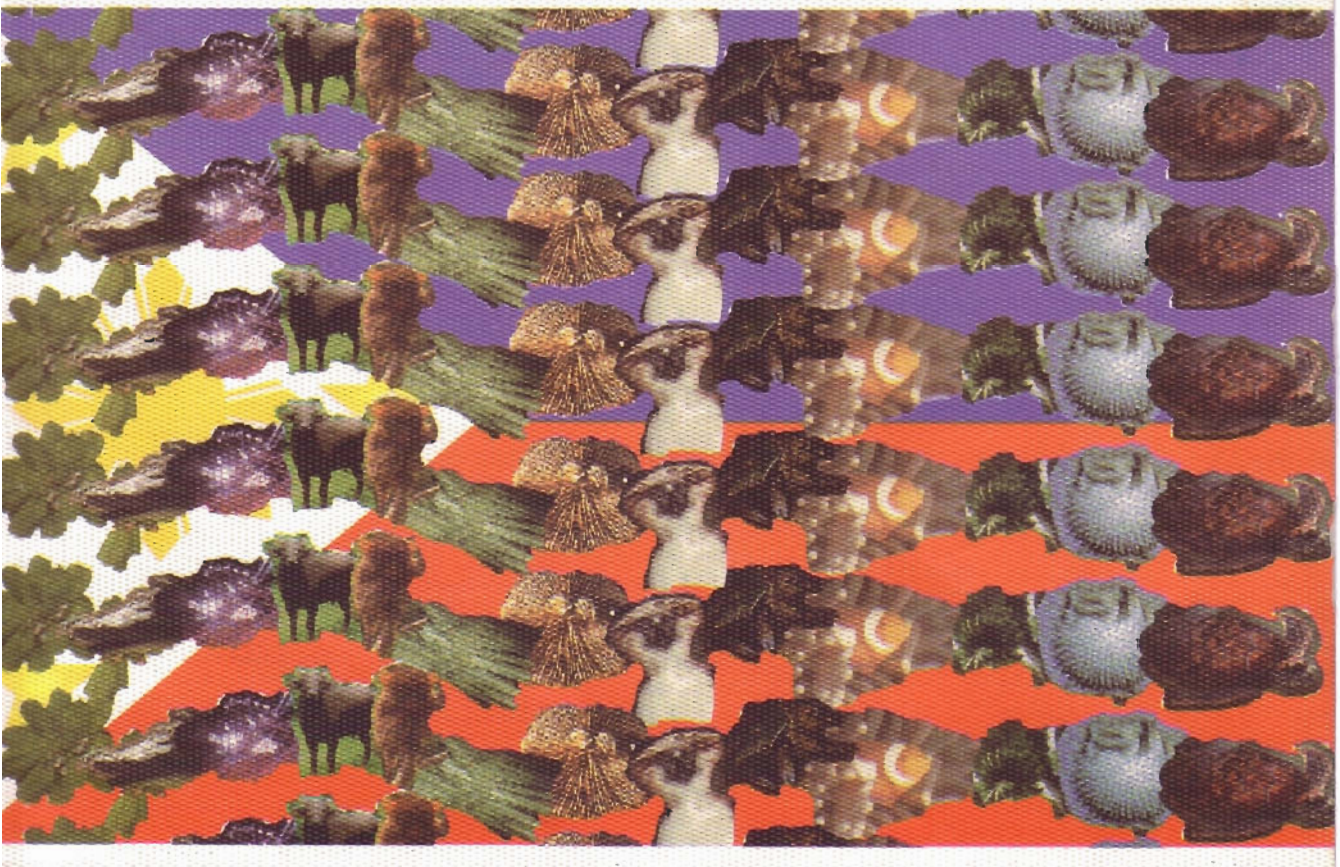
# Implementing the Convention on Biological Diversity in the Philippines

*The First Philippine National Report to the Convention on Biological Diversity*



Protected Areas and Wildlife Bureau
Department of Environment and Natural Resources
*May 1998*

# Implementing the Convention on Biological Diversity in the Philippines

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**Protected Areas and Wildlife Bureau**
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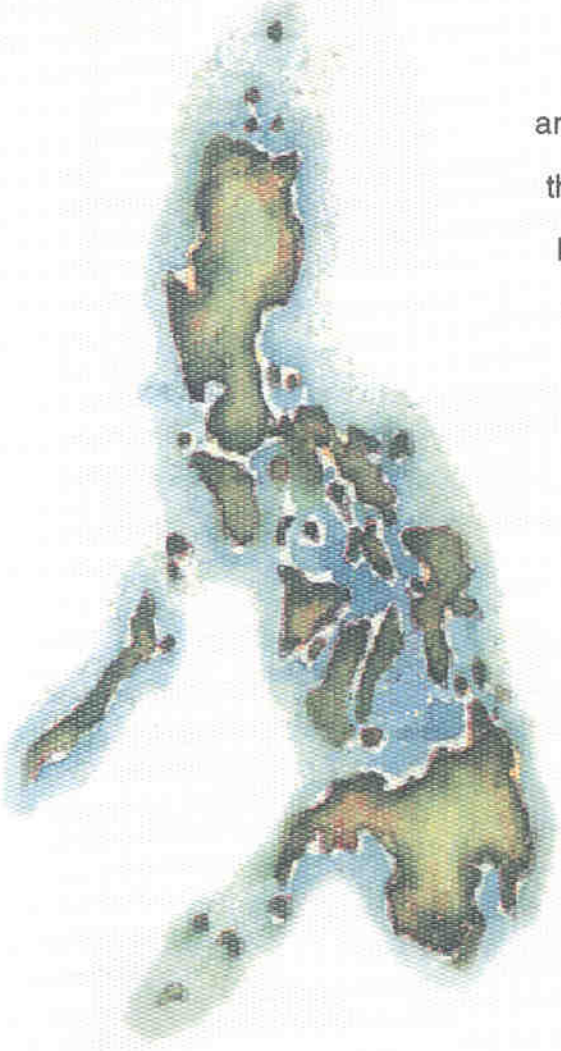
This booklet is a condensed version of a full report submitted to the Fourth Conference of the Parties (COP4) of the Convention on Biological Diversity (CBD) held in Bratislava last 4-5 May 1998. The preparation of this Report is in compliance to Article 26 of the CBD as agreed upon during COP3 held in Buenos Aires in November 1996.

Aimed primarily at disseminating information on the First National Report, this booklet presents a short profile of the country's biological resources, as well as a summary of the National Biodiversity Strategy and Action Plan (NBSAP). It also reports on the measures implemented to conserve biodiversity for the period 1992-1998, including the capacity to implement these measures in terms of reserch, training, public education and awareness and information exchange. It attempts to describe the level of support in terms of financial resources earmarked for biodiversity (and biodiversity-related) management activities in the country and spells out future directions for biodiversity conservation in the Philippines.

# The Philippines



The Philippines is a tropical archipelago of 7,100 islands located off the southeastern coast of mainland Asia. Its land area is approximately 299,404 square km. while its territorial waters cover around 2,200,000 square km. About 90 percent of the territorial waters (the extent of the Philippine economic zone) are oceanic. Being an archipelago, its coastal zone is unusually extensive covering 11,000 square km of land and 267,000 square km of coastal waters.

## Biodiversity:

### *Philippines' Natural Riches*

Philippine landscapes and waterscapes are characterized by a complex mix of ecosystem and habitat types. Many of the islands comprising the archipelago are believed to have a very high degree of plant and animal endemism, meaning these species occur nowhere else in the world.

# Consider these:

photo by: George Tapan

*Rhizophora sp.*

**In Philippine forests**, *at least 13,500 plant species are found representing five percent of the world's flora. The ferns, fern allies, gymnosperms and angiosperms constitute 22.5 percent of the Malesian and 3.88 of the world's vascular flora. Twenty-five genera of plants are endemic. About 5-8 percent of the country's flora is believed to be still unidentified.*

*Impatiens*

**45%** *of the 1,085 species of* **terrestrial vertebrates** *found in Philippine forests are endemic. Of these, 179 species are mammals, 558 species are birds, 252 species are reptiles, and 96 species are amphibians. About 67 percent of the species among the major groups of animals and plants occur nowhere else in the world.*

*Falco tinnunculus*

*The level of endemism of invertebrates is generally poorly known but is suspected to be high.*

**Philippine wetlands** *harbor a rich variety of plant and animal life estimated at 1,616 species of flora and 3,308 species of fauna.*

**Coastal and marine habitats** *are home to at least 4,951 species of marine plants and animals. Coral reefs are by far the most diverse or species-rich with 3,967 species. Seagrass beds follow with 481 species and then mangroves with 370 species. The 381 coral species and 1,030 fish species recorded in Philippine coral reefs rank the country second to the Great Barrier Reef in coral and coral reef diversity. Further, the 16 taxa of seagrasses recorded in the Philippines has firmly placed the country second highest in terms of seagrass species richness in the world.*

*Chelonia mydas*

**Diversity** *in* **agriculture** *is shown by a total of 1,210 species of plants used for their food, feed, medicine, or ornamental values. As of December 1994, the National Plant Germplasm Resources Laboratory maintains a total of 32,446 accessions 0f 396 species, while the Philippine Rice Research Institute as of 1992 maintains 12 species of wild rice.*

This impressive record of species diversity and endemism however does not reflect the extent of loss that has occurred in the past decades in the different ecosystems in the country. Depending on when the inventory was conducted, the current species diversity may reflect either the current level, a remnant of much richer diversity in the past, or that more species remain unexplored . Whichever the situation is, it is now a race against time to understand this natural heritage and the processes affecting it before the situation reaches a no-turning point.

The Philippines has manifested its commitment to protect and conserve its biological resources through major initiatives that address the main causes of biodiversity loss in the country. These causes are classified into four broad categories, namely: habitat destruction and loss, overexploitation, chemical or environmental pollution, and biological pollution.

The sections that follow discuss these initiatives.

# The National Strategy for Biodiversity Conservation

## *Beginnings*

As mandated by Executive Order No. 192, the Department of Environment and Natural Resources (DENR) formulated the Philippine Strategy for Sustainable Development (PSSD). In 1989, the PSSD was endorsed by then President Corazon Aquino and was subsequently approved by the Cabinet as the basic response to the global call for a well-balanced development. It aims to achieve economic growth without depleting the stock of natural resources and degrading the quality of the environment.

The conservation of biodiversity is among the ten major strategies of the PSSD. This was a major consideration when the Philippines signed the Convention on Biological Diversity (CBD) at the Earth Summit in Rio de Janeiro in 1992. That same year, the new President Fidel V. Ramos created the Philippine Council for Sustainable Development (PCSD) with a Sub-Committee on Biodiversity chaired by the Protected Areas and Wildlife Bureau (PAWB).

In 1994, the Sub-Committee started formulating the Philippine Strategy for the Conservation of Biological Diversity (PSBDC). This was approved by the President and became the basis for the preparation in 1995 of the United Nations Environment Programme or UNEP-assisted Biodiversity Country Study. The Project also included the refinement of the PSBDC into a National Biodiversity Strategy and Action Plan for the Philippines (Philippine NBSAP).

Completed in 1996, the NBSAP was submitted to the PCSD for approval and endorsement to the President who later approved it in June 1997. The NBSAP was the result of the pooled expertise of multi-disciplinary groups as well as multi-sectoral consultative forums. UNEP's Ten Guiding Principles for Biodiversity Planning guided the process prescribing an adaptive, cyclical and participatory undertaking. PAWB handled overall coordination. The defined goals of the NBSAP , consistent with those of the CBD, are the following:

*a) Conservation of diversity through improved knowledge and management systems; research and development; information; and institutional support;*

*b) Sustainable use of biodiversity;*

*c) Equitable sharing of the benefits of biodiversity.*

Among its specific objectives are the collaborative application of conservation strategies and management approaches; policies for the conservation, sustainable use and equitable sharing of biodiversity; the practice of conservation ethics; integration of biodiversity conservation in development planning; multi-sectoral participation in planning; and fulfillment of the country's commitments to international agreements on biodiversity.

# Strategies and Actions

The NBSAP is anchored on the symbiotic relationship between man and biodiversity and the need to keep both in equilibrium so as to achieve sustainability. How can the above objectives be attained?

First by expanding and improving knowledge on the extent, characteristics, uses and value of biodiversity through the following thrusts:

- *increasing knowledge on species and ecosystems*
- *providing estimates on the current uses and values of biodiversity*
- *establishing a hedge for the future*

Among the programs intended to increase knowledge are the following:

- *biodiversity inventory to fill in gaps and create baseline information;*
- *ecosystem mapping and data validation to establish the distribution of biological resources in the country;*

- *socio-economic studies to establish indigenous knowledge systems and valuation of biological resources.*

**Second** by enhancing existing and planned biodiversity conservation efforts and identifying potential ones, consolidating research and development and setting up networks of conservation centers.

The two programs that shall implement these strategies are the following:

- *rehabilitation of degraded habitats and ecosystems,*
- *setting up of botanical gardens, wildlife rescue centers and gene banks.*

**Third** by formulating policies and laws on biodiversity conservation with emphasis on sustainable use and equitable sharing of benefits.

The specific policy priorities are on the codification of biodiversity laws, proper assignment of values to natural resources and delineation of ancestral domains.

**Fourth** by further integrating biodiversity conservation in all levels of government and non-government planning as well as strengthening of human resources capability for biodiversity conservation through:

- *institutional capacity building via the establishment of a Philippine Biodiversity Center;*
- *creation of a committee for marine biodiversity conservation;*
- *expansion of the membership of the PCSD Sub-committee on Biodiversity;*
- *under human resource development, capacity-building for stakeholders and decision-makers.*

**Fifth** by mobilizing an integrated Information, Education and Communications (IEC) system for biodiversity by:

- *increasing access to information and databases;*
- *institutionalizing community-based biodiversity education and research;*
- *harnessing of media support;*
- *promoting advocacy for biodiversity conservation.*

To put these on the ground, there are programs on information for local communities, community-based education and research, value-added products and livelihood development.

**Sixth** by advocating stronger international cooperation on biodiversity conservation through:

- *fulfillment of Philippine commitments to international agreements and the related creation of oversight institutions ;*
- *strengthening of NGO linkages with international counterparts;*
- *establishment of the ASEAN Regional Center for Biodiversity Conservation;*
- *establishment of a pool of Filipino experts on biodiversity.*

*"The NBSAP is anchored on the symbiotic relationship between man and biodiversity and the need to keep both in equilibrium so as to achieve sustainability."*

# Conservation Measures Implemented

*(1992-1998)*

The signing of the CBD by the Philippines in 1992 ushered the increased attention given to the importance of biodiversity conservation in the country. These are manifested in many forms, from policies and strategies to action projects as guided by provisions in the CBD.

### *Identification and Monitoring of Resources (Article 7)*

The basic requirement for the formulation of a sound biodiversity conservation strategy is to have a good knowledge base of the resource and their components. This means adequate scientific characterization of the main units of variations like genes, species, ecosystems, and the quantification of variations within and between them.

photo by: George Tapan

*Drynaria quercifolia*

### *Identification*

The Philippine Biodiversity Country Study (PBCS) identified several classifications of Philippine ecosystems and habitats, and of species and communities. Delineated based on plant, animal and geological composition of geographical areas, these classifications are the following:

1. *15 biogeographic zones;*
2. *biodiversity-rich ecosystems such as dipterocarp, mangrove, and mossy forests; coral reefs;*
3. *18 sites as centers of plant diversity;*
4. *6 major islands as centers of animal diversity.*
5. *2 marine biodiversity zones*

A number of species of migratory waders from neighboring countries are known to winter in the coasts of the Philippines. The two most important sites identified for these migratory waders are Manila Bay and Olango Island. Other important sites relevant to biodiversity conservation are protected areas for agriculture, research sites, sites of cultural importance and areas of high endemism.

### *Monitoring*

Monitoring is closely linked with inventory. The repeated measurement of biological entities or processes over a time series is essential in providing feedback on adaptive management programs. To date, biodiversity monitoring efforts are few, fragmented and in need of a system. Some of these efforts are components of survey/inventory activities, while others are components of research.

An initiative to standardize/ systematize a monitoring system for all protected areas is currently being implemented in the three protected areas, namely: Subic-Bataan, Northern Sierra Madre and Mount Kitanglad Natural Park.

### *Initiatives to maintain and organize data*

There are efforts by various government agencies, non-government organizations and other institutions to identify and inventory the flora and fauna species in the Philippines. Some of these take the form of survey and assessment activities of habitats in protected areas, or research and inventory activities tied-up with the publication of various books on Philippine plants, animals and wildlife.

It can be noted, however, that little progress has been made in database systems that will ensure broad transferability of data and interpretation of research results. Initiatives to maintain and organize available data are currently being undertaken by a few government agencies, non-government organizations and institutions. Initiatives worthy to note include ICLARM's Fishbase and Reefbase, PNM's Biodiversity Information Center, DA-BFAR's Philfis and PAWB's Web Site.

### *In-Situ Conservation Measures (Articles 8,10, and 11)*

The centerpiece response of the Philippine government to protect and conserve its biodiversity resources is the establishment of an Integrated Protected Areas System (IPAS). Protected Areas (PAs) are among the most important on-site (in-situ) tools for conserving biodiversity. They are considered the most cost-effective means for preserving genes, species and habitat, and for maintaining various ecological processes that are important to humanity.

*"To date, biodiversity monitoring efforts are few, fragmented and in need of a system."*

PAWB, by virtue of Executive Order 192, is mandated to consolidate all government efforts in the conservation of natural biological resources through the establishment of a network of protected areas.

### *The Integrated Protected Areas System*

The Integrated Protected Area System (IPAS) was initiated to protect and preserve all the representative ecosystems and habitat types, as well as the species of plants and animals found in those ecosystems.

The project was able to identify potential Protected Areas which were classified as terrestrial, wetland, and marine, indicating level of priorities for each site.

*Chelonia mydas*

Also identified were the ten priority protected area sites which were selected based on a set of criteria including:

- *ecosystem type considerations, i.e. all types of ecosystems must be represented;*
- *conservation values, i.e. endemism, biodiversity, endangered species,remaining pristine habitats, size, uniqueness, and scenic values*
- *legal, security and financing factors.*

The ten priority sites selected were: Subic-Bataan, Northern Sierra Madre, Apo Reef, Mount Canlaon, Mount Kitanglad, Turtle Island , Mount Apo National Parks, Batanes and Siargao Landscapes/Seascapes and Agusan Marsh Wildlife Sanctuary.

### *The NIPAS Law*

On June 1, 1992, Republic Act No. 7586, otherwise known as the National Integrated Protected Areas System (NIPAS) Law was enacted. The Law provides for the establishment and management of a comprehensive system encompassing remarkably outstanding areas and biologically important public lands that are habitats of various species of plants and animals. Considered ambitious, the establishment of the System is one distinct strategy for biodiversity conservation and sustainable development. PAWB is mandated to implement the said law.

The NIPAS Law provides answers to the serious problems confronting biodiversity conservation by introducing many innovative policies or directions upon which the government can work hand in hand with the public, non-government organizations, local government units, indigenous cultural communities and simple migrants. Among the Law's special features are the following:

- *the designation of buffer zones as an added layer of protection to stabilize protected area boundaries.*

After the promulgation and issuance of implementing rules and regulations for buffer zones, PAWB developed specific guidelines as a government policy document. These guidelines intend to incorporate buffer zones as part of the protected area planning and management strategy.

Also completed was a Technical Assistance (TA) for Biodiversity Conservation and Buffer Zone Establishment which pilot tested the buffer zone policy in two sites - Mount Iglit-Baco and Bicol National Parks. The TA has come up with major policy documents in the form of guidelines for further consideration by the DENR. These are on the:

a) *establishment and management of protected area buffer zones;*
b) *recognition of the rights and ancestral domains of indigenous peoples with respect to protected areas;*
c) *recognition of the tenured migrants in protected areas.*

- *the recognition of ancestral rights and inclusion of community sustainability along with the concern for the development of the socio-economic and political fibers of the communities that directly use the resources.*

The habitat management approach highlights the involvement of people in the management of protected areas especially of indigenous cultural communities (ICCs) and tenured migrant communities.

Recognition was further strengthened by the Philippine Congress' enactment of the Indigenous People's Rights Act (IPRA) in 1997. IPRA recognizes, respects and protects the rights of Indigenous Peoples (IP) to preserve and develop their cultures, traditions and institutions. The rights protected include the right to claim ancestral domains covering not only the physical environment, but also the spiritual and cultural bonds associated with it. In return, IPs are charged with the responsibility of maintaining ecological balance and restoring damaged areas.

- *the development of a standard planning process for site-specific management plans.*

A General Management Planning Strategy will be used in all areas that comprise the system.

- *the establishment of the Integrated Protected Areas Fund (IPAF), a trust fund for promoting the sustained financing of the System.*

The fund may receive revenues generated within protected areas, donor support and other funds as

"The habitat management approach highlights the involvement of people in the management of protected areas especially of indigenous cultural communities (ICCs) and tenured migrant communities."

provided by law, and disburse the same to finance projects of the NIPAS.

- *the adoption of a decentralized system of protected area management.*

The management of a protected area rests with the Protected Area Management Board (PAMB), a multi-sectoral body consisting of representatives from the local government units, national government agencies, NGOs and ICCs.

As of February 1998, twenty-six Protected Areas covering a total area of 1,442,740 hectares have been proclaimed under the NIPAS category. Various conservation and rehabilitation programs are implemented in these sites. Further, some regional offices of the DENR have identified twenty-five old-growth / mossy forests and proposed their inclusion into the system.

To date, there are two major in-situ conservation programs being implemented. One is the Conservation of Priority Protected Areas (CPPAP) funded by the Global Environment Facility of the World Bank which is pilot-testing the NIPAS Law in the ten priority sites identified in IPAS I. The other is the National Integrated Protected Areas Project (NIPAP) funded by the European Union which approximates the design of the CPPAP but differs in project management strategies.

*Other Habitat/Ecosystem Protection, Rehabilitation and Restoration Efforts*

There are other in-situ conservation efforts which are not within protected areas. The goals and objectives of these programs/projects are directed towards sound resource management, as well as protection of ecosystems, habitats and maintenance of species. Examples are the Master Plan for Forestry Development, Coastal Environment Programme, Fisheries Management and Development Plan, Conservation of Wetland Ecosystems, Basin Approach to Lake Management, Samar Island Biodiversity Project, and the Strategic Environment Plan for Palawan.

The Calauit Island Wildlife Sanctuary in Palawan is one unique effort in the country that serves as an outdoor refuge of many exotic and endemic wildlife species in danger of extinction. At the same time, these animals live harmoniously with African wildlife species like giraffe, zebra, impala, bushbuck, gazelle, waterbuck and eland.

On rehabilitation and restoration, the Forest Management Bureau (FMB) reported an average reforestation rate of about 64,000 hectares per year

from 1986 to 1996, and an area of 46,604 hectares for 1997. Generally, the government accounts for a greater percentage of the reforestation efforts. However, in 1993, about 67% of reforestation was done by the private sector, mainly by timber licensees (NBSAP, 1997).

The first project in the Philippines that focused on fisheries resources management and rehabilitation is the Fisheries Sector Program of the Department of Agriculture. This project which was funded by ADB and OECF of Japan introduced a new regime of sustainable fisheries management through a package of policy and institutional reforms and strategic interventions aimed at rationalizing the utilization of fisheries resources.

*Regulations on activities adverse to biodiversity conservation*

Aside from the NIPAS Law, there are landmark legislations and regulations intended to curb activities that are adverse to biodiversity conservation in the Philippines. The Philippine Environmental Impact Assessment (EIA) System was institutionalized as early as 1978 through Presidential Decree No. 1151 also known as The Philippine Environment Policy of 1978. Since then, the DENR has instituted several refinements to the System which through the years has strengthened its implementation.

Another major issuance that regulate activities harmful to biodiversity include the Fisheries Code of 1998 which reinforces the EIA System and empowers the Department of Agriculture to regulate the introduction of foreign aquatic species for scientific/research purposes.

There are also several DENR issuances regulating wildlife trade, such as those setting the allowable quota for certain wildlife species,

*Cervus alfredi*

photo: George Tapan

*Macaca fascicularis*

establishing the policy and guidelines on this allocation scheme including the gradual phase out of the collection and exportation of fauna from the wild as well as the inclusion of the ECC (Environmental Compliance Certificate) into all applications by wildlife collectors and breeders.

Other efforts to regulate activities adverse to biodiversity conservation are related to commitments to international agreements such as the RAMSAR Convention, the Convention on International Trade in Endangered Species of Wild Flora (CITES), the ASEAN Declaration on the Environment, the Bonn Convention, and the 1992 Convention on Biological Diversity.

### *Ex-Situ Conservation Measures (Article 9)*

To complement in-situ conservation efforts, there are programs and projects aimed at conserving species out of its original habitat. Most of the initiatives currently employed in ex-situ conservation are the establishment of botanical gardens, gene banks, seed banks, zoological gardens, and wildlife sanctuaries.

The DENR has also established three Wildlife Rescue Centers, namely: PAWB-Wildlife Rescue Center at Ninoy Aquino Parks and Wildlife Nature Center in Quezon City; CFI Wildlife Rescue Center in Palawan; and Center for Philippine Raptors in Laguna. Three private establishments are designated by the DENR as rescue centers for various kinds of wildlife, namely: Octagon Farm in Iloilo, Emerald Farm in Albay, and La Union Botanical Gardens in La Union. BFAR Tanay Freshwater Experimental Station has its own rescue centers: one for freshwater species and another for brackish water/marine species.

Efforts to save several Philippine endangered species from extinction outside of their natural habitats have been recently launched by the government and proven to be successful. Some endangered Philippine species in captivity are the Philippine Eagle ( *Pithecophaga jefferyi*); Philippine Crocodile (*Crocodylus mindorensis*) and (*Crocodylus porosus*); Visayan spotted deer ( *Cervus alfredi* ); Visayan warty

pig ( *Sus cebifrons* ); Long-Tailed Macaque ( *Macaca fascicularis* ); Philippine cockatoo ( *Cacatua haematuropygia* ); Philippine Tamaraw ( *Bubalus mindorensis* ); and the Pangoline (*Manis javanica*) .

There are a number of issuances with their attendant rules and regulations relative to ex-situ conservation. Most of these regulations are in compliance with international agreements to which the Philippines is a signatory. Foremost of this is Executive Order No. 247 which regulates the prospecting of biological and genetic resources. Several Administrative Orders were also issued by the DENR to define policies and processes on providing incentives for wildlife breeding industries, to provide guidelines on the accreditation of zoos and wildlife facilities of private collectors, and to create an Inter-Agency Committee to evaluate wildlife export permit applications and allocate quota.

### *Impact Assessment and Minimizing Adverse Impacts (Article 14)*

Presidential Decree 1151 issued in 1978 mandated the conduct of Environmental Impact Assessment (EIA) System for all projects affecting the quality of the environment. The process and mechanism for its administration has been laid out in a subsequent order issued also known as Presidential Decree 1586. This law specifies the scope of the system and categorizes projects that are environmentally critical including national parks, wildlife habitats, ancestral domains, prime agricultural lands, aquifer recharge areas, mangroves and coral reefs. Since 1978, the EIA system has been strengthened with several subsequent policies that enhanced its implementation. Some of which are as follows:

1. *Setting up of the Environmental Guarantee Fund for damages, rehabilitation and restoration measures as well as regular multi-partite monitoring;*
2. *Consultations with stakeholders to determine social acceptability;*
3. *Multi-partite monitoring;*
5. *Livelihood assistance to affected communities;*
6. *Independent review of projects by an EIA Review Committee composed of experts and professionals;*
7. *Formulation of the Environmental Management Plan and Environmental Risk Assessment.*

One other national law that strengthens impact assessment in the country is the newly enacted Philippine Fisheries Code of 1998 (Republic Act No. 8550). This Law requires all government agencies, as

well as private firms and entities who intend to undertake activities or projects which will affect the habitats of the rare, threatened and endangered aquatic species, to prepare a detailed Environmental Impact Statement (EIS) that shall be submitted to the DENR for review and evaluation. It prohibits the capture of these species including the taking of their eggs/offsprings from Philippine waters. It also prohibits the introduction of foreign aquatic species in the Philippine waters (in-land and marine) without a sound ecological, biological and environmental justification based on scientific studies.

### *Technical and Scientific Cooperation (Article 18)*

Some of the biodiversity conservation projects of the DENR are being implemented in cooperation with partners from academic and research institutions; zoological and botanical gardens; and non-government organizations, both local and international.

In July 1997, the Philippines, in behalf of the Association of Southeast Asian Nations (ASEAN) and the European Union (EU), signed an Agreement for the establishment of the ASEAN Regional Center for Biodiversity Conservation (ARCBC) in the Philippines. The Center hopes to develop institutional linkages among ASEAN member countries and EU partner organizations to improve regional cooperation on biodiversity conservation. The Center will assist member countries in developing and enhancing technical and institutional approaches for managing biodiversity conservation. The ARCBC has four major components: network and institution building, training, research, and database establishment and information dissemination. The Center will be administered by the DENR through PAWB.

### *Clearing house mechanism*

PAWB is also the National Focal Point for the Clearing House Mechanism (CHM) for the Convention on Biological Diversity in the Philippines currently being designed under a grant from the Global Environment Facility (GEF) of the UNDP. Expected to be in place by June 1998, the CHM will be structured in accordance with the Articles of the CBD and will contain information on the following:

1. *Country Profile*
2. *NBSAP*
3. *National legislation and policies on or related to biodiversity*
4. *International Agreements*
5. *Scientific information on the components of biodiversity,*

*technological information, research results*

6. *Services and help desk.*

A National Biodiversity Center is also being established in PAWB, with funding assistance from the International Union for the Conservation of Nature and Resources (IUCN). This center will also serve as the National Biodiversity Reference Unit (NBRU) which will be linked to the ARCBC.

### *Implementing National Access and Benefit-Sharing Regimes in Relation to Article 15, 16 & 19*

In the negotiations of the Convention and in subsequent meetings of the Conference of the Parties, considerable attention has been given on issues related to access to genetic resources and sharing of benefits, as well as on promoting and facilitating access to, and transfer and development of technology.

Article 15 called for governments to take legislative, administrative or policy measures to facilitate access to genetic resources. The Philippines was one of the first countries to respond to this call through Executive Order No. 247 (EO 247) issued in 1995 entitled "Prescribing Guidelines and Establishing a Regulatory Framework for the Prospecting of Biological and Genetic Resources, Their By-Products and Derivatives for Scientific and Commercial Purposes and For Other Purposes." A year later, the DENR through Department Administrative Order No.96-20 issued its corresponding implementing rules and regulations. EO 247 provided, among others, a framework for regulating prospecting activities by requiring prior informed consent from the government, Protected Area Management Boards, local and indigenous communities, and private landowners. It also provided minimum terms for academic and commercial research agreements, benefit-sharing and an institutional structure that serves as a competent authority for regulating access.

Three years after the issuance of E.O. 247, the Philippines has yet to approve its first Academic Research Agreement and Commercial Research Agreement. Several issues and problems have emerged during implementation, but efforts are

underway to make it more effective and more responsive so that the access procedures are simplified and benefits derived from the use of biological and genetic resources are maximized and shared with a great majority of the Filipinos.

Measures to regulate access are considered a primary means to promote benefit-sharing. Under E.O. 247, these benefits range from monetary to non-monetary benefits, whether short, medium or long-term, and are subject to mutually agreed terms. The transfer and development of technology, including biotechnology, are important components of these benefits.

Biotechnology is considered as one of the administration's banner programs under Philippines 2000, the Science and Technology Agenda for National Development or STAND 2000, and the national effort to address problems concerning industry, environment, agriculture, food security and health.

The Philippines has identified the need for capacity building in biotechnology (both in human resources and infrastructure development), public education and advocacy, and research and development. These can be addressed by facilitating access to and transfer and development of these technologies from developed to developing countries, the provider of raw materials. In the application of these technologies, however, the Philippines maintains the necessity for safe transfer, handling and use of genetically modified organisms. To this end, it has formulated its own Biosafety Guidelines, currently under revision to ensure that the safeguards are adequately in place.

*"...the Philippines maintains the necessity for safe transfer, handling and use of genetically modified organisms. To this end, it has formulated its own Biosafety Guidelines, currently under revision to ensure that the safeguards are adequately in place."*

## *Improving National Capacity for Biodiversity Conservation/Management* (Article 12,13, and 17)

The success in conserving biological resources is highly dependent on the institutional and individual capacity for implementing identified programs and projects.

### *Human Capacity*

A typical biodiversity management program involves a wide range of fields and training. It cuts across basic and applied sciences, policymaking and administration, to community organization and extension. Human resource development for biodiversity management can be attained through academic preparations or through specialized training programs.

### *Formal Courses*

In the Philippines, formal courses relevant to biodiversity conservation are still limited to a few schools. However, there is a growing trend towards an increase in courses and number of institutions offering them.

New courses being offered include B.S. Molecular Biology and Biotechnology, B.S. Environmental Planning , Environmental Science/ Studies (BS, MS and PHD),

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Environmental Education (MS, Ph.D), and M.S. Environmental Management. About 66 schools offer the traditional B.S. Biology course which is usually (but not necessarily) the jump-off course to more specialized fields like taxonomy, genetics, pharmacology, microbiology, agronomy, entomology, crop science, and plant breeding, among others.

### *Non-Formal Courses*

Non-formal technical courses on specific concerns offer opportunities for human development in biodiversity conservation. Although the ideal is to have formal training, in most cases technical training courses are useful especially for retooling existing staff who will be assigned new duties related to resource management.

There are numerous opportunities for training in this field, most of them are being conducted in relation to on-going projects of institutions. However, there is no mechanism in place to keep track of these training courses that would have been useful in determining capacity enhancement in the field of biodiversity conservation.

*"A major national policy for biodiversity research in general has yet to be formulated to integrate the fragmented research efforts being done by public and private institutions undertaking research in the natural resources sector."*

In the case of PAWB, most training courses conducted are on areas supportive of their thrusts and programmed activities. The courses cover a wide range of topics including implementation of commitments to CITES, community organizing, Biodiversity Conservation and NIPAS, cave management, workshop on buffer zones, and orientation workshops for new projects. With the enactment of the NIPAS Law, it has become imperative to train park managers to respond to new job demands brought about by this new Law. One response to this was the conduct of a Biodiversity Conservation Training for Managers and Technical Staff of Protected Areas.

### *Research*

National policies with respect to biological diversity research are largely embodied or assumed under general conservation policies. In EO 192, the law which reorganized the DENR, it is simply stated that the Environmental Research and Development Bureau was created primarily to "formulate and recommend an integrated research program relating to Philippine ecosystems and natural resources.... as a holistic and interdisciplinary field of inquiry".

*Researchers at SBMA*

The first clear-cut national policy on biodiversity research in the Philippines is EO 247. However, it covers only biotechnology and bioprospecting and not the whole spectrum covered by biodiversity research. A major national policy for biodiversity research in general has yet to be formulated to integrate the fragmented research efforts being done by public and private institutions undertaking research in the natural resources sector.

### *Key Players in Biodiversity Research in the Philippines*

a) *Government*

In the Philippines, the DENR is the national agency charged with the management of the country's natural

resources. Pursuant to EO 192, three Bureaus under the DENR are directly concerned with biodiversity research, namely: the Protected Areas and Wildlife Bureau (PAWB); the Forest Management Bureau (FMB); and the Ecosystems Research and Development Bureau (ERDB). Among these, the ERDB is the primary agency under the DENR which is tasked with biodiversity research.

Under the Department of Science and Technology (DOST), there are three agencies with mandates relevant to biodiversity research. These are the Philippine Council for Agriculture and Forestry Research and Development (PCARRD), the Philippine Council for Marine and Aquatic Resources (PCAMRD) and the Science and Technology Coordinating Council (STCC).

*Otus megalotis*

PCARRD is in charge of monitoring and evaluation of researches dealing with agriculture and forestry resources. It also ensures that no duplication in these research fields occurs. The PCARRD prepared a National Biotechnology Research and Development Program which identified a package of Biodiversity proposals. The PCAMRD, on the other hand, sets the direction for Philippine fisheries and aquatic research. It monitors and evaluates researches done on aquatic resources management, coastal resources management, and on oceanography in general.

The STCC has formulated a Biotechnology Action and Implementation Plan for 1995-2000 in consultation with different interest groups. The main programs are currently focused on capability building including acquisition of technologies and human resources development, public education and advocacy, and research and development. R and D priority areas are industry, food, health, agriculture, fisheries, forestry and environment. Both PCARRD, PCAMRD and STCC's research thrusts are supportive of the goals of STAND 2000. Since STAND 2000 is oriented towards research and development of the so-called "export winners," researches along these lines

are commodity-oriented and are geared more towards utilization and production.

Another key player in the government arena on biodiversity research is the Philippine National Museum (PNM) which is tasked with the collection of Philippine National Heritage. This covers all aspects of biodiversity, including plants, mammals, insects, algae, corals , etc. The collections are preserved in the museum building, the center for research, preservation, information and training.

b) *Academic and other Research Institutions*

Some of the colleges/institutes under the University of the Philippines ( U.P.) System have on-going biodiversity-related researches. These include the Institute of Biology and the Marine Science Institute in Diliman, and the College of Forestry in Los Banos, among others. These studies, however, have weak links with each other. Other universities that have made substantial contributions to biodiversity research are the University of San Carlos in Cebu City, Silliman University in Dumaguete City, the Visayas State College for Agriculture in Baybay, Leyte and the Central Luzon State University in Nueva Ecija.

Another institution of note is the SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA), one of the eleven regional centers of the Southeast Asian Ministers of Education Organization (SEAMEO). SEARCA's research and development goal is to promote sustainable agriculture and agro-industrial development in Southeast Asia through a well-coordinated research, transfer of appropriate technologies and effective application of development methodologies and strategies.

The newly established ASEAN Regional Center for Biodiversity Conservation (ARCBC) is mandated to coordinate all initiatives and enhance the capacity of the ASEAN on biodiversity conservation. One of its planned activities is the setting of biodiversity research agenda for the

photo by: George Tapan

*Sterna sp.*

region. The ARCBC presents an opportunity at the national level for setting up a mechanism to coordinate biodiversity research.

c) *Non-Government Organizations*

The role of the NGO community in biodiversity research cannot be underestimated. Although at present, researches done by these groups are few and small in scale, it should be noted that they could be effective partners in research since they are usually located on-site. They are also one of the most important potential users of research data, being partners in biodiversity management. To date, there are only a few local NGOs with the technical capability to undertake research. The most notable are Tambuyog, Philippine Eagle Foundation, SEARICE, KKP, SIBAT, Philippine Rural Reconstruction Movement and MASIPAG.

## *Research gaps and other needs*

An initial effort to identify research gaps on biodiversity was done by the Biodiversity Country Study. This was followed in 1996 by a study conducted by a team of consultants commissioned by the Dutch government to explore the possibilities of formulating a collaborative research programme in the field of biodiversity and sustainable development. The research gaps identified include, among others: benchmark information (taxonomy, inventory), indicators to measure biodiversity, studies for both conservation and economic benefits, policy researches, habitat requirement for species maintenance, and conservation of plant genetic resources.

The study also identified other needs that have to be addressed to strengthen biodiversity research. These are human resources development, physical infrastructure, and information. On human resources development, there is a need to develop experts in taxonomy, botany, entomology, wildlife identification and inventory, species rescue, breeding and reintroduction technology, among others. On infrastructure, the need is for more facilities for research including equipment and laboratories.

It was also mentioned that there is a need to educate almost all sectors, especially the local government units on biodiversity conservation in order that they may have a better

*"At present, there is no clear institutional structure and mechanism that would rationalize agenda setting, oversee implementation and monitor biodiversity researches in the country."*

appreciation and understanding of the resource. These would entail a comprehensive information and education campaign.

At present, there is no clear institutional structure and mechanism that would rationalize agenda setting, oversee implementation and monitor biodiversity researches in the country. Given the varied concerns of biological diversity management, it is easy to see how it cuts across many different fields of concerns involving an assortment of people and institutions. Being both a multi- and inter- disciplinary concern, the challenge is to bring together these key players towards a common goal through a structure and mechanism set by stakeholders. The rationalization of research efforts would reduce, if not eliminate, duplication of efforts. This would not only effectively promote efficient use of available resources for research , but also foster cooperation.

### *Public Education and Awareness/Information Exchange*

There are already numerous activities directed towards public education and awareness on the conservation of biological diversity in the country. However, these initiatives have to be rationalized to create an overall lasting impact on the national consciousness.

Seminars, symposia, workshops, and forums on biodiversity, are mostly project-based activities thus making it difficult to strictly categorize them as just IEC or training. Nevertheless, these are important venues for promoting strategies, for exchange of ideas, sharing of experiences, and transfer of know-how on biodiversity conservation. Some activities that promote coservation of biodiversity are the following: Dalaw-Turo (Visit and Teach) Program of the PAWB, "Only in the Philippines..." Conservation Poster Series, Coastal Environmental Program's IEC Campaign, and the Protection and Awareness Campaign for the Conservation of Tubbataha Reef National Park.

### *Efforts to Use the Media in IEC*

Aside from the print media which periodically features environmentally- related articles, mostly to mark important occasions such as World Environment Day, the use of media to propagate the concepts of biodiversity conservation has not been fully tapped.

*Nectarinia sp.*

*Spizaetus philippensis*

At the local level, however, the use of radio in promoting the principles of biodiversity conservation has been extensively used. In the Coastal Environment Program, the project participants are informed and educated on coastal protection, technology tips, and resource management, including alternative livelihood through radio programs.

*Integration of Biodiversity Conservation in Educational Programs*

Education can be effective in helping people view their relationship with nature. It is a means through which society prepares its citizens to carry out its responsibilities. Education, therefore, should necessarily incorporate the concepts of sustainable development if societies are expected to speed up cultural change and value systems towards developing a new environmental and natural resources attitude.

A major effort to incorporate environment and natural resources conservation concerns in the formal and non-formal education sectors is the ADB Technical Assistance on Environmental Education. This was initiated in 1991 and was completed in 1997. In the review phase, it revealed that as early as 1991, many government and non-government organizations are doing environmental education-related activities across the country. However, these activities were neither sustainable nor cohesive, lacked directions and oftentimes, overlapping. At the formal level, many environmental concepts and issues were found to be already incorporated into the curricula at the elementary, secondary and higher education levels. However, the focus is still on understanding the environment and appreciation of its natural resources, rather than on helping students develop skills to solve environmental problems. The review also emphasized that training programs have been conducted to enhance capabilities in creating awareness but these were short in duration and far in between.

The above concerns were given attention in 1992 during the formulation of the National Environmental Education Action Plan (NEEAP) which has three objectives:

1. *to improve mass-based action towards the protection and improvement of the environment,*
2. *to improve the delivery of environmental education across sectors, and*
3. *to increase environmental manpower needed for the next century.*

Specific action programs were identified covering eight major areas such as curriculum development, training, research and development, scholarships, equipment upgrading and lending program, information, education and advocacy program and policy reforms. Biodiversity conservation is considered as a major concern that has been given attention in their priority projects and is thus included as themes for both formal and non-formal modes.

### *Modes of Information Exchange*

a) *Data Generation and Organization of Information*

Data on biodiversity are generated from various sources such as government agencies, academic and other research institutions, NGOs and even private individuals. In order for information exchange to become an important catalyst in espousing biodiversity conservation, it is imperative that these data/information first be organized systematically. This means that data/information should be available and ready for dissemination or exchanged in a form that can be understood by the user. These underscore the importance of databanking, in whatever form appropriate, electronic-based or not.

There are currently several efforts to organize information on biodiversity such as ICLARM's FishBase and ReefBase, BFAR's PHILFIS, PNM's Biodiversity Information Network, and many others.

b) *Information Exchange*

Different international information or research networks of international universities are active in the Philippines. These are important agents for information exchange, especially in sharing research results. Some are based on a tripartite cooperation between universities, government and NGO's.

With the advent of the Internet in the Philippines in 1994, the scientific community as well as the government and non-government organizations have had the benefit of computer-mediated communication. The electronic infrastructure in the country has grown to reach almost all cities with telecommunication facilities. This has benefited the sustainable development community immensely especially in terms of data exchange and communication, not to mention the easy accessibility of on-line information on the Web.

### *Support for Biodiversity Conservation Activities*

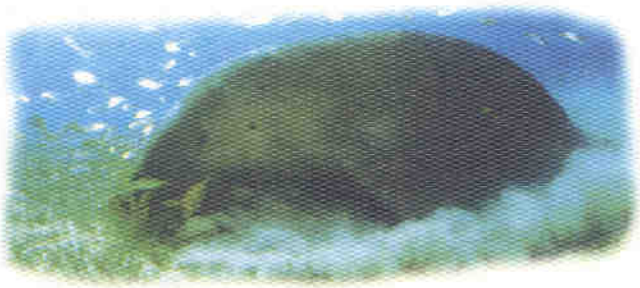
The implementation of the NIPAS Law has been given local and international support. As a result, more

programs and projects focused on the many aspects of biodiversity conservation were implemented as priority activities. The efforts of the local and international non-government organizations in ecosystems/habitat protection and conservation have significantly complemented those of the government in this undertaking.

NGO fund mechanisms have provided support to projects directly or indirectly related to biodiversity conservation, employing habitat/ ecosystem protection strategies. Innovative funding mechanisms such as the debt-for-nature swap paved the way for the participation of the local NGOs in conservation programs. The success of the program led to the establishment of a multi-million endowment fund under USAID's Natural Resources Management Program (NRMP). The local private participation, meanwhile, is present in in-situ conservation, mainly in reforestation by timber licensees and in ex-situ conservation, such as in the establishment of zoos and botanical gardens.

*Bubalus mindorensis*

More substantial support come from multi-lateral and bilateral agreements for the management of particular protected areas and for the protection of specific ecosystems or habitats such as forests, agricultural areas, coastal areas and wetlands.



*Dugong dugong*

# Postscript: *Future Directions*

*From the time the Philippines signed the Convention on Biological Diversity in Rio de Janeiro in 1992, it has consistently played a major role in providing direction to the country's biodiversity conservation policies. Its ratification and being put in force provided the impetus for the Philippine Government to implement conservation strategies such as the integration of environmental considerations, in this case the conservation of biodiversity, into its national and local sectoral plans. It has also exhorted the national leadership to formulate long-needed policies such as those on bioprospecting, biosafety, biotechnology, marine biodiversity, equitable access, indigenous knowledge, and many more.*

*Hoya sp.*

photo by: George Tapan

*The National Biodiversity Strategy and Action Plan (NBSAP) provides the blueprint for the country's biodiversity agenda, and going by it, a lot more has to be done. The NBSAP is intended to be a dynamic set of policies and strategies in the months to come, further planning consultations will be done to provide details. There is further need to define its implementation mechanisms and funding requirements. Nevertheless, the national policymakers have been made aware of the importance of biodiversity conservation, and it is now a pervading theme for consideration in sectoral policy decisions.*

*As indicated in the other parts of this report, while there seem to be various activities that individually address aspects of biodiversity conservation, an important*

*future consideration should be the integration of these various activities in order to complement the overall goals of the NBSAP. It is necessary to orchestrate the research activities on biodiversity through the formulation of an overall research agenda within the framework of the NBSAP. It is equally important to push for training programs to build and to enhance capability of individuals and institutions.*

*The tremendous tasks ahead need resources and partnerships with international and agencies and non-governmental organizations that should help the country accomplish some of these activities. One of the aspects that will be highlighted is the fostering of these alliances to mutually supplement the necessary resources. A vigorous information, education and communication program shall have to be implemented to heighten awareness of decision-makers and citizens alike on biodiversity conservation, and the goals and objectives of the NBSAP. The active participation of all sectors should be the underlying goal of biodiversity conservation and the NBSAP.*

*The country espouses the conservation and sustainable use of biodiversity in accordance with the objectives of the Convention, true to our commitment to CBD, and in order to accomplish the nation's own conservation goals and objectives. With this current review of the extent of the country's activities in biodiversity conservation, an immediate responsibility is the integration of all these efforts, and the formulation of a unified approach. The NBSAP provides the framework for such unified approach, and the task ahead is to sit down with concerned planners and stakeholders and begin working with each other.*

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A mother Monkey-eating eagle *(Pithercophaga jefferyi)* and her young baby in a natural habitat.