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The newsmagazine of the ASEAN Centre for Biodiversity

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From Linnaeus to GTI:

Will Taxonomy Survive?

Enhancing taxonomic capabilities of Southeast Asia and other Asian countries

The status of marine taxonomy in the ASEAN region

COP10 strengthens GTI

Meet the ASEAN Champions of Biodiversity finalists

Plus!
Focus
A pull-out section on featured species

ASEAN CENTRE FOR BIODIVERSITY
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The ASEAN Centre for Biodiversity

Conserving Southeast Asia's Biodiversity for Human Development and Survival

The ASEAN Centre for Biodiversity (ACB) is an intergovernmental regional centre of excellence that facilitates cooperation and coordination among the ten ASEAN Member States and with relevant national governments, regional and international organizations on the conservation and sustainable use of biological diversity, and the fair and equitable sharing of benefits arising from the use of such natural treasures.

ACB's goals are:

- To serve as an effective coordinative body to facilitate discussion and resolution of cross-country biodiversity conservation issues;
- To provide a framework and mechanism for sharing information, experiences, best practices and lessons learned for efficient access of ASEAN Member States;
- To implement a pro-active approach in monitoring and assessing biodiversity conservation status as a strategic approach towards identifying critical issues and future trends;
- To deliver/facilitate conduct of capacity-building services and technology transfer through engaging relevant and appropriate expertise;
- To enhance common understanding of biodiversity conservation issues, strengthening ASEAN regional positions in negotiations and in compliance with relevant multilateral environmental agreements;
- To promote public awareness to develop champions and enhance support at different stakeholder levels on biodiversity concerns; and
- To undertake innovative resource generation and mobilization measures to pursue high-impact activities that will enhance biodiversity conservation in the region.

ACB supports ASEAN Member States in the following thematic concerns that are of global and regional importance: Agriculture and food security, including food certification and biodiversity; Access to, and fair and equitable sharing of benefits from biological and genetic resources; Climate change and biodiversity conservation; Ecotourism and biodiversity conservation; Payment for ecosystems services and valuation of biodiversity; Wildlife enforcement; Managing invasive alien species; Peatland management and biodiversity; Support to the Global Taxonomy Initiative; Support to the Convention on Biological Diversity's (CBD) Programme of Work on Protected Areas; Managing biodiversity information and knowledge; and Business and biodiversity.

For more information, log on to www.aseanbiodiversity.org.

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Stink Bug

Photo by **Lim Xin Yi** (entry to the ASEAN-wide photo contest "Zooming in on Biodiversity")

Millions of species of plants and animals are known because of taxonomy. Millions more are waiting to be discovered and named. However, the dwindling number of taxonomists and the lack of resources for taxonomy are seriously hampering not only our chances of getting to know the world's riches, but also the conservation efforts that need taxonomic support. There is a serious need to revive interest in taxonomy.

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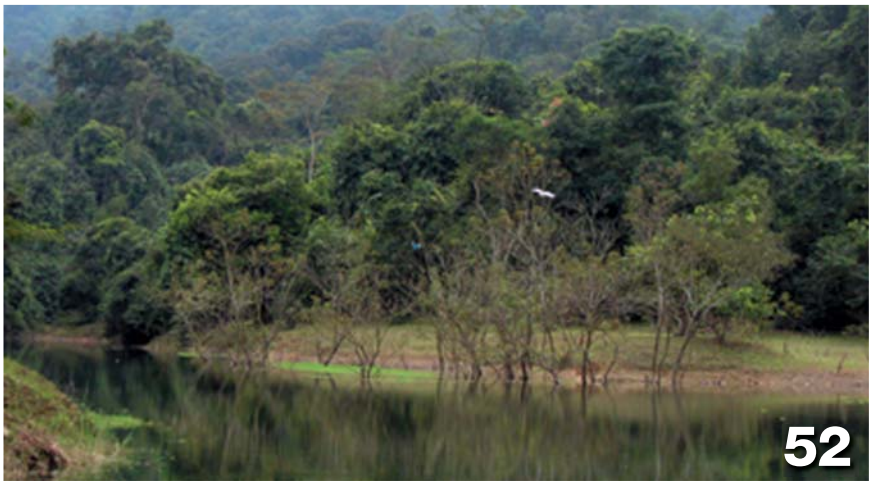

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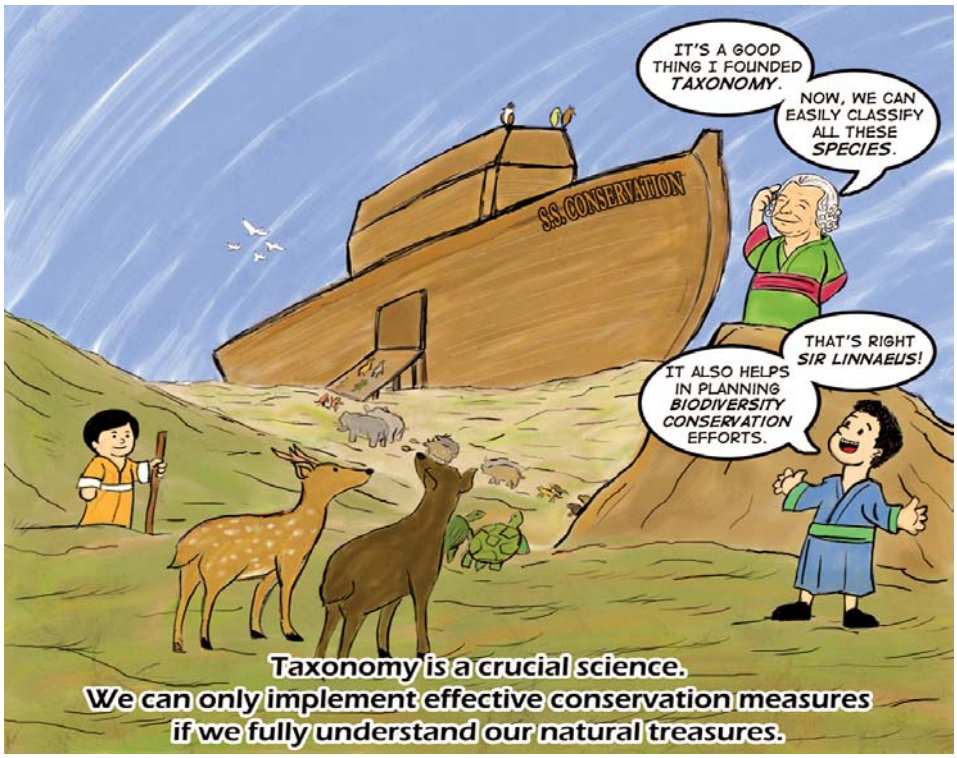

Illustration by Kevin Ray Valentino

About the Contributors

Dr. Ahmed Djoghlaf is the Executive Secretary of the Convention on Biological Diversity (CBD). Prior to his appointment to CBD, he served as United Nations Environment Programme's (UNEP) Assistant Executive Director and Director of Division of the Global Environment Facility in which he raised the profile of UNEP. He has passionately been involved within the UN system and within CBD processes.

Prof. Zulfigar Yasin is a renowned marine scientist in Malaysia. Since 1988, he has been involved in research on Malaysian seas. He led the Malaysian team to Antarctica in 2003, working with the Australian Antarctic Division. Writing from the rolling berth of the Aurora Australis, the journey was chronicled in a Malaysian national newspaper. In 2004, Prof. Zulfigar initiated and led Malaysia's largest scientific voyage – the ROSES Expedition (Research on the Seas and Islands of Malaysia) – through the Straits of Malacca and the South China Sea on board the scientific research vessel, the Allied Commander. The expedition documented and explored the biological richness of the area, recognized as a marine biological hotspot. The voyage noted many first time records of organisms on Malaysia's reefs and detailed location and the prevailing conditions of these outer reefs. To date, Prof. Yasin has received a total of 63 research grants with nine international and 15 national awards.

Dr. Aileen Tan Shau-Hwai is an Associate Professor. Her research interest in marine science especially in the field of mariculture, biodiversity and conservation has earned her vast recognition both in the national and international arenas. She was the first Malaysian who has successfully cultured oysters from eggs and sperms through artificial spawning. She has also extended her success on other invertebrates such as giant clams, sea cucumber, nudibranch, pearl oysters and mussels. She is a pioneer researcher in mariculture involving invertebrates and has won several awards for her research on mariculture and biodiversity. Dr. Aileen has published over 100 articles in various scientific journals, monographs, proceedings, conferences and seminars. She is also involved in building human capacity where she was awarded the Best Woman Scientist for her work in guiding the women-folks in Johore Islands in earning their income through the giant clam conservation program. She is currently a faculty member at the Universiti Sains Malaysia based in Penang, Malaysia.

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Dr. Filiberto A. Pollisco, Jr. specializes in forest ecology and land management/land use planning; biodiversity conservation in genetic, species and ecosystems levels; and ecotourism. He was formerly an Assistant Director/Supervising Science Research Specialist at the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) where he handled sloping land management, solid waste management, organic agriculture, soil and water conservation, and project development. He presently works at the ASEAN Centre for Biodiversity as Program Development Specialist.

Anjo Alimario is a writer and researcher at BusinessMirror, a Philippine-based broadsheet. He is a magna cum laude graduate of the University of the Philippines - Diliman's B.A. in Speech Communication program. As a researcher and writer, he covers topics such as science, learning, business, and lifestyle, among others. His passion and interest in the field of science earned him his first journalism award in the J. Burgos Biotechnology Journalism Awards, placing second in the Best Feature Story category.

Carl Linnaeus
the father of taxonomy

Carl Linnaeus, also known as Carl von Linné or Carolus Linnaeus, is often called the Father of Taxonomy and was one of the most influential scientists of his time. His system for naming, ranking and classifying organisms allowed for clear and easy descriptions of plants, animals and minerals, which is so straightforward that it is still used by scientists today. Born in 1707 in Råshult, southern Sweden, the young Linnaeus showed a keen interest in plants and flowers. By the age of eight, he was given the nickname 'the little botanist'. He studied medicine, first at the University of Lund and then at the University of Uppsala. Medicine at his time was based on herbalism so it meant he also studied plants. He then became a lecturer in Botany. During this period, Linnaeus began to outline the theory of plant sexuality, which he would later use to construct his system of plant classification.

Linnaeus' theory of classification

In the early 18th century, scientific names for species were already in Latin, but were often long and unwieldy. For example, the humble tomato was called *Solanum caule inermi herbaceo, foliis pinnatis incisis, racemis simplicibus.* Linnaeus' idea was to divide nature into groups based on shared physical characteristics. Firstly, the three kingdoms of plants, animals and minerals. Kingdoms were divided into classes and then into orders, which were divided into genera (singular: genus) and then species (singular: species). Linnaeus gave all the plants known at that time a simpler Latin name in two parts, known as a binomial. The first part was the genus, followed by the species. Using this system, the tomato became a more manageable *Solanum lycopersicum.* He gave binomial names to animals five years later and named thousands of plants and animals in his lifetime. This binomial system has since become the standard way of naming organisms.

The professor of botany

1n 1741, Linnaeus was appointed Professor of Practical Medicine at the University of Uppsala and then became Professor of Botany, Dietetics and Material Medica in 1742. Around the same time, the Swedish Parliament wanted an inventory of all the natural resources of the country which led to the publication of *Flora Suecica* and *Fauna Suecica* in 1745 and 1746.

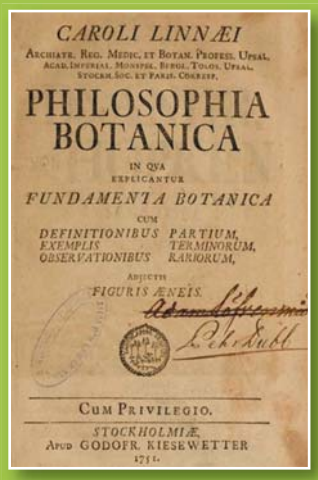
Linnaeus' main focus remained his reform of botany. In 1751, he published *Philosophia Botanica,* which dealt with the theory of botany and the laws and rules the botanist must follow in order to describe and name plants correctly. *Species Plantarum* followed in 1753, describing some 6,000 plant species which introduced a new system of naming organisms, which he extended to animals in his definitive updated *Systema Naturae* in 1758.

Achievements

Linnaeus is remembered nowadays primarily as the great biological name giver of the 18th century. The abbreviation "L." for Linnaeus appended to about 12,000 scientific names of plants and animals indicates the immensity of his achievements, for such names at their publication had to be associated with descriptive information derived from his study of specimens and earlier literature.

Linnaeus' binomial system rapidly became the standard system for naming species. Zoological and most botanical taxonomic priority begin with Linnaeus: the oldest plant names accepted as valid today are those published in *Species Plantarum,* in 1753, while the oldest animal names are those in the tenth edition of *Systema Naturae* (1758), the first edition to use the binomial system consistently throughout. Although Linnaeus was not the first to use binomials, he was the first to use them consistently, and for this reason, Latin names that naturalists used before Linnaeus are not usually considered valid under the rules of nomenclature.

Linnaeus identified ecology as a distinct area of investigation, emphasizing the interrelationships in nature as 'the economy of nature'. He was also one of the first naturalists to describe food chains. ■


CAROLI LINNÆI
PHILOSOPHIA BOTANICA
FUNDAMENTA BOTANICA
CUM PRIVILEGIO.
STOCKHOLMIÆ,
APUD GODOFR. KIESEWETTER

Philosophia Botanica

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Natural History Museum (http://www.nhm.ac.uk/nature-online/science-of-natural-history/biographies/linnaeus/index.html)

Taxonomy – what is it?

Taxonomy is the science of naming, describing and classifying organisms and includes all plants, animals and microorganisms of the world. Using morphological, behavioral, genetic and biochemical observations, taxonomists identify, describe and arrange species into classifications, including those that are new to science.

Taxonomy identifies and enumerates the components of biological diversity providing basic knowledge underpinning management and implementation of the Convention on Biological Diversity (CBD). Unfortunately, taxonomic knowledge is far from complete. In the past 250 years of research, taxonomists have named about 1.78 million species of animals, plants and micro-organisms, yet the total number of species is unknown and probably between 5 and 30 million.

Different kinds of animals, fungi and plants and microorganisms are called different 'species'. This reflects a real biological difference – a species is defined as a potentially interbreeding group of organisms that can produce viable offspring that themselves can interbreed. Thus, animals of two different species, like a horse and a zebra, cannot interbreed, while animals of the same species can.

Taxonomists provide unique names for species, labels that can help us find out more about them, and enable us to be sure that we are all talking about the same thing. Of course, there are names for organisms in many languages, but it is important, for example, when discussing the hedgehog to know whether one is talking about the small spiny insectivore *Erinaceus europaeus,* other members of the same family, cacti of the genus Echinocerus, or the orange fungus *Hydnum repandum,* all of which have the same 'common' name in English. For this reason the Latin 'scientific' name is given as a unique universal identifier.

How to Name a Species: the Taxonomic Process

Taxonomists begin by sorting specimens to separate sets they believe represent species. Once the specimens are sorted, the next job is to see whether or not they already have names. This may involve working through identification guides, reading descriptions written perhaps 200 years ago, and borrowing named specimens from museums or herbaria to compare with the sample.

Such comparison may involve external characters, need to dissect internal structures, or even molecular analysis of the

Photo courtesy of Green Community

"Taxonomy provides a basic understanding of the components of biodiversity which is necessary for effective decision making about conservation and sustainable use."

DNA. If there is no match, the specimens may represent a new species, not previously given a name. The taxonomist then has to write a description, including ways in which the new species can be distinguished from others, and make up a name for it, in a Latin format. The name and the description must then be properly published so that other taxonomists can see what has been done, and be able to identify the species themselves. From finding the specimens to the name appearing in print can take several years.

Why is taxonomy important?

Global biodiversity is being lost at an unprecedented rate as a result of human activities, and decisions must be taken now to combat this trend. But how do decision makers decide where to establish protected areas if they don't know what is being protected? How do regulators identify and combat harmful invasive species if they cannot distinguish them from native species? How can developing countries ensure that they reap the benefits of the use of their biological diversity, if they don't know the biological diversity that is being used? Taxonomy provides a basic understanding of the components of biodiversity which is necessary for effective decision making about conservation and sustainable use.

Taxonomy to combat invasive alien species

Taxonomic information is essential for agencies and border authorities to detect, manage and control Invasive Alien Species (IAS). Effective control and management measures can only be implemented when exotic species are correctly and promptly identified. Misidentifications can cost money when rapid decisions need to be taken.

Networking and sharing of experiences, information and expertise can aid in lowering the costs associated with IAS and reduce the need for eradication programs with early detection and prevention. When eradication is needed, taxonomists can offer expertise that is central to developing the most effective yet economic and environmentally benign eradication measures.

Increased capacity building, especially for developing countries, is necessary to identify, record and monitor invasions; provide current and accessible lists of potential and established IAS; identify potential threats to neighboring countries; and to access information on taxonomy, ecology, genetics and control methods. It is vital that adjacent countries, and all countries along a particular pathway for invasive species, can recognize such species and concur on their nomenclature. Baseline taxonomic information on native biota at the national level is also important to ensure that IAS can be recognized and distinguished from naturally present species. ■

Reference:

Secretariat of the Convention on Biological Diversity. 2007. Guide to the Global Taxonomy Initiative, CBD Technical Series # 27

Will Taxonomy Survive?

Photo courtesy of Green Community

By Leslie Ann Jose-Castillo

Only a fraction of the world's species have been identified owing to insufficient funding and a shortage of taxonomists, according to a Brazilian study.

Scientists Fernando Carbayo and Antonio Marques from the University of Sao Paulo, writing in the journal *Trends in Ecology and Evolution,* said only 1.4 million species have been catalogued, thus far. This leaves an estimated 5.4 million unknown to science. The duo estimated that it would take US$263 billion to catalogue the unknown species.

Apart from lack of funding, Carbayo and Marques point to the shortage of qualified taxonomists as the main stumbling block to identifying millions of unknown creatures. A taxonomist is a scientist who classifies organisms according to their physical or cellular characteristics. These scientists also try to determine the evolutionary relationships among these organisms.

Taxonomists, an endangered species

At the Second Meeting of the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD), it was realized that taxonomic information, as well as taxonomic and curatorial expertise and infrastructure, are insufficient in many parts of the world, particularly in developing countries. Such lack was anticipated to be one of the key obstacles in the implementation of the Convention.

"Taxonomists have become an endangered species. The scientific community has been talking about biodiversity loss, climate change, deforestation, desertification, and other environmental issues that confront us today. But one serious concern that is falling off from the global political, funding, academic and scientific agendas is taxonomy. The issue becomes more serious with the reality that taxonomists, like many endangered species, are not increasing in numbers," Mr. Rodrigo U. Fuen-

tes, executive director of the ASEAN Centre for Biodiversity (ACB), said.

He added that "in a number of taxonomy workshops and trainings that the Centre has co-organized, resource persons and participants from the ten ASEAN Member States, Japan, Korea, China and other countries all mention a shortage of taxonomists who can be called upon to identify species, describe species that are new to science, determine their taxonomic relationships, and make predictions about their properties."

Photo courtesy of Green Community

Taxonomists, an endangered species

With the aging taxonomic workforce and the declining number of students studying taxonomy, the shortage is expected to worsen. Adding to the problem is the fact that many trained taxonomists are under-utilized due to insufficient funds allocated to taxonomic study. Every major museum suffers from the backlog of unstudied specimens and undescribed new species, while every curator can cite the loss of students who were interested in taxonomy, but could not get sufficient fellowship support or failed to find a paying job.

In the United Kingdom, for one, it is estimated that there are only 500 taxonomists. In an interview with The Independent, Professor Geoff Boxshall, zoologist at the Natural History Museum, said "The collapse of taxonomy in the UK universities is extremely worrying, no one is training the new generation of young taxonomists needed to monitor changes in biodiversity, to deliver high-quality research, or to meet the demands of industry." He added that "our concern is that taxonomy is not taken seriously. It is not rated very highly and there is very little in the way of practical courses at universities in the UK. Skills are being lost nationally and new graduates are no longer being trained."

The state of taxonomy in the ASEAN region and in other parts of the world is similar with the UK's.

Need to revive interest in taxonomy

"Adequate taxonomy is one of the fundamental tools required for the global community to implement the Millennium Development Goals and the development targets from the World Summit for Sustainable Development. Without sufficient long-term investment in the human, infrastructural, and information resources necessary to underpin the science of taxonomy, the now well-recognized taxonomic impediment will continue to prevent implementation of sound, scientifically based sustainable, environmental management and development policies," Mr. Fuentes explained.

He added that taxonomy is a critical tool for combating the threat from invasive alien species and other concerns such as in human health. Without access to support, misidentifications are made, costing precious money and time when rapid decisions need to be made.

Parties to the CBD recognize that there is a dire need to revive interest in taxonomy. The diminishing status of this science and profession is crippling the ASEAN Member States' and other Asian countries' capacity to effectively catalogue the region's biological resources. Experts point to the fact that without knowledge and understanding of species, it would be difficult to plan and implement biodiversity conservation efforts.

Speaking at the First Latin American Congress for the Conservation of Biodiversity held in Argentina, CBD Executive Secretary Dr. Ahmed Djoghlaf underscored the key role to be played by taxonomists in achieving the targets of the 2011-2020 CBD Strategic Plan. "Taxonomy and taxonomic capacity are basic concerns for biodiversity conservation and therefore of the CBD. Knowledge of what species occur in what place is fundamental for guiding effective conservation plans and interventions. As climate change causes range shifts, new invasive species will become threatening and the boundaries of some protected areas will need to change," he said.

The Global Taxonomy Initiative

According to the global biodiversity chief, the Programme of Work for the Global Taxonomy Initiative (GTI) was developed under the Convention to guide the taxonomic research, outputs and capacity development needed for implementation of the Convention. "No country can have all the taxonomic capacity it requires – taxonomy is a global science – but for CBD implementation it is vital that each country develops appropriate capacities such that it has access — within country or otherwise — to the expertise, tools and information needed to identify and monitor biodiversity and threats to it. The Programme of Work for the GTI therefore identifies regional and global technical cooperation networks as a key mechanism for meeting national taxonomic needs," he said.

He also called on Parties to the CBD to work on making tangible progress in furthering regional cooperation by establishing a strong network of taxonomists and linking taxonomy to the process of implementing the CBD.

Collaborating to improve taxonomic capacities

In the ASEAN region, such network is being established through the project "Taxonomic Capacity Building and Governance for Conservation and Sustainable Use of Biodiversity" funded by the Government of Japan through the Japan-ASEAN Integration Fund. *(For more information on the project, go to page 16)*.

"Through the collaboration among countries, we are able to mobilize and share expertise in the field of taxonomy and ensure that taxonomic capacities will be made accessible to the ASEAN Member States. Taxonomy should be revived. The challenge now is to address shortfall in taxonomic manpower before it affects our ability to conserve, use and share the benefits of biological diversity. The challenge for all: Will taxonomy survive? What can we do to save it?" Mr. Fuentes said. ■

The Global Taxonomy Initiative

"Identification of large, charismatic animals may be easy; however, the majority of organisms are insects, plants, fungi and microorganisms, which require expert skills for correct identification. Most of them have not been categorized or given formal scientific names."

Photo courtesy of Green Community

Governments, through the Convention on Biological Diversity (CBD), have acknowledged the existence of a "taxonomic impediment" to the sound management of biodiversity. Thus, the CBD established the Global Taxonomy Initiative (GTI), which aims to remove or reduce this taxonomic impediment – in other words, the knowledge gaps in our taxonomic system (including those associated with genetic systems), the shortage of trained taxonomists and curators, and the impact these deficiencies have on our ability to conserve, use and share the benefits of our biological diversity.

Identification of large, charismatic animals may be easy; however, the majority of organisms are insects, plants, fungi and microorganisms, which require expert skills for correct identification. Most of them have not been categorized or given formal scientific names. The inability to identify (or obtain identifications of) species is a major component of the taxonomic impediment.

Simple-to-use identification guides for the non-taxonomist are rare and available for relatively few taxonomic groups and geographic areas. Taxonomic information is often in formats and languages that are not suitable or accessible in countries of origin, as specimens from developing countries are often studied in industrialized nations.

There are millions of species still undescribed and there are far too few taxonomists to do the job, especially in biodiver-

"One aspect of the GTI is to ensure that taxonomic information reaches not only taxonomists but also decision makers and other non-taxonomist users, and in a format that they can employ. "

sity-rich but economically poorer countries. Most taxonomists work in industrialized countries, which typically have less diverse biota than in more tropical developing countries. Collection institutions in industrialized countries also hold most specimens from these developing countries, as well as associated taxonomic information.

Furthermore, although there is extensive taxonomic work on groups such as birds, mammals and higher plants, little is known of their distribution, biology and genetics. It is estimated that only ten percent of vertebrates remain to be described, but greater than 50 percent of terrestrial arthropods and up to 95 percent of protozoa are undescribed. At the most conservative estimate, there are more unknown species than known ones on earth.

What needs to be done?

The GTI was created to remove or reduce the "taxonomic impediment". It was established by the Conference of the Parties (COP) to the CBD to address the lack of taxonomic information and expertise available in many parts of the world, and thereby to improve decision making in conservation, sustainable use and equitable sharing of the benefits derived from genetic resources. This is the first time in history that taxonomy has had recognition at such a high level in international policy.

The GTI was developed by governments, under the CBD, and is implemented by many actors including governments, non-government and international organizations, as well as taxonomists and the institutions where they work. Taxonomy is important for all types of ecosystems, and therefore the initiative is a cross-cutting issue applicable to all of the work under the Convention. The GTI is specifically intended to support implementation of the work programs of the Convention on its thematic and cross-cutting issues. Because the GTI is a part of the CBD, the taxonomic activities that it espouses are in support of the three aims of the Convention.

The GTI has a dual nature, encompassing both policy and implementation. Firstly, as a 'cross-cutting issue' of the CBD, it is part of an agreement that provides the legal and political backing for activities in support of its threefold objective. This is the forum through which the Parties to the CBD develop policy, as articulated in the decisions of the Conference of the Parties. This international policy can then be used to inform national policies by the COP.

Input to the COP comes from its Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), the 'Coordination Mechanism' of the GTI (an informal advisory group), and any other expert meetings or processes that may be convened. Assistance in bringing this information together, and providing other documentation to develop the process, is provided by the Executive Secretary of the CBD and the Secretariat (SCBD), which includes a GTI Programme Officer.

The other aspect of the dual nature of the GTI is that of implementation. The adoption by the COP of a particular decision does not automatically mean that the aspirations expressed within it are implemented. Countries first have to take decisions of their own as to what extent they will put in place policies to implement locally what has been decided globally. The activities outlined in the policies (e.g. the GTI Programme of Work) need to be undertaken by, among others, taxonomists themselves.

The success of the GTI depends largely on the participation of taxonomists and others, and the successful integration of taxonomic work with other Convention activities. This is a challenge. Mechanisms must be established to support implementation, and to record when and how implementation has taken place. Those implementing the GTI are by and large not engaged in policy development, and there may be very tenuous links between the implementers and the policymakers. Taxonomists and their institutions may not be aware of the policy decisions that have been made, and how these can support the work that is required.

Conversely, those tasked with reporting on the progress of the GTI (specifically GTI and CBD National Focal Points) may not be aware of what progress has been made, or, indeed, of who might be involved, since there is generally no mechanism in place to gather and synthesize this information.

The GTI is necessarily driven by user needs, those needs being identified in the context of Convention implementation. Taxonomists already produce vast amounts of basic, valuable information. However, the practices of information dissemination have not always done justice to the importance of that information. One aspect of the GTI is to ensure that taxonomic information reaches not only taxonomists but also decision makers and other non-taxonomist users, and in a format that they can employ.

In addition to effective dissemination of existing information, generation of new information is also a part of the GTI. As noted earlier, the majority of species are not yet described and named. Any taxonomic activity will at some level assist in implementation of the Convention, because better understanding of biodiversity should ultimately support better decisions about conservation and sustainable use of biodiversity.

Nevertheless, the GTI focuses somewhat on taxonomy applied in the context of the implementation of the CBD. End-users of taxonomic information, be they protected area managers, scientists combating alien species, or national governments defining access regimes for medicinal plants, have an important short-term need for good information upon which to base their decisions. In short, effective implementation of the CBD depends largely on taxonomic information. ■

Reference:

Secretariat of the Convention on Biological Diversity. 2007. Guide to the Global Taxonomy Initiative, CBD Technical Series # 27

Photo courtesy of the Government of Japan

COP10 strengthens GTI

At the Tenth Meeting of the Conference of the Parties (COP10) to the Convention on Biological Diversity (CBD) held in Nagoya, Japan in October 2010, the Parties came up with Decision X/39 further strengthening the implementation of the Global Taxonomy Initiative (GTI). The Parties recalled that the ongoing "taxonomic impediment" not only threatens the generation of new taxonomic data, but also endangers the validation of taxonomic specimens and their associated data as deposited in natural history collections and other scientific resources. They recognized the limited progress on taxonomic needs assessments at the national level and urged Parties and other Governments to conduct taxonomic needs assessments, where applicable, with particular regard to the full range of end-users and their need for taxonomic support in the implementation of all relevant articles and work programs of the CBD.

The salient points of Decision X/39:

1. Acknowledging the progress made at the global level with determining priority taxonomic needs for invasive alien species management, encourages Parties, other Governments and relevant organizations to determine priority taxonomic needs in the other thematic areas and cross-cutting issues of the Convention, taking into account the regionally specific needs in taxa and regionally determined capacity-building needs;
2. Encourages Parties and relevant organizations to make taxonomic and other necessary data and metadata from taxonomic and other relevant institutions and organizations easily accessible and their collections available in response to the information needs identified as national and regional priorities such as, inter alia, information and expertise to manage invasive alien species and endangered species;
3. Recognizing the need for better and more comprehensive data of species distribution at bioregional scale, urges Parties and invites other Governments and organizations, to better coordinate their taxonomic research in biogeographic regions, and to share and exchange, new and existing information;

4. Further urges Parties and invites other Governments and organizations to increase the knowledge base on ecological range and the condition of the species in order to better meet the user-needs in respect of bio-indication of ecological health;
5. Requests the Executive Secretary of the CBD with the assistance of the Coordination Mechanism for the GTI and in collaboration with relevant international organizations, to hold capacity-building training workshops in all sub-regions and regions as needed;
6. Urges Parties and invites other Governments to endorse GTI-related project proposals relevant to their national biodiversity strategies and action plans prepared in collaboration with national, regional and global partner organizations and networks, to facilitate the process of project funding by the Global Environment Facility and through other relevant sources of funding;
7. Urges Parties and invites other Governments to facilitate the development of capacity, in collaboration with global, regional and sub-regional networks, as needed in:
    a. The use of shareable taxonomic knowledge, and associated materials, by enhancing the management and use of in-country collections of referenced specimens, subject to the provisions of Article 15 of the Convention;
    b. Molecular techniques commonly used in taxonomy, such as DNA barcoding among others;
    c. Training courses both for the users of taxonomic information and for young professional taxonomists;
    d. Scientific collections in developing countries, particularly the least developed countries and small island developing states among them, and countries with economies in transition
8. Recognizing the importance of exchange of taxonomic voucher specimens for non-commercial biodiversity research, encourages Parties, other Governments and organizations to find ways of facilitating and benefiting from regional and sub-regional scientific and technical collaborations in accordance with relevant national legislation and relevant requirements where applicable with due regard for the need to address changes in use and intent other than taxonomic and subject to the outcomes of the negotiation on the international regime on access and benefit-sharing under the Convention;
9. Recognizing that the number of professional taxonomists is predicted to decrease and that the rapid accumulation of information in DNA sequences will require an expansion of taxonomic expertise to reliably identify the taxa from which the sequences derive; allowing potential of new technologies to be maximized for a wide range of biodiversity assessments, encourages Parties and other Governments to enhance the activities of institutions related to taxonomy to provide job opportunities and incentives for young taxonomists and to strengthen the taxonomic capacity to conduct appropriate training for parataxonomists and relevant end-users of taxonomy at national, regional and global levels;
10. Invites Parties, other Governments and international and funding organizations to carry out implementation of the program of work for the Global Taxonomy Initiative with special attention to national and regional inventories of all organisms, i.e. plants, animals and microorganisms;
11. Further recognizing that taxonomic capacity is crucial for the implementation of all relevant articles and work programs of the Convention and that the taxonomic capacity to inventory and monitor biodiversity, including the use of new technologies, such as DNA barcoding and other relevant information technology is not adequate in many parts of the world, invites the Global Environment Facility, Parties, other Governments, and other international and funding organizations to put higher priority for funding to GTI proposals;
12. Welcoming the progress on the establishment of a Special Trust Fund for the Global Taxonomy Initiative and acknowledging the work of BioNET-INTERNATIONAL and

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Photo by Rayvin Tamisin

relevant networks and organizations and Parties contributing to the development and promotion of the sponsorship strategy and global campaign, as elaborated in the progress report on the establishment of a special fund for the Global Taxonomy Initiative:

a. Invites Parties and other Governments and organizations to respond urgently to make the trust fund operational before the eleventh meeting of the Conference of the Parties;
b. Requests the Executive Secretary of the CBD, in accordance with Decision IX/22 to propose the formal constitution of a steering committee reflecting regional balance and other appropriate expertise to facilitate identification of suitable funding sources and assist the operationalization of the Special Fund taking into account the suggestions included in the progress report;

13. Welcomes the section on taxonomy as part of the statement and recommendation from UNESCO International Year of Biodiversity Science Policy Conference, held at UNESCO Headquarters, Paris from 25 to 29 January 2010 and urges Parties and invites other Governments and relevant organizations to support and implement, as appropriate, in accordance with all three objectives of the CBD and, where applicable, with prior informed consent and/or approval and involvement of indigenous and local communities, as well as relevant national legislation, the following recommendations for scaling up and sustaining taxonomy resulting from this Conference:
    a. Supporting indigenous and local communities in capturing and preserving their taxonomic knowledge;
    b. Applying cybertaxonomy, molecular and other innovative approaches to accelerate the taxonomic workflow of discovery and description;
    c. Using digital and molecular infrastructure tools to integrate taxonomic data with other types of life science information, thus also broadening the products available to support identification and other services;
    d. Prioritization of taxonomic efforts according to scientific knowledge gaps and user needs;
    e. Making communication and outreach standard practice, and using Internet media platforms to reach the public and others;
    f. Training a new generation of taxonomists, able to work flexibly and collaboratively and taking stock of new and emerging technologies and tools;
    g. Appreciating the valuable contributions of taxonomy and recognizing it as a branch of cutting-edge science;
14. Requests the Executive Secretary in consultation with Coordination Mechanism for the Global Taxonomy Initiative, national focal points for the Initiative and relevant institutions, bodies and organizations, to develop a comprehensive capacity-building strategy for the Global Taxonomy Initiative at global and regional levels that addresses the Strategic Plan for Biodiversity 2011-2020, taking into account:
    a. The need for consistency between the planned activities relevant to capacity-building in program of work for the GTI and the outcome oriented deliverables contained in decision IX/22;
    b. Taxonomic needs and capacities as already reported;
    c. The relevant stakeholders and resources required as well as possible funding mechanisms; and
    d. Taxonomic needs and priorities for the thematic areas and other cross-cutting issues for the Convention, in particular for the work on protected areas and invasive alien species; and present the draft progress report to the COP at its eleventh meeting, and requests the Subsidiary Body on Scientific, Technical and Technological Advice to review the draft strategy prior to the eleventh meeting of the Conference of the Parties;
15. Requests the Executive Secretary of the CBD to develop a standard format for taxonomic needs and capacity assessments for use by Parties; and
16. Requests the Executive Secretary of the CBD in consultation with the Coordination Mechanism for GTI and the ad hoc technical expert group on post-2010 indicators to consider developing an indicator in order to assess the progress on the implementation of the program of work for the Initiative as needed. ■

Reference: *SCBD*

Enhancing **taxonomic capabilities** of **Southeast Asia** and other **Asian countries**

By Dr. Filiberto Pollisco, Jr. and Dr. Noriaki Sakaguchi*

At the Sixth Conference of the Parties (COP6) to the Convention on Biological Diversity (CBD), an operational program of work for the Global Taxonomy Initiative (GTI) was endorsed through COP6 Decision VI/8, Paragraph 5. The program of work set the objectives and provided the rationale for the choice of the operational targets. The COP VI/8 decision concluded that fast and successful implementation of the program of work will, to a large extent, depend on coordinating it with existing national, regional and global initiatives, partnerships and institutions such as, among others, the Global Biodiversity Initiative Facility (GBIF) and BioNET-International; and taxonomic capacity building at the national and regional levels.

At the CBD-COP9, the program of work was adopted as Decision IX/22. In this decision, Parties to the CBD were "urged to promote and carry out the program of work through coordination of its implementations with existing partners and initiatives, designation of national GTI focal points, provision of updated information about legal requirements for exchange of genetic and biological specimens and about current legislation and rules for access and benefit-sharing in terms of the needs for the GTI, and initiatives of setting up of national and regional networks to aid the Parties in their taxonomic needs in implementing the CBD."

Expanding taxonomic capacities

During CBD-COP10 held in Nagoya, Japan last October 2010, the Parties recognized that the number of professional taxonomists is decreasing and that the rapid accumulation of information in DNA

"Taxonomic knowledge is indispensible not only for research activities but also for assessment and monitoring of biodiversity to evaluate the results and impacts of policies."

Participants to the Plant Taxonomy Internship Program tour the laboratory in Bangkok's Royal Forestry Herbarium

Dr. Edwino S. Fernando of the University of the Philippines Los Banos supervising AMS participants during the Plant Taxonomy Internship Program

Identifying corals during the Coral Taxonomy Training at the Universiti Sains Malaysia in Penang

Identifying plants in Cibodas Botanic Garden, Indonesia

Resource person and TRAFFIC-SEA Deputy Regional Director Mr. Chris Shepherd showing a python to AMS participants

sequences will require an expansion of taxonomic expertise to reliably identify the taxa from which the sequences are derived from. COP10/Decision 39 encouraged Parties and other Governments to "enhance the activities of institutions related to taxonomy to provide job opportunities and incentives for young taxonomists and to strengthen the taxonomic capacity to conduct appropriate training for parataxonomists and relevant end-users of taxonomy at national, regional and global levels".

Responding to the CBD-COP's call for the need for taxonomic information and capacity building efforts, the East and South East Asia Biodiversity Information Initiative (ESABII) was started in January 2009 in collaboration with the ten ASEAN Member States, China, Japan, Mongolia, and Republic of Korea and six organizations including the ASEAN Centre for Biodiversity (ACB), and the Secretariat of the CBD. In December of the same year, ESABII crafted its strategy and work plan.

ESABII

The goal of ESABII is to contribute to the implementation of the CBD Strategic Plan for Biodiversity 2011-2020, including the Aichi Biodiversity Targets, through the development of biodiversity information and taxonomic capacity building needed for developing policies in the conservation and sustainable use of biodiversity in East and Southeast Asia.

Basic data is crucial in developing and implementing policies for the conservation and sustainable use of biodiversity. Information, however, is scattered and not easily accessible to policy and decision makers in East and Southeast Asia. Thus, ESABII aims to gather scattered information, develop useful information database, and make them easily accessible to policy and decision makers through its website. The information on threatened species and migratory water-birds, for example, is currently being developed by the Ministry of the Environment, Japan under the ESABII Strategy.

Taxonomic knowledge is indispensible not only for research activities but also for assessment and monitoring of biodiversity to evaluate the results and impacts of policies such as the Aichi Targets and the National Biodiversity Strategy and Action Plans (NBSAP).

At the country level, taxonomic capacity of the Customs authorities is essential in law enforcement of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and laws on invasive alien species. However, as mentioned above, lack of taxonomic capacity and human resources in such fields have been standing in the way of proper implementation.

Collaborating for taxonomic capacity

As part of taxonomic capacity building efforts in the region, ACB and the Ministry of Environment of Japan (MoE-J) are collaboratively conducting taxonomic capacity building programs in Southeast Asian countries.

A Regional Workshop on GTI participated by the ASEAN + 3 Member Countries (ASEAN Member States, Japan, China and Republic of Korea) was conducted in the Philippines in May 2009. The workshop assessed the taxonomic needs in the conservation and sustainable use of biodiversity in the area of training and capacity building. The workshop also crafted a regional action plan in accordance with the Program of Work of the GTI. It was the first ASEAN GTI regional workshop jointly organized by the ESABII through the MoE-J, ACB and the French Government through its embassies in the Philippines and Thailand. The workshop was supported by various French, Japanese and other local and international institutions such as L'Institut de recherche pour le développement (IRD), Le Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), HNMN, Global Biodiversity Information Facility, Japan International Cooperation Agency

Cyathea contaminans

(JICA), and the University of the Philippines Los Baños.

Taxonomic capacity building and governance for the sustainable use of biodiversity

As an offshoot of the first workshop, the ACB, with support from the Japan-ASEAN Integration Fund (JAIF), launched a project aimed at increasing the number of taxonomists in the Southeast Asian region. The project on "Taxonomic Capacity Building and Governance for the Sustainable Use of Biodiversity" has already implemented three training programs on Coral Taxonomy held in the Universiti Sains Malaysia in Penang; Terrestrial Plant Taxonomy held at the Research Center for Biology in Bogor, Indonesia; and the Training of Trainers on CITES Policies and the Identification of Threatened Species (Reptiles) held in Kuala Lumpur, Malaysia in partnership with TRAFFIC-Southeast Asia, an organization against trafficking and illegal trade of wildlife. The three workshops trained 94 young scientists from all over Southeast Asia, with participants from China, Japan and the Republic of Korea.

The three taxonomic training programs were part of the ESABII activities.

In February 2011, the MoE-J conducted a National Training on CITES Policies and Species Identification in Ho Chi Minh, Viet Nam in collaboration with TRAFFIC-SEA and the ASEAN-Wildlife Enforcement Network. Four Vietnamese trainers, who participated in the Training of Trainers in Kuala Lumpur, trained 37 participants from Customs and Environment Police and other stakeholders. Utilizing the knowledge they gained from the Kuala Lumpur training, the four Vietnamese trainers facilitated the whole training course.

Part of the series of training programs is the Internship for Corals and Plants Taxonomy. Participants from five priority ASEAN Member States (Cambodia, Lao PDR, Myanmar, Viet Nam and Thailand) will immerse themselves in the Phuket Marine Biological Center for the corals group, and in the Bangkok Royal Forestry Herbarium for the plants taxonomy group, both in Thailand, to experience a more advanced and hands-on form of taxonomic activities. At the end of the one-month internship program in June 2011, the participants are expected to draft scientific articles, in publishable format, about their chosen group of plants or corals. The articles will be reviewed by a panel of taxonomy experts. The products of the internship program are a checklist of a particular group of plants or corals, a revision of previous literature of a particular taxon, or a synopsis of a selected species or genera of plants or corals.

Bright future for taxonomy

Taxonomic classifications of biological resources is vital, first, in the comprehensive identification of these potential resources, and second, in the formulation of suitable mechanisms that will regulate industrial and commercial utilization and production of these resources to ensure use efficiency and sustainability in the future, in compliance with the CBD requirements and the attainment of the Millennium Development Goals. It will also protect and strengthen the cultural identity, spiritual values and appreciation of biodiversity among the peoples of ASEAN + 3 countries while boosting opportunities for livelihood, business, ecotourism, education and research in the region. Ultimately, it will contribute significantly to the global efforts to meet the UN Millennium Development Goals on the environment and achieve a significant reduction in the rate of biodiversity loss by 2020, as a commitment to the 2011-2020 Aichi Strategic Plan.

The lack of trained human resources and inadequate capacities on taxonomy has been stressed as one of the obstacles in the implementation of CBD commitments, especially in the ASEAN region. But with taxonomic cooperation among ASEAN Member States and with its dialogue partners going into high gear, taxonomy in Southeast Asia has a bright future. ■

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The status of **marine taxonomy** in the ASEAN region

By Dr. Aileen Tan Shau-Hwai and Dr. Zulfigar Yasin*

"The marine areas surrounding the ASEAN region are at the heart of the world's biodiversity. The diverse habitat found here are home to thousands of species of plants and animals, which range from the smallest planktonic life to large migratory marine mammals. Much of the human population here derives their food, wealth, tradition and livelihood from the seas."

Photo courtesy of Conservation International

The ten ASEAN Member States are located between two major oceans – the Indian Ocean and the Pacific Ocean, and surrounded by three main seas. The Andaman Sea is on the northwest, the South China Sea lying in the middle of the region, and the Philippine Sea on the east. In addition, there are several other seas such as the Gulf of Thailand, Sulu Sea, Sulawesi Sea and Java Sea.

Rich marine biodiversity

The marine areas surrounding the ASEAN region are at the heart of the world's biodiversity. The diverse habitat found here are home to thousands of species of plants and animals, which range from the smallest planktonic life to large migratory marine mammals. Much of the human population here derives their food, wealth, tradition and livelihood from the seas. Of the world's

17 mega-diverse countries, three are found in the region, namely, Indonesia, Malaysia and the Philippines. Overall, the ASEAN region has unique and highly diverse biological resources.

Another rich marine area is the "Coral Triangle", bounded by the marine region from Malaysia to the west and Papua New Guinea to the east, is characterized by the richest seas in the world from the perspective of marine biodiversity. Almost all the major tropical marine habitats are represented here which include the coral reefs, the sea grass beds, the mudflats, the mangrove forests, the continental shelf and the deep sea.

Taxonomy and museums in the ASEAN region

Although the ASEAN region is located in the heart of the world's most diverse area, the science of taxonomy and systematics in this region is still in its developmental stage. Taxonomic research in general appears neglected. The field of taxonomy, although providing the foundation for biodiversity conservation, has yet to receive the necessary resources and incentives to attract more researchers and experts, thereby enhancing research in this field.

Serious efforts are needed to bring back the science to its rightful place to progress systematically with other areas of study for which taxonomy is the key. Under the auspices of several international programs such Japanese Society for Promotion of Science (JSPS), Natural Geography in Shore Areas (NaGISA), UNESCO, IOC-WESTPAC and the Danish International Development Agency (DANIDA), taxonomy workshops had been organized in some of the ASEAN countries like Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam, with participants from the ASEAN countries.

In addition to traditional methods of taxonomy, more modern approaches like molecular taxonomy and genome mapping have recently become more popular. These new approaches need to be encouraged for a more comprehensive study and identification of marine species.

However, there are very limited depository areas in the ASEAN region for marine organisms and much less the archived reference collections. To date, Thailand has the most number of depository areas with regards to marine specimens, which are mainly located at the Phuket Marine Biological Station and in the local universities. One of the most referred museums in the ASEAN region is the Raffles Museum of Biodiversity Research, located at the National University of Singapore. Table 1 shows some of the museums where marine specimens are deposited.

The Phuket Marine Biological Centre (PBMC) located in Thailand, although not known as a museum, has a vast collection of marine specimens which had been identified both by international and local taxonomists. PMBC has also conducted many taxonomy training workshops for both local as well as the international researchers.

Most of the museums are supported by scientists and research staff instead of full-time curators. There are five curators based in Raffles Museum of Biodiversity Research specializing in crustaceans, fish/amphibians/reptiles, herbarium, bird/insect/mammal/molluscs and cnidarians/crustaceans/echinoderms. The National Museum of the Philippines

Table 1. Museums with depository of marine organisms in the ASEAN Member States.

Country	Name of museum
Malaysia	Marine Science Laboratory Collection, Universiti Sains Malaysia
	Marine Ecosystem Research Centre, Universiti Kebangsaan Malaysia
	Institute of Biological Sciences, University Malaya
Viet Nam	Institute of Oceanography, Nha Trang
Thailand	Bangkok Seashell Museum
	Biological Science Museum, Chiang Mai University, Chiang Mai
	Chulalongkorn University of Museum of Natural History, Bangkok
	Kasetsart University of Museum of Fisheries (Natural History), Bangkok
	Kasetsart University's Zoological Museum, Bangkok
	Mahidol University's Mollusk Museum, Bangkok
	Phuket Seashell Museum, Phuket
	Phuket Marine Biological Centre Reference Collection
	Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkhla University, Hat Yai
	Rattanakosin Natural History Museum, Kasetsart University, Bangkok
	Thai Island and Sea Natural History Museum, Chonburi
Singapore	Raffles Museum of Biodiversity Research, National University of Singapore
Philippines	UPLB Museum of Natural History, University of the Philippines, Los Banos
	National Museum of the Philippines (Zoology Division)
Indonesia	Indonesia Institute of Sciences (LIPI)

Photo by Rhoda Tayag

Photo by Lee Chin Yong

Green turtle

is supported by two full-time curators and 18 research staff; while Chulalongkorn University of Museum of Natural History is supported by two marine curators specializing in cnidarians and molluscs. It is obvious that the ASEAN region lacks full-time taxonomists.

Taxonomic research

Taxonomic research in the ASEAN region is not in the top list of priorities among scientists and funding institutions. Young people consider taxonomic research as a low career prospect.

Several factors may have led to the slow development of taxonomic science in the region. These are:

- Widespread belief that taxonomy is old science and that most of the work relating to taxonomy has been 'sorted out'. This view is changing as molecular approaches contribute to the development of the science.
- Financial assistance and grants on pure sciences are relatively few. This is also true for support in taxonomic research.
- Career development in taxonomy is not financially rewarding while career opportunities are few. It is generally believed that the learning curve for taxonomic science is also protracted.
- Setting up and maintenance of reference collections is expensive and long-term support is rare except for the most established centers and museum; although these are necessary for the development of the science. Depository locations for marine science materials and specific reference collections are spread over different institutions; because many of them are associated with particular experts and existing interests, their long-term sustainability is doubtful.
- Lack of expertise for many taxonomic groups in the region; the issue of supervision and training needs to be addressed.
- Lack of resources to database their collections in ways to allow information to be electronically available via the Internet for use by decision makers and the community at large.

Some of the issues mentioned above can be addressed by pooling resources in the ASEAN region and even from international agencies and institutions. The efforts of these bodies in organizing workshops and training programs should be lauded and encouraged. They have created interests and long lasting impressions among the young scientific community. However, there is no formal drive to promote the science of taxonomy at the policy and managerial levels of many ASEAN Member States. As awareness on biodiversity conservation becomes more pronounced in the region, taxonomy and its related sciences should use this opportunity to advance its cause. Relevant government agencies, universities and institutions in each country could establish taxonomy research centers by providing the necessary incentives and employment opportunities. Support for formal training and research will be beneficial to the region as the necessary science of taxonomy provides the foundation for the conservation and wise use of its rich biological resources. ■

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Dr. Rachun Pooma
Profile of a Taxonomist

By Sahlee Bugna-Barrer

Dr. Rachun Pooma is the curator of The Forest Herbarium in Bangkok, Thailand. His roots in taxonomy can be traced to his training as a forester. He earned his Certificate in Forestry from the Forestry School in Phrae, Thailand in 1985, before finishing his Masters of Science in Forestry from the Gregorio Araneta University Foundation in the Philippines in 1986. He then went on to work at The Forest Herbarium, which was under the auspices of the Royal Forest Department.

At The Forest Herbarium, he was assigned to work as the Assistant Head of the Maesa Botanical Garden in Chiang Mai (now the Queen Sirikit Botanic Garden), after which he headed the Huai Kaeo Arboretum also in Chiang Mai. He then established a new botanical garden called The Royal Forest Department's Centennial Botanical Garden in the east of Thailand, where he worked for two years.

During this initial period of his career, Dr. Pooma concentrated on getting living collections for the gardens and conducted plenty of fieldwork. The plant specimens he collected were sent to The Forest Herbarium, since the botanical gardens and arboretum were under its control. This track began to shape his career as a botanist. In 1996, Dr. Pooma was the recipient of a Darwin Initiative to work on repatriation at the Royal Botanic Gardens in Kew, London. There, he collaborated with many botanists and had the chance to work on herbarium specimens. Upon his return to Thailand, he worked on his PhD in Botany from Kasetsart University, which he finished in 2003. "Therefore, I am a forester who became a taxonomist by job experience and practice," stated Dr. Pooma.

Taxonomy in Thailand

Unlike in other countries in the ASEAN region, taxonomy is one of the most popular fields among the biological sciences in Thailand. Most universities have a botany section or related discipline such as parataxonomy, chemotaxonomy or more commonly, biodiversity science.

Dr. Pooma explains, "The trend began in early 2000 when Thailand ratified the Convention on Biological Diversity (CBD). Implementation of the CBD, particularly on enhancing biodiversity awareness and knowledge, requires taxonomic expertise and adequate taxonomic information."

"As such, one of the specific targets of the country's National Policy, Strategies and Action Plan was to increase the number of taxonomists in government organizations and academic institutions by at least 20 personnel by the year 2007. However, a number of taxonomists have been graduating each year, but to get the government jobs or work in academic institutions is more difficult than in other biological sciences such as biotechnology, biology or even forestry." Dr. Pooma added.

Despite the popularity of taxonomy and the growing number of scientists in the field, a number of challenges still remain. "As a forester who became a botanist working within the Royal Forest Department (now Department of National Parks, Wildlife and Plant Conservation), trying to promote taxonomic work to those at the decision-making level was an uphill climb. Therefore, promoting taxonomical work in the forest department is one of the top challenges I have faced," stated Dr. Pooma.

In the ensuing years, Dr. Pooma worked on developing The Forest Herbarium into the national herbarium. It now holds a significant number of important plant resources of the country.

One of the obligations of the Department of National Parks, Wildlife and Plant Conservation (DNP) is to promote biodiversity conservation and develop sustainable use, and taxonomists are the key persons to implementing this task. To contribute to these goals, Dr. Pooma has published a number of publications, two of which have promoted taxonomic work and are now widely used by most DNP staff. These publications are "A Preliminary Checklist of Threatened Plants in Thailand" and "Rare Plants of Thailand".

Dr. Pooma explains that, in most cases, general foresters lack taxonomical knowledge and hardly know the plants in the wild, especially the herbs. The two books have been distributed to foresters working in protected areas such as national parks and wildlife sanctuaries, and have

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now become the manual for checking the rare plants in the areas where they work.

Aside from creating knowledge among those working in protected areas, Dr. Pooma has also worked on spreading the wealth of taxonomic information.

"I have done a lot of work to get information of the taxonomy of Thai plants available on the Internet, usually in Thai. I published the Encyclopedia of Thai Plants in Thailand on the Internet in May 2006, which now covers over 1,000 species including indigenous and introduced species."

The encyclopedia is widely used not only by the staff of the DNP but also by many others who have been searching for plant information on the Internet. Dr. Pooma notes that most taxonomic publications are in foreign languages and difficult to access, especially for non-taxonomists, hence his interest in making taxonomic information available in the local language.

To further promote and encourage more people to go into taxonomy, The Forest Herbarium offers courses on Plant Taxonomy each year, mainly for the DNP staff. This is to help them collect and identify plants especially in protected areas where they work and send them to The Forest Herbarium. It also provides an opportunity for a number of students to work as trainees in taxonomy and herbarium management at the herbarium for about three months every year. These students come mostly from the botany departments of various universities throughout the country.

The Forest Herbarium and biodiversity conservation

The Forest Herbarium is under the auspices of the DNP which was separated from the Royal Forest Department (RFD) in 2002. The DNP is an implementing agency for the forest and wildlife policies covering both ex-situ and in-situ conservation in Thailand through national parks, wildlife sanctuaries, and forest research institutions. One of the main tasks of The Forest Herbarium is to survey rare plants in Thailand and be responsible for ex-situ conservation for rare and endangered species through 55 arboreta and eight botanical gardens around the country. It has also been assigned by the Office of Natural Resources and Environmental and Planning to work on a red data list of plants in Thailand. This resulted in the publication of the Thailand Red Data: Plants book, which was published in 2006.

As Curator of The Forest Herbarium, the major challenges for Dr. Pooma include the promotion of herbarium work in the DNP, as well as the development of the herbarium according to standards of similar institutions in developed countries. "We have improved a lot of our herbarium facilities including expanding the compactor

The Forest Herbarium

The Forest Herbarium (BKF) or Office of the Forest Herbarium is under the auspices of the Department of National Parks, Wildlife and Plant Conservation (DNP), which became a separate agency from the Royal Forest Department (RFD) in 2002. The DNP is an implementing agency for the forest and wildlife policies covering both ex-situ and in-situ conservation in Thailand through national parks, wildlife sanctuaries, and forest research institutions, including BKF.

BKF undertakes research on plant and fungal taxonomy, forest ecology, ethnobotany and conservation biology. The aims and duties of The Forest Herbarium include:

1. Conduct of botanical inventories, collecting plant specimens and undertaking plant taxonomic research for the "Flora of Thailand Project", in collaboration with several botanical institutions. An important aspect of this task is the maintenance of The Forest Herbarium.
2. Survey and classification of forest types in Thailand. Based on ground surveys, Thai forests are described with respect to their structure and species composition. The purpose of this is to identify silvicultural priorities, economic plants and to strengthen conservation management.
3. Establishment of contacts and making the collections available for groups dealing with conservation and protected area management, silviculturists and ecologists, wildlife experts and lay people, and facilitate research activities within Thailand.
4. Supervision of management and research of botanical gardens and arboreta located throughout Thailand.

The BKF is Thailand's biggest herbarium and a center of scientific excellence in taxonomic and biodiversity research. It contains an international collection of over 250,000 preserved specimens, mainly of flowering plants and ferns collected in the country. Specimens collected are dealt with in two ways, one is their input onto a plant database system to make information more accessible, and the other is for a database with pictures of specimens on CD-ROM, undertaken as part of "The Princess Maha Chakri Sirindhorn Project on Plant Genetic Resources Conservation".

The BKF website (http://web3.dnp.go.th/botany/) provides a wealth of information for plant researchers concerning Thai flora. The site contains information about the Forest Herbarium, Flora of Thailand project, Thai Forest Bulletin, Botanical Gardens and Arboreta, and other plant research including a bibliography of taxonomic work in Thailand. ■

system, setting up a security system, fire and insect protections, developing specimen databases, increasing the specimens on loan and increasing the exchange partners, especially in the Malesian region including FRIM and Singapore herbaria."

Today, the institution has become the national herbarium and there has been an increasing number of collaborating institutions, both foreign and local, that constantly work with it. Consequently, there has also been an increase in the number of specimens housed by the herbarium, approximately 5,000 new specimens each year. In addition, the herbarium library has become the largest library in terms of the number of botanical publications in Thailand.

Another major contribution of the herbarium to biodiversity conservation in Thailand is its policy of establishing contacts and making the collections available for groups dealing with conservation and protected area management. This policy has been assigned to all staff that are in charge of plants collection in protected areas. They pass on information on plants to the staff of protected areas and give them advice for future conservation of the species. Where possible, members of the herbarium staff collect the seeds or seedlings of rare and endangered species and send them to botanic gardens and arboreta near the protected areas to grow and propagate in their gardens.

Rewards of taxonomy

Dr. Pooma explains some of the rewards of his work in taxonomy, "Since I have made a lot of plant collections, many of them have been described as new to science, and five have been named after me, including Sauropus poomae Welsen and Chayamarit, Croton poomae Esser, Aristolochia poomae Phuph., Schefflera poomae Esser and Jebb and Wrightia poomae D.J. Middleton."

Comparing Dr. Pooma's collections with old collections has also been very useful for the Flora of Thailand project as they provide more information for conservation assessment. For the Flora of Thailand project, Dr. Pooma was assigned to work on *Dipterocarpaceae* and *Burseraceae,* among the most important economic families in the Asian region. His revision on *Dipterocarpaceae* and *Burseraceae* data in Thailand is nearly complete and will be ready for publication in 2012 and 2013, respectively.

Dr. Pooma adds "Being curator of the largest herbarium in the country, overseeing the installation of a new security system, extension of the compactor system, and introducing database systems have been rewarding."

Specimens on loan and exchanges have become much larger and the number of visitors to the herbarium continues to grow. Dr. Pooma is also currently the Thai Forest Bulletin (Botany) Managing Editor and maintaining the standard of its papers and constantly improving the quality of the publication is another major source of satisfaction.

His advice to people who want to go into taxonomy is to "…practice by themselves, do as much plant collecting as possible, and try to identify plants by using keys and compare them with herbarium specimens."

He adds that it is also important to write articles, not only in taxonomy, but also in plant diversity, ethnobotany and other relevant disciplines. It also helps to use a database and taxonomic software if possible to store the data and make them available to the public.

Dr. Pooma stresses that "If you have a successful taxonomic career, a lot of opportunities and challenges will come to you and lead you to a satisfying life."

His work surely exemplifies a career that has not only provided significant personal and professional rewards, but has strengthened biodiversity conservation efforts in Thailand, as well. ■

Search for the ASEAN Champions of Biodiversity

Fourteen youth organizations, corporations and media with outstanding achievements on biodiversity conservation and advocacy in the ASEAN region have landed in the semi-final round of the ASEAN Champions of Biodiversity.

Launched at the Tenth Conference of the Parties to the Convention on Biological Diversity (CBD) in Nagoya, Japan in October 2010, the ASEAN Champions of Biodiversity is a recognition program for ongoing projects on biodiversity conservation and advocacy in Southeast Asia. It is aimed at generating greater leadership, public and media awareness of the problems facing the region's rich but highly threatened biodiversity and the need for a concerted effort in biodiversity conservation and advocacy.

Specifically, the award seeks to recognize ongoing projects of the private sector, media and youth which have clear impacts on biodiversity conservation; identify leaders among these sectors from which a cadre of champions will be selected to serve as Ambassadors of Goodwill for biodiversity; promote awareness of the values of biodiversity among ASEAN leaders and the public in general; and promote corporate social responsibility in biodiversity conservation and advocacy.

ASEAN CHAMPIONS OF BIODIVERSITY

The ASEAN Centre for Biodiversity (ACB) is conducting the search, with funding support from the ASEAN Foundation, the Government of Japan through the Japan-ASEAN Solidarity Fund, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the European Union, and the United Nations Educational, Scientific and Cultural Organization. The Asian Institute of Journalism is the project manager.

The semi-finalists will be trimmed to three entries per category where the board of judges will select one Champion per category. The Champions will be recognized on May 31, 2011 at an awarding ceremony and forum to be held in the Philippines. They will receive token cash prizes and will be featured in a magazine of best practices. They will also have year-round opportunities to speak before business, youth and media leaders. ■

The semi-finalists

BUSINESS CATEGORY

CEMEX Philippines. Working closely with Conservation International, CEMEX Philippines helped design the Adopt-a-Species Program. The initiative aims to institutionalize a strong, science-based framework for a long-term species conservation program to effectively prevent the extinction of endangered species and the degradation of their habitat. The Adopt-a-Species Program also determined priority species in need of protection based on the 2007 Red List of Threatened Species of the International Union for Conservation of Nature (IUCN). Through the CEMEX Philippines Foundation, the cement company advocates the conservation of whale sharks in Donsol, Sorsogon and in Bantayan Islands, Cebu. It was also a staunch supporter of the Adopt-A-Species bill which was passed into law in 2008. A key component of the Adopt-A-Species Program, the law seeks to conserve and protect biological diversity and promote ecologically sustainable development.

Chevron Philippines, Inc. The Philippines is home to Danajon Bank, the only double barrier reef in Southeast Asia. Danajon Bank, which straddles the provinces of Cebu, Bohol, Leyte and Southern Leyte, is one of the world's six double barrier reefs – very rare geological phenomena built by coral growth. A known breeding area for fish, Danajon Bank is the main source of food and livelihood for many communities living along its coastlines. It also protects nearby islands from typhoons and storms. Like many rich marine ecosystems, however, Danajon is a target of illegal fishers. To save Danajon Bank, Chevron Philippines, Inc. joined hands with the Project Seahorse Foundation for Marine Conservation, Inc. in 2007 to establish the "Sustainable Marine Protected Areas as Catalysts to Enhancing Inter-Sectoral Collaboration on Marine Resource Conservation." The initiative resulted in the creation of the Minantaw Marine Park and Sanctuary, a pioneering 214.6-hectare innovative multi-use marine zone.

HSBC Brunei. With its climate change mitigation and biodiversity conservation activities in the Heart of Borneo, this global bank is showing Bruneians and the rest of the world that investing in the envi-

ronment makes sound business sense. HSBC became the first corporation to support the "Heart of Borneo" conservation initiative. The bank is helping the government of Brunei establish a "Heart of Borneo Center" which will oversee the implementation of "Heart of Borneo"-related activities in the country. Focusing on climate change, HSBC also committed US$330,000 to support research being conducted by the Centre of Tropical Forest Science (CTFS) of the Smithsonian Tropical Research Institute. Through the support of HSBC, the University of Brunei and international research partners established a 25-hectare long-term forest research plot in Kuala Belalong. The research will provide critical information on the impact of climate change on the forests of Brunei, one of the most biodiverse forests in the world.

Intel Malaysia Sdn. Bhd. Intel launched a program called "From Land to Ocean: Intel Malaysia's Commitment to the Environment." Under this project are several key initiatives including the "Intel and Friends Solid Waste Recycling" which the company conducts with the Department of Education, Malaysia Newsprint Industries and 58 schools and colleges. Funds generated from the solid waste sale are used to support projects such as a turtle satellite tracking system. The project also conducts a series of talks featuring Intel employee volunteers who encourage students and teachers across Penang and Kedah to apply the 5R principle: rethink, replace, reduce, reuse and recycle. Intel also supports the River Ranger Program, an education program and science initiative that involves students and teachers from 35 schools to analyze and evaluate river water quality and river biodiversity as a hands-on approach to understanding the importance of river ecosystems.

PTT Public Company, Ltd. In the heart of Pak Nam Pran in Thailand's Pranburi District lies a vast expanse of land covered with lush mangroves. The area has been attracting over 100,000 visitors a year who want to learn more about mangroves and their importance to biodiversity. The 126-hectare mangrove forest was developed in 1997 by PTT Public Company, Ltd., Thailand's premier oil and gas producer. From a once-abandoned shrimp farm, the area has been transformed into a healthy mangrove forest. In honor of Her Majesty the Queen, PTT also built the Sirinath Rajini Mangrove Ecosystem Learning Center within the mangrove forest in 2004 to promote a greater appreciation of mangroves. To further improve its mangrove conservation program, PTT joined hands with the IUCN to raise the potential of the Sirinath Rajini Committee in their studies on using proper waste water management, harnessing the local wisdom of the Pranburi fishing community, and developing site-specific biodiversity management.

Finalists

YOUTH CATEGORY

Adopt-A-Stream Team. Initiated in 2009, the Adopt-A-Stream (AAS) Team is composed of Grade 7 students from the International School of Kuala Lumpur (ISKL). Under the program, students monitor water quality, habitat diversity, macro-invertebrate biodiversity and stream ecosystem health in areas adjacent to their school community. The project contributes to conservation through data collection and data sharing. The AAS Team believes that by using data they collect to educate their peers and local community, they can inspire local communities to advocate stream biodiversity conservation in Malaysia. Since the team was established, they have conducted several water quality-sampling trips, held one community forum, and featured in newspapers, radio and magazines in Malaysia. They have also received a US$1,000 grant to purchase equipment from the East Asian Regional Council of Schools and an ISKL development fund grant for US$1,500 to continue their stream monitoring efforts.

ASAPHIL-UP. In the Philippines, a group of university students are using the concept of green architecture in their campaign to promote wetlands conservation. Known as critically important ecosystems, wetlands provide significant ecological, economic and social benefits. To contribute to wetlands conservation, the Architectural Students' Association of the Philippines – University of the Philippines Diliman Chapter joined hands with the Society for the Conservation of Philippine Wetlands, Inc. for a competition dubbed "Designing the Lumban Delta as an Ecotourism Site." The pioneering design contest created awareness among college students on sustainability in the fields of architecture, tourism, and the environment. The winning entries were turned over to the Municipality of Lumban for implementation. By promoting the Lumban Delta as an ecotourism site, it is expected that there will be an increase in economic activity in its catchment area, alleviating the local inhabitants' poverty and increasing the capability of the community to help preserve, protect, conserve, sustain and limit stress on the catchment area.

Green Community. This is a study group focusing on the conservation of biodiversity and wildlife habitat. The group's vision is to promote the sustainable management of natural resources and save biodiversity through simple but high-impact activities. Composed of 50 members who are between 19 and 26 years old, Green Community seeks to involve students in conservation initiatives. Members are expected to form a cadre of environmentalists who will spread the word of conservation. Believing that children should be introduced to conservation at an early age, members of Green Community conduct environmental education activities among school children in Semarang City. Field trips and games are employed to ensure that the children will enjoy the learning experience. Facilitators from Green Community introduce the kids to various animals, the importance of gardening, the role of birds and butterflies as pollinators, and the life cycle of plants. Using their knowledge and skills as students of biology, members of Green Community periodically conduct "Flora and Fauna Inventory" activities. Information gathered is used to develop a database of plants and animals.

Sahabat Alam. After witnessing flood waters ravage her hometown, 12-year-

old Adeline Tiffanie Suwana decided to be an environmental advocate. After learning the importance of mangroves in preventing floods and other natural disasters, Adeline invited 150 friends to plant 200 mangrove saplings at Wisata Angke Kapuk during a long school holiday. That day, July 6, 2008, Sahabat Alam (friends of nature) was formed. Today, Sahabat Alam has 2,000 members conducting activities to generate awareness of biodiversity conservation through school seminars, events, talk shows, films and various activities to encourage young people to save and protect the environment. Apart from planting mangroves, Sahabat Alam conducts activities such as freeing turtles into their natural habitat, teaching fellow youth not to pollute the ocean, gathering trash from rivers, holding story-telling sessions about the importance of maintaining the river's cleanliness, and launching a "no styrofoam" campaign that aims to reduce trash being thrown into seas and rivers.

The Scouts Association of Malaysia. The Persekutuan Pengakap-Pengakap Malaysia (PPM) or The Scouts Association of Malaysia is going the extra mile in training scouts who will champion the cause of biodiversity conservation.

PPM established the Scouts for Nature program which seeks to raise the awareness of the general public in Malaysia about the urgent need to conserve biological resources. Through the project, scouts across the country are conducting an information and petition campaign to encourage the public to stop the consumption of turtle eggs and report wildlife crime to authorities. They also inform people about the importance of conserving wetlands through a wetlands camp and participated in mangrove replanting in Setiu Wetlands with local children. In 2009, Scouts for Nature partnered with WWF-Malaysia for the "Egg=Life" campaign which sought to improve the protection of marine turtles in Malaysia. Through the campaign, scouts collected signature pledges. To spread awareness on turtle conservation and gather pledges, the Scouts for Nature used a variety of channels such as social networking and scouting events.

Finalists

MEDIA CATEGORY

The Brunei Times. Stories about biodiversity rarely make it to the front page of newspapers. While news on politics, crime and disasters get the prime spaces, news about animal and plant species, conservation, and the web of life are often buried in less prominent pages. Only a handful of newspapers see the value in giving biodiversity the space it deserves. One such paper is The Brunei Times, an independent English-language newspaper. The newspaper's focus on biodiversity and other environment-related issues is not treated as a project. It is upheld as a priority. This focus is manifested in the way the newspaper gives front-page treatment, even top-story space, to biodiversity conservation and related stories. Apart from regularly featuring news on biodiversity, The Brunei Times has been supporting biodiversity protection through its environmental campaign to get more Bruneians to refrain from the heavy use of plastic bags. Over the last two years, the newspaper has carried numerous in-house ads encouraging the public and the government to stop supermarkets from giving free plastic bags.

BusinessMirror. Stocks, economic indicators, insurance, trade and finance – these are the usual topics headlining business papers. Because of this, many editors do not see how biodiversity fits into their pages.

With BusinessMirror, a Philippines-based daily newspaper, biodiversity is considered a crucial business issue. Bringing out the business angle in biodiversity issues, the newspaper features stories on the economic values of biodiversity, the impact of biodiversity loss on livelihood, as well as the equitable sharing of biological resources. The BusinessMirror's editorial policy gives premium attention to biodiversity stories. Its reportage allows its readers to understand how biodiversity loss impacts on health; how progress affects biodiversity; the economic values of biodiversity; and how biodiversity could mitigate climate change. The newspaper also uploads in its web site, articles that tackle the issues and problems, solutions to these and initiatives on biodiversity conservation.

Dat Viet Newspaper. In response to the need to generate a greater awareness of the values of biodiversity, the Dat Viet Newspaper in Viet Nam is giving special focus on this topic. A special section on biodiversity was established by Prof. Dr. Vu Tuyen Hoang, chairman of Vietnam Union of Scientific Technological Association (VUSTA). The section features two papers on biodiversity every month. To sustain this focus on biodiversity, the newspaper created a biodiversity group composed of five journalists. They take charge of gathering news related to the web of life. These journalists also attend workshops on biodiversity-related issues so they can effectively report on the topic. Dat Viet, through its reportage, fosters community participation in environmental protection by making the public aware about the importance of biodiversity.

GMA-7's Born to be Wild. Every Wednesday night, millions of Filipinos tune in to GMA-7, one of the Philippines' largest television networks, as they eagerly watch Born to be Wild, a TV show that features biodiversity. The weekly program showcases various species and habitats found in the Philippines and other countries in Southeast Asia. The show has aired stories on the predicted depletion of marine resources, drought, climate change and other current issues. To ensure accuracy of information presented in the show, the program researchers seek the expertise of scientists. It is often lauded for bridging the gap between scientists and the general public. One of the TV's hosts, Dr. Ferds Recio, regularly visits wildlife centers which are in need of veterinarians. He offers his services to treat endemic or endangered animals being cared for in these centers. He has also participated in a number of wildlife rescue missions, responding almost on-call to wildlife-saving missions. The show's annual "Born Project" has drawn many volunteers for various initiatives – from caring for rescued and injured animals at the Protected Areas and Wildlife Bureau to gathering pledges from communities to safeguard their forests and marine reserves. ■

FREELAND Foundation to combat wildlife trafficking in Asia

The U.S. Agency for International Development (USAID) has chosen the Thailand-based Freeland Foundation to lead an $8 million regional project to help Asia protect its unique biological diversity and fight against the illegal trafficking of wildlife.

Under the terms of the five-year agreement, the FREELAND Foundation will work with the Member States of the Association of Southeast Asian Nations (ASEAN) and China to improve wildlife trafficking enforcement, strengthen regional cooperation and reduce consumer demand.

Illegal trade in protected plants and animals is a multi-billion dollar industry that affects every country in Asia and threatens to cause irrevocable biodiversity loss. In 2010 alone, more than $15 million in wildlife contraband was recovered, and on March 31, 2011, Thai customs agents seized more than two tons of Africa elephant tusks, the largest seizure of illegal ivory in Thailand's history.

If the current illegal activity continues, over 40 percent of Southeast Asia's animal and plant species could disappear this century. Wildlife plays a vital role in sustaining human life. The illegal wildlife trade weakens natural ecosystems, supports organized crime, and increases the risk of transmitting emerging infectious diseases such as avian pandemic influenza and severe acute respiratory syndrome (SARS).

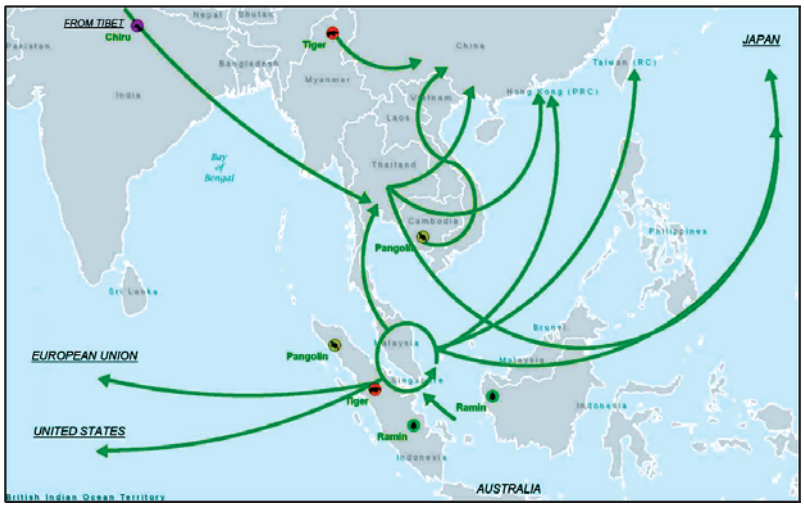
Since 2005, USAID's support to FREELAND and other partners has helped establish the ASEAN Wildlife Enforcement Network (ASEAN-WEN). This region-wide system created dedicated national task forces in seven countries and a secretariat to coordinate their activity. Some 2,000 officials have been trained and arrests for wildlife trafficking has increased substantially.

At the same time, a broad public education process has alerted million to the importance of protecting the region's wildlife, and numerous public-private sector partnerships set up in support of the counter trafficking effort. As a result, ASEAN-WEN is now a model for collaborative wildlife enforcement networking which other regions are seeking to replicate.

The new program will strengthen the ASEAN Wildlife Enforcement Network; expand the network to China, South Asia, the United States and other parts of the world; develop regional centers of excellence in marine enforcement, forest protection, and wildlife forensics; help replicate the "WEN" (Wildlife Enforcement Network) model throughout Asia; produce a special television series with National Geographic, which will be seen throughout Asia and help reduce demand for endangered species; and launch internet public awareness campaigns in China, Vietnam and Thailand and build on these to reach out elsewhere in Asia.

The program will also work with the South Asia Wildlife Enforcement Network (SA-WEN), an organization modeled after the USAID-funded ASEAN-WEN program; Global Tiger Initiative (GTI); the ASEAN Centre for Biodiversity; and government agencies across Asia. Local NGOs from Vietnam, Cambodia, China and other countries will also participate. International partners include INTERPOL, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), United Nations Office on Drugs and Crime (UNODC), U.S. Fish and Wildlife Service (USFWS), U.S. Department of Justice, U.S. Forest Service and U.S. Department of State.

Don Clark, Acting Mission Director for USAID's Regional Development Mission for Asia, said "This new program demonstrates the commitment of the United States Government to work through local organizations that are change agents who have the cultural knowledge and in-country expertise to ensure USAID assistance leads to real local institutions and solutions. Wildlife trafficking affects everyone. Through the Freeland Foundation and ASEAN-WEN, and with the support of many partners, this region has taken great strides to protect its unique biodiversity. This new award will build upon that success, protect the region's environment and help turn the tables on organized crime." *US Embassy News - Bangkok*



Common illegal wildlife trade routes in Southeast Asia based on case studies.

ASEAN law enforcers train on taxonomy and wildlife protection policies

Law enforcers from the ten ASEAN Member States underwent training on identifying threatened reptile species and familiarized themselves with international wildlife protection policies that will enable them to combat the multimillion dollar illegal wildlife trade. The "Training of Trainers (ToT) on CITES Policies and Identification of Threatened Species (Reptiles)" was held from January 17 to 20, 2011 at the Novotel Hotel in Kuala Lumpur, Malaysia and was co-organized by the ASEAN Centre for Biodiversity (ACB), TRAFFIC – Southeast Asia, the ASEAN Wildlife Enforcement Network (ASEAN-WEN), and the Ministry of the Environment-Japan with support from the Ministry of Natural Resources and Environment of Malaysia and the Japan-ASEAN Integration Fund.

The training course equipped wildlife law enforcers with skills in identifying threatened reptile species that are commonly traded; familiarized them with CITES policies; and upgraded the participants' skills in conducting their own training courses on wildlife regulation. CITES is an international agreement between governments aimed at ensuring that international trade of wild animals and plants will not threaten their survival. Roughly 5,000 species of animals and 28,000 species of plants are protected by CITES against over-exploitation through international trade.

Experts from ASEAN-WEN and TRAFFIC-Southeast Asia served as trainers for the four-day course. There were also observers from China, Japan and the Republic of Korea.

Mr. Manop Lauprasert, Senior Officer of the ASEAN-WEN Program Coordination Unit said "the criminals involved in the illegal wildlife trade are well organized and financed. It's only by working together and pooling our skills, knowledge and resources across the region can we hope to combat wildlife trafficking effectively."

Regional Director of TRAFFIC Southeast Asia, Dr. William Schaedla said, "We really are starting with the basics. Most law enforcement personnel never get any training in areas related to wildlife crime. With this course, we're imparting necessary skills to the right people."

The training course was part of the project on "Taxonomic Capacity Building and Governance for Conservation and Sustainable Use of Biodiversity" funded by the Japan-ASEAN Integration Fund.

ACB Executive Director Rodrigo U. Fuentes said the project aims to promote the science of taxonomy which is increasingly considered a fundamental tool required by the global community to implement the Millennium Development Goals and the development targets set by the World Summit for Sustainable Development. ■

Viet Nam wildlife law enforcers build skills to combat illegal wildlife trade

Viet Nam's law enforcers were recently trained on how to identify threatened reptile species and familiarize themselves with international wildlife protection policies in an effort to combat illegal wildlife trade in the ASEAN region.

The workshop was led by Vietnamese trainers who attended a "Training of Trainers" for members of the ten ASEAN nations in January 2011 in Malaysia, as part of a project funded by the Japan-ASEAN Integration Fund and Ministry of the Environment, Japan under the East and Southeast Asia Biodiversity Information Initiative (ESABII). The project seeks to involve and enhance the capabilities of ASEAN and neighboring countries in the understanding and application of taxonomic knowledge and wildlife trade regulations.

Viet Nam is the first country in the region to be selected to organize its own CITES and species identification course, conducted entirely by national trainers. The three-day course equipped key staff working in land and air ports in southern Viet Nam with basic knowledge of the wildlife trade in Southeast Asia, international regulations governing the trade, such as CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora), and relevant national laws. Participants were also trained to identify threatened reptile species that are commonly traded in the region during an interactive session at the Saigon Zoo.

TRAFFIC

Wildlife Enforcement Events

Global Tiger Initiative SMART Patrolling Training

Thailand, January 2011

Under the Global Tiger Initiative, a practical SMART Patrolling training course, supported by the Department of National Parks of Thailand, Smithsonian Institute, and the World Conservation Society, was conducted in Thailand, mainly in the Huai Kha Khaeng Wildlife Sanctuary. Participants from the 13 Tiger Range Countries participated in the course. The ASEAN-WEN Program Coordination Unit was invited to present on existing work on regional enforcement cooperation to provide insights to participants on how SMART Patrolling may contribute in the regional work against wildlife trafficking.

2nd Meeting of South Asia Experts Group on Illegal Wildlife Trade and South Asia Wildlife Enforcement Network (SAWEN) Launch

Paro, Bhutan, January 28 – 29, 2011

The 2nd Meeting of the South Asia Experts Group on Illegal Wildlife Trade was held in Paro, Bhutan from January 28 to 29, 2011. The regional South Asia Wildlife Enforcement Network (SAWEN) was launched during the meeting. The ASEAN-WEN PCU was invited to provide its inputs and experiences to the Meeting that can assist in the establishment of the SAWEN Secretariat. The need to further strengthen cooperation and links between ASEAN-WEN and the newly-launched SAWEN was also highlighted to make more effective efforts in stopping the illegal trade of wildlife.

8th AEG-CITES Meeting

Bandar Seri Begawan, Brunei Darussalam
February 8 – 10, 2011

From February 8 to 10, 2011, the ASEAN Experts Group on CITES held its 8th Meeting in Bandar Seri Begawan, Brunei Darussalam. The ASEAN-WEN PCU was invited as an observer to the meeting. Under a requested separate agenda item on ASEAN-WEN matters, the PCU presented: (1) a progress of ASEAN-WEN activities, (2) the ASEAN-WEN Project Proposal in conformity with the 5th ASEAN-WEN Meeting and Special Workshop on the Project Proposal to submit to the AEG-CITES for its endorsement; and (3) ASEAN-WEN implementation of activities under the ASEAN Regional Action Plan (2005-2010). The Meeting decided that the ASEAN-WEN Project Document will be reviewed by the AEG-CITES and subsequently be transmitted to the ASOF with the AEG-CITES comments for its support.

Inter-Agency Workshop

Ha Long, Viet Nam, March 18, 2011

The ASEAN-WEN PCU was invited by the Viet Nam CITES Authority to provide insight on the regional cooperation under ASEAN-WEN against wildlife trafficking in the Inter-Agency Workshop on Strengthening Control of Trans-National Wildlife Crime in Viet Nam. The workshop was attended by participants from the provincial offices and the Viet Nam-WEN cooperating national agencies, which sought to strengthen inter-agency cooperation and coordination at the provincial and local levels, and highlight how local cooperation can contribute to the success of the regional network. ■

The Nagoya Biodiversity Compact

By Dr. Ahmed Djoghlaf, Executive Secretary, Convention on Biological Diversity

In early May 2010, the world received a wake-up call. Global Biodiversity Outlook 3, based on the best available scientific evidence and drawing from 120 national reports of Parties to the Convention, warned of the consequences of our current development path. The continuing loss of species and habitats, predicted to accelerate under the growing impact of climate change, has placed so much pressure on the life-supporting ecosystems of our world, that many risk passing a "tipping point." We were reminded that the status of biodiversity for millions of years to come will be determined by the actions that human society takes in the coming decades.

Under the leadership of Japan, the world responded. Last October 2010, 18,500 participants representing 193 Parties and their partners adopted the Nagoya Biodiversity Compact comprising: a global and comprehensive biodiversity strategy for 2011-2020, known as the Aichi Targets; the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising out of their Utilization; the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety; and the Strategy for Resource Mobilization in support of the three objectives of the Convention.

Importantly, the Aichi Targets were endorsed by the 65th session of the United Nations General Assembly as the strategic plan of the whole biodiversity family. Moreover, the 650 participants at the October 2010 Nagoya Summit on Cities and Biodiversity agreed to translate the Aichi Targets into action plans at the city level. To this end, a Singapore urban biodiversity index, tested out in 34 cities, was endorsed in Nagoya.

Over 120 parliamentarians from around the world also agreed to endorse the Aichi Targets, in the Nagoya Declaration on Parliamentarians and Biodiversity, while a Multi-Year Plan of Action on South-South Cooperation on Biodiversity for Development was adopted by the Group of 77 and China in support of the Aichi Targets. In addition, representatives of 34 bilateral and multilateral donor agencies agreed to translate the plan into their respective development cooperation priorities. At the Ecosystems Pavilion, heads of agencies and international organizations discussed ways to better integrate actions to combat biodiversity loss, climate change and land degradation.

To support developing countries in implementing the Nagoya Biodiversity Compact, Japan established the Japan Biodiversity Fund. Japanese Prime Minister Naoto Kan committed US$2 billion for the next three years to financing biodiversity projects. Additional financial resources were announced by France, the European Union and Norway, with nearly US$110 million being mobilized in support of projects under the CBD LifeWeb Initiative, which aims at enhancing the Protected Area agenda. Parties will define mechanisms in time for the 11th meeting of the Conference of the Parties to the CBD (COP 11) in India in 2012, through which additional financial resources can be identified and channeled.

In order to engage people across the world beyond 2010, on the recommendation of the Nagoya meeting, the 65th session of the UN General Assembly declared 2011-2020 the UN Decade on Biodiversity. The Decade is beginning with a new wave of national biodiversity planning. A series of regional workshops is taking place to assist countries in translating the Aichi Targets into National Biodiversity Strategies and Action Plans (NBSAPs) before COP 11. And there is no time to waste, for any delay in developing new NBSAPs will augur poorly for the achievement of the Aichi Targets.

In addition to revising NBSAPs, the signing and ratification of the Nagoya Protocol is an urgent topic. The CBD Secretariat and the Global Environment Facility (GEF) are working to ensure that the first meeting of the governing body of this historic instrument will take place in India in October 2012 back-to-back with COP 11. To this end, 50 ratifications are required before July 19, 2012. The Nagoya-Kuala Lumpur Supplementary Protocol also is open for signature, and will enter into force 90 days after the deposit of the 40th instrument of ratification, acceptance, approval, or accession.

There is much to be done, for the task the world set itself in Nagoya was ambitious. It will require leadership and creative thinking from the international community to ensure the timely delivery of the Aichi Targets at the national and regional level. And yet no task today is more urgent. For biodiversity is life…biodiversity is our life. ■

Photo courtesy of the Government of Japan

Photo by Jason Pomeroy of Broadway Malyan

The Idea House: a multi-award winning prototype known as the first zero-carbon house in Asia.

Sustainable construction safeguards biodiversity

By Anjo C. Almario

Office, residential buildings and housing enclaves have been sprouting like mushrooms all over the Philippines. While some have environment- or biodiversity-friendly features, others are silent about them, if they have any. One office building boasts of having green roofs, a façade designed to reduce heat gains, indoor environmental quality and sustainable construction practices, while a condominium incorporates a roof garden.

The *Third Global Biodiversity Outlook's* report and the *ASEAN Biodiversity Outlook's* (ABO) findings revealed that the world and the region failed to meet the target of significantly reducing biodiversity loss by 2010, as the call for intensified protection and conservation of ecosystems extend beyond the confinements of government and nongovernment organizations and demands businesses to put this goal into action.

And among the industries that are starting their campaign for biodiversity-friendly business practices is the construction industry. It accounts for 35 to 40 percent of global carbon emissions, of which half will be generated by the growth economies in Asia by 2050, Singapore-based Jason Pomeroy, award-winning architect and director of international design practice, Broadway Malyan, said in an e-mail interview with the BusinessMirror.

Pomeroy noted that the construction industry forms a vital part of the Asian countries' human and economic development.

"The issue, therefore, is how one mitigates the cataclysmic effects of climate change that comes as a by-product of such industrial- or technology-driven growth, while ensuring that development can take place for the betterment of economies, society and the environment—now and in the future," he said.

Responsible construction is sustainable construction

The emerging concept of "sustainable construction" underscores the importance of biodiversity, where "preserving the sources of biodiversity and conserving biodiversity services can be its goal," said Roberto

Cereno, Makiling Center for Mountain Ecosystems deputy director and Makiling Botanic Gardens head.

Cereno added that sustainable construction could refer to a process or outcome that considers the requirement of present generation for food, clothing and shelter and the demand of future generations for biodiversity and environmental services.

For Pomeroy, sustainable construction seeks to ensure that buildings and places can be designed, constructed and operated which are focused on reducing carbon emissions, promoting the sense of community, while ensuring income generation to safeguard people's urban habitat for future generations.

"What one needs to bear in mind is that sustainable construction is nothing more than responsible construction—it is not a magical art that necessarily involves high technology," he said.

Meanwhile, biodiversity, or the idea that a variety of natural life forms can coexist in a given ecosystem can be greatly improved if people act responsibly by undertaking more sustainable construction that seeks to promote the incorporation of greenery to replenish the loss of the natural habitat in urban centers and, on a more macro scale, ensure that deforestation is reduced, Pomeroy noted.

Taking sustainable construction as a concern to Southeast Asia's biodiversity becomes a primary consideration such that the ASEAN Centre for Biodiversity (ACB) saw it fit to produce a publication on *Guidelines for Developers in Biodiversity Conservation.*

According to the booklet, developers should take into account the value and importance of biodiversity when undertaking construction projects, especially when implementation of activities is expected to cause harm or damage to areas with high biodiversity. Negligence may lead to serious implications and irreversible negative impacts to biodiversity.

"What one needs to bear in mind is that sustainable construction is nothing more than responsible construction—it is not a magical art that necessarily involves high technology."

Defining 'samu't saring buhay' and the threats to it

Dr. Edwino Fernando, professor at the College of Forestry and Natural Resources in the University of the Philippines Los Baños (UPLB), said in a briefing that biodiversity encompasses almost everything, as biodiversity is "nature," "biological resources" and "all life on Earth." "In its strictest sense, biodiversity refers to the quality, range or extent of difference between the biological entities in a given set," he added.

ACB executive director Rodrigo Fuentes noted that biodiversity, or "samu't saring buhay" in Filipino, is the variety within species, between species and their ecosystems.

The Association of Southeast Asian Nations (ASEAN) region occupies a miniscule three percent of the world's total area but is home to 18 percent of known endemic plant and animal species in the world.

But the ABO report published by the ACB noted that while Southeast Asia enjoys having rich biodiversity, specifically since it is home to three megadiverse countries—Indonesia, Malaysia and the Philippines—the region is also confronted with massive habitat and species loss.

It may be home to 18 percent of the world's plants and animal species, as assessed by the International Union for Conservation of Nature, but four of the world's 34 biodiversity hot spots and 2,517 out of its 47,915 species are threatened.

Specifically, the report noted that when it comes to forest ecosystems there is increasing per-capita consumption of forest products, while forest area decreases.

Among the critical pressure points are logging and timber harvesting, fires, conversion for agricultural use, human settlement and infrastructure development, mining and mineral resource extraction, invasive alien species, poaching/illegal wildlife trade, and slash-and-burn farming.

The United Nations Environment Programme (UNEP) data showed that the loss of ecosystem services could lead to a 25-percent loss in the world's food production by 2050, and based on ABO report's estimates, biodiversity loss could possibly affect over 500 million people in the ASEAN region alone.

Putting the dollar sign on ecosystem services

According to UNEP data, ecosystem services in ASEAN is valued at over $2 billion and the global ecosystem services provide up to $70 trillion per year of economic benefits.

An ACB paper said national economies and local livelihoods in many countries in the Southeast Asian region rely on natural resources, such as agricultural commodities, biological raw materials and ecotourism services.

In spite of their importance, the Millennium Ecosystem Assessment in 2005 found that two-thirds of the ecosystem services that people depend on are being degraded or used unsustainably; and it is likely that this degradation will grow significantly worse in the next decades. This is partly due to the fact that most of the benefits of biodiversity are not expressed in monetary terms and are invisible in national and local budgets. In turn, this means that they tend not to be factored into economic and financial planning, or properly reflected in the policies, prices and markets that people face as they make decisions about how to produce, consume and invest.

"The persistent undervaluation of biodiversity and ecosystems has resulted in many policy, institutional, price and market failures," the paper read.

It is also essential that an understanding of biodiversity and ecosystem costs and benefits is integrated into the actual prices, markets and incentive structures that people and companies face as they go about their day-to-day economic business, it added.

In a separate forum, Dr. Adachi Naoki, CEO of Response Ability Inc. Japan and executive director of Japan Business Initiative for Conservation and Sustainable Use of Biodiversity, argued that if businesses are going to operate on a business-as-usual way, at least seven percent is lost in the world's gross domestic product.

"Businesses should put premium attention in addressing biodiversity conservation," he said.

'Building blocks' of sustainable construction

Los Banos-based Dr. Filiberto Pollisco Jr., ACB program development specialist, said in an e-mail interview with the BusinessMirror that in view of standard environmental safeguards, construction projects should include at least an Environmental Management Plan (EMP) and an Environmental Monitoring Plan (EMoP) as part of the work plan to ensure that potential negative impacts to biodiversity are avoided, minimized or mitigated.

The EMP would spell the activities of the company to avoid, minimize or mitigate the impacts of construction on the biodiversity of the area. On the other hand, the EMoP would consider the time frame in which progress in avoidance, minimization and mitigation is measured.

"This would serve as a barometer in determining the decrease or increase in biodiversity of the area during the construction and operation of the property, in which case, decisions could be made for avoidance, mitigation or minimization," Pollisco noted.

Cereno agreed with Pollisco, adding that for a construction project to be considered biodiversity-friendly, it should not harm biodiversity species or should not degrade the natural ecosystems.

On the other hand, Pomeroy pointed out that a green design seeks to ensure that buildings are designed to minimize the negative impacts on the environment while balancing the needs of society and their economies.

This may entail trying to replenish the loss of open spaces and parks by the incorporation of alternatives—such as sky terraces and sky gardens—to bring greenery back into the city, and help foster greater biodiversity.

"With an increasing global population, we are seeing the reduction of the natural habitat that has promoted a biodiversity of flora, fauna, insects, birds, animals and other creatures in addition to ourselves," he said.

This reduction, Pomeroy said, has given way to increasing high-density urban development that is often made up of mass-manufactured artificial materials that have high heat-absorbent properties and, collectively, have reduced the quantum of greenery and, therefore, the biodiversity in urban habitats.

Asked on how the mushrooming of building constructions has affected ASEAN's biodiversity, specifically that of the Philippines', Cereno said constructions of built-up areas that destroy natural environment—especially converting forestlands into urban settlement areas (such as what is happening in Baguio and Tagaytay)—are threats to the protection of habitats (e.g., forest, mountains, rivers, lakes, etc.), natural ecosystems and their ecological processes (e.g., water cycle, carbon cycle), and services (e.g., watershed protection, soil-erosion control and flood prevention).

Pollisco said the risk for biodiversity loss is very high due to the rampant construction of infrastructure projects that are not properly regulated by the gov-

Photo by Jason Pomeroy of Broadway Malyan

The Valley: a low energy bio-climatic office development in Putra Jaya, Malaysia.

ernment in terms of compliance to environmental safeguards.

As such, construction projects disrupt the life cycle of species, whether plants or animals, especially in areas considered "environmentally critical area," such as protected areas, wetlands and areas where endangered species have been identified.

Pollisco pointed out that biodiversity should not be seen as "biodiversity for its own sake." It should be seen as beneficial to business, health, food security and for human well-being.

In this regard, construction industry is business, and they need timber/lumber for their construction, food to feed their workers, rubber to keep their heavy equipment running and, most important, water to use in their many activities.

"All these are goods originating from biological resources, which, in collective term, is biodiversity," Pollisco said.

Unregulated construction, according to Pollisco, would take away these biological resources by clearing the land of these resources to make way for their infrastructure that, in turn, would reduce nature's capacity to provide the goods and services necessary to sustainably operate the construction business.

The effects may not be immediate, but, for example, when water becomes limited to sustain the business in property development, such that in a subdivision, it may already be too late, he said. It remains crucial for property developers to consider protecting biodiversity in their projects.

"It is quite crucial, if one thinks deeply into it," Pollisco argued.

Property developers should have an objective in mind when going into biodiversity conservation and protection, and not just for the sake of planting trees for compliance to biodiversity conservation.

"The objectives should, of course, be in line with the corporate vision and mission such as to provide an atmosphere of relaxation for property owners," he noted.

To do that, property developers should make the landscape as beautiful and pleasing to the eye as possible, and have diverse species of plants and birds to greatly enhance the aesthetics and value of the property.

In turn, having high biodiversity in the property would, among others, improve the microclimate—such that consumption in power would significantly go down, the property would be buffered against suspended particulates (air pollution) and the general ambiance of the property would be improved. Once that is attained, more business—through property acquisition by potential locators—would increase.

It is important to note that the relaxing and spiritual atmosphere in the property is priceless, therefore, there would be a "give and take" for business and biodiversity, Pollisco said.

Commenting on companies' initiative to conduct tree planting to do away with the damages their business activities have caused, Pollisco noted that planting trees alone would not compensate for the long-term negative impacts to biodiversity that may be brought about by destructive construction practices.

"Developers must look at the bigger picture in that," he said, adding that when biodiversity conservation is concerned, the ecosystems approach should also be considered. This means that one has to consider the surrounding areas in their development planning and not just the project footprint their development activities occupy."

Having designed urban habitats in a variety of places around the world at a breadth of economic scale and need, Pomeroy observed that it is often the low-income environments that prove to be the most sustainable and compliant insofar as the 3Rs (reducing, reusing and recycling) are implemented on almost a daily basis in order to survive.

Pomeroy said sustainable construction is a "back-to-basics" approach that finds its roots in traditional, climatically responsive building designs and construction that are appropriate to a region.

He noted that this approach is all about considering: 1) The environment through careful site planning that responds to the climate; 2) Energy efficiency in order to reduce running costs and energy wastage; 3) Water efficiency to reduce wastage of such an important source; 4) Selecting the appropriate materials and resources with low toxicity and carbon footprint; 5) Managing construction processes that embrace modern methods to optimize speed and ease of construction to minimize waste; and 6) Embracing green technology sparingly, and only after a passive design solution has been sought that minimizes reliance on artificial lighting and cooling.

"I, therefore, believe that such a transition to a sustainable means of construction is straightforward and necessary if we are to combat climate change," he said.

Pomeroy argued it is commonly believed that sustainable construction is more expensive than the traditional form of construction, but if the method he highlighted is followed, it does not necessarily cost more, and if anything costs less in the long term, operating and maintenance costs are reduced.

The World Green Building Council reaffirms that what may be an initial three-percent to five-percent investment to deliver a Leadership in Energy and Environmental Design (LEED) gold-plat-

The risk for biodiversity loss is very high due to the rampant construction of infrastructure projects that are not properly regulated by the government in terms of compliance to environmental safeguards. Construction projects disrupt the life cycle of species, whether plants or animals, especially in areas considered "environmentally critical area," such as protected areas, wetlands and areas where endangered species have been identified."

Photo by Jason Pomeroy of Broadway Malyan

Acqua: an award-winning mixed-use residential-waterfront development in Mandaluyong City, Philippines.

inum building may, in fact, yield returns of seven to ten percent in property value or a three percent to five percent improvement in leasing and tenancy retention, he added.

Promoting sustainable construction and biodiversity conservation

When asked if government intervention in promoting sustainable construction is crucial, Pomeroy reiterated that both the government and the private sector have equally crucial roles to play.

"It is crucial for governments to be active in reducing carbon emissions, as they have the power to implement and enforce policies to safeguard our natural and urban habitat," he said.

For instance, the United Kingdom government is seeking wide reforms in the building and planning regulations to ensure that from 2016, all new residential properties will need to be net-zero carbon.

In Singapore, every project needs to attain a level of sustainability driven through the Building and Construction Authority (BCA) greenmark assessment, without which no construction can take place.

"However, this should not be without consultation with the private sector, who naturally responds to the ever-changing market forces of commerce and provide an effective voice of what is economically deliverable and what is not," he said.

True to this commitment, some businesses have already shifted their attention in helping preserve and protect biodiversity.

Sheila Vergara, ACB Biodiversity Information Management director, noted that in 2008, the Ninth Meeting of the Conference of Parties (COP9) to the UN Convention on Biological Diversity (CBD) launched the Business and Biodiversity Initiative (BBI).

"An initial of 34 international companies joined the BBI and signed the Leadership Declaration committing them to implement corporate social responsibility projects that can contribute to the 2010 goal of reducing biodiversity loss," she said.

According to ACB communication and public affairs chief Rolando Inciong, the BBI aims to intensify the engagement of the private sector in achieving the objectives of the CBD by encouraging companies to incorporate the conservation and sustainable use of biodiversity into their management systems by signing and implementing the Leadership Declaration; publishing their best practices; actively taking part in the CBD COP10 in Nagoya, Japan, in October 2010; and broadening the international profile of the Initiative. To date, there are 42 companies involved in the BBI, among them are Fujitsu, Volkswagen, Puma, Ricoh and Ritter Sport. In the Philippines, ACB has explored partnerships with SM Supermalls, Tagaytay Highlands, TeleTech, Absolute Chemicals, Cemex Philippines, Broadchem and Holcim Philippines to help conserve biodiversity.

"Without a green-policy agenda, the future of our planet could be very much driven by commercial desires, and so it is important for a middle ground to be struck—policy informed by commercial realities and vice versa," Pomeroy said. ■

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Photo by Mariani Bintiramli

UN Decade on Biodiversity 2011-2020

Living in harmony with nature

By Leslie Ann V. Jose-Castillo

"Biodiversity is Life. Biodiversity is our life." This was the key lesson learned when people across the globe celebrated 2010 as the International Year of Biodiversity (IYB). Actions toward conserving biodiversity whether big or small were witnessed as individuals and organizations contributed their share in celebrating life. IYB also provided an opportunity for the public to learn about the grim reality that biodiversity is being lost at alarming levels.

"Last year, during the International Year of Biodiversity, the world was given a stark warning. *Global Biodiversity Outlook 3,* drawing on the expertise of scientists from around the world, and mobilizing the best information from national reports, warned that our way of doing business would lead to tipping points beyond which the rich ecosystems that sustain us would collapse, leaving us all poorer. The time for choice is now. The actions that we take in the next decade will determine the fate of biodiversity for hundreds, if not thousands of years to come," Dr. Ahmed Djoghlaf, executive secretary of the Convention of Biological Diversity (CBD), said.

After the successful year-long event, the United Nations General Assembly declared 2011 to 2020 as the "United Nations Decade on Biodiversity." This is in response to the recommendation of the Conference of the Parties to the CBD at its tenth meeting in Nagoya, Aichi prefecture, Japan.

The Declaration aims to highlight the importance of biodiversity for the achievement of the Millennium Development Goals; emphasizes the need to achieve the full implementation of the objectives of the Convention and other biodiversity-related conventions, organizations and processes; reaffirms the importance of raising public awareness on biodiversity related issues; and stresses the need to build on the momentum achieved by the celebration of the International Year of

Biodiversity.

The UN Decade on Biodiversity supports and promotes the implementation of Biodiversity Strategic Plan 2011-2020 and the Aichi Biodiversity Targets at national, regional and international level with a special focus on addressing the underlying causes of biodiversity loss, which includes patterns of production and consumption.

The goal is to involve targeted actors such as National Focal Points; UN agencies and programs; regional, international and civil society organizations; business; children and youth; indigenous, local, and scientific communities; media and other stakeholders in mainstreaming biodiversity through communication, education and awareness, appropriate incentive measures, and institutional change.

All partners and stakeholders are encouraged to promote public awareness on biodiversity; carry out actions that support the Strategic Plan; strengthen networks for implementation of the CBD; enhance coordination of their actions; and increase mainstreaming efforts.

Part of the Strategic Plan for Biodiversity is the five strategic goals and 20 targets, collectively known as the Aichi targets. The five strategic goals are to: address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society; reduce the direct pressures on biodiversity and promote sustainable use; improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity; enhance the benefits to all from biodiversity and ecosystem services; and enhance implementation through participatory planning, knowledge management and capacity building.

The ASEAN Centre for Biodiversity (ACB) expressed its support for the Decade on Biodiversity. "Biodiversity conservation is not just a one-year concern; it should be a lifetime commitment and the decade-long celebration is actually a recognition that biodiversity is something that should be protected and sustainably managed year-round. We should keep in mind that we should live in harmony with nature," Mr. Rodrigo U. Fuentes, executive director of ACB, said.

"We encourage the governments of ASEAN Member States to declare 2011-2020 as the National Decade on Biodiversity in their respective countries. This way, the celebration will be institutionalized with national governments leading the activities."

Communities and individuals are invited to be involved in the various activities of the Decade by learning more about biodiversity in their region and how their consumption patterns and daily activities are affecting it. People are also encouraged to voice their views about biodiversity to the government, different private sectors, and their communities through knowledge sharing. Finally, everyone is called to conserve biodiversity by making responsible consumption choices, supporting conservation activities and organizations, and joining local environmental non-government organizations. Moreover, people can organize their own activities and make creative solutions in staving off biodiversity loss. Information on the Decade on Biodiversity, including the logo can be found on the official website of the United Nations Decade on Biodiversity at www.cbd.int/2011-2020. ■

Take action for biodiversity

Private companies, landowners , fishermen and farmers take most of the actions that affect biodiversity. Governments need to provide the critical role of leadership, particularly by setting rules that guide the use of natural resources, and by protecting biodiversity where they have direct control over the land and water. Under the Convention on Biological Diversity (CBD), governments undertake to conserve and sustainably use biodiversity. They are required to develop national biodiversity strategies and action plans, and to integrate these into broader national plans for environment and development. This is particularly important for such sectors as forestry, agriculture, fisheries, energy, transportation and urban planning. The CBD also requires its Parties to:

- Identify and monitor the important components of biodiversity that need to be conserved and used sustainably;
- Establish protected areas to conserve biodiversity while promoting environmentally sound development around these areas;
- Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species in collaboration with local residents;
- Respect, preserve and maintain traditional knowledge of the sustainable use of biodiversity with the involvement of indigenous peoples and local communities;
- Prevent the introduction of, control, and eradicate alien species that could threaten ecosystems, habitats or species;
- Control the risks posed by organisms modified by biotechnology;
- Promote public participation, particularly when it comes to assessing the environmental impacts of development projects that threaten biodiversity;
- Educate people and raise awareness about the importance of biodiversity and the need to conserve it; and
- Report on how each country is meeting its biodiversity goals.

While governments should play a leadership role, other sectors of society need to be actively involved. After all, it is the choices and actions of billions of individuals that will determine whether or not biodiversity is conserved and used sustainably.

The ultimate decision-maker for biodiversity is the individual citizen. The small choices that individuals make add up to a large impact because it is personal consumption that drives development, which in turn uses and pollutes nature. By carefully choosing the products they buy and the government policies that they support, the general public can begin to steer the world towards sustainable development. Governments, companies, and everyone have a responsibility to lead and inform the public, but ultimately it is individual choices, made billions of times a day, that count the most. *Secretariat of the Convention on Biological Diversity.*

International Year of Forests 2011

Protecting forests for people

By Leslie Ann V. Jose-Castillo

"I think that I shall never see a poem as lovely as a tree. A tree whose hungry mouth is pressed against the earth's sweet flowing breast; a tree that looks at God all day and lifts her leafy arms to pray; a tree that may in summer wear a nest of robins in her hair; upon whose bosom snow has lain; who intimately lives with rain. Poems are made by fools like me, but only God can make a tree."

Some stories say that when famous poet Joyce Kilmer wrote Trees in 1913, he was inspired by the numerous oaks, maples and white birches that he saw while looking out his office window in New Jersey. Simple yet meaningful, the poem pays tribute to the beauty and usefulness of trees. Almost a decade later, Kilmer's poem remains much-quoted in many parts of the world. This year, its message rings louder as the world celebrates the International Year of Forests (Forests 2011).

Launched on February 2, 2011 during the High-Level Segment of the 9th Session of the United Nations Forum on Forests (UNFF 9) in New York, Forests 2011 was declared to raise awareness on sustainable management, conservation and sustainable development of all types of forests. The celebration, with the theme "Forests for People," will serve as a global platform to celebrate people's action to sustainably manage the world's forests.

The declaration comes at a critical time when the world's forests are facing immense pressures and challenges.

The global launch was led by Joseph Deiss, President of the 65th session of the UN General Assembly. Apart from Deiss, other speakers were UN Secretary-General Ban Ki-moon (through a video message), UN Under-Secretary-General for Economic and Social Affairs Sha Zukang, and ministers from Croatia, Rwanda, Canada and Mexico. Nobel Peace Prize Laureate Wangari Maathai, UNFF Director Jan McAlpine, Global Environment Facility CEO and Chair Monique Barbut, and many other experts also shared their views on the celebration.

Photo by Leslie Ann Jose-Castillo

At the launch, environmental experts and world leaders joined hands in calling for the sustainable management of forests in the interest of human development.

"We have a chance to agree on how best to realize the full potential of forests – for sustainable development, economic stability,

International Year of Forests 2011

All over the world, governments, schools and youth, civic organizations, business, media, conservation organizations, and individuals will celebrate the International Year of Forests (FORESTS 2011). The United Nations General Assembly declared FORESTS 2011 to raise awareness on sustainable management, conservation and sustainable development of all types of forests. The celebration will serve as a global platform to celebrate people's action to sustainably manage the world's forests.

Forests, which cover 31 percent of the world's total area, play a key role in sustaining life on Earth. Forests are home to 300 million people around the world and to 80 percent of our terrestrial biodiversity. The livelihoods of over 1.6 billion people depend on forests. Some 30 percent of forests are used for production of wood and non-wood products. In 2001, global trade in forest products was estimated at $327 billion.

What other benefits do we get from trees? A single mature tree, for example, can release enough oxygen back into the atmosphere to support two human beings. It can absorb 4.5 kilos of air pollutants, including 1.8 kilos of ozone and 1.4 kilos of particulates.

Trees store carbon and help slow human-caused climate change. Tree canopies and leaf litter protect the soil

the fight against poverty and our efforts to ensure future prosperity for all," Secretary-General Ban Ki-moon said.

According to Deiss, "We have to eradicate poverty, but not the forests." He also underscored that "each minute that we spend on this planet breathing in and breathing out, about 25 hectares of forests are lost. Ultimately, as history reminds us, in the past, entire civilizations collapsed due to deforestation."

By providing food, medicine, timber, source of livelihood and many other products and services, forests play a crucial role in sustaining lives of billions of people. Forests are home to 300 million people around the world and to 80 percent of our terrestrial biodiversity. The livelihoods of over 1.6 billion people depend on forests. Some 30 percent of forests are used for production of wood and non-wood products. In 2001, global trade in forest products was estimated at $327 billion.

However, the growing population's dependence on these products and services, as well the conversion of forests into agricultural and industrial lands, are taking their toll on the world's forests.

The Food and Agriculture Organization (FAO) estimates that every year 130,000 square kilometers of the world's forests are lost due to deforestation. Conversion to agricultural land, unsustainable harvesting of timber, unsound land management practices, and creation of human settlements are the most common reasons for this loss of forested areas.

In Southeast Asia, the ASEAN Biodiversity Outlook reported that the transformation of forests has been quite extensive especially over the last 50 years. According to the report, the entire region was covered by forests 8,000 years ago. As of 2000, only 47 percent of the region was forested. By 2007, the forest cover of the entire region was down by four percentage points at 43 percent. Between 1980 and 2007 the ASEAN forests have decreased by a total of 555,587 square kilometers, an area roughly the size of Thailand.

Photo by Filiberto Pollisco, Jr.

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Experts at the launch of Forests 2011 emphasized that forests and people must work together. For Mr. Deiss, it is important to involve people from various levels and sectors to achieve the goal of protecting forests for people.

"It is my hope that this Year of Forests will raise high political awareness and galvanize activities from the grassroots up so that the interlinked challenges of biodiversity loss, climate change and desertification can be effectively tackled for the benefit of sustainable development," Mr. Deiss said.

He expected that "in 2011 and beyond, every country and each citizen of our planet will take action in favor of forests and bring this message across: we are all dependent on forests as much as forests are dependent on us."

surface from the erosive power or rain. Trees purify our air and water and provide us with food, timber and medicine. Forests provide outdoor recreation, education and ecotourism.

Over a 50-year lifetime, a tree generates $31,250 worth of oxygen, provides $62,000 worth of air pollution control, recycles $37,500 worth of water, and controls $31,250 worth of soil erosion.

All these ensure the well-being and survival of humans and all forms of life relying on trees and forests.

FORESTS 2011 has a logo which was designed to convey the theme of "Forests for People" celebrating the central role of people in the sustainable management, conservation and sustainable development of our world's forests. The iconographic elements in the design depict some of the multiple values of forests and the need for a 360 degree perspective: forests provide shelter to people and habitat to biodiversity; are a source of food, medicine and clean water; and play a vital role in maintaining a stable global climate and environment. All of these elements, taken together, reinforce the message that forests are vital to the survival and well-being of people everywhere, all seven billion of us. For the use of the FORESTS 2011 logo, please log on to http://www.un.org/en/events/iyof2011/index.shtml for the documentary requirements.

Everyone is encouraged to participate in the celebration of FORESTS 2011, linking it to biodiversity conservation, as forests and biodiversity are inextricably tied up with each other.

The ASEAN region played a very visible role in the global celebration of the International Year of Biodiversity 2010. FORESTS 2011 is another opportunity for ASEAN to continue highlighting the values of biodiversity through conservation and protection of our forests. ■

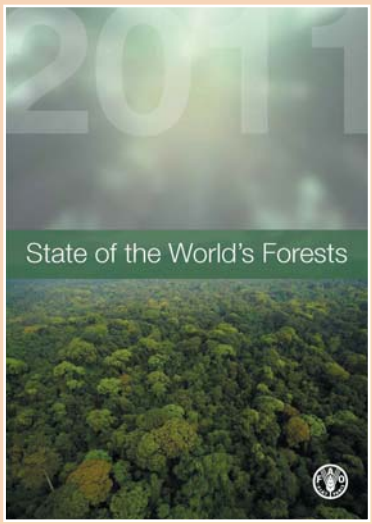
In Southeast Asia, the ASEAN Centre for Biodiversity issued a statement of support for Forests 2011. "The ASEAN region played a very visible role in the global celebration of the International Year of Biodiversity 2010. This 2011, we will show the same enthusiasm and support for FOREST 2011 as this celebration will enable us to continue highlighting the values of biodiversity through conservation and protection of our forests," Mr. Rodrigo U. Fuentes, executive director of ACB, said.

He invited governments, schools and youth, civic organizations, business, media, conservation organizations, and individuals to participate in the worldwide celebration of Forests 2011. "We need all hands on deck to ensure that the well-being and survival of humans and all forms of life relying on trees and forests," Mr. Fuentes said. For more information on the International Year of Forests 2011, log on to http://www.un.org/en/events/iyof2011/. ■

FAO launches 2011 State of the World's Forests report

Millions of forest-dependent people play a vital role in managing, conserving, and developing the world's forests in a sustainable manner, but the outside world often underestimates their rights to use and benefit from local forest resources, says the State of the World's Forests report by the Food and Agriculture Organization (FAO), launched at the opening ceremony of the UN International Year of Forests in New York on February 2, 2011.

"What we need during the International Year of Forests is to emphasize the connection between people and forests, and the benefits that can accrue when forests are managed by local people in sustainable and innovative ways," said Eduardo Rojas, FAO's Assistant Director-General for Forestry.



An increased interest in social and environmental sustainability presents a unique challenge to the forest industry to innovate and restructure itself to be able to respond to the demands of the 21st century and to change the generally poor perception of wood products by consumers, who often feel guilty about using wood as they think it is ethically unsound to cut down trees.

The FAO report stresses that on the contrary, the forest industry forms an important part of a "greener" economy and wood products have environmental attributes that would appeal to people. Wood and wood products, as natural materials, are made from renewable resources that store carbon and have high potential for recycling.

The forest industry is responding to numerous environmental and social concerns by improving sustainability of resource use, using more waste materials to make products, increasing energy efficiency and reducing emissions. For example, 37 percent of total forest production in 2010 came from recovered paper, wood waste and non-wood fibers, a figure that is likely to grow to up to 45 percent in 2030, with much of that growth from China and India.

Furthermore, most solid wood products, like sawn wood and plywood, are produced with relatively little energy use. This results in a low "carbon footprint" from their production and use, which is further enhanced by the fact that carbon is stored in wood products. Pulp and paper production is more energy intensive but is coming under increased pressure to reduce its energy intensity and carbon emissions by adopting improved technologies and emission trading.

Many governments believe that the forest industry has great potential in promoting a "greener economy" including through the use of bio-energy, wood promotion activities, and new wood based products and biomaterials and many developed countries have increased their support for the development of forest industries over the last few years.

The FAO report also stresses that urgent action is needed to protect the values of forests that sustain local livelihoods in the face of climate change. Recent decisions taken in Cancun in December 2010 on REDD+ (Reducing Emissions from Deforestation and Degradation) should be aligned with broad forest governance reform and enable the participation of indigenous people and local communities. Their rights should be respected in national REDD+ activities and strategies, the report suggested. According to the report, countries will need to adopt legislation to clarify carbon rights and to ensure equitable distribution of costs and benefits from REDD+ schemes. While REDD+ forest mitigation actions are attracting major attention and funding, the role of forests in climate change adaptation is crucial but often underestimated by governments. The report stresses the importance of forests in contributing to the achievement of national adaptation strategies.

Forestry measures can reduce the impacts of climate change on highly vulnerable ecosystems and sectors of society. For example, stemming the clearance of mangroves (one fifth of which are believed to have been lost globally since 1980), would help protect coastlines from more frequent and intense storms and tsunamis. Planting forests and trees for environmental protection and income could help the poor in arid countries to be less prone to droughts. Examples of adaptation measures in developing countries include mangrove development and conservation in Bangladesh, forest fire prevention in Samoa and reforestation programs in Haiti.

The report points out that the close links between forests, rural livelihoods and environmental stability underline the need for substantial financial support for forest adaptation measures.

Without such attention given to local-level issues, there is a risk of eroding traditional ways of life and threatening some of the most biologically diverse and environmentally important forests in the world," the report stated. To download a copy of the report, log on to http://www.fao.org/docrep/013/i2000e/i2000e00.htm. *FAO news*

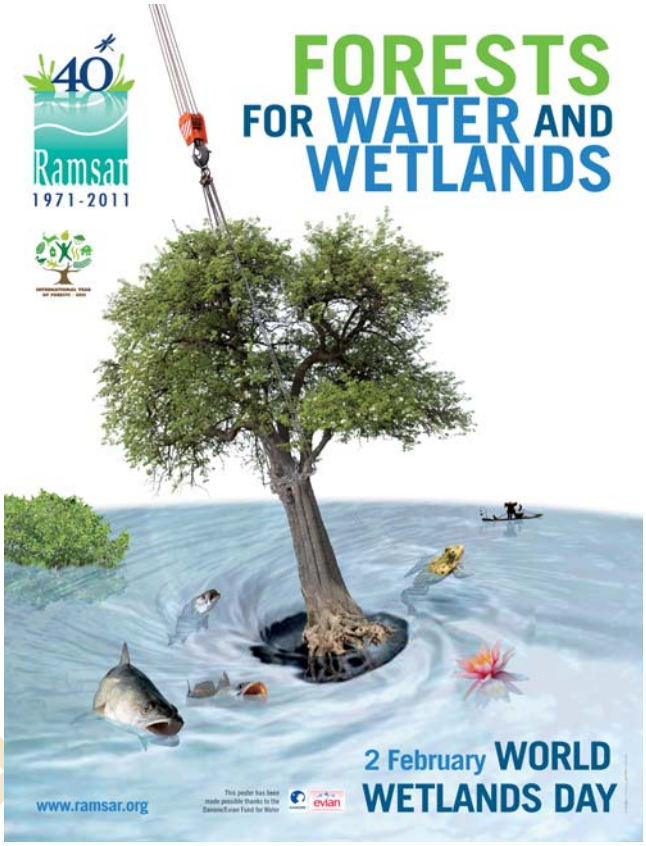
World Wetlands Day, February 2

Celebrating wetlands

The international community celebrated World Wetlands Day on February 2, 2011. February 2 each year marks the date of the adoption of the Convention on Wetlands of International Importance in 1971 in the Iranian city of Ramsar on the shores of the Caspian Sea. Each year since 1997, governments, non-governmental organizations, and groups of citizens at all levels of the community have taken advantage of the opportunity to undertake actions aimed at raising public awareness of wetland values and benefits in general and the Ramsar Convention in particular.

Rivers, swamps, marshes, lagoons, deltas, and bogs - they are collectively known as wetlands. We see them yet we fail to recognize their value. Many of us do not realize the fact that wetlands are important ecosystems that support vital ecological functions, and provide valuable products and services for human survival.

Wetlands provide us with water and fish. They are as productive as coral reefs, serving as habitat for plants and animals including many endangered or threatened species. Mangroves, freshwater turtles, waterbirds, crabs, monitor lizards, river dolphins, lobsters, and



Forests and Wetlands – Key facts

Forest and wetland ecosystems are inter-dependent

- Forests route and store water, regulate soil erosion and pollution, and help prevent desertification and salinization
- Many forests depend on groundwater for survival and rely on wetlands to replenish it
- Many wetlands are forested, and many forests are wetlands.

Forests and wetlands capture and store water, prevent soil erosion, and serve as natural water purification systems

- Less than 0.03% of the world's water is freshwater and in a liquid form available for use
- More than one in six people worldwide still do not have access to safe drinking water
- By 2025, 1.8 billion people will be living in regions with absolute water scarcity, with the possibility of two-thirds of the world's population experiencing water-stress conditions
- Approximately 80 per cent of the world's population live in areas where water resources are insecure
- Over three quarters of the world's accessible fresh water comes from forested watersheds and wetlands
- More than one third of the world's largest cities obtain some, if not most, of their drinking water supplies from forested protected areas and wetlands.

Forests and wetlands support biodiversity and provide valuable ecosystem services

- Some 80 per cent of people in developing countries rely on traditional medicines–a majority of which originate from plants found in forests and wetlands
- Wetlands, such as mangroves and river floodplains, protect human communities from natural catastrophes such as tsunamis and floods
- Natural disasters, most of which are due to water related impacts, cause a sustained reduction of 14 per cent in GDP of least developed countries
- OECD countries and Brazil, the Russian Federation, India and China spend US$ 750 billion yearly in water infrastructure
- Natural forests and wetlands are among the best stores of carbon—which requires a continued availability of water—and are important in combating climate change
- Water-related services of tropical forests collectively account for a value of more than US$7,000 per hectare per year, up to 45 per cent of the total value of forests, and exceeding the combined value of climate regulation, food, raw materials, and recreation and tourism.

Forests and wetlands are severely threatened

- Over the last 8,000 years about 45 per cent of the Earth's original forests have disappeared, most of which were cleared during the past century
- Half of the world's wetlands have been lost since 1900
- Approximately 13 million hectares of the world's forests, an area the size of Greece, are lost to deforestation each year
- Clearing, transformation, drainage and water use for agricultural development is the main cause of wetland loss worldwide.

crocodiles are among the many species that thrive in these habitats.

Wetlands also help in water purification and waste treatment, flood control and storm protection, as well as provide recreational opportunities. They are also crucial in recharging groundwater reservoirs. According to the Secretariat of the Ramsar Convention, these services have been valued at US$14 trillion annually.

Wetlands and Forests, this is the theme for World Wetlands Day 2011, especially chosen because 2011 is the International Year of Forests.

Forested wetlands bring us special benefits. Mangroves, peatswamp forests, and freshwater swamp forests are biologically diverse, helping us manage our freshwater, and providing humans with many other 'services' across the globe including vital roles in carbon storage, allies in the face of climate change. The health of our wetlands, whether forested or not, is linked to the health of forests. Losing and degrading forests means losing and degrading wetlands.

Despite the values of forests and wetlands, humans continue to misuse and abuse them. Despite their utility, wetlands are often under threat from development, from drainage and conversion. Large areas of wetlands have been lost mostly to agricultural development. Those that remain are heavily degraded due to the combined impacts of mismanagement, overexploitation, and pollution. The effects of climate change further exacerbate the situation.

This poses a real threat to biodiversity. People should realize the crucial link. When wetlands are degraded, the species that live in them face serious trouble. What does this mean to humans? Two basic needs for human survival are taken away - food and water.

The ASEAN and its ten Member States are taking part in World Wetlands Day 2011 as majority of them have recognized the special attributes of the wetlands and are Parties to the Ramsar Convention. To date, there are 29 Ramsar sites within the ASEAN region, occupying a total area of 1,320,390.95 hectares. ■

Water security depends on forests and wetlands

(Montreal, 2 February 2011) – In our rapidly urbanizing world water security is a key issue. Today, as we celebrate World Wetlands Day and inaugurate the International Year of Forests, it is important to recognize the critical links between water, forests, wetlands and people. More than one in six people worldwide still do not have access to safe drinking water. We are witnessing escalating problems with water scarcity and increasing problems with extremes in water availability – such as droughts and floods.

Estimates suggest that by 2025, 1.8 billion people will be living in regions with absolute water scarcity, with the possibility of two-thirds of the world's population experiencing water-stress conditions. Recent assessments suggest that about 80 per cent of the global population already live in areas where water is insecure.

Water is tightly linked to forests and wetland ecosystems through the hydrological cycle. Forests and wetlands regulate water availability and serve as natural water purification systems. Forests help route water in a watershed by stabilizing soils, which allows water to enter them, and also regulate soil erosion.

This maintains catchments, preventing desertification and salinization. Forests also emit water vapour into the atmosphere, thereby regulating local climate and rainfall. In turn, forests depend on groundwater and soil moisture for their survival and rely on wetlands to replenish this.

There are also crucial economic benefits from the linkages between water, forests and wetlands. For example, forested protected areas provide a significant portion of the drinking-water supply to at least one third of the world's largest cities. Forested wetlands, like mangroves, protect human communities from natural catastrophes such as tsunamis, and river floodplains play a key role in protecting downstream communities from floods.

The Economics of Ecosystems and Biodiversity (TEEB) study, for example, estimates that water-related services of tropical forests account for more than US$ 7,000 per hectare each year, i.e., up to 45 per cent of their total value. This

exceeds the value of timber, tourism and carbon storage combined. The TEEB study concludes that, "There is a compelling cost-benefit case for public investment in ecological infrastructure (especially restoring and conserving forests, mangroves, river basins, wetlands, etc.)…"

Yet, despite their importance to human well-being, forests and wetlands are among the most threatened ecosystem types. Deforestation is still alarmingly high and poses a major threat to water catchments and the quantity and quality of available fresh water. Concurrently, it is estimated that half of the world's wetlands have been lost since 1900, resulting in adverse effects for many natural cycles and an unprecedented loss of biodiversity. It is now becoming widely recognized that wetland loss is a major contributing factor in increasing flood risk, particularly for cities. There are, however, some positive trends. We are seeing better use of these ecosystems through the conservation of their valuable functions in order to address water security needs.

The management of forests and wetlands are inextricably linked. It is therefore imperative that policymakers consider ecosystems in their entirety and manage them more wisely to achieve sustainable and cost-effective solutions to our water related needs.

Achieving water security is probably our most important environmental challenge. For this reason, the

Strategic Plan for Biodiversity 2011-2020, adopted at the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity in Nagoya, recognizes the cross-cutting nature of water in underpinning the services that we need from ecosystems. ■

International Women's Day, March 8

Women as custodians of biodiversity

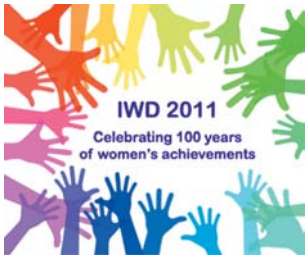
By Sahlee Bugna-Barrer

This year marks the 100th anniversary of International Women's Day, which was first commemorated on March 19, 1911 in Austria, Denmark and Germany. In 1975, during International Women's Year, the United Nations (UN) officially began celebrating March 8 as International Women's Day. The UN cited two reasons for setting aside one day to celebrate Women's Day: to recognize the fact that securing peace and social progress and the full enjoyment of human rights and fundamental freedoms require the active participation, equality and development of women; and to acknowledge the contribution of women to the strengthening of international peace and security.

Since the early days of Women's Day celebrations, the event has gained a wider meaning, and it has become an occasion to review how far women have come in their struggle for equality, peace and development. It is also an opportunity to unite, network and mobilize for meaningful change.

Women have made a mark in many areas, including the environment. Women have been recognized for centuries as guardians of traditional knowledge of biodiversity. After all, female figures are prominent in elements of life and nature. Various cultures across the globe feature a Mother Earth or Goddess. Since they portray primary roles in fertility and birth, and as natural caretakers of children and families, women also play an active role as primary users of nature to serve the needs of loved ones.

Women's role as caregivers for children and families allowed them to create an intimate relationship with



the environment. They traditionally use nature in the preparation of food, clothes, shelter, utensils and medicines. As primary users of environmental services, women became knowledgeable in the cultivation, breeding, and use of various plants and animals. Their awareness of the building, nourishing, and healing elements of the environment were then passed to future generations of women, who also cared for nature and biodiversity since these provided the necessary materials that allowed families and communities to survive.

Today, women continue to gather firewood and other plant and animal products for food, medicine, and house building. In times of famine and conflicts, knowledge of edible wild food has enhanced food security in many communities. Rural women often use wild root crops, insects, and fruits, leaves and roots of native plants to supplement the family diet when food is scarce.

Women also play primary roles in agriculture. After men have cleared the land, women sow, weed, hoe and bind the stalks. On their own plots, they manage home gardens, growing a wide variety of vegetables, relishes and condiments. In countries such as Bolivia, Colombia, Peru, Viet Nam, Indonesia and India, women are responsible for the selection, improvement and storage of seeds and the manage-

"Women have made a mark in many areas, including the environment. Women have been recognized for centuries as guardians of traditional knowledge of biodiversity."

Photo courtesy of Green Community

ment of small livestock. In sub-Saharan Africa, women have grown over 120 different plant varieties in small areas alongside cash crops handled by men. The Food and Agriculture Organization reports a trend towards the "feminization of agriculture" largely due to the occurrence of war, pandemics, and migration of men to urban areas seeking paid work. Women's responsibilities have thus increased as they continue to contribute to food production.

Another women's task tied closely to biodiversity is the collection of medicinal plants, which may be used for curing ailments while also serving as fuel, fertilizer and pesticide. Their immense knowledge of the healing qualities of biodiversity is crucial since the community depends on it, thus making the preservation of such knowledge and the biodiversity on which it is based all the more important. Since this knowledge is often now in the minds of elderly women, there is a need to document such information so that more generations can benefit from biodiversity resources.

As biodiversity resources continue to degrade and deteriorate, there have been renewed calls to return to traditional management practices of natural resources. This entails the collection and documentation of traditional knowledge of biodiversity, which, however, has eroded. The youth have become detached from nature and fewer individuals have been willing to learn about nature. The loss of species that constitute the wealth of biodiversity known and enjoyed by previous generations have also contributed to the loss of knowledge, as well.

As primary custodians of traditional knowledge of biodiversity, women should also be involved in the decision-making process in the use of nature and biodiversity resources. While various international conventions on gender and the environment continue to encourage the inclusion of women in all aspects of the management of biodiversity, governments should be able to translate this into reality. Still, women remain in the fringes, and while some countries have shown examples of women who have led groundbreaking environmental movements, there should be a move to mainstream women's voices and decisions into the overall decision-making process in the use of nature's resources. Since women's local knowledge is acknowledged as fundamental to food security and biodiversity conservation, it makes sense to involve more women in the sound management of biological resources.

To increase the involvement of women and enhance their role as decision-makers and managers of biodiversity, governments and development organizations should treat gender as a cross-cutting issue that is relevant in different areas of development, as well as incorporate gender concerns into national biodiversity strategies and action plans.

Recognized as custodians of biodiversity, stronger efforts from all sectors can lead to greater strides in women as managers of biodiversity resources. As the world celebrates 100 years of International Women's Day, where women have made milestones in various sectors such as business, health, education, peace and security, governments should also ensure the enhanced role of women in environment as keepers of traditional knowledge and consequently, sound managers of biodiversity resources. ■

World Water Day, March 22

World focuses on water and urbanization

Each year on March 22, the world celebrates International World Water Day to focus attention on the importance of water and the sustainable management of global water resources. This year, International World Water Day highlighted Water and Urbanization, reflecting the importance of water in ever-growing urban populations around the world.

Access to water is vital to the location and growth of cities. Great cities have been founded on riverbanks, which provide their inhabitants with freshwater, allowing agricultural activities to thrive, and trade to ensue through water transport. Cities have thus become a magnet for migration since urban areas are viewed as sites of development, innovation and social and economic improvement.

An increasing population, however, puts a strain in resources due to growing demands. As more people move into urban areas, more land, that used to be agricultural areas and forest, are converted to provide housing and buildings for offices and commercial establishments. Prices of goods and services are higher. Water becomes scarce as water systems and sources are unable to cope with the demands of a growing population. Many of those who migrate to urban areas and do not have sufficient financial means end in informal settlements, which often lack adequate drinking water and sanitation facilities. A lack of safe water and sanitation in cities leads to cholera, malaria and diarrhea.

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The observance of World Water Day 2011 focused international attention on the challenges and opportunities of urban water and sanitation management. It also alerted the world to the adverse global situation in urban water management, as well as encouraged decision-makers to seize opportunities to address these challenges. On March 22, 2011, a concerted effort was made to: raise the profile of the urban water challenge and generate commitment to tackle this crucial issue; facilitate policy dialogue and implementation partnerships for lasting water service improvements; and-

promote innovative solutions to provide safe water and sanitation to growing informal settlements.

Growing urbanization poses many challenges for governments to cope with the water and sanitation demands of city dwellers. In general, water utilities in less developed regions have a long way to go in improving efficiency and effectiveness to meet state obligations and user's needs.

Current infrastructure has to be maintained to ensure that water is not lost to faulty connections and leaks. In some cases, residents tap into water systems, causing slower flow to legitimate connections, and essentially causing damage to pipes and water connections. Infrastructure for new water sources is more costly to develop, but governments may have to look into alternatives to respond to the demand for clean water.

Pollution control has to be maintained. When industrial and domestic waste is dumped into water resources, this diminishes the supply of freshwater, causes environmental degradation, increases costs for water treatment, and adversely affects major industries such as agriculture.

Investments in water treatment facilities are necessary to recycle water. Industries that are major water consumers, such as factories, resorts, hotels and hospitals, should have efficient water treatment equipment to satisfy both industry demands and the need to conserve and save scarce water resources. Conservation measures must also be set in place so that water is not used unnecessarily.

According to Rodrigo U. Fuentes, executive director of the ASEAN Centre for Biodiversity, ecosystems that serve as water resources need to be protected.

"Many watersheds that provide clean water to urban centers are threatened by illegal logging, population encroachment, siltation, and pollution. Climate change is another threat to the water sector, particularly through the impact of floods, droughts, or extreme events. The effect of climate change will mean more difficult operations, disrupted services and increased cost for water and wastewater services," Director Fuentes explained.

A threatened water supply and strained drinking and sanitation facilities require efficient water management. It requires innovative approaches to raise awareness of the need to protect and conserve water resources, as well as technical support to ensure that infrastructure for water facilities are well maintained. Cities of the future should explore opportunities to adopt more efficient water treatment technologies, increased re-use of water and wastes, better optimization of the interdependency between water and power, and improved demand management. Facilities should also be improved to reduce the costs of water provision, improve access to services in adjacent rural areas, and minimize environmental and downstream pollution.

Governments have to move quickly and work with the private sector in the face of these tremendous threats to address urgent issues in water management. Strong governance in addressing supply and water system issues will help alleviate immediate water use concerns. The private sector should also contribute by contributing to watershed protection activities, investing in water efficiency measures in industries. A concerned citizenry also has to be motivated to help in the protection of watersheds and conservation of water resources. ■

World Health Day, April 7

Biodiversity ensures human well-being

By Sahlee Bugna-Barrer

Biodiversity took center stage as the international community celebrated World Health Day on April 7. Biodiversity refers to all forms of life on Earth, and the many interactions between elements of nature that make life on Earth possible. The diversity of life provides the basis for all forms of food, shelter, clothing and medicine. Ecosystem products and services such as food, clean air and water and fuel assure quality of life for all living things. Conversely, the degradation of these resources resulting in water scarcity, lack of food security, and polluted air ultimately affect health. This underpins the relationship between biodiversity and human well-being.

Biodiversity heals

Biodiversity provides many direct benefits to human health. Forests provide the variety of plant sources that build agricultural industries that provide fruits, vegetables, grains and meat on people's tables. The oceans provide all forms of fish and marine products that drive fishery industries. Biodiversity is integral to world food production since it provides the genetic resources for all crops, livestock, and marine species harvested for food. Access to a sufficiency of a nutritious variety of food is a fundamental determinant of health.

Ecosystem services provided by a healthy biodiversity assure human health. Lush forests support watersheds that trap water for human consumption, agricultural irrigation and domestic and industrial use.

These same forests prevent erosion that causes siltation and pollution of water sources, assuring people of a supply of clean freshwater. Healthy forests and seas trap carbon and other greenhouse gases and help regulate climate. With biodiversity, people will also have access to clean air, clean water, and a healthy climate.

Biodiversity is nature's pharmacy. All kinds of medicines, from those used by indigenous peoples to new discoveries that fight HIV/AIDS and cancer, continue to be used and discovered from nature. Traditional medicine continues to play an essential role in health care. They are estimated to be used by 60 percent of the world's population and in some countries are extensively incorporated into the public health system.

Natural products collected from the wild are widely used for both medical and cultural purposes. Many traditional medicines provide relief against cough, colds, stomach pains, toothaches, muscle pain and fever. One example is lagundi *(Vitex negundo),* a shrub that grows in the Philippines and is traditionally used to treat cough. Lagundi has been clinically tested to be effective in the treatment of colds, flu, bronchial asthma, chronic bronchitis and pharyngitis. Lagundi is now widely available in capsule form and syrup for cough.

Biodiversity continues to provide new sources of medicine

Recent discoveries show many species as having properties that may combat HIV and cancer. For instance, bintangor (*Calophyllum lanigerum* and *C. tesymannii*) is an exceedingly rare South Asian tree found in Borneo in the state of Sarawak in Malaysia. Its leaves and twigs yield Calanolide, a compound with anti-HIV properties. The bintangor tree has practically disappeared, most likely due to great demand for use as fuel wood or building material. As such, a pharmaceutical company has developed and patented a process for the total synthesis of the Calanolide compound so that it can be used to treat patients with HIV.

Diazona angulata is a sea squirt that was discovered off the coast of central Philippines in 1990 as scientists were looking for species that might lead to useful drugs. It looks like a translucent doughnut and lives in colonies anchored to rocks. In 1991, scientists extracted a tiny amount of a toxin, diazonamide A, which the animal probably uses to repel predators. This natural defense mechanism is now being utilized to treat cancer in humans. The toxin blocks uninhibited reproduction of human cancer cells while leaving healthy cells unaffected.

Cone snails (genus *Conus*) are marine gastropod mollusks that live in the shallow waters of tropical oceans. A cone snail has a cone shaped shell, a fleshy foot, a head, and tentacles. More than half of the world's cone snail species can be found in Southeast Asia and are extremely valuable as sources for new medicines and in biomedical research. Cone snails use venom to paralyze their prey, including fish, marine worms and other snails. The venom does this by blocking certain channels in the body, which are related to how brains perceive pain.

Scientists have been able to separate toxins from the venom mixture, sequence and purify the peptides, and modify the toxins to only work on certain channels related to pain. Drugs are being developed from this venom that can block specific pain that is otherwise untreatable or poorly managed. With over 700 species of cone snails, the *conus* venom is a real gold mine of over 100,000 neuroactive molecules. Drugs developed from cone snails include Prialt, a more powerful alternative to morphine but without the side effects, which is used for the treatment of severe pain, particularly in patients with cancer or certain types of neuropathies. Another toxin, conantokin, is being studied for its potential as an anti-convulsive for treating epilepsy. Another cone snail drug is ziconotide, which is 1,000 times more potent than morphine but is not addictive. It is aimed at people suffering from severe chronic pain.

Natural products also provide the basis for various biomedical tools used in science. For example, green fluorescent proteins from the jellyfish *Aequorea Victoria* has been used to make biosensors. Factor C, which comes from horseshoe crabs, is a product used to test for contaminants in drugs, and vaccines, and drips, among others.

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Biodiversity loss imperils human health

Intensified human activities have led to biodiversity loss and thus continue to affect human health. The need to feed a growing global community has led to unsustainable production and harvesting practices.

"Forests have been increasingly cleared to support lucrative logging industries, support mining and other industries, provide habitable spaces for growing populations, and make way for large agricultural areas, leading to erosion, loss of soil quality, water scarcity, and pollution of water sources. Mangrove areas are routinely cleared to support aquaculture. Oceans suffer from overfishing, pollution and loss of corals due to harvesting and destructive fishing practices. Loss of habitats leads to species loss, and thus the basis of traditional medical sources and possible new sources of medicine also disappear," Executive Director Rodrigo U. Fuentes of the ASEAN Centre for Biodiversity said.

He added that chemical inputs designed to maximize crop production, such as fertilizers and pesticides, poison both soil and water, and kill both pests and healthy organisms. When they enter the food chain,

these chemicals may affect birds, insects, and other species that live in poisoned soil or feed on tainted water and fruits.

These massive changes in the environment affect both the structure and functions of ecosystems and alter indigenous biodiversity. Such disturbances reduce the abundance of some organisms, cause population growth in others, modify the interactions among organisms, and alter the interactions between organisms and their physical and chemical environments. Patterns of infectious diseases are sensitive to these disturbances. Major processes affecting infectious disease reservoirs and transmission include deforestation, land-use change, water management, resistance to pesticide chemicals used to control certain disease vectors, climate variability and change, migration and international travel and trade, and the accidental or intentional human introduction of pathogens.

Director Fuentes warned that biodiversity loss affects the various ecosystem services provided by nature. A degraded ecosystem will lead to less food, lack of or poor quality of water, and polluted air. A most significant effect of biodiversity loss is currently the issue of climate change, which affects human health with its changes in climatic conditions. Climate change has created extreme weather events, such as drought and flooding that directly affect human life.

Biodiversity and World Health Day 2011

Biodiversity and its impact on human well being is an urgent concern. It is reflected in the theme for World Health Day 2011. World Health Day is celebrated every 7th day of April to mark the founding of the World Health Organization (WHO). Each year, WHO selects a key health issue which provides a unique opportunity for communities from across the world to come together for one day to promote actions that can improve human health. The 2011 theme is "Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow."

Antimicrobial agents are medicines used to treat infections caused by micro organisms, including bacteria, fungi, parasites and viruses. The discovery of antimicrobials is one of the most important advances in health in human history – alleviating suffering from disease and saving billions of lives over the past 70 years.

Antimicrobials include antibiotics, chemotherapeutic agents, anti-fungal, anti-parasitic medicines and antiviral. Antimicrobial resistance – also known as drug resistance – occurs when microorganisms such as bacteria, viruses, fungi and parasites change in ways that render the medications used to cure the infections they cause ineffective. When the microorganisms become resistant to most antimicrobials, they are often referred to as "superbugs". This is a major concern because a resistant infection may kill, can spread to others, and imposes huge costs to individuals and society.

Antimicrobial resistance is facilitated by the inappropriate use of medicines, low-quality medicines, wrong prescriptions and poor infection control. Lack of government commitment to address these issues, poor surveillance, and a diminishing arsenal of tools to diagnose, treat and prevent also hinder the control of drug resistance.

The World Health Organization states that some of the medicines that saved earlier generations are already unusable today. Drug resistance imposes huge costs on health systems and is taking a growing toll in lives. Resistance to current drugs requires intensive search for new medicines, which can only be found in nature. But as humans continue to destroy biodiversity resources, the hope and time needed to study and procure new medicines may be lost.

Discovery of natural products to cure human ailments takes time and resources. There has to be opportunities for clinical trials to ensure that drugs work and are safe for human consumption. In many cases, certification of drugs takes decades, and in some instances, such as that of the bintangor tree, by the time the tree's anti-HIV properties were confirmed, the tree population had already been decimated. Marine species are also at risk, since they may be sensitive to changes in temperature brought about by climate change and the warming of the oceans. Many species that may provide medical cures may already be lost due to deforestation, mangrove clearing, and other threats to habitats and ecosystems.

As WHO calls for action to raise accountability and halt the spread of drug resistance, policy makers should also seek to address issues that affect the major source of the world's drugs: nature and biodiversity. Governments, industry and all stakeholders must answer the call, since after all biodiversity loss affects global health and puts millions of lives at risk. For more information on World Health Day, log on to http://www.who.int/world-health-day/en/. ■

Earth Day, April 22

A Billion Acts of Green

By Sahlee Bugna-Barrer

The first Earth Day celebration was held on April 22, 1970 in the United States. Led by Senator Gaylord Nelson, the event was an attempt to create a better understanding of the impact people had on the planet, and how people and communities can make positive environmental changes. The first Earth Day was attended by 20 million Americans, and was celebrated everywhere from college campuses to town halls nationwide.

This initiative brought millions of people to work together in their neighborhoods, starting grassroots campaigns to help revolutionize the way people handled waste, recycling, power consumption, and conservation in general. That event set a powerful precedent for the rest of the world, eventually inspiring more than 140 nations all around the globe to have their own Earth Days.

This year, millions across the world celebrated Earth Day through various environmental activities, ranging from bike rides to recycling fairs and environmental clean-ups. Earth Day has also become more significant with worsening environmental issues, many of which cut across borders and affect millions. There is an increasing call for urgent and immediate action to address global environmental issues such as climate change, biodiversity conservation, water scarcity, food security, and pollution, among others.

Every single act of compassion for the Earth helps as everyone can contribute to a healthier and more

resilient planet. It is not enough to let government agencies, environmental organizations, schools and church groups do the work. Each contribution is an act that can multiply and help heal the environment. In the past, people have taken nature for granted, and the current and future generations will have to endure the impacts of actions that have wreaked havoc on the environment. It is time for everyone to realize that their actions matter, and each can participate in creating a stronger environment.

The Earth Day Network (www.earthday.org) emphasized this call through the Billion Acts of Green campaign. The goal of the campaign is to reach a billion acts of environmental service and advocacy before Rio +20 (Earth Summit 2012), which will be held in Rio de Janeiro in June 2012, 20 years after the first historic United Nations Conference on Sustainable Development in 1992.

This year, Earth Day was celebrated by people being part of the solution and contributing to a Billion Acts of Green. Beginning April 22 and everyday thereafter, there are a number of ways that one can commit to the healing of Mother Earth, and every act, big or small, will go a long way. Here are some suggestions, and more importantly, get friends and family to join your commitment to the Earth:

1. *Know more about the environment.* Taking action begins by learning about the importance of the environment and what can be done to help curb destruction. To have a multiplier effect, share what you have learned with family, friends and colleagues.
2. *Plant and nurture trees.* Many environmental, government, and civic organizations hold tree planting or tree nurturing activities all year round, but particularly around Earth Day and other environmental events. Tree planting activities help strengthen forests and watersheds, as well as combat climate change.
3. *Maintain a garden.* Use idle space in your home for a garden, and plant herbs, flowers, and maybe some medicinal plants that can provide home remedies for coughs and colds. Tight spaces require

some creativity, and empty bottles of soda and other large containers can help create that makeshift garden.

4. *Reduce, reuse and recycle.* Buy products in bulk or environment-friendly packaging to reduce your contribution to landfills. Reuse and recycle products, especially plastic containers. A number of shopping malls have regular recycling fairs where you can bring old newspapers, used batteries, and old appliances for recycling.
5. ***BYOB.*** Always bring your own bag so that purchases at the supermarket or shopping mall won't require plastic bags at the checkout counter. Bring your own bottle, as well, to minimize the need for plastic beverage containers.
6. *Ride a bike.* Bike commuting is a healthy alternative and reduces dependence on cars and fuel. Keep fuel costs down as well by using mass transport more often.
7. *Conserve water and energy.* Don't keep water running when washing dishes or brushing teeth. Turn off lights and other appliances when they're not being used.
8. *Buy local products.* Products that travel less leave a smaller carbon footprint. Patronize fruits, vegetables and other products that are produced locally since this is not only good for the environment, but good for the economy as well.
9. *Buy organic products.* Perhaps if people bought more organic products, this will reduce the price of organic goods and encourage more farmers and manufacturers to reduce pesticide use and go green. There are already a number of locally produced personal hygiene and household products on the market. Organic products, particularly fruits, vegetables and meat, contribute to a healthier population and a stronger planet.
10. *Join an environmental activity or event.* During Earth Day, International Day for Biodiversity (May 22) and other environmental events, it is common for governments and non-government organizations to hold activities such as bike rides, fun runs, tree planting activities, or clean-ups to commemorate the event. Some organizations hold such activities every month. You can also initiate an activity with your family and friends.
11. *Support and join an environmental organization.* Many environmental organizations provide a variety of opportunities to participate in environmental protection. Advocacies can range from biodiversity conservation to reforestation, species conservation to wildlife protection, and clean-up activities to environmental education, among others.

These are just some of the simple actions that can be done to heal the environment. The important thing is to pledge an act of green, and get involved in environmental protection and conservation. Contribute to a Billion Acts of Green! ■

• Cambodia

Phnom Samkos Wildlife Sanctuary

Phnom Samkos Wildlife Sanctuary is located at the upper and northern part of the Cardamom Mountains in Koh Kong province, Cambodia. It is found near the shared border of Cambodia and Thailand, and at the west and north part connected to Pursat province.

The wildlife sanctuary was established by Royal Decree in 1993 and covers an area of 332,565 hectares. The sanctuary is an area that has historically been inhabited by ethnic Por minority or highland Khmer.

The Phnom Samkos Wildlife Sanctuary stretches across three provinces, namely Pursat, Battambong, and Koh Kong. The topography of the sanctuary is mountainous and dominated by three discrete peaks: Mount Samkos (1,717 meters), Mount Khmaoch (1,496 meters) and Mount Tumpor (1,250 meters).

Habitats

Main forest types in Phnom Samkos Wildlife Sanctuary include dry forest, deciduous, evergreen and montane forest.

At elevations up to 1,000 meters above sea level, the vegetation of the wildlife sanctuary is dominated by lowland evergreen forest, which has been disturbed by logging in many areas. At elevations between 1,000 and 1,300 meters above sea level, lowland evergreen forest grades into hill evergreen forest. Above 1,300 meters above sea level, near the summit of Mount Samkos, dwarf hill evergreen forest formations are found.

Wildlife

The recorded species richness of Phnom Samkos Wildlife Sanctuary indicates the presence of thousands of insects, 25 species of amphibians, 60 species of fish, 67 species of mammals, 204 species of birds and 55 species of reptiles.

Significant wildlife species include tiger, Asian elephant, banteng, fishing cat, leopard, gaur, and the endangered Eld's deer. The pig-tailed macaque *(Macaca nemestrina),* silvered langur *(Semnopithecus cristatus),* pileated gibbon *(Hylobates pileatus),* and southern serow *(Naemorhedus sumatraensis)* have also been recorded in the sanctuary.

Phnom Samkos Wildlfie Sanctuary supports both restricted-range species found in the Cambodia-Thailand-Mountains Endemic Bird Area, namely, the chestnut-headed partridge *(Arborophila cambodiana)* and Cambodian laughingthrush *(Garrulax ferrarius).* All evergreen and semi-evergreen forest above 400 meters above sea level is thought to be the lower altitudinal limit of chestnut-headed partridge.

Other significant bird species include the scaly-breasted partridge, silver pheasant, coral-billed ground-cuckoo, moustached barbet, black-and-buff woodpecker, brown-rumped minivet, yellow-breasted magpie, stripe-throated bulbul, grey-eyed bulbul, streaked wren-babbler, blue-winged minla, golden-crested myna, slaty-backed forktail and black-throated sunbird.

Threats

One of the major threats to biodiversity at the wildlife sanctuary is illegal logging, with logging roads being constructed into the Phnom Samkos from Thailand. In addition to the direct impact of logging in terms of habitat degradation, the construction of roads has been facilitating access to the area by returning refugees. This in turn has resulted in an increasing rate of conversion of forest to agriculture, particularly in lowland areas. Forests are illegally cleared and occupied by settlers to develop their homes and support small-scale agriculture, such as the planting of upland rice, sesame, kitchen gardens, as well as caring for some livestock.

The construction of roads also facilitates hunting, which was initially for local consumption and linked with the collection of agarwood (*Aquilaria* sp.). However, hunting for

Asian elephant

Pig-tailed macaque

Stripe-throated bulbul

Balanophora Fungosa Indica

commercial purposes, particularly from Thailand, is also thought to be increasing. This also includes the illegal gathering of non-timber forest products for subsistence and sale.

Conservation Program

The management of the Phnom Samkos Wildlife Sanctuary is under the auspices of the Ministry of Environment. International support for the sanctuary has been provided since 2003, and management and zoning plans were approved in 2007.

At the local level, the Phnom Samkos is managed in coordination with three provincial authorities. The main challenges in managing the sanctuary include the need for effective coordination between the Ministry of Environment and the local authorities as well as the widely divergent stakeholder communities that have to be contended with. Stakeholders include local communities, government, non-government organizations, military, and local businesses. There is also a need to institutionalize technical and funding support, which is currently dependent in external sources.

Some of the project strategies to strengthen the wildlife sanctuary include the following:

1. Improve planning and management of the sanctuary
2. Enhance government capacity to manage and protect the sanctuary
3. Engage communities in the protection, management and sustainable use of natural resources
4. Increase international, national and local recognition and awareness of the Phnom Samkos Wildlife Sanctuary
5. Establish long-term finance mechanism for the management of the sanctuary

Since the establishment of the Phnom Samkos Wildlife Sanctuary, various achievements have been noted by the Ministry of Environment with the support of a number of conservation organizations. The appropriate management structure and processes have been established and are currently operational in the park. Zoning and management plans have been developed and implemented. The boundaries of the wildlife sanctuary are currently being marked and clearly demarcated. The livelihoods of the local communities adjacent to the park have also been diversified through the adoption of sustainable approaches. This is necessary to prevent local residents from resorting to activities that are detrimental to the biodiversity of the park, such as illegal logging, hunting of wildlife, as well as processing of non-timber forest products (NTFP). Law enforcement capability of park management has also been enhanced resulting in a significant reduction in forest loss and illegal exploitation of NTFPs. Capacity levels of the Ministry of Environment and Department of Environment staff have also been raised.

A variety of challenges, however, remain for the management staff of the Phnom Samkos Wildlife Sanctuary. These include: greater integration of stakeholders into the management of the wildlife sanctuary; improved planning and coordination of development initiatives within the wildlife sanctuary; completion of a sustainable financing mechanism; large military presence within the wildlife sanctuary; ongoing issues relating to the apprehension, prosecution and conviction of offenders of environmental laws and regulations; continued requirement for capacity and motivation building among Department of Environment staff; and current ranger patrolling and enforcement initiatives in Phnom Samkos Wildlife Sanctuary that has focused on illegal activities (e.g., hunting and logging) should be continued and increased to cover all important areas.

Ecotourism

There are a number of adventures that await visitors to Phnom Samkos Wildlife Sanctuary. These include bird watching, viewing of wildlife, walking and hiking, canoeing and camping. Tourists can also stay at a variety of hotels near the wildlife sanctuary. ■

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• Viet Nam

Ke Go Nature Reserve

Covered by rare trees and home to many endangered animal species, Ke Go Nature Reserve has become a popular destination in Ha Tinh province. Located around 20 kilometers south of Ha Tinh City, the nature reserve is located in Huong Khe, Cam Xuyen and Ky Anh districts in Ha Tinh province. It comprises a 35,159-hectare area within one of the largest remaining blocks of broadleaf evergreen forest in the level lowlands of central Viet Nam.

The nature reserve takes its name from an ancient village in Ha Tinh province. Ke Go was situated along the Rao Cai River, which is home to hundreds of streams from the Truong Son range and has supported the life of its locals for generations. However, it can also be wild and raging, bringing extreme danger to people during the rainy season every year. In the early 20th century, the French designed a dam to control this river, work that remained unfinished due to World War II and the Indochina War. In 1976, after the country's reunification, construction of a reservoir named Ke Go began.

Ke Go reservoir began operations in 1988 and is located in the three districts of Cam Xuyen, Ky Anh and Huong Khe. With an area of 3,000 hectares, the reservoir is a huge irrigation resource, which can hold 350 million cubic meters of water to irrigate 17,000 hectares of rice and crops in Ha Tinh province. With a length of over 30 kilometers, this reservoir is also a source of fish and shrimp for residents. The reservoir has since become a key part of the Ke Go Nature Reserve.

Ke Go Nature Reserve was established by Decision No. 519/QD-UB dated May 3, 1997 of the Ha Tinh People's Committee. The reserve was established to protect the Vietnamese pheasant *(Lophura hatinhensis)* and the imperial pheasant *(Lophura imperialis)* as well as biodiversity in the southern area of the province. The nature reserve consists of three zones – strictly protected zone, special use zone and buffer zone – and is also given priority in the Biodiversity Action Plan for Viet Nam.

Habitats

The northern boundary of Ke Go Nature Reserve follows the southern shore of the Ke Go reservoir. The topography of the nature reserve is comprised of gently undulating low hills, a landscape typical of the midlands of central Viet Nam. Elevations in the nature reserve range between 50 and 497 meters, although most of the nature reserve is below 300 meters.

There are three main watersheds in the nature reserve. The Rao Boi watershed feeds Ngan Sau river, which flows into the Ngan Pho river, which in turn flows into the Lam River, and then into the South China Sea. Ke Go reservoir watershed is fed by a number of rivers and permanent streams and covers the largest area of the nature reserve. The Chin Xai-Cat Bin watershed feeds the Khe Canh River, which flows south into Quang Binh province and, eventually, joins the Gianh River.

The nature reserve lies within one of the largest remaining blocks of natural broadleaf evergreen forest in the Annamese lowlands. Ke Go Nature Reserve supports 24,284 hectares of natural forest, equivalent to 98 percent of the total area. However, the forest has been selectively logged in the past, 76 percent of it is classified as heavily disturbed, and undisturbed primary forest is virtually absent. Lightly disturbed forest is concentrated at higher elevations, while heavily disturbed forest is distributed in more accessible lowland areas.

Wildlife

A total of 562 plant species have been recorded in the nature reserve. Below 300 meters, the tree flora is dominated by *Michelia* spp., *Cinnamomum* spp., *Madhuca pasquieri* and *Erythrophleum fordii.* Above 300 meters, the tree flora is dominated by *Hopea* spp. Many timber trees in the nature reserve are listed in the Viet Nam Red Book such as green ironwood, meranti, red-wood and frankincense. The Ke Go forest is also home to many beautiful and different types of flowers such as magnolias and orchids. The rich and diverse flora of the reserve is representative of the flora in northern Viet Nam, South China, Indonesia, Malaysia and the Himalayas.

Records show that 364 vertebrate animal species have been found in the Ke Go Nature Reserve, including 47 species of mammal species and 270 species of birds. Among the species of mammals, 18 are recorded in the Viet Nam Red Book and the global Red List of endangered species. However, several of these species, such as the Asian elephant *(Elephas maximus),* gaur *(Bos gaurus)* and tiger *(Panthera tigris),* may already be extinct or reduced to relict populations as a result of hunting. The buff-cheeked gibbon *(Hylobates gabriellae)* and the white-cheeked crested gibbon *(Nomascus leucogenys),* which are both species of conservation concern, are reported to be extremely rare in the area as a result of unrestricted hunting and exploitation of the forest.

Ke Go Nature Reserve supports populations of five restricted-range

bird species: Vietnamese pheasant *(Lophura hatinhensis),* imperial pheasant *(L. imperialis),* crested argus *(Rheinardia ocellata),* short-tailed scimitar babbler *(Jabouilleia danjoui)* and grey-faced tit babbler *(Macronous kelleyi).* The reserve, together with the adjacent forest area in northern Quang Binh province, is the only site in the world known to support a population of Vietnamese pheasant. The reserve provides refuge for the white-tailed wattle pheasant, one of the three endemic pheasant types of Viet Nam, which is currently at risk of extinction.

Breakthroughs in biodiversity surveys in the reserve include the discovery of a new species of Crocidura (shrew). Its small body size and conspicuous brownish black mystacial patches on the muzzle above the upper lips readily distinguish it from the three species of *Crocidura* commonly reported from Viet Nam: *C. fuliginosa, C. attenuata* and *C. indochinensis.* In body size, the Ke Go shrew most closely resembles another crocidurine, *C. wuchihensis,* which also occurs in Viet Nam. The new species has a smaller body size, certain shorter cranial and dental dimensions. The discovery of the new *Crocidura* underscores the meager knowledge of Vietnamese diversity and the need for continued surveys of small mammals in remnant lowland and mountain forests within the country.

Buff-cheeked gibbon

Grey-faced tit babbler

Park Management

Prior to 1990, the Ke Go area was under the management of the Cam Ky Forest Enterprise, which managed all the forested areas in the Ky Anh and Cam Xuyen districts in Ha Tinh province. In 1990, Cam Ky Forest Enterprise ceased logging operations and part of the area under its management was designated as the Ke Go Reservoir Watershed Protection Forest. On June 1, 1994, following decision No. 773 QD/UB of the Ha Tinh Provincial People's Committee, a management board was created for the Ke Go Reservoir WPF. Ke Go Nature Reserve was then established in 1997.

The Ke Go Management Board manages the reserve and is directly accountable to the Province. The Management Board's departments include forest inspection, science research, inventory, and planning. There are five forest inspection stations in the nature reserve.

Park management has implemented actions to ensure that villagers living adjacent to the Ke Go Nature Reserve are clear about the exact boundaries of forestland, agricultural land, regeneration zones, and strictly protected land of the nature reserve. Some residents have also benefitted from a past government poverty alleviation program focusing on forestry assistance where seedlings were provided to households. When trees are ready for harvest, households that received assistance from these particular programs must give a percentage of their harvesting income to the government.

Forest fire prevention policies are also strictly enforced and some village residents are members of forest fire prevention teams. People who cause forest fires are fined. Villagers often use fire in the forest to make coal from firewood, as well as chase bees from their hive to facilitate the extraction of honey.

Conservation Program

Situated in the Annamese lowlands, Ke Go is noted for the occurrence of several endemic bird species, including the globally endangered Vietnamese pheasant and the globally critically endangered imperial pheasant. BirdLife International, in collaboration with the Centre for Natural Resources and Environmental Studies (CRES), first initiated field surveys for these enigmatic pheasants in 1988 and in early 1990, the two organizations identified the forests of Ke Go as being potentially important for the conservation of these species. As a result, Viet Nam, BirdLife International and Forest Inventory and Planning Institute published an investment plan for Ke Go Nature Reserve in August 1996 as part of the European Union-funded project "The Conservation of Biodiversity in the Annamese Lowlands and the Da Lat Plateau".

Prior to the establishment of Ke Go Nature Reserve, CRES, Ky Anh District People's Committee and Ha Tinh Provincial Department of Science, Technology and the Environment implemented a project to protect the Gat Che Me area in the east of the nature reserve. This project was supported financially by Oro-Verde.

Some of the other conservation projects that have been implemented in Ke Go Nature Reserve include the following:

- Between 1992 and 1998, with funding from the National Environment Program of Viet Nam, the Institute of Ecology and Biological Resources conducted a biodiversity survey of the Ke Go area.
- In 1996, with funding from the Danish Embassy in Hanoi, BirdLife and Oxfam UK-Ireland implemented a one-year environmental education project. The project worked in collaboration with Ky Anh District Department of Education and Training in the buffer zone of Ke Go Nature Reserve.
- Between 1997 and 1999, with funding from the British Birdwatching Fair, BirdLife implemented the Ke Go Forest Project. Activities included construction of two guard stations, provision of motorbikes and other equipment, and training of nature reserve staff.
- In 1998, the Non-timber Forest Product Research Centre of the Forest Science Institute of Viet Nam began implementing the project "Sustainable Utilization of Non-timber Forest Products", with funding from the Netherlands Government and technical support from the International Union for the Conservation of Nature. The project promoted the conservation of biodiversity through the sustainable use of non-timber district forest products.
- In 1998, the Department for International Development of the United Kingdom funded a poverty alleviation program in Ha Tinh province entitled the "Ha Tinh Poverty Programme". The program was implemented by ActionAid, Oxfam Great Britain and Save the Children (UK), in collaboration with the Viet Nam Women's Union.
- In 2001, Dansk Ornitologisk Forening (BirdLife Denmark), together with Ha Tinh Provincial DARD and the BirdLife International Vietnam Program began implementing an integrated conservation and development project entitled "The Sustainable Management of Ke Go Nature Reserve" with funding from the Danish International Development Agency. The project was aimed at conserving the biodiversity of Ke Go Nature Reserve while improving the socio-economic conditions of local communities in the buffer zone.

Threats

The major threats to biodiversity at Ke Go Nature Reserve are hunting, illegal timber extraction, charcoal production, fuelwood collection and fragrant oil extraction. Thousands of households that live adjacent to the reserve often supplement their income through the exploitation of forest resources such as firewood, charcoal, palm leaves, rattans and honey.

Fragrant oil distillation is widely practiced and has significantly contributed to the degradation of the forest at Ke Go Nature Reserve. Fragrant oil is distilled from *Cinnamomum parthenoxylum,* although other members of the *Lauraceae* family are also used. It is estimated that, for each tree from which fragrant oil is distilled, one square kilometer of forest is negatively affected, because the process requires large quantities of firewood.

Timber is extracted for use locally in construction but is also illegally exported abroad. The tree species favored for timber are Hopea spp., although other species of lower value are also exploited.

Hunting also plays an important role in the local economy. In the past, animals were hunted principally for local consumption. However, the opening of Viet Nam's economy has changed this pattern significantly and foreign demand for wild animals has broadened the range of species subject to hunting and increased overall hunting pressure. Populations of large and medium-sized mammals suffer from constant hunting pressure. Moreover, the use of non-specific hunting methods, such as traps and snares, threatens ground bird species, such as the Vietnamese pheasant.

Ecotourism

The presence of numerous globally threatened and restricted-range bird species could attract a small number of specialized ecotourists, particularly overseas bird watchers. Overall, however, the proposed nature reserve can be considered to have low potential for general ecotourism because wildlife populations have been seriously depressed by hunting, to the point at which most mammals and large birds are impossible to observe. In addition, Ke Go is a lowland area and lacks major landscape features, and the nature reserve currently has lacks adequate visitor facilities.

Ha Tinh authorities are thus calling for investments to turn the Ke Go reservoir and the Ke Go Nature Reserve into an ecological tourist site. ■

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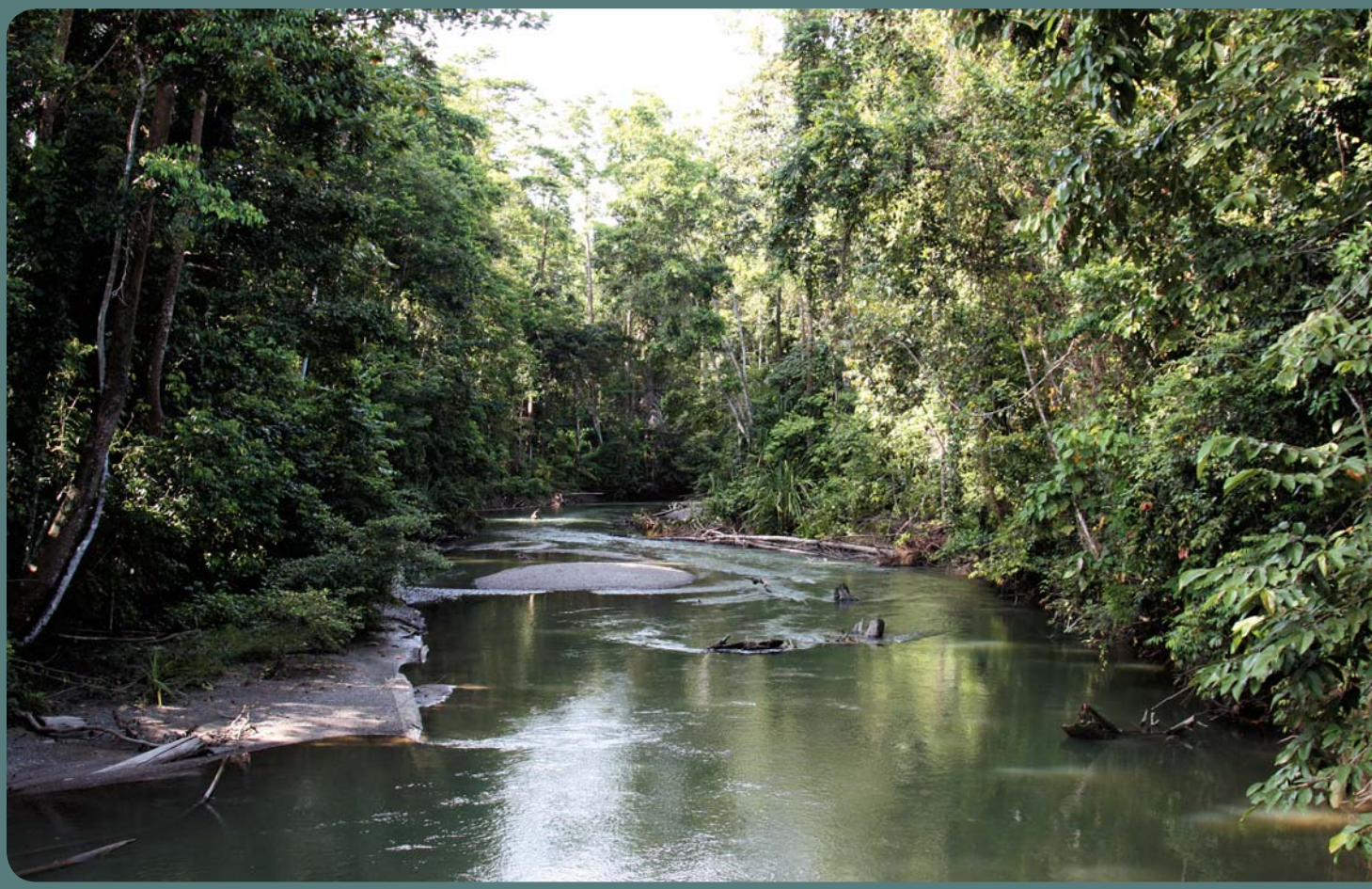

• Indonesia

Manusela National Park

Manusela National Park is located on Seram island, in the Maluku archipelago of Indonesia. Seram is remarkable for its high degree of localized bird endemism. The park is dominated by Mount Binaiya, which at 3,027 meters is the highest of the park's six mountains. Steep, fast-flowing rivers traverse the Park.

Manusela National Park was established in 1997 and covers an area of 186,000 hectares, about 11 percent of the surface area of Seram.

There are four villages in the park, namely Manusela, Ilena Maraina, Selumena and Kanike. Manusela is also the name of one of the mountains within the park, the local ethnic group and their language. In the local language, Manusela means "bird of freedom". The local people believe that the mountains within the Park area give them their spirit and protect them from harm. This belief implies that the local people take care to protect and conserve the balance of nature that surrounds them.

The rugged Manusela National Park on Seram vies with Halmahera as Maluku's premier birding destination on account of its many endemic species and unspoiled wilderness. Expedition-style trekking is required to enter the park, and the going is tough.

Habitats

The Park contains a broad selection of the habitats present in Seram, stretching from the north coast to within five kilometers of the south coast. It includes a large portion of the Binaia-Merkele limestone massif with the highest mountain on Seram, Gunung Binaia, as well as the lower parallel ridge of Gunung Kobipoto (1,500 meters) to the north, together with a broad section of the lowland alluvial plain where three wide rivers, the Wae Toluorang, Mual and Isal, drain northwards to the sea.

Manusela National Park in Maluku is made up of coastal forest, swamp forest, lowland rain forest, and montane rain forest ecosystem types, with a range of associated vegetation types including mangrove, riparian, and sub-alpine.

Wildlife

Among the plants that grow in this Park are tancang *(Bruguiera sexangula),* mangrove *(Rhizophora acuminata),* api-api *(Avicennia sp.),* lime *(Dryobalanops* sp.*),* pulai *(Alstonia scholaris),* ketapang *(Terminalia catappa),* pandan *(Pandanus* sp.*),* meranti *(Shorea selanica),* benuang *(Octomeles sumatrana),* matoa/kasai *(Pometia pinnata),* cajuput *(Melaleuca leucadendron),* and various species of orchid.

The mammals found on Seram include Asian species (murid rodents) as well as Australasian marsupials. The montane area of Seram supports the greatest number of endemic mammals of any island in the region. It harbors 38 mammal species and includes nine species that are endemic or near endemic, several of which are limited to montane habitats. These include the Seram bandicoot, Moluccan flying fox, Seram flying fox, Manusela mosaic-tailed rat, spiny Ceram rat and the Ceram rat, all considered threatened.

Other animals include the Timor deer *(Cervus timorensis moluccensis),* common cuscus *(Phalanger orientalis orientalis),* water-hagedis dragon *(Hydrosaurus amboinensis),* wild pig *(Sus celebensis),* marbled cat *(Pardofelis marmorata),* giant skink *(Tiliqua gigas gigas),* dugong *(Dugong dugon),* common green turtle *(Chelonia mydas),* and various species of butterfly.

There are about 117 species of birds, 14 of them endemic, like the eclectus parrot *(Eclectus roratus roratus),* purple-naped lory *(Lorius domicella),* salmon-crested cockatoo *(Cacatua moluccensis),* lazuli kingfisher *(Halcyon lazuli),* sacred kingfisher *(H. sancta),* Seram friarbird *(Philemon subcorniculatus),* and Moluccan king parrot *(Alisterus amboinensis).* The population of the endemic salmon-crested cockatoo is now gravely threatened due to hunting and the destruction of its habitat.

Other significant bird species include the grey-necked friarbird, bicolored white-eye, black-chinned monarch, southern cassowary, blue-eared, purple-naped and Moluccan Red Lories, pale cicada bird, Moluccan thrush, streak-breasted fantail, bicoloured honeyeater, long-crested myna, and black-naped oriole.

Wild pig

Caption

Conservation Program

In 1972, two areas in central Seram were designated as nature reserves, namely Wae Nua (20,000 hectares) and Wae Mual (17,500 hectares). After a survey in 1978, a proposal was made to unite the two areas, which led to the establishment of

Salmon-crested cockatoo

the Manusela National Park in 1997, representing 11 percent of the land area of Seram island.

Threats

A major threat is posed by deforestation, with logging concessions covering 48 percent of Seram's forest. Illegal logging activities have also been recorded inside Manusela National Park. Another threat is posed by illegal wild bird trading, particularly targeting the salmon-crested cockatoo. The population of the endemic Salmon-crested Cockatoo is now gravely threatened due to hunting and the destruction of its habitat, and the park remains its last stronghold. In 2006, nine cockatoos confiscated from a smuggler in 2004 were released back into the wild.

Ecotourism

Various areas in the park provide different attractions for tourists. Tepi Merkele, Tepi Kabipoto and Wae Kawa provide interesting sites for forest exploration, climbing, and observation of local flora and fauna. Birdwatching and observation of deer are recommended at Pasahari. Wai Isal is a good area for camping, exploring the forest, and observing plant and animals. Forest exploration and butterfly watching can be done at Pilana. Mt. Binaya is also good for climbing and exploring waterfalls and the forest.

The National Park Centre at Sasa Ratu is about 10 kilometers from Wahai on the road to Pasahari. Guides to various areas in the park and transport services can be arranged here. Visitors are also recommended to visit the nipa and mangrove swamps, which are two kilometers away from park headquarters.

To go trekking in Manusela, permits must first be obtained in Ambon City. These should then be presented at the National Park so that arrangements for the trek can be made. Trekkers will also have to report to the police station in Wahai. Visitors need to bring in cooking equipment, food and, depending on the route, the necessary camping gear. Strong, worn-in walking boots, compass and rain gear are also essential. Visitors can choose from a variety of hiking trails, which may take from as short as three hours to a whole day's effort. Terrains may vary from flat land to undulating hills and steep uphills. Some routes may provide accommodations in local villages, while others will require camping out in the forest.

Visitors who climb towards Mt. Binaya from Kanikeh are often asked to make a small offering. While the customary law of the area may have embraced the arrival of visitors, guides may be fearful if trekkers ascend the mountain without first making an offering to deceased ancestors.

Cultural attractions outside the park include the Masohi Festival in November and the kora-kora (rowing) races in April. The best time to visit Manusela National Park is from May to October.

How to reach the Park

The Park can be reached either by the north coast (Sawai and Wahai), or the south coast (Tehoru and Moso). The route from Moso is preferred by those who like climbing, since it has a slope of about 30 percent. There are daily eight-hour trips by bus or ferry from Ambon to Saka. One then proceeds to Wahai by speedboat, which will take about two hours. There are also 24-hour trips by ship from Ambon to Wahai, which is available three times a week. Once-a-week flights from Ambon to Wahai are also available. The National Park Centre at Sasa Ratu is about 10 kilometers from Wahai on the road to Pasahari. There are regular buses from Wahai to Pasahari.

Alternately, visitors can travel from Ambon to Tehoru by motor boat (about nine hours), then to Moso and Saunulu village.

In Mosso, visitors can stay with the kepala desa (village head) in Wahai or at Losmen Sinar Indah. It is also possible to stay at the National Park Centre, but visitors will have to bring their own food. ■

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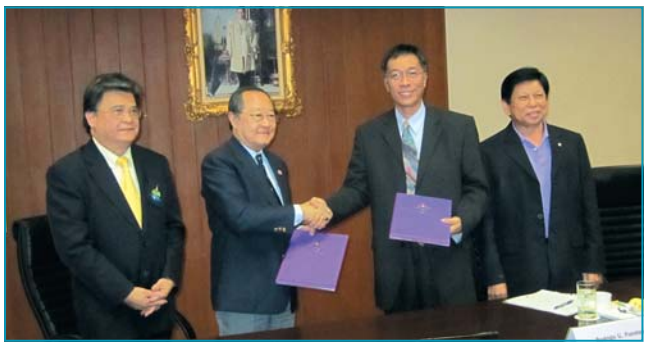
ASEAN and Royal Thai foundation to promote biodiversity conservation



(L-R) Dr. Mario Tabucanon, Advisor of SIEP Executive Board; Dr. Sumet Tantivejkul, Chairman of SIEP Foundation; Mr. Rodrigo Fuentes, Executive Director of ACB; and Dr. Sanit Aksornkoae, Chairman of SIEP Executive Board.

THE ASEAN Centre for Biodiversity (ACB) and the Sirindhorn International Environmental Park Foundation (SIEP) recently signed a Memorandum of Cooperation to formalize their partnership in promoting biodiversity conservation initiatives in the ASEAN region.

"Joining hands with SIEP on this endeavor is an important activity of the Centre, as the partnership is in line with our goal of working with various groups and sectors to promote biodiversity conservation in the ASEAN region," Mr. Rodrigo U. Fuentes, executive director of ACB, said.

"SIEP is immensely proud to establish formal linkages with the esteemed ASEAN Centre for Biodiversity in bringing about transfer and advancement of knowledge in the areas of biodiversity conservation, natural resources management, environmental awareness, energy conservation, and related fields" said Dr. Sumet Tantivejkul, Chairman of the SIEP Foundation Board.

ACB is an intergovernmental regional organization that coordinates efforts of ASEAN Member States in conserving and sustainably managing biodiversity resources.

Under the patronage of Her Royal Highness Princess Maha Chakri Sirindhorn of the Kingdom of Thailand, SIEP is an international learning center for transferring knowledge and training for the youth and the general public, non-governmental organizations, international organizations and organizations from the ASEAN Member States on the conservation of energy, natural resources, and the environment. SIEP conducts integrated, diverse learning activities while fostering innovations linking science and technology, both domestic and international, to local wisdom for the benefit of sustainable development.

SIEP and ACB will participate in joint or complementary capacity development initiatives and other events related to the sustainable development and conservation of biodiversity resources in the region. They will also explore opportunities to strengthen regional cooperation in implementing an integrated approach to biodiversity conservation using regional and global multilateral environment agreements as frameworks and platforms for multi-sectoral cooperation; and continuously support common advocacy efforts within the bounds of SIEP's and ACB's mandates.

Under the Memorandum of Cooperation, ACB and SIEP will also share relevant technical information, as well as provide copies of publications and research materials and allow linking and information sharing in their respective websites. The partnership will provide opportunities for staff interaction and exchanges to further enhance collaboration between the two organizations. Set to benefit from the partnership are the ten ASEAN Member States whose capacities in biodiversity conservation will be strengthened by the joint conservation initiatives.

ASEAN and Germany cooperate on biodiversity and climate change

GERMANY is supporting the ASEAN in enhancing capacities of its member countries to mitigate climate change through biodiversity conservation. An inception meeting for the ASEAN Biodiversity and Climate Change Project was held on January 12-13, 2011 in Jakarta, Indonesia.

To be implemented by the ASEAN Centre for Biodiversity (ACB) and GIZ, Germany's development cooperation arm, the project aims to strengthen ACB's capacity in developing and implementing strategies and instruments in the field of biodiversity and climate change. The project will be mobilized through an arrangement between the ASEAN Secretariat and the Government of the Federal Republic of Germany with a budget of Euro 2M in the next three years.

ACB Executive Director Rodrigo Fuentes said that climate change exerts extreme pressure on the existing terrestrial and marine biodiversity, as well as the resulting environmental benefits such as protection against erosion, flood and carbon dioxide emissions.

"More than 20 percent of the global biodiversity, approximately 35 percent of the global mangrove forests and 30 percent of the coral reefs are found in the ASEAN Member States. Owing to their long coastline (173,000 kilometers) and island nature (113,000 square kilometers ocean surface between land surfaces) many ASEAN countries are most affected by climate change," Director Fuentes explained.

Dr. Berthold Seibert, project manager, says that the interconnection of global climate change and biodiversity loss is now widely recognized. The effects of climate change on biodiversity have negative impacts on the well-being of people. Biodiversity, through the ecosystem services it supports, also makes significant contribution to both climate change mitigation and adaptation.

"Biodiversity management is an important means for helping slow down climate change and its impacts. Missing awareness and knowledge, however, hamper the comprehensive appreciation of the interaction between biodiversity and climate change," Dr. Seibert said.

ACB launches two new books

EXECUTIVE Director Rodrigo U. Fuentes of the ASEAN Centre for Biodiversity (ACB) recently presented to the Secretary-General of ASEAN, Dr Surin Pitsuwan, two new publications on the environment: The ASEAN Heritage Parks: A Journey to the Natural Wonders of Southeast Asia and The ASEAN Biodiversity Outlook.

The first book features the 28 ASEAN Heritage Parks. The parks best represent the region's protected areas and their rich biodiversity. The Outlook assesses the successes and challenges in meeting the 2010 target of reducing the rate of biodiversity loss, in addition to the recommendations of the next steps.

Mr. Fuentes, who was accompanied by senior officers of the ACB at the meeting held on January 13 at the ASEAN Headquarters, also updated Dr. Surin on the ACB's current search for the winners of the ASEAN Champions of Biodiversity, a program honoring outstanding contributions to biodiversity conservation and advocacy. The winners will be awarded in May 2011, to coincide with the International Day for Biodiversity.

Executive Director Rodrigo U. Fuentes of the ASEAN Centre for Biodiversity (ACB) recently presented to the Secretary-General of ASEAN, Dr Surin Pitsuwan, two new publications on the environment.

The recent ASEAN Biodiversity Outlook report published by ACB has observed that the current management structure of government and non-government stakeholders for the conservation and sustainable use of biodiversity in the ASEAN region, either fails to appropriately take climate change into account or insufficient to stop biodiversity loss. Many causes of biodiversity loss as well as their negative consequences are felt beyond the borders of the individual ASEAN Member States. The ASEAN challenge is to have adequate policies, instruments, and the capacity to tackle issues on biodiversity and climate change. The Biodiversity and Climate Change Project hopes to respond to this ASEAN challenge by enabling ACB to provide ASEAN Member States with advisory services on strategies and instruments for biodiversity conservation-related intervention measures on climate protection and adaptation to climate change.

The project targets to benefit the vulnerable population of ASEAN Member States who depend on the ecosystem services and biodiversity resources for their subsistence. The project is in line with the ASEAN Vision 2020, the ASEAN Blueprint 2008-2015, and the 2007 Regional Action Plan for ASEAN Heritage Parks and Protected Areas. The project supports regional initiatives such as the Heart of Borneo, the Coral Triangle, and Greater Mekong Sub-Region, as well as the UN Conventions on Biological Diversity and Climate Change.

AWGNCB discusses ACB work plan for 2011

The ASEAN Working Group on Nature Conservation and Biodiversity (AWGNCB) held a special meeting in Jakarta, Indonesia on January 14, 2011 to discuss the ASEAN

Centre for Biodiversity's (ACB) Work Plan for 2011. The AWGNCB, part of ACB's management structure, provides technical guidance to ACB's work planning process and endorses the work plan to the ACB Governing Board for approval. The work plan for 2011 focuses on the implementation of major donor-funded projects on climate change, taxonomy, wildlife law enforcement, and support to countries in preparing national biodiversity strategies, to name a few.

ACB will continue to enhance its services to ASEAN Member States through its seven mandated priorities: serving as an effective coordinative body to facilitate discussion and resolution of cross-country biodiversity conservation issues; providing a framework and mechanism for sharing information, experiences, best practices and lessons learnt for the efficient access by the ASEAN Member States; implementing a proactive approach in monitoring and assessing biodiversity conservation status as a strategic approach towards identifying critical is-

Germany supports ASEAN in establishing a biodiversity fund

GERMANY, through KfW, is supporting the ASEAN Centre for Biodiversity (ACB) in establishing an endowment fund. To be called the ASEAN Biodiversity Fund (ABF), this facility will provide ASEAN Member States and other governments, the international donor community, organizations and individuals a mechanism to contribute financially to biodiversity initiatives being implemented by ACB.

At a consultative meeting held in Jakarta, Indonesia on January 14, 2011, KfW consultants, ACB officials and the ASEAN Working Group on Nature Conservation and Biodiversity discussed the proposed mechanics of establishing the ABF. The fund is expected to be launched this year.

sues and future trends; delivering/facilitating conduct of capacity-building services and technology transfer through engaging relevant and appropriate expertise; enhancing common understanding of biodiversity conservation issues and strengthening ASEAN regional positions in negotiation and in compliance with relevant multilateral environmental agreements; promoting public awareness to develop champions and enhance support at different stakeholder levels on biodiversity concerns; and undertaking innovative resource generation and mobilization measures to pursue impact activities that will enhance biodiversity conservation in the region.

Japan and ASEAN boost taxonomic capacities

PLANTS are the backbone of all life on earth. Crop plants are used for food and fibers. Thousands of wild plants provide medicine, fuel, clothing and shelter. They also protect soils from erosion, help regulate climate, support animal life, and maintain ecosystem stability. Plants, however, are facing serious threats and are being lost at alarming rates.

To implement effective conservation measures, there is a need to tap taxonomists who will identify species, describe species that are new to science, determine their taxonomic relationships, and make predictions about their properties.

To boost the taxonomic capacities of the ten ASEAN Member States and the ASEAN Plus Three Countries of China, Japan and Korea, the ASEAN Centre for Biodiversity (ACB), in partnership with Japan's Ministry of Environment, conducted a Training Workshop on Taxonomy of Terrestrial Plants from February 16 to 23, 2011 at Herbarium Bogoriense, R.C.Biology, CSC-LIPI in Bogor, Indonesia.

Through the workshop, botanists and plant ecologists from participating countries were introduced to the taxonomy of terrestrial plants particularly selected families of dicotelydons. Also known as dicots, dicotyledons are a group of flowering plants whose seed typically has two embryonic leaves. Beans, lentils, peanuts, potatoes, squash and tomatoes are among the many examples of dicots used as food.

The workshop familiarized the participants with the general biology of dicots and upgraded their taxonomic skills in terms of methods of morphological observation, sample collection, processing and managing. They were also introduced to advanced taxonomic methodologies such as molecular techniques, bar coding and databasing. These are deemed to be helpful in curbing the ongoing loss of plant diversity.

"In 1998, it became very apparent that the implementation of the objectives of the CBD was being hampered by the lack of appropriate taxonomic information. This impediment was later named the Global Taxonomic Impediment. In the 250 years since Linnaeus introduced the binomial system of naming, taxonomists have described and named some 1.78 million species of animals, plants and microorganisms. The full number of species on Earth is unknown, but it probably lies between 5 million and 30 million. At the most conservative estimate, the biota itself comprises more unknown species than known ones," Mr. Rodrigo U. Fuentes, executive director of ACB, said.

"If Parties to the Convention do not know what species reside in their national boundaries, they will find it difficult to enact effective legislation concerning them, plan for conservation and sustainable use or protect national or subnational rights concerning benefits of the genetic resources of their biodiversity. Although there are many species to be described, there are too few taxonomists to do the job, particularly in the countries where they are arguably most needed - the biodiversity-rich developing countries, especially in our region in South East Asia.

"Taxonomy is very important in conserving plant species and other biological resources. We are aware that taxonomic information is crucial to understanding biodiversity and maximizing its use and protection. How will we implement effective conservation measures if we do not

ACB IN PHOTOS

Senator Jose Miguel Zubiri donates three million pesos to the ASEAN Centre for Biodiversity. The senator is known for championing biodiversity policies and initiatives in the Philippines Senate. In photo are (L-R): Atty. David Torres, chief legal officer of Senator Zubiri; Rolando Inciong, Head of ACB Communication and Public Affairs; Rodrigo Fuentes, Executive Director of ACB; Willy Obien, Head of ACB Finance and Administration; and Larry Punzalan, ACB Protocol Officer.

Dr. Makarim Wibisono, Executive Director of the ASEAN Foundation (at center in suit) visits the ACB Headquarters where he served as Chairman of the Board of Judges for the search for ASEAN Champions of Biodiversity. ACB will award the champions on May 31, 2011 in Manila.

Forty representatives from various Philippines institution involved in promoting biodiversity conservation gathered in Los Baños, Laguna for a one-day seminar on using information management to assist in biodiversity conservation through science-based decisions and policies. The seminar was organized by ACB and the Philippine Council for Aquatic and Marine Research and Development.

fully understand the natural treasures that we have?" Mr. Fuentes said.

The workshop was the third in a series of capacity development activities under a project on "Taxonomic Capacity Building and Governance for Conservation and Sustainable Use of Biodiversity" funded by the Japan-ASEAN Integration Fund. The first in the series, held in cooperation with the University Sains Malaysia (USM) from December 4 to 8, 2010 in Penang, focused on corals taxonomy. The second, Training of Trainers on CITES Policies and Identification of Threatened Species, was held in Kuala Lumpur, Malaysia from January 17 to 20, 2011.

The project aims to promote the science of taxonomy which is increasingly considered a fundamental tool required by the global community to implement the Millennium Development Goals and the development targets set by the World Summit for Sustainable Development.

According to project coordinator Dr. Filiberto Pollisco, Jr., ACB policy research specialist, taxonomy has always been a poorly understood science. While it is one of the most needed of the sciences, it is among the least known.

"Many trained taxonomists are under-utilized due to insufficient funds allocated to taxonomic study. Every major museum suffers from the backlog of unstudied specimens and undescribed new species, while every curator can cite the loss of students who were interested in taxonomy, but could not get sufficient fellowship support or failed to find a paying job. This is where taxonomy comes in. It is not there to simply name and identify species. It can be a useful tool to improve knowledge, which can then lead to the efficient use and protection of biodiversity," Dr. Pollisco explained.

Int'l confab links climate change and biodiversity

SOME 300 local and international environmental advocates, including scientists, researchers, academicians, policy makers and representatives of international organizations participated in an international conference to discuss the relationship between biodiversity and climate change.

Held from February 1 to 3 in Manila, the conference was organized by the Philippines' Commission on Higher Education (CHED) and the Department of Environment and Natural Resources (DENR), in cooperation with the United Nations Development Programme (UNDP), National Economic and Development Authority, DIVERSITAS, ASEAN Centre for Biodiversity (ACB), World Wildlife Fund (WWF), Commission on Climate Change, DENR-Protected Areas and Wildlife Bureau, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, and the Philippine Council for Aquatic and Marine Resources Research and Development.

Participants to the three-day International Conference on Biodiversity and Climate Change at the Philippine International Convention Center discussed and exchanged research findings on the interactions of biodiversity and climate change, status of biodiversity, effects of climate change on biodiversity, and climate change mitigation and adaptation; identified research gaps and conceptualized collaborative research undertakings on biodiversity and climate change; identified strategies for mitigation and adaptation, including education and advocacy; and linked potential donors, and research experts and educators for the conduct of future research and implementation of programs on biodiversity conservation and climate change adaptation and mitigation.

Conference Chairperson Dr. Angel Alcala, former DENR Secretary, said paper presentations and discussions focused on the following themes: status of biodiversity;

causes and impacts of climate change on biodiversity and ecosystems; climate change mitigation and adaptation; education and advocacy; and partner's perspectives for research on biodiversity and climate change.

Prominent environmentalists who addressed the Conference were Senator Loren Legarda, chairperson, Senate Committee on Climate Change; Secretary Ramon Paje, DENR; Secretary Patricia Licuanan, CHED; Secretary Mario Montejo, Department of Science and Technology; Commissioner Naderev Sano, Philippine Climate Change Commission; Country Director Renaud Meyer, UNDP; Executive Director Rodrigo U. Fuentes, ACB; and Vice-Chairman Jose Ma. Lorenzo Tan, WWF.

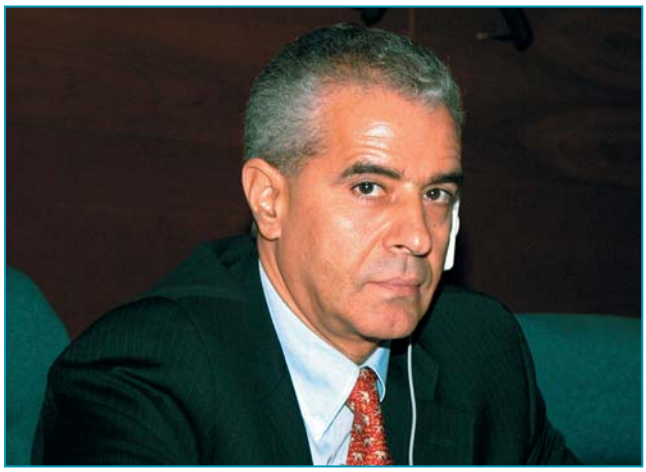
ABS protocol opens for signature

At a ceremony held on March 7 in New York, the Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety was opened for signature by Parties to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity.

The Supplementary Protocol aims to contribute to the conservation and sustainable use of biodiversity by providing international rules and procedures for liability and redress in the event of damage resulting from living modified organisms (LMOs).

Addressing the ceremony, Ms. Patricia O'Brien, Under-Secretary General for Legal Affairs speaking on behalf of United Nations Secretary-General, Ban Ki-moon, said: "The issues on biodiversity and biosafety require a global response and the Secretary-General encourages States to ratify this Supplementary Protocol. By your actions today you encourage other States to do the same and contribute to the advancement of international law, and the rule of law which is one of the main objectives of the Organization."

Speaking on behalf of the President of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP), Mr. Hidenori Murakami, Advisor to the Minister of Agriculture, Forestry and Fisheries of Japan, said, "The adoption of the Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress was a remarkable achievement from the meeting in Nagoya. The Supplementary Protocol presents us with another valuable tool to address the issue of global biodiversity and to protect the lives and livelihoods of the present and next generations. It is our responsibility to pass on to the next generation life in harmony with nature and the wealth of biodiversity on our planet."



Dr. Ahmed Djoghlaf

During the ceremony, representatives of the Governments of Colombia, Denmark, the Netherlands and Sweden signed the Nagoya – Kuala Lumpur Supplementary Protocol, which remains open for signature until March 6, 2012 at the United Nations Headquarters in New York.

After several years of negotiations, the Parties to the Cartagena Protocol on Biosafety adopted the Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress on 15 October 2010, in Nagoya, Japan. The Supplementary Protocol takes its name from the city of Nagoya, where it was adopted, and from the city of Kuala Lumpur, in recognition of its role as host of several meetings pertaining to the negotiations on liability and redress.

The Supplementary Protocol fulfills the commitment set forth in Article 27 of the Cartagena Protocol to elaborate international rules and procedures on liability and redress for damage to biodiversity resulting from transboundary movements of LMOs. It is also inspired by Principle 13 of the 1992 Rio Declaration on Environment and Development which calls on States to "cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control".

The Supplementary Protocol specifies the measures that need to be taken in response to damage resulting from LMOs that find their origin in a transboundary movement. In the event of damage or sufficient likelihood of damage to biological diversity, a government, through a competent authority, would require the person in control of the LMO, i.e. the operator, to take appropriate response measures, or would take such measures itself with a right of recourse against the operator.

Speaking at the opening ceremony, the Executive Secretary of the Convention on Biological Diversity, Mr. Ahmed Djoghlaf, said, "It is the first time that a legally binding instrument bears the name of two cities, namely Nagoya and Kuala Lumpur. This reminds us more than ever that a global partnership among the international community without any exception is urgently required to address the unprecedented challenges of the continued loss of biodiversity compounded by climate change."

The Nagoya – Kuala Lumpur Supplementary Protocol will enter into force 90 days after the deposit of the 40th instrument of ratification, acceptance, approval, or accession.

The Nagoya Protocol is available at: http://treaties.un.org/doc/source/signature/2010/Ch-XXVII-8-b.pdf.

ASEAN presents Southeast Asia's biodiversity report card

WHAT is the status of Southeast Asia's biodiversity? Did the region meet the global target of reducing biodiversity loss by 2010? What are the prospects for biodiversity beyond 2010? These questions were answered at the launch of the ASEAN Biodiversity Outlook report on March 23, 2011 at the Dusit Hotel in Makati City, Philippines.

Philippines uses information management to strengthen biodiversity conservation

FORTY representatives of various national and international institutions involved in promoting biodiversity conservation in the Philippines gathered in Los Baños, Laguna for a one-day seminar on using information management to assist in biodiversity conservation through science-based decisions and policies.

Organized by the ASEAN Centre for Biodiversity (ACB) and the Philippine Council for Aquatic and Marine Research and Development (PCAMRD), the Seminar on Species and Protected Area Database Interfaces held on March 10 at the PCAMRD Auditorium was attended by representatives of the Natural History Museum; National Museum; Biotech, Zoology and Biology departments of UP Los Baños; UPLB School of Environmental Science and Management; Department of Environment and Natural Resources' Protected Areas and Wildlife Bureau and Mts. Iglit-Baco National Park, and Fishbase Information and Research Group.

Director Sheila Vergara of ACB's Biodiversity Information Management Unit said the seminar promoted the importance of interoperable datasets and their establishment as basis for making science-based decisions and policies for biodiversity conservation; enhanced capacities of data holders to digitize species and protected areas information; facilitated the integration and organization of species and protected area (PA) information in different holdings; and introduced to the participants the species and PA interfaces developed by ACB which uses the Darwin Core (for species) and IUCN categories (for protected areas) as encoding convention.

Mr. Rodrigo Fuentes, ACB Executive Director, explained that "making data interoperable is an attempt to bring out all the things that you can do closer to everyone. Information is an important resource to make the right kind of decisions. Biodiversity information must be shared so that all sectors involved in conservation, especially our leaders, can come up science-based policies and decisions."

"While we recognize data ownership, we also hope that embracing the idea of sharing information becomes a natural process," Director Fuentes said.

Dr. Loureeda Darvin, Supervising Science Research Specialist of PCAMRD said, "This seminar is timely as data establishment is a laborious task and requires partnerships. It is a means to draw all information out from the shelves and use them. All participants recognized the need to make databases functional so that they can be translated to meaningful analyses as bases for biodiversity conservation."

The launch, in cooperation with the Philippine Science Journalists Association (PsciJourn), was attended by key officials and representatives of the Department of Environment and Natural Resources; PsciJourn; Department of Foreign Affairs; embassies of ASEAN Member States, Japan and the European Union; conservation organizations, business sector and media.

Produced by the ASEAN Centre for Biodiversity (ACB), the Outlook confirms the findings of the Third Global Biodiversity Outlook that the world failed to meet the target of significantly reducing biodiversity loss by 2010.

The Outlook is based on the 4th National Reports of the ten ASEAN countries to the Convention on Biological Diversity (CBD), the Fourth ASEAN State of the Environment Report, the Global Biodiversity Outlook, and numerous other sources. Biodiversity experts from a number of international organizations independently reviewed the Outlook.

A contribution to the International Year of Biodiversity 2010, the Outlook is envisioned as a tool to generate awareness on the status of biodiversity in the region, the obstacles faced by countries in their efforts to conserve biodiversity, and the next steps that have to be undertaken. The prospects of biodiversity in the region beyond 2010 are likewise outlined in the report.

"This is a modest attempt at responding to the question of whether or not we as a region met the 2010 target. Through the report, we tried to capture and present the progress made by the ASEAN Member States in this global effort. With the region's well-recognized richness in biological resources and its impact on global environmental sustainability, the ASEAN countries saw it as imperative to come up with an outlook focusing on the region," Mr. Rodrigo U. Fuentes, executive director of ACB, said.

One of the major conclusions of the Outlook is that the ASEAN region, like the rest of the world, is increasingly losing its biodiversity within various ecosystems - forest, agro-ecosystems, peatlands, freshwater, mangroves, coral reefs and seagrass.

"The implications of biodiversity loss to human well-being can be profound, affecting not only human societies' way of life, but its very existence, as well," Fuentes warned. He added that "No one will be spared from the impacts of biodiversity loss and the degradation of ecosystem services, but the first one who will bear the heaviest burden will be the poor and marginalized whose lives are strongly linked with the environment."

The Outlook also underscores that the drivers of biodiversity loss continue to intensify. The key drivers of biodiversity loss in the ASEAN region include ecosystems and habitat change, invasive alien species, over-exploitation (as a result of deforestation and land-use and water-use change, as well as wildlife hunting and trade for food), pollution, poverty and climate change.

The Outlook emphasizes that the impacts of climate change on biodiversity remains to be better understood. A formidable challenge, it reports, is enhancing the resilience of biodiversity components to adapt to climate change.

In terms of addressing the drivers and threats to biodiversity loss, the Outlook points out that the ASEAN region remains slow in delivering progress, particularly in preventing invasive alien species, addressing the impact of biodiversity to species and ecosystems, and abating pollution and the exploitation of forests and wetlands.

One success story highlighted in the Outlook is the progress made by the region in expanding the coverage of terrestrial and marine protected areas. Since 1950, the

designated protected areas have increased by 98 percent by area and by 89 percent by number. The ASEAN region also met the suggested target of having 10-percent of its terrestrial land declared as protected areas, having established 13.2 percent for such purpose. Six ASEAN Member States have exceeded the 10-percent target. The countries were also successful in shoring up efforts to further develop capacities and expand the network of wildlife law enforcers.

The Outlook points out that these initiatives have to be sustained in the long term. "This requires sustained political, technical, financial and stakeholder engagement at all levels," Fuentes said. He stressed that the ASEAN region, as with the entire global community, has to move forward in collectively achieving the Biodiversity Target beyond 2010.

"Addressing biodiversity loss is a shared responsibility for all humanity. While it is recognized that the challenges are daunting, involving foremost a major shift in perception and priorities in societies' current lifestyles, it is an imperative shift to carry out the actions identified in the Outlook at the necessary scale and address the underlying causes of biodiversity loss. The continued failure to avert the current trends of biodiversity loss and the degradation of ecosystems services is simply unacceptable. We need cogent and comprehensive actions that will replace the current business-as-usual effort for addressing the issues. This will require political will and collective actions," Fuentes said.

Workshop discusses REDD-Plus as tool vs. biodiversity loss and climate change

REDUCING emissions from deforestation and forest degradation, conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks in developing countries were discussed by Asia-Pacific countries at a regional consultation and capacity-building workshop held in Singapore from March 15 to 18, 2011. These topics are commonly known as REDD-Plus, a set of steps designed to use market/financial incentives in order to reduce the emissions of greenhouse gases from deforestation and forest degradation and contribute to biodiversity conservation.

The workshop was organized by the Secretariat of the Convention on Biological Diversity (CBD) and the National Parks Board of Singapore, with support from the Government of the United Kingdom, Great Britain and Ireland; and the ASEAN Centre for Biodiversity through the GIZ Biodiversity and Climate Change Project. Participants were government experts on forests, biodiversity and climate change; representatives of indigenous organizations, non-governmental organizations and donor countries; REDD-Plus Interim Partnership; and Coalition of Rainforest Nations.

The workshop identified possible indicators to assess the contribution of REDD-Plus to achieving the objectives of the CBD, and assessed potential mechanisms to monitor impacts on biodiversity from these and other ecosystem-based approaches for climate change mitigation measures.

The workshop served as opportunity to consult with countries that are Parties to the CBD on the development of relevant safeguards for biodiversity, so that REDD-plus actions are consistent with the objectives of the CBD, as well as avoid negative impacts and enhance benefits for biodiversity.

Results of the Asia-Pacific workshop will be brought to the attention of the eleventh meeting of the Conference of the Parties to the CBD, as well as to the relevant bodies of the UN Framework Convention on Climate Change.

Forests cover a vast area of the earth's surface. They support about two-thirds of the world's terrestrial biodiversity but these areas suffer the most widespread form of conversion and degradation. Southeast Asia, also known as the ASEAN region, is home to the most diverse forest ecosystems in the world but its forests have transformed extensively over the last 50 years.

The ASEAN Biodiversity Outlook, published by the ASEAN Centre for Biodiversity (ACB) reported that as of 2000, only 47 percent of the ASEAN was forested, with Brunei Darussalam, Cambodia, Indonesia, Malaysia and Myanmar at least having more than 50 percent of their total land area under forest cover.

By 2007, the forest cover of the entire region was down by four percentage points, at 43 percent. Between the period from 1980 to 2007, the ASEAN forests have decreased by a total of 555,587 square kilometers, an area roughly the size of Thailand; or by an annual average rate of 20,578 square kilometers, an area almost 29 times the size of Singapore.

The Outlook explained that the fragmentation of forests following the construction of roads, agriculture and human settlement development has had dire impacts on wildlife, reducing the corridors in which they can move or migrate. As a result, a number of endemic plant and animal species dependent on the health of forest ecosystems are at risk.

The Outlook reported that during the past decades, the primary threat to ASEAN forests has been deforestation attributed largely to logging and timber harvesting. Illegal logging has exacerbated the situation. Other prominent threats that the Outlook identified are forest fires; forest conversion for human settlement and infrastructure development, mining and mineral resource extraction; the introduction of invasive alien species; illegal wildlife trade; and slash-and-burn farming.

ACB Executive Director Rodrigo U. Fuentes said it is important to value biodiversity and ecosystems services, including forests, by translating biodiversity into economic terms.

"The wealth of biodiversity in Southeast Asia and its continuing loss must be valued and appreciated in order to effect appropriate policy changes and solutions. Managing and investing in natural capital, as espoused by The Economic of Ecosystems and Biodiversity study, provides a number of opportunities on investments to mitigate and

adapt to climate change. Thus, expanding REDD to the REDD-plus instrument could create a revenue stream for national governments to meet emission reduction targets," Director Fuentes explained.

Director Fuentes reported that in the ASEAN region, there is a great potential for raising revenues from REDD in Indonesia and Cambodia. There is an ongoing REDD project in the Seima Biodiversity Conservation Area which is inhabited by the Bunong minority, an indigenous peoples group that is described as having low literacy, small in numbers and of weak political clout. The first activities included staff training, actual data collection for carbon stock surveys, and baseline analysis to record and project deforestation rates. Fundraising for implementation is ongoing, along with the writing and certification of the Project Design Document. In six to twelve months, the first credits will be ready to be brought to market.

In Viet Nam, there exists the potential and willingness on the part of government to include REDD as part of its strategy on climate change response. A national framework has been developed, particularly in linking it with the existing policy on Payment for Ecosystem Services. Prospects are bright for REDD to be established in the country and Viet Nam has demonstrated its interest in cooperating with its neighbors to start work on an international accounting system.

New international treaty on LMOs opens for signature

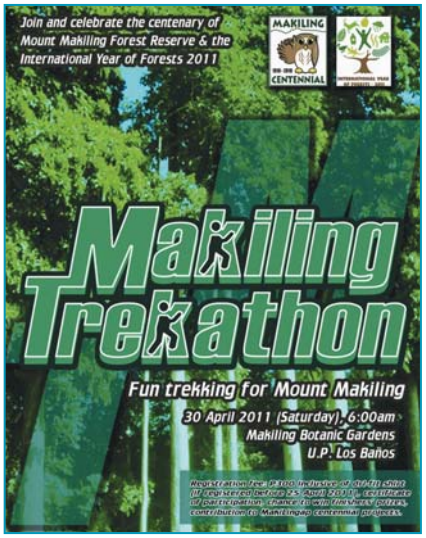
AT a ceremony held in New York, the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety was opened for signature by Parties to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity. The Supplementary Protocol aims to contribute to the conservation and sustainable use of biodiversity by providing international rules and procedures for liability and redress in the event of damage resulting from living modified organisms (LMOs).

The Supplementary Protocol specifies the measures that need to be taken in response to damage resulting from LMOs that find their origin in a transboundary movement. In the event of damage or sufficient likelihood of damage to biological diversity, a government, through a competent authority, would require the person in control of the LMO, i.e. the operator, to take appropriate response measures, or would take such measures itself with a right of recourse against the operator.

During the ceremony, representatives of the Governments of Colombia, Denmark, the Netherlands and Sweden signed the Supplementary Protocol, which remains open for signature until 6 March 2012 at the United Nations Headquarters in New York. *SCBD*

Makiling "Trekathon" held

THE Makiling "Trekathon", a fun trekking and fund raising campaign, was held on April 30 as part of the centennial celebration of the establishment of Mount Makiling Forest Reserve and the 101th foundation anniversary and alumni homecoming of the College of Forestry and Natural Resources (CFNR)-University of the Philippines Los Banos. The event also coincides with the observance of the International Year of Forests 2011.



The event sought to advance information and advocacy campaigns for the conservation of Mount Makiling being a scientific reserve, a significant biodiversity area, a critical watershed and airshed, a geothermal production field, and a key ecotourism site.

Singapore starts comprehensive marine biodiversity survey

SINGAPORE is undertaking its first comprehensive survey to take stock of the republic's marine ecosystem, species diversity and distribution. The survey is being led by the National Parks Board (NParks) in partnership with experts from tertiary institutions, non-governmental organizations and individual enthusiasts. It's expected to be completed by December 2013.

NParks said sites with coastal and marine habitats around Singapore have been identified and mapped, using satellite images. They are further validated through the ongoing biodiversity surveys conducted at these sites, including Chek Jawa, Cyrene Reefs and Pulau Semakau.

More than 80 volunteers have come forward to register their interest and support. They will be participating in various aspects of the survey, including photography, outdoor field sampling and collection, and specimen processing.

NParks is working with the National University of Singapore (NUS) to train the volunteers. Several organizations have also come on board. Shell companies in Singapore have donated S$500,000 to the NUS for conservation activities, of which S$300,000 will go towards bringing in scientific experts for this survey. The Care-for-Nature Trust Fund has pledged S$250,000 to finance equipment required for the survey.

NParks is keen for more public and private sector support. It said Singapore has many marine treasures waiting to be documented. In the last two years, a species of sponge new to science was discovered in Singapore's shallow waters. *Mustafa Shafawi, Channel NewsAsia 7*

Raise the value of forests, says IUCN

A BETTER evaluation of what forests are worth will generate direct benefits for poor forest dwellers, open up new markets and affect global economic growth. The economic benefits of forests are massively under-valued by governments and donor agencies, according to the International Union for Conservation of Nature's (IUCN's) latest report.

Forests are traditionally valued for their main commercial resource, timber. But they are home to 80 percent of terrestrial biodiversity and provide a wide range of ecosystem services such as clean water, protection against floods and other natural disasters, estimated at more than US$ 720 billion a year for national and global economies.

"When deciding how to spend their budgets, governments usually don't factor in the economic returns to investing in locally-controlled forestry," says IUCN's Lucy Emerton, one of the authors of the report. "They miss a critical opportunity to invest in stimulating economic growth, sustainable development and poverty reduction."

At least 400 million hectares of forest landscapes, an area roughly the size of the European Union, and 1.5 billion people, a population larger than that of China, are already involved in locally-controlled forestry. However, only about 47 percent of the legal rights over forests are formally placed under their management.

The aim of IUCN's report, The Value of Investing in Locally-controlled Forestry, launched at the United Nations meeting on the International Year of Forests in New York, is to show the global economic impact of forests if they are managed and controlled by the people who live in and around them.

"Locally-controlled forest management is a highly profitable public investment and development assistance option," says Stewart Maginnis, IUCN's Director of Environment and Development. "We are talking about an absolutely revolutionary way of changing the world economy-and changing it for the better."

The direct livelihood values, such as food, medicines, fuel, energy, income and employment, are estimated at US$130 billion a year to the world's poorest communities, according to the report. This is more than France and Switzerland's gold reserves combined. To read the full report visit:http://www.iucn.org/about/work/programmes/forest/?6853/valuelocally-controlledforestry.

UN-REDD releases first 5-Year strategy

THE UN-REDD Programme has released its first five-year strategy (2011-2015), which provides a road map for increased support to UN-REDD partner countries for activities related to reducing emissions from deforestation and forest degradation in developing countries, including conservation, sustainable management of forests, and enhancement of carbon stocks (REDD-Plus).The Strategy outlines the Programme's overall vision and mission, namely to support countries' efforts towards REDD and transform their forest sectors so as to contribute to human well-being, and meet climate change mitigation and adaptation aspirations. It also includes the 2011-2015 objective of promoting the elaboration and implementation of national REDD-Plus strategies to achieve REDD-Plus readiness. The Strategy defines six key work areas for Programme support: measuring, reporting and verification, and monitoring; national REDD-Plus governance; stakeholder engagement; multiple benefits of forests and REDD-Plus; management of REDD-Plus payments; and REDD-Plus as a catalyst for transformations to a green economy. The Strategy highlights the following objectives: increasing the number of countries that receive support; creating a new financial modality; and scaling up coordination with strategic partners. *UN-REDD Programme*

Biodiversity in Food Awards now open

GENEVA – The Union for Ethical BioTrade (UEBT) has announced the second round of the Biodiversity in Food Awards, held in partnership with the Food Ingredients Europe (FI Europe) tradeshow organized by United Business Media (UBM).

Launched last year, the annual awards recognize companies in the food sector that are pioneering efforts to promote conservation and the sustainable use of biodiversity, through their supply chains.

Applicants will be rewarded on how they contribute to the objectives of the Convention on Biological Diversity (CBD), which include the promotion of biodiversity conservation, the sustainable use of biodiversity and the equitable sharing of benefits throughout the supply chain.

UEBT, a non-profit association that promotes the ethical trade in biodiversity-based products, said the awards aim to recognize leading companies and products as well as to increase the awareness of sustainable sourcing and good biodiversity practices within the food industry.

"With the awards we want to recognize leaders and innovators in the field, but also highlight the important role businesses can play in realizing the biodiversity objectives included in the CBD" said Executive Director of UEBT Rik Kutsch Lojenga.

The awards are divided into two categories: innovation and leadership. The innovation award will be given to an innovative product created in a sustainable manner, with respect for the environment and surrounding biodiversity. The leadership award is destined for a company promoting sustainable practices and respect for biodiversity in a way that will influence other businesses to adopt similar practices.

Companies interested in applying to 2011's Biodiversity in Food Awards are invited to send their applications before August 26 2011. Winners will be announced at UBM's Food Ingredients Europe trade show, held this year in Paris, November 29-December 1. More information and details of how to be apply can be found at www.ethicalbiotrade.org/awards. *Union for Ethical BioTrade*

■ Brunei Darussalam

Blue Flag bid gets support from Jastre. A bid by the non-government organization Beach Bunch to develop Meragang beach into a Blue Flag beach has received the official support of the Department of Environment, Parks and Recreation. Beach Bunch has been eyeing Meragang beach as the first beach in Brunei they want to develop to the stringent environmental standards of the Foundation for Environmental Education (FEE), the international agency that runs the Blue Flag program for beaches and marinas. Beach Bunch is aiming to raise almost $2 million for the initial development of the Blue Flag beach, with the bulk of the funds going into the construction of an Environmental Information Centre that will house administrative offices and other facilities such as classrooms and research workstations.

The Brunei Times

Bat and pitcher plant enjoy an unusual harmony. A study led by Ulmar Grafe of the University of Brunei Darussalam showed the mutually beneficial relationship between the Hardwicke's woolly bats and pitcher plants. Transmitters placed on bats caught in a peat swamp forest showed that many of the bats chose to rest and sleep in the aerial pitchers of the carnivorous plant Nepenthes rafflesiana. Chemical analysis of the plants found that some 33.8 percent of their nutrients came from the bat poop and urine. Further investigation of the plants revealed that they put little energy into trapping insects. They released low amounts of insect-attracting volatile compounds and produced little digestive fluid. Instead, the plants devoted energy towards enticing bats to roost by growing elongated, narrow and cylindrical pitchers that create snug, cozy hideaways for roosting bats. Most of the plant's pitchers provide enough space for two bats stacked on top of each other, allowing pup's to suck on mother bats while inside the plant. The bat-plant relationship may have evolved after some bats happened to roost in the plant.

Pitcher plant

Promoting environmental education vital in schools. Dato Paduka Dr Haji Mohd Amin Liew bin Abdullah, Permanent Secretary at the Ministry of Industry and Primary Resources stressed the importance of environmental education during a workshop for government and non-government secondary school teachers entitled "Implementing Environmentalism in Schools" at Jerudong International School. "As a growing global population increasingly presses up against the limits of the earth's resources and ecosystems, the general public will more frequently be called upon to understand complex environmental issues and assess risk and understand how individual decisions affect the environment at the local, national and global level. A systematic approach to environmental education would create a scientifically informed citizenry that is better equipped to address environmental issues," the Permanent Secretary explained. Some 87 secondary school teachers attended the workshop that aimed to inform and assist in the communication of practical and logistic elements of implementing environmentalism in schools.

BruDirect.com

■ Cambodia

Prime minister cancels titanium mine project citing impact on biodiversity and local people. Cambodian Prime Minister Sandech Hun Sen has cancelled a titanium strip mine project in one of Southeast Asia's last great intact forest ecosystems, the Cardamom Mountains. The mine was canceled due to concerns of the impact on the environment, biodiversity and local livelihoods of villagers. The mine, which was planned to sit directly in the migration route for the largest population of Asian elephants in Cambodia, had been largely opposed by locals in the region who spent years developing ecotourism. Incredibly rich in wildlife, the Cardamom Mountains is home to Indochinese tigers, Malayan sun bears, and pileated gibbons, in addition to 250 species of birds. According to Wildlife Alliance 70, threatened species live in the area, including the Siamese crocodile, which is listed as Critically Endangered. *mongabay.com*

WWT wins funding for Sarus crane reserves. A partnership led by the Wildfowl and Wetlands Trust (WWT) has been awarded funding totaling over $350,000 by the Critical Ecosystem Partnership Fund to fully establish and conserve designated Sarus crane reserves in Cambodia. The project will focus on two sites: Boeung Prek Lapouv (which covers 9,276 hectares) and the recently designated Kampong Trach (1,106 hectares). Together, the areas support significant numbers of Sarus cranes – over 300 birds, which are over 20 percent of the regional population – during the dry season. The species is currently in decline and considered globally threatened. *WWT*

Report includes Cambodia within world's most endangered biodiversity area. Conservation International has named a biodiversity area that includes all of Cambodia as the most endangered such region in the world, claiming it has only five percent of its original habitat remaining. The environmental group released a list of the world's 10 most threatened "forest hotspots", grouping Cambodia within the "Indo-Burma" region, which also includes Burma, Thailand, Cambodia, Laos, Viet Nam and small areas in India and China. All 10 regions on the list have lost at least 90 percent of their original habitat and contain at least 1,500 unique plant species, CI said. Conservation International regional director David Emmett called Cambodia the "jewel" of the Indo-Burma region. More than a quarter of the Kingdom, he said, has been classified as protected land, in contrast to regional

neighbours such as Thailand and Viet Nam that have nearly decimated their forests. "Cambodia has some of the highest concentrations of the most endangered species in the hotspot," he said. Logging and development have taken their toll on Cambodia's forests and wildlife, however. Government officials have announced plans for numerous hydropower dams on the Mekong River and elsewhere, projects that pose a critical threat to local fish populations, said Eric Baran, a senior scientist at the WorldFish Centre. In its 2010 annual report, the Forestry Administration said more than 1.3 million hectares worth of economic land concessions, or roughly 7 percent of Cambodia's territory, have been granted to date. The FA recommended a review of existing concessions to ensure that the land is being used productively.

Phnom Penh Post

■ Indonesia

Illegal logging, mining ravages Kalimantan, costs Indonesia $36.4 billion. The Ministry of Forestry says illegal logging, land clearance, forest fires and mining has devastated Indonesian Borneo and cost the country an estimated Rp 311.4 trillion ($36.4 billion). Raffles Panjaitan, Director for Forest Investigation and Protection at the Ministry, said an estimated 1,236 mining firms and 537 oil palm plantation companies were operating illegally in Central, East and West Kalimantan on the Indonesian half of Borneo. The companies had caused losses put at Rp158.5 trillion in Central Kalimantan, Rp 31.5 trillion in East Kalimantan and Rp121.4 trillion in West Kalimantan, he said. Forestry Minister Zulkifli Hassan said the names of the companies, including a number of large operations with thousands of hectares of concessions, were not being released because they were still under investigation by the ministry in conjunction with the Judicial Mafia Eradication Task Force.

The Jakarta Globe

Rare Sumatran tiger gives birth. A rare Sumatran tiger has given birth to three cubs at Taman Rimba Zoo in Jambi province in a welcome boost for the endangered species. There are as few as 400 Sumatran tigers left in the wild in Indonesia. Human-animal conflicts are a rising problem in the country as people encroach on wildlife habitats. The birth of the cubs presents new hope in the effort to save the tiger population.

Javan rhinos

Hope for Javan rhinos. Hidden cameras have captured proof that Javan rhinos are breeding in Indonesia's Ujung Kulon National Park. The population in Ujung Kulon represents the last real hope for the survival of a species that is on the brink of extinction. The video clip shows two females with their calves, one a female aged about a year and the other a younger male. They enter a small clearing in the jungle and appear to approach the hidden camera. Environmentalists had believed there were only about 40 Javan rhinos left in the wild, but the camera data have led them to believe there could now be up to 50. Conservationists celebrated the discovery of the calves but warned that Ujung Kulon's rhino population remains extremely vulnerable. Threats include poachers, habitat loss due to illegal clearing, disease from livestock that wander into the park from surrounding paddocks, tsunamis triggered by earthquakes and eruptions from the nearby Anak Krakatau volcano. *AFP*

■ Lao PDR

Mekong ecology in the balance due to dam. An intergovernmental meeting in Lao PDR has failed to reach agreement on the proposed £2.1bn, 1,260-megawatt Xayaburi dam on the Mekong River. Environmentalists say the dam will adversely affect 60 million people and Cambodia and Viet Nam – concerned about the flow of water further downstream – are officially opposed to the project. But reports revealed that work on the proposed project in northern Lao PDR was already under way and that the Laotian authorities and a Thai construction company that has the contract for the work had already prepared several miles of roads and set about removing local villagers by giving them £10 in compensation. There has been intense opposition to the dam from NGOs and villagers whose livelihoods would be affected. The authorities in Lao PDR, who said the country needs the foreign exchange it would earn for investment in social programs, have not responded to the claims that they have started work on the project. *The Independent*

A news species, Bare-faced Bulbul, has been discovered in a rugged limestone karst area of Laos

New bulbul discovered. The first new Asian species of bulbul (songbird) in more than 100 years has been described from a limestone karst region of Lao PDR. Bird inventories in the country resumed in the 1990s after a hiatus lasting nearly 40 years. Pycnonotus hualon is distinctive for its bald face, plumage details and coloration, and the whistled, dry bubbling notes of its song. The species name is from the Lao word hualon, which means bald-headed. The bird was discovered by scientists from the University of Melbourne and the Wildlife Conservation Society.

guardian.co.uk

Micro hydro power helps achieve sustainable livelihoods among minority community. In the remote Houay Ngou village in northern Lao PDR, a newly installed 7.5kW hydro power turbine now supplies electricity to the Hmong ethnic community of 290 people, a project initiated by the villagers

themselves. The villagers proposed the construction of the micro-hydro power system to the Sayaboury Provincial authorities. After securing funding from the Global Environment Facility Small Grants Programme implemented by the United Nations Development Programme, the villagers voluntarily participated in constructing the small water catchment area, installing the pipes and transporting the building materials. Most of the villagers in Houay Ngou are engaged in rice cultivation, animal husbandry, and the collection of non-timber forest products. The community has few opportunities for income generation and the continued degradation of farmer's livelihoods. Its remote location worsens the situation with little access to external financial and policy support. However, with access to 24-hour power villagers are now able to save money and time. The hydro power project has also resulted in improved environmental protection of the surrounding area. The villagers no longer need to cut down trees to burn for cooking and use electric powered stoves instead. In addition, the watershed forest is now a protected area as it holds the water resource for the hydro power. To ensure the sustainability of the project, 6,000 Lao Kip (about $US 0.75) is paid by each household monthly to maintain the hydro power turbine and protect the watershed forest. *UN in Lao PDR*

■ Malaysia

Malaysia to charge soldiers over hornbill killing. Five Malaysian soldiers on anti-poaching duty face criminal charges after Facebook pictures showed them posing with a dead, endangered Great Pied Hornbill bird. Defense Minister Ahmad Zahid Hamidi said the group was part of a force protecting the Royal Belum-Temengor rainforest in the northern state of Perak, when they came across the bird, which had been shot by a hunter. Upon seeing the dying bird, the soldiers slaughtered it. Although the soldiers were not responsible for shooting the bird, they should have tried to save rather than kill the hornbill. The Great Pied Hornbill is found in the rainforests of India, Malaysia and Indonesia. The bird's impressive size and plumage have made it an important part of tribal culture and rituals. Hornbill numbers have declined perilously owing to habitat loss and poaching. Their trade or sale is illegal under the Convention on International Trade in Endangered Species of Wild Fauna and Flora. *AFP*

Clouded leopard female and her cub caught on camera trap in a corridor in the vicinity of DGFC. Photo courtesy of Sabah Wildlife Department, Danau Girang Field Centre and HUTAN.

Big mammals survive in fragmented forest in Borneo. Camera trap photos taken in the fragmented forest along the Kinabatangan River in Borneo have revealed a number of key mammal species surviving despite forest loss mostly due to expanding palm oil plantations. The photos are part of a recent programme to monitor carnivores along the Kinabatangan River in the Malaysian State of Sabah by the Danau Girang Field Center, the NGO HUTAN, Oxford University's Wildlife Conservation Research Unit, and the Sabah Wildlife Department. The programme has already captured rare intimate shots of female Sunda clouded leopard with a cub. The pictures show that the animals rely on forest corridors for moving around forest patches. Without these corridors, most populations will decline and go extinct. One of the major conservation issues along the Kinabatangan is fragmentation: forests have been split by plantations, making it difficult for animal populations to migrate without traversing through palm oil plantations or human habitations.

The coal plant would have sat 20 kilometers from Tabin Wildlife Reserve, home to the largest population of the world's last Bornean rhinos, a subspecies of Sumatran rhinos. Researchers estimate that 250 Sumatran rhino survive in the world, and 40 or so Bornean rhinos, such as this captive male, named Tam.
Photo by: Jeremy Hance.

Environmentalists and locals win fight against coal plant in Borneo. Environmentalists, scientists, and locals have won the battle against a controversial coal plant in the Malaysian state of Sabah in northern Borneo. The State and Federal governments announced that they would "pursue other alternative sources of energy, namely gas, to meet Sabah's power supply needs." Proposed for an undeveloped beach on the north-eastern coast of Borneo, the coal plant would have threatened the Coral Triangle, one of the world's most biodiverse marine ecosystems, and Tabin Wildlife Reserve, home to Critically Endangered Sumatran rhinos and Bornean orangutans. Local fishermen feared that discharges from the plant would have imperiled their livelihood. Green SURF (Sabah Unite to Re-Power the Future), a coalition of environmental and indigenous rights groups, developed a robust campaign against the plant, including hiring an energy expert to prove that Sabah's power needs could be met without coal. The cancellation of the coal plant ends a three-year struggle, including the plant's site being moved twice due to intense local opposition. Green SURF consisted of WWF-Malaysia, Land Empowerment Animals People, Sabah Environment Protection Association, Partners of Community Organisations and the Malaysian Nature Society (Sabah branch). *mongabay.com*

■ Myanmar

Plastic bags get the toss from Yangon. Manufacturing, storing and selling high-density polyethylene (HDPE) plastic bags and rope has been banned in Yangon by the Yangon City Development Committee (YCDC). Manufacturers were also warned that anyone who ignored the ban would have their business license annulled. YCDC officials would not renew licenses for the production of HDPE bags, but would permit the manufacture of low-density polyethylene (LDPE) plastic bags, which biodegrade more quickly than HDPE material. Aside from banning the production of HDPE bags, businesses also cite the need to encourage recycling and systematic waste disposal to reduce the negative impacts of trash, such as the blockage of drains in the city. *Myanmar Times*

People walk past a garbage dump filled with plastic bags on the outskirts of Yangon on April 27. AFP photo

First international level safari park to be opened. A new international level safari park will soon be opened at Myanmar's capital of Nay Pyi Taw. The park will have endangered species of animals from Myanmar and around the world and will serve as a public recreational and educational center where people can learn about the natural ecology. Animals will be kept in natural condition as an open zoo so that visitors could feel as though they are in an African forest. The park will soon be filled with over 200 animals of 16 rare species from some foreign countries, including kangaroo, giraffe, white rhino, zebra, ostrich, goat, deer, one-hump camel, lion and African deer.

China helping Myanmar's hydropower needs. China is helping Myanmar boost its hydropower capacity with 18 joint-venture projects currently under construction in Kachin state. The 18 projects, which are being implemented in partnership with Chinese companies, will produce a combined 20,760 megawatts of electricity, making Kachin the major electricity-producing region in Myanmar when the projects are completed. *China Economic Review*

■ Philippines

Philippine Eagle

Trapping threatens near-extinct Philippine eagle. Conservationists raised alarm over the future of the near-extinct Philippine eagle after several maimed or diseased birds were retrieved from captivity over recent months. The Philippine Eagle Foundation said that since December 2010, it had rescued four of the one-meter birds, which are among the world's largest raptors, suggesting conservation laws had not deterred trapping. The foundation said the retrieved birds, all recovered from the large southern island of Mindanao, included a female eagle that was missing two out of three toes on one foot when it was recovered in December. The government in January 2011 handed over a year-old male to the Mindanao-based foundation, which it had received from villagers. Later, a year-old eagle with just two primary feathers remaining on its right wing was turned over by local residents while a juvenile retrieved from another community died from a fungal infection. The IUCN says there are just 180 to 500 mature Philippine eagles in Mindanao, Luzon, Leyte and Samar islands, with forest loss and poaching the main threats to their survival. *AFP*

Children's museum re-opens science gallery on climate change and saving planet Earth. Museo Pambata (Children's Museum) re-opened on January 18, 2011 its Science Through Discovery theme room with more exciting, interactive exhibits designed to help children understand the various factors that affect climate change. Dubbed "I Love My Planet Earth", the room introduces environmental concepts while doing away with complicated jargon. The exhibits will entertain children while helping them understand climate change. Nina Lim-Yuson, President and CEO of Museo Pambata said the hands-on exhibits explain basic science concepts on environmental concerns and how one can help in making the world a better place to live in by protecting and conserving our resources. Aside from targeting children, the exhibits also encourage adults who have a strong influence on children, particularly parents and teachers, to join the campaign by being good role models to the young. Complementing the room are a teacher's guidebook and a poster-checklist on saving our planet. The guidebook explains and expands on the concepts presented in the exhibits through suggested sit-down written activities and experiments. The guidebook and checklist will be distributed for free to all museum visitors.

Tree-planting world record set in Philippines. Philippine environmentalists have set a world record for the most trees planted simultaneously, kick-starting an enormous reforestation programme. Nearly 7,000 people helped in the mass planting of saplings in denuded forest and grassland in the eastern province of Camrines Sur. The El Verde (The Green) project reported that 64,096 trees were planted in 15 minutes, which was certified by the Guinness Book of World Records. The effort beat the previous Guinness world record of 50,033 trees planted in India in 2010. The event marked the start of the provincial government-backed programme to plant 12 million trees in the logged forests of Camarines Sur by 2012. The tree planting, on government-owned land, is intended to stop erosion and restore watersheds. *The Independent*

■ Singapore

Singapore youth

Singapore declares April 22 as "Youth for the Environment Day". The Singaporean government has declared April 22 as the "Youth for the Environment Day", coinciding with the annual celebration of the international Earth Day. The move was part of efforts to promote clean and green living, according to the National Environment Agency (NEA), a statutory board of the Ministry for the Environment and Water Resources tasked to protect the city-state's air, land and water resources. Over 130 local schools observed the day by organizing environment-related activities to promote energy efficiency, recycling, good public health practices, nature appreciation and a litter-free environment. *Wild Singapore*

Singapore Green Landscape 2011 now available. The Singapore Green Landscape 2011 provides a review of 80 key environmental news in Singapore and gives an overview of 160 non-governmental organizations, green groups, business associations and groups, green websites, government agencies, and institutes and centers in Singapore, which are related to the environment. The book will be useful for everyone interested in the state of the environment in Singapore, find and connect with the environmental organizations in the country, or explore personal and business opportunities. The book is free and may be downloaded from Green Future Solutions (http://www.greenfuture.sg/2011/01/07/singapore-green-landscape-2011/).

Singapore given air quality title for Asia. Singapore City has been named the greenest city in Asia for its high level of air quality. The Asian Green City Index, commissioned by Siemens and carried out by the Economist Intelligence Unit, revealed that it is the greenest metropolis of 22 cities in the continent. The city was tested with regards to its energy and CO2 emissions, land use, transport, sanitation, air and water quality and environmental governance. *Environmental Technology*

■ Thailand

UN climate talks open in Thailand. The first round of UN climate change talks since the Cancun summit in December 2010 was held in Bangkok. Negotiators from 173 governments are supposed to build on the Cancun agreements and work towards establishing a new global climate change regime, to extend or replace the Kyoto Protocol, when its first commitment period expires at the end of 2012. Governments this year must resolve fundamental issues over the future of the Kyoto Protocol. Governments must also agree on emission reduction targets and actions which will allow the world to stay below the maximum temperature rise of two degrees Celsius above pre-industrial levels, a target set by governments in Cancun. Agreed actions and institutions should also be delivered on time and in accordance with the deadlines agreed in Cancun so that the broader global climate regime is up and running in 2012. The institutions include a Green Climate Fund to house the international management, deployment and accountability of long-term funds for developing country support. Other institutions agreed at Cancun include a Technology Mechanism to promote clean technologies; and an Adaptation Framework to boost international cooperation to help developing countries protect themselves from climate change impacts. *Environment News Service*

Dive sites closed to halt damage to reefs. Thailand is closing dozens of dive sites to tourists after unusually warm seas caused severe damage to coral reefs in the Andaman Sea, one of the world's top diving and beach resort regions, authorities said. More than half of southern Thailand's 15,000 hectares of coral reefs are suffering from bleaching, or the shedding of coral colors, a phenomenon caused largely by rising sea temperatures over an extended period, officials said. "We will study the cause and effect and find a way to restore them," Sunan Arunnopparat, director of the Department of National Parks, told Reuters, adding that the reefs will be closed across seven national parks. He declined to say how many diving spots would be closed or how extensive the damage was to the reefs. He said diving sites where bleaching had spread to 80 per cent of the reefs would be shut for an unspecified period. Coral bleaching – the whitening of corals due to heat driving out the algae living within the coral tissues – was first reported in May 2010 after a surge in temperatures across the Andaman Sea from the northern tip of Sumatra island to Thailand and Myanmar. Other parts of Southeast Asia have also suffered. An international team of scientists studying bleaching off Indonesia's Aceh province found that 80 percent of some species have died between May and August. *Jutarat Skulpichetrat, Reuters*

Photo by Roger Greenway

Solar power plants under construction in Thailand. Thailand's first large-scale solar power plants are expected to be pumping out renewable energy by 2011. At least two solar power plants are currently under construction just outside Bangkok: an 8-billion-baht project in Lop Buri Province, famous for its large population of unruly primates, and another smaller power plant in Ayutthya Province. The solar power plant in Lopburi is the 'largest in the world' and will produce 73 megawatts when completed in 2012. The solar power plant in Ayutthaya Province will be producing 38 megawatts by the end of 2011, according to solar

panel manufacturer and supplier Suntech Power Holdings Co. The major investor in the Ayutthaya solar power project, Bangchak Petroleum PCL, reportedly plans to invest heavily in 11 solar power plants planned in the surrounding area under a government initiative to provide 20 percent of the country's energy needs through renewable sources by 2022. The Lopburi solar power plant will comprise about half-a-million solar panels and is expected to reduce carbon dioxide emission by over 1.3 million tons a year and reduce the need for imported fuel by over 35,000 tons a year. *Phuket World*

■ Viet Nam

Viet Nam reserve brings hope for rare animal. Authorities in the central Quang Nam province agreed to set up a reserve dedicated to the secretive saola, a relative of antelopes and cattle and one of the world's rarest animals, which was only discovered in 1992. This has brought new hope for the survival of the creature, which is on the brink of extinction. The saola is hunted illegally for its horns using snares and dogs and the population could be as low as a few dozen. The elusive creature was seen for the first time in a decade in August 2010 but died a few days after it was captured by villagers in Lao PDR, according to the International Union for Conservation of Nature. The animal was photographed before its death, the first confirmed record since 1999 when pictures of wild saola were taken by automatic cameras in Lao PDR. *AFP*

Vietnam's Biodiversity Has Deep Roots in Earth's Past. On account of the very high number of animal and plant species which are mostly only found there, Southeast Asia is a global biodiversity hotspot. Despite its highly endangered terrestrial and freshwater ecosystems, Viet Nam makes a significant contribution to this biological diversity. In a current publication the scientific team around Professor Madelaine Böhme, leader of the team on Terrestrial Palaeoclimatology of the Senckenberg Center for Human Evolution and Palaeoecology (HEP) at the University of Tübingen (Germany), demonstrates for the first time that North Viet Nam was already a hotspot of biodiversity about 30 million years ago. The group succeeded in recovering mammals, crocodiles, six species of turtles, around 20 fish species and 10 mussel species, snails and various plants from marine sediments as evidence of the early biodiversity. Several of the fossil animals are completely new to science and are still awaiting a precise description. Even so, the yield in knowledge has already been considerable Professor Böhme sums up the objective of her research work: "Since many of the fossil species are closely related to today's plants and animals, the findings not only provide information on living conditions during the Cenozoic, but also help us to learn more about basic evolutionary patterns and the global mechanisms within the Earth system." The group investigated the Na Duong basin with the Rinh Chua fault in the province Lang Son, the Cao Bang basin North-West of it as well as the Hang Mon basin, not quite 300 kilometres South-Western of it, close to the Laotian frontier. All three basins lie along major dislocations which originated from powerful tectonic movements during the Eocene (c. 56-34 million years ago). The publication presents the first scientific results of the German-Vietnamese research project carried out in 2008 and 2009 in North Vietnam under the leadership of Madelaine Böhme. *ScienceDaily*

"Vampire Flying Frog" found. The mountain jungles of Viet Nam are home to a new breed of "vampire"—a "flying" tree frog dubbed Rhacophorus vampyrus. First found in 2008, the two-inch-long amphibian is known to live only in southern Vietnamese cloud forests, where it uses webbed fingers and toes to glide from tree to tree. Adults deposit their eggs in water pools in tree trunks, which protect their offspring from predators lurking in rivers and ponds. Vampire tree frog tadpoles have a pair of hard black hooks sticking out from the undersides of their mouths—the first time such

The new "vampire flying frog" species in Vietnam in an undated picture. Photograph courtesy Jodi Rowley, Australian Museum.

fangs have been seen in a frog tadpole. Scientists do not yet know what purpose the fangs serve. However, frogs that raise tadpoles in tree-trunk water holes often feed their young by laying unfertilized eggs as meals. The fangs could help in slicing these open.

Hanoi to become the latest destination on world eco-cities list. Architecture firm Skidmore, Owings and Merrill was awarded a commission to develop Hanoi's first "green tech corridor," merging two existing villages and cutting the area's carbon emissions. The development plan for the Vietnamese city involves the redevelopment of two villages to create a miniature city roughly 180 hectares in size. The redevelopment, which is expected to be completed over the next 10 to 15 years, involves environmentally friendly technology such as heating and cooling systems powered by renewable energy, waste recycling schemes and rainwater collection points. The development includes 'smarter' and more environmentally friendly planning techniques such as utilizing natural waterways to transport water back to the river rather than installing an array of piping. The trend for 'green building' is no longer restricted to individual residences or housing projects but is increasingly being extended to cover entire cities. China, one of the world's leading manufacturers of renewable energy technology, is intending to build an 'eco city' near Tianjin, 112 kilometers south of the capital Beijing. The Tianjin eco city, designed by Surbana Urban Planning Group, will be about 30 square kilometers and utilize the latest environmentally friendly technology; it is expected to be completed around 2020. *The Independent*

Photo from www.thefeaturedcretaure.com

Bare-faced Bulbul

(Passeriformes: Pycnonotidae)

An odd songbird with a bald head living in a rugged region in Lao PDR has been discovered by scientists from the Wildlife Conservation Society (WCS) and University of Melbourne, as part of a project funded and managed by the mining company Minerals and Metals Group that operates the Sepon copper and gold project in the region.

Dubbed the bare-faced bulbul because of the lack of feathers on its face and part of its head, it is the only example of a bald songbird in mainland Asia. It is the first new species of bulbul – a family of about 130 species – described in Asia in over 100 years.

The thrush-sized bird is greenish-olive with a light-colored breast, a distinctive featherless, pink face with bluish skin around the eye extending to the bill and a narrow line of hair-like feathers down the centre of the crown. The bird seems to be primarily tree-dwelling and was found in an area of sparse forest on rugged limestone karsts – a little-visited habitat known for unusual wildlife discoveries. Its apparent restriction to rather inhospitable habitat helps to explain why such an extraordinary bird with conspicuous habits and a distinctive call has remained unnoticed for a long time.

Fortunately, much of the bird's presumed habitat falls within legally protected areas in Lao PDR. However, quarrying of limestone looms as a potential threat to wildlife in this area, along with habitat conversion for agriculture. In 2002, in the same area, Rob Timmins of the Wildlife Conservation Society described the kha-nyou, a newly discovered species of rodent so unusual it represented the lone surviving member of an otherwise extinct genus. Three years earlier, he described a unique striped rabbit in the region also new to science.

A description of the new species is published in the Oriental Bird Club's journal Forktail. Authors include Iain Woxvold of the University of Melbourne, along with Wildlife Conservation Society researchers Will Duckworth and Rob Timmins.

Reference:

Wildlife Conservation Society (http://www.wcs.org/new-and-noteworthy/bulbul-bird-discovery.aspx)

Photo from www.orientalbirdclub.org

Bukidnon Woodcock

(Scolopax bukidnonensis)

The Bukidnon woodcock *(Scolopax bukidnonensis)* is a medium-sized wader. Specimens of this new taxon obtained in the 1960s from Dalton Pass, Nueva Vizcaya, Luzon, were incorrectly identified as the Eurasian woodcock *(S. rusticola).* When it was sighted and heard in Mt. Kitanglad, Bukidnon, Mindanao in February 1993, and when a specimen was obtained from Mt. Kitanglad in January 1995, the species involved was recognized as distinct and new. The species was described as new to science in 2001.

Darker and more richly colored than the Eurasian woodcock, the Bukidnon woodcock is mostly dusky brown, has a long beak and a stripe below the eye on the cheek. The Bukidnon woodcock is restricted to mountain forests (over 1,000 meters above sea level) on the islands of Mindanao (four mountaintops) and Luzon (center and north) in the Philippines. It appears to be locally common above 900 meters on the mountains on which it has been recorded. Its habitat is extremely remote and rugged, and is unsuitable for either logging or agriculture, and it is listed as Least Concern by the International Union for Conservation of Nature.

Little is known about the bird in the wild. It is described as having a roding (courtship) display flight like other birds of the genus. The Bukidnon woodcock undertakes roding flights both at dawn and at dusk. It is remarkably regular in the time of its appearance, particularly at dusk, when it starts its roding flights and begins calling when the light is such that humans can see objects, but can barely discern colors. In general, roding lasts about 30 minutes in the morning but may last up to 1.5 hours, particularly on clear bright nights. In the evening, roding is generally shorter, usually about 10 to 20 minutes, but has lasted as long as 30 minutes. The Bukidnon woodcock appears less active during rainy conditions.

The species takes its name after the collective name for all of the local tribes of people inhabiting the Mt. Kitanglad Range, and for whom the province of Bukidnon, Mindanao is named. The Visayan word bukid means “mountain” and the word bukidnon means “of the mountain.” The English name Bukidnon woodcock thus means “woodcock of the mountains” and in the broad sense is an accurate description of the habitat of this species.

Reference:

Kennedy, Robert S., Timothy H. Fisher, Simon C.B. Harrap. Arvin C. Diesmos and Arturo S. Manamtam. A new species of woodcock (Aves: Scolopacidae) from the Philippines and a re-evaluation of other Asian/Papuasian woodcock. Oriental Bird Club (http://www.orientalbirdclub.org/publications/forktail/17pdfs/Kennedy-Woodcock.pdf)

Photo from www.orientalbirdclub.org

Limestone Leaf Warbler

(Phylloscopus calciatilis)

The limestone leaf warbler *(Phylloscopus calciatilis)* is a species of warbler in the family *Phylloscopidae.* This diminutive and colorful bird, when it was first sighted in 1994, was thought to be a member of a similar-looking species, the sulphur-breasted warbler, but ornithologists began to question that assumption when the bird produced a significantly different call.

On closer inspection, researchers found that the limestone leaf warbler has shorter and more rounded wings and a larger bill compared to the sulphur breasted warbler. Olive-green with a yellow breast and striped crown, the new species is fully described in the journal IBIS (The International Journal of Avian Science).

The limestone leaf warbler has a loud and distinct call, which is what first alerted scientists that the bird may be new to science. Its vocalizations, both song and contact call, are markedly different from those of the sulphur-breasted warbler. DNA analyses also suggest that it is more closely related to the yellow-vented warbler *(Phylloscopus cantator)* from eastern Himalayas, northern Lao PDR and adjacent part of China, which is quite different in plumage.

The limestone leaf warbler was discovered in the Annamite mountain range of Lao PDR, which is gaining a reputation among environmentalists as a Lost World for new and unusual wildlife. The species name, *calciatilis,* means “dwelling on limestone”, which along with its common name is a reference to its natural habitat, which is broadleaved evergreen and semi-evergreen forest growing around limestone karst mountains. The bare-faced bulbul, described in 2009, was found in the karst of the same region.

The species is known to occur in northern Viet Nam and Lao PDR, and potentially also occurs in southern China as well. While the bird is thought to be common in its preferred habitat, the forests that the bird depends on are threatened by clearing for subsistence agriculture and wood collection.

The limestone warbler was discovered by a team of scientists from the Wildlife Conservation Society, Lao PDR Department of Forestry, Swedish University of Agricultural Science, Swedish Museum of Natural History, and BirdLife International.

Reference:

BBC Earth News (http://news.bbc.co.uk/earth/hi/earth_news/newsid_8413000/8413590.stm)

Description of a new species of Phylloscopus warbler from Vietnam and Laos. Per Alstro, Pete Davidson, J.W. Duckworth, Jonathan C. Eames, Trai Trong Le, Cu Nguyen, Urban Olsson, Craig Robson, and Rob Timmins. Ibis (2010), 152, 145–168.

Wildlife Conservation Society (http://www.wcs.org/press/press-releases/limestone-leaf-warbler.aspx)

The Star Online (http://www.thestar.com.my/news/story.asp?file=/2008/10/18/nation/2316389&sec=nation)

Photo from Wikimedia Commons

Wattled Smoky Honeyeater

(Melipotes carolae)

The wattled smoky honeyeater *(Melipotes carolae)* is a species of honeyeater that is medium-sized, and has a sooty-grey plumage and a black bill. Its most distinctive feature is arguably the extensive reddish-orange facial skin and pendulous wattle. In other members of the genus *Melipotes,* these sections only appear reddish when "flushed" and the wattle is smaller. It is these features that distinguish it from the more widespread common smoky honeyeater. In addition, the species is exceedingly quiet, rarely giving any vocalizations.

An Indonesian endemic, this honeyeater was discovered in December 2005. It is found in the remote montane forests of the Foja Mountains range, Western New Guinea at an altitude over 1,650 meters (5,445 feet). The wattled smoky honeyeater is a common and unwary inhabitant of the Foja uplands, and feeds mainly on small fruit.

The first bird species found in New Guinea since 1939, the honeyeater was one of over 20 new species discovered by an international team of 11 scientists from Australia, Indonesia and the United States, led by an American ornithologist and Melanesia Conservation International Vice-President Bruce Beehler. The bird is named after the wife of Bruce Beehler, Carol Beehler.

In three field trips to the Foja Mountains, Conservation International field teams have found the species to be common but inconspicuous, often feeding low in the vegetation at the edge of openings. There is no reason to think the wattled smoky honeyeater is in any way threatened, in spite of its very restricted range.

Melipotes carolae is depicted in Indonesian stamps issued on November 6, 2006 along with the golden-fronted bowerbird, and two palm species native to Mamberamo, *Licuala arbuscula* and *Livistona mamberamoensis.*

Reference:

Avian Web (http://www.avianweb.com/wattledsmokyhoneyeaters.html)

Conservation International (http://www.conservation.org/explore/discoveries/surveys/birds/Pages/melipotes_honeyeater.aspx)

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