten the food security of vulnerable coastal populations. Loss of coral habitat also reduces the natural coastal defense service they provide leading to increased vulnerability. The resulting loss of infrastructure or of pristine coral habitat needed for profitable diving operations can reduce tourism revenue.

Based on State of the Coral Triangle Report from the Philippines in 2012, mangrove cover has increased from 0.247 million ha in 2003 to 0.311 million ha in 2012 due to mangrove reforestation efforts. Planted mangroves have reached up to more than 44,000 ha (Samson & Rollon, 2008; Primavera, Rollon, & Samson, 2011). Several interventions have been introduced to address mangrove rehabilitaton loss, the NGP in 2011, and the Integrated Coastal Resources Management Project (ICRMP).

[7] All fishes showing the top 1% of species richness (white)

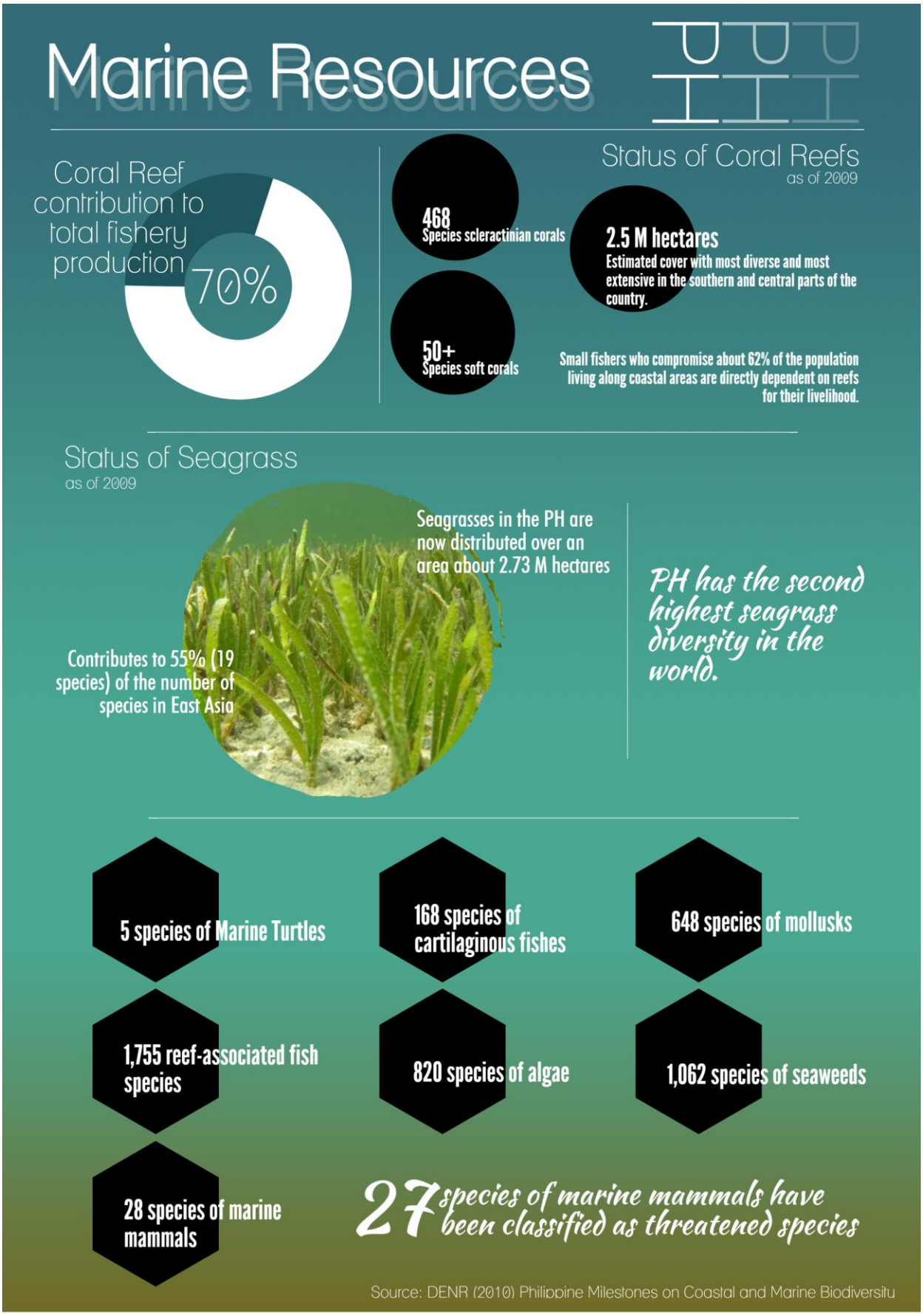


Figure 12. Infographic on coral reefs, sea grass and other marine resources

Marine Flora and Fauna

The Irrawaddy dolphins (*Orcaella brevirostris*) are among the cetaceans that are at greater risk to population extirpation and perhaps extinction. Seventy seven (77) individual dolphins were found geographically isolated in Malampaya Sound, Palawan (Smith & Beasley, 2004).Irrawady dolphins are also reportedly frequently seen in the waters of Guimaras Strait, near Bago-Pulupandan-San Enrique wetlands in Negros Occidental (L. Paguntalan & P. Jakosalem, personal communication, 2014).

The greater threat to cetaceans to date is the incidental takes from fisheries (i.e. mortality due to net entanglement). With the advent of newer technology and the expansion of fishing industry, there have been increasing reports of cetaceans being caught during fishing operations.

Figure 12 presents an infographic on marine resources.

C. SPECIES

1. Marine and Terrestrial Species

In terms of wildlife species management, scientific expeditions carried out through partnership agreements between the DENR and various local and international academic and research institutes have led to continuous discovery of new species with many more awaiting discoveries. Some of these new discoveries include the Camiguin hawk owl (*Ninox leventisi*), Cordillera shrew mouse (*Archboldomys maximus*), Zambales forest mouse (*Apomys zambalensis*), Sierra Madre forest mouse (*Apomys sierra*), and Southern Leyte frog (*Platymantis guentheri* and *Platymantis hazelae*).

In June 2011, a government-authorized group of scientists from the California Academy of Sciences surveyed Luzon Island—the largest island in the Philippine archipelago—and discovered more than 300 new species (see Annex 2.5)

There are also ongoing conservation efforts for some endangered and threatened species like the national bird, the Philippine Eagle (*Pithecophaga jefferyi*), Philippine Cockatoo (*Cacatua haematuropygia*) Tamaraw (*Bubalus mindorensis*), Philippine tarsier (*Tarsius syrichta*), Philippine Freshwater Crocodile (*Crocodylus mindorensis*) and marine turtles.

An example of this is the Tamaraw Conservation Program that continues to regularly monitor its population in Mts. Iglit-Baco National Park. The latest tamaraw count, conducted in April 2014, yielded 382 heads in the wild (DENR-MIMAROPA, 2014).

In addition to species-specific conservation programs, KBAs and critical habitats have been identified for conservation measures. KBAs represent known habitats of 855 globally important species of plants, corals, molluscs, elasmobranchs, fishes, amphibians, reptiles, birds and mammals in the country. A total of 228 KBAs (see Figure 18) have been identified - 128 terrestrial and freshwater KBAs in 2006 and 123 marine KBAs in 2009 (Ambal, Duya, Cruz, Coroza, Vergara, De Silva, Molinyawe, & Tabaranza, 2012), with 91 out of 240 PAs within KBAs. Six critical habitats with a total area of 9,391.697 ha have also been established to protect the habitats and populations of threatened species of wild flora (e.g., *Rafflesia schadenbergiana*) and wild fauna (e.g., Philippine falconet, Philippine hanging parakeet, marine turtles, Philippine wild duck and other waterbird species), pursuant to RA No. 9147 or the Wildlife Resources Conservation and Protection Act. In spite of the alarming rate of biodiversity loss, new discoveries continue. From 2005 to 2012, there were 151 species of birds, mammals, reptiles, amphibians and plants discovered (see Annex 2.6).

In caves and karst systems, several invertebrates like insects and crustaceans have been identified such as a cave spider (*Althepus noonadanae*), cave crab (*Boholina fosshagen*), and vertebrates such as gobiine fish (*Caecogobius crytopthalmus*). Figure 13 shows the 2014 wildlife crime hotspots in relation to the protected areas and biodiversity importance index in the Philippines.

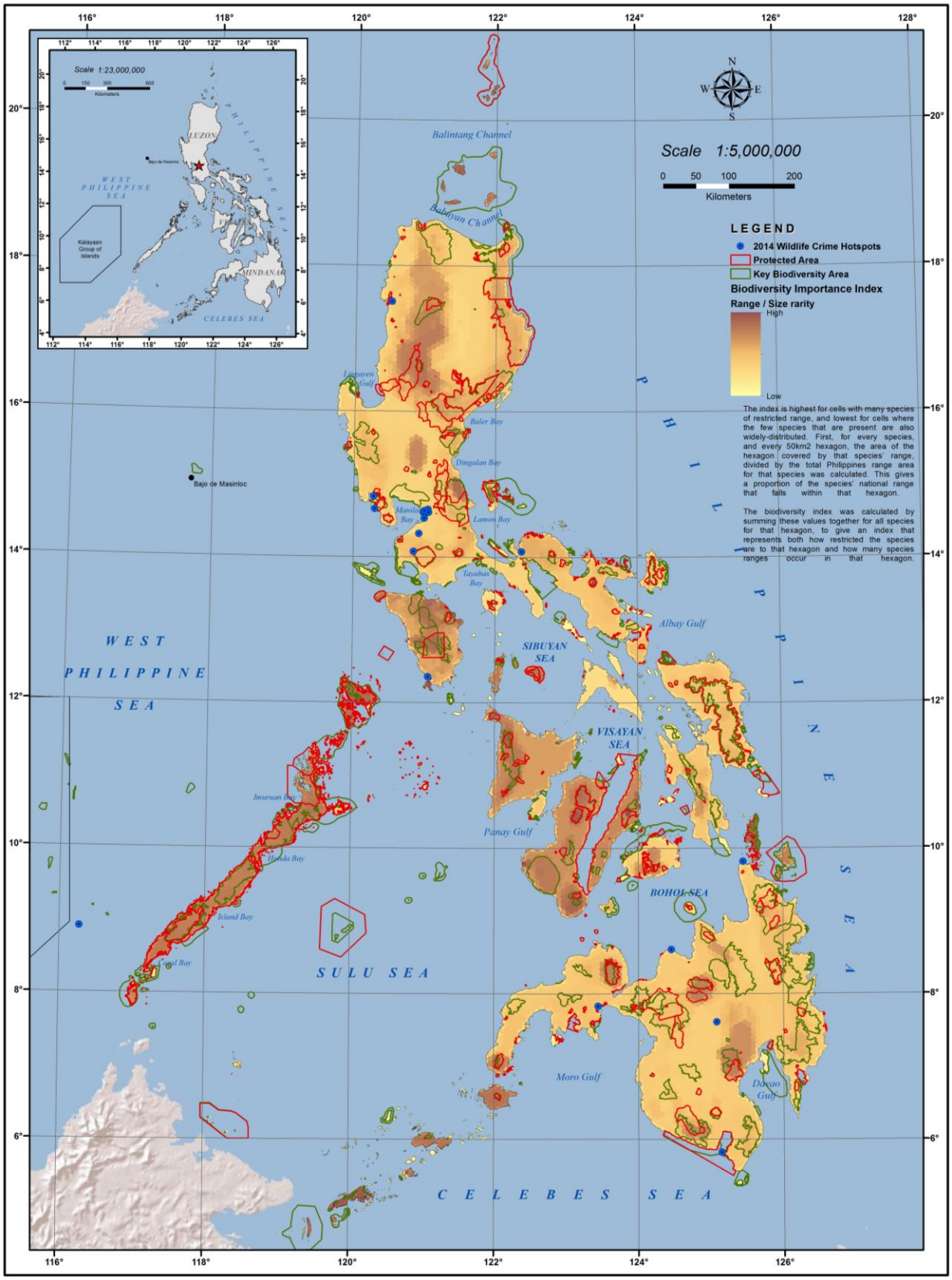


Figure 13. Wildlife crime hotspots in relation to protected areas and biodiversity importance index of the Philippines, 2013

Data source: Wildlife crime hotspots 2014 – BMB; Biodoversity importance index – IUCN 2013; IUCN Red List of Threatened Species (Version 2013.1) in Osti et al., 2014

D. THEMATIC AREAS

1. Urban Biodiversity

City biodiversity exposes urban residents to an environment or landscape which facilitates their appreciation for nature. It provides opportunities for recreation, health, relaxation and community cohesion. Green area accessibility has been linked to reduced mortality and improved perceived and actual general health. Psychological benefits of green space increase with biodiversity and that a green window increases job satisfaction and reduces stress.

Urban biodiversity is a new concept in the Philippines but some pockets of green space and landscape have been established (see Annex 2.7). Through synergism between and among different sectors, these urban green spaces can be improved so urban residents can benefit from their ecosytem services and enhance human well-being.

Las Piñas-Parañaque Critical Habitat and Ecotourism Area, a coastal urban wetland and bird sanctuary situated within the metropolis of Metro Manila, comprises two interconnected, mangrove-covered islands, shallow lagoons and coastline.

Source: Philippine Daily Inquirer, May 2011(http://newsinfo.inquirer.net/files/2011/05/Coastal-Lagoon-Manila-Bay.jpg)

At least 47 migratory species such as the vulnerable Chinese Egret (*Egretta eulophotes*) have been recorded at the site. Records from 2007-2011 show that the site supports at least one percent of the estimated population of Black-Winged Stilts (*Himantopus himantopus*) using the EAAF. The site faces threats such as waste from nearby cities, heavy metals and other organic contents coming from residential and industrial effluents. Other threats include ongoing land reclamation projects and mangrove cutting.

2. Agricultural Biodiversity

Agrobiodiversity has been developed through the application of the knowledge and skills of farmers, herders and fisherfolk in a wide range of agroecosystems. The knowledge it has produced is key to global food security because of their wild relatives. The genetic diversity found in domestic animal breeds allows farmers to select stocks in response to changes in the environment, threats of disease, market conditions and societal needs, all of which are largely unpredictable. Indigenous livestock breeds often possess valuable traits such as disease resistance, high fertility, good maternal qualities, longevity and adaptation to harsh conditions and poor-quality feed, all desirable qualities for low-input, sustainable agriculture.

The importance of the role of agrobiodiversity in protecting and promoting the use of traditional crop varieties as well as enhancing people's livelihoods has been emphasized in this plan. Likewise, the number of in situ and ex situ sites that conserve and propagate diverse indigenous species and varieties will be increased. Policies and programs to support and recognize communities practicing heritage agriculture will be formulated and mainstreamed into LGU plans.

From 1996 to 2000, a total of 14 populations of wild species of rice were collected by Bon & Borromeo (2003) consisting of eight populations of *Oryza officinalis* and six (6) populations of *O. meyeriana* which were further classified into newly discovered, re-discovered, and re-canvassed species (see Figure 14). These areas are potential candidates for nationally important agricultural heritage sites.

Experiences have shown that full involvement of local farming practices in agricultural research and development -- through participation and leadership of local people -- has had beneficial outcomes. In Kalinga, Davao, Palawan, Pampanga and Oriental Mindoro, at least seven (7) ethnic groups are practicing 15 types of measures vs. rainfall aberrations and at least 11 ethnic groups are practicing 33 types of practices vs. temperature change as an example of indigenous knowledge on climate change adaptation. These are carried out in rice, vegetables, fruits and sugarcane varieties.

Initial inventories are currently being implemented on ex situ conservation, as well as pilot efforts on in situ varietal conservation/multiplication and agriculture heritage conservation are on-going.

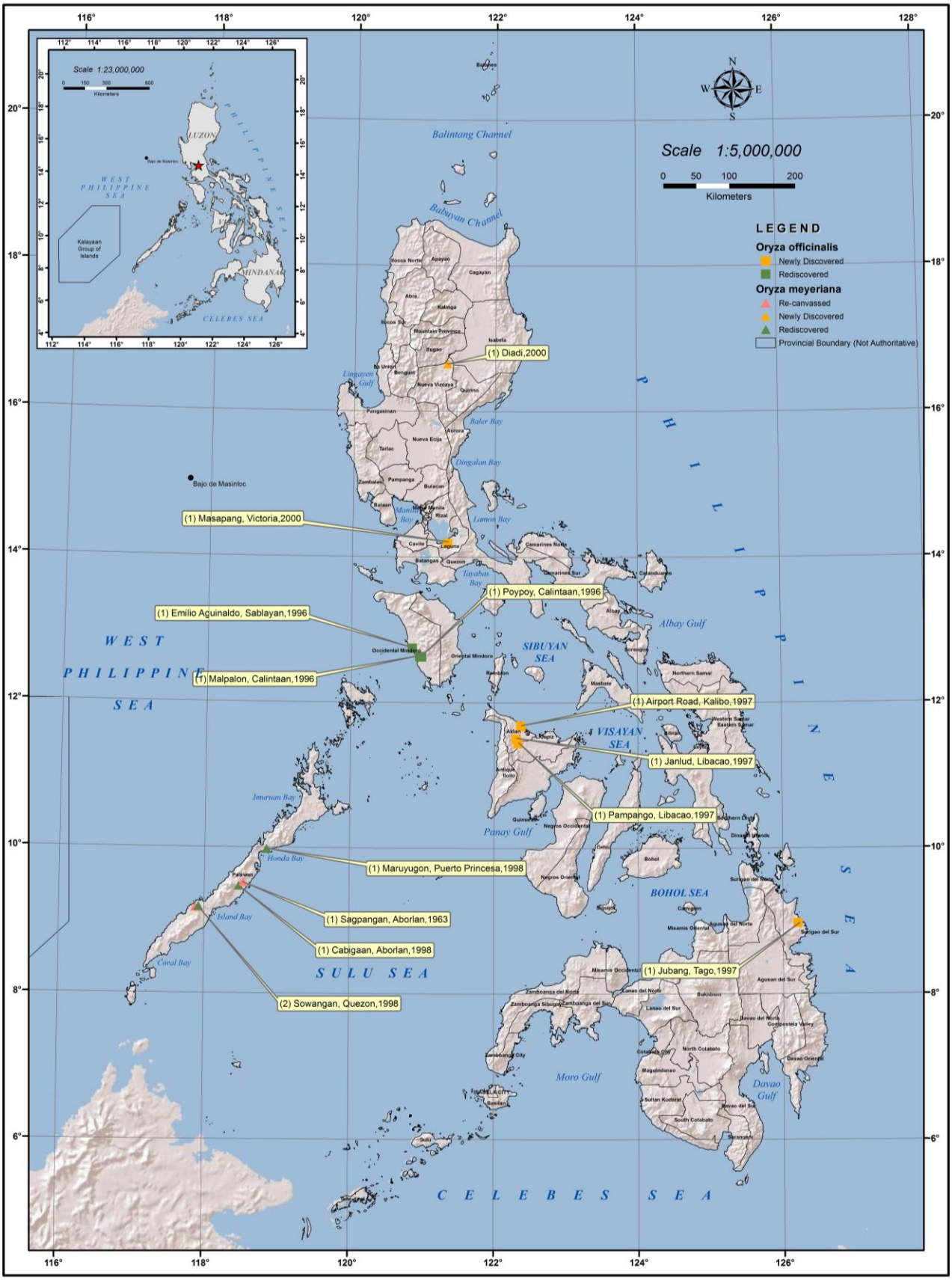


Figure 14. Discovery and re-discovery of wild rice populations, 1996-2000

Data source: Bon & Borromeo (2003) Discovery and rediscovery of wild rice populations in the Philippines

Philippine Plant Genetic Resources for Food and Agriculture

In the Philippines, over 3,000 plants are utilized for food, feed, shelter, fiber, fuel, medicine, ornamentals and ornaments. Plant genetic resources are a vital element of our nation's cultural heritage. A vast number of plants are of significant cultural value to local communities, as a symbol in religion, folklore, rituals and the arts. Conservation strategies include ex situ (cold storage, field genebanks, in vitro, pollen storage, DNA storage and ultra drying) and in situ (on-farm and home garden) (Borromeo, 2014).

The Philippine germplasm collection has 173,205 accession from forty (40) agencies and institutions such as DA, PhilRice, and research universities. The Department of Science and Technology (DOST) Philippine Council for Agricultural and Aquatic Resources Research and Development (PCAARRD) has a current program on restoring crop diversity using National Germplasm Repository. Germplasms duplication is conducted in the National Plant Genetic Resources Laboratory, international genebanks, regional genebanks and Svalbard. Fifty-eight countries served as donors of germplasm used in crop improvement of nine crops in the Philippines for the past 20 years (Borromeo, 2014).

A. Agriculture

Based from 2013 data, the agriculture and fisheries sector contributed an estimate of PhP701 billion to the country's GDP (Philippine Statistics Authority website). In addition, 44.52 percent of the country's total land area is utilized as agriculture land and 85 million metric tons of agricultural crops were harvested in 2013. The country's Gross National Income grew by 7.48 percent while GDP posted a 7.18 percent growth and Gross Value Added in agriculture and fishing went up by 0.90 percent. This sector contributed 10 percent to the GDP (see Annex 2.8).

Production in the livestock subsector improved by 1.76 percent. Hog and cattle production rose by 1.95 percent and 1.76 percent, respectively. Dairy had a 5.58 percent output gain. The poultry subsector came up with a 4.29 percent growth in production. All poultry components posted output increments. Chicken had the biggest expansion at 5.11 percent.

The fisheries subsector recovered from the previous year's decline with a 1.24 percent increase in production in 2013[8].

Figures 15, 16, and 17 present infographics on agriculture, livestock and poultry and fisheries.

[8] CountrySTAT Philippines: http://countrystat.bas.gov.ph/?cont=9

Figure 15. Infographic on the agriculture in the Philippines

B. Livestock and Poultry

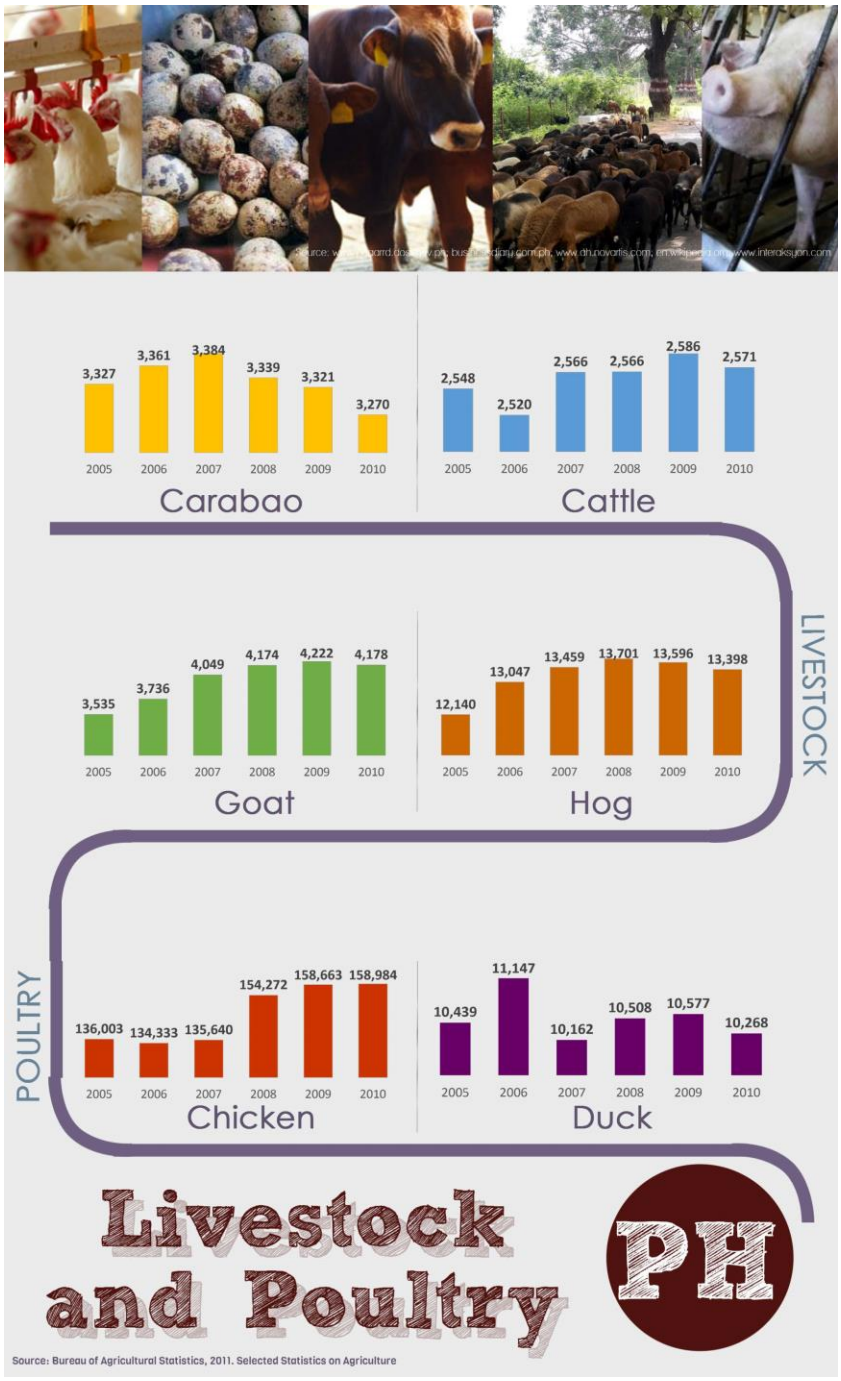


Figure 16. Infographic on livestock and poultry

C. Fisheries

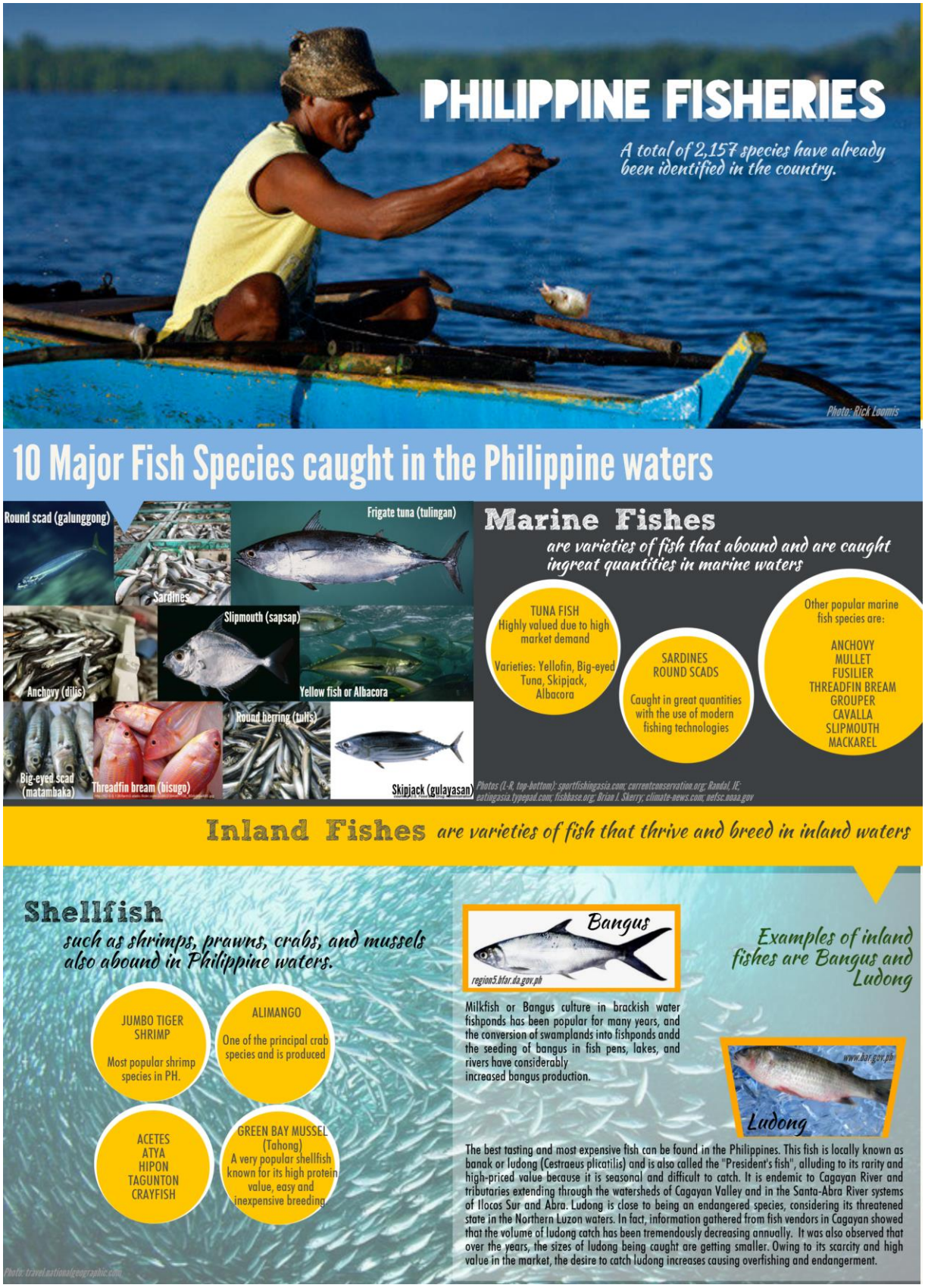


Figure 17. Infographic on fisheries in the Philippines

3. Cross Cutting Concerns

A. Key Biodiversity Areas

Conservationists fear that, without immediate intervention, the Philippines hotspot is on the brink of an extinction crisis. One way of ensuring that the network of PAs adequately conserves biodiversity is through the conservation of KBAs (see Figure 18).

KBAs represent the most important sites for biodiversity conservation worldwide. They are places of international importance for the conservation of biodiversity through PAs and other governance mechanisms. They are identified nationally using simple, standard criteria, based on their importance in maintaining species populations. As the building blocks for designing the ecosystem approach and maintaining effective ecological networks, KBAs are the starting point for conservation planning at landscape level. Governments, intergovernmental organizations, NGOs, the private sector, and other stakeholders can use KBAs as a tool for identifying national networks of internationally important sites for conservation (IUCN, n.d.)

A process for identifying KBAs for the Philippines was undertaken in two phases. The 128 terrestrial and freshwater KBAs were identified in 2006 and the 123 marine KBAs were identified in 2009. A total of 228 KBAs resulted from the integration of the terrestrial, freshwater and marine KBAs. These KBAs represent the known habitat of 855 globally important species of plants, corals, molluscs, elasmobranchs, fishes, amphibians, reptiles, birds and mammals in the country (see Table 3).

Table 3. Key Biodiversity Areas in the Philippines

KBAs by ecosystem coverage	Area (km^2)	# of KBAs	% of KBAs	# of KBAs Protected	# of KBAs Partially Protected	# of KBAs Unprotected
Terrestrial only	51,249	101	44%	27	25	49
Marine only	19,601	77	34%	8	6	63
Terrestrial and Marine	35,702	50	22%	15	10	25
Total	106,552	228	100%	50	41	137

The terrestrial KBAs cover 20 percent of the country's land area, which includes the majority of the remaining terrestrial natural habitats, while the marine KBAs covered only 1.93 percent of the country's marine area or Exclusive Economic Zone (EEZ). Some 44 percent of the sites identified are terrestrial KBAs, 34 percent are marine and 22 percent include both marine and terrestrial areas (Ambal et al., 2012).

In addition to creating effective PAs, basic field research is desperately needed to support conservation activities. New endemic species are frequently discovered and information related to these new discoveries feed directly into the refinement and prioritization of KBAs.

The KBA approach presents a novel framework for identifying fine-scale conservation priorities in the Philippines, and will benefit from the methodology updating process that is currently under development. The Philippines needs to improve data gathering efficiency and information management in order to highlight other important ecosystems such as inland wetlands, peatlands and caves.

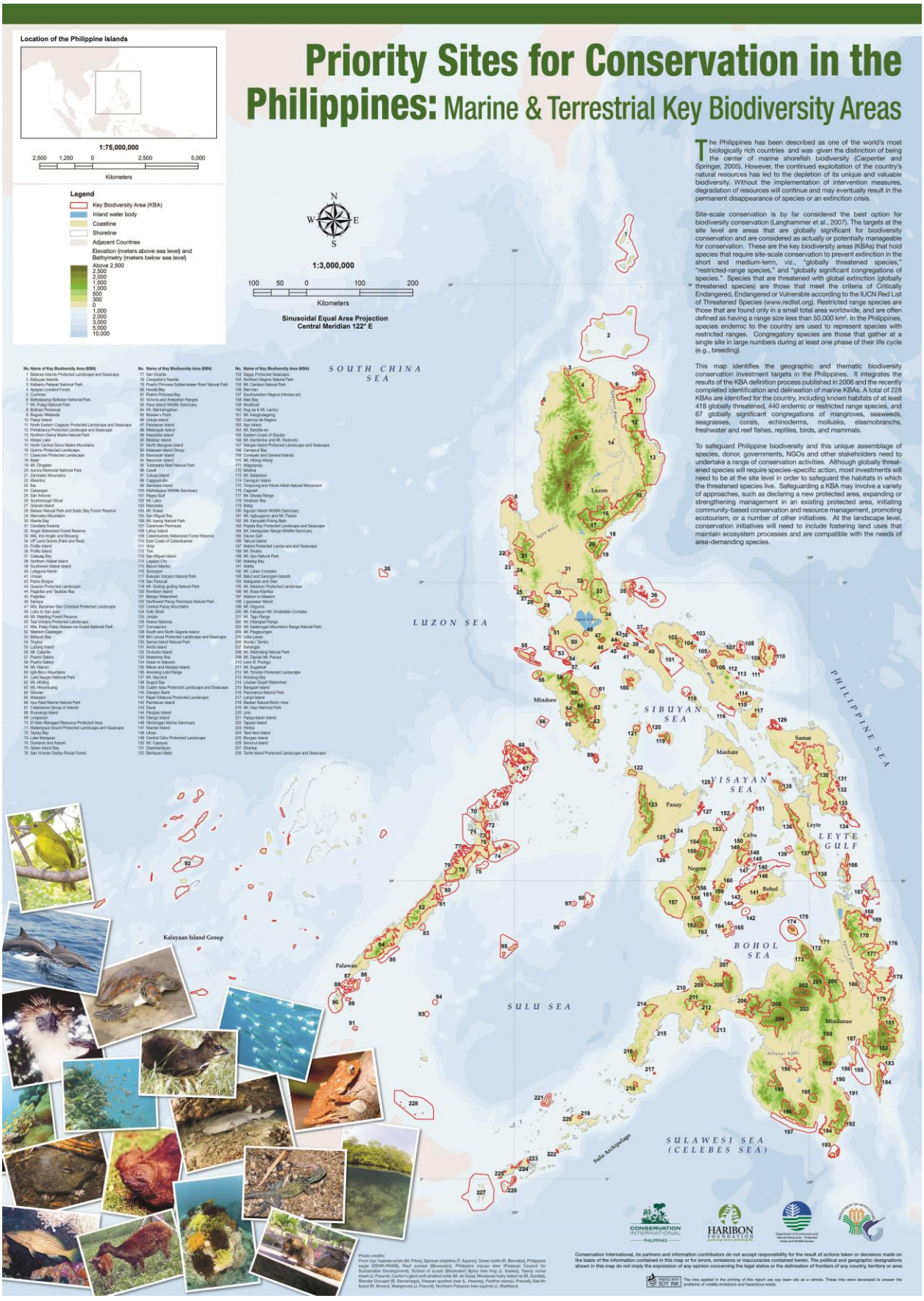


Figure 18. Key Biodiversity Areas in the Philippines

Protected Area Management in the ASEAN Region

The results of various assessments conducted by ASEAN Member States (AMS) revealed that in spite of increased areas of protection, the loss of biodiversity has not been effectively addressed. The Gap Analysis on Protected Areas Report for Southeast Asia was conducted by compiling the gap analysis assessments conducted by AMS including Cambodia, Indonesia and Viet Nam for terrestrial PAs and Cambodia, Indonesia, Malaysia, the Philippines, Thailand and Viet Nam for coastal and marine PAs.

Using the 10 percent target of PA coverage within each country, all countries in the ASEAN region were able to meet the target in so far as protecting their terrestrial area is concerned when comparing their percentage covered of terrestrial PAs versus the countries' total forest area. In spite of the increase in PAs, the regional level of forest trends in the ASEAN region from 1980-2007 showed a continuous decline in forestry resources and forest area. Between 2000 and 2007, the rate of deforestation in the region average about 1.11 percent per annum. This indicates that there are still major gaps in the current terrestrial PA system within the region. Apparently, the 10 percent of PA coverage per country is not sufficient to protect all the important habitats for varied reasons, including: a. that this may not all be adequately represented in the existing PA networks; b. that collection of resources (e.g. harvesting of trees and related forest products) in PAs is on going at unsustainable levels; and c. that PA policies are not enforced.

Based on aggregate current information sourced from the World Database on Protected Areas (WDPA) and MPA gap analysis reports of AMS, Philippines registered 2.5 percent of marine protected area coverage in AMS (ACB, 2010). Consequently, out of the 82 marine KBAs identified in the region, 78 percent remain unprotected, indicating a significant representation gap. Ten percent are partially protected, signifying an ecological gap in the MPAs managed. Only 12 percent of the MKBAs are under protection but management concerns remain to be an issue.

In 2007, data from the FAO showed a steady decline of 1.06 percent per year in mangrove forests between 1980 and 2005 even though the proportion of protected mangrove areas exceeded CBD's target at 15 percent.

Protection of the remaining mangrove forests needs to be scaled up to address impending negative impacts such as extinction of associate species, reduced fishing production, and other activities and functions associated with the use of mangrove resources. This also applies to coral reefs and seagrasses which are continuously threatened by drivers of marine biodiversity loss such as habitat change, the impact of climate change, overexploitation, and pollution.

For seagrasses, the aggregate protection areas fell below the 10 percent target at 8.33 percent protection. Only Thailand and Indonesia surpassed the 10 percent target at 35 percent and 17 percent, respectively. Cambodia, the Philippines and Viet Nam fell short of the 10 percent mark. There is a need to expand the reach of information coverage on the conservation and economic values of seagrasses in the region to increase appreciation and conservation efforts for this ecosystem. Their nursery function for various fishes and invertebrate larvae makes this ecosystem an important resource for inclusion in conservation plans and establishment of MPAs.

For coral reefs, about 14 percent of the coral reef areas are protected, thus meeting the CBD target. A closer look into individual country performance in protecting their coral ecosystems indicated rigorous conservation activities in Thailand, Indonesia and Viet Nam whose protection ratio exceeded the ten percent CBD target. In Brunei Darussalam, Cambodia, Malaysia, Myanmar and the Philippines, protection activities remain to be a challenge (ACB, 2010).

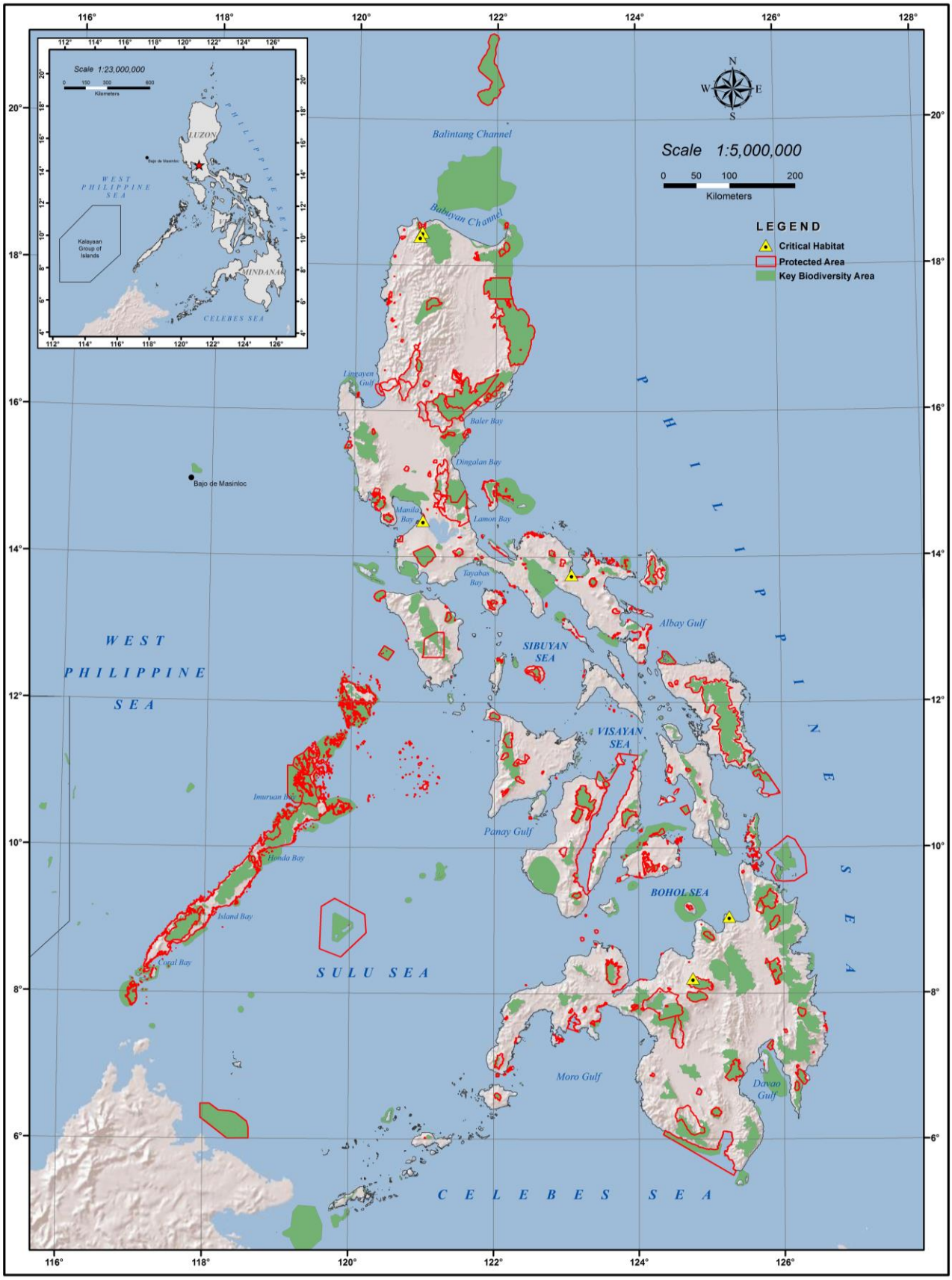
Protected Area Management in the Philippines

A PA Master Plan that will update the Philippines' Programme of Work for Protected Areas is currently being formulated. The adoption of the system approach to PA planning and management was conceived to provide for a more strategic perspective for assessing the current portfolio of PAs, rationalize the expansion of PAs into the system, and provide for better arguments for relating PAs with broader national development objectives. While the NIPAS has clearly articulated the policy framework for the establishment of PAs, the emergence of other governance types has also reinforced the arguments for developing a national PA system plan, to take account of other modes of area based conservation efforts.

The BMB, in collaboration with Philippine Congress has proposed an Expanded NIPAS Bill which will facilitate the process of congressional enactment of at least 100 PAs with Presidential Proclamation. Other effective conservation mechanisms were introduced in establishing PAs in the form of ICCAs directly managed by IPs and LCAs managed by LGUs. A total of 50,006 ha of ICCAs have been documented and 9,297 ha from three sites (Mt. Kalatungan, Cabangan and Mt. Hilong Hilong) have been formally registered at the global ICCA registry of the UNEP-WCMC. Around 71,317 ha of LCA from six (6) sites have been established through LGU resolutions. Figure 19 shows the current distribution of PAs in relation to KBAs and critical habitats (CH) in the Philippines.

Based on the National Management Effectiveness and Capacity Assessment of Protected Areas in the Philippines draft report (2014), the major specific challenges to effective PA management were increasing conversion of PAs into agricultural land, prevalence of illegal extracton of timber and non-timber products within the PA, increasing human settlements and establishment within the PA, and increasing unregulated tourism activities (Guiang & Braganza, 2014). Other challenges identified through the consultation processes and workshop activities were a) overlapping policies and conflicting management regimes, b) political intervention, c) limited financial and manpower resources result to weak technical and enforcement capacities of staff, and d) lack or absence of accurate technical data on the biological state of the PA.

In a study on "Effectiveness of Marine Protected Areas in the Philippines for Biodiversity Conservation" conducted by Weeks, Russ, Alcala and White (2010), the group used a newly compiled database of nearly 1,000 MPAs to measure progress toward targets (The 1998 Fisheries Code legislation, calls for 15 percent of coastal municipal waters (within 15 km of the coastline) to be protected within no-take MPAs, and the Philippine Marine Sanctuary Strategy (2004), which aims to protect 10 percent of coral reef area in no-take MPAs by 2020). The group evaluated conservation effectiveness of MPAs in two ways, first, by determining the degree to which marine bioregions and conservation priority areas are represented within existing MPAs and second, by assessing the size and spacing patterns of reserves in terms of best-practice recommendations. Based on the results of the study, the current extent and distribution of MPAs does not adequately represent biodiversity. At present just 0.5 percent of municipal waters and 2.7-3.4 percent of coral reef area in the Philippines are protected in no-take MPAs. Moreover, 85 percent of no-take area is in just two sites; 90 percent of MPAs are <1 km^2. Nevertheless, distances between existing MPAs should ensure larval connectivity between them, providing opportunities to develop regional-scale MPA networks. Despite the considerable success of community-based approaches to MPA implementation in the Philippines, this strategy will not be sufficient to meet conservation targets, even under a best-case scenario for future MPA establishment. The group recommends that implementation of community-based MPAs be supplemented by designation of additional large no-take areas specifically located to address conservation targets (Weeks et al., 2010).



Figrure 19. Key biodiversity areas, protected areas, and critical habitats in the Philippines

Data source: KBA- CI, Haribon, BMB ; PAs & CH-BMB-DENR

B. Management of Invasive Alien Species

The occurrence of species invasions in the Philippines, one of the most biodiverse countries in the world, has been reported in PAs, wetlands, and agricultural areas as well as in production and protection forests. Many of the past and present introductions are intended for food production, reforestation, horticulture, and recreation. Invasion by alien species in the Philippines is a result of one or any combination of the following factors:

1. Transport of organisms to a new habitat – this could be between islands or countries;
2. Establishment and propagation of the alien species in the new habitat – either in natural or human-made habitats, such as enclosures, lakes, reforestation areas, and gardens; and
3. Uncontrolled spread from initial population over large area – either through deliberate release or accidental escape. However, most of these reports are anecdotal and not scientifically or rigorously studied.

The Philippines has developed and aims to implement the National Invasive Species Strategic and Action Plan (NISSAP) to prevent new introductions and spread of invasive species to control the spread of existing IAS and to effectively manage their impacts on biodiversity. The NISSAP covers the management of various types of IAS, such as vertebrates and invertebrates, weeds, marine and freshwater plants and animals in areas that are most vulnerable to the impact of IAS.

C. Philippine Experience in REDD+ Actions

Pursuant to EO 881, a REDD+ Unit at the FMB was created which took the lead in integrating, coordinating, monitoring and evaluating all REDD+ related programs, projects, investments and activities. It also linked the REDD+ activities to the Philippine National REDD+ Strategy (PNRPS) Road Map and tracked the country's progress towards establishing the Measurement, Reporting and Verification system, benefit-sharing mechanism and the social and environmental safeguards for REDD+.

As a collective effort between government and non-government sectors, the PNRPS outlines the country's approach and roadmap towards developing and implementing REDD+ from the readiness and demonstration phases to the full implementation phase. The PNRPS has a vision of empowering stakeholders to sustainably and equitably manage forestlands, PAs and ancestral domains, while contributing towards biodiversity conservation, poverty alleviation and improved governance.

Hence, it proposes a safeguards framework which is initially drawn from international models and best practices. The framework is elaborated within the Philippine setting through a set of principles, criteria and indicators. This will serve as basis for developing operational safeguards and a functioning Safeguards Information System for the Philippines. The proposed framework and guidelines provide 10 principles classified into environmental, governance and socio-economic clusters. One of the environmental principles states that: "REDD+ conserves biodiversity and maintains ecosystem functions and services." Under this principle, the following criteria were identified:

1. Ensure that REDD+ activities do not cause the conversion of natural forest to planted forest and other land uses (e.g. agriculture, infrastructure);
2. Ensure that land use planning for REDD+ explicitly takes account of potential synergies and trade-offs between the multiple functions of forest and the benefits they provide, respecting local and other stakeholders' values;
3. Ensure that conservation status of threatened species are improved and of non-threatened species are maintained; and
4. Promote effective management of natural habitats and watersheds.

The PNRPS adopts a "Triple Bottomline" approach, where carbon, community and biodiversity are seen as equally valued benefits to REDD+ development and implementation and therefore has implications on how planning and monitoring are conducted. The country's national experience with REDD+ implementation includes the involvement of biodiversity experts and traditional knowledge where experts from academe as well as tribal leaders/representatives are regular participants in all the planning and capacity building initiatives as well as in the implementation of pilot sites in the local level (see Annex 2.9).

Such practical approaches are driving innovation towards establishing REDD+ as a potential sustainable revenue model, which could leverage biodiversity, ecosystem services, and livelihoods giving more tangible benefits to communities. This broader framework for "performance" more confidently secures carbon benefits and the enabling environment needed for permanence.

In 2014, the Philippines submitted its position on Non-Carbon Benefits (NCB) based on the PNRPS, which is a strategy that defines the policy direction of the country in terms of REDD+ implementation. Our position reiterates that NCBs should be nationally defined and that methodologies, modalities and procedures should be identified at the country level. It also emphasized the need to view REDD+ in a holistic manner which gives impetus to valuing the forests not only for their capacity to store and sequester carbon dioxide, but also for the myriad of other uses and services they currently provide within the context of climate change adaptation and sustainable development. Figure 20 provides an overview of the distribution of areas under the Community-Based Forest Management Agreement (CBFMA) and PA Community-Based Resource Management Agreement (PACBRMA) in relation to PAs and KBAs. It shows where sustainable management of forests could be implemented as an activity under REDD+, in a way which also contributes to biodiversity conservation.

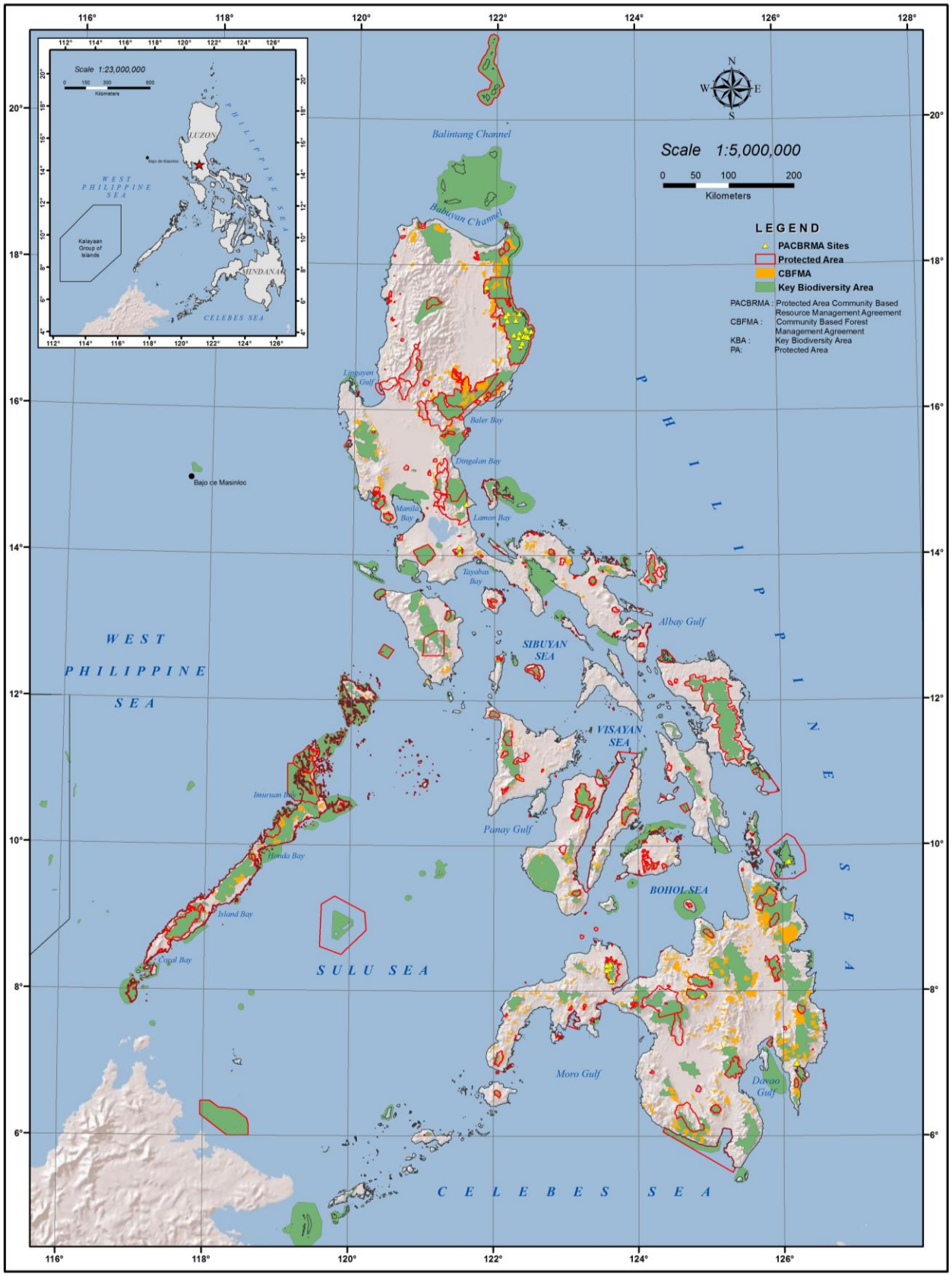


Figure 20. CBFMA and PACBRMA in protected areas and key biodiversity areas in the Philippines

Data source: Cited in Osti et al., 2014 a) KBA – compiled by BirdLife International and CI, October 2012; b) CBFMA – FMB-DENR data obtained Dec 2013 (no data is available for regions VIII, ARMM, CAR, and Manila).

D. Solid Waste

Under RA 9003, the LGU is responsible for collecting non-recyclable materials and special wastes, while barangay units are given the task and responsibility of collecting and segregating the biodegradable, compostable, and reusable wastes (see Annex 2.10). Section 37 of RA 9003 states that *"no open dumps shall be established and operated, nor any practice or disposal of solid waste by any person, including LGUs, which constitutes the use of open dumps for solid waste, be allowed after the effectivity of the Act. Provided that within three (3) years after the effectivity of the Act, every LGU shall convert its open dump into controlled dumps and that no controlled dump be allowed five (5) years following the effectivity of the Act."* Figure 21 presents an infographic on waste management.

E. Land Use

Policies on land use recognize the need to protect the environment and its natural resources in view of the requirements of future generations. These are generally provided by (1) Presidential Decree 705 [14] or the Revised Forestry Code of the Philippines; and (2) RA 7586 or the NIPAS Act of 1992. The Revised Forestry Code generally provides for the protection, rehabilitation and development of forestlands. Similarly, the NIPAS Law seeks the establishment of a comprehensive system of integrated PAs (i.e., biologically important public lands including forest areas) ranging from large natural parks, to landscapes and seascapes, to wildlife sanctuaries and small watersheds, among others (Senga, 2001, 56).

The increasing demand for human settlement and other non-agricultural purposes has led to the indiscriminate conversion of productive agricultural lands and this, in turn, resulted in the opening of ecologically fragile lands or PAs (see Annex 2.11). Farmers, for example, encroach into vulnerable and marginal upland areas, including forestlands, for subsistence farming among others in order to augment the demand for food supply and increase income.

The presence of properly demarcated forestland boundaries is the starting point towards the resolution of many land use conflicts and one of the enabling factors to achieve the sustainable management of forest resources. The FMB already completed the delineation of forest line boundaries for 75 out of 80 provinces in the country. The remaining five (5) provinces of the Autonomous Region in Muslim Mindanao (ARMM) are still undergoing final review and evaluation by the National Assessment and Delineation Committee TWG. The draft bill on the said forestland delineation was already submitted to the Office of the Senate under the sponsorship of Senator Loren Legarda.

Figure 21. Infographic on waste management in the Philippines

F. Gender

There are important gender issues in the matter of access to and control over natural resources and climate-change-induced disasters. According to the PDP 2011–2016, the deteriorated state of the country's environment and natural resources is felt mostly by the poor who depend on such resources for their livelihood and are likely vulnerable to the unfavorable consequences of resource degradation and depletion. Climate change and risks from natural disasters only amplify the association between poverty and environmental degradation. The most vulnerable sectors are women, men, and children of poor and marginalized households and communities that depend on natural or ecological resources for their human development needs and security. They are involved in farming, fisheries, and forestry-based activities and livelihoods.

To address these concerns, gender considerations were integrated in both the National Climate Change Action Plan (NCCAP 2011-2028) and the National Disaster Risk Reduction and Management Plan (NDRRMP). Consistent with the National Framework Strategy on Climate Change, which was adopted in 2010, the NCCAP's ultimate goal is to "build the adaptive capacities of women and men in their communities, increase the resilience of vulnerable sectors and natural ecosystems to climate change and optimize mitigation opportunities towards gender-responsive and rights-based sustainable development." The Plan explicitly recognizes that certain activities cut across strategic priorities and sectors, including gender and development, information, education and communication (IEC), and capacity building. Specific gender-related activities have been identified in the NCCAP's seven strategic actions, namely: food security, water sufficiency, ecological and environmental stability, human security, climate friendly industries and services, sustainable energy, and knowledge and capacity development.

On the other hand, the NDRRMP outlines the activities aimed at strengthening the capacity of the national government and LGUs, together with partner stakeholders, to build the disaster resilience of communities and institutionalize arrangements and measures for reducing disaster risks, including projected climate risks, and enhancing disaster preparedness and response capabilities at all levels. Like the NCCAP, the NDRRMP recognizes that gender mainstreaming cuts across the four Disaster Risk Reduction and Management priority areas, namely: prevention and mitigation, disaster preparedness, disaster response, and recovery and rehabilitation (Philippine Commission on Women [PCW], 2014).

Chapter 2. Development Framework of the Philippines

In the pursuit of inclusive growth and poverty reduction, the Philippine government has outlined five major guideposts to pursue rapid and sustainable economic growth and development, improve the quality of life of the Filipino, empower the poor and marginalized and enhance our social cohesion as a nation.

The country's five major guideposts are embedded in the PDP that serves as the country's guide in formulating policies and implementing development programs from 2011 to 2016. The country's policies that contribute to biodiversity conservation in the Philippines and the responsible agencies handling their implementation are summarized in Chapter 3. This enables the Philippines to work systematically to give the Filipino people a better chance of finally finding their way out of poverty, inequality, and the poor state of human development.

Table 4. How PBSAP contributes to sector outcomes in PDP resulting to inclusive growth and poverty reduction

Sector Outcomes / Government's Five Major Guide Posts	**Chapter 4 Subsector Otcome 4a.** Productivity in Agriculture & Fisheries sector increased	**Chapter 4 Subsector Outcome 4c.** Sector resilience to climate change risks increased	**Chapter 6 Subsector Outcome 6a.** Health & nutrition status improved	**Chapter 7 Subsector Outcome 7a.** Transparency, citizens' participation & accountability increased	**Chapter 7 Subsector Outcome 7b.** Rule of law strengthened	**Chapter 9 Subsector Outcome 9a.** Adaptive capacities of human communities improved	**Chapter 9 Subsector Outcome 9b.** Sustainability managed natural resources achieved	**Chapter 9 Subsector Outcome 9c.** Environmental quality improved for a healthier & cleaner environment
Anti-corruption/ Transparent Governance					✓			
Poverty Reduction	✓	✓	✓			✓	✓	✓
Rapid, Inclusive & Sustained Economic Growth	✓	✓	✓	✓	✓	✓	✓	✓
Just and Lasting Peace and the Rule of Law				✓	✓		✓	
Integrity of the Environment and Climate Change	✓	✓	✓	✓	✓	✓	✓	✓

The PDP adopts a strategic development policy framework thus focuses on improving transparency and accountability in governance, strengthening the macro economy, boosting the competitiveness of our industries, facilitating infrastructure development, strengthening the financial sector and capital mobilization, improving access to quality social services, enhancing peace and security for development, and ensuring ecological integrity (NEDA, 2011). With good governance and anticorruption as the overarching theme of each and every

intervention, the Plan translates into specific goals, objectives, strategies, programs and projects all the things that the Philippines wants to accomplish in the medium term.

The Government's Five Major Guide Posts are supported by various sector outcomes in the PDP. The PBSAP is anchored to the PDP and will help accomplish sector outcomes of Chapters 4, 6, 7 and 9 to achieve the goal of inclusive growth and poverty reduction (see Table 4).

Nevertheless, NEDA, as lead agency in the formulation of the PDP, considers the PBSAP as a useful tool to ensure continuity of biodiversity related short/midterm strategies of the PDP in the next planning cycle thus sustain the benefits and gains from biodiversity conservation efforts. The succeeding medium term development plans should consider the set targets and interventions in the PBSAP.

PBSAP contributes to the sector outcome of Chapter 4 (Competitive and sustainable agriculture and fisheries) of the PDP by ensuring the effective management of terrestrial and marine PAs and the protection and restoration of ecosystem functions to sustain and improve productivity of our agriculture and fisheries sector thereby ensuring our food security and improving incomes. The PDP recognizes that the country's environment and natural resources are a means and an end in achieving inclusive growth. As a means, they provide the needed inputs and ecosystem services to sustain resource dependent communities and sectors, such as the agriculture and fisheries sector. As an end, the ENR bears both the positive and negative impacts of activities intended to accelerate economic growth.

The PDP will continue to pursue the strengthening of the management of natural resources through conservation, protection and rehabilitation to sustain ecosystem services in support of productive sectors. In pursuing efforts to achieve subsector outcome 4a, the PDP upholds the adoption of effective approaches to develop, rehabilitate and restore the natural resource base for agriculture and fisheries production to reduce the degradation and improve the quality of natural resources.

Likewise, it also contributes to the sector outcome of Chapter 6 (Social development) of the PDP by protecting areas that harbor high agrobiodiversity as nationally important agricultural heritage sites and promoting organic agriculture, home gardens and community-based seed banks.

The PBSAP supports Chapter 7 (Good governance and the rule of law) of the PDP by highlighting environmental governance through strict implementation of environmental laws and mainstreaming of biodiversity conservation into local development plans. Capacity building and increasing awareness are the responses of the PBSAP to achieve this sector outcome. Moreover, the PBSAP underscores multi-stakeholdership in protecting our biodiversity.

The PBSAP also complements the other existing national plans such as the NCCAP, Environmental Natural Resource Framework, Women's Empowerment, Development and Gender Equality Development Plan, National Action Plan to combat Desertification, Drought and Poverty, National Ecotourism Strategy, PNPRS, and Master Forestry Development Plan.

The PBSAP also serves as a safety net to protect the country's biodiversity in the pursuit of inclusive economic growth. The PDP adopts a neoliberal economic framework that relies on the gradual removal of barriers in the regulation of the market to promote inclusive growth, which is high growth that is sustained, generates mass employment, and reduces poverty.

The pursuit of economic growth is anchored on the principles of shared responsibility, good governance, participation, social and environmental justice, intergenerational space and gender equity, with people at the core of conservation, protection and rehabilitation, and developmental initiatives.

Anchored within the goals of the PDP, the PBSAP works towards the vision that by 2028, the Philippines' biodiversity is restored and rehabilitated, valued, effectively managed and secured, maintaining ecosystem services to sustain healthy, resilient Filipino communities and delivering benefits to all women and men.

Chapter 3. Policy, Governance and Financing of Biodiversity Conservation in the Philippines

As people become more vigilant about the state of the environment and insistent that offenders of environmental laws be held accountable, policy framework and governance of biodiversity in the Philippines are in place with the intent of protecting the environment and aid people from all walks of life in their pursuit to a balance and healthful ecology.

A. Policies that Contribute to Biodiversity Conservation in the Philippines

Policy	Pertinent Provisions/ Description	Responsible Agencies
Philippine Constitution	Article 2, Section 16. The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature. Article 12, Section 5. The State, subject to the provisions of this Constitution and national development policies and programs, shall protect the rights of indigenous cultural communities to their ancestral lands to ensure their economic, social, and cultural well-being.	
NIPAS Act of 1992 (RA 7586)	It provides the legal framework for the establishment and management of protected areas in the Philippines. It identified 202 initial components comprising of proclaimed national parks, game refuge and wildlife sanctuaries, nature reserves, wilderness areas, mangrove reserves, watershed reservations, fish sanctuaries, protected landscapes and seascapes.	DENR
Wildlife Resources Conservation and Protection Act of 2001 (RA 9147)	This law aims to conserve and protect wildlife species and their habitats for sustainability. It provides the conditionalities for the collection, possession, transport, export and/or import, registration, and introduction, reintroduction or restocking of wildlife species. It also lays down the basic requirements for the use of wildlife resources for bioprospecting, scientific researches and commercial undertakings as well as for botanical and zoological parks purposes. It establishes the Wildlife Management Fund; requires the establishment of National Wildlife Research Centers and Wildlife Rescue Centers; and, mandates the creation of Wildlife Traffic Monitoring Units and the deputation/designation of Wildlife Enforcement Officers who shall have the full authority to seize illegally traded wildlife and to arrest violators of the Act in conformity with existing laws, rules and regulations on arrest and detention. The Act is also the enabling legislation for the implementation of the rules and regulations of the CITES in the country.	• DENR – covers all terrestrial plant and animal species, all turtles and tortoises and wetland species, including but not limited to crocodiles, waterbirds and all amphibians and dugong. • DA – covers all declared aquatic critical habitats, all aquatic resources including but not limited to all fishes, aquatic plants, invertebrates and all marine mammals, except dugong. • Palawan Council for Sustainable Develppment (PCSD) – covers the province of Palawan
National Caves and Cave Resources Management and Protection Act of 2001 (RA 9072)	Caves and cave resources are part of the country's natural wealth. It mandates the DENR to formulate, develop and implement a national program for the management, protection and conservation of caves and cave resources.	DENR

Policy	Pertinent Provisions/ Description	Responsible Agencies
	The National and Regional Cave Committees oversee the implementation of the Act and its support policies.	
An Act to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing , Amending RA 8550 or the Philippine Fisheries Code of 1998 (RA 10654 of 2015)	The State shall ensure the attainment of the following objectives of the fishery sector: • Conservation, protection and sustained management of the country's fishery and aquatic resources; • Poverty alleviation and the provision of supplementary livelihood among municipal fisherfolk; • Improvement of productivity of aquaculture within ecological limits; • Optional utilization of offshore and deep-sea resources; and • Upgrading of post-harvest technology.	DA
The IPRA of 1997 (RA 8371)	It recognizes and promotes all the rights of ICCs/IPs of the Philippines. This law recognizes the ancestral land rights of the IPs (see Annex 2.12).	NCIP
Philippine Mining Act of 1995 (RA 7942)	All mineral resources in public and private lands within the territory and EEZ of the Republic of the Philippines are owned by the State. It shall be the responsibility of the State to promote their rational exploration, development, utilization and conservation through the combined efforts of government and the private sector in order to enhance national growth in a way that effectively safeguards the environment and protect the rights of affected communities.	DENR-MGB
Institutionalizing and Implementing Reforms in the Philippine Mining Sector (EO 79, s. 2012)	This produced the "No-go zone" map which states that applications for mineral contracts, concessions and agreements shall not be allowed in the following: a) areas expressly enumerated under Section 19 of RA 7942; b) protected areas categorized and established under the National Integrated Protected Areas System (NIPAS) under RA 7586; c) prime agricultural lands, in addition to lands covered by RA 6657, or the Comprehensive Agrarian Reform Law of 1988, as amended, including plantations and areas devoted to valuable crops and strategic agriculture and fisheries development zones and fish refuge and sanctuaries declared as such by the Secretary of the DA; d) tourism development areas, as identified in the National Tourism Development Plan; and e) other critical areas, island ecosystems, and impact areas of mining as determined by current and existing mapping technologies that the DENR may hereafter identify pursuant to existing laws, rules and regulations, such as, but not limited to, the NIPAS Act.	DENR - MGB
National Policy Agenda on Revitalizing Mining in the Philippines of 2004 (EO 270, s. 2004)	This recognizes that remediation and rehabilitation of abandoned mines shall be accorded as top priority to address the negative impacts of past mining in the country.	DENR - MGB
Philippine Clean Water Act of 2004 (RA 9275)	The law aims to protect the country's water bodies from land-based pollution sources (industries and commercial establishments, agriculture and community/household activities). It provides for a comprehensive and integrated strategy to prevent and minimize pollution through a multi-	DENR-Environmental Management Bureau (EMB)

Policy	Pertinent Provisions/ Description	Responsible Agencies
	sectoral and participatory approach involving all the stakeholders. Anyone discharging wastewater into a water body will have to pay a wastewater charge. This economic instrument will encourage investments in cleaner production and pollution control technologies to reduce the amount of pollutants generated and discharged.	
Philippine Ecological Solid Waste Management Act of 2000 (RA 9003)	It provides the legal framework for the country's systematic, comprehensive, and ecological solid waste management program that shall ensure protection of public health and the environment.	National Solid Waste Management Commission - oversees the implementation of solid waste management plans and prescribes policies to achieve the objectives of the Act. National Ecology Center – is under the National Solid Waste Management Commission and provides consulting, information, training and networking services for the implementation of the provisions of RA 9003. Pursuant to the relevant provisions of RA 7160 otherwise knows as the Local Government Code, the LGUs shall be primarily responsible for the implementation and enforcement of the provisions of the Act within their respective jurisdictions.
Revised Forestry Code of 1975 (PD 705)	This Act lays down the basic principles of forest management and conservation, makes provision for proper classification, management and utilization of public domain lands to maximize their productivity and meet the demands of the country's increasing population. The Revised Forestry Code of the Philippines also covers management on industrial tree plantations, tree farms and agro-forestry farms, forest protection of swamplands and mangrove forests. The Act also covers special uses of forest resources, such as grazing, wildlife, and recreation, and prescribes criminal offences, including unlawful occupation or destruction of forestlands and grazing lands.	DENR-FMB
Moratorium on the Cutting and Harvestiing of Timber in the Natural and Residual Forests and Creating the Anti-Illegal Logging Task Force (EO 23, s. 2011)	Apart from a number of exemptions to the moratorium on the cutting and harvesting of timber in natural forests, it provides for the implementation of a forest certification system in accordance with UN standards and a convergence program with other national agencies and the private sector to increase awareness, improve livelihoods and mobilize resources.	DENR - FMB
National Greening Program (EO 26 s. 2011)	This implements a National Greening Program as a government priority which aims to plant 1.5 billion trees covering 1.5 million hectares from 2011-2016 in forestlands,	DENR - FMB

Policy	Pertinent Provisions/ Description	Responsible Agencies
	mangroves and protected areas, ancestral domains, civil and military reservations, urban areas, inactive and abandoned mine sites and other suitable lands. This Order also enjoins participation of other government agencies, the private sector and civil society.	
Sustainable Forest Management (EO 318 s. 2004)	This pursues the sustainable management of forests and forestlands in watersheds. It adopts Community-Based Forest Management (CBFM) as the primary strategy in all forest conservation and development and related activities, including joint ventures, production sharing and co-production. It also provides for the proper valuation and pricing of forestry resources and financing sustainable forest management.	DENR - FMB
Delineation and Mapping of Protection and Production Forests (FMB Technical Bulletin No. 5, April 2014)	The objective of this bulletin is to provide reliable information on the relative locations of all production and protection forest areas in the country to help in the planning and application of appropriate management systems which are ecologically compatible, economically feasible and socially acceptable based on the biophysical and economic resources of the area. The output is a Production and Protection Forests Map based on thematic maps and existing/related laws, rules and regulations. Moreover, it will determine the relative locations of the protection and production forests on the ground that can be integrated with environment and development planning activities.	DENR - FMB
The Balance Fertilization Strategy of 1997 (Proclamation No. 1071)	This gives emphasis on management of crop residues, farm water recycling and an optimum combination of organic and inorganic fertilizers.	DA
Organic Agriculture Act of 2010 (RA 10068)	This Act provides for the following: 1) policy formulation on regulation, registration, accreditation, certification and labeling on organic agriculture; 2) research, development and extension of appropriate sustainable environment and gender-friendly organic agriculture; 3) promotion and encouragement of the establishment of facilities, equipment and processing plants that would accelerate the production and commercialization of organic fertilizers, pesticides, herbicides and other appropriate farm inputs; and 4) implementation of organic agricultural programs, projects and activities, including the provision and delivery of support services with focus on the farmers and other stakeholders.	DA
Amended Animal Welfare Act of 2013 (RA 8485/10631)	The purpose is to protect and promote the welfare of all terrestrial, aquatic and marine animals in the Philippines by supervising and regulating the establishment and operations of all facilities utilized for breeding, maintaining, keeping, treating or training of all animals either as objects of trade or as household pets including birds.	DA
Climate Change Act of 2009 (RA 9729) as amended by People's Survival Fund (RA 10174 of 2012)	The Act aims to systematically integrate the concept of climate change in the policy formulation and development plans of all government agencies and units, to the end that the government will be prepared for the impact of climate change. It provides long-term finance streams to enable the government to effectively address the problem of climate change.	CCC

Policy	Pertinent Provisions/ Description	Responsible Agencies
Philippine Disaster and Risk Reduction Management Act of 2010 (RA 10121)	The Act mainstreams disaster risk reduction and climate change in development processes such as policy formulation, socio-economic development planning, budgeting and governance, particularly in the areas of environment, agriculture, water, energy, health, education, poverty reduction, land use and urban planning and public infrastructure and housing	National Disaster Risk Reduction and Management Council
Environmental Awareness and Education Act of 2008 (RA 9512)	The Act promotes environmental awareness through environmental education and covers the integration of such in the school curricula at all levels, be it public or private, including day care, preschool, non-formal, technical, vocational, indigenous learning, and out-of-school youth courses or programs. It also declares November as the Environmental Awareness Month in the Philippines.	Department of Education (DepEd), Commission on Higher Education (CHED), Technical Education and Skills Development Authority, DSWD, DENR, DOST
Local Government Code of 1991(RA 7160)	Section 17 states that provinces can enforce forestry laws limited to community-based forestry projects, pollution control law, small-scale mining law, and other laws on the protection of the environment; and mini-hydro electric projects for local purposes.	Department of Interior and Local Government (DILG)
Urban Development and Housing Act of 1992 (RA 7279)	In relation to urban biodiversity, this Act provides for the rational use and development of urban land to bring about reduction in urban dysfunction particularly those that adversely affect public health, safety and ecology.	HLURB
Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990 (RA 6969)	The Act provides the legal framework to regulate, restrict or prohibit the importation, manufacture, processing, sale, distribution, use and disposal of chemical substances and mixtures that present unreasonable risk and/or injury to health or the environment; to prohibit the entry, even in transit, of hazardous and nuclear wastes and their disposal into the Philippine territorial limits for whatever purpose; and to provide advancement and facilitate research and studies on toxic chemicals.	DENR-EMB
Rules of Procedure for Environmental Cases	In April 2010, a Philippine legislature promulgated the Rules of Procedure for Environmental Cases ([9], a landmark instrument representing a significant reform in environmental litigation and protection. This laid down procedures governing the civil, criminal, and special civil actions in all trial courts regarding environmental cases, with a view to protecting and advancing the constitutional right of the people to health and to a balanced and healthful ecology, and providing a simplified, speedy, and inexpensive procedure for the enforcement of environmental rights under Philippines law. The Rules of Procedure for Environmental Cases empowers the courts to issue environmental protection orders as an immediate action to protect the environment and the communities affected. This also enables communities to petition for the suspension or stoppage of destructive, environmental and development activities through the Citizen's Suit provision.	Supreme Court

[9] Supreme Court of the Philippines (Accessed on 27 July 2014) Rules of Procedure for Environmental Cases A.M. No. 09-6-8-SC (Phil.) Retrieved from http://www.lawphil.net/courts/supreme/am/am_09-6-8-sc_2010.html.

B. International Commitments to Biodiversity Conservation

There are several international conventions and conferences of which the Philippines is either a signatory to the multilateral environmental agreements (MEA) of the conventions or a participating party to the international conferences. The Philippines is a signatory to the MEAs that include the CBD, Framework Convention on Climate Change (FCCC) and the Convention to Combat Desertification (CCD). With these international conventions, the Philippines has legal obligations to develop its national strategies and plans for its fulfillment of the objectives of the conventions.

Commitment	Pertinent Provisions/ Description
Convention on Biological Diversity	The Philippines with 154 other states and the European Union (EU) have signed the CBD in June 1992 during the Earth Summit in Rio de Janiero. The Philippine Senate ratified the Philippine membership to the CBD on October 8, 1993. The key objectives of the CBD, namely, conservation and sustainable use of biodiversity and the fair and equitable sharing of benefits from the utilization of genetic resources and associated traditional knowledge is carried out by the DENR and other key agencies through the following: a) for conservation, through the establishment of PAs in terrestrial and marine ecosystems including those that are set up under the NIPAS Act or RA 7586; b) for sustainable use, through various AOs that mandate this approach towards the utilization of the country's biodiversity which are carried out by the various bureaus of the DENR, including that of the LGUs, other key agencies and specialized agencies; c) for the fair and equitable sharing of benefits arising from the use of genetic resources, through the provisions of the Wildlife Act on bioprospecting and the administrative regulations (DENR-DA-PCSD-NCIP AO No. 1, Series of 2005, and the 2004 Wildlife Act Implementing Rules and regulations) that lay down the ways in which scientific and commercial researches on Philippine genetic resources and associated traditional knowledge are carried out including the ways in which the FPIC of the appropriate authorities are secured. The NCIP, under its mandate from the IPRA supervises the procedures on which the FPIC of IPs are secured, including on researches that involve indigenous knowledge systems and practice of IPs in the Philippines. The Philippines is currently exerting efforts to accede to the Nagoya Protocol on Access and Benefit-Sharing while undertaking reform measures to improve the coordination of key implementing agencies on access and benefit-sharing from the utilization of the country's biological and genetic resources and associated traditional knowledge.
Convention on Wetlands, known as the Ramsar Convention	The Ramsar Convention on Wetlands is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It is the only global environmental treaty that deals with a particular ecosystem. As a contracting party to the Convention, the Philippines has updated and implemented the National Wetlands Action Plan that provides the framework to conserve Philippine wetlands; designated two (2) additional wetlands of international importance (Las Pinas-Paranaque Critical Habitat and Ecotourism Area and Puerto Princesa Subterranean River National Park); identified 7 potential Ramsar sites in Luzon (Canarem Lake, Candaba Swamp, Dunoy Lakes, Lalaguna Marsh, Malasi Lake, Pantabangan Dam, Taal Lake); updated the information of all designated Ramsar sites; and organized an interim National Wetland Committee.
Convention on Migratory Species (CMS)	Adopted in 1979 and entered into force in 1983, the CMS aims to build and strengthen global conservation efforts for migratory species in the air, on land, and in the seas. CMS, also known as the Bonn Convention, is an international and intergovernmental treaty backed by the United Nations Environmental Programme. The Philippines is a member of CMS since 1994 and has been implementing measures such as:

Commitment	Pertinent Provisions/ Description
	• Dialogue with fishefolk to eradicate problems related to migratory birds (e.g. tufted duck (*Aythya fuligula*), migratory birds that travel seasonally between the breeding and overwintering grounds. • Strengthen enforcement activities in Balabac Straits and in Baguan Island (one of the islands of the Turtle Islands) to address direct capture of sea turtles. The Balabac Srait and Turtle Islands Heritage Protected Area (TIHPA) are the two areas where foreign poachers were usually caught. A Philippine plan of action covering the two areas was drafted by concerned agencies and national government organizations in 2009. Further, a Philippine-Malaysia plan of action covering Balabac Strait and TIHPA was also drafted in 2009, and the document was discussed in the 7th Philippine-Malaysia Joint Commission Meeting held on 14-15 April 2011[10] .
United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)	In September 2007, the UN General Assembly adopted the Declaration on the Rights of Indigenous Peoples. The document emphasizes the rights of IPs to maintain and strengthen their own institutions, cultures and traditions to pursue their development in keeping their own needs and aspirations. This declaration addresses both individual and collective rights, cultural rights and identity, rights to education, health, employment, language, and others. It also asserts that indigenous peoples and individuals have the right to be free from any kind of discrimination in the exercise of their rights. In 2008, a national conference of IPs was held in the Philippines and consequently a national network mandated towards the effective implementation of the UN Declaration in the country was established. The workshop discussed how the international mechanisms work in relation to the UN declaration and to come up with realistic strategies on how to promote its implementation. The UNDRIP has unofficial translation in “bisaya”, a language widely spoken in the Philippines that can be accessed from the UN site[11].
Cartagena Protocol	In 2006, the Philippines ratified the Cartagena Protocol, a supplementary agreement to the CBD that seeks to protect biodiversity from the potential risks posed by genetically modified organisms (GMO) resulting from modern biotechnology. Implementation of the Protocol entails the cooperation of various stakeholders, including those from government such as the DENR, DA, DOST and the Department of Health (DOH). In the same year, EO 514 establishing the National Biosafety Framework (NBF) of the Philippines was issued providing guidelines for its implementation, strengthening the National Biosafety Committee of the Philippines and for other purposes. Along with other regulations, the NBF is expected to support implementation of the Protocol.
International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)	The Philippines also ratified the ITPGRFA in 2006. The objectives of the Treaty are similar to that of the CBD but focus on plant genetic resources important to food and agriculture. Ex situ collections of important germplasm have been assembled and maintained since the early 1900s. There are 45 government and CSOs that hold ex situ germplasm collections in the Philippines totaling 173,205 accessions. A total of 40 percent of the total collection has been characterized morphologically, 7 percent biochemical properties, 3 percent on molecular properties, and 60 percent had been evaluated for insect pest and pathogen reaction, physiological and abiotic stress reaction and product quality. Major ex situ needs include funding, staff, equipment and facilities. There is adequate to strong capacity in plant breeding in the public and private sectors[12].

[10] Philippines, CMS National Report (2011)
[11] United Nations Permanent Forum on Indigenous Issues
[12] DA-Bureau of Plant Industry [BPI], January 2007

Commitment	Pertinent Provisions/ Description
Convention on International Trade in Endangered Species of wild flora and fauna (CITES)	This is an international agreement between governments that aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES works by subjecting international trade in specimens of selected species to certain controls. All import, export, re-export and introduction from the sea of species covered by the Convention have to be authorized through a licensing system. The DENR through the BMB, DA-BFAR and the PCSD are the CITES Management Authorities in the country, while the ERDB, UP Marine Science Institute (MSI), UP Visayas and Silliman University are the Philippines' CITES' Scientific Authorities. From 2005 to 2013, the monitoring conducted by the DENR field staff under its Philippine Raptors Conservation Program yielded an increase in sightings of critically endangered Philippine Eagles in the wild. However, this number is not reflective of an increase or decrease in population. Conservation and protection efforts were boosted with the discovery of Philippine Eagles in various locations in Apayao from 2011-2013, rediscovery of the species in Burauen, Leyte in December 2012, and successful breeding and hatching in December 2013 of a new eaglet "Atbalin," the 4th offspring of a pair of Philippine Eagles in the wild in Zamboanga del Norte[13].
International Plant Protection Convention (IPPC)	The International Plant Protection Convention (IPPC) is an international plant health agreement, established in 1952, that aims to protect cultivated and wild plants by preventing the introduction and spread of pests. Contracting parties to the IPPC share the same goal: to protect the world's cultivated and natural plant resources from the spread and introduction of plant pests while minimizing interference with the international movement of goods and people. The IPPC provides an international framework for plant protection that includes developing International Standards for Phytosanitary Measures (ISPMs) for safeguarding plant resources. The IPPC also provides information exchange related to import and export requirements, pest status and regulated pest lists provided by each member country. the Convention encourages support to developing countries to improve the effectiveness of their National Plant Protection Organizations (NPPOs) and to participate in regional plant protection organizations, to help them realize the benefits of safe trade.
World Heritage Convention (WHC)	The World Heritage Convention sets out the duties of States Parties in identifying potential sites and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The States Parties are encouraged to integrate the protection of the cultural and natural heritage into regional planning programmes, set up staff and services at their sites, undertake scientific and technical conservation research and adopt measures which give this heritage a function in the day-to-day life of the community. The Convention stipulates the obligation of States Parties to report regularly to the World Heritage Committee on the state of conservation of their World Heritage properties. These reports are crucial to the work of the Committee as they enable it to assess the conditions of the sites, decide on specific programme needs and resolve recurrent problems. It also encourages States Parties to strengthen the appreciation of the public for World Heritage properties and to enhance their protection through educational and information programmes.

[13] Philippines, Fifth National Report

C. Governance of Biodiversity in the Philippines

The National Capacity Self-Assessment Report (2005) revealed that the poor coordination among the focal point agencies (FPAs) of the Rio Conventions have led to duplication of tasks, wastage of physical and financial resources, including loss of synergy and complementation in implementing the common tasks related to fulfilling country obligations to MEAs. It was realized that apart from the lack of feedback and monitoring mechanism among MEA FPAs, there is no mechanism to ensure that the country position in one Conference of Parties (CoP) is not in conflict with the country position in another CoP. There is also no mechanism to ensure that the Philippines' commitments at the international level are disseminated and applied at the local level.

As such the UNDP-GEF-assisted project entitled "Strengthening Coordination for Effective Environmental Management" has brought together the FPAs of CBD, FCCC and CCD including relevant national government agencies under a National Technical Coordinating Committee (NTCC). Instead of creating a new committee, the Committee on Conservation and Management of Resources for Development (CCMRD) under the Philippine Council for Sustainable Development was re-activated and strengthened to serve as the NTCC for MEAs. This was by virtue of Philippine Council for Sustainable Development Resolution 2011-01 issued last March 2011. The Philippine Council for Sustainable Development -CCMRD was identified as the most ideal institutional mechanism for MEA mainstreaming because of its existing mandate to establish guidelines and mechanisms to expand, concretize and operationalize sustainable development principles as embodied in the Rio Declaration, Agenda 21, the National Conservation Strategy, and Philippine Agenda 21 instituted under EO 15. Furthermore the concerns of the four (4) Sub-Committees under the Philippine Council for Sustainable Development -CCMRD, namely the Sub-Committee on Biodiversity, Sub-Committee on Atmosphere, Sub-Committee on Land Resources and Sub-Committee on Water Resources, are highly responsive to the thematic concerns of the Rio Convention. The reactivated CCMRD as NTCC for MEAs has adopted its previous member agencies under EO 370 with additional member agencies such as the HLURB, the Department of Foreign Affairs (DFA), the Leagues of Municipalities, Cities, and Provinces of the Philippines (LMP/LCP/LPP), DepEd, CHED, and the NCIP.

The current structure of CCMRD is illustrated in Figure 22.

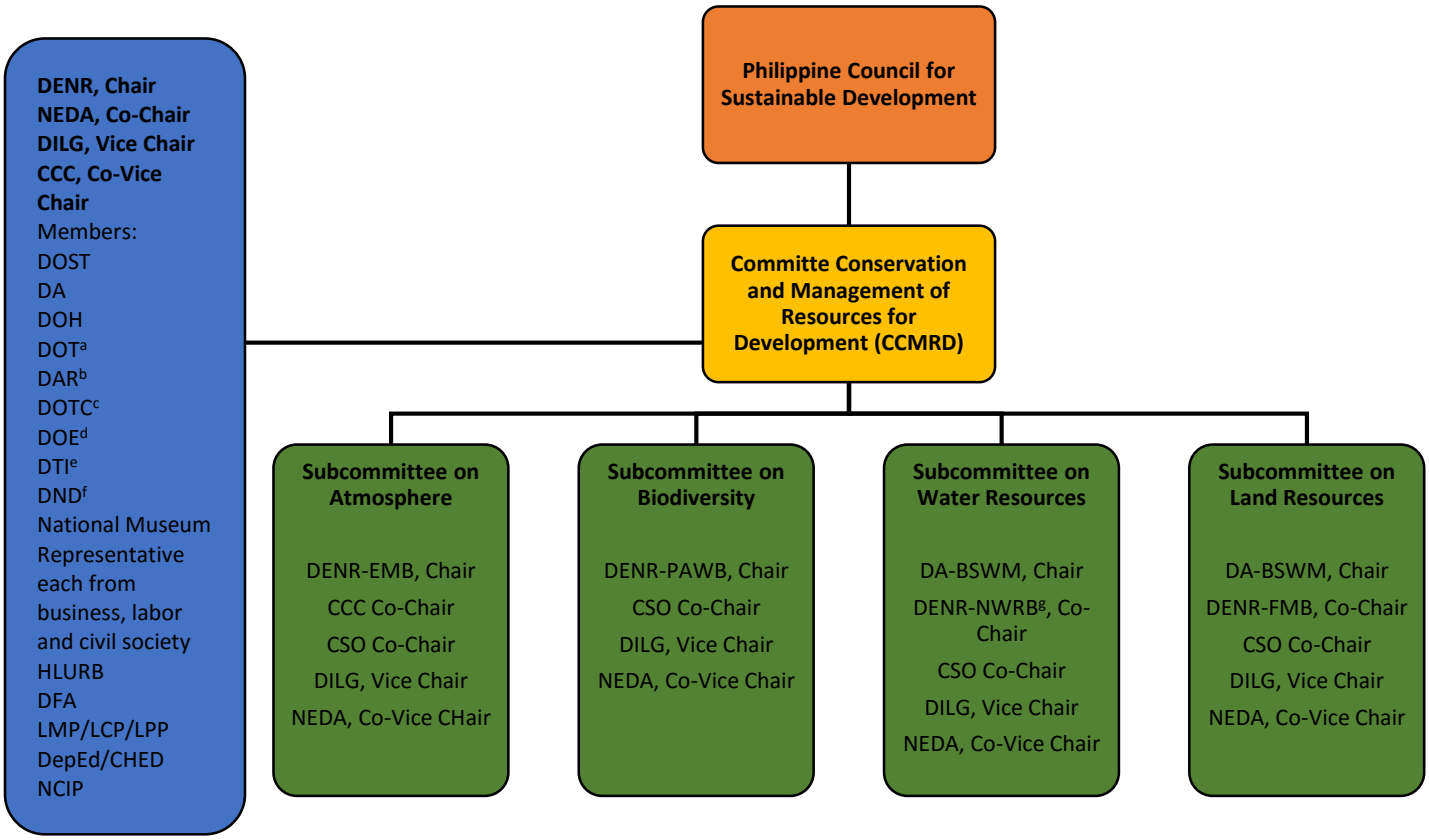


Figure 22. Current Structure of CCMRD

Notes: [a]*Department of Tourism*
[b]*Department of Agrarian Reform*
[c]*Department of Transportation and Communication*
[d]*Department of Energy*
[e]*Department of Trade and Industry*
[f]*Department of National Defense*
[g]*National Water Resources Board*

Table 5 lists the technical agencies with key resource management functions, agencies using and supporting ecosystems services, planning and accountability agencies, local governments and associated bodies and the interface between government and non-government sector, community institutions, citizen networks and business sector.

Table 5. Technical Agencies with Key Resource Management Functions and Programs

Agency	Functions and Programs
DENR • Forest Management • Lands Management • Mines and Geo-Sciences • Environmental Management • Ecosystems Research and Development • Biodiversity Management	To conserve, manage, develop, and properly use the country's environment and natural resources, specifically forest and grazing lands of the public domain; as well as license and regulate all natural resources to ensure equitable sharing of the benefits derived therefrom for the welfare of the present and future generations of Filipinos.
DA - BPI	To conserve and develop Philippine plant genetic resources and protection and development of the plant industry.
DA - BFAR	To improve fisheries productivity within ecological limits and empower stakeholders towards food security, inclusive growth global competitiveness and climate change adaptation.
NCIP	To recognize and promote all the rights of ICCs/IPs.

Agency	Functions and Programs
Agencies Using and Supporting Ecosystems Services	
DOST- PCAARRD	To promote science and technology as a platform for agriculture, aquatic and natural resources products innovation and environment resiliency.
DOST	To lead and coordinate scientific and technological efforts and ensure that the results are geared and utilized in areas of maximum economic and social benefits for the people.
	To uphold the right of every Filipino for better health through the provision of safe, effective and affordable traditional and alternative health care products, services and technologies. One of its functions is to formulate policies for the protection of indigenous and natural health resources and technology from unwarranted exploitation.
Agencies on Planning, Monitoring and Accountability	
NEDA	To formulate development plans and ensure that plan implementation achieves the goals of national development. Chapter 9 of the PDP[14] discusses sustainable and climate-resilient environment and natural resources.
DBM	To ensure the equitable, prudent, transparent and accountable allocation and use of public funds to improve the quality of life of each and every Filipino through public expenditure management.
CCC	To coordinate, monitor and evaluate government programs and ensure mainstreaming of climate change in national, local, and sectoral development plans towards a climate-resilient and climate-smart Philippines.
Commission on Audit (COA)	To examine, audit, and settle all accounts pertaining to the revenue and receipts of, and expenditures or uses of funds and property, owned or held in trust by, or pertaining to, the Government, or any of its subdivisions, agencies, or instrumentalities, including government-owned or controlled corporations with original charters.
Institutional Framework	
LGUs	• Province: (1) to acquire and transfer of real and personal properties, 2) to engage into contracts, including those incurring obligations, which are expressly provided by law; and 3) to exercise such other rights and incur such other obligations as are expressly authorized by law. • Cities: (1) to levy and collect taxes in accordance with law; 2) to enact ordinances; 3) to provide for public works constructions and for the maintenance of a local police force; 4) to establish fire zones within the city and to regulated the type of building which may be constructed within each zone; and 5) to provide for the protection of the inhabitants from public calamities and to provide relied in times of emergency. • Municipalities and Barangays: May organize fire brigades, organize groups of citizens to fight criminality and approve all payments from barangay funds. Associated bodies: • Local Special Bodies and Local Task Forces • Inter – LGU coalitions (Watershed, Bays) • Leagues of Local Governments • Leagues of Local Government Professionals
Interface between Government and Non-Government Sector	
• Regional Development Councils (RDC) • PAMB • Local Multi-Sectoral Task Forces such as Fisheries and Aquatic Resources Management Council, Bantay Gubat, Bantay Dagat, watershed networks/councils, Solid Waste Task Forces	
Community Institutions /Citizen and Business networks • Tribal Councils • POs • Citizen Networks, CSOs • Business Chambers	

[14] The Philippine Development Plan 2011-2016

The Philippines' DA has promulgated various policies that are aligned with the CBD objectives of conservation, sustainable use, and fair and equitable sharing of the benefits arising out of the use of genetic resources. In 2005, EO 481 mandating the establishment and implementation of a National Organic Agriculture Program by the National Organic Agriculture Board was issued. This was followed two years after by EO 29 or the DA-Sustainable Agriculture Development Program, which is implemented in partnership with the Catholic Bishops Conference of the Philippines-National Secretariat for Social Action-Justice and Peace.

Moreover, provincial LGUs are encouraged to pass local resolutions to further strengthen these national policies. The provinces of Bohol, Negros Oriental and Occidental, and Marinduque are some of the provinces that have resolutions to support organic farming and sustainable agriculture and, in some cases, ban the entry of GMOs into their areas.

The DA, through its different agencies and bureaus, also undertakes several projects and researches aimed at conserving and promoting sustainable use of agrobiodiversity. The BPI has a project promoting indigenous crops through techno-demo farms, while the Bureau of Agriculture and Fisheries Products Standards, Bureau of Agricultural Research, and Bureau of Soils and Water Management (BSWM) are also embarking on projects and researches on organic and/or sustainable agriculture. For the country's animal genetic resources, the Bureau of Animal Industry (BAI) implements several activities to improve cattle, swine, and small ruminant genetics. It also developed strategies for genetic improvement such as the Unified National Artificial Insemination Program that synchronizes all breeding programs and activities to carry out genetic improvement in large ruminants through artificial insemination. Researches by BAI include the characterization of different strains of Philippine native goats through electrophoresis and other research and development directed towards the establishment of a policy environment that would promote development of the local carabao industry, among others (BAI, 2003). The DA also collaborates with the DOST- PCAARRD on many of the aforementioned projects and researches. To a certain extent, agricultural biodiversity considerations have been included in the country's socio-economic blueprint, the Medium-Term Philippine Development Plan 2004-2010. The Philippines' own Ifugao Rice Terraces was included as one of the pilot sites in the FAO project on Globally Important Agricultural Heritage Systems (GIAHS). The project aims to establish the basis for global recognition, conservation and sustainable management of such systems and their associated landscapes, biodiversity, knowledge systems and cultures. Aside from heritage conservation, the GIAHS project will also conserve and manage biodiversity in the form of traditional agricultural systems practiced in the site thus complementing the CBD objectives.

D. Financing Biodiversity Conservation Programs in the Philippines

The main sources of financing for biodiversity programs in the Philippines are:

- Government
  - National
  - Local
  - Special Funds (e.g. User fees)
- Official Development Assistance (ODA) (loans, grants, small grants)
- Emerging/innovative financing schemes
  - PES
  - Corporate Social Responsibility (CSR)
  - Volunteer resources

The DENR's budget for biodiversity programs and initiatives has increased from PhP13, 996,243,000 (2012), PhP18,044,310,002 (2013) to PhP19,833,652,000 in 2014 (DENR, 2013). However, this amount only represents one percent of the Philippines' total government budget (see Figures 23 and 24).

The increase in budget is attributed to the development of new programs such as ecotourism which is implemented together with the DOT and concerned agencies as part of the Program Budgeting Approach of the DBM. Likewise, BMB was successful in obtaining funding for its Sustainable Coral Reef Ecosystem Management Program, a priority program developed in 2013. Funding for PA protection was also increased in 2014.

Opportunities for increased biodiversity conservation funding came with the passage of RA 10629 (An Act Providing for the Retention by the Protected Area Management Board of 75 percent of the Revenues Accruing to the Integrated Protected Areas Fund) which provides for better and more direct access by PAs to revenues generated by them. The development of sustainable financing mechanisms (i.e. user fees, PES) for important sites was also prioritized. Partnerships were underscored and strengthened such as the "Adopt a Wildlife" scheme wherein incentives are provided to private corporations that support programs on threatened species.

It is worthwhile to mention that the two previous NBSAPs were not costed, thus, it is difficult to ascertain which programs were funded and which were not. Nevertheless, upon a quick review, some funding was provided to several actions (CHM maintenance, research, expansion of PAs, establishment of critical habitats, biodiversity monitoring, capacity building of PA managers, communication, education & public awareness (CEPA) and baselining of unique ecosystems) but may have not been enough to achieve the outcomes that the previous plans have targeted.

DENR is also a recipient of ODA funds. For CY 2013, the total project cost for all active ODA loans amounted to PhP 562.19 billion, with the local counterpart amounting to PhP147.03 billion or 26 percent. From this portfolio, a total of 18 programs and projects (loans and grants) amounting to PhP95.972 billion were identified to have components with climate change strategies/interventions and disaster risk reduction wherein DENR serves one of the implementing agencies.

As an example, the ICRM Project of DENR/WB attained an overall physical accomplishment of 85.09 percent, while financial performance is 72 percent. The physical accomplishment per component included policy and institutional strengthening and development (100%), ICRM and biodiversity conservation (97%), enterprise development and income diversification (94%) and social and environmental services and facilities (87%) (NEDA, 2013).

The DENR's 2013 budget is found on the figures below:
NOTE: 1 USD = 44.43 PHP (Bloomberg Currency Exchange April 16, 2014)

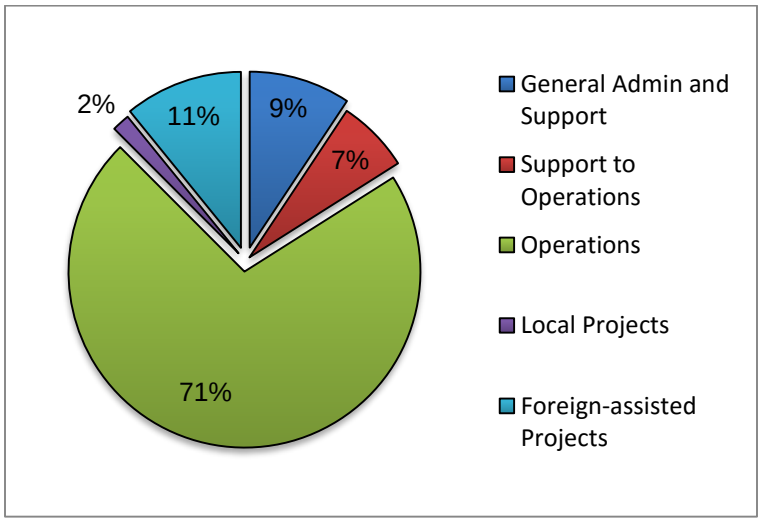


Figure 23. DENR Budget in 2013

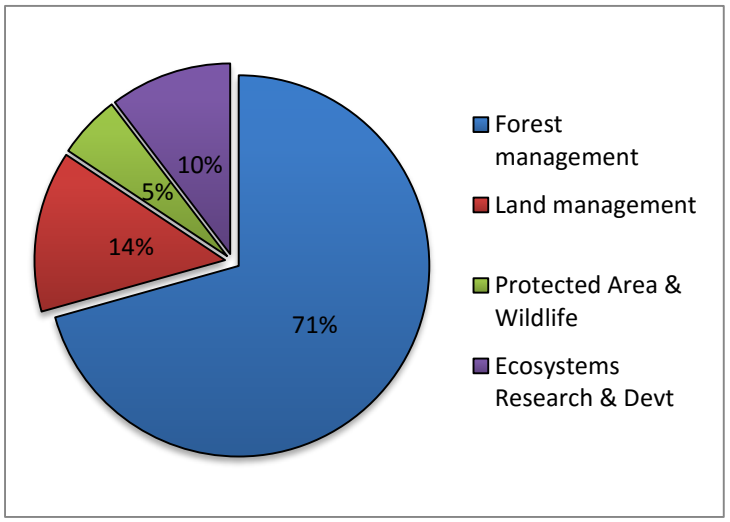


Figure 24. DENR Operations Budget in 2013

E. Interface of Multilateral environmental agreements

In February 2016, the CBD conducted a workshop on "Synergies among the Biodiversity-related Conventions" in response to decision XI/6 of the CoP to pursue efforts to enhance synergies among the biodiversity-related conventions[15] to promote policy coherence, improve efficiency and enhance coordination and cooperation at all levels and with a view to strengthening Parties' ownership of the process.

The thematic areas for enhanced synergies include the following:

a. the global Strategic Plan for Biodiversity 2011-2020, the Aichi Biodiversity Targets and NBSAPs;
b. institutional arrangements and coordination mechanisms;
c. information and knowledge management;
d. national reporting, monitoring and indicators;
e. communication and awareness raising;
f. science-policy interface;
g. capacity building; and
h. resource mobilization and utilization.

At the national level, efforts have been made to include the PBSAP targets into the country's commitments to the SDGs. By doing so, these targets can be mainstreamed into the national, regional and local development plans and implemented through current institutional and coordination mechanisms.

The BMB, acting as Secretariat to the PBSAP implementation, and in coordination primarily with the CBD, will formulate guidance and courses of action to ensure implementation of the biodiversity-related conventions in an increasingly coherent manner, involving greater collaboration and cooperation among convention parties, convention secretariats and key partners, leading to more efficiency and effectiveness in achieving the aims of those conventions; and, second, increased collaboration and cooperation in the implementation of the biodiversity-related conventions at all levels, facilitated engagement with other sectors, and improved opportunities for mainstreaming biodiversity objectives into other policies and sectors (including through the United Nations development assistance frameworks and in furtherance of the Sustainable Development Goals).

[15] The biodiversity-related conventions are: Convention on Biological Diversity, Convention on the Conservation of Migratory Species of Wild Animals, Convention on International Trade in Endangered Species of Wild Fauna and Flora, International Plant Protection Convention, International Treaty on Plant Genetic Resources for Food and Agriculture, Ramsar Convention on Wetlands and the World Heritage Convention.

Chapter 4. Principal Pressures of Biodiversity Loss

Five major pressures of biodiversity loss (see Figure 25) were identified from a problem tree analysis that was conducted during the regional and national consultations with various sectors *(see Chapter 5- How the current PBSAP was formulated).* The six regional and national consultations provided a large amount of information on biodiversity threats, good practices and successful strategies, proposed actions, and indicators.

Main Pressures of Biodiversity Loss in the Philippines

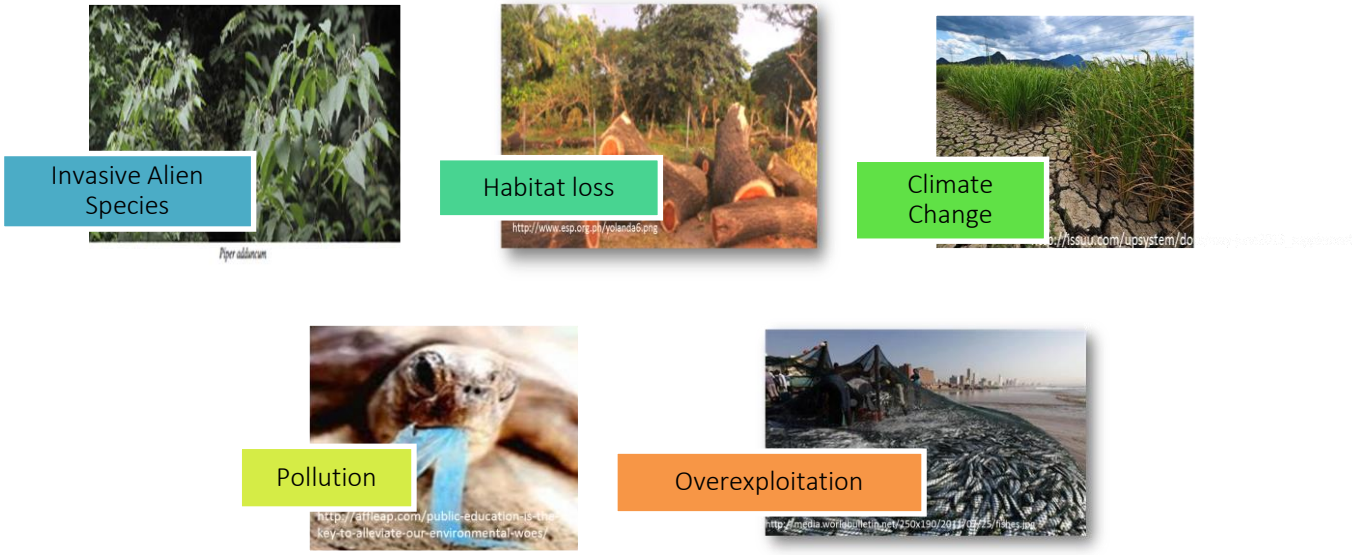


Figure 25. Main Pressures of Biodiversity Loss in the Philippines

Mind mapping of pressures of biodiversity loss linking the information to causes-effects; locating the information in time, space, and social sectors and levels of governance were conducted during the regional and national consultations. These biodiversity threats were analyzed and classified as principal pressures, or forces that adversely affect (such as pollution emissions or land use changes) and can induce changes in the environment.

As a result, habitat loss and degradation, overexploitation, pollution, climate change and IAS were identified as the main pressures of biodiversity loss in the Philippines.

A. Habitat Loss and Degradation

Of the various processes leading to biodiversity loss, the most notorious is habitat destruction (Pimm and Raven, 2000), an environmental process that renders habitats unsuitable to support species. Considering that tropical forests are the key habitats, habitat loss due to deforestation is a major driver of biodiversity loss in the country.

1. Deforestation

In the Philippines, some of the direct causes of deforestation are logging, conversion to other uses, *kaingin* or slash-and-burn cultivation, forest fire and other natural phenomena such as pests and diseases and natural calamities. Apart from its impact on biodiversity, deforestation can directly affect human well-being.

Deforestation has resulted in increasing frequency and intensity of floods and droughts, erosion, landslides, siltation of coral reefs and decreased groundwater supplies (Heaney et. al., 1998)(see Annex 2.13).

Indeed, forest ecosystems provide important goods and services for human livelihoods and environmental health. These are called provisioning services which include both consumptive and non-consumptive in nature such as water, energy, agricultural/forest products and genetic material. Regulating services, on the other hand, pertain to ecological or life support services provided by the forest ecosystem. These include services such as carbon sequestration and soil erosion control. At the same time, forests are important biological reserves that can detect and modulate regional climate change patterns as well as moderate the occurrence of infectious diseases (Beniston, 2003; Foley et al., 2007). Forest ecosystems also store terrestrial carbon in biomass and soils interacting in the carbon cycle between air and land. Non-market goods which are rarely valued such as cultural benefits are categorized under cultural services.

Figure 26 highlights areas where forest cover loss has occurred between 2000 and 2012 (Hansen et al., 2013). Figure 27 shows relation of biomass carbon (Saatchi et al., 2011), illegal logging[16] and wildlife confiscation[17] hotspots to areas of importance for biodiversity[18], which may therefore be particularly important natural habitat. Conserving forests can help in protecting carbon stocks and so climate change mitigation. Additionally, there is evidence that biodiversity can play a role in maintaining the resilience of carbon and ecosystems (including three literature reviews: Elmqvist et al., 2003; Miles, et al., 2010; and Thompson et al., 2012).

2. Mining

The Philippines is said to host one of the world's biggest deposits of undiscovered minerals, especially of gold and copper (Herrera, 2012). Mineral reserves are estimated at about 7.1 billion tonnes of 13 known metallic and 51 billion tonnes of 29 non-metallic minerals, many of which are located in areas of rich biodiversity and within ancestral domains of IPs (Alyansa Tigil Mina [ATM], 2011). For 2012, the MGB-DENR expects US$ 2.27 billion of foreign investment in mining (Herrera, 2012). Between 2004 and 2011, thirty-two mining projects were pipelined and more than 2,000 applications for mining contracts and exploration permits were filed (ATM, 2011). Moreover the Philippines also depends on geothermal, coal, and oil for its energy needs (see Figure 28).

EO 79 enacted in 2012 provided guidelines to ensure environmental protection and responsible mining. It enumerates the following as no-go areas for mining: a) areas expressly enumerated under Section 19 of the Mining Act; b) PAs categorized and established under NIPAS; c) prime agricultural lands in addition to lands covered under the Comprehensive Agrarian Reform Law including plantations and areas devoted to valuable crops, and strategic agriculture and fisheries development zones and fish refuge and sanctuaries declared as such by the Secretary of the DA; d) tourism development areas, as identified in the National Tourism Development Plan; and, e) other critical areas, island ecosystems, and impact areas of mining as determined by current and existing mapping technologies, that the DENR may hereafter identify pursuant to existing laws, rules, and regulations, such as, but not limited to, the NIPAS Act.

A number of mining projects, however, have been alleged to cause forest degradation, physical displacement of IPs, and cultural dislocations (see Annex 2.14). DINTEG-Cordillera Indigenous Peoples Legal Center (2010) has noted that the mining operations of Lepanto Consolidated Mining Company have caused landslides in the mining operated areas in Mankayan, Benguet Province. Reports claimed that some communities have lost entire mountainsides, burial sites and hunting grounds to ground collapse and deep open pits. The operations have seriously jeopardized the Abra River with widespread erosion and siltation.

[16] Digitized from data provided by Forest Management Bureau-DENR as cited in Osti. Et al., 2014
[17] Data from Wildife Resources Division of BMB-DENR
[18] KBAs of the world including Important Bird Areas (IBAs) and Alliance for Zero Extinction sites (AZEs) compiled by BirdLife International and Conservation International (October 2012).

The same report documented that many of the natural water sources in Itogon and Mankayan have been privatized by mining companies. Environmental investigations such as Environmental Investigative Missions have revealed that, inter alia, heavy metal content and other toxic substances were elevated in the soil and waters, causing the deterioration of aquatic life and loss of flora and fauna. The loss of aquatic life is a major change in the life support system of the communities that rely on the river for daily sustenance. Not only are livelihood sources affected, the general biodiversity is also damaged (Asia Indigenous People's Pact, 2012).

Furthermore, mining affects the strong cultural ties of indigenous communities and leads to the loss of their culture and identity (Brawner Baguilat, 2011).

In 2015, the Nevada Supreme Court heard a nearly 10-year-old state lawsuit filed by the Philippine island province of Marinduque for contamination it endured from a 1996 mining waste disaster involving Barrick Gold Corporation. Among damages for which the province is seeking compensation include tailing dam failures in 1993 and 1996 that sent contaminated mine waste into a river, leaving two children dead, and the repercussions of decades of copper and gold mining on the island. The lawsuit alleges the river leading up to Boac, Marinduque's capital city, was polluted with tons of waste laden with arsenic, nickel, sulfate and lead among other chemicals (Constante, 2015).

The PBSAP recognizes the existing mining tenements. Thus, it will be proactive in terms of engaging mining companies in biodiversity conservation. Some of the actions that have been identified include: a) formulation of guidelines to incorporate biodiversity conservation in the allocation of the 1.5% of operating cost of mining companies for their social development management program, Environmental Protection and Enhancement Program and Final Mine Rehabilitation/Decommisioning Program Plan; b) existing mining companies will be encouraged to allocate at least 5 percent of the same forest/habitat (all forms of habitat)type within their concessions for strict protection (no-go areas in mining areas) and c) for new mining applications, designation of at least 5 percent of the same forest/habitat type within their concessions for strict protection (no-go areas in mining areas).

Policy actions such as the passage of the National Land Use Act may address the threats of mining as well as the mainstreaming of biodiversity conservation into national and local plans. Figure 28 shows the locations of existing mining tenements, coal plants, geothermal plants and petroleum service contracts in the Philippines with reference to PAs.

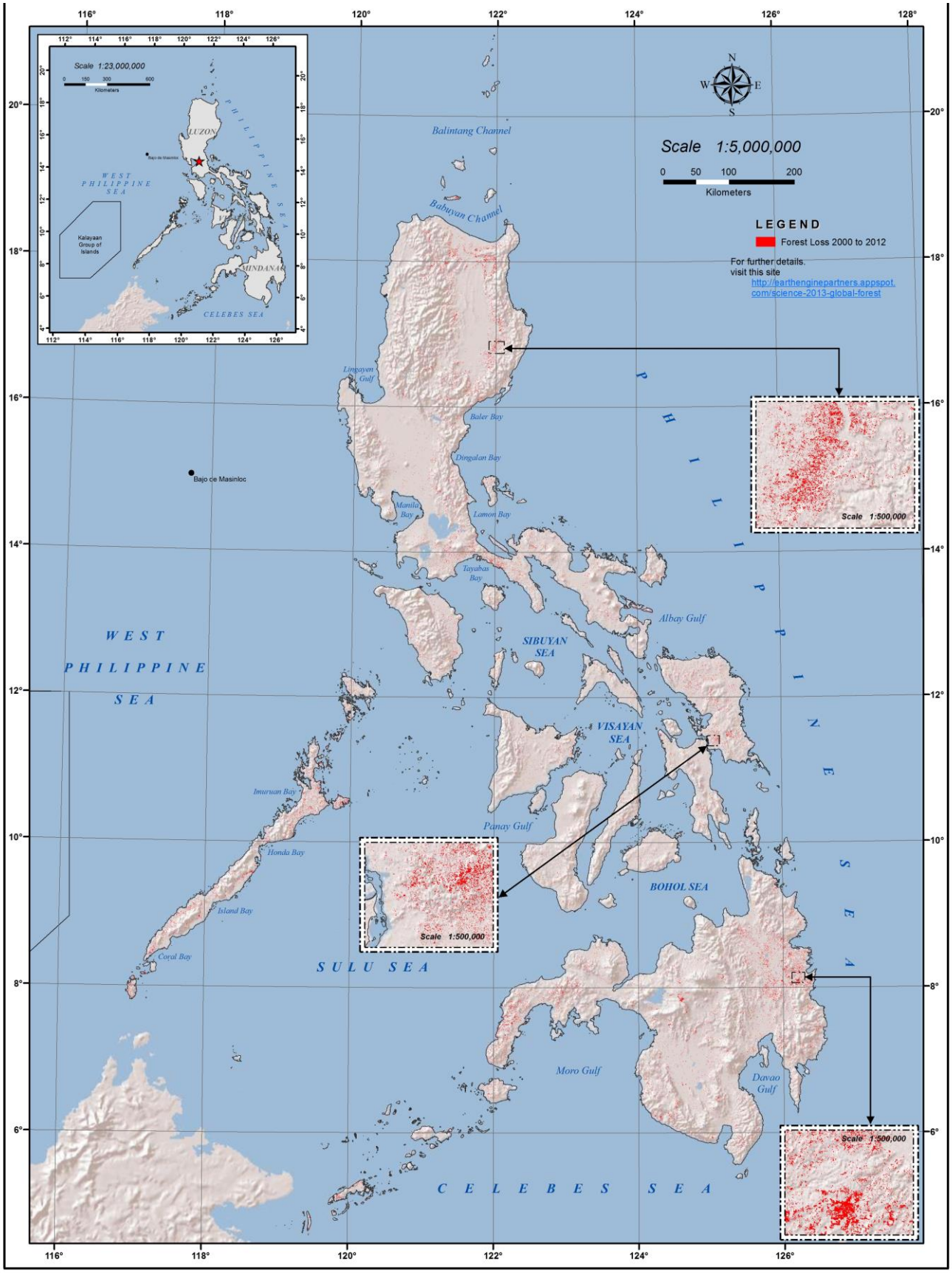


Figure 26. Forest loss map: Philippines, 2000-2012

Data source: Hansen, et al. (2013) High-resolution Global Maps of 21st Century as cited in Osti et al., 2014

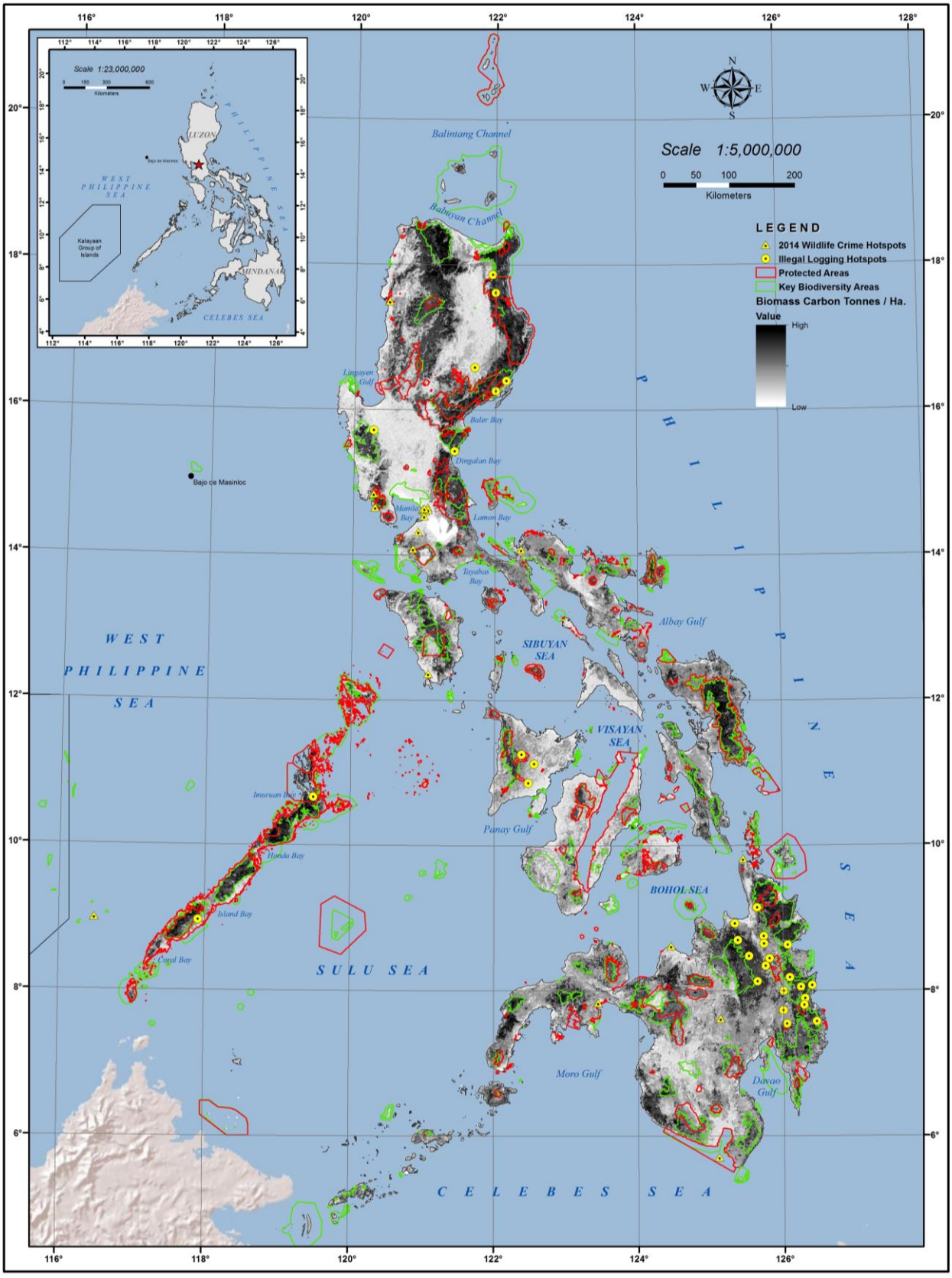


Figure 27. Above and below-ground biomass, key biodiversity areas, and illegal logging and wildlife hotspots in the Philippines

Data sources: Biomass- Saatchi et. al., 2011 as cited in Osti et. al., 2014; Illegal logging hotspots- FMB-DENR; Wildlife crime hotspots - BMB

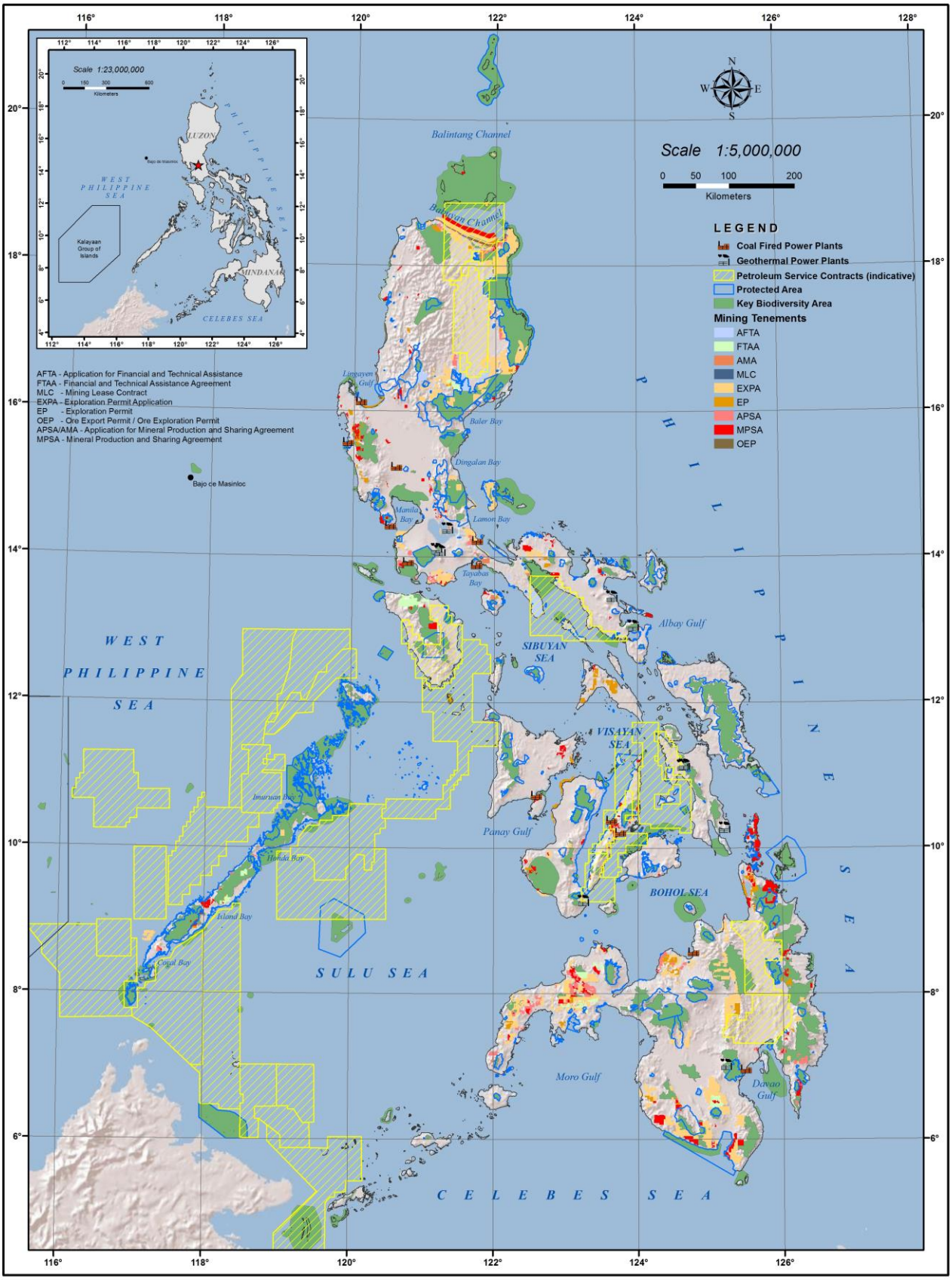


Figure 28. Mining tenements, coal and geothermal power plants, and protected areas in the Philippines

Data sources: Mining tenements- MGB-DENR; PAs- BMB-DENR; Coal and geothermal plants - DOE

3. Degradation of Marine Ecosystems

Poor land use practices have been cited as a major cause of the degradation of coastal ecosystems in the Philippines. The recognition of the country as the hottest of the hot spots highlights the urgent need for marine biodiversity conservation.

Impact of Habitat Loss on Species

Fish catch is depleting for 52-year-old Ronnie Estrera and his son Dondon, 17.
In Bago Aplaya, where they used to fish, was once a haven of marine resources in Davao City. But in one particularly noon recently, the elder Estrera already docked his banca with no catch even though he started out fishing since dawn. "It's not only now, several times, we went home without fish," he lamented (Tacio, Nov. 2011).

In spite of the ecological and economic value of seagrasses, between 30-50 percent of Philippine seagrass beds have been lost due to industrial development, ports, and recreation in the last 50 years.

Poor coral cover is found in 40 percent of the country's reefs, while areas with excellent cover have steadily declined to less than 5 percent from 2004. Despite considerable improvements in coral reef management, the country's coral reefs remain under threat from destructive fishing practices, unsustainable coastal development, sedimentation, and pollution. The impacts of overfishing on coral reefs are evident in the decreasing biomass of reef-associated fish, resulting in considerable local extirpation. Based on the 2012 Status of the Coral Triangle Initiative Report, the threat from destructive fishing has declined, while the other threats have increased considerably, indicating some successes in enforcement activities in MPAs and fishery management areas in many municipalities throughout the country.

The growth in coastal populations has amplified these threats, compromising food security and socioeconomic stability in coastal areas. There is an urgent need for a comprehensive and integrated approach to the development of coastal areas in the Philippines, as 78 percent of the 80 provinces and 56 percent of the 1,634 cities and municipalities are located along the coast.

B. Overexploitation

Overexploitation in some cases leads to exhaustion, particularly by excessive forestry, fishing and hunting. This overexploitation may be explained in part by human overpopulation that leads to increasing resource demands that impacts the decline in the condition of the country's ecosystems. Industrial scale logging of wood products and timber destroys or fragments forests along with the habitat they provide to many uniquely adapted species. The following figures show the distribution of areas highly susceptible to landslides (Figure 29) and flooding (Figure 30) in relation with carbon stocks and population density in the Philippines. Areas where high biomass carbon coincide with areas of high population density (shown in brown on the map) could be priority sites for projects which aim to both enhance livelihoods and reduce deforestation, for example through promoting fuel efficient stoves. On the other hand, areas where there is high biomass carbon and low population density (shown in orange on the map) may be priorities for conservation of forest carbon stocks.

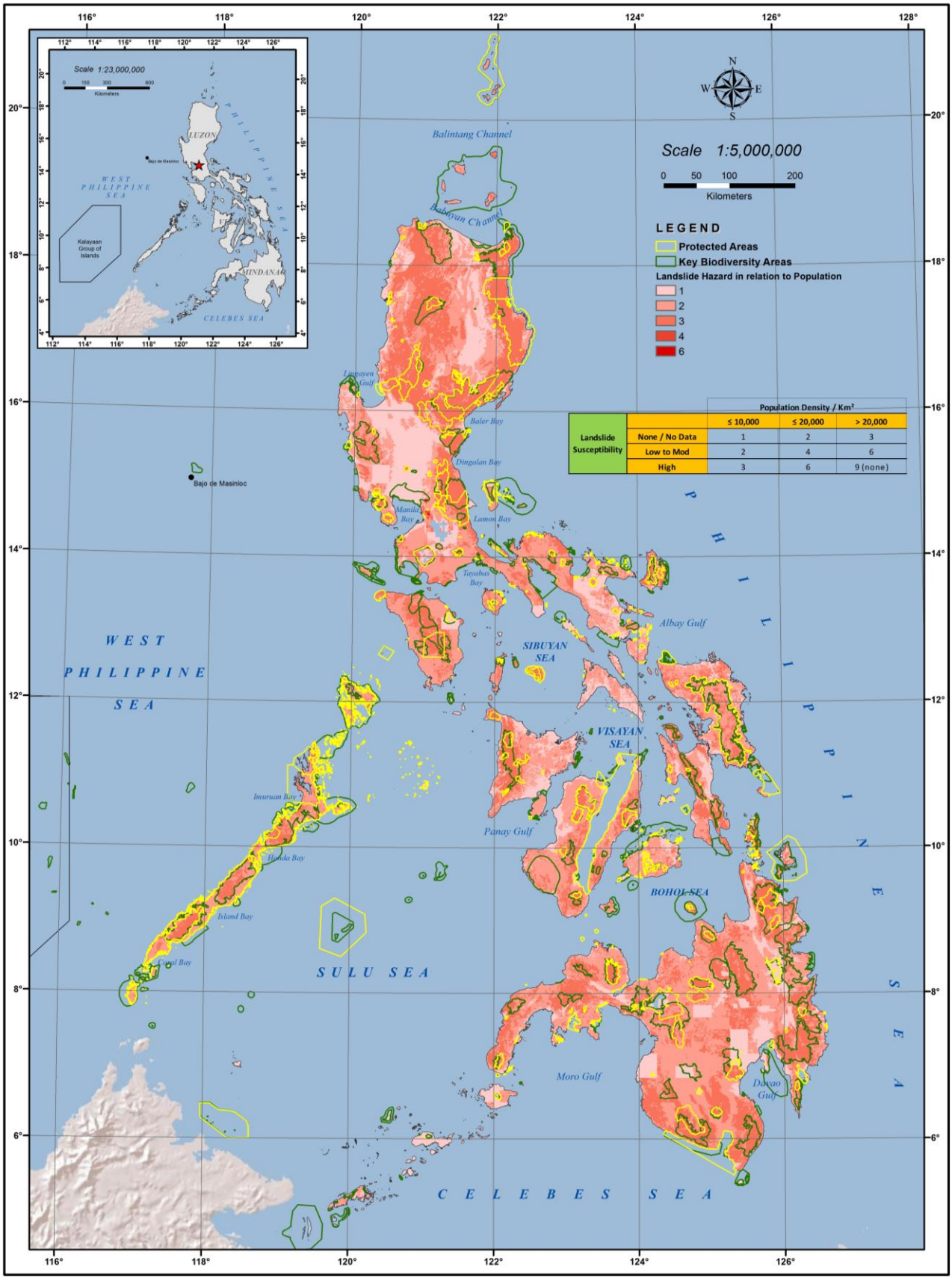


Figure 29. Protected areas in relation to population density and susceptibility to landslides: Philippines, 2013

Data source: PA- BMB-DENR; Population density- CIESIN & CIAT, 2005 as ited in Osti et. al., 2014

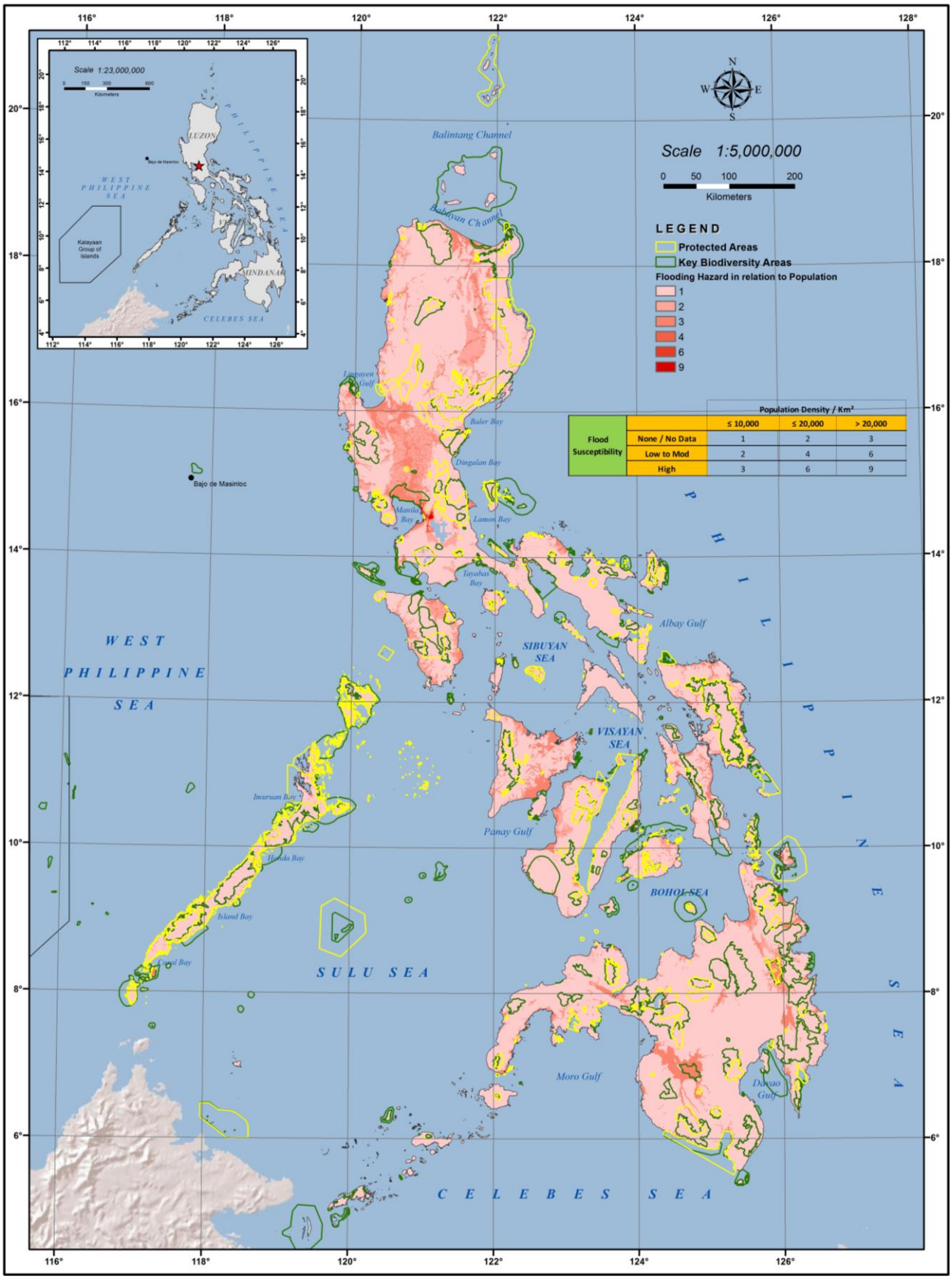


Figure 30. Protected areas in relation to population density and susceptibility to flooding: Philippines, 2013

Data source: PA- BMB-DENR; Population density- CIESIN & CIAT, 2005 as ited in Osti et. al., 2014

Overharvesting of fisheries has driven several fish species to the brink of extinction and reduced the overall diversity of marine life. Overhunting and illegal trade in endangered species are a prime threat to their survival.

1. Fisheries

The illegal unreported and unregulated fishing (IUUF) is a blatant aggravating factor, posing impediments to all attempts to manage fisheries resources and fish stocks in the country. The growing demand for fisheries resources, the increase in the numbers of fishers and vessels, and the improving efficiency of fishing gear drive the collection of these resources way beyond their capacity to recover. Moreover, the reduced availability of fisheries resources increases competition and, thus, prods players to resort to illegal, and often, more efficient forms of fishing. A recent report estimated the value of IUUF at the global scale to be between US$10 to 23.5 billion annually (Agnew et al. 2009). Information in the same report attributes Philippine losses in 2008 in the amount of US$598 million to poaching by foreign vessels and blast and cyanide-fishing (BFAR, 2008 in Torell et al., 2010).

2. Illegal Wildlife Trading

The combined factors of hunting (game and food) and illegal wildlife trading threaten about half of bird population in the wild. Hornbills, parrots, doves, cockatoos and Hill mynas are most favored targets for pet trade. Likewise, elephant ivory from African countries have found their way to the Philippines through international crime syndicates. When the Philippines destroyed its more than four-ton stockpile of seized elephant tusks in 2013, it marked the record as the first ASEAN member country and the first ivory consuming nation and non-elephant range state to take such a public action (see Annex 2.15).

From 2009 to 2013, the government law enforcement agencies have successfully effected 136 confiscations of illegally traded wildlife, including live mammals, reptiles and birds, insects and wildlife by-products and derivatives. In 2014, there were 20 confiscations made by the BMB which comprised of 1,162 heads of reptiles (42%), birds (39%), mammals (4%) and arachnids (16%) and by products and derivatives from wildlife. A total of 17 cases were filed in court.

C. Pollution

In the agriculture sector, application of agrochemicals (i.e., fertilizers, herbicides, pesticides) remains a common practice among farmers in rural areas. Intensive use of agrochemicals has been known to create and result to both environmental problems and diseases (see Annex 2.16). The hazards accompanying this practice, especially those associated with persistent organic pollutants have been known for years and the knowledge of the extent of harm they cause has increased.

Overutilization of these inputs decreases the soil's humus content, which adversely affects its infiltration and waterholding capacities. The loss of these two vital soil characteristics, in turn, makes the soil loose and more susceptible to erosion. Furthermore, nitrogen and phosphorus nutrients from fertilizers are washed down by run-off water into freshwater bodies, thus creating eutrophication problems. One of the major threats to Philippine coastal resources includes siltation due to improper agricultural practices (Briones, 2005).

According to a study by Maramba (1996), most farmers may be aware that pesticides are hazardous but there is a lack of awareness of exposure risks. Pesticide handlers are the ones most heavily exposed. In addition, exposure of households in farming communities may occur due to spray drift from nearby fields. This exposure is further enhanced by farmers' practice of washing their sprayers near, or in, irrigation canals, which may then become

part of agricultural runoff. They also use this water source for washing of hands and feet, clothes, and to some extent, for taking a bath. Maramba's report further mentions that groundwater near rice paddies may at times contain pesticide residues. While levels detected were below the allowable limit, this may present long-term chronic exposure problems.

D. Climate Change

The impacts of climate change are beginning to be felt more dramatically in the Philippines. Ocean acidification, sea level rise, extreme weather conditions, elevated sea surface temperature are going to affect not only the biodiversity of our marine resources but also coastal livelihoods, infrastructure, and the achievement of poverty and hunger targets of the country's MDG. While the Philippines is among the nations that are presently active in addressing climate change challenges, ultimately, the lack of resources and preparedness would affect the ability to adequately cope with the impacts of climate change.

The DOST – Philippine Atmospheric, Geophysical Astronomical and Geophysical Services Administration (PAGASA) in 2011 analyzed climate trends using available observed data from 1951 to 2009 with the average for the period of 1971 – 2000 as the reference value. In order to generate projections of temperature increase and rainfall change in the Philippines in the future, DOST-PAGASA used the PRECIS (Providing Regional Climates for Impact Studies) model in two time frames 2020 and 2050.

The key findings are summarized in Table 6.

Table 6. Climate Trends and Projections in the Philippines

Current Trends	Projected Trends
There has been an increase in annual mean temperature by 0.57 °C;	All areas of the Philippines will get warmer, more so in the relatively warmer summer months;
In terms of maximum and minimum temperatures, the increases have been 0.35 °C and 0.94 °C;	Annual mean temperatures (average of maximum and minimum temperatures) in all areas in the country are expected to rise by 0.9 °C to 1.1 °C in 2020 and by 1.8 °C to 2.2 °C in 2050;
Results of analysis of trends of tropical cyclone occurrence/passage within the so-called Philippine Area of Responsibility (PAR) show that an average of 20 tropical cyclones form and/or cross the PAR per year with strong multi-decadal variability, with maximum sustained winds of greater than 150 km per hour and above (typhoon category) being exhibited during El Nino years.	In terms of seasonal rainfall change, there is a substantial spatial difference in the projected changes in rainfall in 2020 and 2050 in most parts of the Philippines, with reduction in rainfall in most provinces during the summer season making the usually dry season drier, while rainfall increases are likely in most areas of Luzon and Visayas during the southwest monsoon.

Source: DOST PAGASA (2011)

However, projections for extreme events in 2020 and 2050 show that hot temperatures (indicated by the number of days with maximum temperature exceeding 35°C) will continue to become more frequent, number of dry days (days with less than 2.5mm of rain) will increase in all parts of the country and heavy daily rainfall (exceeding 300mm) events will also continue to increase in number in Luzon and Visayas.

The observed changes in climate in most recent times have never been seen in the past 140 years. Worse, the country's current climate (in particular, the increasing frequency of extreme events) has already been observed to impact adversely on water resources, forestry, agriculture, coastal resources and health and well-being of the people (see Annex 2.17).

Yusuf and Francisco (2009) identified all regions of the Philippines as most vulnerable to climate change (Figure

31). The Philippines is not only exposed to tropical cyclones, especially in the northern and eastern parts of the country, but also to many other climate-related hazards especially floods (such as in central Luzon and Southern Mindanao), landslides (due to the terrain of the country), and droughts. Figure 32 shows the country's adaptive capacity which is defined as the degree to which adjustments in practices, processes, or structures can moderate or offset potential damage or take advantage of opportunities (from climate change).

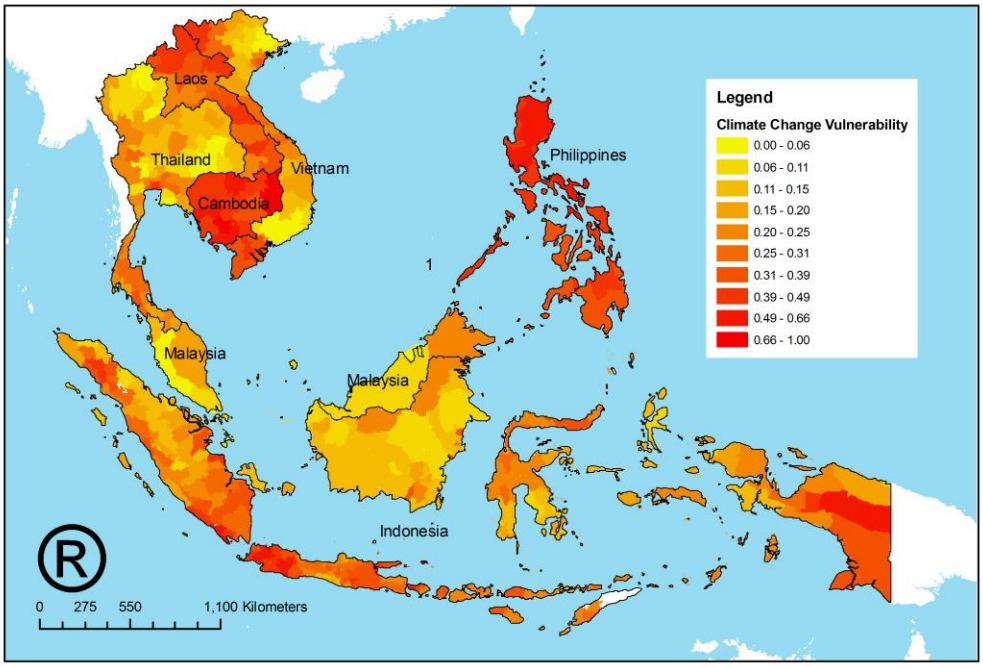


Figure 31. Climate change vulnerability map of the Philippines

Source: Yusuf & Francisco (2009) Climate Change Vulnerability Mapping for Southeast Asia

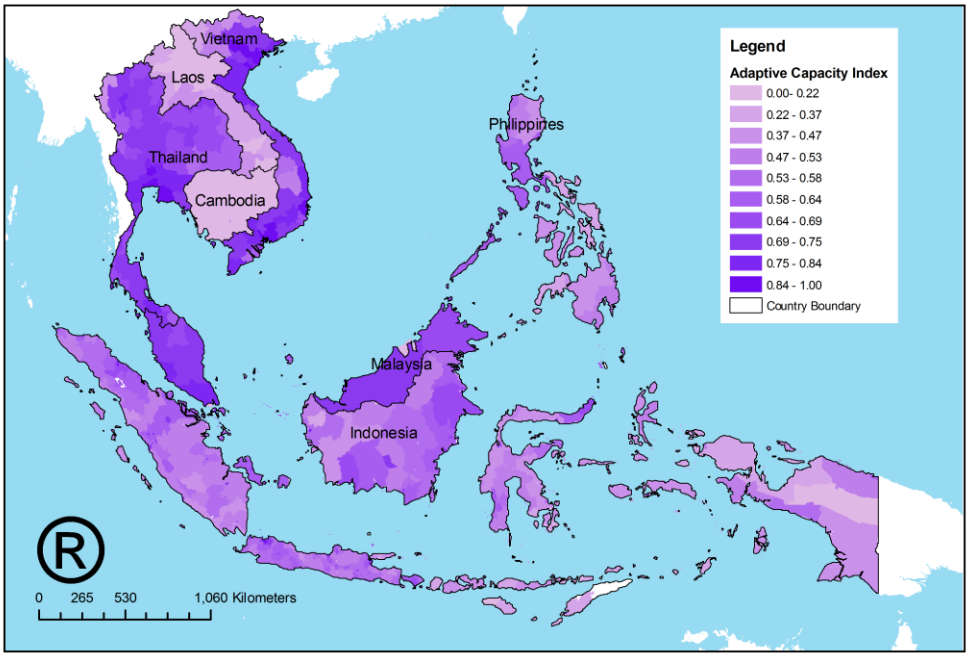


Figure 32. Adaptive capacity map of the Philippines

Source: Yusuf & Francisco (2009) Climate Change Vulnerability Mapping for Southeast Asia

A number of strategies discussed in the PBSAP will help address the risks of the changing climate. One is to undertake research to better understand its impacts. For coastal and marine ecosystems, priority areas of concern cover the following: a) species to sediment/substrate matching for mangroves and mudflats based on lessons learned from NGP; b) diel migration of plankton in priority sites; c) detection of persistent plankton blooms (fishery productivity is high in these areas) and its relation to climate change and effects of ocean acidification; d) seabirds and correlation of their population to intertidal flats health; e) adaptation to climate change effects of sea turtles; and, f) improvement of coral reef restoration techniques. Likewise, vulnerability and climate risk of coastal areas to storm surge, flooding, coastal erosion and sea level rise increase in surface and sea temperature and ocean acidification due to climate change will be assessed. On the other hand, vulnerability assessment of selected inland wetlands and wetland species to climate change will be undertaken. This includes life history characteristics of priority species (fecundity and reproductive patterns) such as *biya* and *sinarapan*. Also, research and development studies on specific climate change mitigation functions such as carbon sequestration of inland wetlands prioritizing Ramsar sites will be done. This will provide PBSAP actors/key players the fundamental knowledge on how these species will be affected by climate change as well as guide in the identification of appropriate adaptation and management practices specific to species/ecosystems.

E. Invasive Alien Species

IAS poses one of the greatest threats to aquatic biodiversity. IAS can hasten the extinction of threatened species and reduce the diversity of indigenous and endemic species through predation, competition, parasitism, diseases, hybridization, and species displacement caused by environmental and habitat change. Alien species, as defined during the CBD, include any species that are introduced into new habitats by human intervention; usually they are invasive or aggressive. A total of 70 IAS under 40 families were classified in a profiling done in 16 PAs in the Philippines (ERDB, 2013).

The concern on invasive species in the Philippines has only been recently realized and addressed. A series of conference-workshops on IAS and their impacts on biodiversity were held in 2013 to identify major strategies and specific actions to address the problem and a NISSAP and its Implementing Guidelines was completed in 2013.

The BFAR is tasked with the responsibility of granting permits for importation and for implementing quarantine regulations for aquatic species. Importation of alien species (for recreation, food, research) from other countries continues to be practiced, however, even without government permits and prior impact assessment. In addition, the country lacks capacity to monitor and regulate entry of alien species, particularly backdoor entry.

Suckermouth armoured catfish - *Pterygoplichthys pardalis*
Photo by: Ott, Gerhard H. F. (1995)

Casal (2003) cites that 12 species introduced in the Philippines are among the top 18 species reported adversely affecting the ecosystem[19]. Four of the most important alien invasive pests are the golden apple snail, locally known as golden *kuhol* (*Pomacea canaliculata* (Lamarck)), the rice black bug, locally known as *itim na atangya* (*Scotinophara coarctata* (Fabricius)), the mango pulp weevil (*Sternochetus frigidus* (Fabricius)) and the mango seed weevil (*S. mangiferae* (Fabricius)). Moreover, of the 157 finfish species introduced, 36 have been reported as having established themselves in the wild. Currently, there are evidences that introduced species are replacing native species in aquaculture production in the Philippines.

[19] http://www.fishbase.or/home.htm

Examples of commonly found IAS in the Philippines are listed in Annex 3. In addition, Figure 33 plots the location of sightings of suckermouth armoured catfish, which is an IAS, in the Luzon Island.

In 1985, the golden apple snail was all over the Philippines and found its way to agroecosystems and started to alarm the rice farmers. Farmers consider it to be the most serious pest in the Philippines in 1986 (Morallo-Rejesus, Bilog, & Javier, 1990). Further, it is said that the population of the native apple snail (*Pila luzonica*) has declined drastically since the introduction of the golden apple snail.

Aside from the five major pressures discussed, other contributing factors were identified during the regional and national consultations (see Table 7).

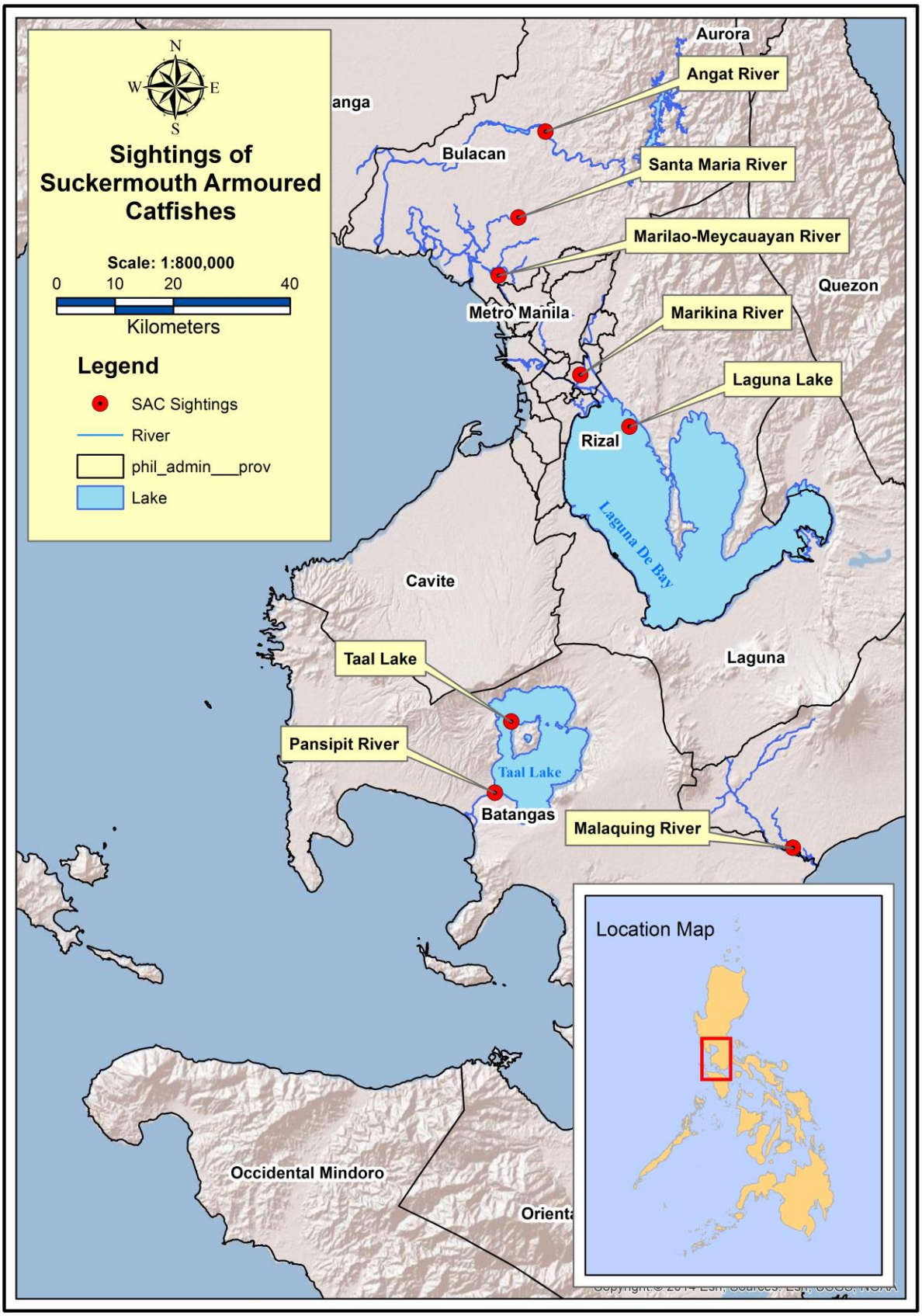


Figure 33. Sightings of suckermouth armoured catfishes in the Luzon Island

Source: Chavez, Santos, & Carandang (2014) Invasion Stages of Pteryophlichthys spp. In the Luzon Island, Philippines

Table 7. Other Contributing Factors to Pressures on Biodiversity Loss

Contributing Factors	Proposed Supporting Actions*
Lack of awareness (example is the need for a consolidated inventory of biodiversity resources).	• Orientation on Biodiversity Basics and Communication Skills • Incorporation of biodiversity information series in Family Development Sessions of the 4Ps program • Use of spokespersons /champions/personalities • Popularization of biodiversity concepts as understood within IP context • Advocacy and constituents' mobilization through IEC, multi-media campaigns and citizen science initiative
Good governance issues due to lack of enforcement and political will.	• Incorporation of biodiversity into CLUP • Creation of multi-sectoral committees for monitoring • Formulation of model settlement plan for informal settler • Implementation of policy on reversion, income diversification, and marine conservation agreements • Replication of population-health-environment programs
Research and knowledge management gaps due to lack or expertise in the field of biodiversity.	• Updating of information on species • Formulation of a National Research Agenda • Determination of carrying capacities • Operationalization of the Bioweb • Conduct of studies on hydrologic behavior of exotics
Lack of effective policies.	• Enactment of the National Land Use Act • PES policy that provides appropriate sharing for host communities • Unification of rules and regulations on fishing • Mandatory creation of environment and natural resourcs officers (ENRO) at the LGU level • Promotion of rain forestation/use of indigenous species in the NGP
Financing requirements due to low budget allotment to biodiversity programs.	• Amendment of the internal revenue allotment formula to reflect land use (ex.absorptive capacity of forest cover) • Effective and sustainable tapping of volunteerism • Timely release of LGU share of national wealth • Conduct of economic valuation • Allocation of specific amounts for biodiversity conservation
Lack of capacity	• Strengthening of POs, *Bantay Gubats, Bantay Dagats* • Capacity building for rescue workers, DENR, academe and other stakeholders in handling wildlife • Provision of scholarships particularly in the fields related to biodiversity conservation • Capacity building on data management • Strengthening of PAMBs
Socio-economic factors (e.g., the need for scaling up sustainable livelihood programs, increasing population that increases pressure on biodiversity use increasing the need for livelihood)	• Establishment of eco-friendly social enterprises • Intensive community organization • Establishment of production/communal forests • Provision of incentives to forest maintenance • Identification of other sources of fuelwood

** Responses from the regional and national consultations*

Chapter 5. How the current PBSAP was formulated

As a member-party to the Rio Conventions, the Philippine government has to prepare NBSAPs that reflect measures to implement the UNCBD, UNFCCC and UNCCD. Each national action plan has to be kept updated to reflect the pressing global and national thematic issues.

A. The First National Biodiversity Strategic Action Plan

The first NBSAP identified 6 strategies and 17 major thrusts anchored on the framework of resources, humans, the interaction between the two, and the need to balance utilization and conservation. Then President Fidel Ramos directed the integration of these strategies into the sectoral plans and programs of various government agencies. From its publication and implementation in 1997, significant progress has been made to meet the goals of the strategies through several programs, plans, activities that were implemented. However, the lack of targets and indicators, including lack of monitoring has made it difficult to quantitatively assess progress in implementation.

B. The Second National Biodiversity Strategic Action Plan

Five years later, in 2002, about 206 identified conservation priority areas and species conservation priorities, collectively known as the PBCP, were integrated into the second NBSAP revision. The PBCP is considered as the second iteration of the NBSAP. This was subsequently reinforced in 2006 with identified 206 biodiversity conservation priority areas, 5 strategic actions in the conservation priority areas and marine and terrestrial biodiversity corridors.

C. The Gaps in the Previous NBSAP Iterations

The following are the recommendations to augment the gaps in the previous NBSAP iterations (Andres, 2013):

- Monitoring and information systems should be integral part of the plan.
- LGUs and communities need to be involved and their capacities also updated for monitoring and information, including reporting and learning.
- Coordination of many efforts (agencies and projects) addressing overlaps and potential disconnect or conflicting actions.

D. Summary of key lessons learned from the previous NBSAP Planning Process

The Philippines was cited twice in a report by Swiderska (2002) and Prip, Gross, Johnston, and Samson (2010) as one of the CBD Parties which were not able to integrate biodiversity objectives in economic policy and planning. Carew-Reid (2002) of the International Center for Environmental Management summarized the lessons learned from the biodiversity planning processes it undertook in Asia, focusing in the past experiences of the Philippines in its previous revision of the NBSAP:

1) The biodiversity assessment and NBSAP process must be conducted with adequate time and resources; it is a huge undertaking which requires a great deal of time, resources and involvement from a broad range of sectors and disciplines. The original nine months allotted for carrying out the Philippine Biodiversity Country Study was too short, since the process involved not only data gathering and writing of the assessment report and the action plan, but also review by a broad range of sectors, a long approval process, and publication.

2) Biodiversity country studies should take into consideration all the components of the process and their requirements. Comprehensive information on the status and dynamics of environmental systems is required: The NBSAP must be comprehensive, and responsive to practical field conditions. This demands extensive data on the condition of different ecosystems and sectors affecting biodiversity. The use of GIS is important as it helps in generating information on the spatial inter-relationships of relevance to the maintenance of biodiversity and in pinpointing specific areas for action.

3) The NBSAP must be well integrated with development plans: The strength of the NBSAP in relation to the development planning process derives from the fact that it was formulated by a broad range of stakeholders with as much involvement as possible from various disciplines and groups. The plan was approved by the President and supported by a directive requiring that it be integrated into government initiatives. This allowed the NBSAP to be incorporated into broader plans such as Philippine Agenda 21, the Medium-Term Development Plan for 1999-2004 and the proposed National Land Use Policy, and ensured that it receives substantial support from the conservation sector.

4) Defining institutional and financial arrangements is critical to the implementation of the plan. The weakness of the NBSAP is that it did not articulate the institutional and financial schemes for its implementation. These issues are addressed in the current NBSAP concerning the roles and responsibilities of different stakeholders and information as to where to obtain funds for the specific programs and projects.

5) The successful features of the NBSAP are its comprehensiveness, widespread support and spatial specificity. The comprehensiveness of the plan enables it to address the needs of different ecosystems and sectors, including the many issues relevant to biodiversity conservation. Widespread support of the NBSAP was generated in part through the involvement of many stakeholders from various sectors, disciplines and regions of the country, and in part because of the directive issued by the President requiring government agencies to integrate it in their respective plans, programs and projects. This helps ensure that the actions identified in the plan will be given priority in development planning at the national and sub-national levels. Finally, the spatial specificity of the findings of the Philippine Biodiversity Assessement Report, and of the recommendations of the NBSAP, make the preparation of detailed projects easier and more responsive to the actual conditions in the field.

6) The NBSAP is an iterative, cyclical and continuous process. Planners should not expect to come up with a "perfect" plan: as more information is gathered, as the plan itself is implemented, and as conditions in the field change, the plan will be updated, revised and expanded. Future iterations of the plan may be conducted after an assessment of its implementation and impacts.

E. The Third Philippine Biodiversity Strategic Action Plan

The third PBSAP comes at the heels of the Global Biodiversity Strategic Action Plan adopted in Nagoya during the 10th CoP of the CBD where the need for updating national biodiversity strategy and action plans was emphasized. In the said CoP, it was stated that each party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan by 2015.

The Philippines has submitted four national reports to the CBD, the preparation of which was through a consultative process across the country. The four national reports assessed the Philippines' progress towards

meeting the 2010 biodiversity target of achieving a significant reduction in the current rate of biodiversity loss at the global, regional and national levels, consistent with the strategic plan for the CBD.

Based on CBD CoP 11 Decision, the third PBSAP updating process calls upon the GEF to avoid additional and lengthy processes and to utilize existing NBSAPs as the basis for GEF's determination of needs-based priorities. As a result, a PBSAP was prepared through regional and national stakeholder consultations to include indicators, monitoring partnerships, timeline, responsible agencies and projected costs of actions. This was managed by the PBSAP Project Steering Committee and TWG as detailed in Table 8.

Table 8. Management of the PBSAP Updating Process

	PBSAP Project Steering Committee	Project Technical Working Group
Chair	DENR Undersecretary	Assistant Director, DENR-BMB
Co-chair	NEDA Deputy Director General	
Members	UNDP, DSWD, DBM, DA-BFAR, CCC, NCIP, PCW, Haribon, DENR-BMB, DENR-FMB, DENR-MGB, DENR-PPSO, DENR-FASPO	Senior technical staff from NEDA, UNDP, DBM, DA-BFAR, CCC, NCIP, ACB, DENR-BMB, DENR-FMB, DENR-MGB, DENR-PPSO, DENR-FASPO, Partner Academe, Partner non-government organizations (NGO)

The schedule of the six (6) regional and national consultations initiatives is found on Table 9. A total of 807 participants from various sectors attended the national and regional consultations. Various representatives from women's organizations, IPs, fishery, forestry, social welfare and development, biodiversity conservation, academe, and media were part of the stakeholders who participated in the PBSAP revision process. Beyond these, additional meetings were held to further refine the actions, targets and indicators.

Table 9. Regional and National Consultations for PBSAP Updating Process

Area	Dates
Luzon (Regions 1, 2, 3, Cordillera Autonomous Region)	June 27-29, 2013
Luzon (Regions 4a, 4b, 5, National Capital Region)	July 24-26, 2013
Visayas (Regions 6 and 8)	August 28-30, 2013
Mindanao (Regions 9, 10, Autonomous Region of Muslim Mindanao)	September 18-20 2013
Mindanao (Regions 11, 12, Caraga)	October 23-25, 2013
National Consultation	November 21-22, 2013

The regional consultations were aimed to validate and provide inputs, information and recommendations, based on regional and local contexts, realities and observed trends, for PBSAP 2028 priorities, targets and actions. Various FGDs and TWG meetings with experts and government agencies were also conducted to streamline action and implementation plans for the PBSAP. The whole process builds on the current status and achievements of the Philippines with respect to biodiversity planning and reporting. It aims to integrate the Philippines' obligations under the CBD into its national development and sectoral planning frameworks through a renewed and participative 'biodiversity planning' and strategizing process. It produced measurable targets for biodiversity conservation and sustainable use.

Stakeholder Engagement

During the planning process, workshop results were shared to and from the various stakeholders including vulnerable groups, women, indigenous communities and rural communities. A list of all organizations and agenies who participated in the updating process is provided (see Annex 4). Furthermore, a Facebook account (i.e., Pbsap-biofin) was created to provide updates. Briefings on the background, process and content about the NBSAP and the revision process were provided to attendees including workshop presentations and directories of

participants.

During the consultation, participants were all encouraged to share their experiences and ideas in their workshop groups. Questions, suggestions and clarifications were sought in the open forum that followed after each session. The differing views of various societal actors were taken into consideration and for the views that came out that were somehow in conflict (example are those that relate to mining), individual consultations with the officials of concerned government agencies and related organizations to discuss the disputes were done. For the mining sector, the MGB suggested language which was acceptable to them and did not offer to delete anything that was included in the actions matrix. Selected participants expressed their satisfaction on the way their views were taken into account in the consultations.

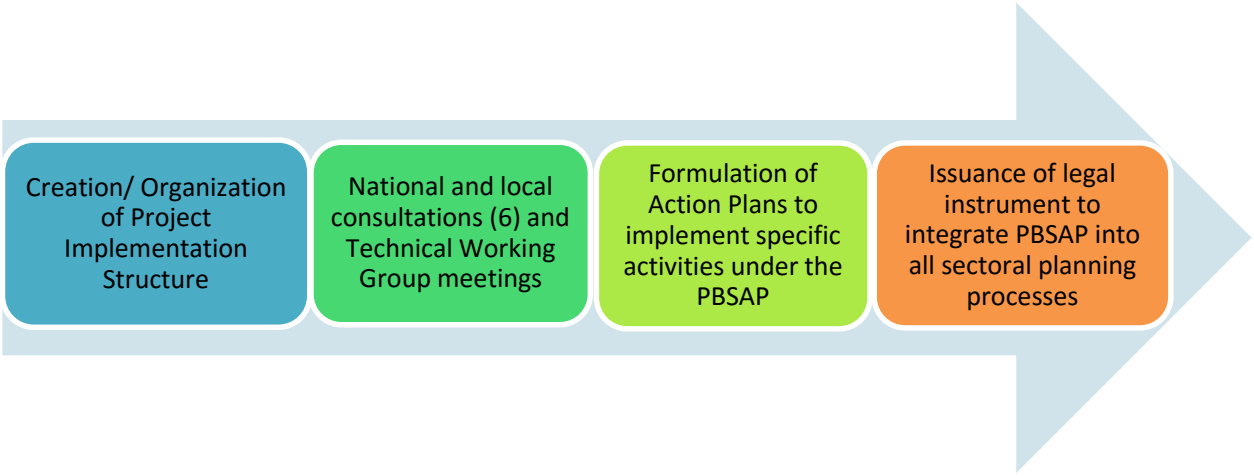


Figure 34. PBSAP planning process and procedure

After updating the PBSAP, specific stand-alone action plans were produced by the BMB that will operationalize the achievement of the targets indicated in the PBSAP. These are:

- An Action Plan to raise awareness on biological diversity, more specifically to communicate elements of the NBSAP that could contribute to gaining support from relevant decision makers
- A plan for fully implementing the Programme of Work on Protected Areas, including increased protection and landscape/seascape connectivity (on-going)
- A plan for strengthening ecosystem resilience and the contribution of biodiversity to carbon stocks, including the restoration of at least 15 per cent of degraded ecosystems and to prevent extinctions of globally and nationally threatened species
- An Action Plan to identify different funding sources and negotiate financing mechanisms including but not limited to budget advocacy and sustainable financing schemes for protected area management to effectively implement the NBSAP
- A Framework Agreement among key institutions on information sharing that contribute to national reporting and the monitoring of the status of Philippine biodiversity with a view of sustaining the provision of up-to-date information for regular national reporting (in effect)

These action plans are expected to jump start biodiversity conservation in the country given the following current scenarios:

- A growing urban population is also creating a generation of people with very little experience and appreciation of nature conservation. In a survey commissioned by Haribon Foundation in 2005 to measure the awareness of environmental issues, only 17 percent of the respondents were aware of biodiversity (Plantilla, n.d.). Urban Manila is the seat of the national government's executive, legislative

and judicial branches. With heightened public awareness and a louder voice, decision makers will likely support biodiversity conservation efforts. The target of BMB's current CEPA plan is limited to the Bureau, the DENR and its current partners. It recognizes that it has yet to establish brand identity and equity and while awareness for biodiversity may be present, it is not fully appreciated. The plan has two (2) objectives: a) to increase by five percent annually from baseline the number of schools, POs, media, LGUs, private corporations, policy makers, BMB personnel, and DENR offices that are aware of the concept of biodiversity, its importance, threats and benefits of protecting it; and b) to build the support from schools, POs, media, LGUs, private corporations, legislators and other government agencies for the conservation and sustainable use of biodiversity through one biodiversity commitment/undertaking per sector annually. Specific activities to achieve these goals will be formulated, tested and adapted accordingly. Results monitoring will be done regularly to reinforce activities and their impacts needed to achieve targets.

- PAs are important to overall well-being of Filipinos. They feed and nurture, provide water and jobs, house important cultural heritage, and protect from disasters. A PA Master Plan will ensure effective management of the PA system and will address the following pressing issues: representativeness and ecologically adequacy of PAs, sufficiency and capacity of PA managers and staff; involvement of communities and traditionally marginalized sectors; presence of sustainable financing mechanisms; and policy gaps.

- The restoration action plan will build on the gains of the government's NGP as well as other sectors' efforts in ecosystem restoration. It will prioritize critical areas (i.e., forest, coral reefs, mangroves, seagrass, inland wetlands, caves) in need of restoration and provide recommendations on the restoration approach that may be the most appropriate to selected sites which may harbor threatened species. Although new species continue to be discovered, the number of globally and nationally threatened species has remained the same. The action plan also prioritizes and consolidates actions towards research and baselining, building on ex-situ conservation, CEPA, capacity building of various stakeholders, reconciling conservation with sustainable livelihoods, law enforcement and improving laws and administrative issuances.

After completion of the PBSAP, a directive from the President of the Philippines through a legal instrument (e.g. EO) is targeted to be issued to incorporate the PBSAP into all plans and programs of relevant agencies, organizations and private sectors (see Figure 34).

VISION

By 2028, biodiversity is restored and rehabilitated, valued, effectively managed and secured, maintaining ecosystem services to sustain healthy, resilient Filipino communities and delivering benefits to all.

Chapter 6. The Biodiversity Strategy and Action Plan

With improved human well-being as the overall goal of the PBSAP, direct and enabling interventions were identified to address and reduce the five (5) major pressures of biodiversity loss (i.e.,habitat loss and degradation, overexploitation, IAS, climate change, pollution) *(See Chapter 4. Principal Pressures of Biodiversity Loss)*. The PBSAP shares the same objectives as the CBD and these are: a) Conservation of biological diversity; b) Sustainable use of its components; and c) Fair and equitable sharing of benefits arising out of the utilization of genetic resources.

The direct program interventions are: a) restoration of ecosystem functions; b) promotion of biodiversity-friendly livelihoods; and c) strengthening law enforcement. These are actions when implemented will result into concrete physical changes in the KBAs. The re-planting of forest trees will result into increased forest cover that will arrest soil erosion, enable sustained water supply and provide livelihoods for communities dependent on its resources. Strengthening law enforcement will help reduce, control and manage direct pressures on biodiversity such as illegal activities (i.e., blast fishing, illegal logging, illegal harvesting and trade of natural resources, pollution) resulting in the further degradation and destruction of ecosystems.

Enabling or supporting program interventions that were identified are: a) CEPA; b) capacity development for biodiversity management; c) biodiversity conservation-related research; d) strengthening policy for biodiversity conservation; e) promotion of biodiversity-friendly technology; and f) resource mobilization. These are interventions when implemented individually or together with other actions, may amplify the impacts of the direct interventions thus, contribute to the achievement of identified targets.

Figure 35 illustrates the framework of the PBSAP.

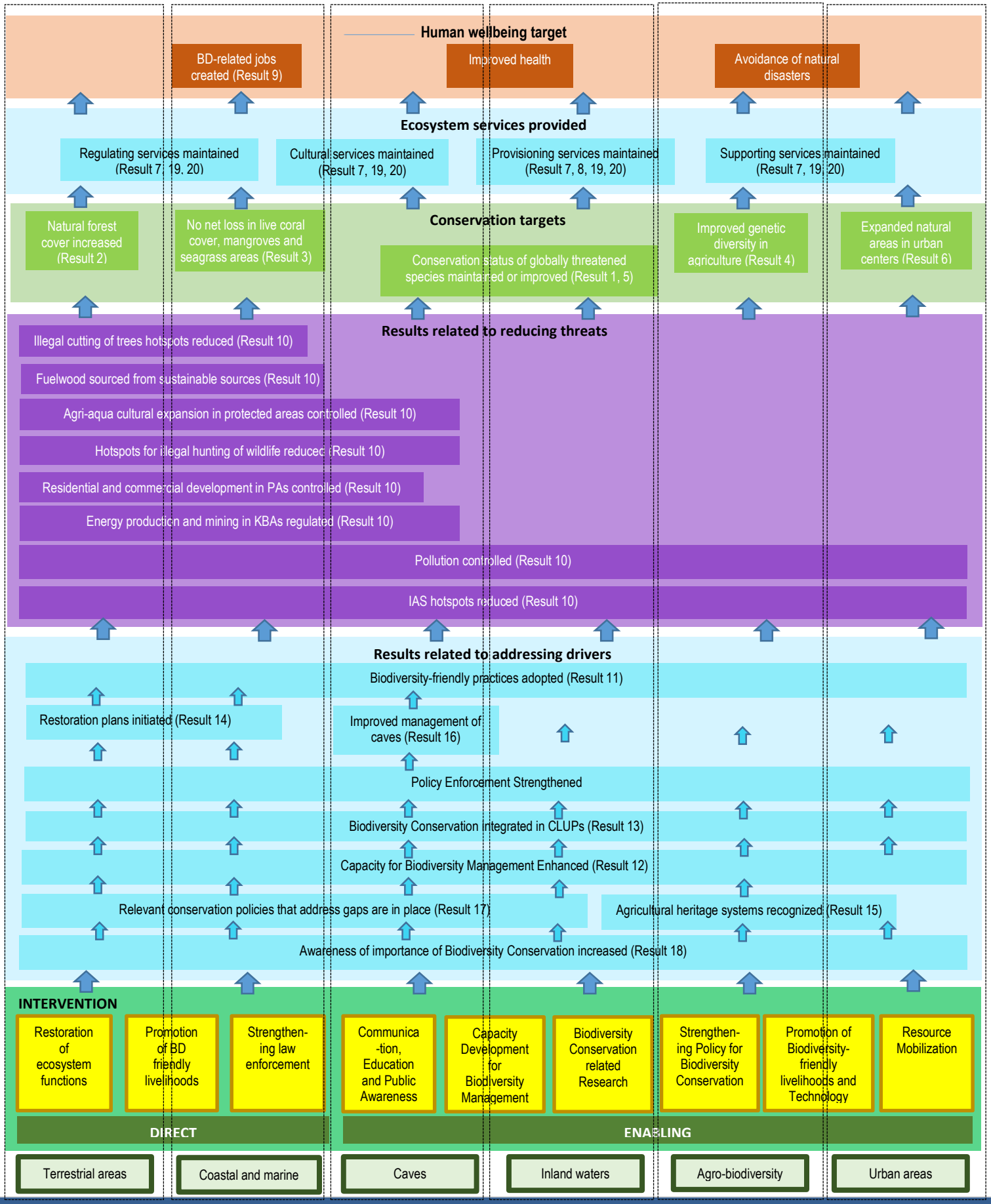

Human wellbeing target
BD-related jobs created (Result 9)
Improved health
Avoidance of natural disasters
Ecosystem services provided
Regulating services maintained (Result 7, 19, 20)
Cultural services maintained (Result 7, 19, 20)
Provisioning services maintained (Result 7, 8, 19, 20)
Supporting services maintained (Result 7, 19, 20)
Conservation targets
Natural forest cover increased (Result 2)
No net loss in live coral cover, mangroves and seagrass areas (Result 3)
Conservation status of globally threatened species maintained or improved (Result 1, 5)
Improved genetic diversity in agriculture (Result 4)
Expanded natural areas in urban centers (Result 6)
Results related to reducing threats
Illegal cutting of trees hotspots reduced (Result 10)
Fuelwood sourced from sustainable sources (Result 10)
Agri-aqua cultural expansion in protected areas controlled (Result 10)
Hotspots for illegal hunting of wildlife reduced (Result 10)
Residential and commercial development in PAs controlled (Result 10)
Energy production and mining in KBAs regulated (Result 10)
Pollution controlled (Result 10)
IAS hotspots reduced (Result 10)
Results related to addressing drivers
Biodiversity-friendly practices adopted (Result 11)
Restoration plans initiated (Result 14)
Improved management of caves (Result 16)
Policy Enforcement Strengthened
Biodiversity Conservation integrated in CLUPs (Result 13)
Capacity for Biodiversity Management Enhanced (Result 12)
Relevant conservation policies that address gaps are in place (Result 17)
Agricultural heritage systems recognized (Result 15)
Awareness of importance of Biodiversity Conservation increased (Result 18)
INTERVENTION
Restoration of ecosystem functions
Promotion of BD friendly livelihoods
Strengthening law enforcement
Communication, Education and Public Awareness
Capacity Development for Biodiversity Management
Biodiversity Conservation related Research
Strengthening Policy for Biodiversity Conservation
Promotion of Biodiversity-friendly livelihoods and Technology
Resource Mobilization
DIRECT
ENABLING
Terrestrial areas
Coastal and marine
Caves
Inland waters
Agro-biodiversity
Urban areas

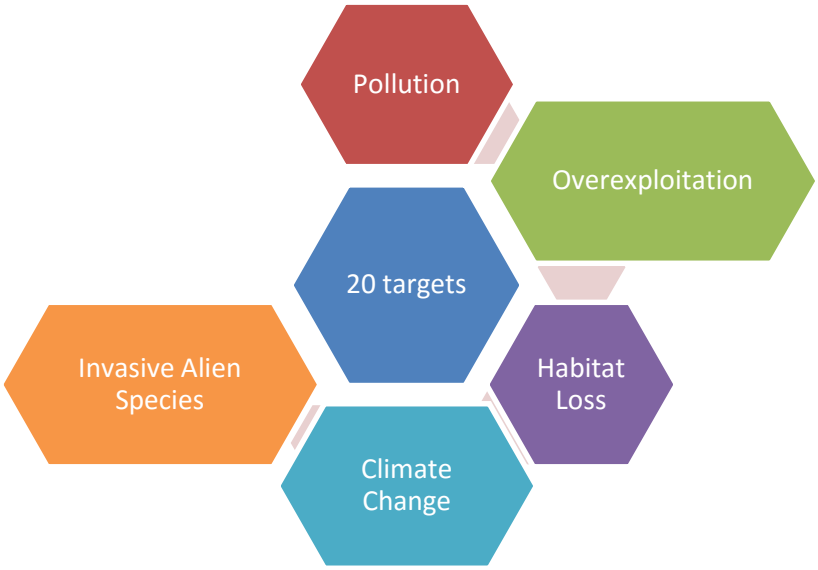
Figure 35. PBSAP Framework for Biodiversity Conservation

Twenty (20) targets were formulated to realize this goal. Specific indicators per target were also identified which will be regularly monitored to determine progress (see Table 10).

Table 10. Targets with indicators to address and reduce pressures to biodiversity

No.	PBSAP Target Results		Indicators
	Conservation targets		
1	By 2028, the conservation status of nationally and globally threatened species in the country from 2016 levels is maintained or improved.	1	Number of critically endangered (CR), endangered (EN), vulnerable (V) species whose status have not been upgraded in the Philippines List of Threatened Species (per DAO 15-2004, Fisheries AO 233-2010, DAO 01-2007, and RA 9147 [2001])
2	By 2028, there will be no net loss in natural forest cover	2	Area of land covered in natural forests (closed, open and mixed forests based on National Mapping Resource and Information Authority land cover classification)
3	By 2028, there will be no net loss in presence and area distribution of live coral cover, mangrove and seagrasses.	3	Presence and area distribution of live corals, mangroves and seagrasses and their condition
4	By 2028, over 50% of genetic diversity of cultivated plants and farmed and domesticated animals and wild relatives will be conserved or maintained.	4	Genetic diversity of cultivated plants and farmed and domesticated animals and wild relatives
5	By 2028, the population of migratory bird species identified in selected inland and coastal wetlands along the EAAF will be maintained.	5	Population of migratory bird species recorded and analyzed during population counts in key inland and coastal wetland sites in the Philippines along the EAAF
6	By 2028, there will be a 5% increase in the proportion of green spaces in the five largest cities.	6a	Proportion of green spaces in Philippine cities
		6b	Proportion of cities that have adopted the City Biodiversity Index
	Ecosystem services provided		
7	By 2028, as result of improved conservation, ecosystem services provided by key biodiversity areas will be enhanced.	7a	Amount of estimated carbon stocks in forest areas in the Philippines
		7b	Number of irrigation systems and water systems for domestic use that are sourced from KBAs and volume and quality of water from these sources
		7c	Number of sites in KBAs that serve as ecotourism destinations
		7d	Number of IP communities with identified sacred places and/or ICCAs within KBAs
8	By 2028, fish stocks of economically important species will be maintained.	8	Abundance and biomass of fish species recorded in national stock assessments and other local stock assessment initiatives
	Human wellbeing target		
9	By 2028, there will be an annual increase of at least 5% in biodiversity conservation related jobs (ecotourism, sustainable agriculture, ecosystem restoration)	9	Number of people employed in biodiversity conservation-related jobs annually
	Results related to reducing threats to biodiversity		
10	By 2028, the key threats to biodiversity will be reduced, controlled or managed.	10a	Number of IAS hotspots
		10b	Number of coastal and fresh surface water systems in KBAs that pass the minimum criteria for water quality under the provisions of DAOs 34 and 35
		10c	Number of agricultural, including fisheries, expansion hotspots in KBAs

No.	PBSAP Target Results		Indicators
		10d	Number of energy production and mining hotspots in KBAs
		10e	Number of fuelwood collection hotspots that source raw materials from sustainable sources
		10f	Number of illegal cutting of trees hotspots
		10g	Number of illegal logging hotspots
		10h	Number of hotspots for hunting and poaching of wildlife
		10i	Number of hotspots of illegal fishing practices
		10j	Number of hotspots for residential and commercial development in KBAs
	Results related to addressing drivers of threats		
11	By 2028, there will be a 10% increase in agricultural areas devoted to all types of biodiversity-friendly agriculture.	11	Number and area of farms practicing biodiversity-friendly agriculture in the Philippines
12	By 2028, capacity for biodiversity conservation of public and private sector groups in terrestrial and marine PAs/KBAs will be strengthened.	12a	Proportion of PA management structures with high management effectiveness assessment scores
		12b	Number of private companies, POs/NGOs, communities involved in biodiversity conservation
13	By 2028, 50% of LGUs will have formulated and adopted the enhanced CLUP using revised HLURB framework.	13	Number of LGUs with enhanced CLUPs based on revised HLURB framework
14	By 2028, 1 million ha of degraded ecosystems will be restored and/or will be under various stages of restoration	14	Number of ha of degraded ecosystems placed under restoration programs
15	By 2028, there will be at least 10 nationally recognized agricultural heritage systems.	15	Number of nationally recognized agricultural heritage sites
16	By 2028, there will be improved conservation management of caves	16a	Number of caves with functional conservation/management partnerships or engagements
		16b	Number of caves that have been officially classified
17	By 2020, relevant biodiversity conservation policies to address existing gaps are in place	17	Number of RA, EO, implementing rules and regulations (IRR), DAO, Memorandum Circular, local ordinances, policy review/studies enforced or implemented
18	By 2028, there will be a 10% annual increase from the 2015 baseline in the number of schools, POs, media organizations, LGU, private companies, policy makers, government offices that are aware and supportive of biodiversity, its importance, threats and benefits of protecting it	18	Number of stakeholder groups that are aware of biodiversity, its importance and benefits and threats to it.
19	By 2028, there will be a 10% increase in total area from 2015 levels of terrestrial including inland wetlands PAs managed through NIPAS and other conservation measures (indigenous community conserved areas, local conservation areas, critical habitats) that overlap with KBAs.	19	Proportion of total area of terrestrial PAs in relation to KBAs
20	By 2028, there will be a 20% increase from 2015 levels in the coverage of established MPAs/sanctuaries across various aquatic habitats.	20	Proportion of area established MPAs/sanctuaries against total area of aquatic habitats.



Progress on these targets will be monitored regularly through a set of indicators to enable us to measure our gains in terms of biodiversity conservation. Performance indicator definition and reference sheets for each indicator will be prepared.

A more comprehensive list of actions that address biodiversity loss and focus on four ecosystems (i.e., forest, caves and cave systems, inland wetlands, coastal and marine) and thematic areas (i.e., urban biodiversity, agrobiodiversity, PAs, IAS and ABS) are found in Annex 5.

Priority Programs in the Short-term

Based on the PBSAP framework, a number of programs were developed to initially address the drivers and threats to biodiversity loss across ecosystems and thematic areas. The following programs will implement single or multiple interventions indicated in the framework as well as address concerns of other multilateral environmental agreements such as the CBD, UNFCC, UNCCD, CITES, CCMSWA, IPPC, ITPGRFA, Ramsar Convention, and WHC.

1. Integrated Approach in the Management of Major Biodiversity Corridors in the Philippines
2. Maintaining Ecosystem Flows, Mainstreaming Biodiversity and Restoring Degraded Forestlands and Enhancing Carbon Stocks through an Integrated Landscape Approach
3. Sustainable Financing of the Philippines PA System
4. Capacity Building for the Ratification and Implementation of the Nagoya Protocol on Access and Benefit-Sharing in the Philippines
5. Combatting Environmental Organized Crime in the Philippines
6. Carbon-Resilient, Low-Carbon and Sustainable Cities
7. Enabling Investments in Natural Capital: Strengthening Fisheries Value Chains, Financial Monitoring and Evaluation Capacity in the Coral Triangle
8. Implementation of Sulu Celebes Seas Large Marine Ecosystems Regional and National Strategic Action Plans
9. Exploration of Collaborative Conservation Framework in line with MARPOL and CBD in the East Asian Seas
10. Implementation of PCB Management Programs for Electric Cooperatives and Safe E-wastes Management
11. Eliminating the Use of POPs in the Philippines through the Mainstreaming into the Relevant Planning, Programming and Regulatory Processes and Development of Safer Substitutes

Costing the PBSAP (as of 24 April 2015)

The table below shows the estimated costs of implementing direct and enabling interventions according to thematic area (i.e., ABS, IAS, PAs, urban biodiversity, and agrobiodiversity) and ecosystem (i.e., forest/terrestrial, inland wetlands, caves and cave systems, and coastal and marine).

Table 11. Summary of the cost of strategies per thematic area and ecosystem

Ecosystem / Thematic Area	PhP		USD*		%
	LOW	HIGH	Low	High	

ECOSYSTEMS					
Forest	65,356,084,522.23	76,907,763,078.23	1,452,357,433.83	1,709,061,401.74	**19.34**
Coastal and Marine	48,576,116,779.29	56,051,484,392.45	1,079,469,261.76	1,245,588,542.05	**14.37**
Inland Wetlands	67,205,587,084.22	78,062,500,578.79	1,493,457,490.76	1,734,722,235.08	**19.89**
Cave and Cave Systems	5,368,174,648.48	7,626,725,163.58	119,292,769.97	169,482,781.41	**1.59**
THEMATIC AREAS					
Protected Areas	131,641,188,288.46	151,038,853,291.01	2,925,359,739.74	3,356,418,962.02	**38.95**
Access and Benefit-Sharing	1,437,360,154.05	1,822,595,204.50	31,941,336.76	40,502,115.66	**0.43**
Agrobiodiversity	11,356,883,887.78	13,091,891,532.39	252,375,197.51	290,930,922.94	**3.36**
Invasive Alien Species	4,202,653,618.48	4,963,062,630.50	93,392,302.63	110,290,280.68	**1.24**
Urban Biodiversity	2,795,344,021.98	3,742,528,502.41	62,118,756.04	83,167,300.05	**0.83**
TOTAL	**337,939,393,004.96**	**393,307,404,373.86**	**7,509,764,289.00**	**8,740,164,541.64**	**100.00**

**1 USD = PhP 45.00*

The total estimated cost of implementing the PBSAP from 2015-2028 ranges from PhP 337.9 Billion (low) to PhP 393.3 Billion (high). Thirty nine percent (39%) or PHP 131.6 Billion (low) of the total cost was computed to prevent habitat loss and overexploitation of Protected Areas. It is followed by inland wetlands with a total of PHP 67.2 Billion (low) to address habitat loss, overexploitation, pollution and climate change.

Summary of Cost for All Interventions According to Category

Each direct and enabling action per thematic area and ecosystem was tagged correspondingly with the Aichi Targets as shown in Figure 36.

Restoration strategies account for 47 percent of the total estimated cost or PHP 159.4 Billion while 40 percent is attributed to protection strategies or PHP 136.6 Billion. While this budget includes direct actions towards attempting to restore ecosystem services and functions, it does not include the value of lost ecosystem services, which will even inflate the cost even more. This also denotes that the goal of the country for both protection and restoration go hand-in-hand with its attempt in reverting to pre-exploitation levels.

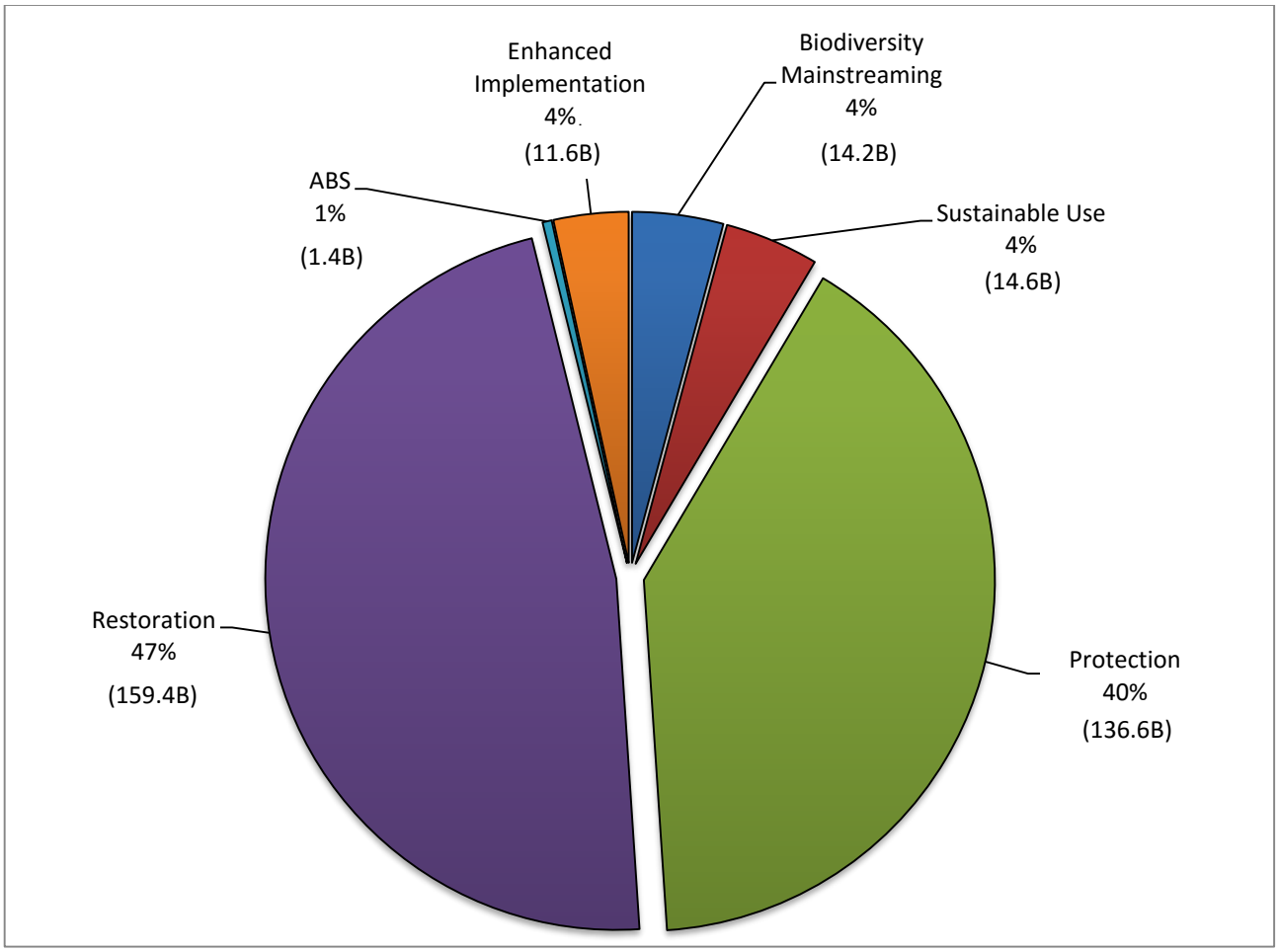


Figure 36. Cost of PBSAP implementation cost (2015-2028) according to Aichi Targets (low estimate in billion PHP)

The computed cost for protection cuts across all thematic areas. Assuming that protection measures are well enforced and funded, it can prevent the estimated USD 1 billion dollars annual loss from IUUF[20] alone, and does not yet include the value of losses from inland wetlands, agriculture, and forest resources. In Region 2 alone (for example), the BFAR estimates an economic loss of USD37,000 to USD75,000 per foreign fishing vessel[21].

Summary of Cost for All Interventions According to Program Interventions

Each direct and enabling action per thematic area and ecosystem was tagged as shown in Figure 37.

Restoration of ecosystem functions account for 45 percent of the total estimated cost at PHP 156.6 Billion while 30 percent is attributed to capacity development for biodiversity conservation at PHP 103 Billion.

[20] Based on the study of Aliño (2002) as cited by Palma (2007)
[21] http://www.rappler.com/move-ph/30579-poaching-fun-philippines

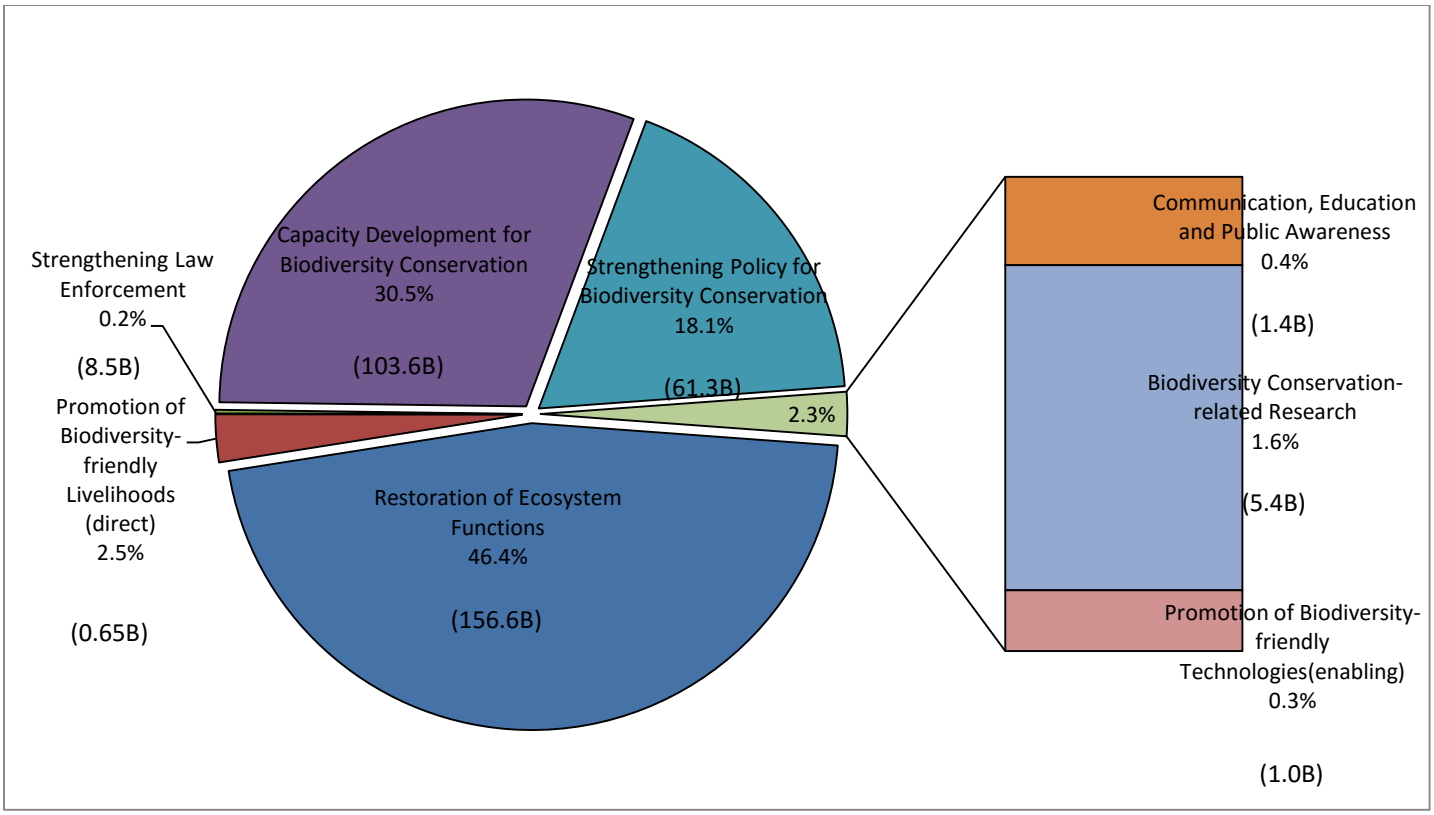


Figure 37. Cost of PBSAP implementation cost (2015-2028) according to program intervention (low estimate in billion PHP)

The Philippines is currently implementing the Biodiversity Financing Initiative (Biofin) Project which seeks to contribute to closing the financing gap for the conservation and sustainable use of biological diversity by identifying, accessing, combining and sequencing sources of biodiversity funding to meet specific needs. Under this project, a finance solutions plan was formulated in 2015 with at least one strategy implemented by 2016. However, a prioritization of cross-sectoral actions to be led by the BMB will be undertaken should the resources not be available in a timely manner.

Chapter 7. Implementation Plan

This chapter discusses the implementation needs of the PBSAP derived from the lessons learned from the implementation of earlier PBSAP plans. A discussion of the strategies to ensure effective implementation is discussed subsequently followed by a proposed coordination and management mechanism.

7.1. IMPLEMENTATION NEEDS

7.1.1 Actions and Tasks

Based on the PBSAP, it can be said that the dominant implementation tasks include the following:

i. Policy formulation (national policy, proposed legislation, developing guidelines)
ii. Sectoral planning /area planning and reconciling the same with other competing sectors
iii. Mainstreaming plans in the bigger socioeconomic development plans
iv. Law enforcement and conflict resolution
v. Recognition of and support to management and utilization rights and intellectual property rights of stakeholders
vi. Provision of support services under limited resources (extension, research and documentation)
vii. Human resources and institutional capacity building, CEPA and knowledge management
viii. Constituency building among non-state actors (NGO networks, business networks)

7.1.2 Phasing

The tasks are divided into short term (2015-2016); medium term (2017-2020) and long term (2021-2028). Short-term tasks are important for building the operational vision, organization, operational plans and capacity of actors to implement tasks. They would consist of immediately doable tasks that can be completed on the first 2 years that can be supported by earmarked or maturing pipeline projects. Some tasks start on year 1 and require more than 3 years or more than 5 years to complete. They are considered medium- and long-term tasks.

7.1.3 Actors

There are several actors involved from the point of view of tasks under PBSAP. Each set of actors has its own set of capacity building needs.

ACTOR	EXAMPLES
National Agencies	
• Biodiversity governance - agencies that directly govern/allocate/regulate the use of biodiversity landscapes and resources except those devolved to LGUs	DENR, DA, NCIP
• Resource use – agencies that largely use goods and services produced by biodiversity resources (landscapes, species, genes). The activities of these agencies can either enhance or impinge on the integrity of the resource.	DOST, DOH, DOT, Department of Public Works and Highways (DPWH)
• Communication and education – agencies that can support mainstreaming and public understanding	DePEd, CHED, National Commission on Culture and Arts, Philippine Information Agency, DILG
• Development administration – agencies that are responsible for the management of cross cutting resources such as funds agencies	NEDA, DBM, COA, Civil Service Commission, human resource systems of line agencies
Local Governments Some of the PBSAP programs will require direct implementation inputs by selected pilot LGUs. LGUs can draw stakeholders to the table and generate local action.	Provinces, Municipalities, Cities

ACTOR	EXAMPLES
Inter-agency and inter-LGU bodies These include existing formal bodies or ad hoc task forces. They may also include inter-LGU bodies that cover certain ecosystems such watersheds, bays and rivers. They are important for risk minimization, conflict management and synergy of action.	PAMBs, Baywide Councils, Watershed Councils
Peer Support Networks These are professional associations, NGO and academic networks and business chambers. Emphasis is placed here on the networks rather than individual NGOs and business firms. These networks help set standards and promote adoption of good practices by its members.	Leagues of LGUs, Leagues of Civil Servants, NGO and Academic Networks, Business Chambers

7.1.4 Implementation capacity

The strengths and weakness of the above actors is largely public knowledge. Some of the more well-known strengths and weaknesses are:

Type of Actor	Strengths	Weaknesses
National agencies	• Sectoral planning • Project planning	• Inter-agency coordination • ODA absorption capacity • Knowledge management
Local governments	• Can lead local multi-sectoral action. Many good practices are nationally recognized.	• Ad hoc/"pet" projects • Hostage to leadership changes
Inter-agency bodies; inter-LGU bodies	• Many are ecosystems-based	• Usually project driven • Managing leadership changes • Quality of secretariat support
Peer support networks (LGU leagues, CSO and Academic networks, business associations)	• Sharing of good practices	• Organizational problems • Knowledge management • Volunteer fatigue

A national capacity self-assessment for CBD implementation (2005) indicated overall "sufficient" capacity for policy formulation and planning but "lacking to barely sufficient" in financing and obtaining public support. Human capacity is "lacking" in focal government offices and "barely sufficient to sufficient" among non-government, academe and business.

Capacity building activities have been largely project-based (depending on donor-driven opportunities). There are noticeable anecdotal achievements at project level but due to lack of monitoring, it is difficult to make a strategic assessment of cumulative gains.

Biodiversity is currently under the purview of the BMB whose name (until recently) connotes a slant towards PAs and wildlife. DENR is undergoing reorganization towards supporting biodiversity more holistically (ex. PAs + non-PAs).

7.1.5 Funding

The PBSAP will be supported by a mix of sources coming from the national government, local government, voluntary contributions from non-state actors (civil society and business sectors) and international support.

7.2 LEARNINGS FROM EARLIER NBSAP IMPLEMENTATION

7.2.1 Key gaps in previous work

Presidential Memorandum Order 289 of 1995 directed the integration of the first NBSAP in sectoral plans and programs of national government agencies. This was updated by the PBCP in 2002 that provided strong spatial reference to the NBSAP. The need to mainstream the NBSAP and the PBCP strategies was reiterated in November 2006 through EO 578 establishing a national policy for biodiversity. The mainstreaming instructions appeared more as a "rider" to a new coastal program that was being launched. There are no known implementation actions to this EO. The Philippine Council for Sustainable Development - CCMRD-Sub-Committee on Biological Diversity currently serves as de facto steering committee of the PBCP.

The government encountered the following key implementation issues in the earlier NBSAPs:

a. Both plans did not have clear institutional arrangements, monitoring and evaluation system and a systematic resource mobilization strategy. The de facto secretariat role of BMB was severely hampered by limited staff resources.
b. Strategies were generally reflected in DENR programs but hardly in sectoral plans beyond the environment sector. There was a general lack of mechanisms to integrate targets in agency level planning.
c. Most of the limited interventions were highly project-based and the incorporation of their accomplishments and learnings in the strategic planning process has been minimal.
d. Lack of a communication and knowledge management strategy to support the continuing need for awareness and commitment building. Due to the limited attention and support to the CHM, the latter was marginalized.
e. Human resources capacity has been largely project-based and left largely untracked.
f. Monitoring (every two years) is largely done for reportorial obligations to CBD. It has not been sufficiently used to support proactive internal assessment and follow on planning.

7.2.2 Recommended features

Based on review of capacities and lessons from earlier NBSAP implementation, it is clear that the coordination and management process and structures of the PBSAP need to possess the following minimum features:

a. It is supported by an EO that clearly establishes roles and functions and start-up funding.
b. A strong national PBSAP secretariat is crucial. To complement limited government resources for secretariat work, volunteer resources must be mobilized and managed effectively.
c. Biodiversity is a complex subject matter and will be implemented by various stakeholders who have varying levels of understanding of and commitment to biodiversity conservation. To compete for the attention of decision makers, continuing education and communication strategies need to be proactively embedded in PBSAP decision-making processes.
d. The traditional roles of coordination and management are no longer sufficient. It must also be concerned with developing and enabling champions who can advocate biodiversity conservation in decision-making, planning programming and budgeting.
e. To support the mainstreaming process, the PBSAP must be embedded in the planning and budgeting process of participating agencies.
f. To better manage conflict and promote synergy, operational plans need to be regularly vetted with multi-sectoral bodies at national (Philippine Council for Sustainable Development), regional (RDCs) and local levels (Local Development Councils, ecosystems-based councils).
g. The resources of LGUs, and the social capital of civil society organizations and business need to be tapped more effectively. Peer support networks (LGU leagues, government networks, business associations) provide the platform to reach out to these sectors.

h. The management system must take advantage of the evolving mechanisms and tools of open government reforms being instituted in order to institutionalize participation of non-state actors and exact accountability from implementing agencies.

The work of the National Committee will be partly "mirrored" at the regional level by the appointment of at least two regional focal points - one with the DENR Regional Office, the other with the NEDA regional office. The regional focal points will facilitate the discussion of PBSAP targets in the RDC and the incorporation of the same in the regional development plan and monitoring and reporting systems.

7.3 RECOMMENDED COORDINATION MANAGEMENT FRAMEWORK

7.3.1 Overall Program Direction

National Committee

With the DENR as the focal agency, a National Committee will be created that will exercise oversight on the PBSAP implementation and will have the following functions:

- ensure the commitment of all government agencies and other stakeholders and their compliance with the implementation of the PBSAP;
- ensure the mainstreaming of biodiversity conservation into the planning and budgeting process of national government agencies and LGUs as well as into national socio-economic development plans;
- through its members, educate the public on biodiversity conservation and communicate and build awareness about the CBD, the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets as well as the progress of their implementation in the Philippines;
- require the support or assistance of any department, bureau, agency or office of the government;
- create a TWG to provide support and assistance in the performance of its functions; and
- perform such other functions and activities as may be necessary to carry out the provisions of the EO that will be enacted to implement the PBSAP.

Technical Working Group

A TWG will be created to provide support and assistance to the National Committee.

The TWG will have the following duties and responsibilities:

- provide technical assistance to the National Committee in the planning, implementation, monitoring and evaluation of the PBSAP;
- assist in the coordination of activities that have direct relevance to their respective agencies' or organizations' objectives and functions;
- provide links to different sectors taking into consideration perspectives from respective and other relevant sectors;
- provide technical assistance to the Regional Committees;
- facilitate information dissemination and feedback within their respective agencies and organizations;
- perform relevant activities e.g. cascade within her/his Department the PBSAP implementation/action plan; and
- perform other functions as may be assigned by the National Committee.

National PBSAP Secretariat

A national PBSAP secretariat to be based at the BMB will be in charge of program development and coordination, monitoring and evaluation and knowledge management, resource mobilization and communication, education and public awareness. The secretariat will be responsible for three major tasks:

Secretariat Tasks	Work Activities
Program development and coordination	• Propose the agenda for National PBSAP Secretariat and sub-committee meetings. • Facilitate multi-sectoral consultative processes. • Co-facilitate planning and implementation processes at line agency levels and with peer support networks of LGUs, CSOs and business as needed.
Monitoring, assessment and knowledge management	• Facilitate program monitoring, analysis and documentation of good practices and lessons learned. • Redesign, fortify and maintain the CHM.
Resource mobilization and CEPA	• Maintain and update the roster of funding windows, training resources and link the same to various implementing agency actors who need them. • Facilitate the tapping of government human resources and tap and manage volunteer resources. • Design and manage communication campaigns.

The Secretariat may combine various implementation modalities for the above tasks - direct implementation or outsourcing of tasks to certain competent groups. Volunteer resources will undergo appropriate training and accreditation.

Regional Focal Points: Subcommittee under the Sectoral Committee on Economic Development of the Regional Development Council

To support the mainstreaming process, the PBSAP will be embedded in the planning and budgeting process of participating agencies. The work of the National PBSAP Secretariat will be partly mirrored at the regional level through focal points at the DENR and NEDA. A subcommittee under the Sectoral Committee on Economic Development of the RDC will be created to ensure that progress of PBSAP implementation will be monitored on a regular basis. The DENR Regional Director shall serve as the Chair and the NEDA Regional Director as co-chair.

7.3.2. Consultation with multi sectoral bodies to support mainstreaming

Sectoral plans and budget proposals will be submitted to multi-sectoral bodies for information, review and feedback. This is to ensure relevance and synergy of action. The PBSAP national secretariat will observe the respective planning calendars of these multi-sectoral bodies and work with their respective secretariats to implement these measures. At the national level, this multi-sectoral body will be embodied by the National Committee. At the sub-national levels, the target multi-sectoral body will be the subcommittee under the Sectoral Committee on Economic Development of the RDC and as needed, by inter-agency bodies working on themes and ecosystems (bays, watersheds). At the LGU level, this will be the Local Development Councils (particularly Provincial Development Councils) or equivalent special bodies created by law or ordinance.

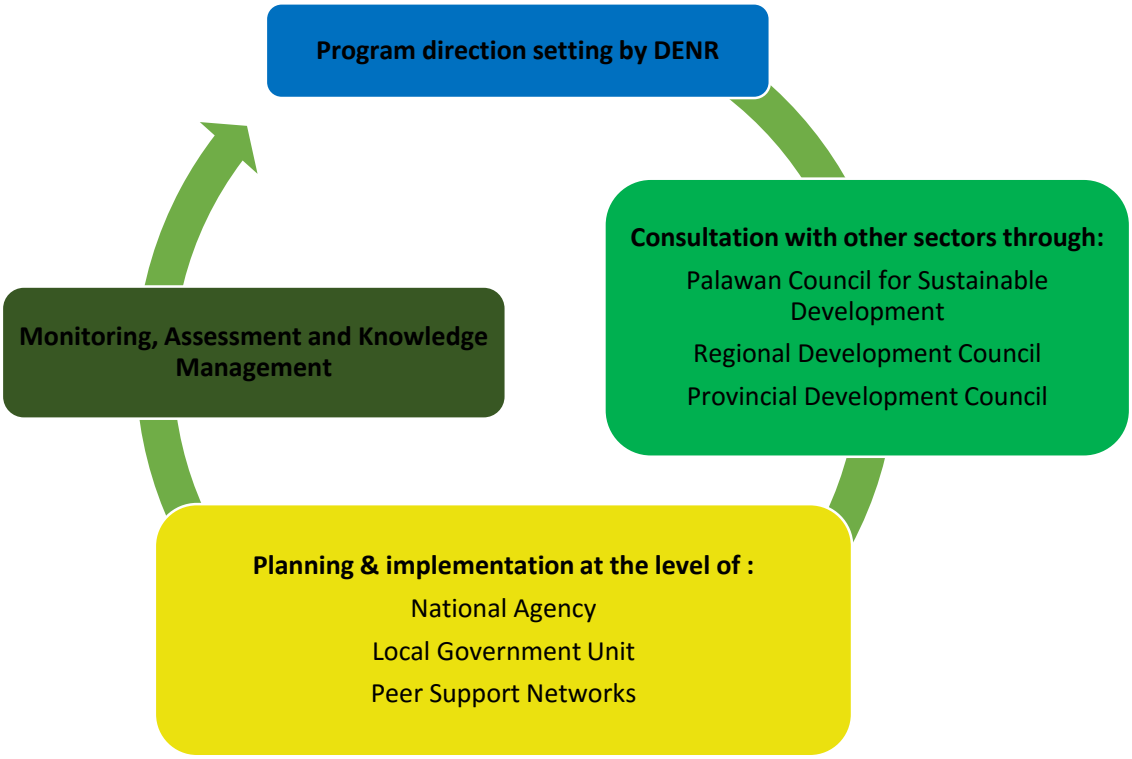


Figure 38. PBSAP process for planning, programming, budgeting, monitoring, assessment and knowledge management

To better manage conflict and promote synergy, operational plans need to be regularly vetted with multi-sectoral bodies at the national, regional and local levels. The resources of LGUs and the social capital of civil society organizations and business need to be tapped more effectively. Peer support networks like LGU leagues and business associations provide potentially powerful platforms to reach out to these sectors (Figure 38).

Illustrative examples of activities and networks are as follows:

Example of Key PBSAP Action/Target	Targeted Peer Support Network
Adoption of City Biodiversity Index	LMP, LCP
Biodiversity assessment in school campuses	Philippine Association of Tertiary Level Educational Institutions in Environmental Protection and Management
Resource mobilization for targeted wildlife species or natural parks	League of Corporate Foundations
Facilitation of documentation of Indigenous Knowledge Systems and Practices	National Network of IPs

7.4. Sustainability of PBSAP Implementation

7.4.1 Institutionalizing the PBSAP Implementation

The PBSAP shall be institutionalized through an EO highlighting the accountabilities of partner agencies, sustainability mechanisms and instruments, as well as technical and financial support particularly at the local

levels. Since the EO is signed by the Philippine President, this will be serve as an effective instrument to increase compliance and participation of entities in PBSAP implementation.

7.4.2 Capacity Building to Support Implementation

Current Situation

There is overall "sufficient" capacity for policy formulation and planning but "lacking to barely sufficient" in financing and obtaining public support. Human capacity is "lacking "in focal government offices and "barely sufficient to sufficient" among non-government, academe and business.

Capacity building activities have been largely addressed depending on donor-driven opportunities. There are noticeable anecdotal achievements at project level but due to lack of monitoring and documentation, it has been difficult to make a strategic assessment of cumulative gains.

Until recently biodiversity conservation is currently under the purview of the BMB whose previous name connotes a slant towards PAs and wildlife. DENR is undergoing reorganization towards supporting biodiversity more holistically (e.g. PAs and non-PAs). The PAs in the country are only 10% staffed compared to ideal staffing rate in ASEAN standards.

Training Needs Assessment (TNA)

On the first year of PBSAP implementation, a TNA will be conducted to determine current capacity to implement the range of PBSAP tasks covering

a. Policy formulation (national policy, proposed legislation, developing guidelines).
b. Sectoral planning /area planning and reconciling the same with other competing sectors.
c. Mainstreaming plans in the bigger socioeconomic development plans.
d. Law enforcement and conflict resolution.
e. Recognition of and support to management and utilization rights and intellectual property rights of stakeholders.
f. Provision of support services under limited resources (extension, research and documentation, etc.)
g. Human resources and institutional capacity building, CEPA and Knowledge Management.
h. Constituency building among non-state actors (civil society, NGO networks, business networks, etc.)

The results will be used to develop a training framework that will establish priority needs and identify the relevant training resources within and outside the country that can match those needs. The PBSAP national secretariat will facilitate this process of matching needs with resources by providing timely information to concerned agencies. Technical bureaus of the DENR particularly BMB and ERDB will be tapped to help manage the matching process. The PBSAP national secretariat will take note of the wide range of training opportunities (usually subsidized) provided by the international community. The PBSAP national secretariat will also work with training institutions and propose a national budget to cover high priority human resources training needs.

Capacity Building Modalities

To address training needs, the PBSAP national secretariat will employ both conventional and innovative modalities for human resources capacity building. Conventional modalities will include the conduct of discrete training courses for targeted teams and individuals assigned to perform certain tasks. Alternatively biodiversity topics may be integrated in existing training modules of both government and non-government institutions. An example would be the current training module of the Local Government Academy on climate change adaptation. Agrobiodiversity conservation measures may be included in these modules as a specific measure to adapt to climate change in the farming sector.

Non-conventional modalities will include activities that may not be considered as formal training activities but are nonetheless opportunities for learning, if coordinated with the CEPA activities of the PBSAP.

Summary of human resource capacity building modalities for PBSAP

Conventional modalities	Emerging modalities
• Formal courses for individuals • Non-formal courses for teams or individuals • Planning and review workshops • Study tours • Personalized use of online resources • Informal exchange	• Participation in carefully facilitated program review and reflection workshops at the agency level • Sharing of good practices within the peer support networks (LGU Leagues, professional associations) • Sister cities and sister towns • Customized online courses (webinars) offered by international and national organizations • Mediated use of social media

7.5 Summary of Recommended Actions for Coordination and Capacity Building Support

The following is a summary of recommended actions relevant to the effective implementation of the PBSAP.

NBSAP promulgation and implementation at national agency level

Promulgation, Coordination and Monitoring	Indicators	Lead Agency
An EO officially promulgates the updated PBSAP. It will outline the coordination, monitoring and funding mechanism as well as overall implementation roles of both government and non-government sectors within and outside the environment sector.	EO implementing the PBSAP and overall implementing mechanism is promulgated	DENR-OSec and BMB
Annual review and assessment at agency and program levels	Annual review meetings conducted and results and lessons learned are reflected in subsequent work plans	Agencies concerned

Implementation plan for multi-sectoral mainstreaming

Promulgation, Coordination and Monitoring	Indicators	Lead Agency
PBSAP priorities are incorporated in the PDP	Biodiversity is part of the PDP	DENR
Review and adoption of annual PBSAP program priorities by the RDC	Adoption as part of Regional Development Plan	DENR, NEDA
Review and adoption of annual PBSAP program priorities by Provincial Development Council (PDC)	Adoption as part of Provincial Development Plan	
Conduct of mid-term review during the 3rd and 7th year and adoption of results by RDC, PDCs	Adoption of results, recommendations and including use of knowledge products	Concerned agencies

Implementation Plan at LGU level and peer support networks

Local Level Capacity to support NBSAP	Indicators	Lead Agency
Guidance is provided to LGUs on how to plan implement and assess basic biodiversity actions through a joint guidebook by DENR, DILG, National Committee and Leagues of LGUs	Guidebook endorsed by DILG and League of LGUs (this may include separate guidance on City Biodiversity Index) Biodiversity-oriented practices in included in training modules of the DILG, LGA Number of surveyed LGUs have incorporated biodiversity-friendly practices in land use plans and action programs and number of LGUs has full-fledged ENROs.	DENR, DILG, Local Government Academy (LGA), Leagues of LGUs

MOA is established with key peer support networks of NGO and private sector to optimize their support to the PBSAP	Increased human and financial resources provided by the NGO and business sectors to mutually identified joint actions Increased participation of civil society and business sectors in selected participating LGUs	NGO networks, Business associations

Implementation plan for human resources capacity building to support implementation

Overall NBSAP Human Resource Capacity	Indicators	Lead Agency
A human resource capacity building framework and corresponding agency level programs is established in target sectors among local government agencies, NGOs, academe and business. The program is supported by a consortium of key training organizations that is forged to advocate observance of the human resource capacity building program.	Human Resource programs and activities of projects are formulated and monitored using the TNA and human resource capacity building program as basis.	DENR - HR, DENR-BMB, Agricultural Training Institute, DILG, DOST, Development Academy of the Philippines (DAP) and NGO consortia
The DENR reorganization (institutional capacity) is fully completed and supported by HR capacity building to allow for the integrated coordination of the PBSAP.	Biodiversity is actively mainstreamed among all DENR sub- sectoral programs.	DENR HR, BMB

Monitoring and Evaluation (M&E)

The M&E is one of the components of the implementation plan containing the PBSAP targets, indicators and responsible agencies. The review of the PBSAP will be included regularly in accordance with the UN CBD reporting schedule. The key evaluation questions revolve around expounding on whether the strategic targets are being achieved, how these were achieved and what were the facilitating and hindering factors that affected implementation of the plan. The M&E plan is intended to be an adaptive management tool that provides relevant information for status assessment on performance targets on a regular basis and evaluation of the effectiveness of strategic interventions.

Each target will be assigned a reference sheet which contains the following information: a) indicator definition, b) data capture and analysis, c) data quality assessment, d) data analysis, review and reporting and e) baselines, targets and performance values. Refer to Annex 6 for a sample reference sheet.

Key indicators as identified in the PBSAP will be embedded in the respective national program plans and agency plans. Indicators will be also amplified as needed. The National Committee will hold annual review workshops with key agencies. The review workshops will identify accomplishments by the agency that contributes to the PBSAP and how these simultaneously contribute to agency mandates and targets. The workshops will identify and recommend policy reforms within the purview of the agency. The same process would likewise be done in participating pilot LGUs. The NPC in turn would conduct annual review workshops that involve all key agencies and partners.

A mid-term program review (in-house and external) will be facilitated by the National Committee every three (3) years. Results will be presented to the Committee, key agencies and multi-spectral bodies earlier cited. The review will, likewise, identify outstanding good practices and lessons and how these contribute the programs of participating agencies and networks. Knowledge products will be identified and communicated to key policy makers, planners and other key stakeholders guided by a communication strategy. The CHM will likewise be tapped to support the communication campaign.

Data Management

Currently, data on PAs and species are encoded in the CHM website, which houses the information on country's biodiversity to facilitate scientific and technical cooperation, knowledge sharing and information exchange, and to establish a fully operational network of partners.

Building on what the CHM has started, BMB will develop an Integrated Biodiversity Management Information System Portal, a comprehensive and up-to-date information and database on protected areas, other conservation areas and species and genetic level conservation in the Philippines that will ensure fast and efficient data retrieval, better information sharing and improved data security.

The IBMIS will deliver essential information on in-situ and ex-situ biodiversity conservation and will be closely linked with the enhanced CHM and in monitoring the targets of the PBSAP.

References

Agnew, D., Pearce, J., Pramod, G., Peatman, T., Watson, R., Beddington J., & Pitcher, T. (2009). Estimating the Worldwide Extent of Illegal Fishing. PLOS ONE. Retrieved from http://www.plosone.org/article/info:doi/10.1371/journal.pone.0004570.

Philippine Statistics Authority (PSA). (2011). Agriculture and Fisheries, 2011 Philippine Yearbook. Retrieved from http://www.census.gov.ph/content/agriculture-and-fisheries

Alcala, A. C. (1998). Community-based Coastal Resource Management in the Philippines: a Case Study. Ocean & Coastal Management 38:179-186.

Alibo, V. L. & Lasco, R.D. (2012). Carbon Storage of Caimpugan Peatland in Agusan Marsh, Philippines and its Role in Greenhouse Gas Mitigation. Journal of Environmental Science and Management 15(2): 50-58.

Alyansa Tigil Mina. A legacy of disasters. The mining situation in the Philippines January 2011. Quezon City.

Ambal, R. G. R., M.V. Duya, M. A. Cruz, O.G. Coroza, S.G. Vergara, N. De Silva, N. Molinyawe, & B. Tabaranza. (2012). Key Biodiversity Areas in the Philippines: Priorities for Conservation. Journal of Threatened Taxa 4(8): 2788-2796.

Andres, A. (2013). Overview of the Philippine Biodiversity Strategy and Action Plan Updating Process. Presentation given at the Visayas Regional Consultation for the Updating of the PBSAP, 28 August 2013, Cebu City.

Asean Centre for Biodiversity. (2010). Protected area gap analysis in the ASEAN region.

Asia Indigenous Peoples Pact. (2012). Indigenous peoples and corporate accountability in the ASEAN. Chiang Mai, Thailand: AIPP.

Beniston, M., 2003. Climatic change in mountain regions: a review of possible impacts. Climatic Change, 59:5–31.

Borromeo, T. (2014). State of the art Philippine Plant Genetic Resources for Food and Agriculture. Paper presented in the National Workshop on Genetic Resources for Wealth Creation, 3-5 December 2014, Taal Vista Hotel, Tagaytay City.

Boyd, J., & Banzhaf, S. 2007. What are ecosystem services?. Ecological Economics 63(2–3): 616–626.

Brawner Baguilat, T. (2011). Philippines. Mining and its impacts to indigenous communities. Retrieved from http://indigenouspeoplesissues.com/index.php?option=com_content&view=article&id=1988:philippines-mining-and-its-impacts-to-indigenous-communities&catid=32&Itemid=65

Briones, N. (2005). Environmental sustainability issues in Philippine agriculture. Asian Journal Agriculture and Development 2(1-2): 67-78.

Bureau of Agricultural Statistics http://www.bas.gov.ph/

Bureau of Fisheries and Aquatic Resources (BFAR). (n.d). Philippine coral reefs. Accessed from http://www.bfar.da.gov.ph/habitat.jsp?id=4

Bureau of Fisheries and Aquatic Resources. 2008. in Torell et al. 2010.

Bureau of Fisheries and Aquatic Resources (BFAR). (2011). Inland Fishery Resources in the Philippines [Data file]. Available on www.bfar.gov.ph

Carew-Reid, J. (ed) 2002. Biodiversity Planning in Asia. IUCN Sri Lanka; Swiderska, K. 2002. Implementing the Rio Conventions: Implications for the South. IIED, WSSD Opinion Paper; OECD and UNDP 2002. Sustainable Development Strategies: A Resource Book.

Castillo, T.S. (2010). Philippine Milestones on Coastal and Marine Biodiversity. Quezon City, Philippines: DENR.

Catibog-Sinha, C.S., & Heaney, L. (2006). Philippine Biodiversity: Principles and Practice. Quezon City, Philippines: Haribon Foundation

Climate Change in the Philippines, Feb. 2011 http://kidlat.pagasa.dost.gov.ph/cab/climate_change/Climate%20change%20in%20the%20Philippines%20-%20August%2025%202011.pdf

Climate Change Commission (CCC) and United Nations Development Programme (UNDP). (2013). Reducing Environmental Vulnerabilities and Optimizing Wealth Creation from Philippine Environment and Natural Resources: A Post 2015 Development Agenda towards Resilience and Well Being for the Filipino People [Second National Consultation]. Retrieved from http://data.worldwewant2015.org/documents/4799/download

Conservation International (CI). (2014). CI website. Available on http://www.conservation.org/global/philippines/Pages/partnerlanding.aspx

Conservation International, Philippines. Department of Environment and Natural resources – Protected Areas and Wildlife Bureau and Haribon Foundation. 2006. Priority Sites for Conservation in the Philippines: Key Biodiversity Areas. Quezon City, Philippines, 24pp.

Constante, A. (2015). Nevada's top court hears case from Philippine province [online article]. Retrieved from http://asianjournal.com/news/nevadas-top-court-hears-case-from-philippine-province/#sthash.8QY3mPLk.dpuf

Coulby, H. (2009). A guide to multistakeholder work: Lessons from the Water Dialogues. The Water Dialogues: multistakeholder dialogues on water and the private sector: London, United Kingdom. Accessed from http://www.waterdialogues.org/downloads/new/Guide-to-Multistakeholder.pdf

Department of Environment and Natural Resources (DENR) Ecosystems Research and Development Bureau (ERDB). 2013 DENR-ERDB Annual Report. Laguna, Philippines: ERDB.

DENR Environmental Management Bureau. Major Environmental Laws in the Philippines. Retrieved from http://www.emb.gov.ph/portal/ecac/MajorEnvironmentalLaws.aspx

DENR Forest Management Bureau (FMB). (2012). Philippine Forestry Statistics 2012. Quezon City, Philippines: FMB-DENR.

DENR MIMAROPA. (2014). TCP Accomplishment Report 2014. Unpublished as cited in the DENR-BMB. Treasures of the Philippine Wild 2014.

DENR Mines and Geosciences Bureau (MGB). (2013). MGB website accessed from http://www.mgb.gov.ph/

DENR Protected Areas and Wildlife Bureau (PAWB), United Nations Development Programme (UNDP), and ASEAN Center for Biodiversity and Ateneo School of Governance (ASOG). (2009). Assessing Progress Towards the 2010 Biodiversity Target: The 4th National Report to the Convention on Biological Diversity.

DENR PAWB & Gaia Exploration Club. (2013). Philippine Cave Primer. Quezon City. 30 p.

DENR PAWB. (2013). The National Wetlands Action Plan 2011-2016. Quezon City. 75 p.

Elmqvist, T., Folke, C., Nyström, M., Peterson, G., Bengtsson, J., Walker, B. and Norberg, B. (2003). Response diversity, ecosystem change, and resilience. Frontiers in Ecology and Environment 1: 488-494.

Farmer-Scientist Partnership for Development (MASIPAG), Philippines http://www.masipag.org

Food and Agricultural Organization website http://www.fao.org/home/en/

Foundation for the Philippine Environment (FPE). (2014). Indigenous Peoples and Community-Conserved Areas. Retrieved from http://fpe.ph/indigenous-communities.html/view/where-are-indigenous-peoples-distributed-in-the-philippines

Global forest watch. (n.d.). Philippines Country Profile. Accessed from http://www.globalforestwatch.org/country/PHL

Gold, K. and McBurney, R.P.H. (2010). Conservation of plant biodiversity for sustainable diets. In Burlingame, B. and Derninin, S. (eds.) Sustainable diets and biodiversity directions and solutions for policy, research and action. Proceedings of the International Scientific Symposium: Biodiversity and Sustainable Diets United Against Hunger, p.108-115 on November 3-5, 2010. Rome.

Guiang, E., & Braganza, G. (2014). National management effectiveness and capacity assessment of protected areas. Manila: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. a., Tyukavina, a., Thau, D., Stehman, S. V., Goetz, S. J., Loveland, T. R., Kommareddy, A., Egorov, A., Chini, L., Justice, C. O. & Townshend, J. R. G. (2013). High-Resolution Global Maps of 21st-Century Forest Cover Change. Science, 342(6160), 850–853. As cited in Osti et al., 2014.

Heaney, L. R., D. Balete, L. Dolar, A. Alcala, A., Dans, P. Gonzales, N. Ingle, M. Lepiten, W. Oliver, P. Ong, E. Rickart, B. Tabaranza, and R. Utzurrum, 1998. A synopsis of the mammalian fauna of the Philippine Islands. Fieldiana: Zoology, n.s. 88:1-61.

Herrera, C. F. (2012, June 29). No-mining zone in rice terraces urged under EO. Manila Standard Today. Retrieved 29 June, 2012 from http://news.manilastandardtoday.com/2012/06/29/no-mining-zone-rice-terraces-urged-eo/

Hoddinott, J. & Yohannes, Y. (2002). Dietary diversity as a food security indicator [Discussion paper no 136]. Washington: International Food Policy Research Institute, Food Consumption and Nutrition Division.

Israel, D.C. & Lintag, J. (2013). Assessment of the Efficiency and Effectiveness of the Reforestation Program of the Department of Environment and Natural Resources. Makati City, Philippines: Philippine Institute for Development Studies.

International Union for the Conservation of Nature (IUCN). (n.d.). Key Biodiversity Areas. Retrieved March 2, 2016, from https://www.iucn.org/about/union/secretariat/offices/iucnmed/iucn_med_programme/species/key_biodiversity_areas/

International Union for the Conservation of Nature and Natural Resources (IUCNNR). (2014). Consultation document on an IUCN standard for the identification of key biodiversity areas. Retrieved from http://worldparkscongress.org/drupal/sites/default/files/documents/docs/consultation_document_iucn_kba_standard_01oct2014.pdf

Japan International Cooperation Agency and National Water Resources Board (NWRB). 1998. Master Plan Study on Water Resources Management in the Philippines.

Kennedy, G., Pedro, M.R., Seghieri, C., Nantel, G., and Brouwer, I. (2007). Community and international nutrition dietary diversity score is a useful indicator of micronutrient intake in non-breastfeeding Filipino children. The Journal of Nutrition 137: 472-477.

Magdaong, E., H. Yamano, and M. Fujii. (2012). Assessing long-term coral cover change in the Philippines: a meta-analysis. Paper presented at The International Symposium including Field Workshops: Biodiversity in Changing Coastal Waters of Tropical and Subtropical Asia on November 30 to December 4, 2012. Amakusa, Japan

Maramba, N. (1996). Philippine Case Study: A Developing Country's Perspective on POPs. A paper presented at the Intergovernmental Forum on Chemical Safety (IFCS) Experts Meeting on POPs, Manila, Philippines June 17-19, 1996.

Mendoza, M.M., & Navarro, J.M. (2014). Inventory of Inland Wetlands in Luzon, Philippines. Unpublished Report. 30 p.

Miclat, E., & Ingles, J. (2004). Standardized terms and definitions for use in marine protected area management in the Philippines. In: Arceo HO, Campos WL, Fuentes F, Aliño PM, eds. Proceedings of the Workshop Toward the Formulation of the Philippine Marine Sanctuary Strategy, p. 3-8. Quezon City: Marine Science Institute, University of the Philippines.

Miles, L., Dunning, E., Doswald, N., & Osti, M. (2010). A safer bet for REDD+: Review of the evidence on the relationship between biodiversity and the resilience of forest carbon stocks. Multiple Benefits Series 10.

Morallo-Rejesus, B., G. P. Bilog and P. A. Javier. (1990). Mass rearing technique of Aphytis lingnanensis Compere, In: Proc. 21st Ann. Conf. of the PCCP, May 7-10, Sugarland Hotel, Bacolod City.

National Biodiversity Strategy and Action Plan/Philippine Biodiversity: An Assessment and Action Plan. DENR, 1997. Bookmark, Inc. Makati, Philippines.

National Commission for Culture and the Arts (NCCA). (2015) School of Living Traditions/ Accessed from http://ncca.gov.ph/school-of-living-traditions/

National Commission on Indigenous Peoples (NCIP) Annual Report CY 2007.

National Economic and Development Authority (NEDA). (2011). Philippine Development Plan 2011-2016 Results Matrices. Ortigas Center, Pasig City: NEDA.

National Economic and Development Authority (NEDA). (2013). CY 2013 ODA Portfolio review report. Retrieved from http://www.neda.gov.ph/wp-content/uploads/2014/07/CY2013-ODA-Review-Overall-Writeup.pdf

National Greening Program (NGP). (n.d.). National Greening Program website. Accessed from http://ngp.denr.gov.ph/

National Statistics Office (NSO). http://www.census.gov.ph/

New Conservation Areas in the Philippines Project primer: Threats to Philippine Biodiversity, DENR, GEF, UNDP, undated http://www.newcapp.org/about-philippine-biodiversity.php

Ngo, H.T., Gemmill-Herren, B., Azzu, N. & Packer, L. (2012). The economic valuation of pollinators for Southeast Asia: Philippines and Vietnam. Presented at the CEPA Fair-COP 11: GBPIHED & FAO side event on October 8-19, 2012. Hyderabad, India. Retrieved from https://www.cbd.int/cepa/cepafair/2012/cepa-fair-2012-gbpihed-pollinators2.pdf

Office of the Presidential Adviser on the Peace Process
http://opapp.gov.ph/

Osti, M., Thorley, J., Väänänen, E., Goodman, L., Woroniecki, S., Coroza, O. G., De Alban, J. D. T., Rico, E. L. B., Monzon A. K. V., Liss, B.-M., Estomata, M. T., Uychiaoco, A. J., Diaz, E. O. and Mant, R. (2014) Using spatial analysis to explore synergies between the Aichi Biodiversity Targets and REDD+ in the Philippines. A preliminary analysis. Prepared by UNEP-WCMC, Cambridge, UK.

Paguntalan, L.M., Jakosalem, P.G., Gonzalez, J.C. & Diesmos, A. 2009. IUCN Red List of Threatened Species. Version 2013.

Partnerships in the Environmental Management for the Seas of East Asia (PEMSEA). (9 September 2011). Verde Island Passage MPAs Honored Among Country's Best. Accessed from http://www.pemsea.org/news/verde-island-passage-mpas-honored-among-countrys-best

Philippine Commission on Women (PCW). (2014). Women's empowerment, development and gender equality plan 2013-2016. Manila, Philippines: PCW.

Philippine Atmospheric, Geophysical Astronomical and Geophysical Services Administration (PAGASA). (2011). Climate Change in the Philippines. Philippine Atmospheric, Geophysical and Astronomical Services Administration, Department of Science and Technology, Quezon City, Philippines.

Philippine Multilateral Environmental Agency (MEA) Portal
http://mea.denr.gov.ph/index.php?option=com_content&view=article&id=135&Itemid=239

Philippine Statistics Authority (PSA). (28 July 2014). A 142 million Philippine population by 2045? [Population projection statistics 2014-2050]. Accessed from https://psa.gov.ph/content/142-million-philippine-population-2045

Pimm, S. L. and P. Raven. (2000). Extinction by numbers. Nature, London 403: 843–845.

Plantilla, A. (n.d.). Results of the pre-and post-awareness surveys on biodiversity conservation, 2001 and 2002. Manila: Haribon Foundation. (Powerpoint presentation retrieved from http://www.haribon.org.ph).

Popkin, B.M. (2001). The nutrition transition and obesity in the developing world. Journal of Nutrition 131: 871s-873s.

Primavera, J.H. (2000). Development and conservation of Philippine mangroves: Institutional issues. Ecological Economics Special Issue – The values of wetlands: Landscape and institutional perspectives 35: 91-106.

Primavera, J.H., R.N. Rollon, and M.S. Samson. 2011. The Pressing Challenges of Mangrove Rehabilitation: Pond Reversion and Coastal Protection. In E. Wolanski and D.S. McLusky, eds. Treatise on Estuarine and Coastal Science. Vol. 10. Waltham: Academic Press.

Prip, C., Gross, T., Johnston, S., Vierros, M. (2010). Biodiversity Planning: an assessment of national biodiversity strategies and action planes. United Nations University Institute of Advanced Studies, Yokohama, Japan. Accessed from http://www.cbd.int/nbsap/, accessed on 18 November 2010,

Quitoriano, E. L. .(2013). Supporting Philippine REDD+ readiness Final evaluation of the Climate-relevant Modernization of the National Forest Policy and Piloting of REDD Measures in the Philippines Project. Manila : Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Rasmussen, P. C., Allen, D. N. S., Collar N. J., Demeulemeester, B., Hutchinson, R. O., Jakosalem, P. G. C., Kennedy, R. S., Lambert, F. R., & Paguntalan, L. M. (2012). Vocal divergence and new species in the Philippine Hawk Owl Ninox philippensis complex. Forktail 28: 1-20.

Rebugio, L.L., R.V. O. Cruz, W. M. Carandang, E. L. Tolentino, L. U. de la Cruz, R. D. Lasco, R. G., Visco, J. T. Dizon, F. B. Pulhin, R. V. Dalmacio, N. C. Bantayan, M. M. Calderon, and L. D. Camacho. (2005). Forest restoration in the Philippines: A review of research and development initiatives. University of the Philippines Los Baños, Office of the AKECOP Coordination in the Philippines, College of Forestry and Natural Resources, College, Laguna.

Ruel, M., Graham, J., Murphy, S., & Allen, L. (2004). Validating simple indicators of dietary diversity and animal source food intake that accurately reflect nutrient adequacy in developing countries. Report submitted GLCRSP.

Saatchi, S. S., Harris, N. L., Brown, S., Lefsky, M., Mitchard, E. T. A., Salas, W., Zutta, B. R., Buermann, W., Lewis, S. L., Hagen, S., Petrova, S., White, L., Silman, M. & Morel, A. (2011) Benchmark map of forest carbon stocks in tropical regions across three continents. Proceedings of the National Academy of Sciences of the United States of America, 108(24), 9899–9904.

Samson, M.S. and R.N. Rollon. (2008). Growth Performance of Planted Mangroves in the Philippines: Revisiting Forest Management Strategies. Ambio. 37: 234–240.

Save the Marikina Project
http://emi.pdc.org/soundpractices/Metro-Manila/SP6-MM-Save-the-Marikina-River.pdf

Secretariat of the Convention on Biological Diversity (CBD). 2006. Guidance for promoting synergy among activities addressing biological diversity, desertification, land degradation and climate change [CBD technical series no. 25]. Retrived from https://www.cbd.int/doc/publications/cbd-ts-25.pdf

Secretariat of the Convention on Biological Diversity (CBD). 2012. Cities and Biodiversity Outlook. Montreal. 64 p.

Senga, R. (2001). Establishing protected areas in the Philippines: Emerging trends, challenges and prospects. The George Wright FORUM 18(2): 56-55.

Smith, B.D. & Beasley, I. (2004). Orcaella brevirostris (Malampaya Sound subpopulation). The IUCN Red List of Threatened Species 2004: e.T44187A10858619. http://dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T44187A10858619.en.

Swiderska, K. 2002. Mainstreaming Biodiversity in Development Policy and Planning A Review of Country Experience. London, UK: IIED. Accessed from http://www.iied.org/NR/agbioliv/bio_liv_documents/Mainstreamingbiodiversity1.pdf

Steyn, N., Nel, J. Nantel, G., Kennedy, G., and Labradarios, D. (2006). Food variety and dietary diversity scores: Are they good indicators of dietary adequacy? Public Health Nutrition 9: 644-650.

Tacio, H. (4 November 2011). Fish depletion, marine habitats destruction in the Philippines [Gaia Discovery online article]. Retrieved from http://www.gaiadiscovery.com/marine-life-latest/tag/fish-shortage

Talaandig Cultural Site
http://talaandigsite.blogspot.com/2008/05/school-for-living-tradition.html

Talavera, M.T., Felix, A., and Narciso, M. (2011). Integrated report on formative research on food preparation and complementary feeding practices of mothers of 0-23 month old children. Institute of Human Nutrition and Food, College of Human Ecology: UP Los Banos.

World Wildlife Fund (WWW). (September 2013). TAYTAY: Taking Charge of a Critical Resource A case study on the Philippines (Irrawaddy Dophins in Palawan). Accessed from http://wwf.org.ph/wwf3/downloads/casestudies/WWF-Philippines-Taytay-Case-Study.pdf

Thompson, I. D., Ferreira, J., Gardner, G., Guariguata, M., Koh, L, P., Okabe, K., Pan, Y., Schmitt, C. B. & Tylianakis, J. (2012) Forest biodiversity, carbon and other ecosystem services: relationships and impacts of deforestation and forest degradation. In J. A. Parrotta, C. Wildburger, & S. Mansourian (Eds.), Understanding Relationships between Biodiversity, Carbon, Forests and People: The Key to Achieving REDD+ Objectives. A Global Assessment Report. Prepared by the Global Forest Expert Panel on Biodiversity, Forest Management, and REDD+. Vienna, IUFRO World Series Volume 31.

Torell, Magnus, Siri Ekmaharaj, Somboon Siriraksophon, and Worawit Wanchana. 2010. Strategies to Combal Illegal Fishing and Manage Fishing Capacity: Southeast Asian Perspective. Fish for the People (8:1). pp10-19.

Turner, K. & Fisher, B. (2008). Ecosystem services: Classification for valuation [Letter to the editor]. Biological Conservation 141: 1167-1169.

Wallace, K.J. (2007). Classification of ecosystem services: problems and solutions. Biological Conservation 139:235–246.

Weeks, Rebecca, Russ, Garry R., Alcala, Angel C., and White, Alan T. (2010). Effectiveness of marine protected areas in the Philippines for biodiversity conservation. Conservation Biology, 24 (2). pp. 531-540.

White AT, Aliño PM, Cros A, Fatan NA, Green AL, Teoh SJ, Laroya L, Peterson N, Tan S, Tighe S, Venegas-Li R, Walton A, and Wen W. (2014). Marine protected areas in the Coral Triangle: progress, issues, and options. Coastal Management 42(2):87-106.

World Bank (WB) & National Disaster Coordinating Council Republic of the Philippines. Natural Disaster Risk Management in the Philippines: Enhancing Poverty Alleviation through Disaster Reduction. World Bank 2005

Yusuf, A. & Francisco, H. (2011). Climate change vulnerability mapping for Southeast Asia. Singapore: Economy and Environment Program for Southeast Asia.

Zafar, S. (2015 May 12). Biomass energy potential in the Philippines [online article]. Retrieved from http://www.bioenergyconsult.com/biomass-philippines/

ANNEX 1

Biodiversity Aichi Targets

Aichi Targets

Strategic Goal A

Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strategic Goal B

Reduce the direct pressures on biodiversity and promote sustainable use

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Aichi Targets (continuation)

Strategic Goal C

Improve the status of biodiversity by safeguarding ecosystems, species and genetic biodiversity

Target 11: By 2020, at least 17 per cent of terrestrial and inland water areas and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.
Target 12: By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic Goal D

Enhance the benefits to all biodiversity and ecosystem services

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks have been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their utilization is in force and operational, consistent with national legislation.

Strategic Goal E

Enhance the implementation through participatory planning, knowledge management and capacity building

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

ANNEX 2

Stories and Best Practces in the Philippines

ANNEX 2.1

School of living traditions among the Tala andig in Lantapan, Bukidnon

The School for Living Traditions is Datu Vic Migketay Saway's symbol of the Talaandig peoples' vision of a transformed society; where the youth know their roots and identity, chant epic songs, dance the Binanog rhythm by heart with a sense of dignity, that same dignity provided for by the very Source of Life in our world.

In the midst of growing threat on the indigenous cultures brought about by the fast changes of a globalized world, Datu Migketay Victorino Saway started a School for Living Tradition. It is a space within the cultural center of the Talaandig community in Songko, Lantapan Bukidnon where children can play their own musical instruments specifically the big Talaandig tambol.

Children sing their own songs, listen to the Talaandig stories and learn the Talaandig games and dances from Inay a Talaandig cultural master. In this haven for children, anyone is free to explore and experiment with sound and space. It is here where children build their foundation on the Talaandig story and self-identity.
(Source: Talaandig Cultural Site - http://talaandigsite.blogspot.com/2008/05/school-for-living-tradition.html)

Annex 2.2
The National Greening Program

On February 26, 2011, President Benigno S. Aquino III issued EO 26 ordering and declaring the implementation of the NGP[22] as a government priority. The NGP aims to plant 1.5 billion trees covering 1,500,000 ha of public lands by the year 2016 and is the main strategy for reforestation of the Philippine government.

Department of Interior and Local Government participating in the National Greening Program.
(Photo credits: DILG news, September 19, 2011)

Definition of FOREST

Land with an area of more than 0.5 ha and tree crown cover (or equivalent stocking level) of more than 10%. The trees should be able to reach a minimum height of 5 meters at maturity in situ. It consist either of closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground or open formations with a continuous vegetation cover in which tree crown cover exceeds 10%. Young natural stands and all plantations established for forestry purposes, which have yet to reach a crown density of more than 10% or tree height of 5 meters are included under forest.

Source: FAO. 2000. Global Forest Resource Assessment 2000. Rome.

Aside from being a reforestation initiative, the NGP is also seen as a climate change mitigation strategy as it seeks to enhance the country's forest stock to absorb carbon dioxide, which is largely blamed for global warming. It is also designed to reduce poverty, providing alternative livelihood activities for marginalized upland and lowland households relating to seedling production and care and maintenance of newly planted trees.

As a convergence initiative among the DA, DAR, DILG, DENR and other institutions, the commodities to be planted constitute both forest tree species and agroforestry species, namely timber, indigenous species, mangrove species, urban spaces, fuelwood, coffee, cacao, rubber, other fruit trees, bamboo and rattan.

Areas eligible for rehabilitation under the program include all lands of the public domain. Specially, these include forestlands, mangrove and PAs, ancestral domains, civil and military reservation, urban greening areas; inactive and abandoned mine sites and other suitable lands.

[22] *http://ngp.denr.gov.ph/*

In 2013, the program has already planted a total of 333,160 ha or 111 percent of the target area of 300,000 ha. Of the total area planted in the same year, 182,584,862 seedlings were planted.

Good Practice: Former rebels from Negros-Panay to work as forest guards for DENR-PAMANA National Greening Program

Former rebels from the Rebolusyonaryong Partido ng Manggagawa-Pilipinas/Revolutionary Proletarian Army/Alex Boncayao Brigade – Tabara Paduano Group (RPM-P/RPA/ABB – TPG), now known as Kapatiran para sa Progresong Panlipunan is taking active part in protecting forestry and natural resources as part of the peace process with the government.

Office of the Presidential Adviser on the Peace Process Undersecretary Ma. Cleofe Gettie Sandoval underscored that the program is part of the government's commitment to support former rebels. The RPM-P/RPA/ABB is a breakaway group of the Communist Party of the Philippines/New People's Army/National Democratic Front. RPM-P/RPA/ABB split in 2007, and the TPG now pursues a Closure Agreement with the government.

Photo 3. Former rebels from RPM-P/RPA/ABB – TPG, now known as "Kapatiran para sa Progresong Panlipunan" in the orientation workshop for forest guards for the DENR-PAMANA National Greening Program
(Source: opapp.gov.ph)

A report entitled "Assessment of the Efficiency and Effectiveness of the Reforestation Program of DENR" outlines the values and gaps within the NGP. Based from the report published by the Philippine Institute for Development Studies [PIDS] in 2013, the NGP was effective in promoting:

1. Other values aside from reforestation: The program seeks to indirectly improve water quality in rivers and irrigation for farm lands, reduce the potential for flooding, absorb carbon dioxide out of the atmosphere, and lay down a strong foundation for an expanded wood-products economy.
2. Social mobilization: Students, from Grade 5 to college level, are also made to contribute by planting at least 10 seedlings each, annually. Upland communities are also tapped to be responsible in taking care of the seedlings planted by other participants.

It also mentioned the need for independent evaluations. There is no available independent evaluation of the NGP so far which is understandable given that it is still into its third year of implementation. It has been reported that the DENR Secretary has recently ordered the notarization of all reports submitted by the DENR field offices playing key roles in the implementation of the NGP in an apparent move to remove doubts on the veracity of reports (Mosqueda 2012). In response, a regional validation team that will periodically monitor and evaluate the implementation of the NGP by various field offices in Region VII has been created by the regional office of the DENR. This move, if not yet done in some other regions, should be practiced by all regional offices of the DENR for a more effective national and regional validation.

Annex 2.3

Quicker Flooding Subsidence

Source: http://www.emb.gov.ph/adopt-estero/aas-accomplishment.pdf

In Loyola Heights for Diliman Creek, a kagawad reported that while before, 45 minutes of continuous heavy downpour is enough to flood their area, they were happy to have noted they did not experience flooding during Typhoon Falcon last June 2011. He attributed this to the orchestrated monthly cleanup they were having among the different barangays traversed by Diliman Creek.

Most "Adopt-an-Estero" communities already observe significant reduction in the amount of time it takes for rainfall runoff to subside.

Annex 2.4

Verde Island Passage MPAs honored among country's best

Twin Rocks Marine Sanctuary in Mabini, Batangas and Agsalin Fish Sanctuary in Gloria, Oriental Mindoro, were honored as finalists of the *Para El Mar* competition in awarding rites held at the University of the Philippines on August 31, 2011.

Source: http://www.conservation.org/global/philippines/PublishingImages/Agsalin_spillover.jpg

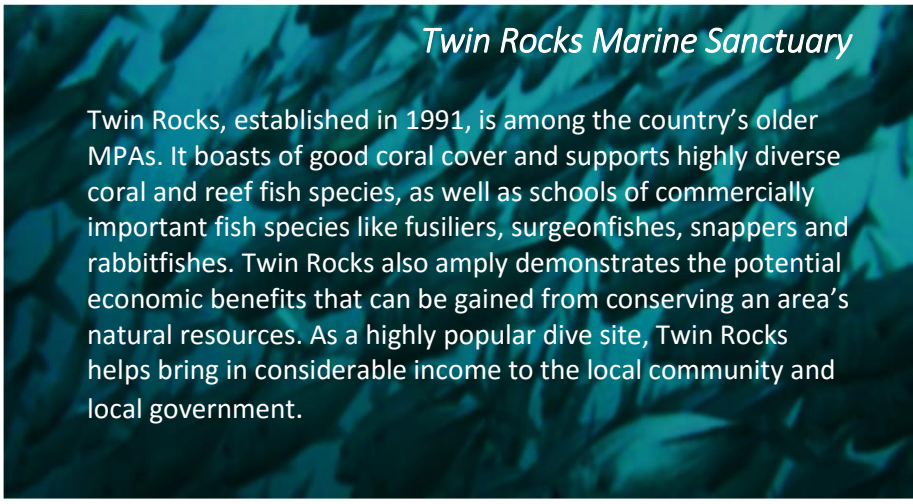
The *Para El Mar* seeks to recognize and provide incentives for best practices in MPA management. The Marine Protected Areas Support Network, a multi-sectoral group from government and non-government organizations (NGO), POs and academic institutions, organizes this event.

The *Para El Mar* award screens nominees based on management effectiveness, bio-physical and ecological impacts, and social and economic benefits.

"We are very proud and I think that this award gives much-needed encouragement to the people and local government of Mabini and of other Batangas municipalities that are involved in MPA management," said Lorie Sollestre of the Batangas Provincial Environment and Natural Resources Office. "We are working very hard to protect and effectively manage our MPAs, and I'm optimistic that when the next *Para El Mar* comes along, we will even have more MPAs qualifying to join," she said.

Agsalin Fish Sanctuary

Agsalin Fish Sanctuary in Oriental Mindoro, on the other hand, was established through a local ordinance in 2004. Fruits of effective protection efforts since its establishment is shown by the observed recovery of corals and maintenance of live coral cover within the sanctuary. Local fishers in areas adjacent to the MPA or within its buffer zone have also observed improvements in their fish catch, demonstrating the so-called "spill-over effect" of increased protection.



"We are inspired and honored by this recognition," said Marilyn Alcañices of the Provincial Agriculture Office of Oriental Mindoro. *"We also consider our performance in this competition as a good measure of how far we have gone and of the gaps that we still need to address. We may not have made it to the top three, but we are still happy with the result since we know that we are already competitive in other aspects of MPA management and we are willing to work on our weak points,"* she said.

Networking for Effective Management

Twin Rocks and Agsalin are both part of the Verde Island Passage MPA Network, which currently comprises nearly 70 MPAs in Batangas, Occidental Mindoro and Oriental Mindoro provinces. These MPAs represent more than 17,000 ha of critical habitats in the Verde Island Passage, a recognized global center of marine biodiversity.

Annex 2.5

More than 300 new species discovered in the Philippines during California Academy of Sciences Expedition

Scientists find additional evidence that the Philippines is one of the most species-rich places on the planet; Along the way, they encountered more than 300 species that appear to be new to science, including such notable finds as a cicada that makes a distinctive "laughing" call, a deep-sea swell shark that inflates its stomach with water to bulk up and scare off other predators, a starfish that exclusively eats sunken driftwood, three new lobster relatives that squeeze into crevices instead of carrying shells on their backs, a crab whose pincers are lined with needle-like teeth, and a worm-like pipefish that hides among colonies of soft coral. Many of the new species avoided previous detection because of their diminutive size, such as goblin spiders, sea slugs, and barnacles that all measure just a few millimeters in length. Others simply exist in places that are rarely, if ever, visited by humans, such as a snake eel from the bottom of the ocean and a primitive plant called a spikemoss from the dangerously steep upper slopes of Mt. Isarog. All of the new species add weight to the idea that the Philippines is a critically important haven for biodiversity, and that its waters likely house more species than any other marine environment on Earth (Source: California Academy of Sciences, 24 June 2011).

Annex 2.6

Scientific Discoveries in 2012

- Camiguin Hawk-owl is found only on the small island of Camiguin Sur, close to northern Mindanao.
- Cebu Hawk-owl thought to be extinct, as the forests of Cebu have almost all been lost due to deforestation.

Conservationists recognized in splitting of Philippine Hawk-owl complex

Since 1945, Philippine Hawk-owl has been treated as a single species, *Ninox philippensis*, with eight subspecies. Now a paper in the Oriental Bird Club journal, Forktail[23], co-authored by a BirdLife scientist, proposes that the hawk-owls of the Philippines form a complex of seven species from different islands and island groups, including two that have not previously been described at any taxonomic level.

These two undescribed species have been given scientific names honouring two conservationists and long-term supporters of BirdLife International. These owls group into three distinctive plumage types: one with all-streaked underparts and plain crowns, one with mottled or barred breasts, streaked lower underparts, and spotted crowns, and one with barred to nearly plain underparts (the 'unstreaked' group).

Philippine Hawk Owl

ic/hawk-

Although specimens have been in museum collections for many years, sound recordings were adequate to establish that the Mindoro form *mindorensis* differs profoundly in vocalisations (thin high-pitched whistles and hoarse rasps) from the nominate Luzon form *philippensis* (a series of mid-pitched barking notes), prompting the separation of Mindoro Hawk-owl *N. mindorensis* in 1999. The recordings[24] reveal an extraordinary degree of differentiation in a group of birds for which vocal communication is of paramount importance in species recognition.

On the basis of their analysis, the authors propose the following arrangement for the *N. philippensis* complex: Luzon Hawk-owl *Ninox philippensis* Mindanao Hawk-owl *Ninox spilocephala* Mindoro Hawk-owl *Ninox mindorensis* Romblon Hawk-owl *Ninox spilonota* Cebu Hawk-owl *Ninox rumseyi* Camiguin Hawk-owl *Ninox leventisi* Sulu Hawk-owl *Ninox reyi.*

"Hawk-owls that differ in plumage also differ in vocalisations, so much so that their treatment as one species in a group with innate vocalisations such as owls is untenable", said Dr. Nigel Collar[25], co-author of the paper, and Leventis Fellow in Conservation Biology at BirdLife International.

[23] *FORKTAIL 28 (2012): 1–20:Vocal divergence and new species in the Philippine Hawk Owl Ninox philippensis complex P. C. RASMUSSEN, D. N. S. ALLEN, N. J. COLLAR, B. DEMEULEMEESTER, R. O. HUTCHINSON, P. G. C. JAKOSALEM, R. S. KENNEDY, F. R. LAMBERT & L. M. PAGUNTALAN*

[24] can be accessed at http://avocet.zoology.msu.edu/recordings/14561

[25] *Article from Martin Fowlie, Birdlife International*

Annex 2.7

Ninoy Aquino Parks and Wildlife Nature Center

The 22.7-ha Ninoy Aquino Parks and Wildlife Nature Center (NAPWC) offers city dwellers an escape from the stressful city life and a glimpse of Philippine biodiversity. The park is under the management and administration of the BMB by virtue of former President Gloria Macapagal-Arroyo's Proclamation 723 on October 25, 2004.

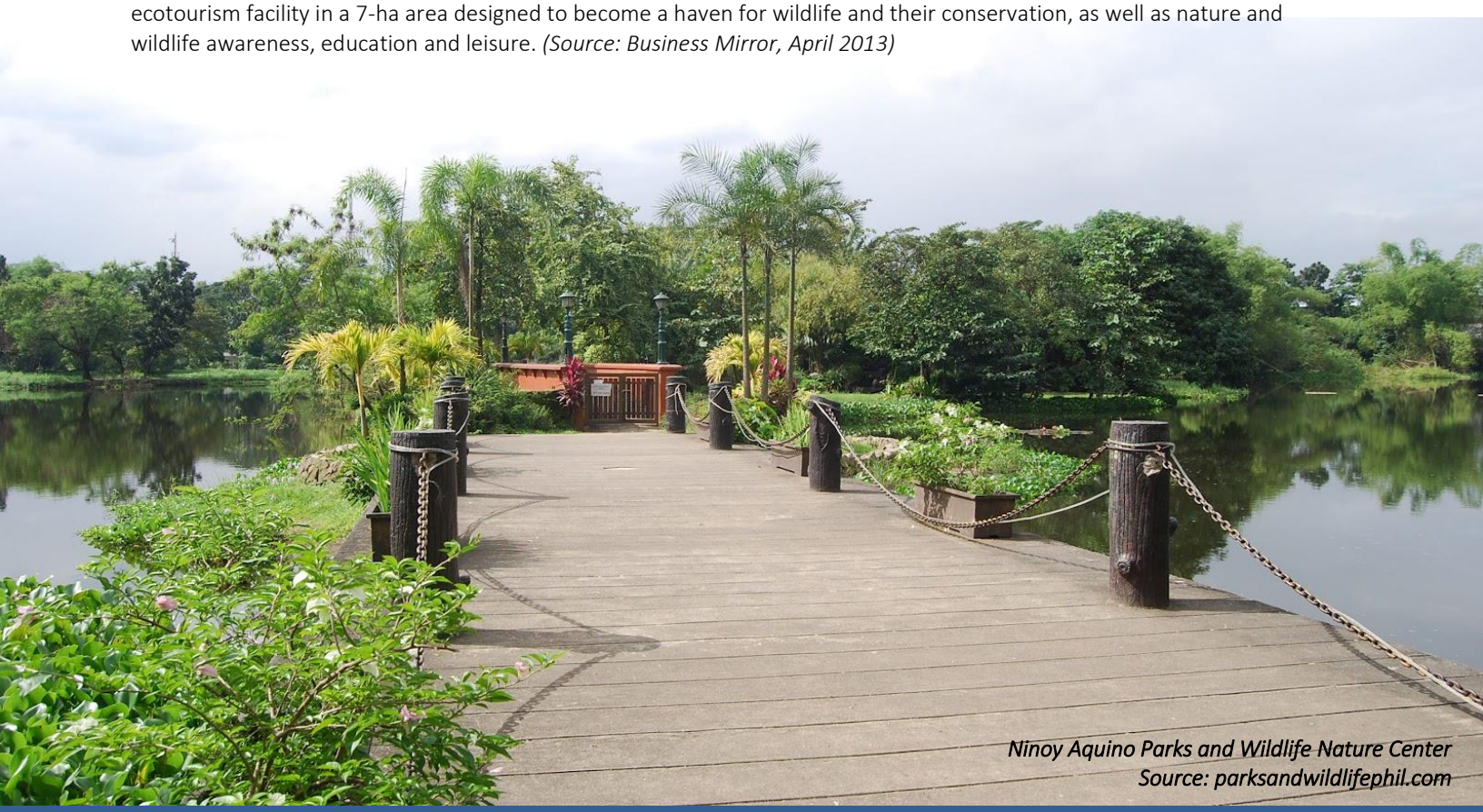
"The trees and natural surrounding allows the city to breathe fresh air because they absorb the excess carbon dioxide. It is an alternative for city dwellers for rest and recreation at a very low cost, because this is really for the public for them to be able to relax," said Theresa Mundita Lim, Director of BMB.

The park is planted with 4,500 trees, comprising of about 1,200 different tree and plant species, making it a haven for birds and bats that freely fly around the area, Lim said. *"It is actually a patch of green where wildlife converges, because we have a wetland that serves as watering area for animals,"* she said.

Lim said the presence of the NAPWC supports the government's effort to promote biodiversity and wildlife conservation, in particular, and the protection of the environment, in general. *"It is a place where people can really appreciate nature and learn about its importance to human existence,"* she said.

The park-cum-wildlife rescue center is a refuge and repository for animals that have been confiscated and or donated to the NAPWC. It serves as a rehabilitation clinic for animals and, at the same time, as a living laboratory for Biology and Veterinary students from different learning institutions and wildlife enthusiasts nationwide. The center has a clinic and a laboratory for animals, a quarantine area, a necropsy facility and about 200 enclosures for the different animals.

The NAPWC, a proclaimed PA and a component of the NIPAS, also accommodates the "Lungsod *Kalikasan"*, a model ecotourism facility in a 7-ha area designed to become a haven for wildlife and their conservation, as well as nature and wildlife awareness, education and leisure. *(Source: Business Mirror, April 2013)*



Ninoy Aquino Parks and Wildlife Nature Center
Source: parksandwildlifephil.com

Annex 2.8

The MASIPAG Experience

The goal of *Magsasaka at Siyentipiko para sa Pag-unlad ng Agrikultura* (MASIPAG) or Farmer-Scientist Partnership for Development is to empower resource-poor farmers and improve their quality of life by bringing back traditional varieties, improve these varieties and minimize cost of production inputs.

Some of its programs include[26]:

- Collection, Identification, Maintenance, Multiplication and Evaluation
- Breeding (Rice, Corn, Livestock)
- Soil Fertility Management
- Alternative Pest Management
- Diversified-Integrated Farming System
- Farmer-developed / adapted technology
- Network Strengthening
- Local Processing and Marketing

As of 2013, it has[27]:

- 1,313 traditional rice varieties collected and maintained
- 1,288 MASIPAG rice
- 506 farmer-bred rice

Annex 2.9

The Philippines' REDD+ 101 and Color It REDD Roadshows

As part of the communication and capacity building program of the PNRPS, a set of "REDD+ 101" modules was developed and is now being delivered to both national and field-based practitioners by accredited organizations across the country.

The 3-day modules provide a basic overview of the REDD+ mechanism, its relationship with climate change and biodiversity, alongside its risks and opportunities specific to the Philippines.

Source: Climate Change Commission http://www.bafu.admin.ch/wald/01152/01169/11759/index.html?lang=de&download=NHzLpZeg7t,lnp6I0NTU042l2Z6ln1acy4Zn4Z2qZpnO2Yuq2Z6gpJCHdIF4f2ym162epYbg2c_JjKbNoKSn6A--

[26] *Source: Farmer-Scientist Partnership for Development (MASIPAG), Philippines http://www.masipag.org*
[27] *Source: Farmer-Scientist Partnership for Development (MASIPAG), Philippines http://www.masipag.org*

Advanced modules towards training more participants with basic skills for monitoring and MRV (measurement, reporting and verification), including forest resources and biodiversity assessments, are currently being developed.

Source: Climate Change Commission
http://www.bafu.admin.ch/wald/01152/01169/11759/index.html?lang=de&download=NHzLpZeg7t,lnp6IONTU042l2Z6ln1acy4Zn4Z2qZpnO2Yuq2Z6gpJCHdIF4f2ym162epYbg2c_JjKbNoKSn6A--

There are also roving "Color It REDD Roadshows" which are targeted towards broader local audiences packaged as "townhall meetings"or "talkshow programs". In these roadshows, local communities are given the opportunity to raise questions on REDD+ and its related issues. These informal gatherings catalyze a deeper and more transparent understanding of the implications of REDD+ and provide opportunities to clear the air on potentially controversial issues. A night of cultural activities, including folk shows, singing and dancing, follows each Roadshow.

Annex 2.10

Albay Province, Philippines Prohibits Plastic Bags

As of June 1, commercial establishments across the province of Albay are regulated to use plastic bags, styrofoam and other synthetic materials as packaging for goods sold to the public. Located in the Bicol Region on southeastern Luzon island, Albay is the first province in Bicol to pass an ordinance banning the use of plastic bags and other synthetic materials that are harmful to the environment. The ordinance was signed into law by Albay Governor Joey Salceda on February 21, 2011.

Bicol bans the use of plastic bags
(plasticwastesolutions.com)

Proprietors of malls, groceries, food chains, drugstores, and mini-marts are publicizing the program through word of mouth. They have been advising customers to buy woven native bags called "bayongs."

Several cities in the Philippines, including the city of Las Pinas, have passed plastic bag regulation and Philippine are considering a ban covering the entire country. The House of Representatives of the 15th Congress approved the Plastic Bag Regulation Act of 2011 last September[28].

[28] *Source: Environment News Service (ENS) 2012.*

Annex 2.11

Good Practice: MGB stops black sand mining operations in Cagayan[29]

Source: The Philippine Star, February 24, 2014

Residents of Punta village in Aparri, Cagayan try to remove a pipe abandoned by a black sand mining firm. Image from: Charlie Lagasca

APARRI, Cagayan, Philippines – Mining firms extracting black sand in this province's coastlines have either been stopped or suspended indefinitely pending a review of their applications and operations, according to the MGB. Engineer Mario Ancheta, MGB director for Cagayan Valley, said the operations of most companies extracting black sand along the northern coastlines here had been stopped since last year.

The last suspension of black sand extraction, according to the MGB, was made in January 2014, even before National Bureau of Investigation agents conducted operations against these activities in the province.

"The mining permits of these firms were either revoked or suspended due to several violations like operating within the 200-meter prohibited zone," Ancheta said.

The MGB's stoppage orders also came in the wake of last month's recommendation by the Mining Industry Coordinating Council for the suspension of black sand mining operations in the country, pending evaluation of their operations. The MICC, co-chaired by Environment and Natural Resources Secretary Ramon Paje and Finance Secretary Cesar Purisima, is under the Office of the President.

Mayor Carlito Pentecostes Jr. of Gonzaga said the MGB stopped black sand mining in his town as early as last year. "At present, there are no more extractions of black sand in our town. We will not allow any company to operate or resume operation unless they have permission from the MGB and other concerned authorities," he said.

[29] *(The Philippine Star) February 24, 2014*

Black sand or magnetite is used as an additive in the manufacturing of concrete and steel products, magnets, paint, ink, paper, jewelry and cosmetics, making it a lucrative commodity in China, Taiwan and other foreign markets.

Annex 2.12

Ayta's Traditional Environmental Management

In the 1970, the Magbukún Aytas moved to higher elevation of their ancestral domain to start a new beginning. For a time, they divided into two groups. Some families opted to live in Biga while others settled in Kanawan. Later they joined together in Kanawan because the water source in Biga is difficult.

In 1987, former President Corazon C. Aquino proclaimed the 227 ha of Bataan Natural Park as Kanawan Negrito Reservation Area. Today there are about 41 ha of land occupied by 13 non-indigenous migrant families and 186 ha are used by the Aytas with about 156 ha for agricultural and agroforestry use, 2 ha for residential use, 1 ha for the elementary school and 30 ha protected, reforestation and sloping areas that are not suitable for farming.

The Aytas have their own traditional practices in conserving and protecting natural resources. Their concept of conservation is integrated with the Ayta's indigenous knowledge, systems, and practices. There are many distinct ways in the Aytas' daily lives that indicate their traditional practices of conserving the environment.

Periodic hunting and gathering practices – Hunting wild pig and deer is allowed only during rainy days while honey gathering commences in January until May. PHOTO: Philippine Daily Inquirer

Dispersing forest tree seeds like birds – When the Aytas hunt, they pick up seeds found in the forest and throw these away in other areas. This way, the natural diffusion of the diversity of plants takes place through human intervention.

The Aytas have, through generations, developed the proper way of gathering honey in such a way that the bee colony will not die. Harvesting what is needed – the Aytas harvest only what they need for a day. They do not harvest more than what they able to consume or sell. They do not over harvest or avoid 'salanta' or destroying the balance of nature.

Annex 2.13

Philippines: Floods and Landslides - June 2012

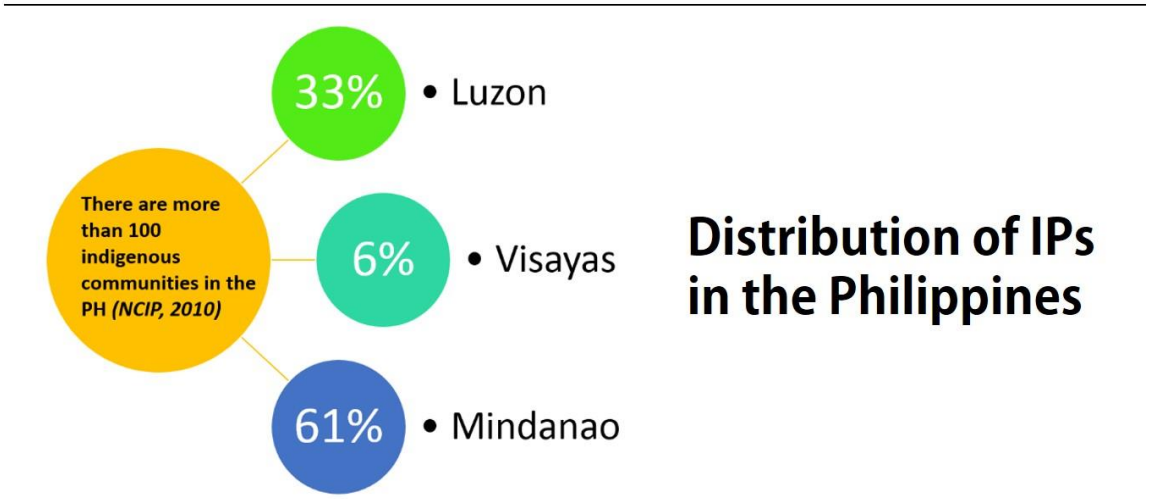
More than 900,000 families (4.4 million people) in northern and central Luzon including Metro Manila were affected by severe flooding since June 2012. The rains and floods left 78 people dead, 11 missing, 36 injured, and caused extensive damage to agricultural products and infrastructure. Of the 4.4 million people affected, over 1 million were displaced; 1.2 million are living with relatives and friends while 135,308 people were transferred in 431 evacuation centers across the affected areas in Luzon as of 31 August. Local authorities are expecting prolonged displacement of people from areas where floodwaters are historically known to slowly subside (Office for the Coordination of Humanitarian Affairs, 6 Sep 2012).

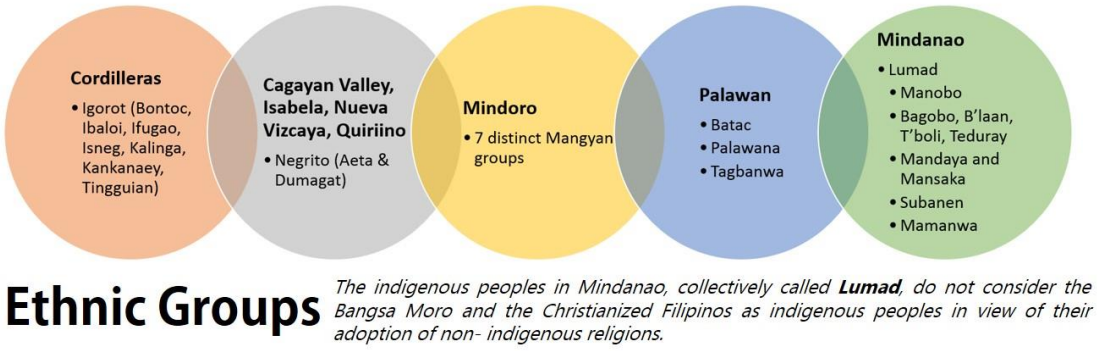
Annex 2.14

IP Rights in Resource Conflict Areas: Zambales Experience

Aetas, a big indigenous group in the Philippines who can be found in the mountains of Luzon, has been proven to be residents of the town of Maporac (or Sitio Maporac) in New San Juan, Cabangan, since time immemorial. Almost 90% of the population in Sitio Maporac are IPs or have married non-IP. Maporac Aetas depend primarily on upland farming and charcoal-making as source of livelihood. But one of the big issues faced by Aetas in Maporac is the encroachment of mining companies, both legally and illegally, in the land covered by Certificate of Ancestral Domain Claim 042. Zambales is found to be rich in gold, nickel, chromite, copper, talc, and magnetite sand. Currently, it is covered under 12 large scale and 98 small-scale mining permits. The resource related conflicts have risen and pose serious threats to the rights of IPs. This has caused human rights violations against IPs—they have been harassed, some areas militarized, intimidated and deceived to either give up or leave their lands. (ATM, April 2011)

Who are the IPs in the Philippines?





Annex 2.15

In Global First, Philippines Destroy Its Ivory Stock

No other ivory-consuming nation has taken such a dramatic step.

On June 21, 2013, the Philippines have destroyed five tons of seized ivory, becoming the world's first ivory-consuming nation to destroy its national ivory stock.

A woman arranges confiscated elephant tusks in Manila, the Philippines. Source: Romeo Ranoco, Reuters

"The destruction of the items would hopefully bring the Philippines' message across the globe that the country is serious and will not tolerate illegal wildlife trade, and denounces the continuous killing of elephants for illicit ivory trade," says Mundita Lim, director of the PAWB-DENR.

The ivory cache is worth roughly US$6.5 million, based on prices charged by the Chinese government for raw ivory after its 2008 purchase (National Geographic, 2008). According to Philippine government officials, the ivory was smuggled from various countries, including Kenya, Tanzania, Zambia, and Uganda. Officials have taken samples for DNA analysis at the Center for Conservation Biology, University of Washington, U.S.A. The Philippines is both a consumer of ivory (predominantly for carving of Catholic religious icons) and a transit country for smuggled ivory on its way from Africa to China. During the most recent meeting of CITES parties and of its Standing Committee, the Philippines was identified as one of a so-called "gang of eight" countries with significant roles in the illegal ivory trade. They range from supplier countries—Kenya, Tanzania, and Uganda—to transit and consumer countries: Malaysia, the Philippines, Thailand, Vietnam, and China. These eight nations were required to submit Ivory Action Plans to the CITES Secretariat by May 15, 2013, outlining how they intend to deal with their ivory-trafficking problems.[30]

[30] *Source: National Geographic, 2013*

Annex 2.16

Philippines: Filipinos exposed to slow pesticide poisoning

"All population groups are at risk of exposure to slow pesticide poisoning", said Dr. Leonila M. Varca of the College of Agriculture, University of the Philippines Los Banos. *"Pesticides use is like a two-edge sword,"* Varca said, adding it contributes to increased yields but also poses problems like toxicity that disrupts the ecology, contaminates environment and leaves residues in feed and food that affect people and animals they are not meant for.

"Pesticides are the major components of crop production in the Philippines, especially in rice and vegetable farming," she said. The P6 billion industry includes insecticides (39 percent), fungicides (24 percent) and herbicides (23 percent). Most are used in rice farming (37 percent), plantation crops like banana and pineapple (28 percent), fruits (14 percent) and vegetables (12 percent).

"The application of pesticides on crops and soil can reach the soil, surface water, groundwater and air," Varca said. *"They can leach to water bodies through run off water and eroding soil particles."* For example, high pesticide applications are known in Lucban vegetable farms and in Pagsanjan rice fields. The levels of malathion use in Lucban during 2007-2008 until mid-2009 were above the allowable levels set by the World Health Organization.

Pesticide use in Agriculture
Source: Perigreen Safe Foods

A study of prolonged exposure of farmers in Quezon province, Laguna and Nueva Ecija shows that pesticide poisoning affects the eyes, skin, pulmonary and cardiovascular systems, gastrointestinal tract and the nerve system. The lack of information, knowledge and awareness as well as supervision, especially for young workers, expose farmers to poisons without their knowledge, she said.

"It is important to use the proper protection and safety procedures to minimize, if not eliminate, pesticide poisoning," she said.

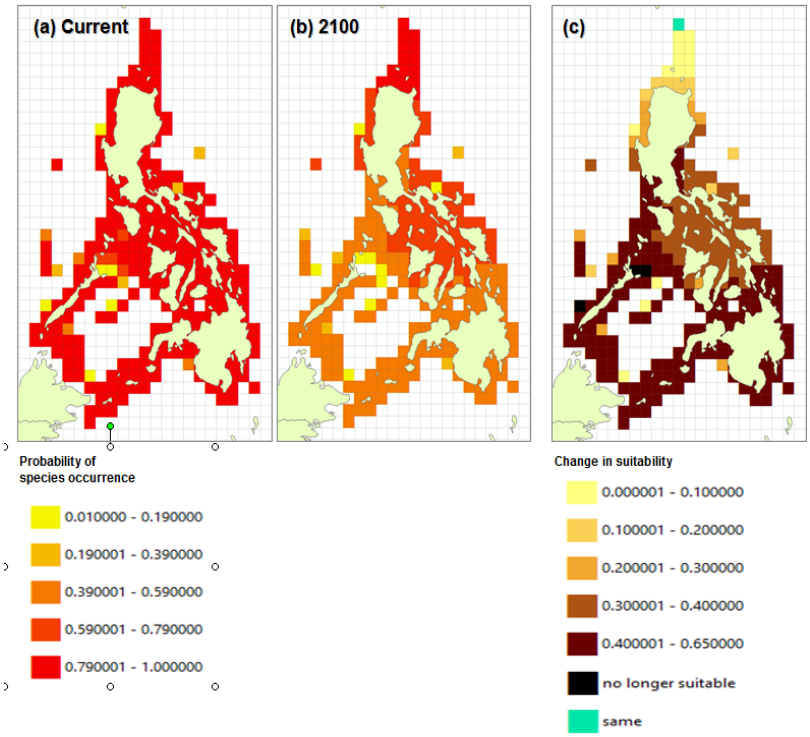
Source: Malaya.com.ph June 2012

Annex 2.17

Climate Change Impacts on the Distribution of Decapterus maruadsi (galunggong) in the Philippines Seas

by K. Kesner-Reyes and C. V. Casal, FIN

"Climate change is projected to increase the risk of extinction for already vulnerable species with limited climatic ranges and restricted habitats." -IPCC



Distribution and relative probabilities of species occurrence of galunggong (Decapterus maruadsi) within Philippine waters based on predicted habitat suitability (a) in the current period, and (b) by the year 2100[31]

Decapterus maruadsi, commonly known locally as *galunggong*, is a pelagic and reef-associated species found throughout warm, coastal waters of the eastern Indian Ocean and western central Pacific. It is a highly commercial species, marketed mostly fresh, but also frozen and dried-salted in the Philippines and in neighboring Asian countries.

Based on the AquaMaps species distribution model, *D. maruadsi* has an estimated distribution range of about 65,627,869 ha within the Philippine EEZ (see above figures). Approximately 93.5 percent of this range are areas of very high environmental suitability for the species, having between 79-100 percent probability of species occurrence (red cells). In fact, *D. maruadsi* is found in most waters around the Philippines including its internal seas.

Under the A2 scenario for year 2100, the total distribution range of *D. maruadsi* is expected to decrease slightly to about 64,794,376 ha. Habitat suitability however is predicted to decrease markedly overall due to increasing sea temperature and, to a lesser degree, decreasing primary productivity. Approximately 31.2 percent of the

[31] IPCC emissions scenario A1B; yellow to red cells indicate increasing probability of species occurrence); (c) predicted change in habitat suitability based on the difference in probabilities of species occurrence between both periods (light yellow to dark brown cells indicate predicted areas of decreasing habitat suitability; light blue indicates no change in habitat suitability).

distribution range is predicted to drop to a probability of species occurrence of around 59-79 percent (dark orange cells), while 57.6 percent will drop to around 39-59 percent probability of species occurrence (light orange cells). Only 6.2 percent of the current distributional area, at extreme northern Luzon, will remain very highly suitable for this species (red cells).

The greatest change predicted in the distributional range of *D. maruadsi* is the decrease of around 40-65 percent in habitat suitability (dark brown cells) by 2100. This is seen to affect the coast of Aurora and Quezon in eastern Luzon, Leyte Gulf in the southeast, Bohol Sea in the Visayas, and the waters around Mindanao. It also includes much of the coast along the West Philippine Sea from Manila Bay down to Palawan (extending to the Spratly Islands), and the shallow areas in the Sulu Sea. The internal seas from southern Luzon to the Visayas, and coastal areas of the eastern seaboard from Lamon Bay to Samar are predicted to experience a decrease of around 30-40 percent in habitat suitability. A decrease of about 1-30 percent is seen at the northernmost region which diminishes northwards from Ilocos Norte and Cagayan towards the Batanes islands. No new suitable habitats for *D. maruadsi* are seen within the Philippine EEZ while a few localities in the northeastern and south western tips of Palawan (black cells), are predicted to be no longer suitable for *D. maruadsi* to occur by 2100.

Annex 2.18

Citizen Science: A Good Practice in Biodiversity Management

FishBase - global premier Biodiversity Information System on all fishes of the world (finfishes), covering at least 33,000 species.

Decapterus maruadsi

Photo by Jeffrey T. Williams

FishBase provides a range of country, regional, and ecosystem-specific information. State of the art analytical and graphical tools allow users to transform raw data into information that can be used to assess fisheries and identify management techniques to restore depleted fish stocks. It is used extensively by fisheries managers and scientists to estimate important biological parameters like mortality, annual reproductive rate, growth, and status of fish stocks.

FishBase works closely with the Catalog of Fishes of W.N. Eschmeyer (California Academy of Sciences), the world taxonomy and nomenclature authority database for fishes. A major issue is to sustain the quick integration of the newly described species (still between 300 and 500 per year during the past ten years), and the changes from the most recent taxonomic revisions.

Aside over 95,000 synonyms, over 300,000 common names are recorded by language and by country for 299 languages in 258 countries for about 27,000 species, including non-Roman scripts such as Arabic, Farsi, Cyrillic, Greek, Chinese, Japanese, Thai, Gurmukhi, Hindi, Malayalam, Tamil, Telugu, Marathi, Kannada, Gujarati, Nepali, Bangla and Hangeul.

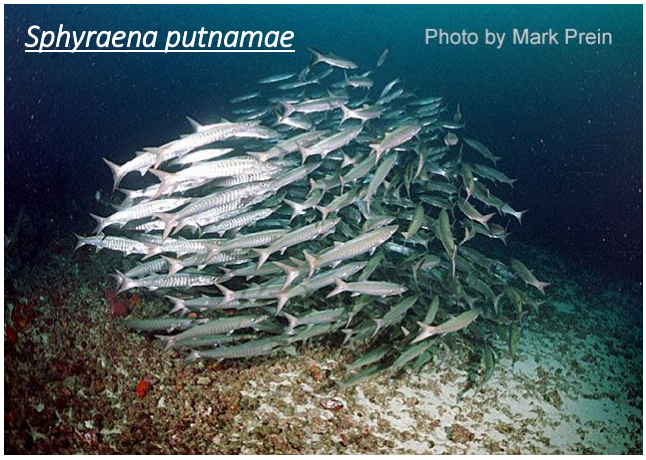
FishBase is linked with other global initiatives in Biodiversity Informatics such as Global Biodiversity Information Facility and Ocean Biogeographic Information System for species occurrences, IUCN Red List for threat status, Catalogue of Life, GenBank, FishBoL (Barcode of Life), and Encyclopedia of Life, among others.

***FishBase is a** website for fish-related natural resource management for conservation and sustainable use. As a Global Species Database, it records a wide range of information on all fish species currently known in the world on their biology, ecology, taxonomy, life history, trophic features, population dynamics and uses, as well as historical data reaching back 250 years, citing at least 51,000 references.*

*People can upload their photos and sightings (**through the FishWatcher facility)** directly via FishBase web portal (http://www.fishbase.org/), experts validate the entries and results are shown in the species map.*
Information within the database are all referenced, giving the source of the information as well as the collaborator who provided/encoded the data. As a Global Public Good, information are publically available. Photos provided via FishBase are owned by the contributors. Currently, there are more than 55,000 images gathered for more than half of the species, with the help of many contributors.

As the world's leading biodiversity information system on fishes, FishBase has collaborators from over 150 countries, with scientists, museums and institutions, as well as other private individuals. The 9 members of the FishBase Consortium, ensures its scientific integrity. These are the Leibniz Institute of Marine Sciences (Kiel, Germany), University of British Columbia (Canada), Muséum National d'Histoire Naturelle (Paris, France), Royal Museum for Central Africa (Tervuren, Belgium), Swedish Museum of Natural History (Stockholm, Sweden), Aristotle University (Thessaloniki, Greece), Chinese Academy of Fishery Science (Beijing, China), FAO (Rome, Italy), and WorldFish (Penang, Malaysia). The FIN, a Philippine NGO employs the core encoding and development team.

In 2004, the FishBase Team, based at Los Baños, Laguna, Philippines, won the prestigious Consultative Group for International Agriculture Research (CGIAR) Science Award for Outstanding Scientific Support Team for their contribution in the creation and development of this information system, an award shared together with its wide variety of institutional partners and from almost 2,000 individual collaborators from all over the world.



ANNEX 3

Agencies who participated in the updating process

ACADEME

Abra State Institute of Science & Technology

Ateneo de Manila University
- Ateneo School of Government

Bataan Peninsula State University

Bohol Island State University-Bilay

Bukidnon State University

Bulacan State University

Cagayan State University

Capiz State University

Carlos Hilado Memorial State College

Cebu Normal University
- Biology Department

Central Philippines State Universty

De La Salle University

Don Mariano Marcos Memorial State University

Highland Agriculture and Resources Research and Development Consortium

Isabela State University

Mariano Marcos State University

Mindanao State University - Naawan

Mindanao State University
- Iligan Institute of Technology

Miriam College
- Public Education and Awareness Campaign for the Environment (PEACE)
- Environmental Studies Institute

Naval State University

Negros Oriental State Unversity
- College of Forestry

Nueva Vizcaya State University

Pampanga Agricultural College

Pangasinan State University

Philippine Normal University

Silliman University
- Silliman University Angelo King Center for Research and Environmental Management
- Institute of Environmental and Marine Sciences

Tarlac State University

Technological University of the Philippines, Manila

University of Eastern Philippines
- Center for Environmental Studies and Advocacy

University of San Carlos
- Marine Biology Section

University of Santo Tomas

University of Southern Mindanao

University of the Philippines
- UP Diliman
  - College of Science

UP Los Banos
Crop Science Cluster
Institute of Agroforestry
Museum of Natural History
School of Environment Science and Management
Training Center for Tropical Resources and Ecosystems Sustainability
Western Visayas State University
Xavier University
Research & Social Outreach
College of Agriculture
McKeough Marine Center

DONORS

Foundation for the Philippine Environment
Philippine Tropical Forest Conservation Foundation
The Samdhana Institute
The Deutsche Gesellschaft für Internationale Zusammenarbeit
United Nations Development Programme
United Nations Food and Agriculture Organization
United States Agency for International Development

GOVERNMENT

Asean Centre for Biodiversity
B+WISER Project
Baguio Water District
Commission on Higher Education
Department of Agriculture
National Fisheries and Development Institute
Philippine Coconut Authority
Department of Budget and Management
Regions 1, 2, 10
Department of Environment and Natural Resources
Coastal and Marine Management Division and Protected Area and Wildlife Division of Regions 2, 3,
Regional Offices - CAR, 7, 8, 10, NCR, 4A,
Ecosystems Research and Development Service - ARMM
Mt. Kalatungan Range Natural Park
Batanes Protected Landscape/Seascape
Lidlidda Watershed Forest Reserve
Mines and Geosciences Bureau (Central office, Reg. 10)
Mt. Pulag National Park
Northwest Panay Peninsula Natural Park
Protected Area Wildlife Coastal Zone and Management Services
Provincial Environment and Natural Resources Office of Bukidnon
Foreign Assisted and Special Projects' Office
Biodiversity Management Bureau
Public Affairs Office
New Conservation Areas in the Philippines Project
Biodiversity Partnership Programme

- Small Grants Programme 5th Cycle - UNDP
- Protected Area Management Enhancement Project - GIZ
- Geographically Important Agricultural Heritage Systems Project
- Forest Management Bureau
- Environmental Management Bureau
- Ecosystems Research and Development Bureau

Department of Agriculture
- Bureau of Fisheries and Agricultural Research
- Regions 2, 3, 6, 7, 9

Department of Education
- Central Office
- Regions 1, 3, 4B , 7, 8, 10

Department of Interior and Local Government
- Regions CAR, DILG 6, 7, 10
- Local Government Monitoring and Evaluation Division

Department of Public Works and Highways
- Region 10

Department of Social Welfare and Development
- Regions 1, 6, 7

Department of Tourism
- NCR, CAR, Region 1, 6, 7, 8, 10

Department of Trade and Industry
- Region 2

Department of Science and Technology
- Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD)

Ecosystems Improved for Sustainable Fisheries (Ecofish) Project

League of Municipalities of the Philippines

League of Cities of the Philippines

Metro Manila Development Authority

Mt. Kitanglad and Mt Balatukan projects, Land Care Philippines Foundation

National Commission on Indigenous Peoples
- Regions 2
- Cordillera Administrative Region
- Misamis Oriental
- Region 9

National Economic and Development Authority

National Museum of Natural History

National Power Corporation (Upper Agno River Watershed Management Department)

National Youth Commission

Palawan Council for Sustainable Development

Pasig River Rehabilitation Commission

Philippine Fiber Industry Development Authority

Philippine Information Agency
- National Capital Region
- Cordillera Administrative Region
- Region 1

Region 3
Region 10
Philippine Rice Research Institute
Southeast Asian Fisheries Development Center- Aquaculture Department
Senate of the Philippines
Subic Bay Metropolitan Authority - Chamber for Health and Environment Conservation

Wildlife Conservation Society of the Philippines

Local Government Units

Catbalogan, SAMAR
City Environment and Natural Resources Office
Region 1
Region 7
Iligan City
Lanuza Bay Development Alliance
Local Government of Santiago City, Isabela
Local Government of Tayabas, Quezon
Northern Samar Provincial Government Environment and Natural Resources Office
Policy and Planning Development Office, Province of Guimaras
Port Management Office of Cagayan de Oro
Quezon City Environmental Protection and Waste Management Department (EPWMD)
Province of Albay
Province of Ifugao
Provincial Government of Eastern Samar
Provincial Government of Palawan
Provincial Planning & Development Office, Cebu
Provincial Planning & Development Office, Southern Leyte
Provincial Planning and Development Office (PPDO) Antique
Provincial Planning and Development Office, Iloilo
Rizal Provincial Government
Makati City Department of Environmental Services
Malaybalay City Enviroment and Natural Resources Office

MEDIA

Green City Advocates
Opinyon
Manila Bulletin

Non-Government Organizations

AKBAY Children and Youth Organization
ALKFI-Bantay Kalikasan Green Initiative
Antique Outdoors, Inc.
BioResource Conservation Trust of the Philippines, Inc.
Biodiversity Conservation Society of the Philippines

Bioversity International
Birdlife International
Bohol Integrated Development Foundation, Inc.
Cagayan Valley Partners in People Development
Cebu Biodiverisity Conservation Foundation
Coastal Conservation & Education Foundation
Community Services for Education and Economic Development, Inc.
Conservation International
Consumer Rights for Safe Food
Cordillera Network of Development NGOs and POs
Earth Day Network Philippines
Federation of Environmental Advocates in Cagayan
FishBase Information and Research Group, Inc.
Friends of the Environment for Development and Sustainability
Friends of the Flying Foxes
Green Convergence
Haribon Foundation, Inc.
Indigenous Communities Conserved Areas Consortium
Indigenous Peoples and Biodiversity Programme, Tebtebba Foundation
Kalahan Educational Foundation Inc.
Kalatungan Council of Elders
Karunungan Sa Gagmay Mangingisda Sa Concepcion
Koalisyon ng Katutubong Samahan ng Pilipinas Inc.
Lanao Aquatic and Marine Fisheries Center for Community Development, Inc.
Maporac Aeta Organization
Magsasaka at Siyentipiko para sa Pag-unlad ng Agrikultura
Negros Economic Development Foundation
Negros Island Initiatives for Rural Development
Northern Samar Environmental Protectors, Inc.
Obo-ob Mangrove Garden Integrated Ecotourism and Conservation Association
Pamana ka sa Pilipinas
Participatory, Research, Organization of Communities and Education towards Struggle for Self-Reliance (PROCESS) Bohol
Pederasyon sa Nagkahiusang mga Mag-uuma nga Nanalipud ug Nagpasig-uli sa Kinaiyahan Inc.
Portuliu Tribal Association
PATH Foundation Philippines, Inc.
Peoples Recovery, Empowerment and Development Assistance Foundation
Philippine Biochar Association
Philippine Business for Environment
Philippine Federation for Environmental Concern
Philippine Speleological Society Inc.
Philippines Biodiversity Conservation Foundation Inc.
Project Seahorse Foundation for Marine Conservation
Sagip Sierra Madre Environmental Society Inc.
Samar Island Biodiversity Foundation, Inc.

Save Sierra Madre Network Alliance Inc.
Sibuyan ISLE
SIMAG Foundation Inc.
Social Action Center-Diocese of Marbel
Southeast Asia Regional Initiatives for Community Empowerment
Task Force Sierra Madre for Balanced Ecology Inc.
World Wildlife Fund
Zampen Cavers
Zoological Society of London-Philippines

Private Sector

Association of Wood Crafters
Berkman International
Cebu Chamber of Commerce and Industry
Chamber of Furniture Industries of the Philippines
Chamber of Mines of the Philippines
  Benguet Corporation Nickel Mines, Inc.
  Far Southeast Gold Resources, Inc.
Energy Development Corporation
Enterprise Works Worldwide Philippines
GHD Philppines
Makilala Mining Company
Ozamis City Chamber of Commerce
Philex Mining Corporation, Pacdal, Tuba, Benguet
Philexport (Region 7)
Philippine Exporters Confederation, Inc.
Sagittarius Mines, Inc.- Chamber of Mines of the Philippines
Samar Chamber of Commerce and Industry
San Roque Power Corporation
SN Aboitiz Power Group

ANNEX 4

Examples of commonly found Invasive Alien Species (IAS) in the Philippines

Photo	*Species*	Common Name	Basic information and Impacts
	*Pomacea canaliculata*	Golden apple snail	Introduced to the Philippines in 1962 for food and aquaria; one of the 100 World's worst invasive species. In the 1980s, the economic damage to rice crop in the Philippines was estimated to be US$ 1 B. It has been implicated in the decline of the population of the native snail Pila conical (formerly Pila luzonica). It is a vector of rat lungworm parasite, Angiostrongylus cantonensis that causes eosinophilic meningoencephalitis when ingested by humans.
	*Scotinophara coarctata*	Rice black bug (RBB)	A major rice pest; first reported in the rice fields in southern Palawan in 1979, then spreading to other parts of Palawan, Mindanao in 1992 and the Visayas region in 1998, and then again to Mindanao in 2000 and in the Visayas region in 2001, and later in the Bicol region. It inhabits both rainfed and irrigated wetland environments, but not common in upland rice ecosystem. It is attracted to high-intensity light and produces an offensive odor when disturbed.
	*Pterygoplichthys spp.*	Janitor fish	The species under this genus includes Pterygoplichthys disjunctivus (Liposarcus disjunctivus, Vermiculated sailfin catfish) and Pterygoplichthys pardalis (Hypostomus pardalis, Amazon sailfin catfish). They have become invasive in the Marikina River (Metro Manila), Lake Paitan in

			Cuyapo, Nueva Ecija, and Laguna de Bay. They were accidentally and/or purposely released into natural waters. With no natural predators, the species can multiply fast, out-competing the native fish and other freshwater organisms for food and habitat. Its burrowing behavior in river banks may contribute to water turbidity and soil erosion; also destroys fishing gears.
	*Bufo marinus*	Bullfrog, Cane toad	Introduced to the Philippines in 1934 as a biological control agent of sugarcane insect pests; it has become a pest itself. It feeds largely on invertebrates and competes with native amphibians for food and breeding habitats. It is the most widely distributed alien frog in the Philippines; typically inhabits second-growth vegetation, forest plantation, agricultural plantation, natural and artificial ponds and lakes, and built-up areas.
	*Swietenia macrophylla*	Large leaf Mahogany	First planted in Manila in 1907 and on the campus of the Forestry School at Mt. Makiling in 1913; out-competes the indigenous dipterocarp and non-dipterocarp tree species in natural forest because of its ability to produce and spread its seeds; may also be allopathic, hence, retarding natural ecological succession in forest gaps.

	*Gmelina arborea*	Yemane	Introduced in 1960 as fast-growing reforestation species; produces allelopathic substance.
	*Lantana camara*	Ayam, Lantana Coranitas	Introduced as landscape plant; can become the dominant understory species in disturbed forest; disrupts succession and decrease biodiversity; its allelopathic qualities can reduce vigor of nearby plant species and reduce productivity in orchards.
	*Eichhornia crassipes*	Water hyacinth	Introduced for ornamental purposes; causes heavy damage on the fish pens and cages; undesirable in fishing and aquaculture activities in many major lakes in the country; blocks waterways, limits boat traffic and navigation and recreational activities; prevents sunlight and oxygen from reaching the water column and submerged plants; shades and crowds native aquatic plants leading to reduced biological diversity in aquatic ecosystems.

	*Piper aduncum*	Piper	Invades disturbed areas where it is able to form thickets; spreads by sprouts and suckers; disrupts ecological succession and decreases biodiversity.
	*Chital sp.*	Knifefish	Found in Indus, Ganges-Brahmaputra and Mahanadi river basins in India. No valid records from Irrawaddy, Salween or other river basins of Myanmar. Reports of Chitala chitala from Thailand and Indo-China were based on Chitala ornata and those from Malaysia and Indonesia on Chitala lopis.

ANNEX 5

PBSAP Actions, Targets and Indicators

Annex 5 is a set of actions across ecosystems (forest, coastal and marine, inland wetlands, cave and cave systems) and thematic areas (PAs, ABS, agrobiodiversity, IAS and urban biodiversity) that were formulated through a series of consultations, FGDs and key informant interviews. These specific actions are seen by the stakeholders as viable and realistic actions to address the pressures on biodiversity. Targets, indicators, time frames (short, medium and long), lead and support agencies/sectors and the Aichi Target that the action relates to are identified. The time frame covers 2015 – 2028 spans two (2) planning cycles and is consistent with the DENR ENR framework.

Based on the PBSAP framework, the actions in these matrices are grouped according to direct and enabling program interventions. Direct actions, when implemented, will result into concrete physical changes in the KBAs. These are: a) restoration of ecosystem functions; b) promotion of biodiversity-friendly livelihoods; and c) strengthening law enforcement.

Enabling or supporting program interventions, when implemented, individually and/or together with other actions, may amplify the impacts of the direct interventions thus; contribute to the achievement of identified targets. These are: a) CEPA; b) capacity development for biodiversity management; c) biodiversity conservation-related research; d) strengthening policy for biodiversity conservation; e) promotion of biodiversity-friendly technology; and f) resource mobilization.

The matrices of actions for the forest and cave and cave ecosystems and the thematic area on PAs have direct and enabling interventions that address habitat loss and overexploitation. On the other hand, the matrices of actions for the coastal and marine and inland wetlands ecosystems address pressures of habitat loss, overexploitation, pollution and climate change. The remaining matrices on agrobiodiversity, ABS, IAS and urban biodiversity list various actions that focus on the issues unique to them.

The PBSAP will not be implemented by the DENR alone; it will be a collaboration of men and women belonging to various stakeholder groups with a diversity of disciplines. Annex table 1 shows the involvement of government agencies and stakeholders in the PBSAP implementation per ecosystem/thematic area while Annex table 2 presents how each stakeholder contributes to the Aichi Biodiversity Targets. Annex table 3 shows the distribution of the 19 PBSAP targets across ecosystems/thematic areas.

Annex table 1. List of Stakeholders and their Role in the Achievement of PBSAP Actions per Ecosystem/Thematic Area

Agency	Forest	Coastal & Marine	Inland Wetlands	Caves & Cave Systems	PAs	ABS	Agrobiodiversity	Urban Biodiversity	IAS
National Government Agency									
1. Armed Forces of the Philippines					*				
2. Climate Change Commission		*	*						
3. Commission on Higher Education	*	*		*			*	*	*
4. Department of Agrarian Reform	*				*				
5. Department of Agriculture	*	*			*	*	*		*
6. DA - Bureau of Fisheries & Aquatic Resources		*	*		*				
7. DA - Bureau of Plant Industry						*	*		*
8. DA - Bureau of Soils and Water Management			*						
9. DA - National Fisheries Research & Development Institute		*			*				

Agency	Forest	Coastal & Marine	Inland Wetlands	Caves & Cave Systems	PAs	ABS	Agrobiodiversity	Urban Biodiversity	IAS
10. Department of Budget & Management	*	*			*				*
11. Department of Education		*	*					*	*
12. Department of Environment & Natural Resources					*				
13. DENR -Biodiversity Management Bureau	*	*	*	*	*	*	*	*	*
14. DENR-Ecosystems Research & Development Bureau	*	*		*	*	*			*
15. DENR - Environmental Management Bureau	*	*	*						*
16. DENR - Forest Management Bureau	*	*	*		*				*
17. DENR - Human Resources Development Service					*				
18. DENR - Laguna Lake Development Authority		*			*				
19. DENR - Lands Management Bureau			*		*				
20. DENR - Mines & Geosciences Bureau	*		*	*	*				
21. DENR - National Mapping & Resource Information Authority	*	*	*		*				
22. DENR - National Water Resources Board		*	*						
23. DENR Regional Offices			*	*					*
24. DENR - River Basin Coordinating Office			*						
25. Department of Finance	*				*				
26. Department of Foreign Affairs		*							
27. Department of Health			*						
28. DOH - National Nutrition Council	*				*		*		
29. DOH - Philippine Council for Health Research and Development							*		
30. Department of the Interior and Local Government	*	*	*		*		*	*	*
31. Department of Justice					*				
32. DOJ - National Bureau of Investigation					*				
33. Department of Labor and Employment	*								
34. Department of Public Works & Highways		*	*		*			*	
35. Department of Science and Technology							*		*
36. DOST - Food & Nutrition Research Institute							*		
37. DOST - National Research Council of the Philippines	*								
38. DOST - Philippine Council for Agriculture & Aquatic Resources Research Development	*	*	*		*		*		*

Agency	Forest	Coastal & Marine	Inland Wetlands	Caves & Cave Systems	PAs	ABS	Agrobiodiversity	Urban Biodiversity	IAS
39. DOST - Science Education Institute	*								
40. Department of Social Work and Development	*	*			*				
41. Department of Tourism		*	*	*	*				*
42. Department of Trade & Industry	*	*							
43. DTI - Intellectual Property Office							*		
44. Department of Transportation and Communications		*							
44. Housing & Land Use Regulatory Board	*	*					*		
45. Metropolitan Manila Development Authority			*					*	
46. Metropolitan Waterworks & Sewerage System		*							
47. National Anti-Poverty Commission		*							
48. National Commission on Culture and Arts							*		
49. National Commission on Indigenous Peoples	*	*		*	*	*	*		
50. National Disaster Risk Reduction Management Council									
51. National Economic & Development Authority	*	*	*						
52. National Historical Commission				*					
53. National Irrigation Administration		*							
54. National Museum		*		*			*		
55. NEDA - Philippine Institute for Development Studies							*		
56. Office of the Solicitor General		*							
57. Palawan Council for Sustainable Development				*		*	*		
58. Philippine Coast Guard		*							*
59. Philippine Council for Sustainable Development Sub-Committee on Biodiversity									
60. Philippine Information Agency	*	*							
61. Philippine National Police		*			*				
62. Philippine Ports Authority		*							*
63. Philippine Reclamation Authority			*						
Other Stakeholders									
1. Congress			*						
2. Academe (SUC, Institute of Plant Breeding)	*	*	*		*		*		*
3. CSO/CSO networks (includes Leagues of Provinces, Cities & Municipalities, professional organizations)	*	*	*		*		*	*	*

Agency	Forest	Coastal & Marine	Inland Wetlands	Caves & Cave Systems	PAs	ABS	Agrobiodiversity	Urban Biodiversity	IAS
4. Private sector (includes Chambers of Commerce, Mines, concerned landowner)	*	*	*		*				*
5. LGUs (includes League of Organic Agriculture Municipalities, barangay health workers, barangay nutrition scholars/local nutrition officers)	*	*	*	*	*		*	*	*
6. Special Management Bodies (includes Local Water Management Bodies, PAMB, RDC)		*	*	*			*		
7. Media	*	*							
8. Relgious sector		*							

Annex table 2. List of Stakeholders and their Role in the Achievement of the Aichi Biodiversity Targets

Agency	Aichi Biodiversity Target																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
National Government Agencies																				
1. Armed Forces of the Philippines					*															
2. Climate Change Commission	*		*							*										
3. Commission on Higher Education	*			*						*									*	
4. Department of Agrarian Reform				*							*									
5. Department of Agriculture		*	*	*	*		*	*	*		*					*			*	
6. DA - Bureau of Fisheries & Aquatic Resources	*	*	*	*	*	*		*		*	*	*		*	*				*	
7. DA - Bureau of Plant Industry	*	*		*					*				*					*	*	
8. DA - Bureau of Soils and Water Management															*					
9. DA - National Fisheries Research & Development Institute	*					*				*		*							*	
10. Department of Budget & Management		*								*	*				*					
11. Department of Education	*			*						*								*		
12. Department of Environment & Natural Resources		*		*	*															
13. DENR -Biodiversity Management Bureau	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14. DENR-Ecosystems Research & Development Bureau	*			*	*		*	*	*	*					*	*			*	
15. DENR - Environmental Management Bureau		*					*	*	*										*	
16. DENR - Forest Management Bureau	*			*	*		*		*		*				*					
17. DENR - Human Resources Development Service					*															
18. DENR - Laguna Lake Development Authority		*					*				*				*				*	

Agency	Aichi Biodiversity Target																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
19. DENR - Lands Management Bureau					*	*					*								*	
20. DENR - Mines & Geosciences Bureau					*		*				*								*	
21. DENR - National Mapping & Resource Information Authority				*			*			*	*				*				*	
22. DENR - National Water Resources Board		*			*	*	*			*										
23. DENR Regional Offices	*			*	*		*		*		*			*	*				*	
24. DENR - River Basin Coordinating Office																			*	
25. Department of Finance											*				*					
26. Department of Foreign Affairs								*											*	
27. Department of Health	*									*									*	
28. DOH - National Nutrition Council	*			*															*	
29. DOH - Philippine Council for Health Research and Development																			*	
30. Department of the Interior and Local Government	*	*		*	*	*	*	*		*	*			*	*				*	
31. Department of Justice					*															
32. DOJ - National Bureau of Investigation					*															
33. Department of Labor and Employment				*																
34. Department of Public Works & Highways						*		*		*	*									
35. Department of Science and Technology	*	*		*				*	*										*	
36. DOST - Food & Nutrition Research Institute																			*	
37. DOST - National Research Council of the Philippines																			*	
38. DOST - Philippine Council for Agriculture & Aquatic Resources Research Development	*					*		*	*	*		*			*				*	
39. DOST - Science Education Institute																			*	
40. Department of Social Work and Development			*	*							*									
41. Department of Tourism							*		*		*			*						
42. Department of Trade & Industry				*		*								*						
43. DTI - Intellectual Property Office				*																
44. Department of Transportation and Communications								*												
44. Housing & Land Use Regulatory Board		*		*						*										

Agency	Aichi Biodiversity Target																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
45. Metropolitan Manila Development Authority				*											*					
46. Metropolitan Waterworks & Sewerage System		*																		
47. National Anti-Poverty Commission										*										
48. National Commission on Culture and Arts																		*		
49. National Commission on Indigenous Peoples		*		*	*						*				*	*		*	*	
50. National Disaster Risk Reduction Management Council										*										
51. National Economic & Development Authority		*	*				*			*	*									
52. National Historical Commission																			*	
53. National Irrigation Administration		*																		
54. National Museum	*				*													*	*	
55. NEDA - Philippine Institute for Development Studies																			*	
56. Office of the Solicitor General					*															
57. Palawan Council for Sustainable Development	*	*		*	*						*			*		*		*	*	
58. Philippine Coast Guard						*		*	*											
59. Philippine Council for Sustainable Development Sub-Committee on Biodiversity							*													
60. Philippine Information Agency	*																			
61. Philippine National Police					*			*												
62. Philippine Ports Authority								*	*											
63. Philippine Reclamation Authority					*															
Other Stakeholders																				
Congress										*										
Academe (SUC)	*	*		*	*	*	*	*	*	*	*	*	*		*				*	
CSO/CSO networks (includes Leagues of Provinces, Cities & Municipalities, professional organizations)	*	*		*	*	*	*	*	*	*	*	*	*	*	*			*	*	
Private sector (includes Chambers of Commerce, Mines, concerned landowner)	*	*		*	*		*	*			*				*					
LGUs (includes League of Organic Agriculture Municipalities, barangay health workers, barangay nutrition scholars/local nutrition officers)	*	*	*	*	*	*	*	*	*	*	*	*		*	*				*	

Agency	Aichi Biodiversity Target																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Special Management Bodies (includes Local Water Management Bodies, PAMB, RDC)		*		*			*													
Media	*																			
Relgious sector	*																			

Annex table 3. Matrix of Targets and Ecosystem/Thematic Areas

Target	Ecosystem/Thematic Area								
	Forest	Coastal and Marine	Inland Wetlands	Caves & Cave Systems	Protected Areas	Access and Benefit-Sharing	Agrobiodiversity	Invasive Alien Species	Urban Biodiversity
1. By 2028, the conservation status of nationally and globally threatened species in the country from 2016 levels is maintained or improved.	*	*	*	*	*				
2. By 2028, there will be no net loss in natural forest cover	*				*				
3. By 2028, there will be no net loss in presence and area distribution of live coral cover, mangrove and seagrasses.		*			*				
4. By 2028, over 50% of genetic diversity of cultivated plants and farmed and domesticated animals and wild relatives will be conserved or maintained.	*	*	*		*		*		
5. By 2028, the population of migratory bird species identified in selected inland and coastal wetlands along the EAAF will be maintained.			*		*				
6. By 2028, there will be a 5% increase in the proportion of green spaces in the five largest cities.									*
7. By 2028, as result of improved conservation, ecosystem services provided by key biodiversity areas will be enhanced.	*	*	*	*	*				
8. By 2028, fish stocks of economically important species will be maintained.		*	*						
9. By 2028, there will be an annual increase of at least 5% in biodiversity conservation related jobs (ecotourism, sustainable agriculture, ecosystem restoration)	*	*	*	*	*		*		*
10. By 2028, the key threats to biodiversity will be reduced, controlled or managed	*	*	*	*	*		*	*	*
11. By 2028, there will be a 10% increase in agricultural areas devoted to all types of biodiversity-friendly agriculture.	*				*		*		
12. By 2028, capacity for biodiversity conservation of public and private sector groups in terrestrial and	*	*	*	*	*	*	*	*	*

Target	Ecosystem/Thematic Area								
	Forest	Coastal and Marine	Inland Wetlands	Caves & Cave Systems	Protected Areas	Access and Benefit-Sharing	Agrobiodiversity	Invasive Alien Species	Urban Biodiversity
marine PAs/KBAs will be strengthened.									
13. By 2028, 50% of LGUs will have formulated and adopted the enhanced CLUP using revised HLURB framework.	*	*	*	*	*	*	*	*	*
14. By 2028, 1 million ha of degraded ecosystems will be restored and/or will be under various stages of restoration	*	*	*	*	*				
15. By 2028, there will be at least 10 nationally recognized agricultural heritage systems.							*		
16. By 2028, there will be improved conservation management of caves				*					
17. By 2020, relevant biodiversity conservation policies to address existing gaps are in place	*	*	*	*	*	*	*	*	*
18. By 2028, there will be a 10% annual increase from the 2015 baseline in the number of schools, POs, media organizations, LGU, private companies, policy makers, government offices that are aware and supportive of biodiversity, its importance, threats and benefits of protecting it	*	*	*	*	*	*	*	*	*
19. By 2028, there will be a 10% increase in total area from 2015 levels of terrestrial including inland wetlands PAs managed through NIPAS and other conservation measures (indigenous community conserved areas, local conservation areas, critical habitats) that overlap with KBAs.	*		*	*					
20. By 2028, there will be a 20% increase from 2015 levels in the coverage of established MPAs/sanctuaries across various aquatic habitats.		*							

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
HABITAT LOSS										
DIRECT PROGRAM INTERVENTIONS										
		Restoration of Ecosystem Functions								
1. Restore degraded habitats, where technically appropriate	1.1 Other denuded areas in forestlands per region are identified	1.1.1 Maps of denuded forestlands	*			DENR-FMB*, Namria	15	14	57,501,911,323.88	64,907,256,184.57
	1.2 At least .5M has. of identified degraded habitats are under restoration	1.2.1 Percentage of habitat types under restoration	*	*	*	DENR-FMB*, DENR-BMB, Academe, CSO, LGUs	15	14		
		1.2.2 Trends in forest biodiversity	*	*	*	DENR-BMB*, DENR-FMB	15	1		
		1.2.3 Percentage of native species in restoration	*	*	*	DENR-FMB*, DENR-BMB	15	14		
		1.2.4 Seed collection guidelines in PAs and other critical habitats	*			DENR-BMB*	15	17		
		1.2.5 Percentage of budget allocated for habitat restoration from various sources	*	*	*	DENR-FMB*, DBM, DENR-BMB	15	12		
		1.2.6 Financing mechanisms for habitat restoration	*	*	*	DENR-BMB*, DENR-FMB, Private sector, DoF, CSOs	15	12		
		1.2.7 Sex-disaggregated data on individuals engaged in habitat restoration	*	*	*	DENR-FMB*, DENR-BMB, CSOs	15	12		
	1.3 An independent third party evaluation of the NGP is conducted	1.3.1 Independent evaluation report on the NGP	*	*		DENR-FMB*	15	14		
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Ensure all faunal regions (i.e. areas of endemism) and natural forest habitat types are known and	1.1 By 2016, all known faunal regions and natural forest habitat types (including peat swamp forests and mangroves) and gaps are identified and included in	1.1.1 Maps and plans that incorporate all faunal regions and natural forest habitat types	*			DENR-BMB*, DENR-FMB, DENR-ERDB	19	12	11,795,712.30	14,597,959.80
		1.1.2 Trends in representation gaps								

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
represented and reflected in DENR forest classification system	existing plans (PA, Master Forestry Plan, Peatlands)									
2. Recognize the contribution of IPs, women, youth and LGUs to biodiversity conservation	2.1 By 2027, all known traditionally and locally conserved areas and their gaps are identified and their recognition strengthened	2.1.1 Maps of traditionally and locally conserved areas	*	*	*	DENR-BMB*, NCIP, DILG, LGUs	19	18	592,526,538.44	1,444,528,067.57
		2.1.2 National registry of ICCAs and LCAs								
		2.1.3 Documentation on contributions of LGUs, IPs, women and youth								
3. Mainstream biodiversity conservation into national and local planning processes	3.1 By 2027 biodiversity conservation is mainstreamed and budgeted by 50% of terrestrial LGUs using the HLURB framework on biodiversity mainstreaming	3.1.1 Percentage of LGUs that have mainstreamed and budgetted for biodiversity conservation	*	*	*	HLURB*, NEDA, DILG, DENR-BMB, Leagues	2	13	2,709,503,346.58	3,357,855,490.71
		3.1.2 Trends in biodiversity investment at the national and local levels	*	*	*	DBM*, DENR*				
		3.1.3 Biodiversity values are explicitly incorporated in the CLUPs and Development and Investment Plan	*	*	*	LGUs*, DENR-BMB, NEDA, DILG				
		3.1.4 Number of ordinances passed on biodiversity conservation	*	*	*	LGUs*, HLURB				
	3.2 By 2016, biodiversity and ecosystem services concerns are incorporated and applied to the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes	3.2.1 Amended EIA policy and procedural guidelines	*			DENR-BMB*, DENR-EMB	2	17		
		3.2.2 SEA guidelines for key sectors	*							
Communication, Education and Public Awareness										
4. Increase awareness of various stakeholders on biodiversity to	4.1 A 10% annual increase in the number of schools, POs, media organizations, LGUs, private corporations, policy makers, government offices	4.1.1 Sex-disaggregated and sectoral trends in awareness levels	*	*	*	DENR-BMB*, Philippine Information Agency (PIA), Media, CSO	1	18	110,875,497.54	127,767,558.45

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
effect behavioral change	that are aware of biodiversity, its importance, threat and benefits of protecting it is targetted	4.1.2 Number of communication Education and Public Awareness (CEPA) materials (including nutrition-biodiversity initiatives) in native dialects targetting various audiences including IPs, women and youth	*	*	*	DENR-BMB*, PIA, CSO, Academe, Media, NNC-DOH*				
		4.1.3 Annual sex-disaggregated lists of recipients of CEPA materials	*	*	*	DENR-BMB*, PIA, CSO, Academe, Media				
		4.1.4 Enhanced curricula (ie. forestry curriculum that includes restoration biology, biodiversity journalism)	*	*	*	CHED*, DENR-BMB*				
		4.1.5 Number of citizen science programs	*	*	*	DENR-BMB*, CSO, Academe, Private Sector, Media				
		4.1.6 Number of stakeholder partnerships	*	*	*	DENR-BMB*, Private sector, CSO, Academe, Media				
	4.2 25% of the population are practicing environmentally appropriate way of life	4.2.1 Percentage of LGUs complying with Solid Waste Management Act	*	*	*	DENR-EMB*, DENR-BMB,CSOs, Academe, Private sector	1	10		
		4.2.2 Percentage of use of energy-efficient lights by households and companies	*	*	*					
	4.3 Support from legislators, academe and other government agencies and business sector for conservation and sustainable use of biodiversity is obtained through one	4.3.1 Trends in support obtained from various sectors	*	*	*	DENR-BMB	1	18		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	commitment/undertaking per sector annually									
		Biodiversity Conservation-related Research								
1. Undertake research studies that will support current forest conservation efforts	Research on the following is undertaken: a) use of using fast-growing native species as first level species and b) diversity as a determining factor of the ability of a forest to store water; c) life history characteristics of priority species (fecundity and reproductive patterns; d) ecology of grasslands	Research results are available for use by policy makers and other relevant sectors	*	*		DENR-ERDB*, BMB	19	12	783,945,279.55	901,537,071.48
OVEREXPLOITATION										
Direct Program Intervention										
		Promotion of Biodiversity-friendly Livelihoods								
1. Facilitate the provision of biodiversity friendly livelihood to the locals	1.1 By 2027, 50% of livelihoods outside PAs are biodiversity-friendly	1.1.1 Percentage of livelihoods that are biodiversity friendly outside of PAs		*	*	DENR-BMB*, DENR-FMB*	4	9	2,505,348,738.25	3,582,655,090.72
		1.1.2 Percentage of women and men engaged in biodiversity-friendly livelihoods outside of PAs	*							
	1.2 POs/local community initiatives, including those of IPs, women and youth, in providing native species for the NGP and habitat restoration programs are supported	1.2.1 Percentage of POs providing native species to NGP and other habitat restoration programs	*	*	*	DENR-FMB*, CSO	4	9		
		1.2.2 Sex-disaggregated data of PO members providing native species to NGP and other habitat restoration programs	*	*	*					
		1.2.3 Percentage of income of PO members from NGP and related programs	*	*	*					
		1.2.4 Streamlined procurement process for POs engaged in NGP and	*			DENR-FMB*				

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
		other habitat restoration programs								
	1.3 Convergence with other government agencies (DSWD particularly on 4Ps in particular Buying Living Tree System and sustainable enterprise programs; Dept. of Trade and Industry [DTI], Dept. of Labor and Employment [DOLE], etc) to prioritize poverty allevation actions in and around natural forests including but not limited to PAs is strengthened	1.3.1 Number of inter-agency/convergence programs	*	*	*	DENR, DSWD*, DENR-BMB*, DTI, DOLE, DA, DAR, LGUs, DILG	4	9		
		1.3.2 Sex-disaggregated list of beneficiaries of inter-agency/convergence programs/projects	*	*	*					
	1.4 Local artisanal food enterprises in various communities are promoted and established	1.4.1 Percentage of artisanal food enterprises	*	*	*	NNC-DOH*, LGUs, NGOs, Local Nutrition Officers, DA, DTI	4	9		
	1.5 A Philippine-specific quality accreditation system to protect and promote produce and products coming from various geographical areas/ecological settings is implemented	1.5.1 Accreditation system		*		NNC-DOH*, DA, LGUs, NGOs	4	17		
ENABLING PROGRAM INTERVENTIONS										
		Promotion of Biodiversity-friendly Technology								
1. Adopt existing and develop new technologies to reduce utilization of existing resources	1.1 50% of households and 50% of industries adopting/practicing new environment friendly technologies	1.1.1 Percentage of households applying new environment friendly technologies (ie. Renewable energy)	*	*	*	DENR-EMB*, DA, DTI, LGUs	4	10	161,895,005.59	186,101,180.19
		1.1.2 Percentage of industries applying new environment friendly technologies (ie. Renewable energy)								

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	1.2 National certification systems for natural resources is developed and implemented	1.2.1 Percentage of organizations/companies certified		*		DENR-FMB*, DA*	4	17		
		Capacity Development for Biodiversity Conservation								
2. Improve capacities of local stakeholders including IPs, women and youth and communities to control and limit overexploitation and destructive practices on agriculture and forestry resources	2.1 Sex-disaggregated data on utilization of economically important species is gathered	2.1.1 Sex-disaggregated trends on utilization of economically important species	*	*	*	DENR-FMB*, DA, DENR-BMB, Academe, CSO	5	12	797,171,024.38	1,637,231,587.20
		2.1.2 Percentage of communities which have defined carrying capacities of resources that they use	*	*	*	DENR-ERDB				
		2.1.3 Study on selected economically important species	*							
	2.2 Unsustainable use of selected economically important species is reduced by 30% by 2027 based on study	2.2.1 Baseline of unsustainable use of selected economically important species	*	*		DENR-ERDB*, DENR-BMB, DENR-FMB	5	12		
		2.2.2 Trends in unsustainable use of economically important species		*	*					
	2.3 50% of Community-Based Forest Management Agreement, PACBRMA and other forest tenure holders are engaged in biodiversity-friendly livelihoods	2.3.1 Percentage of women and men engaged in biodiversity-friendly livelihoods	*	*	*	DENR-BMB*, DENR-FMB*	5	9		
	2.4 The inventory of IP traditional food knowledge is conducted	2.4.1 Inventory of IP traditional food knowledge	*	*	*	DOH-NNC*, NCIP	5	18		
3. Strengthen capacity for conservation research and expertise	3.1 A National Research Agenda for biodiversity conservation including wealth generation and sustainable diets is developed and implemented	3.1.1 National Research Agenda	*	*	*	DENR-ERDB*, DOST-PCAARRD*, other DOST councils, National	19	12	181,112,055.73	205,241,891.44
		3.1.2 Trends in biodiversity research	*	*	*					
		3.1.3 Trends in research publications on biodiversity	*	*	*					

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
		3.1.4 Sex-disaggregated list of researchers				Research Council of the Philippines, CHED, CSO, Academe, DENR, NNC-DOH, Food & Nutrition Research Institute				
	3.2 A program to encourage voluntary local and foreign expertise and institutional collaboration in research through material or non-material support is developed	3.2.1 Institutionalized research program	*	*		DENR-BMB*, DENR-ERDB	19	18		
	3.3 Funding agencies are encouraged to support basic and applied including policy research and benchmarking	3.3.1 Percentage of support for basic and applied research	*	*	*	DOST*, Scientific and research institutions, CSO, HEIs, Academe, concerned NGAs	19	12		
	3.4. Scholarships for taxonomy, systematics are provided	3.4.1 Percentage of scholarships for taxonomy, systematics	*	*	*	Science Education Institute-DOST*, CHED*, Academe	19	18		
		3.4.2 Sex-disaggregated list of scholars								
Strengthening Policy for Biodiversity Conservation										
4. Enact priority ENR legislations under the updated PDP 2011 – 2016 that will enhance biodiversity	4.1 The following bills are enacted into law: a) Sustainable Forest Management Bill and b) Forest Limits Act	4.1.1 Laws on sustainable forest management and forest limits	*	*		DENR-FMB*	7	17		
	4.2 The Mining Fiscal Regime and Revenue Sharing Agreement is rationalized	4.2.1 A policy on mining fiscal regime and revenue sharing				DENR-MGB*	7	17		
								TOTAL	**65,356,084,522.23**	**76,364,772,082.14**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
HABITAT LOSS										
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Formulate and implement an expanded national program for protection and management of PAs with PAs selected to include representative areas of all of the faunal regions (i.e. areas of endemism) and natural habitat types including caves and cave systems	1.1 By 2027, equitably managed terrestrial areas, important for biodiversity and ecosystem services, is increased to 10% of total land area through NIPAS and other effective area-based conservation measures	1.1.1 Percentage in PA coverage and other area-based conservation measures	*	*	*	DENR-BMB*, LGUs	11	19	41,471,879,069.94	46,368,450,233.61
		1.1.2 Percentage in PA representation gaps								
		1.1.3 Percentage in critical habitat establishment and other forms of area-based conservation	*	*	*	DENR-BMB*, LGUs, CSOs, Academe	11	19		
		1.1.4 Management Effectiveness Tracking Tool (METT) scores		*	*	DENR-BMB*, LGUs	11	12		
		1.1.5 Policy on mining areas in KBAs and LCAs	*	*		DENR-BMB*, LGUs	11	17		
		1.1.6 Percentage in budget allocations for PAs and other effective area-based conservation measures from various sources	*	*		DENR-BMB*, DBM, LGUs	11	12		
		1.1.7 Percentage of resources mobilized for PAs and other effective area-based conservation measures	*	*		DENR-BMB*, DoF, LGUs, Private sector	11	12		
		1.1.8 Sex-disaggregated data on PAMB/PA Community-Based Resource Management Agreement (PACBRMA) members/Indigenous Community Conserved Areas (ICCA)/Locally Conserved Areas (LCA)/PA managers per region	*	*		DENR-BMB*	11	18		

Program Interventions	Targets	Indicators	Time Frame S	Time Frame M	Time Frame L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	Estimated Cost High
	1.2 By 2016, all known faunal regions and natural forest habitat types within protected areas delineated	1.2.1 PA maps with delineated faunal regions and natural habitat types		*		Namria*, DENR-BMB	11	12		
2. Increase coverage of effectively managed MPAs/sanctuaries and network of PAs across marine habitats such as coral reefs, mangroves and seagrass beds based on the KBA identification process	2.1 50% of total MPA sanctuaries are effectively managed with Management Effectiveness Assessment Tool (MEAT) scores at Categories 3 and 4	2.1.1 MEAT scores			*	DENR (FMB, BMB*, LLDA), NCIP, DA-BFAR, CSOs, Academe	11	12	11,323,879,752.25	13,022,461,715.08
		2.1.2 Improved livelihoods of women and men evidenced by increased incomes	*	*	*	DENR-BMB*, DA-BFAR, LGUs, CSOs, Academe	11	9		
Strengthening Policy for Biodiversity Conservation										
3. Ensure implementation of priority legislation and policies in PAs and other critical habitats	3.1 Data on specific offenses on PAs and other habitats, if any are gathered	3.1.1 Sex-disaggregated data on the number and types of offenses in PAs and other habitats, if any	*	*	*	DENR-BMB*	11	10	60,680,842,364.28	69,711,886,597.35
	3.2 The trend on specific offenses on PAs and other habitats is reduced by 50%	3.2.1 Sex-disaggregated trends in offenses in PAs and other habitats	*	*	*		11	10		
		3.2.2 Threats and maps of physical extent of impact (hectares) of offenses on PAs and other habitats	*	*	*					
	3.4 "Prior rights" as stated in Sec. 29, 2nd paragraph of Mining Act of 1995 is clarified with the Supreme Court	3.3.1 Supreme Court decision clarifying prior rights in the Mining Act	*	*		DENR-BMB*, NCIP, CSO	11	17		
	3.5 Guidelines to incorporate biodiversity conservation in the allocation of the 1.5% of operating cost of mining companies for their social development management	3.4.1 Guidelines on biodiversity conservation for mining companies	*			DENR-BMB*, DENR-MGB*, Mining companies, CSO, NCIP, DSWD	11	17		
		3.4.2 Social development management, rehab and environmental plans are	*							

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	program, Environmental Protection and Enhancement Program and Final Mine Rehabilitation/Decommisioning Program Plan are formulated	gender-sensitive and contain biodiversity components								
	3.6 Existing mining companies are encouraged to allocate at least 5% of the same forest/habitat (all forms of habitat) type within their concessions for strict protection (no-go areas in mining areas)	3.5.1 Percentage of no-go areas within mining sites	*	*	*	DENR-BMB*, DENR-MGB*, Chamber of Mines, NCIP, CSO	11	19		
	3.7 For new mining applications, at least 5% of the same forest/habitat (all forms of habitat) type within their concessions for strict protection (no-go areas in mining areas)	3.6.1 Guidelines on no-go areas within mining areas	*	*		DENR-BMB*, DENR-MGB*	11	17		
	3.8 Mining companies' restoration efforts are monitored through multi-partite committees that will include women and men representation from BMB, FMB and Ecosystems Research and Development Bureau (ERDB)	3.7.1 Percentage of mining sites planted to native species	*	*	*	DENR-FMB, DENR-BMB, DENR-MGB*, Chamber of Mines	11	14		
		3.7.2 Percentage of budgets allocated for restoration					11	12		
		3.7.3 Sex-disaggregated list of multi-partite committees					11	12		
	3.9 Convergence among DA, DENR, DAR, NCIP, IP communities and LGUs is strengthened to prevent further conversion of forest lands to agriculture or human settlements particularly in and around PA and forested areas	3.8.1 Joint memoranda on programs and budget allocation from DA, DAR, DENR, NCIP, LGUs and other related agencies for biodiversity conservation	*	*	*	DENR-BMB*, DENR-FMB, DENR-LMB, DA, NCIP, DAR, CSO	11	17		
		3.8.2 Agency mandates at the executive level are streamlined								
	3.10 A more coherent policy among DA, DAR and DENR on locating large scale plantations	3.9.1 DA, DENR and DAR joint guidelines on locating large plantations	*	*		DENR-FMB*, DENR-BMB, DA, DAR	11	17		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	that consider KBAs is formulated and implemented									
	3.11 The use of SEA as appropriate is promoted, FPIC is secured and sound EIAs are conducted for infrastructure development (eg. Roads/Highways, irrigation canals, tourist facilities inside PAs) in and around PAs and forested areas	3.10.1 Number of SEAs conducted	*	*	*	DENR-BMB*	11	17		
		3.10.2 ECCs incorporating biodiversity conservation provisions	*	*	*	DENR-EMB*, DENR-BMB				
		3.10.3 Biodiversity guidelines in EIA process	*			DENR-BMB*				
		3.10.4 Design guidelines for infrastructure in and around PAs and forested areas	*			DENR-BMB*, DENR-FMB, DPWH, DOT, DA				
	3.12 Alternative settlement sites are provided for migrant lowlanders (i.e. Balik-Probinsiya Project and related programs) that consider the needs of women and youth	3.11.1 Maps of settlement sites for migrant lowlanders	*	*		DENR-BMB, DENR-FMB, MGB, Namria, LGUs*, DILG, DSWD	11	10		
		3.11.2 Sex-disaggregated list of relocated informal settlers	*	*	*	DENR-BMB, DENR-FMB, LGUs*, DILG, DSWD				
	3.13 Tenure and incentives for community forest managers are strengthened	3.12.1 Gender-sensitive incentives	*	*		DENR-FMB*, DENR-BMB*	11	17		
		3.12.2 Percentage of LGU budget allocations for community forest rangers	*	*	*	LGUs*, DILG	11	12		
		3.12.3 Percentage of budget allocations for community volunteers in PAs	*	*	*	LGUs*, DILG	11	12		
		3.12.4 Sex-disaggregated list of community forest rangers and community volunteers in PAs/conservation areas	*	*	*	DENR-FMB, DENR-BMB*, LGUs, DILG	11	18		
	3.14 Congressional review of NIPAS Act, Fisheries Code and IPRA is done to address overlap of functions	3.13.1 Amended NIPAS Act	*	*		DENR-BMB*	11	17		
		3.13.2 NIPAS Act is reviewed to shorten process of PA declaration								

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
		or process of providing protection								
OVEREXPLOITATION										
DIRECT PROGRAM INTERVENTIONS										
		Promotion of Biodiversity-friendly Livelihoods								
1. Facilitate the provision of biodiversity friendly livelihood to the locals	1.1 By 2027, 100% of livelihoods in PAs are biodiversity-friendly	1.1.1 Percentage of livelihoods that are biodiversity friendly within PAs		*	*	DENR-BMB*, DENR-FMB*	4	9	2,505,348,738.25	3,582,655,090.72
		1.1.2 Percentage of women and men engaged in biodiversity-friendly livelihoods within PAs	*				4	9		
		Strengthening Law Enforcement								
2. Strengthen law enforcement in and around forest and other natural habitats and seriously pursue prosecution of offenders	2.1 An appropriate and cost effective monitoring of biodiversity in forest and other natural habitats is developed and implemented	2.1.1 Trends in forest and other natural habitat biodiversity	*			DENR-BMB*, DENR-FMB, Academe, CSO	5	12	749,315,594.35	1,026,832,223.31
		2.1.2 Guidelines for biodiversity monitoring for KBAs and other natural habitats	*			DENR-BMB*, DENR-FMB, DENR-ERDB, Academe		17		
	2.2 Law enforcement agencies are engaged	2.2.1 Trends in offenses/violations	*	*	*	DENR-BMB*, DENR-FMB*, DILG, PNP, LGUs, NBI, AFP	5	10		
		2.2.2 Sex-disaggregated list of offenders by nature of offense	*	*	*					
		2.2.3 Alliances between and among government and law enforcement agencies (eg. POGI)	*	*	*					
	2.3 Paralegal trainings to both women and men of law enforcement agencies, PAMBs and multisectoral forest protection councils are provided	2.3.1 Sex-disaggregated list of trainees	*	*	*	DENR-Asec for IAS and Anti-Corruption*, DENR-HRDS*, DILG, LGUs, PNP, CSO, Academe	5	12		
		2.3.2 Trends in terrestrial habitat-related offenses	*	*	*					

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	2.4 The deputation of bantay gubats, Wildlife Enforcement Officers (WEO), Mult-sectoral Forest Protection Councils (MFPC) is facilitated and participation of IPs, women and youth is encouraged	2.4.1 Sex-disaggregated list of deputized forest and wildlife wardens	*	*	*	DENR-BMB*, DENR-FMB*, LGUs	5	12		
	2.5 The offices of the City ENRO, MENRO, PASu are strengthened	2.5.1 Percentage of budget allocations	*	*	*	DBM, DILG, LGUs*, DENR-BMB	5	12		
		2.5.2 Number of financing mechanisms for biodiversity conservation developed	*	*	*	DBM, DILG, LGUs, DENR-BMB*				
	2.6 The designated Green Courts are strengthened	2.6.1 Trends in cases filed and litigated	*	*		DOJ*, DENR, DBM	5	12		
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Define and operationalize national species conservation action plans for globally and nationally threatened forest species that will complement site-based strategies	1.1 By 2027, maintain or improve relative abundance of threatened species	1.1.1 Trends in sightings of priority species encountered	*	*	*	DENR-BMB*, Academe, CSO, LGUs	12	1	13,777,634,775.92	15,386,510,974.17
	1.2 The conservation status of globally and nationally threatened species is improved	1.2.1 Conservation status of threatened species in national lists	*	*	*					
2. Improve capacities of local stakeholders including IPs, women and youth and communities to control and limit overexploitation and destructive	2.1 Sex-disaggregated data on utilization of economically important species is gathered	2.1.1 Sex-disaggregated trends on utilization of economically important species	*	*	*	DA, DENR-BMB, DENR-FMB*, Academe, CSO	5	10	797,171,024.38	1,637,231,587.20
		2.1.2 Percentage of communities which have defined carrying capacities of resources that they use	*	*	*	DENR-ERDB	5	10		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
practices on agriculture and forestry resources		2.1.3 Study on selected economically important species	*			DENR-BMB, DENR-FMB, DENR-ERDB*	5	18		
	2.2 Unsustainable use of selected economically important species is reduced by 30% by 2027 based on study	2.2.1 Baseline of unsustainable use of selected economically important species	*	*		DENR-BMB, DENR-FMB, DENR-ERDB*	5	18		
		2.2.2 Trends in unsustainable use of economically important species		*	*	DENR-BMB, DENR-FMB, DENR-ERDB*	5	10		
	2.3 50% of Community-Based Forest Management Agreement (CBFMA), PACBRMA and other forest tenure holders are engaged in biodiversity-friendly livelihoods	2.3.1 Percentage of women and men engaged in biodiversity-friendly livelihoods	*	*	*	DENR-BMB*, DENR-FMB*	5 5	9 12		
	2.4 The inventory of IP traditional food knowledge is conducted	2.4.1 Inventory of IP traditional food knowledge	*	*	*	NNC*, NCIP	5	1		
3. Improve conservation status of globally, nationally threatened and CITES species	3.1 A national Red List assessment of the conservation status of fisheries and non-fishery species is conducted	3.1.1 Number of species that are Red List assessed and listed nationally as threatened species			*	NFRDI, DA-BFAR*, DENR-BMB, PCAARRD, Academe, CSOs	12	1	709,774,766.28	816,240,981.22
		3.1.2 Conservation status of nationally Red Listed threatened species			*	DA-BFAR*, DENR-BMB, PCAARRD, NFRDI, Academe, CSOs	12	1		
		3.1.3 Database on species and actions for the species		*		DENR-BMB, DA-BFAR*, Academe, CSOs	12	18		
	3.2 A national Red List assessment of the conservation status of habitat forming species (mangrove, seagrass, coral) is conducted	3.2.1 Updated national action plans	*	*		DA-BFAR, DENR-BMB*, PCAARRD, NFRDI,	12	12		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
						Academe, CSOs				
	3.3 A National Red List assessment of the conservation status of marine species is conducted	3.3.1 National Red List of marine species indicating their conservation status		*		DA-BFAR*, DENR-BMB, PCAARRD, NFRDI, Academe, CSOs	12	12		
	3.4 Fisheries AO 233 on aquatic wildlife conservation is operationalized	3.4.1 Functional National Aquatic Wildlife Management Committee	*			DA-BFAR*, DENR-BMB, NFRDI, Academe, CSOs	12	10		
		3.4.2 Functional Regional Aquatic Wildlife Management Committee	*					10		
		3.4.3 Sex-disaggregated list of members of National and Regional Aquatic Wildlife Management Committees	*	*	*			10		
		3.4.4 Sex-disaggregated list of wildlife aquatic enforcement officers	*	*	*			10		
		3.4.5 Number of aquatic wildlife rescue centers	*	*	*			10		
		3.4.6 Trends in issuance of gratuitous permits disaggregated by sex, as applicable	*	*	*			10		
		3.4.7 Trends in registration of aquatic wildlife	*	*	*			10		
		3.4.8 Trends in violations	*	*	*			10		
		3.4.9 Sex-disaggregated list of offenders	*	*	*			10		
		3.4.10 Fund status of the Aquatic Wildlife Management Fund	*	*	*			12		
	3.5 Species with potential economic value are documented	3.5.1 List of species with potential economic value		*		DA-BFAR*, DENR-BMB, NFRDI,	12	18		

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
						Academe, CSOs				
		TOTAL							**132,015,846,085.64**	**151,552,269,402.67**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
HABITAT LOSS										
DIRECT PROGRAM INTERVENTIONS										
		Restoration of Ecosystem Functions								
1. Restore/rehabilitate degraded coastal and marine ecosystems using site-appropriate methods	1.1 At the minimum, no net loss in natural ecosystems in priority areas such as mangrove, intertidal areas, seagrass, soft-bottom, coral reef habitats is achieved	1.1.1 Extent of natural aquatic ecosystems cover			*	DENR (FMB, BMB*, National Mapping and Resource Information Authority [NAMRIA]) DA-BFAR	15	14	42,233,456,525.88	48,568,255,534.39
		1.1.2 Extent of natural ecosystems cover showing species richness, composition and abundance (corals = % cover; mangroves = crown cover or density of trees/ saplings/ seedlings)			*	DENR (FMB, BMB*, Namria), DA-BFAR	15	14		
		1.1.3 Percent of degraded natural ecosystems rehabilitated/restored			*	DENR-BMB*, DA-BFAR, DILG, LLDA, NCIP, CSOs, Academe	15	14		
	1.2 Culture technologies for coral propagules from eggs and larvae are developed	1.2.1 Number of culture technologies	*	*		University of the Philippines-Marine Science Institute (UP-MSI)*, University of San Carlos (USC), Mindanao State University-Tawi-Tawi College of Technology and Oceanography (MSU-TCTO)	15	14		
		1.2.2 Reproductive patterns of at least 10 species of Philippine corals	*	*						
		1.2.3 List of resilient and susceptible species to elevated water temperature and eutrophication	*	*						
		1.2.4 Molecular markers for stress response and resilience	*	*						
	1.3 The applicability of the Filipinnovation approach (public-private-	1.3.1 Percentage of reef sites rehabilitated and monitored using the	*	*		USC, MSU-TCTO*, Bohol Island State	15	14		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	academe partnership) in coral reef restoration is pilot-tested	asexual reproduction (corals of opportunity)				University, MSU-GenSan, Sangkalikasan				
	1.4 Reef sites (one ha/site (aggregate or contiguous reef area) with 10,000 grown coral fragments are restored	1.4.1 Percentage of reef sites rehabilitated and monitored using the asexual reproduction (corals of opportunity)	*	*	*					
	1.5 At least 10 reef sites devastated by typhoon Yolanda using asexual reproduction (corals of opportunity) are restored	1.5.1 Percentage of reef sites rehabilitated and monitored using asexual reproduction (corals of opportunity)	*	*						
2. Strictly enforce existing easement policies within priority areas	2.1 Easement policies are implemented	2.1.1 Percentage of LGUs incorporating easement protection principles in their policies, plans & programs	*	*	*	LGUs*, DENR-EMB, DILG, CSOs, Private sector (eg Chambers)	7	12	241,651,132.42	281,779,331.42
		2.1.2 Percentage of LGUs monitoring and addressing violations	*	*	*					
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Sustainably manage important Philippine coastal and marine ecosystems through the implementation of relevant action plans	1.1 Action plans are funded and relevant stakeholders including IPs, women and youth, take action	1.1.1 Number of action plans sufficiently funded and effectively implemented by relevant stakeholders including IPs, women and youth	*	*	*	DENR-BMB*, NEDA, DBM, LGUs, CSOs, Academe, DA-BFAR	11	12	-	-
		1.1.2 Improved livelihoods of women and men evidenced by increased incomes		*	*			9		
2. Mainstream biodiversity conservation into national and local planning processes	2.1 Biodiversity-responsive guidelines in the EIA process are developed, adopted and effectively implemented	2.1.1 Number of ECCs with biodiversity conditionalities that conform to EIS guidelines	*	*	*	DENR-EMB*, DILG, CSOs, Private sector (eg Chambers), LGUs	2	9	45,493,161.99	61,554,514.85

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	2.2 ICM is mainstreamed and budgeted by 100% of coastal LGUs into their enhanced CLUPs using the HLURB framework on biodiversity mainstreaming	2.2.1 Percentage of LGUs implementing enhanced CLUPs with the participation of IPs, women and youth	*	*	*	HLURB*, DENR-BMB, DILG, LGUs	2	13		
		2.2.2 LGU investment in ICM per Annual Investment Plan	*	*	*					
		2.2.3 List of women and men trained on ICM	*	*	*					
	2.3 All requests for assistance in the formulation of fishery ordinances are addressed	2.3.1 Extent to which requests for assistance was addressed	*	*	*	DA-BFAR*, DENR-BMB, CSOs, Academe	2	9		
	2.4 Species- and ecosystems-based land and water use planning (eg. regional, island, biogeographic zone, corridor, bay-wide, basin-wide, PA-wide, KBA) is promoted	2.4.1 Number of plans jointly prepared by LGUs and other stakeholders including IPs, women and youth	*	*	*	LGUs*, DENR-BMB, DILG, CSOs, Private sector (eg Chambers), HLURB, NEDA, Leagues, NIA, Metropolitan Waterworks and Sewerage System, RDCs, NWRB, LLDA, NCIP, PCSD	2	13		
3. Implement the National Assessment of the Coral Reef Environment	3.1 Science-based information on the state of the coral reefs and associated habitats in different coral reef sites all over the country is generated	3.2 Distribution maps, density, coral cover, fish catch, income, bathymetry, database	*	*		UP MSI*, De La Salle University, Xavier University, UP Mindanao, USC, MSU-TCTO	19	18	586,177,432.13	648,095,153.20
		Strengthening Policy for Biodiversity Conservation								
4. Revert idle, abandoned and illegally acquired fishponds	4.1 Joint DA-DENR-DILG AO No. 1 – 2008 is implemented	4.1.1 Reports on implementation of Joint DAO	*			DA-BFAR*, BMB-DENR, DILG	5	17	72,599,408.46	101,518,169.89
	4.2 All reported and/or suspected fraudulent titles and lease	4.2.1 Percentage of fraudulent titles and lease agreements	*	*	*	DA-BFAR*, DENR-BMB, LGUs, NWRB,	5	17		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	agreements are reviewed and recommended for cancellation and reversion	reviewed, cancelled and/or reversed				DENR-LMB, DILG, LGUs, Office of the Solicitor General				
	4.3 Appropriate guidelines for tenurial instruments for both titled and untitled mangrove areas declared as alienable and disposable are formulated and adopted	4.3.1 Extent to which tenurial guidelines are adopted/implemented	*			BMB-DENR	5	17		
						Communication, Education and Public Awareness				
5. Implement CEPA activities for various stakeholders including IPs, women and youth on biodiversity to effect behavioral change	5.1 A 10% annual increase in the number of schools, POs, media organizations, LGUs, private corporations, policy makers, government offices that are aware of biodiversity, its importance, threat and benefits of protecting it is targetted	5.1.1 Awareness levels	*	*	*	DENR-BMB*, PIA, DepEd, CHED, Academe, CSOs, All mass media, Private sector, Religious sector	1	18	27,340,091.62	32,411,237.65
	5.2 Science-based information on coastal and marine biodiversity is translated into popular media to educate various stakeholders including IPs, women and youth on best practice	5.2.1 Number of available media materials in local dialects that target various audiences including IPs, women and youth	*	*	*	DENR-BMB*, DA-BFAR*, PIA, DepEd, CHED, Academe, CSOs, All mass media, Private sector, Religious sector	1	18		
		5.2.2 Sex-disaggregated list of recipients of media materials	*	*	*					
		5.2.3 Trends on adoption of best practices (eg. Violations on dulong, padas harvesting)	*	*	*	DA-BFAR*, DENR-BMB, PIA, DepEd, CHED, Academe, CSOs, All mass media	1	18		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	5.3 Support from legislators, academe and other government agencies and business sector for conservation and sustainable use of biodiversity is obtained through one commitment/undertaking per sector annually	5.3.1 Trends in support obtained from various sectors	*	*	*	DENR-BMB	1	18		
						Biodiversity conservation-related Research				
6. Undertake geophysical coral mapping	6.1 Seafloor maps in coral reef areas to depths of 20m-200m are produced	6.1.1 Bathymetry maps to depths of 20m-200m, substrate type maps, and maps identifying occurrence of deep sea corals	*	*		UP MSI*	19	18	128,994,620.44	143,833,756.71
7. Undertake exploration mapping and assessment of deep water areas specifically Benham Bank	7.1 Benham Bank's biological diversity, benthic resources and habitats, and biological productivity of the water column are assessed	7.2.1 Maps of bottom types, benthic habitats and resources, coral communities, reef fish and sediments (infaunal) communities	*	*		UP National Institute of Geological Sciences, UPMSI*, UP Los Banos School of Environmental Science and Management	19	18	240,218,857.66	261,749,972.55
		7.2.2 Database	*	*	*					
						OVEREXPLOITATION				
DIRECT PROGRAM INTERVENTION										
						Promotion of Biodiversity-friendly Livelihoods				
1. Diversify incomes of coastal communities including IPs, women and youth to reduce impacts from dependence on capture fisheries	1.1 Biodiversity-friendly sustainable livelihoods are developed and implemented	1.1.1 Trends in community-based ecotourism (ex. Anilao model) and other biodiversity-friendly livelihoods	*	*	*	DENR-BMB*, DA-BFAR, DOT, CSOs, LGUs, DILG	14	9	418,038,820.32	483,365,265.61
		1.1.2 Percentage of women and men benefitting from community-based ecotourism and other biodiversity-friendly	*	*	*					

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
		1.1.3 Percentage of LGU, CSO, IP organization incomes from ecotourism/community-based ecotourism and other biodiversity-friendly enterprises	*	*	*	LGUs*, DENR-BMB, DA-BFAR, DOT, CSOs, DILG	14	9		
	1.2 Standards for biodiversity-friendly sustainable livelihoods are developed and implemented	1.2.1 Number of biodiversity-friendly sustainable livelihoods adhering to the standards implemented in priority areas	*			DENR-BMB*, DA, DA-BFAR, DTI, DILG, LGUs, CSOs	14	9		
	1.3 Incentive systems (eg. Certification, eco-labelling) for biodiversity-friendly and gender-sensitive sustainable livelihoods are developed and implemented	1.3.1 Incentive system in place	*			DENR-BMB*, DA, DA-BFAR, DTI, DILG, LGUs	14	9		
		Strengthening Law Enforcement								
2. Reduce number of overexploited fisheries stocks	2.1 The condition of indigenous and heavily exploited fish stocks is improved and recovering	2.1.1 Freshwater fish: Sinarapan in Bicol, Ayunign in Laguna Lake, and the biya in many freshwater bodies, or pigik in Region 10 or Terapon in Cagayan River; 5 of the heavily exploited stocks (commonly targeted fish such as groupers in Palawan, rabbitfishes in Bolinao, Cebu (Region 7), sardines in Zamboanga area, diwal in Capiz		*	*	DA-BFAR*, LGUs, DOST-PCAARRD, DA-National Fisheries Research and Development Institute (NFRDI), DILG	6	10	89,135,743.05	102,364,819.64
	2.2 The status (E values) of known exploited stocks is optimized	2.2.1 Exploitation ratio (fishing mortality/total mortality)	*	*	*	DA-NFRDI*, DA-BFAR, DOST-	6	10		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
		2.2.2 Change in average size of species	*	*	*	PCAARRD, Academe, CSOs				
		2.2.3 Marine trophic index of catch	*	*	*					
3. Strengthen coastal and marine law enforcement	3.1 IUUF is identified	3.1.1 National violations map of IUUF events	*			DA-BFAR*, DENR-BMB, DA-NFRDI, Academe, CSOs, Philippine Coast Guard (PCG), LGUs, DILG	6	10	24,660,860.77	28,359,989.88
	3.2 A National Plan of Action (NPOA) on IUUF is implemented	3.2.1 Milestones of the Plan achieved	*	*	*					
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Improve capacities of local stakeholders including IPs, women and youth and communities to control and limit overexploitation and destructive practices on fisheries and aquaculture	1.1 A functional permitting/regulating system in LGUs in priority coastal and marine ecosystems/areas is put in place	1.1.1 Percentage of LGUs, communities, etc. with a functional permitting/regulating system in place		*		LGUs*, DILG, DA-BFAR, DENR-BMB	6	10	28,635,089.62	35,317,341.52
	1.2 Local policies/ordinances on regulated use of coastal and marine resources are formulated and implemented	1.2.1 Number of local policies on regulation of use of resources	*	*	*	LGUs*, DA-BFAR, Academe	6	9		
		1.2.2 Trends in the destructive practices on fisheries, agriculture, aquaculture and forestry resources	*	*	*					
	1.3 Communication materials on wise use of coastal and marine resources are developed and distributed	1.3.1 Number of communication materials on regulated use of coastal and marine resources	*	*	*	LGUs*, DA-BFAR*, DENR-BMB*, Academe	6	18		
		1.3.2 Distribution list of communication materials disaggregated by sex, as applicable	*	*	*					
	1.4 Trainings on biodiversity-friendly use of coastal and marine resources are conducted	1.4.1 Percentage of local stakeholders adopting biodiversity-friendly practices	*	*	*	LGUs*, DA-BFAR, Academe	6	10		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	1.5 The provision on required level of commercial scale under Fisheries AO 197-1, 2012 is reviewed and amended, as applicable	1.5.1 Amended Fisheries AO 197-1	*	*		DA-BFAR*	6	17		
2. Manage a more equitable utilization of mineral resources (eg from mining and quarrying) and ensure minimal impact on coastal and marine biodiversity	2.1 A functional permitting/regulating system in LGUs in priority coastal and marine ecosystems/areas is put in place	2.1.1 Percentage of LGUs, communities, etc. with a functional permitting/regulating system in place		*		LGUs*, DILG, DA-BFAR, DENR-BMB	5	10	1,248,787.76	1,387,162.76
	2.2 Coastal and riparian areas are free from actual mining/extraction activities	2.2.1 Incidence of mining activities in riparian and coastal areas	*	*	*					
	2.3 Perverse incentives and subsidies that promote mining and quarrying in priority /important riparian and coastal areas and extraction of associated biodiversity are reviewed and reduced	2.3.1 Trends in perverse incentives and subsidies that promote mining and quarrying in priority /important riparian and coastal areas and extraction of associated biodiversity	*			DENR-MGB*, DENR-BMB, DA-BFAR, Academe, CSOs, Private sector	5	17		
3. Establish mechanisms for storage and retrieval of fisheries information	3.1 Interoperable databases are organized	3.1.1 Knowledge products	*			DA-NFRDI*, DA-BFAR, Academe, DOST-PCAARRD	19	18	-	-
		3.1.2 Protocols for sharing information	*							
Communication, Education and Public Awareness										
4. Strengthen fisheries science, social and policy research in schools	4.1 Coastal resource management and biodiversity conservation is mainstreamed in school curricula	4.1.1 Updated school curricula		*		CHED*, DepEd*, NFRDI, DA-BFAR, Academe, PCAARRD	1	18	2,583,000.00	3,274,875.00
Strengthening Policy for Biodiversity Conservation										
5. Develop economic incentive schemes to support improved	5.1 Schemes for economic incentives to shift to less destructive means of fishing (use of	5.1.1 Number of economic incentives/policies (fish calendars)	*	*	*	DA-BFAR*, DENR-BMB, LGUs, DSWD	3	17	6,885,000.00	9,205,875.00

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
management of fisheries (including optimization of value chain and diversification)	fish-friendly gear) are developed									
	5.2 Adverse economic effects to fisherfolk of management actions (ie. closed seasons) are reduced									
6. Address conflicts on municipal water delineation to facilitate joint and effective management	6.1 Fora for discussions among LGUs are established	6.1.1 Baywide and other Inter-LGU arrangements	*	*	*	LGUs* , DENR-NAMRIA, DA-BFAR,	4	12	3,060,860.77	4,591,291.15
		6.1.2 Map/s of contentious areas	*	*	*					
7. Enact priority ENR legislations under the updated PDP 2011 – 2016 that will enhance biodiversity	7.1 Legislation on the following are enacted: a) establishment of MPAs in all coastal communities and cities; b) integrated coastal management; and c) defining maritime zones of the country	7.1.1 Laws on MPAs, ICM and maritime zones	*	*	*	DENR-BMB*, DA	7	17	51,337,224.66	52,665,429.13
	7.2 The IRR of the Water Code is reviewed/amended	7.2.1 Amended IRR of the Water Code	*	*		DENR-EMB*	7	17		
		Biodiversity Conservation-related Research								
8. Undertake research on priority areas of concern	8.1 Research is undertaken on the following: a) carrying capacities (programmatic) for ecotourism, mariculture, aquaculture; b) life history characteristics of priority species (fecundity and reproductive patterns)	8.1.1 Research results are available for use by policy makers and other relevant sectors	*	*		DENR-ERDB*, DENR-BMB	4	18	666,353,487.62	766,306,510.76
POLLUTION										
DIRECT PROGRAM INTERVENTION										
		Strengthening Law Enforcement								
1. Reduce sedimentation from poorly-planned	1.1 The EIA system is fully implemented	1.1.1 Water and soil quality	*	*		DENR-EMB*, LGU, DA, Private	8	10	27,654,555.20	32,806,256.45

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
land-based activities e.g. mining and mine tailings, deforestation, agriculture, dumping of solid waste, infrastructure development						sector, DPWH, CSOs				
2. Reduce pollution from aquaculture activities	2.1 The Codes of Conduct for Good Aquaculture Practices and for Responsible Fisheries are implemented	2.1.1 Water and soil quality	*	*		DA-BFAR*, Private sector, LGUs, DOST-PCAARRD, Academe, CSOs	8	10	28,045,991.40	32,257,997.21
	2.2 The ban on harmful chemicals used in aquaculture (eg. Organotin and similar molusciscides) is enforced	2.2.1 Water and soil quality	*			DA-BFAR*, LGUs, DENR-EMB	8	10		
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Reduce oil spill impacts	1.1 A local and inexpensive system for oil spill response is initiated	1.1.1 Oil spill response system	*	*		PCG*, Academe, DILG-PNP, Private sector, CSOs, LGUs, DILG	8	10	193,836,928.20	225,560,085.77
		Strengthening Policy for Biodiversity Conservation								
2. Implement Ballast Water Convention provisions consistent with national legislation	2.1 Ratify Ballast Water Convention	2.1.1 Ratification of Ballast Water Convention		*		PCG*, DA- BFAR, Philippine Ports Authority, Department of Transportation and Communications (DOTC), DFA	8	10	29,036,396.70	33,731,651.70
	2.2 A policy that will implement provisions of the Ballast Water Convention is enacted	2.2.1 Policy on ballast water		*		PCG*, DENR-BMB, DA-BFAR, DFA, DOTC	8	10		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
3. Reduce pollution from aquaculture activities	3.1 Incentives to use environment friendly alternatives are provided	3.1.1 Incentives for use of environment-friendly molusciscides and other similar pest control chemicals		*		DA-BFAR*, DENR-EMB, LGUs	8	10		
		3.1.2 Alternatives to harmful chemicals	*			DA-BFAR, DOST*, DENR-EMB, LGUs				
4. Enact priority ENR legislations under the updated PDP 2011 – 2016 that will enhance biodiversity	4.1 The ecological solid waste management and toxic substances and hazardous and nuclear wastes control policy is amended	4.1.1 Amended policy on ecological solid waste management and toxic substances and hazardous and nuclear wastes control	*	*		DENR-EMB*	8	10		
CLIMATE CHANGE										
DIRECT PROGRAM INTERVENTION										
		Restoration of Ecosystem Functions								
1. Restore habitats using ecologically based, appropriate site specific technology	1.1 100,000 hectares of seafront, illegal and abandoned fishponds are reverted to allow for managed retreat of mangroves to address sea level rise	1.1.1 Percentage of hectares of abandoned and illegal fishponds reverted from DA-BFAR to DENR			*	DA-BFAR*, DENR-BMB*, LGUs, DILG, Academe, CSOs, Private sector	15	14	240,314,085.30	324,747,646.27
	1.2 Greenbelt law/policies are passed and enforced on 50-100 m facing open seas including foreshore areas and 20-50 m along riverbanks	1.2.1 Greenbelt policies	*			DA-BFAR*, DENR-BMB, DILG, LGUs, Academe	15	17		
		1.2.2 Number of hectares of intact greenbelts/Maps of greenbelts		*						
		1.2.3 Updated national action plans for mangroves and seagrasses that consider needs of IPs, women and youth	*							
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Integrate effects of climate change impacts in plans and	1.1 Climate change adaptation and disaster risk reduction	1.1.1 Adaptive mechanisms incorporated into plans	*	*		LGUs*, DENR-BMB, CCC, DA-BFAR, National	10	13	407,108,185.47	473,817,002.17

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
programs for biodiversity conservation and sustainable use of coastal and marine resources	management are integrated in local plans that consider needs of IPs, women and youth	1.1.2 Percentage of LGU budget allocated to climate change mitigation & adaptation that consider needs of IPs, women and youth	*	*	*	Disaster Risk Reduction Management Council, Academe, CSOs, NEDA, DBM, DILG				
	1.2 The mosaic approach to planning and the concept of ecologically viable production landscapes is implemeted	1.2.1 Number of hectares under mosaic approach and ecologically viable production landscapes	*	*	*					
	1.3 An early warning system for coastal areas is developed	1.3.1 Predictive models	*							
2. Build capacity of women and men in LGUs to implement ecosystems-based climate change adaptation	2.1 Safe resettlement areas for fisherfolk are established	2.1.1 Maps of resettlement sites of fisherfolk	*	*		LGUs*, National Anti-Poverty Commission, DILG, DENR-BMB, DA-BFAR, Academe, CSOs, CCC, CHED, DePEd, DPWH, HLURB	10	12	1,372,312,793.33	1,602,928,645.44
		2.1.2 Percentage of resettled fisherfolk	*	*	*					
	2.2 Coral reef/mangrove/ seagrass beds monitoring and evaluation teams are established	2.2.1 Number of community-based coral reef/mangrove/seagrass bed evaluation teams	*	*		LGUs*, DENR-BMB, DA-BFAR, Academe, CSOs	10	12		
		2.2.2 Sex-disaggregated list of trained individuals	*	*	*					
	2.3 MPA networks are established	2.3.1 MPA/MPA network ordinances	*			MPA Support Network*, DENR-BMB, DENR-NAMRIA Academe, LGUs, CSOs, DA-BFAR	10	20		
		Maps of MPA networks		*	*					
3. Build an eLibrary of climate change related resources	3.1 The www.chm.ph is strengthened with an elibrary	3.1.1 Species and reference holdings	*			DENR-BMB*, BFAR, Academe, DOST-PCAARRD, DOST, CSOs	19	12	20,079,653.83	23,963,931.76

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	3.2 Comprehensive database on Philippine coastal and marine is digitized	3.2.1 Digitized information of coastal and marine species				DENR-BMB*, DA-BFAR, FIN	19	12		
	3.3 All recipients of gratuitous permits have digitized their biodiversity data	3.3.1 Digitized information of biodiversity data from permittees	*	*	*	DENR-BMB*, DA-BFAR, NM, Academe, DFA	19	12		
		Biodiversity Conservation-related Research								
4. Assess vulnerability and climate risk of coastal areas to storm surge, flooding, coastal erosion and sea level rise increase in surface and sea temperature and ocean acidification due to climate change	4.1 The vulnerability of 33 NIPAS-MPAs is assessed	4.1.1 Vulnerability assessment reports and maps	*	*		DENR-BMB*, DA-NFRDI, DA-BFAR, Academe, CSOs, DOST-PCAARRD, LGUs, CCC	10	12	667,521,660.82	883,386,181.92
		4.1.2 Women and men from LGUs, PAMBs and DENR regional offices with capabilities to conduct vulnerability assessments and implement vulnerability assessment adaptive measures	*	*						
		4.1.3 Climate-proofed plans	*	*						
	4.2 30% non-NIPAS sites are assessed for vulnerability	4.2.1 Vulnerability assessments for non-NIPAS sites				DOST-PCAARRD*, DENR-BMB	10	12		
	4.3 15% of municipal waters are designated as fish sanctuaries and are effectively managed	4.3.1 Monitoring reports				LGUs*, DENR-BMB	10	20		
	4.4 Climate positive areas (that may later be designated as fish sanctuaries) in each marine biogeographic region are identified	4.4.1 Maps of climate positive areas per marine biogeographic region				DOST-PCAARRD*, DENR-BMB, Academe, LGUs	10	20		
5. Undertake research on priority areas of concern	5.1 Research is undertaken on the following: a) species to sediment/substrate matching for mangroves	5.1.1 Research results are available for use by policy makers and other relevant sectors	*	*	*	DENR-ERDB*, DENR-BMB	10	12	666,353,487.62	766,306,510.76

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	and mudflats based on lessons learned from NGP, mix of species (assemblage of species it can support and what ecological functions it can restore); b) diel migration of plankton in priority sites; c) detection of persistent plankton blooms (fishery productivity is high in these areas) and its relation to climate change and effects of ocean acidification; d) seabirds and correlation of their population to intertidal flats health; e) adaptation to climate change effects of sea turtles; f) improvement of coral reef restoration techniques									
		Strengthening Policy for Biodiversity Conservation								
6. Harmonize/ complement BFAR, DENR, DILG policies on mangroves	6.1 Guidelines on biophysical reversion abandoned, unproductive and unutilized FLAs to mangrove are adopted and implemented	6.1.1 Implementing rules and regulations (IRR) available (guidelines and related resources)	*			DENR-BMB, DA-BFAR*, LGUs, DILG, CSOs, Academe	4	17	36,207,900.00	42,174,585.00
7. Develop economic incentives that consider IPs, women and youth and identify sources of support to mobilize mangrove rehabilitation (eg. Blue carbon)	7.1 Incentives that consider IPs, women and youth for mangrove rehabilitation are developed	7.1.1 Percentage of area planted to mangroves/Maps of areas planted to mangroves	*	*		DENR-BMB*, CCC, NEDA, BFAR	3	17	19,775,036.25	23,767,666.88
		7.1.2 Incentives for mangrove rehabilitation	*							
	7.2 Perverse incentives are removed	7.2.1 Updated policies	*	*			3	17		
		Total							**48,576,116,779.29**	**56,051,484,392.45**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
DIRECT PROGRAM INTERVENTION										
		Promotion of Biodiversity-friendly Livelihoods								
1. Increase the number of communities practicing heritage agriculture that adopt dynamic conservation programs which sustain important traditional varieties	1.1 At least 10 identified nationally important agricultural heritage system (NIAHS) sites apply dynamic conservation approaches with government support	1.1.1 Percentage of NIAHS sites with programs and budgetary support	*	*	*	DA-BPI*, Natioanl Commission on Culture and Arts (NCCA), DENR-BMB, PCSD, NCIP	18	15	2,395,231,433.31	2,726,989,640.98
		1.1.2 Sex-disaggregated list of farmers practicing heritage agriculture	*	*	*	DA-BPI*, NCCA, DENR-BMB, PCSD, NCIP	18	15		
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Increase the number of in situ and ex situ sites that conserve and propagate diverse indigenous species and varieties	1.1 The number of community-based breeding and planting material production programs including home gardens in combination with small animal raising is increased by at least 10%	1.1.1 Number of community-based breeding programs	*	*	*	DA-BPI* , Institute of Plant Breeding, CSO, National Nutrition Council (NNC)-DOH	13	4	8,435,838,001.31	9,716,384,665.44
		1.1.2 Sex-disaggregated list of participants	*	*	*	DA-BPI* , Institute of Plant Breeding, CSO networks	13	4		
	1.2 There is clearer guidance and increased funding for at least 4 major ex-situ conservation centers based on an agreed-upon program of priorities that integrate both ex-situ and in-situ efforts	1.2.1 Number of ex-situ efforts that reinforce location specific in-situ conservation efforts	*	*	*	DA-BPI*	13	17		
2. Integrate conservation and sustainable use of agrobiodiversity in PA plans as well as in plans for	2.1 Conservation and sustainable use of agrobiodiversity are integrated in plans of at least 30% of terrestrial PAs	2.1.1 Percentage of PAs, ICCAs and LCAs that integrate agrobiodiversity conservation and its	*	*		DENR-BMB*, DA, PAMBs, DOST, DILG, LGUs	2	12	-	-

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
conservation areas outside the PA system	and at least 50% of plans for conservation areas outside the PA system such as ICCAs and LCAs	sustainable use in their management plans								
3. Incorporate agrobiodiversity concerns in enhanced CLUPs and other LGU programs	3.1 At least 5% of LGUs implement local programs that practice biodiversity-friendly agriculture	3.1.1 Percentage of LGUs using the biodiversity-friendly CLUP guidelines	*	*	*	HLURB*, DENR-BMB, DILG, Leagues , Concerned LGUs	2	11	462,222,603.43	581,712,032.91
		3.1.2 Percentage of LGUs promoting organic agriculture	*	*	*					
		3.1.3 Sex-disaggregated list of organic farmers								
Strengthening Policy for Biodiversity Conservation										
4. Formulate agrobiodiversity guidelines for PA management plans or for conservation areas outside the PA system (i.e. managed by communities or LGUs)	4.1 Agrobiodiversity is included in protocols for preparation of area conservation plans of PAs, community-conserved areas and LCAs	4.1.1 Guidelines for PA prioritization and management planning contain agrobiodiversity conservation and use protocols	*			DENR-BMB*, DA, DA-BPI, NCIP Concerned Academe	2	12	-	-
	4.2 Agrobiodiversity is considered in the biodiversity assessment process	4.2.1 Guidelines on biodiversity assessment that include agrobiodiversity	*							
5. Formulate and establish policies and programs to recognize and sustain communities practicing heritage agriculture which concurrently harbor agrobiodiversity	5.1 A NIAHS is jointly established by stakeholder agencies to identify and recognize areas with high agricultural heritage value	5.1.1 EO or Joint administrative order establishing the NIAHS system		*		DA*, DA-BPI, NCCA, NCIP NM, DENR-BMB	18	15	-	-
		5.1.2 A policy clarifying DA program interventions in areas with high agricultural heritage value to support		*						

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
		climate change adaptation and other national concerns								
	5.2 Agrobiodiversity conservation is integrated in guidelines for the formulation of Ancestral Domain Sustainable Development and Protection Plans (ADSDPP) and documentation of IKSP	5.2.1 Guidelines that integrate agrobiodiversity conservation in documentation of IKSP and development of ADSDPPs	*			NCIP*, Consultative Group on Indigenous Peoples (CGIP)	18	17		
		5.2.2 Sex-disaggregated data on number of NCIP staff and key CSO networks trained on agrobiodiversity conservation practices	*	*	*					
	5.3 Agrobiodiversity is incorporated in at least 10 pilot sites of the DeEd IP education program as well as in selected Schools of Living Tradition (SLT) located in areas with high agrobiodiversity	5.3.1 Percentage of IP education pilot sites with agrobiodiversity in curriculum	*	*	*	DepEd*, NCCA, NCIP, CSO	18	18		
		5.3.2 Percentage of SLTs incorporating agrobiodiversity concerns	*	*	*					
6. Formulate and implement agricultural policies to support agrobiodiversity and biodiversity-friendly mainstream agriculture	6.1 An EO establishing a harmonized support system for plant genetic resources for food and agriculture is enacted	6.1.1 EO supporting a system for plant genetic resources for food and agriculture		*		DA*	4	17	63,591,849.72	66,805,193.06
	6.2 A mechanism is established to acknowledge and support efforts to document farmer actions to conserve plant genetic resources for food and agriculture including the	6.2.1 Guidelines from the Plant Variety Protection Office		*	*	DA-BPI*, CSO, Intellectual Property Office, NCIP	4	17		
		6.2.2 Percentage of community registries with sex-disaggregated data	*	*	*					

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
	development of community registries	under the PVP system								
	6.3 Protocols for agricultural land use planning at national, regional and local levels are modified to take into account the conservation and sustainable use of agrobiodiversity	6.3.1 Revised guidelines or clarification for National Protected Areas for Agriculture and Development and Strategic Agriculture and Fisheries Development Zoning that incorporate agrobiodiversity concerns		*		DA*, HLURB	4	17		
		6.3.2 Extent of dissemination of recently promulgated biodiversity-friendly CLUP guidelines	*	*	*					
	6.4 The Participatory Guarantee System (PGS) is incorporated as permanent feature in organic agriculture ensuring gender equality and parity	6.4.1 An AO with provisions extending the use of the PGS indefinitely		*		DA*, LOAM, CSO	4	17		
		6.4.2 Sex-disaggregated data on small-scale producers benefitting from PGS		*	*					
	6.5 The current policy is strengthened to introduce independent risk assessment of planned programs and inclusion of GMO concerns in the EIA system	6.5.1 AO guidelines for risk assessment and inclusion of GMO concerns in EIA system		*		DENR-BMB*, DOST, DA-BPI, DA, CSO	4	17		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	6.6 Draft legislation or EO on labelling of GMO products is promulgated	6.6.1 EO or draft legislation under technical review		*		DOST*, Bio safety Committee, CSO network, Consumers groups	4	17		
Biodiversity Conservation-related Research										
7. Undertake R&D that establishes the true value of areas of agricultural landscapes harboring high biodiversity, nutrient analysis of newly identified/underutilized crops, animals and other organisms that can be used as food, promote value addition to traditional products of agrobiodiversity and promote effective knowledge management	7.1 An inventory, geographic referencing of crop genetic diversity (heirloom varieties, crop wild relatives and other underutilized crops animals, aquatic resources, and beneficial microbial resources) and documentation of associated local food knowledge is conducted and information is communicated to key decision makers	7.1.1 Extent of updated inventory, documentation of associated local food knowledge and assessment communicated to decision makers	*			DA-BPI*, NNC*, DENR-BMB, DOH, DOST, CHED	19	4	-	-
		7.1.2 Sex-disaggregated list of information/report recipients	*							
	7.2 The multi-functionality of traditional agricultural systems of high/threatened/unique agrobiodiversity and its niche in food security and resiliency is documented, valued and disseminated	7.2.1 Results of valuation study taken up by sub-cabinet clusters for agriculture and climate and environment		*		DA*, BPI, NEDA - PIDS, CHED	19	4		
		7.2.2 Improved valuation methods that incorporate agrobiodiversity, cultural aspects including gender sensitivity		*						
	7.3 Dedicated research to develop strategies that promote and enhance the	7.3.1 Number of programs/products developed	*	*	*	DA*, DA-BPI, DOST, SUCs; DOST,	19	4		

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
	sustainable utilization of agrobiodiversity products is undertaken	7.3.2 Sex-disaggregated list of program/project participants				Concerned CSO, NNC-DOH, Barangay Nutrition Scholars, Barangay Health Workers				
	7.4 A National Integrated Sharing Network for plant genetic resources for food and agriculture is revived, incentivized and fully implemented to focus on priorities that maximize synergy and enhance benefits from ex situ and in situ conservation initiatives	7.4.1 Sustainable incentives in place to encourage proactive use of the system (including updated Protocol on information sharing) and feedback from users.	*			DA*, DA-BPI, DENR-BMB, CHED, DOST-Food and Nutirition Research Institute, DOST-Philippine Council for Health Research and Development, DOST-PCAARRD	19	4		
		7.4.2 Sex-disaggregated list of users	*	*	*					
	7.5 Create a database to document wild relatives of cultivated plants and farmed and domesticated animals, identify which are being maintained or conserved (in situ or ex situ or on farm) where they are and map them out	7.5.1 Database of wild relatives of cultivated plants and farmed and domesticated animals	*	*		DA*, DA-BPI, Academe, NGOs	19	18		
		7.5.2 A functional monitoring system for wild relatives of cultivated plants and farmed and domesticated animals		*	*					
		TOTAL							**11,356,883,887.78**	**13,091,891,532.39**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
HABITAT LOSS										
DIRECT PROGRAM INTERVENTIONS										
		Strengthening Law Enforcement								
1. Research conducted in caves is regulated and monitored	1.1 A system for monitoring and regulating cave research is installed	1.1.1 Number of permits issued and/or IP prior informed consent given	*	*	*	DENR-BMB*, NCIP*, DENR Regional Offices, PCSD,	19	16	1,058,326.13	1,217,075.05
		1.1.2 Sex-disaggregated list of researchers								
ENABLING PROGRAM INTERVENTIONS										
		Capacity Development for Biodiversity Conservation								
1. Conduct cave survey, assessment, and classification providing equal opportunities for both women and men to participate	1.1 Focal persons (regional) are assigned and capacitated ensuring gender parity in trainings on cave surveying, assessment, and classification	1.1.1 Trained focal persons with knowledge on cave surveying, map, assessment, classification including cave management	*	*	*	DENR Regional Offices*, DENR-BMB, PCSD, National Museum (NM), National Historical Commission (NHC)	19	16	705,970,469.25	1,443,872,165.25
		1.1.2 Sex-dissagregated data on focal persons								
	1.2 At least nine (9) Philippine caves per region are classified annually until 2028 using prescribed techniques	1.2.1 Cave distribution maps (using dots to indicate geographical locations) per province or Region	*	*	*	DENR Regional Offices*, DENR-BMB, PCSD, NM, NHC	19	16		
		1.2.2 Length (in meters or kilometers) of cave passages assessed	*	*	*	DENR-Cave Assessment Team*, DENR-BMB, PCSD, NM	19	16		
		1.2.3 Recommended list of classified caves	*	*	*	DENR-Cave Assessment Team*, DENR-BMB, PCSD, Regional Cave	19	16		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
						Committee (RCC)				
	1.3 A Department Memorandum Circular is issued	1.3.1 Department Memorandum Circular on official list of classified caves	*	*	*	DENR*, DENR-BMB	19	16		
Strengthening Policy for Biodiversity Conservation										
2. Identify and set aside caves with high conservation value for national and/or international protection	2.1 At least 10% of the 2000 classified caves identified for inclusion in NIPAS, Critical Habitat and other governance regimes	2.1.1 List of caves identified for inclusion in the NIPAS, Critical Habitat, other governance regimes, and/or international heritage listings	*	*	*	DENR-Regional Offices DENR-BMB*, PCSD, RCC	11	19	198,581,668.73	248,268,120.55
		2.1.2 Endorsement of caves for inclusion in the NIPAS, Critical Habitat, other governance regimes, and/or international heritage listings	*	*	*					
	2.2 1% of the recommended classified caves is proposed for national legislation	2.2.1 Number of proposals submitted		*	*	National Cave Committee (NCC)*, BMB-DENR	11	19		
	2.3 At least 0.5% of the classified caves nominated as outstanding heritage or conservation site for global recognition	2.3.1 Recommended caves or cave systems with recognition as globally important heritage or conservation sites		*	*					
Communication, Education and Public Awareness										
3. Develop and implement a Communication and Education Strategy to enhance public awareness, most especially the marginalized groups i.e. youth, IPs, and women, on the conservation of caves and cave resources	3.1 A wider diversity of participants with better understanding and appreciation of the values of caves is targetted	3.1.1 Levels of awareness	*	*	*	BMB-DENR*, DENR-Regional offices, PCSD, NM	1	18	208,774,633.92	231,962,101.81
		3.1.2 Number of partnerships with stakeholders in the conservation of caves and cave resources								
		3.1.3 Presidential Proclamation on cave conservation	*	*		DENR-BMB*	1	16		
	3.2 The outcome of the Communication and Education Strategy is assessed, necessary improvements are made	3.2.1 Assessment report containing among others, support (non-financial, financial) from community and private sector and awareness levels	*	*	*	DENR-BMB*, PCSD, RCC	1	16		

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
	and gender parity is ensured	3.2.2 Sex-disaggregated list of recipients/participants of information materials/activities	*	*	*					
		3.2.3 Communications materials	*	*	*					
		Biodiversity Conservation-related Research								
4. Enhance basic and applied research on caves	4.1 The continuous conduct studies and research on caves (speleology, archaeology, etc.) is encouraged and supported ensuring gender equality and equity among scientists/ researchers/authors doing cave studies	4.1.1 Effectiveness and application of the conducted studies about caves	*	*	*	Academe*, DENR-BMB, DENR-ERDB, DENR-MGB, PCSD, CHED	19	16	846,450,314.61	964,483,075.77
		4.1.2 Sex-disaggregated data on researchers/scientists/organizations conducting cave studies								
		4.1.3 Effectiveness and application of the research themes/topics, disaggregated by sex of researcher								
	4.2 Basic and applied research to assist in the management and conservation of caves and cave resources is conducted (i.e. biology and ecology of cave biota and of the karst landscape, archaeological exploration, setting water quality and air quality standards inside caves, open and closed seasons for the collection of birds' nest) ensuring gender equality and equity among scientists/ researchers/authors conducting the studies	4.2.1 Effectiveness and application of the basic and applied research								
		4.2.2 Sex-disaggregated data on researchers/scientists/organizations conducting cave studies								
	4.3 The systematic investigation of caves used by threatened and endangered biota, especially bats, blind fish and shrimps is prioritized	4.3.1 List of priority caves for investigation from DENR Regional Offices	*	*		DENR-BMB*, DENR Regional Offices, PCSD	19	16		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	4.4 A Code of Conduct for researchers and speleologists/explorers is developed and implemented	4.4.1 Code of Conduct for Researchers and Cave Explorers	*	*		DENR-BMB*, PCSD	19	16		
		4.4.2 Reports on the implementation of the Code of Conduct including data on researchers adopting the Code disaggregated by sex	*	*	*					
	4.5 Communicating research and monitoring results to relevant staff and stakeholders including marginalized groups i.e. IPs, women, elderly and youth is regularly done	4.5.1 Trends in research undertaken	*	*	*	DENR-BMB*, NCC, PCSD, DENR-Regional Offices, RCC	19	16		
		4.5.2 Trends in publications	*	*	*					
		4.5.3 Percentage of women staff and stakeholders with access to research and monitoring results	*	*	*					
		4.5.4 Monitoring reports	*	*	*					
OVEREXPLOITATION										
DIRECT PROGRAM INTERVENTION										
		Restoration of Ecosystem Functions								
1. Manage and monitor visitor impacts on caves	1.1 Clean-up and/or restoration projects in selected vandalized caves are conducted	1.1.1 Reports including photos on clean-up and/or restoration projects	*	*	*	RCC, DENR-Regional Offices*, Concerned LGUs, Concerned Landowners	15	14	9,799,315.99	11,269,213.39
		Strengthening Law Enforcement								
2. Manage and monitor visitor impacts on caves	2.1 Recreational activities that can adversely impact cave ecosystems (e.g. biking) including vandalism (e.g. graffiti) are prohibited	2.1.1 Trends in apprehensions and penalties imposed including sex disaggregated data on offenders	*	*	*	DENR-Regional offices*, DOT, PCSD, RCC	14	16	297,494,541.24	316,080,901.11
3. Formulate and implement policies on the sustainable use of cave resources	3.1 Export and import of speleothems and speleogens is banned	3.1.1 Policy guidelines on the export and import of speleothems and speleogens in place	*	*		BMB-DENR*, NCC, NM	5	16	53,560,799.50	56,774,142.85
		3.1.2 Number of incidents/cases filed including sex-disaggregated data on offenders	*	*	*					
	3.2 The harvesting/collection of	3.2.1 Policy guidelines on harvesting/collection of guano and edible birds' nests in place	*	*		DENR-BMB*, NCC,	5	16		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	guano and edible birds' nests is regulated	3.2.2 Number of incidents/cases filed including sex-disaggregated data on offenders	*	*	*	DENR-RCC, ERDB, PCSD				
	3.3 A regular monitoring system of licensed cave resource extraction is developed and implemented	3.3.1 Functional monitoring system developed and implemented	*	*	*	BMB-DENR*, NCC, DENR Regional Offices, PCSD, Concerned LGUs	5	8		
		3.3.2 Number of apprehensions made icluding sex-disaggregated data on offenders	*	*	*					
		3.3.3 Amount of penalties collected	*	*	*					
	3.4 A protocol on underwater cave diving is formulated and implemented	3.4.1 Protocol on underwater cave diving	*	*		DENR-BMB*, DENR Regional Offices, RCC, NCC	5	16		
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Develop and implement individual cave management plans	1.1 A holistic management plan including a Cave Monitoring Program for each DENR-approved classified cave or cave system is formulated with participation from women and IPs	1.1.1 Number of management plans implemented	*	*	*	DENR-Regional Offices*, PCSD, RCC, Concerned LGUs	4	16	354,750,035.96	451,414,898.63
		1.1.2 Number and list of local partnerships on cave management	*	*	*	DENR-Regional Offices*, PCSD, RCC, Concerned LGUs, Concerned Landowners				
		1.1.3 Functional Cave Monitoring and Evaluation Scheme	*	*	*	DENR-Regional Offices*, PCSD, RCC, Concerned LGUs, NCC				
	1.2 Cave management plans are harmonized, as appropriate, with other	1.2.1 Management plans implemented and	*	*	*	DENR-Regional Offices*,	4	16		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	plans such as NIPAS Management Plan, Wetland Action Plan, PBSAP, NISSAP	harmonized/integrated with existing biodiversity management plans				PCSD, RCC, DENR-BMB, PAMB, Concerned LGUs				
	1.3 Public-private collaboration in the management and conservation of caves is strengthened	1.3.1 Number of Cave Conservation Agreements with LGUs, landowners and other stakeholders including IP and women organizations, as applicable	*	*	*	DENR-Regional offices*, DENR-BMB, PCSD, Concerned LGUs and Landowners	4	16		
2. Develop selected caves as sustainably managed ecotourism destinations/attractions	2.1 A visitor interpretation program in nearby communities which includes tour guiding to enhance tourist experience and conservation awareness is developed and implemented	2.1.1 Visitor interpretation program in place	*	*		DOT*, NCC, BMB-DENR, RCC, DENR Regional Offices	14	16	2,628,766,400.28	3,833,790,881.49
		2.1.2 Sex-disaggregated number of trained locals as guides for the visitor interpretation program	*	*		DOT*, NCC, BMB-DENR				
	2.2 Policy guidelines on the development of tourism facilities inside and entrance of caves (e.g., ladder, stairways, walk ways, handrails, viewing platforms, lightings, warning and directional signage, etc.), ensuring visitor safety and minimal environmental risk are formulated and implemented	2.2.1 Policy guidelines on tourism facilities inside and at the entrance of caves	*			BMB-DENR*, DOT, NCC	14	17		
	2.3 A visitor-use zoning strategy (including a 'no go' zone) is developed	2.3.1 Visitor-use zoning maps	*	*		NCC*, BMB-DENR, RCC, DENR Regional Offices, DOT	14	16		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	2.4 A mandatory visitor registration logbook is implemented	2.4.1 Completed visitor logbook registration	*	*	*	DENR Regional Offices*	14	16		
		2.4.2 List of visitors disaggregated by sex	*	*	*					
	2.5 A liability waiver system in case cave visitors meet accidents and unforeseen events and/or inflicted with cave-related illnesses is established	2.5.1 Waiver system for cave visitors	*	*		NCC*, DOT, BMB-DENR	14	16		
	2.6 A licensing or accreditation system for commercial cave tour operators or guides, which can be cancelled upon violations of environmental and human safety regulations is implemented	2.6.1 Functional licensing or accreditation system	*	*		DOT, NCC*, BMB-DENR	14	16		
		2.6.2 Trends/Number of licenses/accreditations issued	*	*	*					
	2.7 Procedures on user fee collection and benefit-sharing of revenues derived from the use of caves are developed	2.7.1 User fee collection and benefit-sharing system	*			NCC*, BMB-DENR, RCC, DOT	14	16		
		2.7.2 Percentage of LGU and/or community incomes	*	*	*					
	2.8 A response system to accidents is developed and implemented	2.8.1 Functional response system	*	*			14	16		
3. Manage and monitor visitor impacts on caves	3.1 Visitor carrying capacity is determined	3.1.1 Visitor carrying capacity is implemented	*	*		DENR Regional Offices*, DOT, NCC, RCC, BMB-DENR	14	16		
	3.2 Regular visitor impact assessment aimed at reducing damage to caves and health risks to humans is conducted	3.2.1 Visitor impact parameters to include the nature, duration and frequency of recreational use	*	*		NCC*, DOT, RCC, BMB-DENR	14	16		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	3.3 Regular water quality analysis of underground water, cave pools, and water drips is performed	3.3.1 Water quality analysis results	*	*	*	DENR-Regional Offices*, DENR-EMB	14	16		
	3.4 A Code of Conduct for tourists to minimize visitor impact, prevent accidents and health hazard and damage to caves is developed and implemented	3.4.1 Code of Conduct	*			DOT, NCC*, DENR-BMB, RCC	14	16		
		3.4.2 Reports on Code of Conduct implementation	*							
4. Improve human capacity and capability in the assessment, management and monitoring of caves	4.1 Easy- to-understand, training manuals and guides on cave management and relevant laws and policies are developed	4.1.1 List of training manuals and guides	*	*	*	NCC, DENR-BMB*, DENR Regional Offices	7	16	62,968,142.86	67,592,587.70
		4.1.2 Sex-disaggregated distribution list of training manuals and guides	*	*	*					
	4.2 Practical trainings such as cave assessment, survey, planning, management, monitoring, rescue, visitor safety and tour guiding are conducted	4.2.1 Trends in number of trainings	*	*	*	DENR-BMB*, NCC, DENR Regional Offices, RCC	7	16		
		4.2.2 Training modules	*	*	*					
		4.2.3 Trends in number of individuals trained disaggregated by sex	*	*	*					
		4.2.4 Distribution list of survey equipment	*	*	*					
	4.3 Relevant conferences and symposia at the local, regional and national levels are organized	4.3.1 Number of conferences, seminars and symposia	*	*	*	NCC*, DENR-BMB, DENR Regional Offices, Academe	7	18		
		4.3.2 Sex-disaggregated data of conference, seminars, and symposia participants	*	*	*					
	4.4 A policy on hazard pay/insurance for implementors of cave management plans is formulated and implemented	4.4.1 Policy on hazard pay/insurance	*			DENR-BMB*	7	17		
		TOTAL							**5,368,174,648.48**	**7,626,725,163.58**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
DIRECT PROGRAM INTEVENTION										
		Restoration of ecosystem functions								
1. Rehabilitate areas (in particular areas of high biodiversity value) where IAS have been contained or eradicated	1.1 At least 15% of identified areas is restored	1.1.1 Percentage of restored areas where IAS have been contained or eradicated		*	*	DENR-BMB*, DENR Field Offices, LGUs, CSOs, Academe, DILG	15	14	1,239,166,658.69	1,425,041,657.49
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Stop the entry and new introductions of IAS, as the first-line of defense	1.1 Quarantine procedures are updated	1.1.1 Updated quarantine procedures	*			DENR-BMB*, DA*	9	10	54,431,572.81	59,020,901.68
	1.2 IAS is mainstreamed into the existing EIS system to include assessment of potentially harmful exotic species	1.2.1 EIS guidelines	*			DENR-BMB*, DENR-EMB	9	10		
	1.3 IAS clearing house/database with published research studies and roster experts on IAS is established	1.3.1 Database on IAS	*			DENR-BMB*, DENR-ERDB, DENR-FMB, DENR-EMB	9	10		
	1.4 A list with images of plant and animal IAS is provided to patrollers in sea and air ports	1.4.1 List of IAS	*			DENR-BMB*, DA, Academe, DOST	9	10		
	1.5 Existing inter-agency bodies are strengthened to include IAS concerns	1.5.1 Inter-agency mandates include IAS concerns	*			DENR-BMB*, DOST- PCAARRD, Academe	9	10		
2. Identify, report, and promptly respond to newly introduced IAS by eradicating or containing them before they become widespread	2.1 Detection is integrated with BMS and other site assessment programs	2.1.1 Revised BMS and site assessment programs	*			DENR Field Offices*, DENR-BMB, DA	9	10	773,695,195.02	901,346,964.75
	2.2 A reporting system (online/clearing house, centralized reporting system) is developed	2.2.1 Reporting system		*		DENR-BMB*, DA, Academe, DOST, CSOs, LGUs, DILG	9	10		
	2.3 New infestations are eradicated	2.3.1 Percentage of infestations		*	*	DENR Field Offices*, DENR-BMB, DA	9	10		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
3. Reduce the impacts of widespread IAS by containing and reducing the spread of invasive populations and minimizing their harmful effects	3.1 IAS control, prevention and eradication is integrated into PA Management, other ecosystem manaagement plans, ecotourism plans, and relevant local government plans	3.1.1 Updated plans	*			DENR-BMB*, DENR Field Offices, DA, Philippine Ports Authority	9	10	1,908,348,273.09	2,313,898,845.11
	3.2 Field surveys of native species in areas to be de-infested are conducted	3.2.1 Percentage of native species in areas that will be de-infested	*			DENR-BMB*, DENR Field Offices DA,	9	10		
	3.3 IAS population is reduced	3.3.1 Percentage of IAS populations in infected areas		*	*	Academe, CSOs, LGUs, DILG	9	10		
4. Establish leadership and strengthen collective action in the implementation of the NISSAP and to adapt the management of IAS in light of new and emerging scientific information	4.1 A Joint Administrative Order/EO on IAS to strengthen and expand the memberships of existing committees, that allow the participation of women, and their functions is formulated and implemented	4.1.1 National IAS Coordinating Body	*			DENR-BMB*	9	9	2,955,161.69	3,378,492.14
		4.1.2 Sex-disaggregated list of National IAS Coordinating Body	*			DENR-BMB*	9	9		
5. Strengthen the role of the Philippines in meeting its commitments to international treaties, agreements, etc., urging for technical and financial support to enhance national capacities and capabilities to implement the NISSAP	5.1 The Ballast Water Convention is ratified by the government	5.1.1 Signed Convention	*			DFA*, DENR-BMB, PCG	9	9	2,095,100.00	2,409,365.00
	5.2 IAS concerns are incorporated into the Philippine Ecotourism Strategy and Action Plan	5.2.1 Updated Philippine Ecotourism Strategy and Action Plan	*			DENR-BMB*, DOT	9	9		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
6. Strengthen the technical and management capacities of relevant government units, at the national and local levels, as well as concerned stakeholders in implementing the NISSAP	6.1 Capacity-building program on IAS for NGAs are funded and implemented	6.1.1 Funding is reflected in the General Appropriations Act	*	*	*	DENR-BMB*, DBM, DA	9	10	16,902,809.55	20,208,464.98
		6.1.2 Number of individuals trained	*	*	*	DENR-BMB*				
		6.1.3 Capacity building program in place	*	*	*					
		6.1.4 Trends in IAS introduction and eradication	*	*	*	DENR-BMB*, DENR- ERDB, DENR-FMB, Private sector, Academe, LGUs, CSOs, DILG, DOST-PCAARRD, DOST, DA-BPI				
		6.1.5 Trends in roundtable/technical discussions, conferences and similar activities	*	*	*					
Biodiversity Conservation-related Research										
7. Generate basic and applied scientific knowledge about IAS problems, provide policy advice to efficiently control and manage IAS, and generate online database and information exchange program (in particular saline tilapia, janitor fish, flowerhorn fish, *piper adduncum*)	7.1 Research gaps are identified and addressed	7.1.1 National IAS Research and Information Network		*	*	DENR-BMB*, DA, DOST, Academe	19	12	99,500,615.74	114,425,708.10
Communication, Education and Public Awareness										
8. Promote better and broader understanding and awareness of the threats of IAS and foster stakeholder support including IPs, women and youth for the	8.1 A multi-media IAS information campaign and public awareness program is launched	8.1.1 Increased awareness on IAS	*	*	*	DENR-BMB*, DA, Academe, DOST, CSOs, LGUs, DILG	1	18	105,558,231.89	123,332,231.24
		8.1.2 Multi-media CEPA materials	*	*	*	DENR-BMB*, ERDB, FMB, DepEd, CHED, Private sector, Academe, LGUs, CSOs, DILG,				

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
implementation of the NISSAP						DOST-PCAARRD, DOST, DA-BPI				
	8.2 IAS is integrated in the curriculum of environment related courses	8.2.1 Percentage of courses integrating IAS	*	*		CHED*, DENR-BMB, Academe	1	18		
		TOTAL							**4,202,653,618.48**	**4,963,062,630.50**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
HABITAT LOSS										
DIRECT PROGRAM INTERVENTIONS										
		Restoration of Ecosystem Functions								
1. Rehabilitate priority inland wetlands including peatlands	1.1 A scheme to manage settlements in wetlands is designed and implemented	1.1.1 Management scheme for settlements in wetlands	*			DENR-BMB*, LGUs, CSO	15	14	50,156,854,195.61	57,854,533,198.21
		1.1.2 Maps of settlements in wetlands per region	*	*	*	DENR-BMB*, LGUs, DILG, CSO	15	14		
	1.2 Sound community-based river rehabilitation that considers the needs of IPs, women and youth of priority rivers is implemented	1.2.1 Percentage of rehabilitated rivers	*	*	*	DENR-BMB*, DENR-FMB, LGUs, CSO	15	14		
	1.3 Soil conservation technologies in priority wetlands are implemented	1.3.1 Soil quality monitoring reports	*	*	*	DA-BSWM*, DENR-BMB, LGUs, Academe, CSO	15	14		
	1.4 Degraded marsh areas are identified	1.4.1 Maps of degraded marsh areas	*			DENR-BMB*, LGUs, NGOs, Academe	15	14		
	1.5 ___% of degraded marsh is restored	1.5.1 Percentage of restored marsh areas		*	*	DENR-BMB*, LGUs, NGOs, Academe	15	14		
		1.5.2 Number of hectares of restored marsh areas		*	*					
ENABLING PROGRAM INTERVENTIONS										
		Capacity Development for Biodiversity Conservation								
1. Establish baseline data and conduct bio-physical and socio-cultural including gender assessment and monitoring of freshwater wetlands using the ridge to reef framework	1.1 An inventory of freshwater wetlands per region is conducted	1.1.1 Maps of freshwater wetlands	*	*		NAMRIA*, DENR-BMB, DENR-EMB, DENR-RBCO, DENR ROs, LGUs, DOST-PCAARRD, Academe, CSO	19	12	5,037,647,469.74	5,621,597,680.36
		1.1.2 Mapping guidelines that consider seasonal inundations	*			NAMRIA*, DENR-BMB, DENR-EMB, DA-BSWM,				

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
						DA-BFAR, DENR-LMB, DENR ROs				
	1.2 Bio-physical including the presence of IAS and socio-economic including ecotourism and gender assessment of major lakes, rivers and swamps is undertaken	1.2.1 Bio-physical, socio-economic including gender assessment reports of priority freshwater wetlands	*	*	*	DENR-BMB*, DENR-EMB, RCBO, DENR-ROs, LGUs, DOST-PCAARRD, Academe, CSO	19	12		
	1.3 Regular monitoring, including bio-physical characteristics, of priority freshwater wetlands is conducted	1.3.1 Monitoring guidelines	*	*						
		1.3.2 Regular monitoring reports	*	*	*					
	1.4 Systematic access to databases is established	1.4.1 Linked national and regional databases	*	*		DENR-BMB*, DENR-ERDB, DOST-PCAARRD, LLDA, DENR-RBCO, NWRB, DENR-EMB, LGUs, Academe, CSO	19	18		
2. Establish meta-database and information clearinghouse on Philippine wetlands	2.1 A section on Philippine wetlands in the Clearing House Mechanism (CHM) is created	2.1.1 Functional and updated database on Philippine wetlands in the CHM	*	*		DENR-BMB*, DENR-FMB, DA-BFAR, DENR-ERDB, DOST-PCAARRD, Academe, CSO, Private sector	19	18	-	-
Communication, Education and Public Awareness										
3. Implement a Wetlands CEPA Action Plan	3.1 A Wetlands CEPA Action Plan that targets various audiences including IPs, women and youth, is formulated, adopted and implemented	3.1.1 National and regional CEPA Plans	*			DENR-BMB*, DA-BFAR, DENR-ERDB, DOST-PCAARRD, Academe, CSO, Private sector	1	18	997,038,652.55	1,145,399,988.28

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
		3.1.2 Percentage of regions integrating and implementing the CEPA Action Plan into their plans		*	*	DENR-BMB*, DA-BFAR, DENR-ERDB, Academe, CSO, Private sector				
		3.1.3 Percentage of partner organizations implementing CEPA Action Plan		*	*					
	3.2 Existing CEPA activities are upscaled and ensure participation of IPs, women and youth	3.2.1 Percentage of local resolutions to mainstream outreach activities such as Dalaw-Turo in public and private schools	*	*	*	DENR-BMB*, DepEd, LGUs	1	18		
		3.2.2 Percentage of CEPA materials in the vernacular that target various audiences including IPs, women and youth	*	*	*	DENR-BMB*, CSO, Academe				
		3.2.3 Sex-disaggregated data on distribution of CEPA materials								
		3.2.4 Trends in the conduct of Wetlands Caravan in priority wetlands	*	*	*	DENR-BMB*, LGUs, CSO, Academe				
		3.2.5 Sex-disaggregated data on participation in CEPA activities								
	3.3 Virtual Wetlands Information Centers are established in the CHM	3.3.1 Available information on all inland wetlands are made available in the CHM	*	*	*	DENR-BMB*, LGUs, CSO, Academe	1	18		
	3.4 A National Wetlands Conference that encourages participation from IPs, women and youth is held every 3 years	3.4.1 Number of conferences	*	*	*	DENR-BMB*, CSO, DOST-PCAARRD, DENR-ERDB	1	18		
		3.4.2 Sex-disaggregated list of conference participants								
	3.5 The "Philippine Wetlands Conservation Award" is implemented every 3 years	3.5.1 Number of awarding events	*	*	*	DENR-BMB*, DENR-Regional Offices, CSO, Academe,	1	18		

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
						DILG, Private sector				
4. Document best practices in wetland conservation that include experiences of IPs, women and youth	4.1 Criteria for selection of best practices are developed	4.1.1 Criteria of best practices	*			DENR-BMB*, TWG on Wetlands	1	18	4,667,794.80	6,522,084.54
	4.2 Working models of sustainable wetland management are identified, documented, compiled and included in the CHM	4.2.1 Number of best practices/working models documented and included in the wetland section of the CHM		*	*	DENR-BMB*, DENR-Regional Offices, TWG on Wetlands, DILG, LGUs, Galing Pook	1	18		
Strengthening Policy for Biodiversity Conservation										
5. Implement zoning policies	5.1 National Land Use Act currently pending in Congress is passed	5.1.1 IRR of National Land Use Act	*	*		NEDA*	2	18		
OVEREXPLOITATION										
DIRECT PROGRAM INTERVENTIONS										
Strengthening Law Enforcement										
1. Strictly enforce easement and buffer zone regulations	1.1 Easement and buffer prescriptions particularly for development near wetlands are integrated in the building permit process	1.1.1 Section on easement and buffer prescriptions within the building permit process	*	*		DENR-BMB*, LGUs*	6	10	-	-
	1.2 Local ordinances on buffer zones for developments in wetland areas including sanctions for violations are issued and implemented	1.2.1 Number of new local ordinances	*	*		LGUs*, DENR-BMB, DILG, Leagues, DENR-Lands Management Bureau (LMB), DPWH	6	10		
		1.2.2 Trends in violations	*	*	*					
		1.2.3 Multi-sectoral monitoring teams with participation from IPs, women and youth	*	*	*					
	1.3 Recognition/incentives are given to LGUs with documented best practice on riverbank easement protection	1.3.1 Documentation on best practices including those of IPs, women and youth on riverbank easement/protection	*	*	*	DENR-BMB*, NWRB, Leagues, DPWH	6	10		
ENABLING PROGRAM INTERVENTIONS										
Capacity Development for Biodiversity Conservation										

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
1. Promote ecotourism as a conservation strategy for inland wetlands	1.1 The list and profile of inland wetlands with ecotourism potential is updated	1.1.1 Updated list and profile of inland wetlands with ecotourism potential per region	*	*		DENR-BMB*, DENR Regional Offices, DOT, Academe, CSO	7	7	1,298,480,019.15	1,491,142,788.52
	1.2 Mapping of inland wetlands with ecotourism potential is conducted	1.2.1 Maps of inland wetlands per region	*	*		NAMRIA*, DENR-BMB, DOT, LGUs, CSO				
	1.3 Ecotourism and business plans for priority inland wetlands are developed	1.3.1 Trends in ecotourism and business plans per region	*	*	*	DENR-BMB*, DOT, LGUs, Academe, CSO				
	1.4 An incentive/recognition scheme such as eco-certification in priority inland wetlands with ecotourism potential is implemented	1.4.1 Guidelines for recognition schemes	*			DENR-BMB*, DOT, LGUs				
2. Implement sustainable aquaculture practices in inland wetlands	2.1 Policies on sustainable aquaculture (FAO Code of Conduct for Responsible Fisheries and other Codes of Conduct for Sustainable Aquaculture, BFAR AO1-2008, Wildlife Act) are promoted and implemented	2.1.1 Percentage of aquaculture permittees practicing sustainable aquaculture	*	*	*	DA-BFAR*, DENR-BMB, DTI, DILG, LGUs	6	17	3,144,121,846.23	4,271,623,161.83
3. Prepare and implement management plans for priority inland wetlands	3.1 The Management Planning Manual containing procedures with framework and templates is implemented	3.1.1 Management Planning Manual	*			DENR-BMB*, DILG, LGUs, Academe, CSO	6	12	-	-
		3.1.2 Percentage of communities implementing Management Planning Manual	*	*	*					
		3.1.3 Sex-disaggregated data of community resource managers	*	*	*					

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	3.2 Carrying capacity studies in 14 priority inland wetlands is conducted	3.2.1 Carrying capacity studies	*	*	*	DENR-BMB*, DENR-ERDB, Academe	6	18		
		3.2.2 Sustainable harvesting limits of commercial fish species such as tawilis and sinarapan	*	*	*	DA-BFAR*				
	3.3 1 gender-sensitive management plan for a priority inland wetland per region per year is prepared and implemented	3.3.1 Management plans per region	*	*	*	DENR-BMB*, LGUs, DILG, Academe, CSO	6	12		
		3.3.2 Management plan reports per region	*	*	*					
4. Prepare and implement a capacity development plan for inland wetlands management	4.1 A Capacity Development Plan for Inland Wetlands Conservation in the Philippines is implemented and monitored	4.1.1 Capacity needs assessment study	*			DENR-BMB*, LLDA, DENR-Regional Offices, DENR-ERDB, DENR-EMB, DENR-MGB	7	12	-	-
		4.1.2 Capacity Development Plan is included in wetland section of CHM	*							
		4.1.3 Assessment and monitoring reports of wetlands	*	*	*					
		4.1.4 Number of trainings	*	*	*					
		4.1.5 Sex-disaggregated list of trainees	*	*	*					
		4.1.6 Training modules for various stakeholders including tour guides	*	*	*					
	4.2 Institutional capacity for wetlands conservation is strengthened	4.2.1 Full-fledged National Wetlands Conservation Committee	*			DENR-BMB*, PCSD Sub-Committee on Biodiversity	7	12		
5. Develop and implement methods, tools and technologies for wetland management	5.1 Local level wetland management framework consistent with comprehensive land use and investment plans is implemented	5.1.1 Percentage of implemented local plans integrating wetland management framework	*	*		LGUs*, DENR-BMB, DILG	6	12	-	-
		5.2.1 Indicators identified	*			DENR-BMB*	6	12		

Program Interventions	Targets	Indicators	Time Frame			Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost	
			S	M	L				Low	High
	5.2 Cost-effective bio-physical and socio-economic monitoring tools are implemented	5.2.2 Monitoring reports	*	*	*					
	5.3 Management effectiveness assessment methods are applied in areas with management plans	5.3.1 METT reports and scores	*	*	*	DENR-BMB*	6	12		
	5.4 Climate-appropriate rainwater harvesting facilities in households near or on priority wetlands are implemented	5.4.1 Percentage of households with climate-appropriate rainwater harvesting facilities	*	*	*	DENR-BMB*, NWRB, CSO, Academe	6	10		
	5.5 A scheme to phase out aquaculture in NIPAS sites that existed before RA 7586 is formulated in consultation with stakeholders and implementation is initiated	5.5.1 Phase-out guidelines	*			DENR-BMB*, DA-BFAR	6	17		
		5.5.2 Percentage aquaculture activities in NIPAS sites	*	*	*					
6. Implement local management economic measures to conserve wetlands	6.1 Sanctions for illegal water users are formulated and implemented	6.1.1 List of illegal water users	*			NWRB*	7	10	-	-
		6.1.2 Sanctions for illegal water use in place	*							
		6.1.3 Trends in offenses	*	*	*					
	6.2 User and service fees/PES/raw water charges are in place	6.2.1 Number of user fee policies approved and implemented	*	*		LLDA*, Local water management bodies	7	17		
	6.3 Resource valuation guidelines to determine internal revenue allotment/host community are formulated	6.3.1 Guidelines on resource valuation	*	*		DENR-BMB*, DILG, LGUs	7	17		
7. Resolve reclamation issues	7.1 Areas reclaimed without permits and	7.1.1 List of reclaimed areas	*			DENR-BMB*, DENR-LMB,	5	10	-	-

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	which have not been reclassified by Congress are identified					LGUs, Philippine Reclamation Authority (PRA)				
		7.1.2 Map of reclaimed areas	*	*	*	DENR-BMB*, PRA				
POLLUTION										
ENABLING PROGRAM INTERVENTIONS										
		Promotion of Biodiversity-friendly Technology								
1. Implement bioremediation and/or phytoremediation technologies to address pollution at selected priority inland wetlands	1.1 Bioremediation and/or phytoremediation technologies are implemented on a pilot basis at selected priority inland wetlands	1.1.1 List of bioremediation and phytoremediation technologies appropriate to types of inland wetlands	*	*	*	DENR-ERDB*, DENR-EMB, CSO, Academe, LGUs	8	10	667,199,868.28	767,279,848.52
		1.1.2 Water quality monitoring reports	*	*	*					
CLIMATE CHANGE										
DIRECT PROGRAM INTERVENTIONS										
		Restoration of Ecosystem Functions								
1. Adopt appropriate watershed protection and plantation management by mainstreaming native species in reforestation projects especially in priority wetlands such as Agusan Marsh and Candaba Marsh	1.1 The target here is included in the forest ecosystem's target of at least .5M has. of identified degraded habitats are under restoration	1.1.1 Percentage of reforested areas with native species	*	*	*	DENR-FMB*, DENR-BMB, LGUs, DENR-ERDB	15	14	582,661,864.23	608,461,864.23
	1.2 Urban waterway rehabilitation	1.2.1 Percentage of urban waterways rehabilitated	*	*	*	DENR-EMB*, DENR-BMB, MMDA, LGUs	15	14		
ENABLING PROGRAM INTERVENTIONS										
		Promotion of Biodiversity-friendly Technology								
1. Adopt green technology to promote sanitation in inland wetlands	1.1 Green technology is integrated into the Building, Sanitation and	1.1.1 Amendments to Building, Sanitation and Plumbing and Water Codes	*	*		NWRB*, DPWH*, Professional organizations,	10	12	840,223,290.21	936,965,412.49

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
	Plumbing and Water Codes					DILG, LGU, Congress				
	1.2 CEPA on green sanitation technology in 3 priority inland wetlands is conducted	1.2.1 CEPA materials	*	*	*	DENR-BMB*, NWRB, LGUs, DOH, NGOs, Philippine Center for Water Sanitation	10	19		
		1.2.2 Sex-disaggregated list of recipients of CEPA materials	*	*	*					
	1.3 Green sanitation technology in 3 priority inland wetlands is piloted	1.3.1 Monitoring reports		*		LGUs*, DOH, CSO	10	10		
	1.4 Green sanitation technology in 3 priority inland wetlands is disseminated	1.4.1 Number of wetlands where green technology is applied		*	*	LGUs*, DOH, CSO	10	18		
		Biodiversity Conservation-related Research								
1. Conduct vulnerability assessment of inland wetlands and wetland species to climate change	1.1 A toolkit for vulnerability assessment of inland wetlands and wetland species is developed	1.1.1 Vulnerability assessment toolkit	*			DENR-BMB*, DENR-ERDB, LGUs, Academe, CSO	10	12	173,390,322.42	357,386,402.80
	1.2 Vulnerability assessment including life history characteristics of priority species (fecundity and reproductive patterns) of inland wetlands and wetlands species(i.e. biya, sinarapan) is undertaken	1.2.1 Vulnerability assessment reports per region	*	*	*					
	1.3 An early warning system is developed	1.3.1 Predictive models	*							
2. Conduct a study to identify vulnerable species for climate change	2.1 Studies in inland wetland types such as lakes, rivers, marshes are conducted	2.1.1 Study/ies on vulnerable species	*	*	*	DENR-ERDB*, DENR-BMB, Academe, CSO, LGUs	10	12	10,250,000.00	11,787,500.00

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
effects on inland wetlands										
3. Conduct research and development studies on specific climate change mitigation functions of inland wetlands prioritizing Ramsar sites	3.1 One study per major freshwater wetland type (lake, river, marsh, rice fields, peatlands) is conducted (eg. carbon sequestration functions of specific wetlands)	3.1.1 Climate change studies related to carbon sequestration and carbon stock studies in priority Ramsar sites		*		DENR-ERDB*, DOST, DENR-BMB, Academe	19	12	12,000,000.00	13,800,000.00
Capacity Development for Biodiversity Conservation										
4. Conduct monitoring of migration patterns of birds vis-à-vis their established migration usage	4.1 Monitoring of migratory birds in major wetland sites in Luzon, Visayas and Mindanao is conducted	4.1.1 Regular monitoring reports	*	*	*	DENR-BMB*, LGUs, Academe, CSO	10	5	143,181,648.50	217,450,019.63
	4.2 A Philippine Bird Banding scheme is initiated	4.2.1 Reports on bird banding scheme (number of birds banded)	*	*	*	DENR-BMB*, DENR-ERDB, LGUs, Academe, CSO	19	5		
Communication, Education and Public Awareness										
5. Disseminate information and support Clean Development Mechanism (CDM), REDD and other carbon financing mechanisms for mitigation and adaptation	5.1 Information on CDM, REDD+ and other carbon financing mechanisms in the wetland section of the CHM is included	5.1.1 Trends in number of hits in CHM		*	*	DENR* (BMB, ERDB, FMB), DILG, Academe, Leagues of Provinces, Cities & Municipalities, CCC	1	18	-	-
TOTAL									**63,067,716,971.72**	**73,303,949,949.42**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
ENABLING PROGRAM INTERVENTION										
		Capacity Development for Biodiversity Conservation								
1. Establish models of urban biodiversity conservation and enhancement as part of overall local environmental governance	1.1 Models for urban biodiversity conservation and enhancement (including a holistic approach to water resources development including the tapping of groundwater and rainwater for water supply and the development of standards for the regulation of service efficiency) that encourage participation of women and youth are established in at least 1 urban area per administrative region	1.1.1 Number of LGUs with urban biodiversity conservation and enhancement action programs following agreed-upon biodiversity indicators (i.e. City Biodiversity Index, urban greening framework)	*	*		Concerned LGUs*, DILG, DENR-BMB. Metropolitan Manila Development Authority (MMDA)	4	6	2,631,431,490	3,551,075,973
		1.1.2 Number of LGUs adopting green/blue services to the functions of the city environmental services	*	*						
		1.1.3 Profiles of urban biodiversity conservation and enhancement action programs	*	*						
	1.2 In each Philippine administrative region, good practices are implemented under at least 1 institution-based biodiversity action program. The key categories of institutions may include campuses; industrial estates; town centers, public markets or military installations.	1.2.1 Documented models/practices that include case studies involving women and youth	*	*		LGUs*, DENR-BMB, CHED, DepEd, MMDA, DILG, Industry Associations	4	6		
		1.2.2 Search for the Best City LGU adopting Green/Blue Principles	*	*						
		Strengthening Policy for Biodiversity Conservation								
2. Establish a City Biodiversity Index adapted to Philippine conditions (based on agreed upon international framework e.g. Singapore City	2.1 Philippine City Biodiversity Index is adapted by the Leagues of LGUs	2.1.1 Philippine City Biodiversity Index in place	*			DENR-BMB*, Leagues of LGUs, DILG, MMDA	4	6	163,912,531	191,452,529
		2.1.2 Number of LGUs adopting the Philippine City Biodiversity Index	*	*						

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
Biodiv index) to guide LGU actions										
3. Incorporate biodiversity concerns in standards and protocols of allied industries and associations who influence or depend on urban ecosystems services	3.1 Biodiversity concerns (e.g. protection of iconic wildlife, prevention of IAS) are incorporated in public parks and gardens, public buildings, public markets and the like in model urban areas	3.1.1 Revised building regulations, design standards/guidelines	*	*	*	DPWH*, DENR-BMB, LGUs, MMDA	4	6	-	-
		3.1.2 Passage of National Land Use Bill								
	3.2 Biodiversity concerns are incorporated in work standards of professions and interest groups e.g. architects; landscape designers and horticulture enthusiasts; peri urban gardeners; CSR practitioners, academic institutions, home owners associations, bird watchers	3.2.1 Biodiversity provisions incorporated in standards of key industry and professional associations	*	*	*	DENR-BMB*, Concerned Professional and Industry Associations	4	6		
		TOTAL							**2,795,344,022**	**3,742,528,502**

Program Interventions	Targets	Indicators	Time Frame S	M	L	Responsible Entity/ies (*Lead)	Aichi Target	PBSAP Target	Estimated Cost Low	High
ENABLING PROGRAM INTERVENTIONS										
		Strengthening Policy for Biodiversity Conservation								
1. Develop a national ABS policy framework incorporating or considering relevant international commitments (eg. TRIPs, ITPGRF, Nagoya, PIP)	1.1 An ABS legal Framework is adopted through a Republic Act	1.1.1 ABS Law legislated and IRR issued	*	*		DENR-BMB*	16	9	41,379,933.82	50,455,714.10
		1.1.2 Nagoya Protocol ratified	*							
	1.2 A functional ABS working group is created	1.2.1 Dedicated inter-agency working group with gender expert agencies created (note: Subcom under WMC)	*			DENR-BMB* with inter-agency member agencies	16	9		
	1.3 Support policies, e.g updated fees system, etc. are issued	1.3.1 ABS-relevant support policies issued	*							
		1.3.2 Clear, streamlined and gender sensitive procedures and protocols (e,g FPIC, etc) for new and renewal applications on bioprospecring and/or researches with sanctions for non-compliance	*							
	1.4 The following notice: Collection of species _____ covered by Gratuitous Permit/BU No. _____; dated _____; issued by _____ is indicated in all pertinent publications	1.4.1 List of publications bearing the required notice	*	*	*					
		1.4.2 Extent of disclosure of sources and permits in patent applications	*	*	*					
		1.4.3 Coding of species covered by Materials Transfer Agreement including species number	*	*	*					
		Biodiversity Conservation-related Research								
2. Characterize biodiversity resources	2.1 Inventory of resources (primary and secondary) is undertaken	2.1.1 List and map/s of resources	*	*	*	DENR-BMB* with inter-agency member agencies	16	4	1,078,836,171.90	1,413,112,977.23
	2.2 Indigenous knowledge systems and practices (IKSP) is documented	2.2.1 IKSP documented	*	*						
	2.3 Valuation of genetic resources with commercial potential is conducted	2.3.1 Priority genetic resources valued		*	*					
	2.4 Information on status of past (10 years), present and future biodiversity/IKSP-related	2.4.1 Relevant data gathered, such as past and current projects/researches and their sponsors/donors	*							

	researches compiled and potential benefit sharing claims identified	2.4.2 Sex-disaggregated list of the authors/researchers	*							
	2.5 Develop and maintain database	2.5.1 Database developed and maintained	*	*	*	DENR-BMB*	16	18		
Capacity Development for Biodiversity Conservation										
3. Develop an M&E system on ABS	3.1 M&E System for ABS is developed	3.1.1 M&E System for ABS developed/implemented	*	*	*	DENR-BMB*	16	12	2,407,500.00	3,461,625.00
4. Improve and maintain existing genebanks	4.1 Satellite genebanks are establsihed/improved in Luzon, Visayas and Mindanao	4.1.1 Regional genebanks with regular funding	*	*	*	DA*	16	4	187,861,084.46	216,040,247.13
5. Build capacity of key agencies for ABS implementation	5.1 A speakers pool aiming for an equal number of males and females at the national level is created	5.1.1 Sex-disaggregated list and number of speakers	*			DENR-BMB*, DA, NCIP, Palawan Council for Sustainable Development	16	18	126,875,463.87	139,524,641.03
	5.2 Regional focals/LGUs are trained	5.2.1 Number of regional focals/LGUs trained dissagregated by sex	*	*	*					
		5.2.2 Percentage of women with access to capacity building trainings	*	*	*					
6. Strengthen national network of research institutions	6.1 Collaboration between and among concerned institutions is established	6.1.1 Number of collaborations between and among institutions	*	*	*	DENR-ERDB*, DENR-BMB*	16	18	-	-
Communication, Education and Public Awarerness										
7. Raise awareness on ABS	7.1 An information package (integrated process flow) on existing ABS rules and supporting documents (e.g. affidavits of undertaking) is developed and disseminated	7.1.1 Number of CEPA materials developed and distributed	*	*	*	DENR-BMB* with inter-agency member agencies	16	18	-	-
		7.1.2 Presence of information in DENR, NCIP and other relevant government agencies' websites, including women's organizations, hyperlinked with cooperating agencies	*	*	*					
		7.1.3 Hard and soft copies of the information package	*	*	*					
TOTAL									**1,437,360,154.05**	**1,822,595,204.50**

ANNEX 6

Sample indicator definition and reference sheet

Indicator definition 1 (Number of biodiversity conservation related jobs generated annually)	
Goal, objective or result that the indicator represents	By 2025, x number of people benefits from biodiversity conservation related enterprises.
PBSAP key evaluation question that data on the indicator intends to answer	Key question number 2: What benefits to human beings have enhanced services generated?
Indicator	Number of biodiversity conservation related jobs (eco-tourism, sustainable agriculture, etc) generated annually
Standard BIP indicator?	No [for BMB to decide]
Standard PDP indicator?	Yes [for BMB to decide]
Precise definition of indicator	Benefits to people of biodiversity conservation enterprises could be in the form of jobs from eco-tourism enterprises, wages from forest restoration initiatives in PAs, honorarium from forest and wildlife protection activities, payments for ecosystem services (PES) benefits, etc. The number refers to the number of individuals that are registered as benefiting from an enterprise, forest restoration project, protection projects or PES scheme. Upward trend in indicator figures means better.
Unit of measure	Number
Disaggregation	Sex, type of enterprise, region and PAs.
Management utility	Data on this indicator, for a large part, is mainly for communication purposes as there are other agencies involved in ensuring good performance in this indicator. Data on the indicator informs BMB and the national government of the economic benefits people derive from biodiversity conservation and enhanced ecosystem services. Figures can be used to communicate the benefits of biodiversity conservation.
Data capture and analysis	
Data collection method at source	Source documents in the form of lists will come from those who manage the enterprise or project. BMB might request these groups to share information in a certain format.
Data acquisition by BMB	BMB will collect summarized information and encode and aggregate these in Excel tables.
Data sources	Reports of enterprises and forest protection and restoration and wildlife protection projects.
Frequency and timing of data collection	Annually.
Data storage	Source documents will be kept at source. Aggregated data in Excel will be kept by BMB.
Responsibility (at BMB)	Who at the Wildlife Division?
Data quality assessment	
Data limitations and significance	The indicator refers to number only and does not include information on amounts of benefits derived from biodiversity conservation related enterprises and projects.
Plan to address data limitations	Sources of information could be persuaded to provide details on amounts if these are available.
Procedure for data quality assessments	BMB will do random checks on sources of information that it suspects are not accurate.
Data analysis, review and reporting	
Data analysis	Descriptive statistical analysis of number of people disaggregated as mentioned above.

Data presentation	Tables, pie charts and temporal graphs
Data reporting	How will this feed into the PDP results matrices? CBD? Etc?
Baselines, targets and performance values	
Baseline	
Target (2025)	

Year	Target	Actual	Notes
2014 (baseline)			
2015			
2016			
2017			
2018			
2019			
2020			
2021			
2022			
2023			
2024			
2025			

Philippine Biodiversity Strategy and Action Plan 2015-2028

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