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The newsmagazine of the ASEAN Centre for Biodiversity

Volume 12, Number 2 ■ May-August 2013

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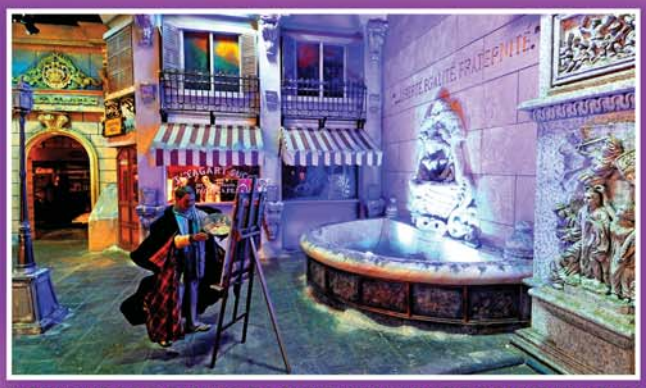

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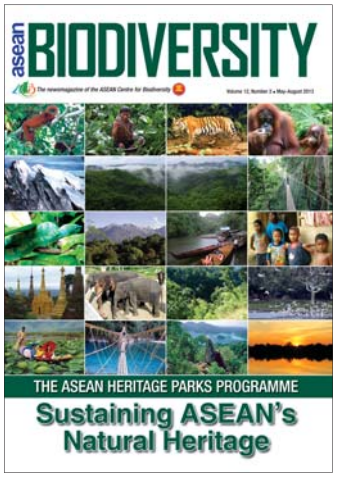

About the cover. The ever-expanding network of ASEAN Heritage Parks (AHPs) represents the very best of the species and ecosystems of the ASEAN region, which provide a substantial contribution to global biodiversity conservation. From an initial listing of 11 AHPs in 1984, there will be a total of 33 AHPs by 2013 with the announcement of Makiling Forest Reserve of the Philippines as the 33rd ASEAN Heritage Park at the 4th ASEAN Heritage Parks Conference on 1-4 October. More protected areas are expected to join the ASEAN Heritage Parks Programme, which will benefit from collaborations, capacity building programmes, and sharing of experiences and best practices in protected area management.

Photos provided by ACB and partners from ASEAN Member States

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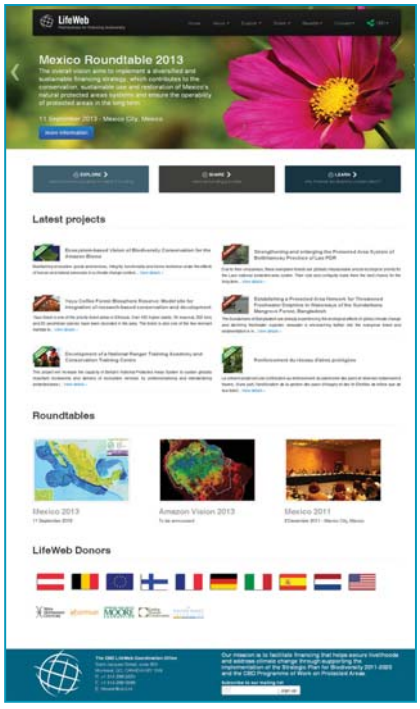

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Mr. Joey Gan is Manager of the Bukit Timah Nature Reserve under the Singapore's National Parks Board. A certified arborist and an experienced mountain biker, he has added significant recreational value to the nature reserve for the residents of Singapore by regularly inspecting the trees and upgrading the mountain biking trails.

Ms. Hadzlinda Samri works at Singapore's National Parks Board where she is Conservation Officer at the Bukit Timah Nature Reserve. With over 7 years experience of taking care of the nature reserve, she is not only familiar with the many plant and animal species that make their home in the forest, but has also met many of the half million annual visitors who provide her with valuable feedback for improving the visitor experience.

Ms. Chew Ping Ting has been working with the National Parks Board since graduating from the National University of Singapore. She started as a Research Officer in the Nature Conservation Branch (NCB) with the Nature Reserves Survey Project (1992-1997), followed by other biological surveys and fieldworks in nature areas throughout Singapore. She had also represented Singapore in ASEAN Regional Centre for Biodiversity Conservation and ASEAN meetings and workshops in the past while with NCB. Presently, she is a Senior Manager for Conservation in the Central Nature Reserve Branch where she assesses and monitors research projects and botanical collection requests carried out within the central nature reserves. Her main interest is in the native tree flora and forest vegetation ecology of the nature reserves and nature areas in Singapore.

Ms. Jeanne Tan, a senior manager with the Central Nature Reserve, started out in the Outreach section as a Senior Outreach Officer with the Sungei Buloh Wetland Reserve, where she worked with students, corporate groups and the public community through different nature programmes. She was also editor of "Wetlands" newsletter for two years at Sungei Buloh Wetland Reserve. Jeanne joined the Central Nature Reserve later to continue bringing an appreciation and awareness of natural heritage out to the community.

Mr. Philipp Gassner is a cross-disciplinary environmental scientist with an international track record in project management, research, consultancy, and science communication. He has a B.Sc. degree in Geoecology and Ecosystem Management, with technical expertise and strong interest in both the science-policy and the development-environment interface. Philipp is currently enrolled in an M.Sc. in Environmental Governance, and works as an external consultant and project correspondent for the ACB-GIZ Biodiversity and Climate Change Project.

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Ana Maria Tolentino has a degree in International Studies from Marymount College of Fordham University, New York, and a Masters degree in Environmental Law from the University of Sydney. She is currently the Project Staff-Technical Specialist on Access and Benefit Sharing at the ASEAN Centre for Biodiversity and provides overall technical and operational backstopping in the coordination, implementation and management of the Regional Project on Access and Benefit Sharing; assists in the review and development of national work plans for the execution of the national components of the Project; and assists in the review of existing policies, as well as legislative and institutional capacity for ABS in each ASEAN Member State.

The ASEAN Heritage Parks Programme: Sustaining ASEAN's Natural Heritage

The establishment of protected areas is an effective measure to ensure the conservation of areas noted for their biodiversity; pristine nature; presence of rare and endangered species; special natural, cultural, geological and historical significance; and aesthetic value. In the ASEAN region, a network of protected areas known as ASEAN Heritage Parks (AHPs) seeks to conserve areas that represent the very best of the region's natural heritage.

The ASEAN region has a treasure trove of biodiversity, from which millions of people derive their food, shelter, medicine, and other resources significant to their life and culture. The ASEAN occupies only three percent of the global surface and yet provides habitats for globally significant terrestrial and marine species, including 18 percent of all species assessed by the International Union for Conservation of Nature (ACB, 2010).

Marine protected areas in the region cover 93,290 km2, which is equal to seven percent of the region's territorial waters. Terrestrial protected areas cover 4,476,383 km2, amounting to 14 percent of the ASEAN's surface area (UNESCAP, 2011). While national protected areas are designated based on national developed standards for the prioritization of conservation action, AHPs are chosen to best highlight the species and ecosystems of Southeast Asia.

What are ASEAN Heritage Parks?

ASEAN Heritage Parks are defined as "protected areas of high conservation importance, preserving in total a complete spectrum of representative ecosystems of the ASEAN region". These areas are established to generate greater awareness, pride, appreciation, enjoyment and conservation of ASEAN's rich natural heritage, through a regional network of representative protected areas, and to generate greater collaboration among ASEAN Member States (AMS) in preserving their shared natural heritage.

Management of ASEAN Heritage Parks

The ASEAN Centre for Biodiversity (ACB) currently serves as the Secretariat of the AHP Programme and the AHP Committee, with representatives from the ten AMS serving as members.

In the management of AHPs, the AWGNCB provides guidance and promotes regional coordination in the implementation of conventions and activities related to biodiversity conservation.

More AHPs Protect the Best of ASEAN's Natural and Cultural Treasures

As regional representatives of Southeast Asian biodiversity, the AHPs provide a window to the environment and culture that is uniquely ASEAN. These protected areas represent the most intact tracts of land and sea that provide vital ecological services to the AMS, protecting important sources of food and clean water, and providing protection against floods, erosion and pollution. Most of the protected areas designated as AHPs are the last bastions of some of the region's most endangered species, such as the Philippine eagle and tamaraw in the Philippines; red panda in Myanmar; and orangutan and rhinoceros in Indonesia. Many of the areas are unique, such as the snow-capped mountain areas in Viet Nam, Myanmar and Indonesia, as well as limestone pinnacles and caves that are so admired in Gu-

nung Mulu National Park in Malaysia.

AHPs also form the lifeblood of many of the region's enigmatic, but slowly dwindling indigenous cultures. Indigenous and traditional knowledge practices are intimately linked to nature, and the loss of forests, lands, and links to the sea, also means the eradication of traditional and sustainable methods of natural resource management, traditional medicine, and knowledge of other resources that may have significant pharmaceutical benefits to humankind. Many conservation organizations have now realized the significance of recording traditional knowledge and practices; identifying and maintaining indigenous crop varieties; as well as developing drugs from little known plant varieties that are traditionally used by indigenous peoples to treat a variety of illnesses. Conservation of AHPs thus ensures the sustainable management of ASEAN's natural resources and the protection of Southeast Asian life and culture.

As of August 2013, there are 32 ASEAN Heritage Parks.

Country	Name of ASEAN Heritage Parks	Category
Brunei Darussalam	1. Tasek Merimbun Heritage Park	Terrestrial
Cambodia	2. Preah Monivong (Bokor) National Park	Terrestrial
	3. Virachey National Park	Terrestrial
Indonesia	4. Leuser National Park	Terrestrial
	5. Kerinchi Seblat National Park	Terrestrial
	6. Lorentz National Park	Terrestrial
Lao PDR	7. Nam Ha National Protected Area	Terrestrial
Malaysia	8. Kinabalu National Park	Terrestrial
	9. Gunung Mulu National Park	Terrestrial
	10. Taman Negara National Park	Terrestrial
Myanmar	11. Alaungdaw Kathapa National Park	Terrestrial
	12. Inlay Lake Wildlife Sanctuary	Wetland
	13. Indawgyi Lake Wildlife Sanctuary	Wetland
	14. Khakaborazi National Park	Terrestrial
	15. Lampi Marine National Park	Marine
	16. Meinmahla Kyun Wildlife Sanctuary	Wetland
	17. Nat Ma Taung National Park	Terrestrial
Philippines	18. Mt. Apo Natural Park	Terrestrial
	19. Mts. Iglit-Baco National Park	Terrestrial
	20. Mt. Kitanglad Range Natural Park	Terrestrial
	21. Mt. Malindang Range Natural Park	Terrestrial
Singapore	22. Sungei Buloh Wetland Reserve	Wetland
	23. Bukit Timah Nature Reserve	Terrestrial
Thailand	24. Khao Yai National Park	Terrestrial
	25. Tarutao National Park	Marine
	26. Ao-Phangnga-Mu Koh Surin- Mu Koh Similan Marine National Parks	Marine
	27. Kaeng Krachan Forest Complex	Terrestrial
Viet Nam	28. Ba Be National Park	Terrestrial
	39. Chu Mom Ray National Park	Terrestrial
	30. Hoang Lien Sa Pa National Park	Terrestrial
	31. Kon Ka Kinh National Park	Terrestrial
	32. U Minh Thuong National Park	Wetland (Peatland)

The ASEAN Heritage Parks:
Southeast Asia's best protected areas

Thirty-two protected areas spread across Southeast Asia – they have one thing in common. They are all ASEAN Heritage Parks: protected areas of high conservation importance, preserving in total a complete spectrum of representative ecosystems of the ASEAN region.

ASEAN Heritage Parks are established to generate greater awareness, pride, appreciation, enjoyment and conservation of ASEAN's rich natural heritage through a regional network of representative protected areasand to generate greater collaboration among ASEAN Member States in preserving their shared natural heritage.

There are 32 ASEAN Heritage Parks across the region.

Tasek Merimbun Heritage Park in Brunei Darussalam is a wildlife sanctuary, recreational centre, and a venue for research and education. The Park encloses catchments of small rivers feeding into Tasek Merimbun Lake, Brunei's largest lake.

Preah Monivong National Park in Cambodia is popularly known as Bokor. It showcases the ruins of an elegant French Hill Station built in the 1920s. The rich biodiversity in the park weaves in and out of its similarly rich history.

Virachey National Park in Cambodia has diverse habitats and biological communities of international importance, and of transboundary potential. Dense semi-evergreen lowland and montane forest, upland savannah, bamboo thickets, and patches of mixed deciduous forest dominate the park's vegetation.

Kerinci-Seblat National Park in Indonesia harbors the oldest tropical rainforest in Asia. The park is part of the 2.5 million-hectare tropical rainforest of Sumatra, which was declared a World Heritage Site in 2004.

Gunung Leuser National Park in Indonesia is home to some of the country's last great forest wilderness. The park is significant for conservation as it is the last place where orangutans, tigers, elephants, rhinoceros and leopards live together.

Lorentz National Park in Indonesia is Southeast Asia's single largest protected area. It is the only protected area in the world that encompasses a continuous, intact transect – from snow-capped mountains to a tropical marine environment.

Nam Ha National Protected Area in Lao PDR is home to more than 20 different ethnic groups, making it a remarkable repository of ethnic diversity and indigenous knowledge. It is the fourth largest national protected area in Lao PDR and the fourth largest protected area in the northern Indochina subtropical forest zone.

Gunung Mulu National Park in Malaysia is the largest national park in Sarawak. It has gigantic limestone caves, tropical karsts, and very high biodiversity. The Park's tropical karsts are the most studied in the world. It is one of Malaysia's World Heritage Sites.

Kinabalu National Park in Malaysia features Mt. Kinabalu with a height of 4,101 meters. It continues

to rise five millimeters per year as the world's youngest granite pluton. Kinabalu is known for its intimate connection with the folklore and local traditions of Sabah.

Taman Negara National Park is Malaysia's first and oldest protected area. One of the world's oldest rainforests, the park is considered to be older than either the Amazon or the Congo as it has remained undisturbed for over 130 million years.

Alaungdaw Kathapa National Park in Myanmar was named after Buddha's saintly disciple. A shrine can be found within the Park boundaries, which houses a reclining figure called Kathapa. The Park harbors a wealth of large mammals such as elephant, leopard, clouded leopard, and black bear.

Hkakaborazi National Park is the largest national park in Myanmar. It is the highest snow-capped mountain in Southeast Asia and is the home of the rare Black Orchid.

Indawgyi Lake Wildlife Sanctuary in Myanmar is

the largest inland lake in Southeast Asia and the third largest lake in the world. This wildlife sanctuary provides researchers with the opportunity to study one of the largest wetland ecosystems in Southeast Asia and its attractive habitats.

Inle Lake Wildlife Sanctuary has the second largest lake in Myanmar. Situated 881 meters above sea level, the huge lake is an important watershed and water resource for electricity and domestic use for people living within the area that straddles the lake.

Lampi Marine National Park is Myanmar's first national park. The island's topography is generally hilly. It rises steeply from sea level to 270 meters, and 500 meters in some areas. The park boasts of large caves and plenty of freshwater sources on the island and major coral formations around the smaller islands.

Meinmahla Kyun Wildlife Sanctuary in Myanmar was established to protect the remaining mangrove forests and as a refuge for

species such as estuarine crocodiles and resident and migratory water and shore birds. The mangrove forests also serve as a breeding ground for fish and prawn.

Nat Ma Taung National Park features Mt. Victoria, the highest mountain in Chin State in the western part of Central Myanmar. In the Chin language, the Park is called Khaung Neu Thom or Earth Mother Goddess. The area is home to the Chin people, whose unique traditions serve as one of the tourist attractions.

Mt. Apo Natural Park is the last stronghold of the Philippine Eagle, the national symbol of the Philippines. The majestic Mt. Apo, a dormant volcano, is the Philippines' highest mountain. The base of Mt. Apo is known to be larger than the island of Singapore.

Mts. Iglit-Baco National Park in the Philippines is the only place in the world where one can find the biggest remaining population of the tamaraw, a type of water buffalo that is endemic to Mindoro Island.

It is home to the Mangyan, one of the Philippines' indigenous peoples.

Mt. Kitanglad Range Natural Park is one of the few remaining rainforests in the Philippines. Its unique ecological diversity is characterized by a combination and interplay of human communities, connected landscapes, and immense natural diversity of its flora and fauna.

Mt. Malindang Range Natural Park in the Philippines is a mountain range formed through a series of volcanic activities. It has a six-hectare crater, Lake Duminagat, known to the indigenous people – the Subanen – as a mystical lake. The Park's allure comes from its waterfalls, crater lake and dense virgin forests.

Bukit Timah Nature Reserve in Singapore is located in the centre of Sin-

gapore. It includes Bukit Timah Hill, the country's highest at 163 meters. The area is ecologically complete, with relatively pristine patches of primary dipterocarp forests interspersed with tall secondary forests.

Sungei Buloh Wetland Reserve is the first and only protected wetland reserve in Singapore. It is home to over 500 species of tropical flora and fauna. A river and an island fringed with mangroves are found within the Wetland Reserve.

Ao Phang-Nga – Mu Ko Surin – Mu Ko Similan National Parks are the most well-known marine protected areas in Thailand. Ao Phang-Nga is famed for its rich folklore, prehistoric rock arts, and natural beauty. Mu Ko Surin supports an abundant population of avifauna. Mu Ko Similan is famous for its granite islands created by up-swelling of hot magma some 65 million years ago.

Kaeng Krachan Forest Complex is the largest national park in Thailand. It lies at the junction of biogeographic zones. Thus, its biodiversity is a mix of Indo-Burmese and Malaysian forms. The Park's vast forest supports ecologically, economically and scientifically valuable plants and animals, including many wild elephants.

Khao Yai National Park is the third largest natural park in Thailand. The Park is one of the most important watersheds for surrounding provinces and boasts of diverse plant communities and rich fauna. The park has among the best developed nature trails in Thailand.

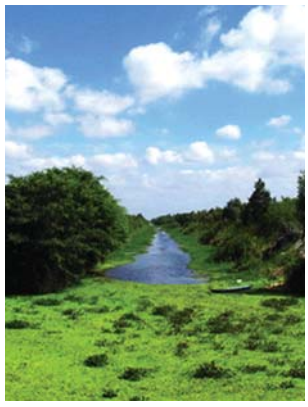
Tarutao National Park in Thailand has been the home for centuries of the Chao Lay, more commonly called Sea Gypsies. The bio-climate of Tarutao is influenced by its position just north of the "Kangar-Pattani line", a transition from rain to monsoon forest. Further complications of geology and a zonal soil types create a mosaic of both Thai and Malayan forest species in the Park.

Ba Be National Park is the premier tourist site in northeast Viet Nam. It is named after Ba Be Lake, the country's largest and highest, natural freshwater lake, one of the richest natural lakes for fish biodiversity in Viet Nam.

Chu Mom Ray National Park in Viet Nam is an important forest watershed for provinces around it. The Park may be one of the best remaining areas for a number of endangered species, such as tigers, the Asian elephant, gaur and banteng.

Hoang Lien Sa Pa National Park features Viet Nam's highest mountain, the Fansipan. Its undisturbed forests are home to rare fauna and flora. The Park is a valuable biosphere with nearly 2,850 floral species.

Kon Ka Kinh National Park in Viet Nam plays an important role in upstream watershed protection for several large rivers that provide water for irrigation and domestic use for provinces around it. Local people depend on the Park's resources for firewood, honey and rattans, and plant species with traditionally-known medicinal values.



U Minh Thuong National Park in Viet Nam is a vast wetland area rich in fish and water birds. The park is one of only three sites in the world known to support a population of hairy-nosed Otter *(Lutra sumatrana)*. Its wetlands support some of the highest avian biodiversity in the Mekong Delta. ■

Makiling Forest Reserve set to join the ranks of ASEAN Heritage Parks

Makiling Forest Reserve in Laguna, Philippines has been nominated to join the ASEAN Heritage Parks network as its 33rd member. The reserve covers 4,244 hectares and lies within the municipalities of Los Baños, Bay, and Calamba in Laguna, and Sto Tomas in Batangas. A popular weekend destination because of its proximity to Manila and the popularity of its hot springs and mountain peaks, the reserve is also recognized for its extremely high biodiversity and is one of the Philippines' centres of plant diversity.

The Makiling Forest Reserve was established in 1910 through Proclamation No. 106, setting aside the reserve for the establishment of a forestry school and for the advancement of silvicultural studies. In 1933, the reserve was renamed the Makiling National Park through Proclamation No. 552, for the purpose of establishing the park as a game refuge. The proclamation of Republic Act (RA) 3523 by President Diosdado Macapagal transferred Makiling National Park to the University of the Philippines to serve as the land resource for a programme on public education and information on forestry to promote the appreciation of forest values. Republic Act 6967 in 1990 then transferred the administration of the Makiling Forest Reserve to the University of the Philippines in Los Baños (UPLB).

The nomination of Makiling Forest Reserve as an AHP has been upheld by the Department of Environment and Natural Resources - Protected Areas and Wildlife Bureau as it adheres to the criteria required of an ASEAN Heritage Park. The reserve has been recognized by the Food and Agriculture Organization as a model of "Exemplary Forest Management in Asia" ensuring continuous and dynamic forest processes. The reserve demonstrates ecological completeness because it is able to regenerate with minimal human intervention. The species recorded in the area are exemplary and represent the best of the Philippines and the ASEAN region. The reserve also has high conservation importance since it is recognized as one of the country's 18 centres of plant diversity as well as one of 32 key ecotourism sites.

Though the reserve is owned by the state, RA 3523 and RA 6967 gave UPLB the exclusive jurisdiction and administration over the forest reserve to serve its primary purpose as a training laboratory for instruction, research and extension.

Exemplary flora and fauna

Makiling Forest Reserve boasts of mixed Dipterocarp and Leguminosae to mossy forest. The richness of the vegetation in the reserve is due to the favorable soil and climate of the mountain.

Biological richness of Makiling Forest Reserve

- 2,038 species of flora belonging to 225 families and 949 genera
- 45 species of mammals
- 181 species of birds
- 65 species of reptiles
- 22 species of amphibians
- 7,000 species of insects

The forest reserve is also divided into four sub-watersheds, namely the Molawin-Dampalit sub-watershed (1,491.88 hectares); Cambantoc sub-watershed (1,618.30 ha); Greater Sipit sub-watershed (676.96 ha); and Tigbi sub-watershed (456.86 ha).

Mt. Makiling contains diverse flora from a large number of endemic families, genera and species that include many interesting forms. The reserve contains at least 225 families, 949 genera, 2,038 species, 19 sub-species, 167 varieties, and many cultivars of flowering plants and ferns. Dominant species vary per sub-watershed because of the differing environmental conditions. Tree species found in all the sub-watersheds of the reserve are *Pterocym biumtinctorium, Artocarpus rubrovenius,* and *Diplodiscus paniculatus,* which grow from the lower to the higher elevations of the mountain.

The fauna found on the reserve is as diverse as its flora. Prior to 2004, recorded species included 45 species of mammals, 181 species of birds, 65 species of reptiles, 22 species of amphibians, and 7,000 species of insects. A survey conducted in 2004 in the Greater Sipit sub-watershed showed a presence of 117 terrestrial vertebrates, of which 84 species were birds, 12 were mammals, and 21 where reptiles and amphibians.

Significant species include the Philippine calotes *(Calotes marmoratus),* which is endemic to the Philippines and found in all the sub-watersheds. Another Philippine endemic naturally thriving in Mt. Makiling is *Phuilau tussardus*, a species of frog in the Rhacophoridae family naturally inhabiting subtropical or tropical moist lowland forests. The Philippine warty pig *(Sus philipinensis*) and *(Cervus mariannus)* and the Philippine deer are endemics that have also been sighted in the Greater Sipit sub-watershed.

Many bats can also be found on the mountain, particularly *Megaderma*

spasma, which is one of only two bat species in Asia and the only one in the Philippines that catches and eats tiny frogs and lizards.

A snail species known as "bayuko" *(Ryssotao taheitana)* can be found in all the sub-watersheds. The snail is highly valued as a nutritious, healthy source of protein and is much sought after.

Cultural and ecotourism features

Mt. Makiling is the home of the legend of Maria Makiling. Maria Makiling is a mystical goddess that is part of Philippine folklore. The slopes of Mt. Makiling seem to resemble a reclining woman. Maria Makiling is believed to dwell in the mountain and protects dwellers and travelers from harm.

Mt. Makiling is one of the most popular recreational destinations in the country because of its proximity to Manila. It is a favorite among tourists because of its vegetation, unique landscape features, boiling mud and hot springs. Among the most frequented areas in the Makiling Forest Reserve include the Makiling Botanic Gardens, Flatrocks, mud springs, Makiling Rainforest Park, and peak 2 of Mt. Makiling. Recent records show that around 200,000 people visit the reserve each year.

The Makiling Forest Reserve continues to distinguish itself as a living laboratory for science and research on forestry. Students of forestry have been learning the basics of forestry at the reserve since its establishment in 1910. Since then it has served as the one of the country's most valuable teaching and research laboratories. Today it continues to serve as an outdoor laboratory for professional instruction and research in forestry and related sciences. ■

Bukit Timah Nature Reserve: Singapore's tropical rainforest

By James Gan, Joey Gan, Hadzlinda Samri, Chew Ping Ting and Jeanne Tan

The Bukit Timah Nature Reserve (BTNR) is a 163-hectare gazetted nature reserve that contains Singapore's highest hill (at 163m), the Bukit Timah Hill. The reserve is primarily composed of granite and still has a substantial portion of its original primary tropical rainforest ecosystem left intact. It is located in the centre of Singapore, an urbanized island republic of 715 sq km with an equatorial climate and a growing population of 5.3 million people in 2013. The reserve is about 12 km from the Central Business District of Singapore, making it easily one of the most accessible primary tropical rainforests in the world.

BTNR is ecologically complete, with relatively pristine patches of primary dipterocarp forests interspersed with tall secondary forests. These forests support a comparatively large biodiversity relative to the small geographical size of Singapore, a large percentage of which are nationally threatened, and some are globally endangered. The reserve is well recognized as an important and favored field venue in Singapore for scientific research and for biological collections for local researchers and international scientists. The management of the reserve for conservation, research, education and recreation is guided by a nature reserves management master plan.

BTNR has an active conservation and research programme for the scientific audience, and an outreach and volunteer programme. Attracting more than 400,000 visitors annually, the reserve enjoys broad-based support from the public and private sectors and people of Singapore, and continues to maintain a high national profile.

In 2011, BTNR was established as Singapore's second ASEAN Heritage Park (AHP), the Sungei Buloh Wetland Reserve being the first. As an AHP, BTNR hopes to play its part to foster greater cooperation in ASEAN. The reserve met all the criteria required for its nomination as an AHP, such as ecological completeness, representativeness, naturalness, high conservation importance, legally gazetted areas, approved management plan, uniqueness and biodiversity.

Uniqueness and features

The BTNR forest has unique features and is primarily made up of Hill Dipterocarp forest of the Seraya-ridge forest subtype of Wyatt-Smith (1963), which is not the typical lowland tropical rainforest type at altitudes below 300m (Tan et. al., 2007). The most conspicuous hill element is the Seraya *(Shorea curtisii).* It is a large and distinctive tree and can be considered a flagship species at the reserve.

BTNR Native Biodiversity Species Numbers at a Glance

	Singapore	BTNR	National Percentage
Vascular Plants	2172	900	41
Ferns	169	107	63
Bryophytes	90	53	58
Mammals	52	26	50
Birds	364	150	41
Reptiles	98	58	59
Amphibians	28	17	60
Freshwater Fishes	68	15	22
Butterflies	305	200	65
Dragonflies	117	70	59

For a reserve the size of 0.2 percent of the total country area (715 sq km) it is remarkable that BTNR contains at least 40 percent of the country's native flora and land fauna, and around 21 percent (42 out of 200ha) of the total primary dipterocarp rainforest left in Singapore.

Noteworthy Flora

Primary Tropical Rainforest. Within these forests are good stands of members of the Dipterocarpaceae family – *Shorea curtisii, S. macroptera, S. leprosula, Dipterocarpus caudatus.* Other notable large trees include *Dyera costulata, Koompassia malaccensis* and *Ixonanthes icosandra.* Prominent under-storey flora includes the Black Lily *(Tacca integrifolia),* while epiphytes such as the Stag's horn fern *(Platycerium coronarium)* is also common.

Nationally endangered flora restricted to BTNR includes the mosses *Pyrrhobryum spiniforme* and *Trismegistia lancifolia,* White Globba *(Globba leucantha),* and Six-stemmed Sonreila *(Sonerila heterostemon).* There are also recent new records and rediscoveries, such as *Geocharis aurantica* and *Memecylon pubescens.* (Davison et. al., 2008)

Noteworthy Fauna

Native species. The animals most often seen at BTNR are the Long-tailed Macaque *(Macaca fascicularis),* along with the Plantain Squirrel *(Callosciurus notatus).* Observant individuals may spot the Colugo *(Cynocephalus variegatus).* Birds are more easily heard than seen. The usual species are Striped Tit Babbler *(Macronous gularis),* the Greater Racket-tailed Drongo *(Dicrurus paradiseus)* and the endangered Straw-headed Bulbul *(Pycnonotus zeylanicus).* There are other species that are notable as denizens of the forest. They include the Asian Fairy Bluebird *(Irena puella),* the Red-crowned Barbet *(Megalaima rafflesii)* and the Blue-winged Leafbird *(Chloropsis cochinchinensis).*

There are also a myriad diversity and abundance of insects, such as the colourful butterflies, the rare Forest Praying Mantis *(Theopropus elegans),* the moth *Dysphania glaucescens* and the Giant Forest Ant *(Camponotus gigas).* Rarer invertebrates include the Singapore Freshwater Crab *(Johora singaporensis)* and the Blue Malayan Coral Snake *(Calliophis bivirgatus).*

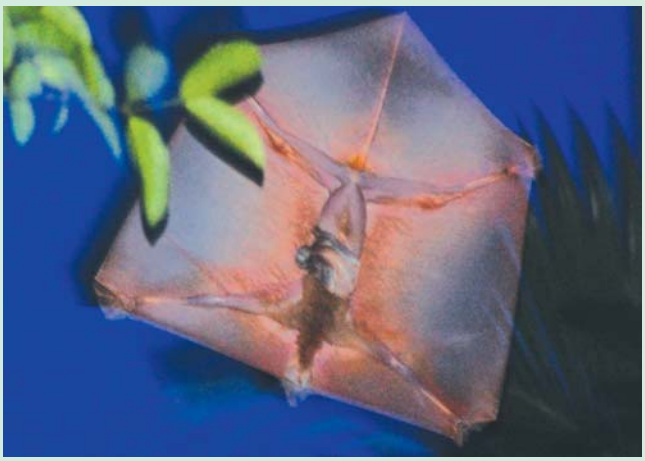
Nationally endangered fauna at BTNR are the Horned Frog *(Megophrys nasuta),* Saint Andrew's Cross Toadlet *(Pelophryne signata)* and Thorny Treefrog *(Theloderma horridum);* and mammals such as the Bicoloured Roundleaf Bat *(Hipposideros bicolor),* Naked Bulldog Bat *(Cheiromeles torquatus)* and Red-cheeked Flying Squirrel *(Hylopetes spadiceus).*

Social and Cultural Values

BTNR is significant for the scientific community. Many plants and animals of the region were first described from specimens collected here. Of social value to people is that the reserve serves as a sanctuary from the stresses of urban living. Many come to BTNR to relax, enjoy nature and get some exercise.

Current Land Use

Singapore's approach to nature conservation has been pragmatic; one which balances conservation of the nation's biodiversity repository with the development of land to support the housing, commercial, economic needs of the population. The multiple uses for which BTNR is managed with recreational, educational, conservation and research values in mind, is exemplary of the land conservation strategy in Singapore. Through management policy and practices based on science, these values complement and support each other.



In addition, efforts have been made to secure land parcels around the BTNR. These plots of land are intended as buffers to the core forest areas within the BTNR. The buffers are managed as nature parks, and though have a significant conservation and education focus, are more accommodating of recreational aspects that are valued by the community. Examples of these parks include the Hindhede Nature Park on the western edge of BTNR, as well as the Dairy Farm Nature Park on the northern boundary.

Adverse factors

The continuing development of the urban environment next to BTNR could pose new threats to the native biodiversity. Vegetation in private homes and estates are dominated by introduced exotic species, some of which have encroached into the reserve.

The closeness and density of people in the residential estates have also brought undesirable behavioral changes in habits to some animals, such as the macaque. For example, deliberate feeding of Long-tailed Macaques by people has altered the behavior of some of these monkeys such that they tend not to forage for food in the reserve, but instead expect food handouts from people. Some of them become aggressive when the food is not forth coming.

It is clear that there are significant challenges that the management needs to overcome. Efforts to conserve and nurture the natural heritage of Singapore while at the same time cater to the needs of a vibrant young population mean that management measures need to be multi-pronged, targeted and calibrated appropriately for each issue.

Current conservation management

Monitoring works and surveys of the flora and fauna and other related works, such as the reserve's facilities maintenance and law enforcement, are conducted regularly. A noteworthy upcoming project to physically strengthen the ecological link between the BTNR and the neighboring Central Catchment Nature Reserve (CCNR) is in progress and will be completed in end 2013.

The "Eco-Link @ BKE" as the project is named is a conservation project that will see a 50m wide bridge constructed between two elevated points to connect BTNR and CCNR, the two central forested reserves managed by the Central Nature Reserve (CNR) Branch of NParks, which are separated by the Bukit Timah Expressway (BKE). The forested corridor that will be planted, managed and maintained on the bridge will enable animals to move unimpeded between the two nature reserves.

Current conservation research

The current situation at BTNR as effectively an island of nature in an urban environment makes it a valuable research tool for the study of forest dynamics that can help contribute to the understanding and eventual management of similar pockets of forest fragments found throughout the region. Recent studies in 2008 to 2010 to take stock of the forest ecosystem and biodiversity with help from corporates and volunteers culminated in the publication of many scientific papers and an "Our Fragile Rainforest" guidebook for the public.

In 1993, the Center for Tropical Forest Science (CTFS) of the Smithsonian Tropical Research Institute (STRI) and the Arnold Arboretum (AA) of Harvard University, together with the National Institute of Education (Nanyang Technological University) established a two-hectare permanent plot at BTNR to monitor the long-term dynamics of a tropical forest fragment. Monitoring and measurements were made of all living trees and new recruits above 1 cm in diameter at breast height within the plot in between 1993 and 2007. The BTNR plot is smaller than all other plots in the CTFS-AA network in the region (this include a plot at Pasoh and Lambir in Malaysia; Aplanan in the Philippines; and Huai Kha Khaeng and Khao Chong in Thailand) but no less significant.

In addition, NParks permit researchers of tertiary institutions and organizations local and overseas to use BTNR as a research field site with subjects as diverse as visitorship/social surveys, geology, taxonomy, ecology and genetics.

Current conservation education

The potential to carry out conservation education at BTNR is very great and some of the conservation education activities, programmes and projects conducted by the BTNR include the following:

SCHOOLS

a) Kids for Nature (KFN). This programme is carried out in partnership with the Ministry of Education (MOE) initiated Programme for Active Learning (PAL) that encourages outdoor learning and education for the lower primary school students. KFN is a module created by the CNR's officers to infuse conservation messages and basic outdoor survival knowledge to the students.

b) Community Involvement Programme (CIP). The staff of Central Nature Reserve are regularly invited to present talks to schools who are embarking on CIP on the flora and fauna of the nature reserves, so as to allow them to better understand their impending involvement and to get to know more about our natural heritage.

c) Invasive Species Management (ISM). School students come to the nature reserve to help remove some of the invasive weed species that threaten the native biodiversity. In addition to protecting Singapore's natural heritage, this programme also builds up students' teamwork and their socio-emotional skills.

CORPORATES

Plant-A-Tree Programme (PAT). Corporate groups can do their part for nature conservation by planting trees. Their employees can also get involved and some eventually do sign up and become volunteers for the nature reserve through the CNR volunteer programme.

COMMUNITY

a) Guided Walks, Educational Worksheets and Publications. There are thematic tours conducted monthly for visitors. These walks are led by NParks staff and/or volunteers. NParks has produced nature publications relating to BTNR, many with sponsorship support. They include visitor's brochures, introductory guidebooks, nature worksheets and workbooks, newsletters and posters.

b) Nature Keeper Programme. The Nature Keeper Programme is for primary school children, and focus on issues and topics of the native forests and biodiversity. The programme aims to stimulate their interest and foster an appreciation of nature through classroom lessons and field workshops.

c) Volunteer Programme. There is a volunteer programme at CNR. It has progressed to a stage where volunteers now take the lead independently in conducting activities on behalf of the CNR office, in areas such as Forest Patrol, Invasive Species Management (ISM), Art in Nature and reforestation works. Many more new volunteers have joined in the Volunteer Programme since it was started.

Volunteers play a vital role in extending the outreach effort in CNR to the community by conducting free guided tours, assisting in children's programmes, thematic roadshows and exhibitions. They also contribute to BTNR's publicity materials through loan of photographs, articles and newsletters. Some involve themselves in scientific research studies carried out by the CNR office.

Current conservation recreation

The recreational use of BTNR by a substantial numbers of visitors (400,000 annual visitors) has necessitated the construction of a visitor centre, boardwalks, and resting huts. In recent years, improvements have been made to the information map-boards to enhance public safety and to further improve the visitor experience.

An analysis of the visitorship trend reveals a tendency to follow a seasonal pattern with peaks during the school holiday seasons in May/June and November/December. There are also weekly patterns that peak at the weekends. To even out the high human traffic on those days, the management of the nature reserve has embarked on a novel strategy to create adjacent nature parks to encourage the non-biodiversity inclined visitors to make use of attractive facilities in those parks. Preliminary indications of this strategy are encouraging. These efforts will continue to be fine-tuned. ■

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From reef to ridge – A Sunday stroll through Mt. Malindang Range Natural Park

By Philipp Gassner

Plummeting down a 500-meter deep valley on your Sunday trip is perhaps not the most tempting outlook for most readers. But once you become finally conscious about the fact that you are safely strapped to a reassuringly strong steel cable, spanning the whooping 1.5-km trek between two mountain ridges, you might actually enjoy this unique zipline experience in Misamis Occidental, Mindanao in the Philippines. As soon as the adrenaline rush settles down a little, it is worthwhile taking a glance around: the mountain Barangay Hoyohoy behind you; Barangay Guimad in front of you, Ozamiz, 850 meters lower, on the coastline to the right, Mt. Malindang to the left; and Labo River, running down the mountain range, beyond you. In next to no time you will make out a remarkable difference between the lush and vivid rainforest on the left hand side, and the landscape on the right hand side, featuring bare land and endless parallel rows of monotonous palm plantations.

ASEAN Heritage Parks as answer to staggering deforestation

Sadly, the bare land and palm plantations represent much of the present day Philippines, and Southeast Asia for that matter. Only about 15 percent forest cover is left in the once entirely woody Philippines, with one-third lost just between 1990 and 2005. In Southeast Asia, deforestation accounts for jaw-dropping 555,587 km^2 between 1980 and 2007, equivalent to the total area of Thailand.

This ravage of ecosystems has dire consequences for mankind, including the alteration of local and global climates, soil erosion, pollution of water resources, extinction of species, and desertification, among many others. Accordingly, deforestation is estimated to reduce the global GDP by about seven percent in 2050, if only measured in economic terms. However, we cannot afford to lose forests as the livelihoods for hundreds of millions of indigenous people, the warrant of a stable climate, and ultimately for its intrinsic value and beauty.

A beauty worth defending! Galvanized by such sad and costly effects, it is imperative to preserve the indispensable values of our natural ecosystems and resources, which brings us back to the left hand side of the picture: the Mount Malindang Range Natural Park, part of the 10 to 15 percent of the world's land surface that is categorized as protected areas. The Philippines feature 240 of such protected areas, which proved to be the single most effective way of conservation. Since environmental problems, however, are not confined to individual countries like the Philippines, protection beyond national boarders is essential.

For Southeast Asia, such supra-national protection is realized through the network of ASEAN Heritage Parks (AHPs), areas of high-conservation importance, preserving an inclusive and representative spectrum of ecosystems in the region. The 32 AHPs in the ten ASEAN Member States are established to facilitate greater awareness, appreciation, and conservation of the ASEAN's rich natural heritage, and to generate collaboration among the states in their conservation.

The launching of Mount Malindang in 2012 as the fourth Philippine AHP provides a rather suitable occasion for a nice Sunday stroll up the green slopes of this stunning mountain range, giving a prime example for the features, importance and challenges of AHPs.

A Snapshot of Mt. Malindang's ecosystems form shore to top

To begin the trip, we have to put our bathing trunks on and immerse ourselves into the aquatic landscape of the park. The coastal zone consists of shallow marine waters, which harbor colorful coral reefs, thriving seagrass beds, a seaweed ecosystem, diverse mangrove forest, and nipa swamps. Here, we can marvel the voluptuous richness of 59 seaweed species, 60 algae species, over 100 plankton species, among manifold fish, sponges, sea fans, anemones, worms, shrimps, lobsters, crabs, shells, slugs, nudibranchs, clams, octopods, starfish, sea-urchins, feather stars and sea snakes, to only name a few. This habitat type serves as important sanctuary for fish and nursery for their young; it supports the marine food web and protects the shoreline from erosion. Considering that 87 percent of the province's population lives within 50km of the coast and directly or indirectly

depends on marine natural resources, this ecosystem is of uttermost importance, but also at peril. Much of the coastal area is already converted to residential area, coconut farms or rice fields.

Well-towelled, we shoulder our bag and leave the coast to follow along the river system of Mt. Malindang, equally influenced by human settlement and utilization. Despite the domestic and irrigation use of water, fishing and the mining of gravel and sand, the two main streams of the park, Langaran and Layawan River, could so far maintain a fair water quality.

It is important to recognize that energy and material flows link the aquatic system intimately to the terrestrial ecosystem, which we enter now. This is especially true for the agro-ecosystem in lower altitudes, consuming high amounts of irrigation water. The system features 73 species of cultivated crops, including vegetables, cereals, agro-forestry and grass-dominated areas, besides 164 animal species. It is also home to the majority of the over one million people, who depend on the Malindang Range.

Already less populated is the adjacent natural lowland dipterocarp forest, from 220-500 m above sea level, featuring 175 plant species, with 25 m high trees, and over 250 different animals. Increasing human encroachment for cultivation, and unregulated extraction of forest products, such as firewood and timber, however, convert this ecosystem to much less diverse mixed forest or plantation forest. These plantations are mostly monocultures, dominated by *Cocos* and *Acacia.*

Likewise, also the dipterocarp forest from 450 to 900 meters is affected and the remaining forest can be found only in small and discrete patches. Moreover, areas cleared by logging cannot be cultivated here, due to the steep slopes.

Following along Layawan River uphill, where the vegetation becomes more and more dense, we will encounter the Subanen, the indigenous 'river people' community of Misamis Occidental. They comprise 75 percent of the occupants of the natural park and are traditionally hunters and gatherers, but most have settled down to plant corn, vegetables, bananas and coconuts. Thus, they shape the agricultural systems of higher altitudes, using mainly the traditional form of shifting cultivation, which involves a short period of agriculture with subsistence crops like cassava, followed by fallow. Besides providing food and material for shelter, the forests are also a source of traditional medicine to them, some of which remain available and are used to this day. One example is the bark of Almaciga, used to treat stomach-ache. The Subanen still enjoy an intimate relationship with nature, and take only what is needed for their subsistence. Furthermore, they protect the mountain by reporting poachers and by supporting the Protected Area Office in their conservation efforts. Fernando Magante, provincial tribal coordinator for the Subanen, laments that Malindang's rich biodiversity is increasingly affected by incidences of illegal logging. He hopes that the declaration as an AHP will strengthen the commitment to defend the park and their home.

After this first exhausting ascent, let us catch our breath and cool our feet in picturesque Lake Duminagat. This eight-hectare crater lake, located at the heart of the park, is not only an important water source for the adjacent rural villages, but also a silent witness of the geologic history of Mt. Malindang. A series of volcanic eruptions over some two million years followed by severe erosion have formed this deeply dissected mountain range of lavas and built-ups. Other indicators of Malindang's fiery past are the hot springs of Sebucal and Tuminawan, extensive volcanic rocks, and the carbonized woods are Mansawan.

Sufficiently refreshed, we now leave the Subanen and ascend the very steep slopes of the submontane dipterocarp forest. It features over 160 plant and 150 animal species, many are endemic to Mindanao and found nowhere else in the world. This forest type provides important ecological services, above all the stabilization of the steep terrain. The steepness makes the forest also poorly accessible to illegal logging, the fortunate reason why only its lower parts have been logged.

At a similar altitude, up to 1,400 meters, we will come across a true forest giant, *Agathis philippinensis,* eponymous for the Almaciga forest. The tallest representative reaches a remarkable 45 meters into the cloudy sky and has a circumference of 11 meters, rendering it also a sought-after and now threatened source for timber.

From 1,400 meters onwards, we cross the threshold to the biodiversity hotspot of the park. The very dense montane forest harbors over 270 plant species alone, a big share of Malindang's 2,283 recorded species, a number which is estimated to be higher by magnitudes. The most prominent inhabitant is the Philippine Eagle, which, contrary to its synonym 'Monkey Eating Ea-

gle', mainly feeds on flying lemurs. Thirty six individuals of the about 400 remaining and highly endangered pairs of eagles in the country find shelter in the park. To protect this heraldic Philippine animal, the private Philippine Eagle Foundation works together with the local communities and prepares the release of eagles, hatched in the Davao Eagle Centre.

The Philippine Eagle is, however, in no way the only noteworthy bird in the park, which is lucky enough to host 162 different bird species. Sixty of them can be found at the last leg of our hike from 1,700 meters to the cold and windy 2,424-meter peak of Mt. Malindang, where, according to Loreto Ocampos, congressman of Misamis Occidental and also a keen mountaineer, the only sound you hear is the chattering of your bones. This altitude is dominated by the mossy forest. On our way through this enchanted world of dwarfed trees with gnarled trunks and prop roots, covered with mosses and ferns, you begin to appreciate why the Subanen consider this place sacred and use it for religious ceremonies. Luckily, this forest remains fairly intact and gives a very neat example of the enduring 18,000-hectare primary forest of the park's 33,700-hectare forested area.

On the way back, we have time to recap the extraordinary diversity in species and habitats, caused by the plentiful environmental conditions along the slopes of Mt. Malindang, and supporting a huge number of people. However, as we have also witnessed, there are many man-made threats putting the ecological integrity of the park at peril. As Herminia Ramiro, the Governor of Misamis Occidental, puts it, *'it is not the righteous people who will protect their village from the storm, but it is the swamps and forests surrounding it,* which provide the protection. *In turn, it is the mission of righteous people to safeguard these swamps and forests'.* A gloomy reminder of this was last year's devastating flood in Metro Manila. Its million or so residents affected would certainly agree and appreciate intact ecosystems around them, holding back the torrential water masses.

Good governance to protect our Web of Life

Having seen the significance of preserving ecosystems, such as Mt. Malindang, what is the best way to achieve this?

This question will be at the heart of the Fourth ASEAN Heritage Parks Conference in Cagayan de Oro City on 1-4 October 2013. The Conference is spearheaded by the ASEAN Centre for Biodiversity (ACB) with support from the German Development Cooperation's Biodiversity and Climate Change Project (GIZ BCCP), and the Government of the Philippines through the Department of Environment and Natural Resources and the Department of Tourism.

At the Philippine ASEAN Heritage Parks Conference on 4-5 August 2012 in Oroquieta City, Misamis Occidental, Nereus Acosta, secretary and presidential adviser for environment protection, tried to answer this question. He cogently pointed out the four elements of good governance for sustainable development in the natural parks and beyond: *'Its natural capital, the people dependent on it, the technology to protect it, and the economy supported by it'.* He further emphasized three capital Cs as prerequisites for ecological protection: **C**onservation, like motherhood and apple pie, comes first, now strongly supported by the declaration of areas as AHPs; **C**apacity, which needs to be strengthened: both carrying capacity of the ecosystem, as well as the caring capacity of the stakeholders involved with its protection; and last, but not least, **C**ost, which is an essential factor in appreciating the value of the ecosystems services that the area provide us. For instance, the major export of Misamis Occidental, the seventh poorest province in the Philippines, is fresh oxygen from the forests, a commodity, which does not have a price tag, and thus, with a low visibility for decision makers. The concepts of Payment for Ecosystem Services (PES), applied in the natural park, are a promising way out.

On such solutions, the 4th AHP Conference in October will follow up on, and set them in the bigger picture: not only, how the unique AHPs and their effective management can contribute to the international strategy on global biodiversity protection, but also to the reduction of poverty. This bigger picture will be filled with 32 smaller pictures of the ASEAN Heritage Park photo exhibit, showing the stunning and diverse heritage of Southeast Asia.

'Preserving this heritage and thus the ecological security of the country and the region, is at least as important for national security as the Scarborough Shoal,' Mr. Acosta highlighted. *'We can talk political security, employment and investment – at the end of the day we return to what sustains life and fuels our economy – ecology, which is more than just natural resources. If we hit the buffers of ecology, we get disconnected from the global web of life. If we cannot protect the support system of life, there is no life to sustain.'*

And we have to be aware, that in contrast to the 500-meter zip line fall into the Labo River valley, there is no harness and safety cable for our quickly plummeting biodiversity – the ecological support system of all life on earth. ■

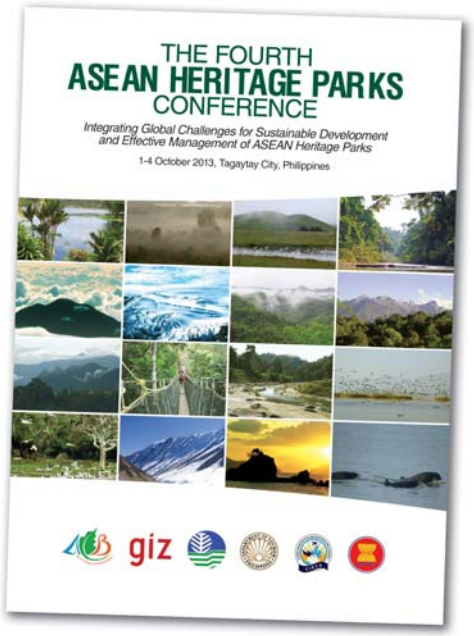
Philippines to host Fourth ASEAN Heritage Parks Conference

The Philippines' Environment Secretary Ramon Paje has announced that the country will host the 4th ASEAN Heritage Parks (AHP) Conference in Tagaytay City on 1-4 October 2013. The conference is spearheaded by the ASEAN Centre for Biodiversity (ACB), hosted by the Department of Environment and Natural Resources (DENR), and supported by the ACB-GIZ Biodiversity and Climate Change Project and the Department of Tourism.

Some 300 delegates from Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam will participate in the conference that will bring together AHP managers, biodiversity experts, policy makers and scientists; representatives from NGOs, indigenous and local communities; and relevant international and regional organizations.

ACB Executive Director Roberto V. Oliva said the conference will update the participants on recent knowledge and tools in addressing biodiversity loss and ecosystems degradation and the preservation of ASEAN's natural heritage; discuss issues on biodiversity, in the context of the outcomes of the 11th Conference of the Parties to the Convention on Biological Diversity (CBD) to achieve the Aichi Targets and contribute to the successful implementation of the CBD Strategic Plan 2011-2020; and identify cooperation opportunities towards capacity building for effective management of AHPs and other critical ecosystems and biodiversity to contribute to poverty reduction.

AHP conferences are conducted every three years. The first conference was held in Khao Yai National Park in Thailand in 2004; the second in Kota Kinabalu, Sabah in 2007; and the third in Brunei Darussalam in 2010. These conferences ensure that park managers, policy makers, conservationists, scientists and relevant stakeholders benefit from available best practices and lessons on the management of AHPs and other protected areas.



The conference in Tagaytay City will have five plenary lectures: Achieving the Aichi Biodiversity Targets: Global Impetus and Challenges in Implementing the Strategic Plan on Biodiversity; Ecotourism, Business and Biodiversity: Increasing Investments by Governments and Private Sector on Ecotourism; Towards Increased Visibility of Biodiversity Among Policy Makers: The Economics of Ecosystems and Biodiversity; Biodiversity and Climate Change: Building Resilience through Protected Area Management; and Protected Areas Governance and the Role of Indigenous and Local Communities.

There will be six breakout sessions on the following biodiversity themes: Management Effectiveness of Terrestrial Protected Areas; Effectively Managing Aquatic Ecosystems; Biodiversity and Climate Change; Integrating Biodiversity Values; Ecotourism, Business and Biodiversity; and Indigenous and Local Communities in Protected Areas.

The session on Management Effectiveness of Terrestrial Protected Areas will look into the challenges in managing terrestrial protected areas, and the lessons learned from the field specifically in the management of terrestrial AHPs.

The session on Effectively Managing Aquatic Ecosystems will take up issues and challenges in managing aquatic ecosystems and promote learning from experiences gained from projects implemented, evolving mechanisms and strategies adopted from implementation elsewhere.

The session on Biodiversity and Climate Change will explore and review good practices and lessons learned in the past as well as ongoing efforts to address climate change mitigation and adaptation issues.

The session on Integrating Biodiversity Values will present developments related to The Economics of Ecosystems and Biodiversity (TEEB). It will share case studies that highlight the application of the TEEB approach in valuing biodiversity and ecosystems as well as in the development of economic and financial tools for protected area management.

The session on Ecotourism, Business and Biodiversity will share the experiences and knowledge of experts and park managers in their respective areas. The importance of implementing ecotourism as a business model will be explained, and how this would help in the management of the ecotourism site, particularly in protected areas.

The session on Indigenous and Local Communities (ILCs) in Protected Areas will focus on cases of protected areas with ILCs taking into consideration their social, cultural, scientific, and economic values as part of the management approach. The involvement of ILCs, including the use of traditional knowledge and benefit-sharing will also be highlighted.

Side events during the conference will include a visit to Makiling Forest Reserve, which will be declared the newest AHP; a Pre-Conference Workshop for Park Managers and AHP Committee Members; Launch of the Biodiversity Small Grants Programme by ACB and KfW; ACB Partners Forum; exhibits; and awarding ceremonies for the winners of the AHP Logo Design Contest, "Zooming In

on Biodiversity and Climate Change" Photo Competition, and the Protected Area Recognition Awards.

The ASEAN Declaration on Heritage Parks was agreed and signed by the environment ministers of the ten ASEAN Member States in December 2003 in Yangon, Myanmar. The AHP Programme was then established to promote greater collaboration among the ASEAN Member States in the management of these parks.

There are 32 AHPs in Southeast Asia: Tasek Merimbun Heritage Park in Brunei Darussalam; Preah Monivong (Bokor) National Park and Virachey National Park in Cambodia; Leuser National Park, Kerinci Seblat National Park and Lorentz National Park in Indonesia; Nam Ha National Protected Area in Lao PDR; Kinabalu National Park, Gunung Mulu National Park and Taman Negara National Park in Malaysia; Alaungdaw Kathapa National Park, Inle Lake Wildlife Sanctuary, Indawgyi Lake Wildlife Sanctuary, Hkakaborazi National Park, Lampi Marine National Park, Meinmahla Kyun Wildlife Sanctuary and Nat Ma Taung National Park in Myanmar; Mt. Apo Natural Park, Mts. Iglit-Baco National Park, Mt. Kitanglad Range Natural Park, and Mt. Malindang Range Natural Park in the Philippines; Sungei Buloh Wetland Reserve and Bukit Timah Nature Reserve in Singapore; Khao Yai National Park, Tarutao National Park, Ao-Phangnga-Mu Koh Surin-Mu Koh Similan National Parks and Kaeng Krachan Forest Complex in Thailand; and Ba Be National Park, Chu Mom Ray National Park, Hoang Lien Sa Pa National Park, Kon Ka Kinh National Park, and U Minh Thuong National Park in Viet Nam. ■

Ecotourism and business strengthens biodiversity conservation

With its pristine beaches, dazzling coral reefs, rich terrestrial life, and scenic forests and mountains, the ASEAN region is definitely a Mecca for travelers. The region offers countless options to travelers who wish to break free from the bustling city. Given the high traffic of visitors coming in, opportunities for the business sector also emerge. However, the fragile ecosystems of Southeast Asia would certainly suffer when things end up uncontrolled.

The heightened awareness of various sectors on the importance of responsible tourism, mostly anchored on ecotourism, deserves recognition. Despite this, the challenge to make genuine ecotourism work remains. It is unfortunate that ecotourism has seemingly become a plain marketing buzzword used as bait that has lured many travelers and nature enthusiasts.

Given the relevance of ecotourism to the ASEAN region, Ecotourism, Business and Biodiversity will be one of the thematic sessions at the 4th ASEAN Heritage Parks (AHP) Conference to be held on 1 – 4 October 2013 in Tagaytay City, Philippines. The conference is organized by the ASEAN Centre for Biodiversity (ACB), hosted by the Department of Environment and Natural Resources, and supported by the Department of Tourism and Germany, through GIZ.

The AHP Conference will bring together AHP managers; biodiversity experts; policy makers; scientists; and representatives from NGOs, indigenous and local communities, and international and regional organizations.

The session on Ecotourism, Business and Biodiversity will provide a venue for experts and park managers to share their respective experiences and knowledge. The importance of implementing ecotourism as a business model will be explained, and how this would help in the management of ecotourism sites, particularly protected areas.

Similarly, examples of policies that would facilitate investments and benefit sharing in public-private partnerships will be presented. To ensure that the benefits would trickle down to the grass roots, education and communication tools for better awareness of biodiversity conservation among visitors and local communities would be tackled as well.

According to Atty. Roberto V. Oliva, Executive Director of ACB, one of the goals of the conference is "to identify cooperation opportunities towards capacity building for effective management of AHPs and other critical ecosystems and biodiversity to contribute to poverty reduction."

Ecotourism offers alternatives

Ecotourism refers to "a low impact, environmentally sound, and community-participatory tourism activity in a given natural environment that enhances the conservation of bio-physical and cultural diversity, promotes environmental understanding education, and yields socio-economic benefits to the concerned community (Philippines, DENR-DOT 1998)."

Ecotourism serves as a tool that can address poverty and protect biodiversity while bringing benefits to communities and businesses. Through ecotourism, locals can have access to alternative sources of income. Instead of extracting

from biodiversity such as through mining and logging, other sustainable means of livelihood can be explored.

Ecotourism also provides the business sector a great opportunity to combine both profitability and corporate responsibility.

Community participation

Southeast Asia's 32 ASEAN Heritage Parks spell the huge potential of ecotourism in the region. The next steps should be geared towards the sustainability of these protected areas, and how the concerned stakeholders can be actively involved in the process.

In the Philippines, Mt. Apo Natural Park is considered one of the most popular recreational areas. The majestic peak of Mt. Apo, which is also the highest mountain in the Philippines, attracts hundreds of mountaineers every year. Mt. Apo Natural Park does not cater to mountaineers alone. Other attractions for visitors include lakes, waterfalls, hot springs, and orchid farms.

The Philippine government's Department of Environment and Natural Resources (DENR) and Department of Tourism (DOT) have beefed up efforts to promote Mt. Apo Natural Park as an ecotourism site.

In August 2013, DENR Secretary Ramon J.P. Paje issued Department Administrative Order (DAO) No. 2013-19 aimed to support the conservation efforts and sustainable use of natural resources in protected areas with potential for ecotourism development.

In a statement, Paje said the DAO could help provide business opportunities for the local community that could involve women, children, indigenous people, and the informal sector. Similarly, it is envisioned to promote responsible tourism.

Since April 2013, DENR has tied up with DOT in training some of the locals residing near the Sibulan trail of Mt. Apo. The training has provided locals knowledge on how to properly read trail signs, so they can serve as tour guides to hikers and campers. The Tibolo Tribal Women's Association was also tapped as part of the ecotourism project and their members received training on hospitality.

Meanwhile, Lao PDR's Nam Ha National Protected Area has successfully involved relevant stakeholders in the promotion of ecotourism. The protected area has amazing views, waterfalls, and caves that have lured many local and foreign tourists. Nam Ha National Protected Area has been widely known for its cultural and ecological brand of tourism. It also imposes a community-based tourism model that helped in alleviating poverty in nearby communities.

As community participation is one of the key aspects of ecotourism, the locals should be involved in the management of ecotourism sites. In return, this promotes a strong sense of ownership among the locals.

In Nam Ha National Protected Area, locals have benefitted from the constant influx of visitors in the area. Aside from serving as guides in trekking tours, they have also been tapped to provide accommodations (homestays) and sell handicrafts. The economic benefits were bundled by their increased awareness on the need to protect the area. Many were recruited as trained tour guides.

Drawing the line

The concept of ecotourism started to become popular in the market during the 1980s financial boom. Today, more and more travel companies offer eco-tours promising a fun experience through nature-themed recreation activities to visitors. The overwhelming number of eco tour packages requires one's critical understanding on the true essence of ecotourism.

As more protected areas are opened to the public, their vulnerability to damages brought about by human activities also increases. Thus, a set of strict standards on the management of protected areas should remain in place—which should always come first before the protected areas' profitability.

Aside from the monetary benefits of using ecotourism as a business model, the cooperation among stakeholders should be considered as a major indicator of its effectiveness. The improved awareness of the communities and visitors of a protected area is a priceless benefit that we can get out of ecotourism.

Simply put, "ecotourism" should not end as a marketing catchphrase. Ecotourism should uphold both financial and social returns of investment while ensuring that the community, business sector, and environment would reap more pros than cons. *Karen Lapitan*

4th ASEAN Heritage Parks Conference to discuss role of indigenous peoples in conservation

For millennia, indigenous and local communities (ILCs) have played a critical role in biodiversity conservation. Indigenous peoples depend directly on nature's bounty, relying heavily on the environment for food, medicine, clothing and shelter. Their very survival depends on the sustainable utilization of resources. Thus, they have evolved traditional practices that nurture the earth and ensure that the environment will continue to support their community.

The role of ILCs in conserving biodiversity in protected areas will be discussed at the Fourth ASEAN Heritage Parks (AHP) Conference to be held on October 1-4, 2013 in Tagaytay City. Organized by the ASEAN Centre for Biodiversity (ACB), hosted by the Department of Environment and Natural Resources, and supported by the ACB-GIZ Biodiversity and Climate Change Project and the Department of Tourism, the conference will gather some 300 delegates from Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam, including AHP managers, biodiversity experts, policy makers and scientists; and representatives from NGOs, indigenous and local communities, and relevant international and regional organizations.

ACB Executive Director Roberto V. Oliva said the conference will update the participants on recent knowledge and tools in addressing biodiversity loss and ecosystems degradation and the preservation of ASEAN's natural heritage; discuss issues on biodiversity, in the context of the outcomes of the 11th Conference of the Parties to the Convention on Biological Diversity (CBD) to achieve the Aichi Targets and contribute to the successful implementation of the CBD Strategic Plan 2011-2020; and identify cooperation opportunities towards capacity building for effective management of AHPs and other critical ecosystems and biodiversity to contribute to poverty reduction.

Deforestation, land clearing, overharvesting of resources, pollution, and other activities have severely depleted the environment that supports indigenous communities. Upland migration and agricultural expansion have also led to encroachment of their traditional hunting grounds. These and other factors have eroded the food and water sources, and the environment that is the basis for the life and identity of many indigenous groups. Degradation of traditional sources of food and poverty have also driven many indigenous groups to adopt unsustainable agricultural practices.

The struggle for the rights of indigenous peoples and belated acknowledgement of their role in conservation would turn the tide and renew respect and interest in traditional knowledge systems. There has been increasing efforts to document the knowledge of indigenous peoples, and engage their participation in conservation and management of critical biodiversity areas. The fact that many protected areas and key biodiversity areas overlap with ancestral domains show that indigenous peoples and their management of lands, waters and other resources have made a substantial contribution to the conservation of global ecosystems.

Many of the region's 32 ASEAN Heritage Parks are homes to indigenous peoples, most of whom are now partners in conservation management.

In Tasek Merimbun Heritage Park in Brunei Darussalam, the Dusun tribe works with park management in conserving the park. Ancient artifacts of the Dusun tribe have been found in the park, and are now displaced in the Natural History Exhibition Center. A major feature of the park is the Dusun House, which evokes the traditional lifestyle of the Dusuns. When visitors come to the park, they are also treated to local music and dance performances of the Dusun tribe.

In Virachey National Park in Cambodia, major indigenous groups that live adjacent to the park are Kreung, Kavet, Brao, Lao and Lun while the minority are Tampuen, Kachok, ethnic Chinese, ethnic Khmer and ethnic Vietnamese. Virachey has great importance to the local communities, especially the Brao and Kavet, whose former territory occupied areas of the present Virachey National Park. This is in part related to the values they associate with traditional food and medicines obtained from the forests, and the importance attached to the harvesting and consumption of bamboo. Other plants and animals are also used for cultural ceremonies and rites.

Many different ethnic groups such as Pakpak, Koro, Melayli and Alas live in and around Gunung Leuser National Park in Indonesia, sustainably using natural resources such as wood, damar, rattan and fish for income. Local people also benefit from the various ecotourism activities such as wildlife viewing, jungle trekking, river rafting, caving and horseback tours.

In Lao PDR, Nam Ha National Protected Area sup-

ports a diverse community of ethnic groups who are highly dependent on the forest and its resources, and live comfortably with their traditional lifestyles. These ethnic groups include the Lao Leu, Thai Dam, Lao Thueng, Ikor, Lao Hoi, Kui, Hmong and Etong. These communities are primary beneficiaries of the Nam Ha Ecotourism Project, a community based ecotourism project that engaged communities and provided training in foreign languages, guiding techniques, hospitality management, food preparation and biodiversity monitoring. The project was designed to provide economic benefits for local people, protect cultural heritage and raise funds for environmental conservation.

In Taman Negara National Park in Malaysia, the Orang Asli community is the only tribe allowed to harvest resources from the park. They still maintain a nomadic lifestyle and have some small settlements within the park. Visitors to Taman Negara may take a trip to the Orang Asli community with the permission of park management, and have an opportunity to see traditional hunting practices of the Orang Asli, and marvel at their traditional handicrafts.

Inle Lake Wildlife Sanctuary in Myanmar is one AHP where the traditional practices of the Intha, the dominant indigenous group, has become part of the park's attractions. The lake is marked by floating gardens, on which the Intha plant tomatoes, cucumber, cabbage, peas, beans and eggplant. The locals are also famed for their unique rowing style, where they use one leg wrapped around a pole to push their amphibious vehicles of choice through the waters of the lake. They also use distinctive conical rattan nets to catch fish, which are pushed down to the bottom of the lake. Another local indigenous group is the Padaung hill tribe, where the women are known as the "long-necked Padaungs" because of the brass rings around their necks. At the age of five or six years, spiral rings are placed around the girls' neck. More neck rings are added every four years until the age of 40.

In the Philippines, the Mangyan is the dominant indigenous group on Mts. Iglit-Baco National Park. They are classified into at least eight ethno-linguistic groups: Iraya, Batangan, Hanuno'o, Alangan, Ratagnon, Tagaydan (or Tadyawan), Buhid and Pula. The Mangyan are traditionally nomadic within their territory and settle temporarily where food is found. Of the eight groups, the Tau-buid or Batangan and the Buhid directly depend on Mts. Iglit and Baco for their source of food and livelihood. They grow corn and sweet potato close to their huts; others supplement these with cassava, rice, bananas, papayas, avocados, squash, beans, taro, and other vegetables. They gather edible forest products, trap wild pigs and chickens and raise domestic stock. The Mangyan consistently stress their desire to maintain their cultural identity and ancestral domain, asserting their right to use resources for sustenance and cultural survival.

Mt. Kitanglad Range Natural Park in Mindanao is considered by local indigenous peoples as the centre of their well-being. The main indigenous groups in the park are the Tala-andig, Higa-onon and Bukidnon tribes. They regard the mountain range as their ancestral domain—their history, myth and tradition revolve around it. They still manifest strong cultural traits in their activities and way of life. They have asserted their rights over the plant and wildlife resources of the Mt. Kitanglad Range, and the permission of the three indigenous groups are critical to the conduct of various activities within the park.

Mt. Malindang Range Natural Park is considered the ancestral domain of the Subanen, the indigenous people of Misamis Occidental. They are also known as Subanos – the freedom loving people in Northern Mindanao. Subano is derived from the vernacular word "suba" which means river, and are so named because they dwell near or along riverbanks. The Subanen comprise around 75 percent of the occupants of the park. They believe that Mt. Malindang is sacred, particularly Lake Duminagat, which is the site of the group's various rituals and gatherings since the water from the lake is believed to have healing powers.

In U Minh Thuong National Park in Viet Nam, about 20,000 people live in the buffer zone, majority of whom are of Kinh ethnicity, with a small percentage of Khmer. Local communities work with park management through the buffer zone development board to ensure that the integrity of the core zone of the park remains intact.

Recognition of the contribution of indigenous peoples in conservation and respect for their rights has led to a shift where indigenous peoples are now actively engaged as partners in conservation. As such, ILCs in protected areas is one of the major sessions at the forthcoming ASEAN Heritage Parks Conference. The session will focus on practices that incorporate the perspective or involvement of indigenous and local communities in protected area management. Issues affecting ILCs in conservation management, such as science and technology, policy, traditional knowledge, and access and benefit sharing, will also be highlighted.

It is now widely acknowledged that effective and sustainable conservation can be better achieved when these are approved and have the collaboration of local indigenous peoples because their knowledge and cultures contribute to the building of comprehensive protected areas. Protected area management and ILCs often have common objectives in the conservation of lands and natural resources. Thus, there should be a greater effort to work with indigenous peoples and local communities in the conservation of protected and key biodiversity areas. *Sahlee Barrer*

Mangroves: Mother Nature's Best Insurance Policy

By Philipp Gassner

Relax in our fabulous, affordable wooden beach cottages with sweeping spectacular ocean views! Embrace the serenity of crystal clear blue waters abundant with vibrant tropical fish! Bask in the afterglow of sunsets draping the horizon and stretching across endless white sandy beaches. Enjoy a cold drink in your hand as the warm, balmy breeze caresses your face. Awake to the sound of rumbling waves…

As thousands of tourists all over South Asia were enthralled by nature, hardly were they prepared for the rumbling of a 30-meter wave – never written about in a travel brochure. The wave, known as the 2004 Indian Ocean tsunami, turned out to be the deadliest natural disaster in recorded history –hitting hardest Indonesia, Sri Lanka, India and Thailand. Wishful thinking – if only tourists could avail of insurance against this kind of a disaster when booking for a holiday. Not discounting, the 200 million people worldwide that are living along coastlines and in particular, the millions of Southeast Asians vulnerable to the cataclysmic nature of tsunamis.

Insurance on the cheap

Indeed, it is better to be safe than sorry! But then again, can one find an insurance provider that can extend coverage against tsunamis? Surely not! Startlingly, there is an answer that's just around the corner of the beach: a couple of inconspicuous, torpedo-shaped seedlings in the sand. Incredible as they are, these seedlings can insure against a 30-meter wave. Wade a bit further in chest-deep, brackish, tea-colored water, you'll take sight of towering giants – 25 meters tall – densely packed with webs of entangled prop roots extending like skirts from each trunk. You wonder, what are these tall mangling structures?

Mangling is the right catchword. *Mangle* is the Spanish origin for the word *mangrow,* widely known today as *Mangroves.*

Mangroves narrowly refer to the plant family Rhizophoraceae. They are normally found growing along the seashores of the tropics and subtropics. Certainly, these clusters of trees provide an enjoyable scenic backdrop. But go figure out how a few trees can insure tourists and coast dwellers from a fierce tsunami!

The 2004 tidal wave did not only leave horrific human tragedy in its wake but also some valuable lessons. Fortunately for the lucky inhabitants of three mangrove-sheltered villages of the Cuddalore District on India's East shore, mangroves cushioned and protected their villages from the wrath brought by the tsunami. Amazingly, 30 trees per 100 square meters helped reduce the maximum flow of a tsunami by more than 90 percent. Unfortunately for two villages nearby, satellite photographs revealed devastation, desolation, and total ruin. It was, sadly, all too late for the villagers who failed to heed an insurance option provided by Mother Nature.

Since the 2004 catastrophe, Mother Nature is now being taken seriously as an insurance provider. In fact, some insurance agencies offer cheaper policies for resorts with beaches seamed by mangroves that not only provide protection against tsunamis, but also from much more frequent calamities, such as typhoons and floods. These calamities are all too familiar to millions of Filipinos, Indonesians and Indians who live just two meters above sea level. Sea levels which are on the rise as the globe warms, the poles melt and the climate changes. Such rise turns average surf into floods and storm surges into small tsunamis.

Blue carbon locked into the soil

Hence, it's better to be climate change insured by mangroves that assuredly does so much more. Mangroves can fix climate change and subsequently render an insurance against it obsolete. It sounds too good to be true but remarkably, it is so!

So, how can a couple of trees in the water mitigate climate change? Well, mitigating climate change is getting into the very cause which is the boosted carbon dioxide levels in the atmosphere that lead to the warming greenhouse gas effect. Just like any other tree, mangroves capture carbon from the air and store it in their wood. But mangroves do an even better job. To discover their secret, we have to dig deep in the muddy, grubby ground. In the rich, tidally submerged soil, mangroves store about 90 percent of the fixed carbon in the form of organic material which decomposes very slowly. Mangroves lock continuously, huge amounts of "blue carbon" into the soil under the sea level: 1,000 tons per hectare – that's more than three times as much as tropical forests on land.

Mother Nature's bank account

This carbon lock is great news for the climate and great news for us. We can kick back and conveniently continue our beach holiday, enjoy the *wooden beach cottages, the colorful fish, the sweeping views and the clear water,* as advertised in the brochure without having to worry about mangroves anymore.

Or do we? Indeed, mangroves are spot on all-rounders. They are a source of timber and construction materials, e.g. for beach resorts, while, at the same time providing them with sweeping panoramas, promoting wellness and recreation. They filter coastal pollution, prevent soil erosion and improve biodiversity. For instance, they are

home to the endangered Kalimantan Proboscis Monkey. They capture and accumulate sediments in their roots, which serve as nursery to many species of fish that feed the world. Near-shore fisheries are not only critically important to millions of coastal communities in Southeast Asia and worldwide, but to most large-scale commercial offshore fisheries that are utterly dependent on mangroves as breeding grounds.

No wonder Viet Nam decided to plant and protect nearly 12,000 hectares of mangroves, spending US$1 million but saving annual expenditures of well over US$7 million on dyke maintenance alone. Try to get such interest rate from your bank.

If you include the other services provided by mangroves, one square kilometer of mangroves is worth a jaw-dropping $900,000 a year. What a nice savings account for every coastal community. But this account has a flip side: by hastily taking too much money out of it – say in the form of timber for a beach cottage that's worth a couple of hundred dollars – you will lose an incredible amount of yearly interest rate.

ASEAN: bestowed with mangroves but…

For the ASEAN region as a whole, this foregone annual benefit is a loss estimated at a staggering US$ 2.2 billion by year 2050, with Indonesia expected to suffer the highest loss at US$ 1.7 billion per year. Sadly, many have not yet realized the vast value of their mangrove account. While Southeast Asia's account contributes 35 percent of the mangroves found on earth, half of it is already lost during the last decades. With grim symmetry also, half of global mangroves are lost, as well as half of Philippine mangroves, or half of Viet Nam's mangrove rich Mekong Delta. *'An area of 628 square kilometers of mangrove got stripped away each year throughout the last couple of decades,'* stressed Mr. Demetrio L. Ignacio, Jr., then Acting Executive Director of the ASEAN Centre for Biodiversity (ACB), in his message as keynote speaker during the Regional Symposium on Mangrove Ecosystem Conservation in Southeast Asia, held on 27 February 2013 in Surabaya, Indonesia.

Indonesia contributes around three million hectares of mangroves, an estimated 21 percent of the world's remaining supply. But conversions to oil palm plantations and shrimp ponds caused Indonesia to rapidly lose its green fringes. Similarly in the region, mangroves are lost to aquaculture, and urban, coastal and agricultural development. This not only causes a huge financial loss but also staggering losses in biodiversity, aesthetic value, and food and livelihoods – particularly severe for the estimated 600 million people that depend directly on mangrove resources. Additionally and more importantly are the losses in carbon storage. Almost 1.2 billion tons of carbon is emitted annually from cutting mangroves and 10 percent of carbon emissions from deforestation globally.

Sorry to say, but without mangroves the travel brochure would read quite differently: *Dull views, lifeless oceans, filthy water and no wooden cottage.*

Mangroves for the future

'Our biggest challenge is to make the public aware of the true values of mangroves', summarizes Mr. Ignacio. ACB addresses the problem in numerous ways, with support from the German Development Cooperation's Biodiversity and Climate Change Project (GIZ BCCP). But how can the public save mangroves with all their values? Easy – by planting them! As a result, you can almost watch them grow. And on suitable ground, some species can reach up to two meters within two years.

Moreover, what is more challenging is protecting the new planted seedlings, as well as old-growth mangrove forests. As we have seen, they are just so versatile in the goods they provide that people get easily lured into making the fast buck rather than using the full mangrove potential. To realize this potential, mangroves conservation needs to be mainstreamed into development planning. This is what the initiative – Mangroves for the Future – tries to do. Introduced after the 2004 tsunami, the initiative offers grants to communities to protect their mangroves. Since its introduction, about 90 projects across South and Southeast Asia have already been implemented. These projects included training people in understanding how best to use and protect their precious mangroves.

Such understanding of mangroves is also crucial in the bigger picture. Mangroves research is a little bit behind compared to other tropical forest issues. The multifaceted plants simply challenge the talents of scientists, as well as decision makers. As a knowledge hub for biodiversity conservation in the ASEAN region, forging collaboration between science and policy is thus high up on the mangrove agenda of the ASEAN Centre for Biodiversity. ■

Access and benefit sharing: solving the battle over biological resources

By Karen Lapitan

Imagine yourself picking species of plants around your area to cure your cough, fever, or headache. This would be very convenient, and of course economical. Unfortunately, most people now need to head to the nearest pharmacy to buy capsules or syrup to cure the simplest forms of illness. And these medicines often come with an expensive price tag.

Most pharmaceutical products are expensive since they are protected by patents sought by companies who developed them. While this utilization of resources, specifically genetic resources, seems to bring benefits and convenience to end users, the absence of a law protecting the rights of the resource providers remain a serious issue.

The ASEAN region is home to 18 percent of the world's known plant and animal species. Ideally, countries in the region should get benefits from the utilization of resources they supply. In reality, however, the rights of resource providers are usually taken for granted. The absence of policies and laws on access and benefit sharing (ABS) in Southeast Asia has hampered development in the region since most countries do not get anything in return whenever users get their biological resources for commercial use.

Benefit sharing in Southeast Asia has been a challenge for centuries that clearly spells an urgent need to implement laws on access to genetic resources, the basic unit of biodiversity.

Existing community protocols

While international and national laws on ABS are still being debated at the moment, some indigenous groups have long been protecting their own biological resources through community protocols.

In Southern Philippines, the Talaandig tribe imposes rules that need to be followed by outsiders who intend to enter their territory. Through this protocol, visitors are asked to tell their purpose and perform the necessary ritual. Because of this protocol, the tribe was able to confiscate around 15 bags of plant specimens from researchers in 1995. To settle the offense, the outsiders were asked to pay penalties imposed by the tribe leaders. The researchers had to pay carabaos, chickens, cloth, and a few coins to the community. All of these were used in a ritual to appease the spirits in the community.

While certain tribes have dared to take brave steps in protecting their resources and traditional knowledge, countries that provide genetic resources to several industries need to have a regulatory system to ensure that both providers and users will benefit from such utilization. The providers, specifically, should consider this as an opportunity as this can function as a tool to eradicate poverty and sustain biodiversity.

The users of biological resources seem to constantly get the loaf while the providers get the crumbs. Equitable sharing of benefits is certainly necessary not just for economic considerations but for the promotion of sustainability as well.

Policy needs in the region

If policies and laws on ABS are imposed by countries that are rich sources of biological resources, the ASEAN region can be saved from losing billions of potential income from biopiracy. Providing an efficient system to link the users and providers of biological resources would mean providing an opportunity to eradicate poverty.

It is worth noting that some ASEAN Member States have imposed legislations related to ABS in varying degrees even before the introduction of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity. Malaysia and the Philippines now have policies and legislations that respond to the challenge of ABS.

The ASEAN Centre for Biodiversity (ACB), an intergovernmental organization that facilitates cooperation on biodiversity conservation and sustainable management among ASEAN Member States, has published its views on the urgency of having defined policies and legislations on ABS in "An Urgent Need: Institutionalizing Access to Genetic Resources and Benefit Sharing in Southeast Asia,"the first in a series of Policy Briefs on ABS.

According to ACB Executive Director Atty. Roberto V. Oliva, this issue of the Policy Brief Series essentially tackles the significance of genetic resources, the global and regional response to the need for ABS, and national policy and capacity needs to implement ABS in the ASEAN region.

"ACB recommends the development of ABS policy, including developing and recognizing links among policy, institutional and regulatory measures; incorporating ABS into environmental legislation; and encouraging public participation in planning and management to increase awareness of the ABS issue," Atty. Oliva stressed.

This issue of the Policy Brief on Access and Benefit Sharing can be downloaded from www.aseanbiodiversity.org/pbs. ■

Save the taxonomists, conserve the web of life

By Karen Lapitan

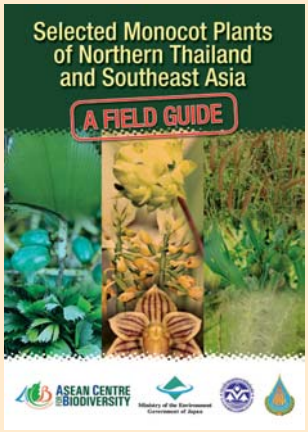
"One kilo of *Oryza sativa,* please."

We do not say this when we want to buy a kilo of rice, hence, some often wonder if scientific names are relevant since we can always use easy-to-understand common names. While scientific names appear as tongue twisters to some, these names play a crucial role in ensuring precision in naming species. Since thousands of languages are spoken all over the world, one species may be labeled differently if scientific names are not used. Simply put, scientific names help avoid confusion when referring to certain species.

Unfortunately, taxonomy, the science of describing, naming, and classifying things is facing a serious threat. Just like some of the species of the world, the population of taxonomists in the whole world is dwindling.

Contrary to the common notion, taxonomy is not just another boring academic field. It serves as a pivotal basis for the conservation, development, and management of species. If the number of taxonomists will continue to decrease, there might be limited information on inventories of commercially important species and we might fail to identify which ones have to be conserved. Sad to say, taxonomy is not generally attractive since the pay in this profession is not as lucrative as others. Considering the aging population of taxonomists, the profession of classifying species is alarmingly nearing extinction.

Even the Convention on Biological Diversity (CBD) has recognized this alarming situation. As a response to this dilemma, the Conference of the Parties to the CBD launched the Global Taxonomic Initiative (GTI) to implement efforts that can increase the number of taxonomists in the world. As a contribution to the GTI, the ASEAN Centre for Biodiversity (ACB), an intergovernmental organization that facilitates cooperation on biodiversity conservation and sustainable management among ASEAN Member States, conducted training courses in the ASEAN region supported by the



Japan ASEAN Integration Fund and other partners. Participants came from the ten ASEAN Member States, Republic of Korea, Mongolia, China, and Japan.

This challenge does not concern taxonomists alone. Since saving this profession has a race-against-time urgency, we are encouraged to take action in any possible means. Policy makers, for instance, can act to include GTI into the National Biodiversity Strategy and Action Plans in consultation with taxonomists from leading universities.

ACB Executive Director Roberto V. Oliva said, "Taxonomists should be consulted in planning and decision-making in biodiversity conservation strategies to develop fully informed and strategic decisions in conservation."

In addition, representatives from the budget and finance departments or ministries and even those from the business sector can be tapped to solve this global taxonomic challenge. ASEAN Member States may also consider availing the services of ACB to assist them in effectively mainstreaming taxonomy in their respective development plans.

Addressing the declining number of taxonomists means contributing to the conservation of biodiversity. Taxonomy is linked with bigger issues of economic losses from biodiversity loss and improving the lives of people whose livelihood are often dependent on biodiversity. Choosing to save taxonomy means choosing to save our biodiversity.

ACB has published its views on taxonomy a Policy Brief Series which can be downloaded from www.aseanbiodiversity.org/pbs. ■

This Earth Day, April 22, conserve biodiversity

By Leslie Ann Jose-Castillo

Earth Day is celebrated all over the world every year on April 22, and this year marks the 43rd anniversary of the event. Earth Day is held to demonstrate support for environmental protection. For 2013, the theme of Earth Day is *The Face of Climate Change.* This campaign seeks to harness the power of Earth Day to personalize the massive challenge that climate change presents, while uniting people around the globe into a powerful call to action.

The ASEAN Centre for Biodiversity (ACB) fully supported the celebration of Earth Day 2013. In partnership with the GIZ of Germany, ACB is implementing *The Biodiversity and Climate Change Project,* an initiative that aims to enhance the capacity of ACB in providing ASEAN Member States with advisory services on strategies and instruments for biodiversity conservation-related intervention measures on climate protection and adaptation to climate change. For ACB, Earth Day 2013 was a perfect opportunity to generate greater awareness about the crucial link between biodiversity and climate change.

The state of ASEAN's biodiversity

Like the rest of the world, the ASEAN region is increasingly losing biodiversity at an alarming rate within various ecosystems – forests, agro-ecosystems, wetlands and peatlands, freshwater, mangroves, coral reefs and seagrass. The ASEAN Biodiversity Outlook (2010), the region's biodiversity report card, 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 growing population's dependence on timber, fuel wood, and other forest products, as well the conversion of forests into agricultural and industrial lands, are taking their toll on ASEAN's forests. Already, Southeast Asian countries had lost a total of 555,587 square kilometers of forests between 1980 and 2007.

While the ASEAN region is gifted with immense mangrove resources, it nonetheless suffers the highest rates of mangrove losses in the world. An area of 628 square kilometers of mangrove got stripped away each year throughout the last couple of decades. In 1980, the estimated regional total mangrove area was 63,850 square kilometers. As of 2005, this whittled down to 46,971 square kilometers for an aggregate decline of about 26 percent within a 25-year period.

There has been a general decline in coral reefs in the ASEAN region between 1994 and 2008. Although the region hosts the largest coral reef areas in the world, it also has the highest rate of loss, which today stands at 40 percent.

Bottom-trawling, extensive coastline destruction and modification, decline in coastal water quality, and human-induced development have endangered seagrass beds in the ASEAN region. Indonesia, Philippines, Singapore and Thailand have each experienced from 30 up to 50 percent losses of seagrass habitats, compounded by the fact that the loss figures for other Southeast Asian countries remain largely unknown.

Pressing issues on biodiversity

One of the most pressing issues faced by biodiversity is ecosystems and habitat change. The local environmental conditions where plant and animal species live are changing due to various human activities, such as land use change and the physical modification of water resources. Today, the loss of habitat areas through clearing or degradation is the primary cause of species decline.

Ecosystems are what sustain human life on this planet. Humans are dependent on the natural environment for the provision of food, quality of air, drinking water, building material, clothes, fuel and medicine. Rapid urban development and the consequential exploitation of natural resources, however, are having deleterious impacts on plant and animal habitats. Scientists believe that species are disappearing at the rate of 150 to 200 a day – between 50 and 100 times the natural rate. It has been referred to as the greatest extinction crisis since the dinosaurs disappeared 65 million years ago.

Two major pressures exert the most impact on habitat change: threats to coastal and marine ecosystems – which include destructive fishing, coral bleaching and the destruction of coral reefs; and deforestation.

Threats to Coastal and Marine Ecosystems

The ASEAN Member States' coastal and marine ecosystems, mostly belonging to the Coral Triangle, are at immediate risk from a host of factors. Along with its various goods and services, these ecosystems confront threats from land- and sea-based sources, unplanned development activities, fishing and aquaculture, oil and gas exploration, and hazards brought about by oil spills and chemical leakages in the seas and oceans. Additionally, the impact of climate change and rising sea levels are significantly more alarming.

Altogether, these factors adversely affect food security, employment opportunities and standard of living of the ASEAN region's over 120 million coastal population that depend on fishing, nature tourism and other coastal and marine resources for survival. Fisheries exports and coastal tourism revenues, each providing some USD3 billion in annual foreign exchange income for the region, are likewise at risk.

Destructive means of fishing, as a case in point, has threatened 64 percent of Southeast Asia's coral reefs. These practices have endangered two-thirds of the reefs of the Philippines, Malaysia and Taiwan, and one-half of Indonesia's.

Sedimentation and pollution caused by coastal development and changes in land use have also threatened 37 percent of the region's total reefs, according to an experts' workshop report in Indonesia in June 2004.

The damage rate of coral reefs in Indonesia has reached 40 percent in 2006, suspected to be mainly caused by inappropriate fish-catching methods – such as dynamite- and cyanide-fishing, muro ami, and the use of unsuitable fishing nets; coral reefs mining; and sedimentation. Water sports and tourism activities also contribute to reef deterioration from boat anchors, harmful disposal activities, and walking on the reef especially by marine tourists.

Seagrass beds are subjected to threats from bottom trawling and extensive coastline destruction and modification. In the Philippines alone, it is estimated that between 30 to 40 percent of seagrass have been lost over the last 50 years. About ten percent or 3,000 square kilometers of seagrass in Indonesia have been damaged by sand-dredging, the use of bag nets in trawling, and pollution. In Malaysia, the loss and degradation of coral reefs and mangrove areas are caused mainly by land development, human encroachment, and overfishing. In Thailand, many coral reef areas have become vulnerable to ecotourism activities. Seagrass beds are degraded mainly by human impact from fisheries, illegal fishing and sedimentation from coastal construction.

Poaching from foreign fishing operations is also adding to the threats to marine and coastal ecosystems. Particularly targeted are marine turtles which command high prices as a delicacy in some foreign markets.

Deforestation

The growing population's dependence on timber, fuel wood and other forest products, as well the conversion of forests into agricultural and industrial lands, are taking their toll on the world's forests. Scientists say that of all major tropical regions, Southeast Asia has the highest relative rate of deforestation. They project that the region could lose 75 percent of its forests by 2100.

Already, Southeast Asian countries have lost a total of 555,587 square kilometers of forests from 1980 to 2007. By 2007, the forest cover of the entire ASEAN region was recorded at 43 percent, equivalent to a total area of 1,904,593 square kilometers. This area comprises a mere five percent of the world's total. Southeast Asia's forest area declined at an average rate of 20,578 square kilometers annually since 1980 to 2007. What remains today are over-logged and degraded forests.

Unabated conversion of natural habitats for other uses is a major driver of biodiversity loss in the region. Massive deforestation was witnessed in the 1800s when the countries pursued agricultural expansion to produce more rice and export crops such as coconut, rubber and oil palm.

Today, vast areas of forests have been converted to oil palm plantations, especially in Indonesia and Malaysia.

The most significant impact of deforestation is the degradation or loss of habitats for species, resulting in massive species declines and extinction. Natural forests are innate repositories of biodiversity resources – from genetic to species levels. Its destruction or conversion for other land uses removes the condition by which the diversity and stability of the ecosystem are maintained. Thus, replacing natural forests with plantation forests do not warrant the return of species and its natural habitats which have been eradicated in the process of conversion.

Climate change

Another pressing issue is climate change. There is ample evidence that climate change affects biodiversity. The Millennium Ecosystem Assessment reports that climate change is likely to become the dominant direct driver of biodiversity loss by the end of the century. As it is, climate change already forces biodiversity to adapt either by shifting habitat or by modifying life cycles.

The Intergovernmental Panel on Climate Change report predicts that in Asia up to 50 percent of biodiversity is at risk, and as much as 88 percent of coral reefs may be lost in the next 30 years as a result of climate change. Globally, about 20 to 30 percent of species will be at an increasingly high risk of extinction – possibly succumbing by year 2100, as global mean temperatures exceed two to three

degrees Celsius above pre-industrial levels.

The implications of climate change for the ASEAN region's biodiversity resources are projected to be serious. Climate change will exacerbate the many factors that are already endangering biodiversity in Southeast Asia. These stressors will be magnified over time. Much uncertainty remains over the magnitude of climate change in the ASEAN region, and how this will affect biodiversity resources.

It is Southeast Asia's less developed nations who are most vulnerable to climate change, as its impact is expected to further worsen poverty, particularly the earning capacity of the poor, and exacerbate the already inadequate provisions for health and livelihood.

What should be done?

Concerted efforts have been made to address biodiversity loss at both the regional and national levels. Innovative ecosystem-based approaches to address these challenges that have been implemented include the establishment of more protected areas, the ASEAN Heritage Parks Programme, the Heart of Borneo Initiative, Coral Triangle Initiative, and the Greater Mekong Sub-region Biodiversity Conservation Corridors Initiative, all of which have attracted worldwide attention.

But much more needs to be done, both by the ASEAN Member States individually and by the ASEAN community collectively, to put an end to the deterioration of biological resources. We need to re-examine our lifestyles and consumption patterns to make our choices more responsible and environmental friendly. We need to assume a fair and equitable share of burden and responsibility as users and providers of these natural resources. We must exert greater efforts in increasing the awareness among the people to protect these ecosystems for future generations, more so to ensure our own continued prosperity and survival.

The ASEAN region, as with the entire global community, has to move forward in collectively achieving the Biodiversity Target beyond 2010. Clearly, ASEAN Member States have to exert greater effort to inch their way toward achieving the biodiversity targets set for the region.

Ways forward have to be explored in order to successfully do this. There is a need to:

- Target efforts to critical areas and ecosystems;
- Mainstream biodiversity in the national development process;
- Connect biodiversity management with climate change efforts;
- Take pride on the current efforts and building on them for designing future efforts; and
- Support efforts that will lead to the adoption of the access and benefit-sharing regime in the region.

The ASEAN Member States have already taken numerous steps in addressing biodiversity loss. The challenge is to push the envelope further, mindful that striking a balance between having a healthy life, secured livelihood and prosperity coupled with protected biodiversity resources and ecosystems is achievable if humans put their hearts into it.

Earth Day 2013

In line with the theme of Earth Day 2013, ACB and GIZ promoted Zooming in on Biodiversity and Climate Change, an ASEAN-wide photo contest. Through the medium of photography, ACB and GIZ encouraged professional, amateur, and

student photographers to draw attention to the twin issues of biodiversity and climate change, and the need for global action to address these issues.

Under the Biodiversity and Climate Change Project, ACB and GIZ also supported the 2012-2013 Civic Journalism Awards of the Philippine Press Institute (PPI) by sponsoring the special award on "Best in Biodiversity and Climate Change Reporting." This is in recognition of media's significant role as partner in demystifying biodiversity and promoting the link between biodiversity and climate change and highlighting their importance to humans. Through this special category, ACB, GIZ and PPI recognized the efforts of community journalists in educating the public on the linkage between biodiversity and climate change. ■

25 May, International Day for Biodiversity

Water for Biodiversity water for life

By Sahlee Bugna-Barrer

Access to water has always been foremost on the minds of governments, private industries, conservation organizations, and ordinary citizens. Everyone needs water since it is essential for survival. Governments fight for access to water to provide basic utilities, service food production, support industries, and ensure their citizen's domestic needs. Industries need water to provide goods and services. No living being on planet Earth can survive without water. It is a prerequisite for human health and well-being as well as for the preservation of the environment.

Water issues have become more problematic in this era of climate change. The increase in the world's core temperature has wreaked havoc with the world's climate systems, leading to extreme weather events, extended periods of drought, record breaking rainfall and more intense storms, wave surges, rise in sea levels, and destruction of coastlines, among others. Habitat destruction, through deforestation and land conversion for agriculture, industrial areas, and human settlements, has destroyed forests and water catchment areas. Freshwater sources, such as aquifers, springs, and lakes have either dried up, have high sediments due to erosion, or heavily polluted by industrial and domestic waste.

Water that nourished and provided sources of food, now destroy homes, properties and livelihoods, due to flooding, wave surges, and sea level rise. Water

scarcity, on the other hand, threatens agricultural production and food security, and decreases water for domestic and industrial use, electricity, and other basic services.

According to the Convention on Biological Diversity (CBD), by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world population could be under water stress conditions. The water extremes of drought and flood are ever increasing problems. Worldwide, more than 7,000 major disasters have been recorded since 1970, causing at least US $2 trillion in damage and killing at least 2.5 million people. Water-related hazards account for 90 percent of all natural hazards, and their frequency and intensity are generally rising. Some 373 natural disasters killed more than 296,800 people in 2010 alone, affected nearly 208 million others and cost nearly US $110 billion.

Flooding, drought, and water security concerns are increasingly urgent issues faced by people all over the world. On the International Day for Biodiversity (IDB) on May 22, the CBD aimed to highlight critical issues in water management and the link between water and biodiversity through the theme "Water for Life." The theme coincided with the United Nations designation of 2013 as the International Year for Water Cooperation.

Water moves around the planet through the water cycle, which is heavily influenced by ecosystems and the life associated with them. As such, forests, grasslands, soils, wetlands all influence water. Vegetated land cover regulates water movement on land and water infiltration into soils, and thus controls soil erosion and regulates water quality. Wetlands store water and help regulate floods. Plant transpiration contributes to humidity and rainfall. Biodiversity is thus critical to the maintenance of both the quality and quantity of water supplies and is essential to ensuring the survival of all forms of life.

The key message of the CBD is that biodiversity is a solution to help achieve water security. Strengthening the natural infrastructure that is central to maintaining water supplies and other ecosystem services offer cost effective and sustainable solutions to water security issues and also provide the measures that will develop climate change resilient communities. Healthy forests and wetlands store water, provide a clean water supply, and reduce impacts from flooding and soil erosion. Healthy soils improve water availability to plants, including food crops, thus ensuring food security. Land cover and mangroves protect coastal communities from erosion and wave surges. At the same time, forests, other vegetation, and soils absorb immense amounts of carbon from the atmosphere and play a huge role in climate change mitigation.

Biodiversity plays a vital role in providing clean water, and other goods and ecosystem services for humankind. These include food, medicine, energy, clean air, carbon sequestration and climate regulation, nutrient dispersal and cycling, pest and disease control, and many other services. While maintaining biodiversity provides a buffer to natural disasters, it must be understood and emphasized that biodiversity degradation is often a primary cause of disasters in the first place. The conservation of intact and healthy ecosystems, and ensuring their expansion, thus helps ensure that goods and services

from biodiversity continue to support humankind, provides protection from natural disasters, and mitigates damage from global environmental concerns such as water security and climate change.

According to Atty. Roberto V. Oliva, executive director of the ASEAN Centre for Biodiversity, the significant link between water and biodiversity is never more pronounced in Southeast Asia, where most countries have concluded a scorchingly hot dry season, and moved onto a rainy season punctuated by intense storms and periods of immense rainfall. For years, many countries in the ASEAN region have had to endure hot dry months, where the availability of food, water and electricity are affected by low water levels, particularly in hydroelectric and irrigation dams. During the rainy season, floods have become more common, and affect property and human health and well-being.

On May 22, it is important to celebrate the International Day for Biodiversity by working for a greener world. Support projects of both government and conservation organizations that help conserve biodiversity and the environment. Conserve water at home, and ensure that water is kept clean by preventing litter, and participate in urban and coastal clean ups. Plant a tree. Do your part and encourage others to do the same. There are many ways to help and all actions will contribute to the greater global effort. Celebrate IDB with the whole world on May 22, but show commitment all year long. It is the only way to ensure that biodiversity is alive, that it can continue to provide water and other services, and also guarantee the survival of life on Earth. ■

Farm to fork – leaving a smaller foodprint

By Philipp Gassner

How would you react if you sit at the dinner table and without warning somebody takes away one third of your dish? One third of your rice, one third of your beef, one third of your veggies, and what's worst, one third of your ice cold beer.

No, this is not the latest diet advice from a lifestyle magazine, to lose a couple of pounds. Neither is it a swoop of your food-jealous neighbor's fork. It is daily reality. More than one third of the food produced every day does not end up on our plates or in our stomachs –it gets lost or wasted. That sums up to 1.3 billion tons. To grasp the dimension: this is five times the combined weight of all humans in the world or 3000 Empire State Buildings. A whole city made from garbage every year. Hard to imagine?

Let's follow your dinner from farm to fork to see if and how that is possible.

Our food's journey

On a visit to a local farm, the very beginning of the food supply chain, we can witness numerous reasons why the food does not reach our plate. We better be quick, since some clouds are forming in the distance, foretelling a storm. Have you checked the weather forecast today? The farmer certainly has, since he is utterly dependent on the weather. Weather extremes like storms or droughts are the main reason for the loss of his harvest. Unfortunately, climate change is loading the dice for ever more increasing extremes, as typhoon-plagued Philippine farmers will readily tell you. Such extremes are often followed by pest infestations, resulting in further loss. But also malfunctioning machinery or on-farm losses in storage, due to rodents, parasites or fungi are widespread, particularly in low income countries.

Such inherent losses are complemented by selective harvesting, due to economic factors, such as regulations and standards for quality and appearance. If a tomato is not round, red and shiny enough, it may well not be sold, and thus not harvested.

Say, the tomato is deemed suitable and leaves the farm; even no wit is not saved, since it is still a long way to your table. Direct production losses are followed by post-harvest loss. Again, heat, humidity and pests can spoil food. You don't want a rotten tomato or some moldy rice with your beef, do you? Such vegetables and rice are lost. This does not only apply to your dish, but happens on a large scale. Up to 45 percent of rice vanishes this way in China, and as much as 80 percent in Viet Nam. Other low income countries experience similar challenges: poor infrastructure and transportation, lack of refrigeration, and inadequate packaging result in high losses.

Just too much to finish?

But even if such infrastructure is in place, as is the case in most industrialized countries, it is still not dinner time. Beforehand, you or your chef has to go to the shops. And here we are, one step further along the food supply chain, the retail level, where loss is largest in developed countries. Nevertheless, inadequate market facilities, such as unsanitary conditions and lack of refrigeration, make it a problem of low income countries, too. Just think of the last visit to the market with tomatoes sweltering in the sun. Similarly, up to 55 percent of fruits and vegetables are lost due to poor temperature management during display.

Say, your chef managed to snatch a bunch of tomatoes, there is yet a lot that can go wrong. Often planning, communication and coordination is lacking, particularly in central kitchens. He might have just bought too many tomatoes, since less guests show up than expected, or the kitchen

help already did the shopping. Much greater factors at this stage are, however, again quality standards that over-emphasize appearance as well as the interpretation of best before, sell-by or use-by dates add. The bottle of beer was already expired? Sorry, we have to ditch it, and you have to go with tap water. Nonetheless, at the time of disposal food is often still edible, and drinks drinkable.

Sounds familiar from your fridge, was there rot in some veggies in the back? Or from the last party, where there was just too much cake to finish? Poor planning and leftovers in households contribute to the biggest wastage in the food supply chain, especially in the industrialized world. Just take the allegedly green Germany as example, where 61 percent of food waste occurs at the household level.

Combined, all these indeed amount to a staggering 1.3 billion tons, lost or wasted every year – the equivalent to more than half of the world's annual cereals crop. It is highest in North America with 294 kg of food lost per person per year, and lowest in Southeast Asia with still 125 kg of food– mainly fruits and vegetables. And the problem is on the rise. US per capita food waste has progressively increased by 50 percent from 1974 till 2009, symptomatic for industrialized countries and emulated by developing and transitional countries.

The hidden costs on our bill

What does this ever-increasing problem mean then, besides leaving the table still slightly hungry?

It means that our global agriculture and food production system is very inefficient. This inefficiency produces high costs. For you, in order to have the same sized dinner as usual, the bill will be on third higher. How much higher this is, showed a recent assessment of yearly discarded, purchased and edible food in the US, accounting for $43 billion. Quite a big tip. However, our food does not only have obvious, economic costs, one can see on the bill, but also well hidden environmental and social costs.

For instance, 70 percent of our fresh water globally goes into producing food, like your dinner. Each kilogram of your beef requires 15,000 liters of water, of your rice 3000 liters and of your tomatoes 240 liters. Then wasting food not only uses water, but also land. Around half the world's 100 million km2 of fertile land is already used to grow food. A twentieth hectare is needed to supply your rice and a whole hectare for your beef.

In a nutshell, food is responsible for about one quarter of climate impacts from private consumption and about one third of other environmental impacts, such as deforestation, land degradation, or biodiversity loss. If food is wasted or lost, the environmental impacts related to its production have been in vain.

In addition to the undue environmental impacts, the disposal of food discards causes pollution: the leftovers of your dinner will end up on a landfill, making up the largest component of materials sent there. In the landfill, the residues of your dinner break down, resulting in the production of methane, a greenhouse gas 25 times more potent than carbon dioxide, and releasing nutrients, which can pollute water bodies.

Such pollution, climatic change, deforestation and biodiversity loss are particularly relevant to Southeast Asia, the ultimate biodiversity hotspot, and very vulnerable to the effects of global warming, as the ASEAN Centre for Biodiversity (ACB) calls attention to. The Centre coordinates conservation and sustainable management of Southeast Asia's vibrant biodiversity, thus also addressing agricultural influences. In this endeavor, GIZ, the German development cooperation arm supports the Philippine-based centre.

The Philippines itself provides a sad example for environmental costs of food waste: it is the third most vulnerable country to climate change, large parts are deforested, air and water is polluted, and 90 percent of coral reefs, as the prime source of protein, are endangered. Can we really afford such undue costs?

This would be at least hard to explain to the about 925 million undernourished people worldwide and the 2.6 million children dying of hunger every year. Mind you, that food security is still a major concern in large parts of the developing world, and global demand for food will increase for at least another 40 years. "In a world of seven billion people, set to grow to nine billion by 2050, wasting food makes no sense – economically, environmentally and ethically," to quote the Executive Director of the UN Environment Programme (UNEP) Achim Steiner.

Lessons learnt from Chinggis Khan

Food waste is not only unaffordable, but also unnecessary. Why? Let's take a glance at Mongolia, one of the fastest growing economies in the world and one that is aiming for a transition to a green economy. "It is not a big waster or loser of food, but the traditional and nomadic life of many of its people does have some ancient answers to the modern-day challenge of food waste," as Achim Steiner points out. The Mongol general Chinggis Khan and his soldiers used a traditional food called Borts to gallop across Asia, not reliant on elaborate supply chains. Borts is essentially concentrated beef equal to the protein of an entire cow but condensed to a little ball. This remarkable method of keeping food, without refrigeration, maps out a way to preserving and thus not wasting food.

Aptly, Mongolia was the global host for World Environment Day, with the motto 'Think.Eat.Save: Reduce Your Foodprint'. It is also the name of a campaign that UNEP and the Food and Agricultural Organization of the UN (FAO), in cooperation with many partners from the public and private sector, launched earlier this year. Every year on June 5th, people across the planet celebrate the World Environment Day, to improve the environment now and for the future. This year they came together to show how to reduce your personal foodprint, whether in your home, whether on your farm, whether in the supermarket, in a canteen, in a hotel or anywhere else where food is prepared and consumed.

Think, eat, save

Leaving a smaller foodprint is child's play. With relative ease and a few simple changes to our habits, we can significantly cut the jaw-dropping food squandering. Just think, eat, save.

First, think: As we have seen, food loss and waste

stem to a large extend from consumer behavior.

Let's just be a bit better informed and organized, and a bit less picky. A best-before-date does not necessarily mean, we have to toss it straight away. Also, planning of food shopping and proper storage is not too hard. And why not take the slightly miss-shaped tomato next time. Ugly veggies are equally jummy.

Valuing food a little more, and putting our values into practice, may well inspire decision makers to do their share. More coordination along the entire food chain and smart investments in food infrastructure would make all the difference.

Secondly, eat. Enjoy your dinner, and if your eyes were just too big, just wrap it and eat it the next day. Likewise, many charity organizations already work with retailers to collect and use discarded food which is still safe, tasty and nutritious. Let's support them.

Last but not least, save. Not only some bucks on your dinner's bill, but much more. Save our environment from the undue onslaught of modern agriculture. Save yourself the trouble of building cities from food waste, instead save people from going to bed hungry.

It has never been easier to save the world. This is your unique chance to slow down climate change, pollution, biodiversity loss and starvation, while at the same time enjoying all three thirds of your dinner. Three thirds of your rice, three thirds of your beef, three thirds of your veggies, and of course three thirds of your ice cold beer. Bon Appetit! ■

Earth Day 2013: Steering the Earth-Ship

By Philipp Gassner

'First, I couldn't eat the food! It's not noodles, it's potatoes. Potatoes, potatoes. Fried potatoes, European style. From the beginning, I said I don't want to eat potatoes. But after maybe 300 days we had to eat powders mixed with cold water instead and I said: I want potatoes' complained Wang Yue, in an interview with the New Scientist, on his return to Earth in November 2011. You read it right: The Chinese researcher and his five colleagues were the first humans to travel to the planet Mars, which took them a mind-boggling 260 days – and 260 days back. With 17 months in windowless isolation, with poor food, it wasn't exactly a small step for the volunteers; it was a giant leap for mankind – on its way to colonize the red planet.

Agreed, it is a bit late for April Fool's day, but if you have followed the news, there was no manned spaceflight to the red planet – yet. The *Mars 500* mission was only a simulated round trip to Mars without stepping foot off Earth.

Nevertheless, the idea is as old as science fiction, and neither Ronald Reagan, nor George Bush, nor German rocket scientist Wernher von Braun was shy to proclaim the quick colonization of our brother planet. The idea is not even rocket science – it is rather straightforward. Currently, mankind is using 50 percent more resources than Earth can sustainably produce. Unless we change course, already in 20 years two planets will not just be enough. So do the math: If we trash the first planet, we need to get a second one. Then we can live on happily ever after. Business as usual, easy as that.

Or is it?

A pocked-sized mirror image of Earth

As a matter of fact, Mars is the most hospitable planet in the solar system other than Earth, given its proximity and surface conditions which are similar to Earth, such as the availability of frozen ground water or an existing atmosphere. Though, it is the most hospitable planet, it is far from being welcoming, if you are not a big fan of nights below -80 °C, reduced gravity or month-long sandstorms blocking out most of the light and if you do not need oxygen. 'No big deal' Reagan or Bush might have said, 'a little terraforming and we will be fine'. And so man tried. Not 'earth-shaping' in a strict sense, to deliberately modify a strange planet to be similar to the biosphere of Earth, in order to make it habitable. But only practice makes the master, right?

Instead of Mars, scientists chose Arizona to spend $200 million, play a little genesis, and built 'Biosphere 2'. The name is akin to Earth's life system, Biosphere 1 if you will. Covering an area of two and a half football fields, this research facility is the largest closed system ever created. With millions well spent, scientists crafted a perfect pocked sized mirror image of Earth, featuring rainforest, an ocean with a coral reef, mangrove wetlands, savannah grassland, fog desert, and an agricultural system.

On the sixth day of creation, how could it be otherwise, mankind entered Biosphere 2, to *'have dominion over the fish of the sea and over the birds of the air, and over every creeping thing that creeps upon the earth'?* And the crew of eight people, sealed inside for two years from 1991 to 1993, did. Soon, the scientists had to learn the hard way, just how enormously complex the web of interactions within the different life systems was. CO2 levels fluctuated wildly, oxygen dropped, most of the vertebrate species and all of the pollinating insects died, while insect pests, like cockroaches, boomed. Lacking oxygen and running out of food, suffering from malnutrition, fatigue and psychological conflicts, the biospherians could not stay autonomous. Although Mission 2 in 1994 achieved complete sufficiency in food production, a severe dispute within the management team ended the experiment after a few months.

What can we learn from this unique experiment and personal hardship of the researchers, making the potato problems of the Mars astronauts look like a stroll in the park? That human psychology thwarts a peaceful co-existence, be it within miniature Earth or the real one? Beyond doubt.

However, more importantly, the tryout presented lessons learnt about Earth, its fragile living systems, and its place in the universe.

A birds-eye view on the blue planet Earth

The most memorable view on this very place in the universe was certainly provided by the Soviet satellite Sputnik in October 1957. For the first time, we were able to see simply how small and delicate our little blue planet in the vastness of space is. This marked a step towards the 'birds-eye' principle of Earth System Science, the ability to obtain a panoramic view of the Earth by observing it from a distance. From this distance, the Earth System could be observed as what it really is. A single, self-regulating system comprised of physical, chemical, biological and human components. A coupled human and ecological system. The processes within this system are studied by Earth System Science, emerging as a holistic super-discipline, with Biosphere 2 as a prime example.

Just like in the experiment, scientists soon realized what this close interlinkage between nature and society also meant. As foreseen in the book of Genesis, mankind now has dominion over *every creeping thing that creeps upon the earth.* Since the industrialization in the 18th century, human exploitation of the Earth's resources has increased dramatically and is now so pervasive and profound in its consequences that it is influencing the very dynamics and functioning of Earth itself. And this does not even require rockets from Cuba or Pyongyang. With human population growth, modern technology, over-consumption, fossil fuel use, land cover changes, and the dispersal of chemicals, mankind started to make more than history — it made geological history. We opened the Anthopocene, the era of 'men', as Eva Lövbrand from the *Centre for Climate Science and Policy Research,* Sweden puts it.

And, unlike the six daring scientists of the mockup *Mars 500* mission, we are really steering 'spaceship Earth' through the Anthropocene era.

A second Copernican revolution

Understanding this astonishing fact, at the end of the Cold War, the U.S. decided to take the pulse of the planet via NASA's Mission to Planet Earth program. The resulting international partnership to build a 'Global Earth Observation System of Systems' (GEOSS) aims to exchange and coordinate the data obtained from all Earth observation satellites. It sets out to monitor the entire Earth, to provide 'the full picture', which was, according to the renowned climate scientist Hans Joachim Schellnhuber, a second Copernican revolution.

Just like in the 16th century, Copernicus removed the Earth from the center of the galaxy, now the human-centered world view gets questioned. The understanding of 'nature' and 'society' as distinct domains dissolve, the 'natural order of things' is challenged. Humbled by the scale, complexity and vulnerability of the Earth, we now need a new ethical framework for Earth stewardship. An eco-centric philosophy, so to speak. An understanding of the world as an intrinsically dynamic, interconnected web of relations in which there are no dividing lines between the living and non-living, or the human and non-human, says Lövbrand. And in which man is certainly not the dominator but on a par with all other elements of the global ecosystem.

The fragile cargo of Spaceship Earth

For this endeavor, a flag showing the Earth, as seen from space, seems appropriate. On April 22, you most likely saw this flag waving all over the world, for it is Earth Day, the largest secular holiday in the world, celebrated by more than a billion people every year. It is observed in 192 countries, and coordinated by the nonprofit *Earth Day Network,* chaired by the first Earth Day 1970 organizer Denis Hayes. Across the globe, individuals, communities, organizations, and governments acknowledged the amazing planet we call home and took action to protect it.

April 22 showed *'The Face of Climate Change'*. A climate change just like the biospherians experienced, but on a much bigger scale, an Earth scale. Earth Day told the world the stories of people, animals and places affected by climate change – and of those stepping up to do something about it.

A man in Viet Nam worrying about relocating his family as sea levels rise; a farmer in Thailand struggling to make ends meet as prolonged drought ravages the crops; a fisherman on Sumatra whose nets often come up empty; a child in the Philippines who lost her home to a super-storm; and a woman in Timor Leste who can't get fresh water due to more frequent flooding and cyclones. These many different faces of climate change, especially in the ASEAN region, are also at the core of the Biodiversity and Climate Change Project (BCCP) of GIZ, the German development cooperation arm. GIZ supports the institutionalization of the ASEAN Centre for Biodiversity (ACB), based in Los Baños, Laguna, Philippines.

An interactive digital display of all the images was shown at thousands of events around the world, including next to federal government buildings in countries that produce the most carbon pollution, calling on our leaders to act boldly together.

The first call was voiced by UN Secretary-General U Thant when he officially established the international Earth Day in 1971: *'May there be only peaceful and cheerful Earth Days to come for our beautiful Spaceship Earth as it continues to spin and circle in frigid space with its warm and fragile cargo of animate life'.*

Indeed, if we do not manage to safely steer Spaceship Earth and its cargo, there might only be one escape capsule. This job advertisement of Mars One, a nonprofit organization based in the Netherlands, which intends to establish a human settlement on Mars in 2023, all of a sudden sounds tempting, doesn't it?

You are resilient, adaptable, curious, creative and resourceful? You have a deep sense of purpose, the capacity for self-reflection and ability to trust? You are over 18 years old? And you are looking for a lifetime adventure? Look no further, you have found your dream job: Astronaut on a mission to Mars. And be sure, on the 260-day flight there will be plenty of potatoes. There is just one catch: *Mars One* only provides a one-way ticket. ■

• Myanmar

Chatthin Wildlife Sanctuary

Chatthin Wildlife Sanctuary is located in the Kanbula township of Sagaing division. Established in 1941, the sanctuary covers an area of 26,820 hectares and protects the largest population of the endangered Eld's deer *(Cervus eldi Thamin)* left in the world.

Forest types include low indaing forests, high indaing forests, flooded indaing forests, upper mixed deciduous forests, and savanna. Chatthin Wildlife Sanctuary also has one of the largest remaining patches of dipterocarp forests in the country.

Flora and fauna

The sanctuary is known to have around 69 species of medicinal plants and herbs that are used extensively by local communities.

Approximately 1,530 Thamins are known to inhabit Chatthin Wildlife Sanctuary. Other significant species include macaques, barking deer, wild boar, wild dog, leopard, and bats.

Chatthin is home to 223 bird species. These include rare Myanmar endemic species, such as the hooded treepie, Jerdon's minivet, Burmese bushlark and white-throated babbler. Other resident forest and water birds species are 14 species of woodpecker; orange-breasted green pigeon; yellow-footed green pigeon; and five species of parakeet (Alexandrine parakeet, red-breasted parakeet, rose-ringed parakeet, blossom-headed parakeet and grey-headed parakeet).

Other recorded bird species include the brown hawk owl, large-tailed nightjar, savanna nightjar, rufous-winged buzzard, white-eyed buzzard, white-rumped falcon, black-collared starling, Indochinese cuckooshrike, olive bulbul, chestnut-bellied nuthatch, Asian paradise-flycatcher, white-tailed robin, woolly-necked stork, comb duck, red-wattled lapwing, oriental darter, lesser whistling-duck, white-winged duck, and spot-billed pelican.

Threats

Through extensive radio-tracking and other survey techniques conducted by local wildlife staff, it has been observed that Eld's deer prefer dry dipterocarp forest. This forest type occurs in dry areas of Southeast Asia below 1,000 meters elevation. Unfortunately, these characteristics are also well suited for agriculture and most of the dry dipterocarp forest has been converted to agricultural land. This rapid change in land use has decimated the habitat available for Eld's deer, and is considered the largest threat to their survival.

Conservation and management

The sanctuary was established to conserve and protect the dry forest ecosystem and related biological species. The area is also a sanctuary for the preservation of the Thamin or Eld's deer, which can be found only in Myanmar, and thus aims to be an outdoor laboratory to study the ecology of Thamin and its related biodiversity. Chatthin Wildlife Sanctuary is also seen as a center for public recreation, natural environmental education, and ecotourism.

The Ministry of Forestry of the Union of Myanmar has been working with various environmental organizations to protect the biodiversity of Chatthin Wildlife Sanctuary, particularly the Thamin. One of these partners is the Smithsonian Institute of the United States, which has been conducting research and providing assistance in the conservation of the sanctuary's natural ecology as part of its conservation, development and research programmes.

Scientists at the Conservation and Research Center (CRC) of the Smithsonian Institute have been working with Eld's deer for almost a decade. This species, once found throughout Southeast Asia, only occupies a fraction of its original range. The majority of this current range is in Myanmar. Eld's deer are an endangered species, with less than 2,000 left in the wild, majority of which can be found in Chatthin Wildlife Sanctuary. Research has been conducted at Chatthin to establish baseline biological data for this species which has otherwise been undefined. Without this baseline knowledge, it is impossible to make successful management decisions.

Research at the CRC is addressing the issue of habitat loss through the use of Geographic Information Systems (GIS) and Remote Sensing. Satellite

Eld's Deer

Red breasted parakeet

images obtained from different dates and different spatial scales are being analyzed to determine the current extent of dry dipterocarp forest. This analysis will provide insight into where unknown populations of Eld's deer may be found, as well as where future reintroduction efforts may be successful.

Ecotourism

The sanctuary is particularly important as a site of the last remaining population of Thamin, but there are other attractions in the park for nature enthusiasts. Bird watching is also popular, so the sanctuary provides a wonderful opportunity for photographing Thamin, rare bird and resident bird species, and other wildlife.

The sanctuary is also known for its butterflies, orchids and other exotic plants.

There are also opportunities to study the dry forest ecosystem of the sanctuary, conduct advanced research work on wildlife, study the medicinal plants found in the area, as well as visit the biodiversity museum in the sanctuary.

The best time to visit is from November to April but observing the Thamin can be done all year round.

How to get there

Chatthin Wildlife Sanctuary can be accessed from Yangon via Mandalay to Chatthin, which is 802 km, by train. Another route by car is from Yangon via Mandalay to Shwebo (929km), and then a drive from Shwebo to Chatthin (128km). ■

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• Thailand

Khao Laem Ya-Mu Ko Samet National Park

In 1981, the Royal Forest department declared the archipelago of Samet, the headland of Khao Laem Ya and 11 kilometers of Mae Ramphueng Beach, as a national park. Located 200 kilometers southeast of Bangkok in Rayong province, Khao Laem Ya – Mu Ko Samet National Park covers 131,000 hectares of land and sea, and is an easy destination for Bangkok residents and world travelers alike.

Khao Laem Ya-Mu Ko Samet is a coastal area and island national park. Samet island is dominated by mountains and hills such as Kra Jom mountain. Beaches lie continuously from bay to bay all around the island. The eastern part of the island is highly sloped while the middle of the island is hilly. Most of the island residents have settled in the plains near the coast, as well as the northern and eastern part of the island.

There are three small islands at the southern tip of the Samet island group, namely Koh Chan (Moon island), Koh San Chalarm (Shark fin island) and Hin Khao (White Rock). There are also eight islands near the shore along the park boundary, specifically Koh Plai Teen (Foot Tip Island), Koh Kred Chalarm (Shark scale island), Koh Ma Kham (Tamarind Island), Koh Kruai (Cone island), Koh Ku Dhi (Monk's Chamber island), Koh Tai Kang Kao (Bat bottom island), Koh Ta Lu (Hole island) and Koh Yung Klua (Salt Silo Island).

The headland of Khao Laem Ya is composed of particularly hard silicates, which are resistant to erosion. The resulting cape maintains the extensive Mae Rampeung Beach to the west and protects a smaller secluded beach and seagrass bed to the east.

Most visitors come to enjoy the beaches but there are also opportunities for hiking and reef exploration. Ko Samet derives its name from the cajeput trees that grow on the island, called "samet" in Thai.

Habitats

The islands are dominated dry evergreen forest and beach forest. Many small coral reefs can be found in the park. The most popular are located near Koh Khudi, Koh Thalu and off the southern shores of Ko Samet. Unfortunately some of these areas have been ravaged by dynamite fishing and anchor damage but have recently been showing signs of recovery.

Flora

Common flora recorded in the dry evergreen forest include *Cansjerar heedei, Cleistanthus helferi, Memecylon cyaneum* and *Wrightia arborea.*

Plant and tree species generally found on the beach forest are dwarf, branched, with short twigs and thick leaves such as *Thespesia populneoides, Streblus asper, Xylocarpus rumphii* and *Terminalia catappa.*

Fauna

The more common wildlife includes the tree shrew, flying fox, and crab-eating and long-tailed macaques. At least 118 bird species are recorded in the national park, including the black-winged stilt, plover, sandpiper, terns, herons and hornbills. There are at least 15 species of reptiles in the park, including the spiny-tailed house gecko, flat-tailed gecko, tockay, and butterfly lizard. There are four species of amphibians confirmed in the park, including the house tree frog and painted bullfrog. Though sea turtles rarely nest on the beaches, they have in the past and still are known to frequent park waters.

Culture and ecotourism

The archipelago of Samet Island inspired classical Thai poet Sunthorn Phu to write his most famous epic, Phra Aphai Manee, a story of princes, sages, mermaids and gi-

Wrightia arborea

Flying fox

ants. This was written 150 years ago and readers can still enjoy the magical qualities of Samet and surrounding areas through the story.

The main attraction of the park has traditionally been a series of sculpted coves on the east shore of Samet Island, which offers a variety of privately run accommodations on splendidly scenic beaches.

Other attractions include the Laem Ya Mountain and Pret Mountain, which are small laterite hills covering an area of 1.09 sq.km. Forests cover the southern cape that project into the sea. Spectacular scenery of curvy and sandy beaches can be viewed afar from the mountain top by looking into the west. Samet Island and two small islands lie in the west right in front from the lookout. Looking to the east, a small bay with spacious sandy beaches and some rocks in crystal clear water can be seen.

Ao Klang (Klang Bay) is in the northern part of Samet Island and can be viewed from the mainland at Ban Phe. The bay has a 1 km stretch of long white and sandy beaches and is an area where tourist boats park. The famous Sai Kaeo Beach is located in northeastern part of the island about 300 meters from Samet village.

Ao Wong Duean is located in the central area on the eastern side of the island. The shape of the bay looks like a crescent. It is a 500 meter-long white and sandy beach, located 1.5 km from Sai Kaeo Beach.It takes no more than 20 minutes of walking time that allows visitors to pass Ao Phai and Ao Cho to Ao Wong Duean.

Ao Wai, Ao Kew, Ao Toei, Ao Saeng Thian, Ao Phai and Ao Prao are suitable sites for viewing coral reefs because the coral lies near the shore and every bay has a beautiful beach, particularly Ao Kew.

Because of the number of islands and the beauty of the coral reefs, the most popular activities in the park are swimming, snorkeling and scuba diving. Fishing is a popular pastime and local residents can often be found sitting among the rocks waiting for the fish to bite. No license or permission is needed and a local beach restaurant can even cook your catch for you.

Visitors can pitch their tents for the night for a fee. Tent rentals are also available at the park toruism office.

The best time to visit the park is from October - May.

How to get there

Visitors can take a car from Bangkok to Rayong (220 km), or take an alternate route along the highway that may take 185 km. In Rayong, drive to Ban Phe (14 km), where a boat can take visitors to Ko Samet. The boat trip lasts for 30 minutes.

There is also a public bus service from Bangkok to Ban Phe from 5:00 am to 8:30 pm, starting from the Eastern Bus Terminal (Aekamai) at Sukhumvit road. ■

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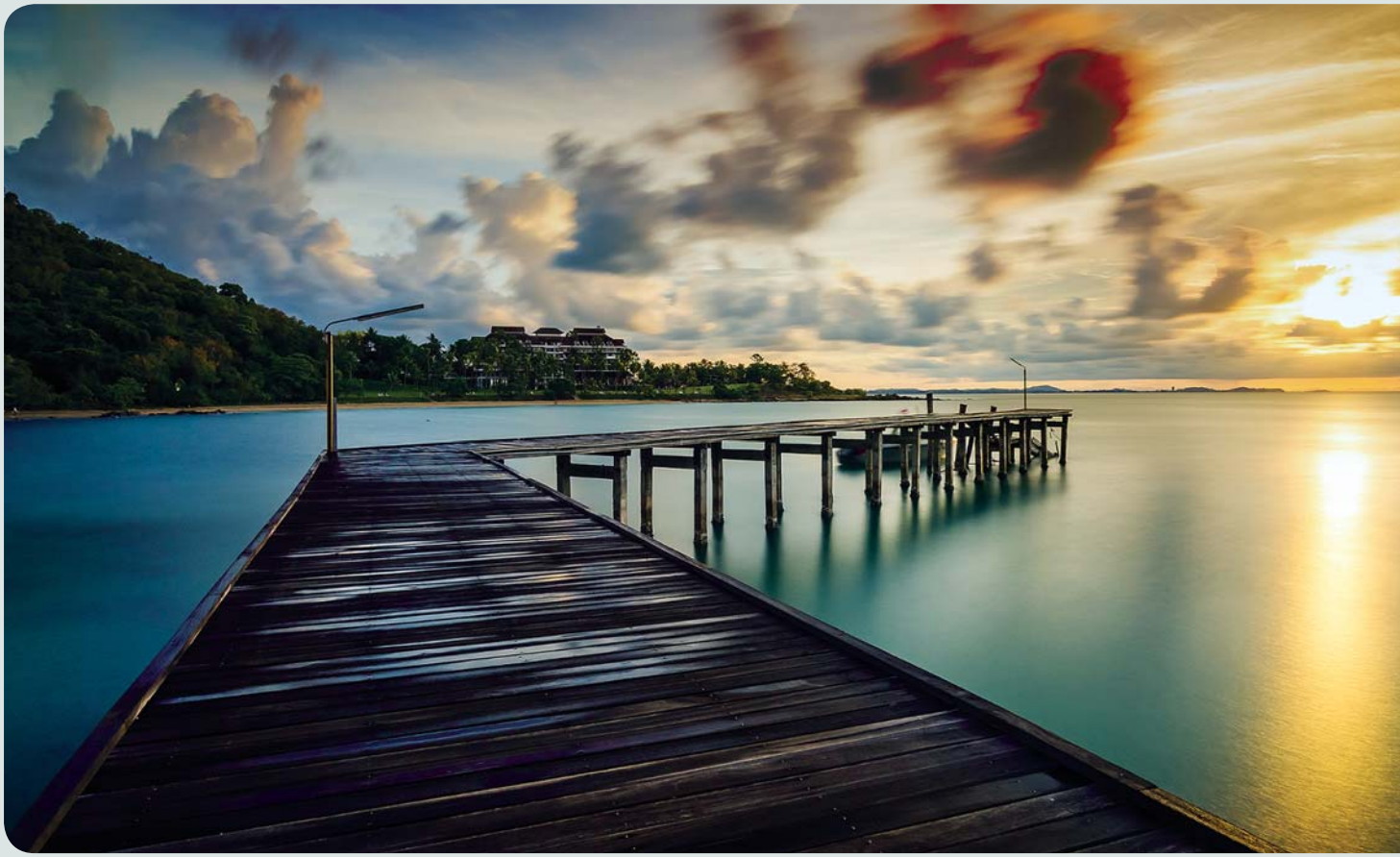


GIZ and ACB Cooperate for Climate Change Mitigation and Adaptation

- An intact biodiversity and its sustainable use pose immense opportunities for protection and adaptation to climate change and have a great developing potential for the ASEAN region. However, this tangible value to society has not yet been fully appreciated. National development strategies consider only some aspects of biodiversity conservation and sustainable development and national policy frameworks addressing climate change are still not thoroughly articulated. The ASEAN challenge is to develop adequate policies, instruments, and the capacity to tackle issues on biodiversity and climate change.

- In response to this challenge, GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) and the ASEAN Centre for Biodiversity (ACB) are jointly implementing the Biodiversity and Climate Change Project which will run until 2015.

- The ACB-GIZ Biodiversity and Climate Change Project focuses on the elaboration and implementation of ASEAN-wide regional and national strategies to appropriately address the interface between biodiversity on one side, and sustainable development and climate change on the other side. The project targets to benefit the vulnerable population of the region who depends on the ecosystem services and biodiversity resources for subsistence.

ACB-GIZ BIODIVERSITY AND CLIMATE CHANGE PROJECT

International Day for Biological Diversity: Tree growing highlights ASEAN, Germany and business sector cooperation in biodiversity conservation

TAGAYTAY Highlands in Cavite celebrated the International Day for Biodiversity through a tree planting activity that launched its programme to plant 1,900 trees in 2013. Held on May 25, the event was organized by Tagaytay Highlands International Golf Club, Inc. and developers Belle Corporation and Highlands Prime, Inc. with support from the ASEAN Centre for Biodiversity (ACB) and GIZ, the development cooperation agency of Germany. Over 150 officers and employees of the partner organizations as well as representatives from the diplomatic corps planted 190 fruit-bearing trees such as aratilis, atis, chesa, duhat, guava, lanzones, malunggay, santol, and star apple.

Dubbed "One Tree at a Time", the annual tree growing activity began in 2010 when Tagaytay Highlands first collaborated with ACB. In 2012, Tagaytay Highlands planted 1,800 trees as its commitment to the environment and has since planted more than 400,000 trees under the initiative. The tree growing activities are the company's contribution to global efforts to curb the impacts of climate change and part of the overall plan to grow one million trees in 50 years inside Tagaytay Highlands.

The event was part of ACB's efforts to encourage the business sector to invest in programmes that will promote the links of business and biodiversity through corporate social responsibility initiatives; direct investments to specific biodiversity programmes; and mainstreaming biodiversity conservation in company policies, operations, products and services. The event was highlighted by the signing of a Memorandum of Cooperation among ACB, Highlands Prime, Inc. and Belle Corporation for joint activities during the United Nations Decade on Biodiversity. The collaboration will also be part of efforts to promote the Global Partnership for Business and Biodiversity, a worldwide campaign spearheaded by the Secretariat of the Convention on Biological Diversity (CBD) to engage the private sector in implementing the objectives of the CBD and preserving the natural foundations of life for future generations.

ACB welcomes ASEAN Working Group on Nature Conservation and Biodiversity

THE ASEAN Centre for Biodiversity welcomed members of the ASEAN Working Group on Nature Conservation and Biodiversity who were in in the Philippines for the 23rd Meeting of the AWGNCB. The AWGNCB members also attended the 50th Anniversary celebration of the Makiling Botanic Gardens.

Makiling Botanic Gardens at 50: Sustaining the role of botanic gardens in global plant diversity conservation

THE Makiling Botanic Gardens celebrated its 50th anniversary with tree planting, the launching of an ecotrail, as well as a symposium on ASEAN Heritage Parks and the Global Strategy for Plant Conservation. The celebration was attended by representatives from the University of the Philippines, Los Baños, Department of Environment and Natural Resources, ASEAN Center for Biodiversity, GIZ, government and non-government conservation organizations, as well as members of the ASEAN Working Group on Nature Conservation and Biodiversity.

The symposium featured discussions on the Global Strategy for Plant Conservation, and the significance of botanic gardens, and protected areas such as the Makiling Forest Reserve and the ASEAN Heritage Parks, in conserving the biodiversity of plants. Resource speakers included Dr. Nathaniel C. Bantayan, Director, Makiling Center for Mountain Ecosystems, College of Forestry and Natural Resources, UP Los Baños; Suzanne Sharrock, Director of Global Programmes, Botanic Gardens Conservation International, London; Dr. Theresa Mundita S. Lim, Director, Protected Areas and Wildlife Bureau, Department of Environment and Natural Resources, Quezon City; and Atty. Roberto V. Oliva, Executive Director, ASEAN Centre for Biodiversity.

Best reportage on climate change and biodiversity announced

BAGUIO Midland Courier and Sun.Star Cebu bagged the Best in Climate Change and Biodiversity Reporting awards for the weekly and daily categories, respectively, at the 2012 Civic Journalism Community Press Awards held on 14 June 2013 in Makati City, Philippines. The special award was borne out of the partnership among the Philippine Press Institute (PPI), the ASEAN Centre for Biodiversity (ACB), and GIZ of Germany. The ACB-GIZ Biodiversity and Climate Change Project (BCCP) supported the award to encourage more media practitioners to help demystify

biodiversity and promote the link between biodiversity and climate change.

Baguio Midland Courier stood out because it produced original and truly community-oriented pieces that featured the efforts of various stakeholders such as women, youth, the church, and many other voices, to help mitigate the impacts of climate change. Baguio Midland Courier also featured best practices on biodiversity and climate change that provided relevant lessons to readers. In the daily category, Sun.Star Cebu was recognized for allocating space for stories focusing on climate change, global warming, ways to reduce carbon dioxide emissions, and other related topics.

This year's Annual Civic Journalism Community Press Awards was conducted in celebration of 16 years of recognizing outstanding community newspapers in the country in the fields of editing, photojournalism, editorial, science and environment reporting, culture and the arts reporting, climate change and biodiversity reporting, and business reporting. The awards programme was the highlight of the PPI's 17th National Press Forum "Watching the Watchdog: Re-examining Ourselves" held on and 13 and 14 June. It is managed by the Asian Institute of Journalism and Communication and supported by The Coca-Cola Export Corporation.

Governing Board discusses ACB sustainability

THE Governing Board of the ASEAN Centre for Biodiversity (ACB) held its 15th Meeting in Jakarta, Indonesia. Hosted by the Government of Indonesia, the meeting approved key ACB proposals, including its work plan for 2014, directions from 2013 to 2020, and a resource mobilization strategy. The meeting was presided by Mr. Dana Kartakusuma, Chairman, ASOEN-Indonesia; Assistant Minister for Global Environment, Ministry of Environment, Indonesia; and Chairman, ACB Governing Board.

Mr. Arief Yuwono, Deputy Minister for Environmental Degradation Control and Climate Change, Indonesia, delivered the keynote address of the Minister of Environment of Indonesia. Mr. Yuwono said the ASEAN region faces the challenge of ensuring the sustainability of ACB's operations. He underscored the Centre's importance in providing services to the needs of ASEAN Member States in responding to their global biodiversity commitments.

Atty. Roberto Oliva, executive director of ACB, expressed appreciation to the ASEAN Member States for selecting him as the new head of ACB and for supporting the ACB through

the years. He emphasized the need to further strengthen ACB and to implement resource mobilization strategies to support the Centre's conservation initiatives.

The meeting also endorsed the nomination of the Makiling Forest Reserve in the Philippines as a new ASEAN Heritage Park and a number of new projects.

Germany grants Euro 10M for biodiversity conservation in ASEAN Heritage Parks

GERMANY, through the German Development Bank KfW, will provide ten million Euros as financial support to the ASEAN Centre for Biodiversity (ACB) for a five-year Small Grants Programme (SGP) for Biodiversity Conservation that will promote biodiversity conservation in the ASEAN Heritage Parks.

ASEAN Heritage Parks are protected areas of high conservation importance, preserving a complete spectrum of representative ecosystems in the ASEAN region. Currently, 32 protected areas have been designated as ASEAN Heritage Parks. The ACB acts as secretariat and provides technical support to these parks through the ASEAN Heritage Parks Programme.

ACB Executive Director Roberto V. Oliva said ten AHPs will be covered initially by the Small Programme – three in Indonesia and seven in Myanmar.

"The Small Grants Programme will address the core problem that threaten globally important biodiversity – unsustainable livelihoods and over exploitation of scarce natural resources. The programme aims to improve biodiversity protection in line with the interest of local populations directly dependent on selected ASEAN Heritage Parks and adjacent areas; improve the livelihood of local communities directly dependent on these areas; and strengthen the role of ACB in promoting biodiversity conservation protection among the ASEAN Member States," Director Oliva said. *Ana Maria Tolentino*

ASEAN-GERMAN COOPERATION ON BIODIVERSITY CONSERVATION. Executive Director Roberto V. Oliva of the ASEAN Centre for Biodiversity (ACB) recently signed the ACB-KfW Agreement to implement a Small Grants Programme for the ASEAN Heritage Parks. From left to right: Ana Maria Tolentino, ACB Technical Specialist; Dr. Dicky Simorangkir, GIZ International Advisor; Dr. Sheila Vergara, ACB Biodiversity Information Management Director; Ms. Olga Caday-Asana, KfW Local Expert; Director Oliva; Ms. Clarissa Arida, ACB Programme Development and Implementation Director; and Dr. Filiberto Pollisco, ACB Programme Development Specialist.

ACB calls for institutionalization of access and benefit sharing of genetic resources

MILLIONS of people stand to gain from institutionalizing access and benefit sharing (ABS) of genetic resources as such natural treasures provide the basic ingredients for many sectors, among them pharmaceutical, cosmetics, forestry and biotechnology. The ASEAN Centre for Biodiversity (ACB) presents its views in An Urgent Need: Institutionalizing Access to Genetic Resources and Benefit Sharing in Southeast Asia, the first in a series of Policy Briefs to promote ABS among policy- and decision-makers in the Philippines and other ASEAN Member States.

ACB Executive Director Roberto V. Oliva said the Policy Brief describes the significance of genetic resources, the global and regional responses to the need for ABS, as well as national policy and capacity needs to implement access and benefit sharing in the ASEAN Member States.

"ACB recommends the development of ABS policy, including developing and recognizing links among policy, institutional and regulatory measures; incorporating ABS into environmental legislation; and encouraging public participation in planning and management to increase awareness of the ABS issue," Director Oliva emphasized.

Download the Policy Brief on Access and Benefit Sharing of Genetic Resources fromwww.aseanbiodiversity.org/pbs.

ACB conducts missions on biodiversity projects in Myanmar

THE ASEAN Centre for Biodiversity (ACB) conducted two missions in Myanmar to promote access and benefit sharing (ABS) of genetic resources and monitor an ongoing project on biodiversity and climate change.

The first mission, on 2-3 July 2013, conducted a national consultation workshop under the UNEP-GEF-funded project on "Building Capacity for Regionally Harmonized National Processes for Implementing CBD Provisions on Access to Genetic Resources and Sharing of Benefits".

The consultation workshop was formally opened by U Win Tun, Minister of the Ministry of Environmental Conservation and Forestry. In his keynote address, the Minister stressed the commitment of Myanmar in setting the context and building capacity for a harmonized national process in implementing the Convention on Biological Diversity (CBD) provisions on ABS. He emphasized the importance and timeliness of the workshop for the future strategic policy and framework of ABS in Myanmar.

Attended by 60 participants from the Ministries of Environmental Conservation and Forestry, and Agriculture and

Technology; NGOs and industry; the consultation provided participants an appreciation of different ministerial policies relevant to ABS. It served as a venue for discussions on ABS, the Nagoya Protocol and its ratification and implementation, and relevance of stakeholder analysis and road map development. The consultation identified national policies which are relevant to ABS, capacity building needs, relevant stakeholders, and timeline for road map development towards implementing ABS activities in Myanmar.

The second mission, on 4-6 July 2013, monitored the ongoing pilot project "Ecosystem Management and Biodiversity Conservation through Community Participation in Meinmahla Kyun Wildlife Sanctuary" funded by the ACB-GIZ Biodiversity and Climate Change Project (BCCP). In coordination with the Nature and Wildlife Conservation Division of Myanmar's Ministry of Environmental Conservation and Forestry and in partnership with the Biodiversity and Nature Conservation Association, and Flora and Fauna International, the project aims to improve the management and protection of the wildlife sanctuary through stronger engagement of key stakeholders, particularly the local communities, and as well as to improve local livelihoods of local communities found near area.

The monitoring mission looked into the status and progress of the project and met with project implementers to discuss implementation issues, extend technical assistance to help resolve identified issues, and improve the level of effectiveness for the successful implementation of the project. Community consultations in the villages of Gwe Chung Gyi and Chung Bye Gyi were conducted in order to have first-hand knowledge and feedback from the members of the local communities on the benefits they have received so far from the project.

The ACB mission team consisted of Mr. Anthony C.T.M. Foronda, ABS project coordinator; Ms. Ana Maria E. Tolentino, ABS project staff; and Mr. Dicky Simorangkir, international adviser, ACB-GIZ BCCP. *Ana Maria Tolentino*

Taxonomists, vital to the web of life

TAXONOMY, the science of describing, naming and classifying living things, is dying. The profession of taxonomy is on the verge of extinction as it cannot compete with high-paying professions. Thus, all over the world, very few students are taking up taxonomy as a course.

The world needs taxonomists to identify and classify species before they can be protected. Recording, studying and inventory of species provide an essential basis for the conservation, development and management of species. What we don't know, we can't protect and conserve.

Statement for the International Day for Biological Diversity, 22 May 2013

THE ten Member States of the Association of Southeast Asian Nations (ASEAN), through the ASEAN Centre for Biodiversity, join the world in celebrating the International Day for Biological Diversity (IDB) on May 22nd.

This year, the theme of IDB is Water and Biodiversity, in recognition of the United Nations' designation of 2013 as the International Year of Water Cooperation. The theme underscores the crucial role of biodiversity and ecosystems in providing for water security, and therefore for sustainable development. It is also a special occasion to reflect on the role of water and biodiversity in our lives.

While water covers most of the Earth, only a meager 0.03 percent is available as liquid freshwater at or near the land surface. This miniscule amount supports all terrestrial and freshwater biodiversity, as well as the well-being of humans and the other species that depend on this source of life.

In Southeast Asia, nearly 700 million people depend on water for sustenance, sanitation, and many forms of economic activities. Similar with the rest of the world, however, we are faced with a worsening international water crisis owing to wanton mismanagement, rapid population growth, and the impacts of climate change. We must therefore work together to address water insecurity.

One potent weapon against water insecurity is biodiversity conservation. We must remember that ecosystems regulate the availability of water, and its quality. Ecosystem degradation increases water insecurity. Ecosystem conservation and restoration therefore help achieve water security.

Let us ensure the wise use of wetlands! There is a critical link between wetlands and water. Without wetlands there will be no water; and without water there will be no wetlands. Without adequate management of wetlands from the mountains to the sea, there is no water of the right quality and quantity where and when it is needed.

Let us protect our forests! They have a close relationship with our water resources. Forests are akin to giant sponges. They soak up rainfall during wet seasons and slowly release in times of drought. Forests have natural filtration and storage systems that supply more than 70 percent of usable water all over the world. Thus, sustainable forest management is needed to ensure a steady stream of good-quality fresh water.

Biodiversity conservation is a sustainable solution to the water crisis. Governments are beginning to realize the importance of using ecosystems to manage water.

The ASEAN Centre for Biodiversity fully supports the celebration of the International Day for Biological Diversity. We encourage all sectors to participate in this global celebration. Now is the time to call public attention to the root causes of biodiversity loss and act decisively to halt the decline of our natural wealth. Let us recognize that biodiversity conservation holds the key to achieving a more water-secure world.

Atty. Roberto V. Oliva
Executive Director
ASEAN Centre for Biodiversity

The ASEAN Centre for Biodiversity (ACB) discusses the relevance of strengthening taxonomy in Save the Taxonomists, Conserve the Web of Life, the first in a series of Policy Briefs on promoting the role of taxonomy in biodiversity conservation.

ACB Executive Director Roberto V. Oliva said the Convention on Biological Diversity (CBD) stresses the dwindling number of taxonomists as an impediment to biodiversity conservation.

"The CBD launched the Global Taxonomic Initiative in the hope of increasing the number of taxonomists all over the world. ACB recommends that taxonomy be integrated in National Biodiversity Strategies and Action Plans of countries. Taxonomists should be consulted in planning and decision making in biodiversity conservation strategies to develop fully informed and strategic decisions in conservation," Director Oliva stressed.

The new Policy Brief on Taxonomy may be downloaded from www.aseanbiodiversity.org/pbs.

Regional meet calls for action to protect mangroves

OVER 200 representatives from government, environmental organizations, funding agencies, academic institutions and civil society called for a concerted action to protect Southeast Asia's mangroves. The call for action was made during the recent Regional Symposium on Mangrove Ecosystem Management in South East Asia – Mainstreaming Mangroves held in Surabaya, Indonesia.

The event, organized by the Directorate General of Watershed Management and Social Forestry Development of the Indonesian Ministry of Forestry in cooperation with the Japan International Cooperation Agency, provided an opportunity for participants to share good practices and lessons, findings and perspectives on mangrove ecosystem management, including technical and management issues in their protection, rehabilitation and sustainable use in Southeast Asia. The symposium also discussed the establishment of cooperation mechanisms and networking for integrating mangrove ecosystem management in development planning and processes in ASEAN Member States.

Keynote speaker was Demetrio L. Ignacio, Jr., former Acting Executive Director of the ASEAN Centre for Biodiversity and Undersecretary of the Philippines' Department of Environment and Natural Resources, who stressed the importance of mangrove ecosystems to humans and the environment.

Ignacio revealed that Southeast Asia is home to 35 percent of mangroves found on earth, where 36 to 47 species of the world's known 70 mangrove species are present. An estimated 600 million Southeast Asians depend directly on these resources for food and income.

"While the ASEAN region is bestowed with immense mangrove resources, it nonetheless suffers the highest rates of mangrove losses in the world. An area of 628 square kilometers of mangrove got stripped away each year throughout the last couple of decades.

"The chief cause of mangrove depletion in the ASEAN territory has been the conversion of mangrove inter-tidal areas to mariculture ponds, most commonly for shrimps. Pond culture is responsible for 50 percent of mangrove losses in the Philippines, and from 50 to 80 percent in Southeast Asia. Other forms of indirect damage from the practice of conversion extenuate to coastal resources, such as the discharge of nutrients by rich waters, or what is known as eutrophication; the associated depletion of natural stocks of fish and crustaceans; and the accumulation of toxins at mariculture facilities that render it unusable after a short span of time, leading to eventual abandonment and further degradation to the ecosystem, yet setting off the conversion of more mangrove areas elsewhere," Ignacio explained.

The Surabaya Call for Action in Mainstreaming Mangrove Ecosystem Management in Southeast Asia listed actions that need to be undertaken by national and local governments, researchers and academics, business and industries, non-government organizations, local communities, and international donors and organizations to mainstream mangrove ecosystem conservation and management in the region.

The list includes developing, harmonizing and implementing policies and plans on sustainable coastal zone management; conducting more intensive research in mangrove ecosystems; monitoring the environmental sustainability of coastal areas and ecosystems; educating and raising awareness on the importance of mangroves; strengthening sustainable management practices among business and industries that depend on mangrove resources; encouraging investment in mangrove conservation activities; identifying

traditional local community practices that have success in mangrove ecosystems management; and strengthening collaboration among stakeholders to ensure sustainability of actions to protect mangrove ecosystems.

The Surabaya Call for Action also stressed the significance of international organizations and donors, who were asked to provide financial, technical and technological support in developing and implementing ecosystem-based projects on sustainable mangrove ecosystem management; promote the formulation of international standard policies on mangrove conservation and management; and help boost networking among governments, NGOs, local communities and academics in all countries in the region to facilitate sharing of information and learning from each other's experiences.

Taking action to mainstream mangrove ecosystem management has become increasingly significant as mangroves contribute to biodiversity conservation by providing feeding and spawning grounds for fish, crabs, shrimp and other marine life. They provide a buffer against the impacts of climate change by serving as barriers against wave surge and protecting coastal areas. Mangroves act as giant filters that mitigate pollution. They prevent soil erosion and capture and accumulate sediments in their roots, which serve as home to many species of fish that feed the world. Mangroves provide timber and non-timber forest products, improve biodiversity, and promote wellness, recreation and ecotourism.

The Surabaya Call for Action highlights the significance of protecting mangrove ecosystems in the region, and that all stakeholders have a role to play to ensure that mangrove areas are sustainably managed to benefit future generations.

CIFOR report examines PES in Viet Nam

THE Center for International Forestry Research (CIFOR) has released a brief that provides recommendations on payments for ecosystem services (PES) in Viet Nam. The brief examines institutional arrangements, benefit sharing, and monitoring and evaluation based on a study of PES mechanisms undertaken since 2008.

With regard to the institutional setting for PES, the brief concludes that a general legal framework is in place for payments for watershed protection, protection of natural landscapes and biodiversity, forest carbon sequestration and emission avoidance, and support for forests as sites for aquaculture. However, the brief reveals that, thus far, disbursement rates for PES remain under 50 percent, transaction costs are high, local communities lack the legal status to enter into PES agreements, and buyers and suppliers are not well-defined and even when they are, the private sector is disadvantaged compared to public entities.

With regard to benefit sharing, the brief suggests that payments be revaluated in order to ensure that PES adequately offset opportunity costs. It also recommends that payments be tied to a percentage of the revenue earned from the supply of the ecosystem service or the percentage of the watershed that is forested. The brief also suggests that high value areas be prioritized for PES and that other programmes for conservation and restoration be paired with PES.

The brief concludes that no clear monitoring and evaluation programme is currently in place for PES, and that environmental and socio-economic baselines are inadequate. The publication attributes these conditions to insufficient staff capacity, insufficient penalties for illegal actions, a lack of authority to ensure compliance, and the absence of grievance mechanisms. CIFOR is a member of the Consultative Group on International Agricultural Research.

CIFOR Release

New report highlights growing biodiversity awareness worldwide

SEVENTY-FIVE percent of consumers surveyed worldwide are aware of biodiversity, while 48 percent can give a correct definition of the term biodiversity. These are some of the findings contained in the 2013 Biodiversity Barometer report launched in Paris by the Union for Ethical BioTrade (UEBT). Consumers in Brazil, China and France, according to the study, show a particular awareness about biodiversity.

"The Biodiversity Barometer is an important source of information on global trends in biodiversity awareness. The results not only demonstrate a growing consciousness, they also show that respecting biodiversity provides tremendous opportunities for business around the world" said Braulio Ferreira de Souza Dias, Executive Secretary for the Convention on Biological Diversity.

Very high biodiversity awareness in China

This year's special focus on China reveals interesting results: Apart from a very high biodiversity awareness (94 percent), Chinese consumers surveyed also show high knowledge of biodiversity: 64 percent could define correctly what biodiversity means. "The survey results do not come as a surprise. In recent years, the government as well as civil society organizations in China has undertaken tremendous activities for communicating and raising awareness of biodiversity issues" says Zhang Wenguo, Ministry of Environmental Protection of the People's Republic of China.

Biodiversity offers branding opportunities

Responses to the question "What are the three brands you consider are making the most efforts to respect biodiversity?" were manifold and often country-specific. In Brazil, there is a clear leader with Natura (49 percent). In the USA, most mentioned food brands, including Kraft, Starbucks and Ben & Jerry's. UK has two leading companies: Bodyshop and CO-OP (23 percent and 20 percent). In France, Yves Rocher, Nestle and Danone top the list, while in China the perceived leaders are Yili, Mengliu and Amway. "There are clear opportunities for brands to position themselves around the issue of biodiversity, and anticipate in-

creasing consumer interest on this issue" concludes Rémy Oudghiri, Director of Trends and Insights at IPSOS.

Biodiversity reporting is growing, but still weak

"Today, 32 of the top 100 beauty companies in the world refer to biodiversity in their corporate communications such as sustainability reporting and websites. This is considerably higher than in 2009, but much lower than what we found in the top 100 food companies" says RikKutsch Lojenga, Executive Director of UEBT. In 2013, 87 percent of consumers say they want to be better informed about how companies source their natural ingredients, and a large majority of consumers say they would boycott brands that do not take good care of environmental or ethical trade practices in its sourcing and production processes.

Youth is the future of biodiversity

For brands interested in reaching consumers on biodiversity, the 2013 Biodiversity Barometer offers the following insights: Young people tend to have the highest awareness of biodiversity (80 percent), as well as more affluent and well-educated people. Traditional media remain by and large the keysources of awareness: 51 percent of all surveyed consumers learned about biodiversity through television, 33 percent through newspapers and magazines.

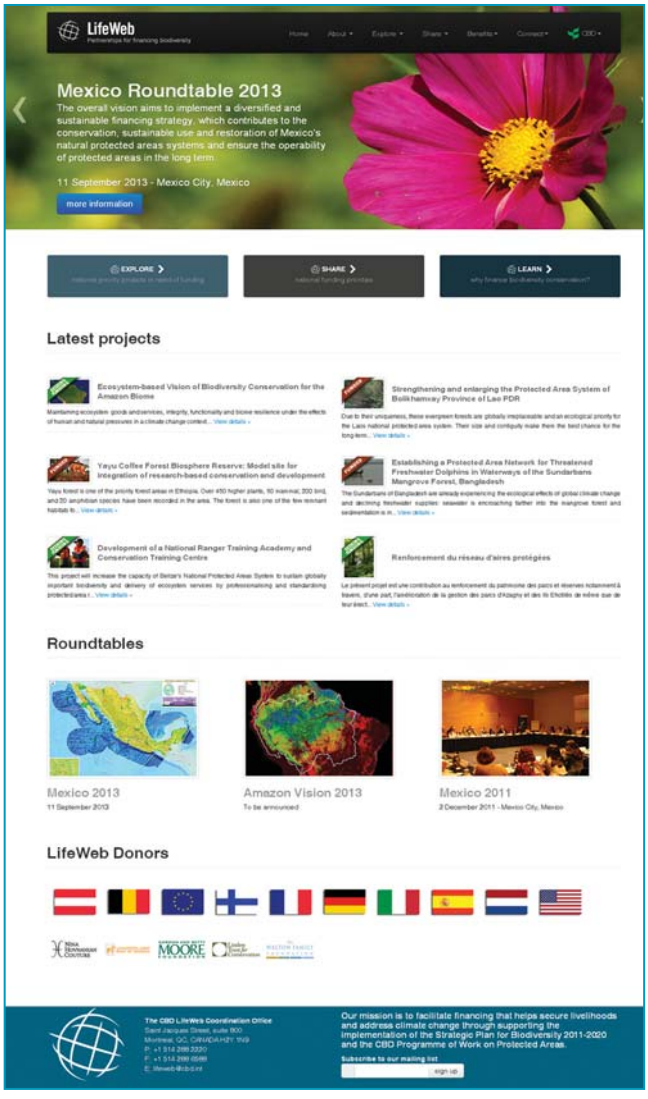
On the UEBT Biodiversity Barometer

The UEBT Barometer provides insights on evolving biodiversity awareness among consumers and how the beauty industry reports on biodiversity. It also illustrates the progress towards achieving the targets of the Strategic Plan of the United Nations Convention on Biological Diversity, and its results will be reflected in the next edition of the Global Biodiversity Outlook as a midway point analysis of the achievement of those targets. Since its first edition in 2009, the global research organization IPSOS, on behalf of UEBT, has interviewed 31,000 consumers in 11 countries (Brazil, China, France, Germany, India, Japan, Peru, South Korea, Switzerland, UK and USA). In 2013, the biodiversity barometer survey was conducted among 6,000 consumers in six countries - Brazil, China, France, Germany, UK and USA. *SCBD News*

SCBD develops new portal on LifeWeb Initiative

THE Secretariat of the Convention on Biological Diversity (CBD) has developed a new online portal for receiving expressions of interest for funding for protected areas in the framework of the LifeWeb Initiative: http://lifeweb.cbd.int

The portal is consistent with the new framework harmonizing the LifeWeb Initiative with the Strategic Plan for Biodiversity 2011-2020 and its Aichi targets. As a result of a consultation process, the LifeWeb Initiative was broadened to offer the opportunity to CBD parties, in particular developing country parties or countries with economies in transition, and local and indigenous community groups, to seek financial support for projects consistent with the area-based Aichi targets through the LifeWeb Clearinghouse. This allows parties to post their financial needs for projects related to the CBD Programme of Work on Protected Areas and Aichi Target 11 (protected areas), and also for Target 5 (habitat loss), Target 9 (invasive alien species), Target 12 (species extinction), Target 13 (genetic erosion of agricultural biodiversity), Target 14 (restoration of ecosystem services) and Target 15 (ecosystem restoration and contribution to carbon stocks). *ISSD*



■ Brunei Darussalam

Pupils learn value of wildlife preservation. The Ministry of Industry and Primary Resources through its Wildlife Division held a roadshow to create awareness on the preservation and protection of all wildlife and ecosystem in the country amongst primary school pupils. The roadshow held at the Rimba Primary School saw the participation of teachers and pupils from 11 primary schools in Brunei Zone II. The event aimed to create awareness on the importance of protecting all wildlife and preventing the extinction of rare species and to ensure that much of the country's biodiversity would be enjoyed by future generations. The roadshow was organized with the cooperation of the Department of Schools at the Ministry of Education. *The Brunei Times*

ASEAN plays key role in eco-talks. At the *14th Seminar on Current International Issues Affecting Forestry and Forest Products,* participants noted that ASEAN is gaining greater recognition as a single group in international climate change negotiations. Dr. Nur Masripatin, coordinator of the ASEAN Regional Knowledge Network on Forest and Climate Change (ARKN-FCC), said the 10 ASEAN Member States have been issuing joint statements under the United Nations Framework Convention on Climate Change (UNFCCC). ASEAN was thus seen as a "hub" for the UNFCCC secretariat to communicate with parties in ASEAN, despite the association not being a negotiating block in the convention. During the Climate Change Conference in Bonn, Germany in June, ASEAN was seen as the group that could offer solutions in coordinating efforts in REDD+ implementation. The group is committed to advancing their efforts in climate change negotiations, particularly on the issues of finance, at the 19th Climate Change Conference to be held in Warsaw, Poland in November. *The Brunei Times*

Forestry, students plant 200 trees at Berakas Forest Reserve. More than 200 Citibank employees and family members, staff from the Forestry Department, and students of the International School of Brunei commemorated Global Community Day by planting 200 trees at the Berakas Forest Reserve. The Forestry Department hoped that the event would instill public awareness on the importance of conserving and protecting the environment and lauded the efforts of the private sector in nature conservation. The activity aimed to raise awareness and educate the next generation on the urgency of combating climate change and on the importance of biodiversity conservation. *The Brunei Times*

Population study of proboscis monkeys to commence soon. The Wildlife Division plans to embark on a study of the proboscis monkey population, particularly those found living along the Brunei River, in the hope that the research findings can be used to conserve their habitats. Locally known as bangkatan, the male orange-haired primates have distinctive long noses and pot bellies, and are among the natural attractions in Brunei. Some travel agencies promote Brunei River tours specifically dedicated to viewing the monkeys in their natural habitat. The proboscis monkey is one of the 34 animal species listed under the Wildlife Protection Act 1978 (Revised 1984). It is endemic to Borneo and is listed as an Appendix I species (endangered) under the International Union for Conservation of Nature (IUCN). *The Brunei Times*

■ Cambodia

Endangered Giant Ibis found in Cambodia. Conservationists expressed hope for the survival of the critically-endangered Giant Ibis after a nest of the bird species was discovered in a previously unknown habitat in northeastern Cambodia. Habitat loss and poaching have pushed the Giant Ibis to the edge of extinction, with around only 345 of the reclusive creatures - distinctive for their bald heads and long beaks - left anywhere in the world, 90 percent of them in Cambodia. A farmer in Cambodia's Stung Treng province discovered the nesting site in the Mekong Flooded Forest area in July. An inspection team from the WWF later saw an adult bird sitting on the nest with two eggs. The Giant Ibis *(Thaumatibis gigantean)* was listed on the Red list of the International Union for Conservation of Nature in 1994 as critically endangered with its habitat limited to Cambodia, Lao PDR and Viet Nam. WWF warned that threats remain as the species' lowland forest habitats continue to be drained and stripped for agriculture, while its eggs are sometimes poached by villagers. *news24*

New bird species in Cambodia. Scientists have discovered a previously undescribed species of bird with distinct plumage and a loud call living in Phnom Penh. Named the Cambodian tailor bird, its scientific name *Orthotomus chaktomuk* reflects an old Khmer word meaning four faces. The Cambodian tailorbird is one of only two bird species found solely in Cambodia. The other, the Cambodian

laughing thrush, lives in the remote Cardamom Mountains. The wren-sized gray bird with a rufous cap and black throat lives in dense, humid lowland scrub where the Tonle Sap, Mekong and Bassac rivers converge in the city. Most individuals probably occupy one large contiguous area of habitat in the Tonle Sap floodplain. Only fragments of floodplain scrub remain in the city, but larger areas of seasonally flooded scrub persist just outside the city limits where the Cambodian tailorbird is more abundant. Scientists describe the new bird in a special online early-view issue of the Oriental Bird Club's journal *Forktail.* The modern discovery of an undescribed bird species within the limits of a large populous city indicates that new species of birds may still be found in familiar and unexpected locations. The scientists expressed their concern that the Cambodian tailorbird is likely to lose its habitat due to the impacts of hydropower development on the Mekong River and its tributaries and recommend that the species be classified as Near Threatened in the Red List of Threatened Species maintained by the International Union for Conservation of Nature.

Environment News Service

Cambodian airports join "Wildlife Trafficking Stops Here" campaign. The Wildlife Alliance, a non-governmental organization fighting wildlife trafficking in Cambodia, has completed the eye-catching new "Wildlife Trafficking Stops Here" exhibition at the Phnom Penh International Airport. The exhibits provide key facts about the illegal wildlife trade and serves to educate travelers about the impact of their actions and the steps they can take to protect wildlife in Cambodia and around the world. Cambodia's international airports receive more than three million passengers annually and are often used as transport hubs for illegal wildlife products destined for markets in Viet Nam and China. The campaign features signs in Khmer and English displayed on TVs throughout departures, arrivals and baggage claim areas at both international airports. The signs feature commonly trafficked species such as tigers, sunbears, moonbears, pangolins and the giant ibis, and inform domestic and international passengers that wildlife trafficking is illegal under Cambodian law and to report wildlife crime to Wildlife Alliance's 24 hour hotline. Other important campaign components include special training seminars for customs, operations staff, baggage and cargo handlers, security personnel and other key airport staff. The campaign is part of the Asia's Regional Response to Endangered Species Trafficking (ARREST) programme sponsored by USAID/RDMA and in partnership with Freeland Foundation, the Cambodian Forestry Administration, and Cambodia Airports. *USAID/RDMA*

Enforcement support for the protection of critically endangered Mekong Dolphins. On 20 May 2013, equipment necessary for effective law enforcement including radio communication tools, GPS units, life jackets, water proof cameras, boat engines, enforcement uniforms and solar panels were handed over by WWF to the Commission for Dolphin Conservation and Development of the Mekong Dolphin Ecotourism Zone. Financed by the IUCN's Save Our Species Programme, the equipment will boost current efforts by the Dolphin Commission river guards, who are performing enforcement work on a 190km stretch of the mainstream Mekong River between Kratie, Cambodia and Khone Falls on the border with Lao PDR known to be the habitat range of the Irrawaddy dolphin. WWF also provided a four-day training course for enforcement units, covering patrol techniques, first aid skills, use of GPS for geo-referencing locations and navigation, and understanding and applying legislations related to dolphin protection. WWF provided equipment and the training to support river guards working along the Mekong in Kratie and Steung Treng who are at the frontline implementing Cambodian laws that specifically protect the Mekong dolphins. *WWF Cambodia*

■ Indonesia

Indigenous Peoples vow to map customary forests. The Indigenous Peoples Alliance of the Archipelago (AMAN) is determined to map out the country's customary forests to save them from the encroachment of palm oil companies and other development projects. A recent ruling by the Constitutional Court, which acknowledged that indigenous communities — and not the state — have rights over some 40 million hectares of customary forests, influenced the decision to chart such lands. Indigenous groups' organizations have already mapped seven million hectares of land, but need to take advantage of mapping tools such as GPS and 3D mapping to chart more than 30 million hectares that have yet to be documented. The government has never mapped customary forests, which often overlap with government concessions handed out to palm oil and pulp and paper companies. Under its one-map policy, the government hopes to create a single map of all forests in order to clarify overlaps. *Jakarta Globe*

ASEAN lauds Indonesian's efforts to fight forest fires. At the 15th Meeting of the Sub-regional Ministerial Steering Committee on Transboundary Haze Pollution in Kuala Lumpur, ASEAN environment ministers praised Indonesia for its quick act to combat land and forest fires that caused air pollution in neighboring countries. They also lauded Indonesia's commitment to speeding up the process of ratifying an ASEAN agreement on transboundary haze pollution. The ministers said Indonesia's efforts to fight land and forest fires indicated its capacity to prevent the fires from spreading. However, they underscored the need for the country to adopt an early warning system to prevent the

land and forest fires from a recurrence in the future. *Antara News*

Kadin asks research, technology ministry to study Riau's haze. The Indonesian Chamber of Commerce and Industry (Kadin) has asked the Ministry of Research and Technology to study land fires producing haze in eight districts in Riau. The Riau government reported fires consuming around 3,700 hectares of land in Riau Province. The worst fires took place in three districts sharing direct borders with Singapore and Malaysia. In efforts to put out forest fires in Riau Province, the government has set a total of Rp100 billion to be allocated for making rain, procuring materials and providing planes to conduct water bombing. *AntaraNews.com*

Some 2,000 smuggled turtle eggs seized in Balikpapan. About 2,000 eggs from turtles on the verge of extinction in Southeast Sulawesi have been seized by port security in East Kalimantan after they were sent via passenger boat and addressed to a person in Samarinda. Police in Balikpapan seized the eggs, trading in which is illegal, and have detained the person who picked up the delivery. Samarinda has become the second biggest market in East Kalimantan because the turtle eggs there are sold for Rp 10,000 each while in Bau Bau three turtle eggs sell for only Rp 1,000. Turtle egg traders are still found in several areas in Samarinda, although trading of turtle eggs has been banned. Authorities urged a halt to consumption of turtle eggs because turtles are protected by national and international laws and are on the verge of extinction. *Jakarta Globe*

■ Lao PDR

Supporting Lao PDR's National REDD+ Framework. With support from Lowering Emissions in Asia's Forests (LEAF), the Lao Ministry of Natural Resources and Environment (MoNRE) organized a workshop in Vientiane on National REDD+ Accounting on 7 August. Lao PDR has set a national goal of increasing forest cover and reducing rates of deforestation. Through participation in global REDD+ efforts, developing countries will potentially be eligible to receive financial incentives from developed countries for reducing carbon dioxide emissions from deforestation and forest degradation. Such anticipated REDD+ financing would potentially provide support for forestry sector activities and for people living in forest areas. Accurate monitoring and accounting of forests and emissions will be needed, and therefore a well-structured national REDD+ accounting framework is essential. Currently several sub-national REDD+ projects are being developed in provinces across Lao PDR, and these efforts will need to be integrated and harmonized in order to establish a national-level system. Through the National REDD+ Accounting workshop, MoNRE and the LEAF programme brought together diverse stakeholders involved in national and sub-national-level REDD+ efforts to collaborate on how this will proceed and how to ensure the robust functioning of a future national REDD+ system. While financing for REDD+ is expected to expand in the coming years, funding will be dependent on the existence of robust national-level frameworks that encompass not only carbon accounting but also equitable benefit sharing and safeguards against negative environmental or social impacts. *USAID*

Lao PDR encourages public involvement in Environmental and Social Impact Assessments. The Government of Lao PDR is increasingly recognizing the need for Environmental and Social Impact Assessments (ESIA) to guide investment projects in the country. It recognizes that investment projects in Lao PDR play an important role in poverty reduction through the creation of new jobs at the local level. However, if these investment projects are not properly managed, they will generate impacts on the environment and society, such as the depletion of natural resources, environmental degradation, and impacts on livelihood of local people. The government of Lao PDR regards public involvement as an important element in conducting ESIAs of investment projects to ensure sustainable development and stresses that the public should be granted the right to be involved throughout the ESIA process.To further this process the government adopted Guidelines for Public Involvement in ESIA's in February 2013. Workshops and training on the implementation of the guidelines will be conducted in various parts of the country. *UNDP-UNEP Poverty-Environment Initiative*

IUCN Lao PDR holds law enforcement and patrolling workshop. IUCN Lao PDR held a Law Enforcement and Patrolling workshop at the District Office of the Natural Resources and Environment in Nakai district, Khammouane Province to monitor and record threats to the biodiversity in each community. The activity helped form the village patrols that would ensure environmental law enforcement in specific areas. The workshop was conducted to ensure that the communities used standard methods in law enforcement and patrolling, as well as appropriate systematic data collection and recording techniques. *IUCN Lao PDR*

Protected areas under threat. The Director General of the Forestry Resource Management Department stated that Phouphanang and Phoukhaokhuay National Protected Areas are under serious threat from deforestation and encroachment by rubber plantations and commercial crops. High demand for timber and land to farm have forced people to intrude into the protected areas despite knowing that it is against the law. About 39,000 hectares of the two protected areas have been encroached upon. Phouphanang and Phoukhaokhuay National Protected Areas cover a combined area of 270,000 hectares that extend into 11 districts in Vientiane and Borikhamxay provinces and the capital. They have significant ecological importance due to their abundant forests and biodiversity. They are also watersheds that feed several hydroelectricity plants and reservoirs for agricultural purposes. The areas are also considered strategic for national defense and security, and an important asset for the country's capital city, Vientiane. *Vientiane Times*

■ Malaysia

Totally protect the sambar deer, or lose it forever. The Malaysian Conservation Alliance for Tigers (MYCAT) is calling for urgent and

decisive action to save the sambar deer, a critical food source for wild tigers and a species that is already missing from several protected forests in the country. The sambar deer, locally known as rusa, is facing extinction in Peninsular Malaysia due to poaching for its meat and for sport. Despite a six-year moratorium on hunting sambar deer that was put into place in 2009, scientists have found no evidence of population recovery to-date. The sambar deer has not been captured in camera trap studies in selected forests in Kelantan and Pahang, and are seen less frequently in areas studied in Johor by MYCAT partner organizations. Rather than wait until the moratorium runs out in 2014, MYCAT calls for an immediate change of the sambar deer's legal status - from hunted species to totally protected species - under the Wildlife Conservation Act 2010. Total protection means absolutely no hunting or trade. Under the Act, penalties for hunting or keeping totally protected wildlife can reach RM 300,000 (approx. USD 91,075) and/or 10 years jailterm. The call is prompted by research in northern Taman Negara National Park, Pahang where MYCAT found that beyond the western border of the Park, the sambar deer is nearly extinct due to poaching. Even inside the park, it has remained a rarity since the 1990s. Meanwhile, tiger population in the same area has plummeted over the past decade. The survival of the sambar deer is also pivotal to realising the country's goal of saving the Malayan tiger. A recent WWF-Malaysia study in Belum-Temengor found that where there are more sambar deer, there are more tigers. *WWF Malaysia*

Final draft of Access to Biological Resources and Benefit Sharing Bill available for views and inputs. As one of the megadiverse countries of the world, Malaysia has huge potential in wealth creation through the sustainable use of the country's rich biodiversity. While resources may be accessed, these have to be done with the prior informed consent of the provider and accompanied with benefit sharing agreements. As such, a Draft Access to Biological Resources and Benefit Sharing Bill has been developed through a consultation process involving various stakeholders such as federal and state agencies, NGOs, indigenous and local communities, and the private sector.The Bill aims to regulate bio-prospecting activities in Malaysia particularly on research and development activities with commercial and potential commercial purpose. The Bill is now in its final form and is available on the Ministry's website at www.nre.gov.my and the National Biodiversity Clearing House Mechanism website at www.chm.frim.gov.my. *Ministry of Natural Resources and Environment*

Terrengganu celebrates importance of sea turtles to culture and the ecosystem. The extinction of marine turtles in Malaysia would mean a significant loss to the country's cultural and natural heritage as well as potential revenue for turtle states. Marine turtles have existed as an integral part of Malaysia's rich historical and cultural context and are also recognized as the icon of the state of Terengganu. However, four of the seven marine turtle species that can be found in Malaysia are now ranked from Vulnerable to Critically Endangered in the International Union for Conservation of Nature (IUCN) Red List. Over the last 20 years, there has been a 99 percent decline of Leatherbacks, 95 percent for Olive Ridleys and more than 60 percent decline in population for the Green Turtles. Terengganu is currently home to one of the largest Green Turtle populations in Peninsular Malaysia, averaging between 2,000 to 2,500 nests per year. To raise awareness of the need to conserve marine turtles, WWF-Malaysia in collaboration with the 'Visit Terengganu Year 2013' Secretariat and Ministry of Tourism held a World Sea Turtle Day celebration themed 'Race against Extinction'. The objectives of the campaign are to raise awareness on the need to protect turtles and their nesting beaches and to make them understand the need for turtle conservation. The WSTD celebration also encouraged the public to participate in learning experiences about turtles, their biology and the threats turtles face. The celebration featured face painting, exhibits and an 8km Turtle Run. Winners of the Turtle Run received cash and were given the privilege to name the turtles which WWF-Malaysia will fix with satellite transmitters during the turtle nesting season. *WWF-Malaysia*

Governments, NGOs work together to help Sumatran rhinos on the edge. Conservationists agree that within a decade or so, the Sumatran rhinoceros may be wiped out if serious efforts are not undertaken to reverse the sharp drop in the species' population. In the wild, the mammal now survives in a handful of locations in Sabah, Malaysian Borneo, East Kalimantan and Sumatra in Indonesia, and its continued presence in Peninsular Malaysia is in doubt. Dwindling numbers are due to poaching of Sumatran rhino horn for traditional and bogus medicine on the black market, poor reproductive health in more than half the remaining rhinos, habitat loss, and insufficient funds for conservation. At the recent Sumatran Rhino Crisis Summit in Singapore, representatives of the Malaysian and Indonesian governments agreed to work hand in hand to ensure no further loss of the species in the wild, and to increase numbers through captive breeding and use of advanced reproductive technologies. Another outcome of the Summit was the strong commitment in encouraging cross-border movement of captive rhinos, encouraged by the birth of four calves in captivity in recent years that proves assisted breeding works.

WWF Malaysia

■ Myanmar

Tour guides study up on bird life. Tour guides and enthusiasts in Mandalay took part in a bird spotting class as part of an initiative to offer a more diverse range of activities to foreign visitors and improve knowledge about the country's ornithological heritage. The project, led by non-government groups Chan Myae Thu Kha and the Myanmar Bird and Nature Society, aims to meet the growing demand for bird-watching activities

from foreign tourists interested in learning more about the country's wildlife. There are an estimated 1,096 bird species in Myanmar, at least six of which are endemic. Some enthusiastic bird watchers, known as twitchers, travel the world in search of rare and unusual bird species, but the project is also aimed at promoting Myanmar's bird life to foreign visitors with a more casual interest. Some tourists are not actually birdwatchers, but they may ask tour guides about the birds they see. If the tour guides can explain more about the birds it will improve not only Myanmar's value as a destination, but also the guides' reputation.

Myanmar Times

Civil society groups to study Ayeyarwady River. A community-based strategic environmental assessment to be implemented by Seinyaungso, Mekong Energy and Ecology Network, Point and the Renewable Energy Association Myanmar is being undertaken at 11 sites along the Ayeyarwady River from July to December to study the impact of development and mining on the waterway. The assessment will determine the impact of development on the economy and environment of the river. Once it is complete the groups plan to use the findings to make recommendations to the government about how to conserve the river. Seinyaungso focuses primarily on environmental issues and in 2012 investigated complaints that pollution from the Monywa copper mine had caused health problems among area residents. Public interest in the condition of the Ayeyarwady River spiked in 2011 because of the Myitsone Dam project, which is a joint project between China Power Investment and Asia World. The dam was suspended by President U Thein Sein in September 2011 for the rest of his five-year term as president.

Myanmar Times

Myanmar to renegotiate resource deals. The Myanmar government plans to renegotiate billions of dollars of natural resource deals as it imposes tougher environmental standards. Myanmar has huge reserves of resources, ranging from petroleum to tin, timber and precious gems. The government is preparing to renegotiate all previously agreed-upon projects to ensure that appropriate safeguards are in place and to subject future projects to stricter social and environmental controls. The value of the deals is likely in the billions of dollars and these may be affected as momentum builds to introduce reforms such as new investment laws. International organizations are also calling on the Myanmar government to work with local communities to make sure all share from resource profits.

Myanmar Times

Myanmar could lose a third of forestry. The WWF Greater Mekong Ecosystems Report states Myanmar could lose up to a third of its remaining natural forestry within the next two decades if current practices continue. The report drew information from satellite imagery and found an increase in loss of forest in Myanmar of about 15 percent—from 49 million hectares to around 42 million hectares—between 2002 and 2009. The report states that across the region poor governance, weak law enforcement, land grabbing, and badly managed and poorly planned economic land concessions are major obstacles in the maintenance of sustainable forestry. To address these concerns, a draft forestry law is being formulated by Myanmar's Ministry of Environmental Conservation and Forestry, which aims to tackle illegal logging, conserve forestry and develop the domestic processing sector. The new law is intended to tackle deforestation and to encourage foreign investment in processing plants and mills. *Mizzima*

■ Philippines

DENR issues guidelines for ecotourism development in protected areas. The Department of Environment and Natural Resources (DENR) has issued Department Administrative Order (DAO) No. 2013-19 as guidelines for planning and managing of ecotourism activities within nationally designated protected areas. The DAO covers various phases in the ecotourism planning and management process, including site assessment that will determine whether ecotourism management is the right strategy for a particular protected area. The data will be used by the Protected Area Superintendent in preparing the corresponding Ecotourism Management Plan (EMP) to involve stakeholders like local government unit (LGUs), the community, people's organizations, and other government agencies. The EMP shall consist of five components, namely: zoning to determine how visitors can use certain areas of the park; visitor site planning to limit the impact of visitors on the natural environment; sustainable infrastructure design to harmonize facilities with ecological processes and natural beauty; visitor management to consider flow and behavior of visitors, as well as support the site's "carrying capacity"; and revenue generation, including determination of applicable fees. All plans will be reviewed by the Regional Ecotourism Committee and subsequently approved by the Protected Area Management Board.

DENR

Bill seeking to establish marine protected areas filed in Congress. Agusan del Norte First District Rep. Lawrence Fortun has filed a bill seeking to establish marine protected areas (MPAs) in all coastal cities and municipalities in the country. Fortun said that it is about time that a clear and comprehensive law of this kind must be made to show that the government is really serious about protecting the environment. The bill embodies the commitment of the State to ensure the sustainable use of marine resources. Salient features of the bill include the minimum size for MPAs; classification of MPAs; and sanctions for violations. The house bill also puts a premium on citizens' participation in protecting marine ecosystem and biodiversity through a co-management scheme.

Philippine Information Agency

DENR destroys huge stockpile of illegal ivory. The Department of Environment and Natural Resources (DENR) destroyed at least five tons of smuggled elephant tusks using

a road roller, making the Philippines the first country in Asia to conduct physical destruction of massive ivory stockpiles in support of global efforts to stamp out illegal wildlife trade. Addressing a crowd of over 200 people that included foreign dignitaries and anti-ivory trade advocates, DENR Secretary Ramon J.P. Paje said the government's decision to crush the ivory tusks was a reaffirmation of the country's commitment to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). During the Conference of Parties of CITES held in Bangkok, Thailand in March, the Philippines was included as one of eight countries of priority of concerns as regard illegal ivory trade, particularly its role as a trade route and transit country for elephant tusks. Since 1996, more than 12 tons of illegally-traded ivory had been confiscated in separate occasions in the Philippines. Of the total, about six tons had been turned over to the DENR through the Protected Areas and Wildlife Bureau (PAWB), the country's designated CITES Management Authority for terrestrial resources. Aside from the five tons that were crushed, the DENR has set aside 30 carefully selected pieces of elephant tusks to be used for educational and research purposes by law enforcers, the National Museum, Department of Education, and the Commission on Higher Education. At least 334 pieces of tusks originating from Kenya, Uganda and Zambia were also not included in the destruction as they are being used as evidence in legal cases pending in local courts. Some 106 pieces of tusks will be returned to Kenya upon clearance by the courts. *DENR*

Protected Areas and Wildlife Bureau holds youth camp for biodiversity. Protected Areas and Wildlife Bureau Director Theresa Mundita Lim welcomed students and teachers from selected high schools in Metro Manila to the Ninoy Aquino Parks and Wildlife Center during the opening of the Youth Summer Camp. The three-day camp, which is part of the celebration of International Day of Biodiversity (IDBD) 2013 on May 22, aimed to promote awareness and advocacy among the youth on the importance of biodiversity conservation, particularly through outdoor recreation amid the flora and fauna of the park. Activities included film showings, performances, games and lectures, which all focused on the IDB 2013 theme of "Water and Biodiversity." *DENR*

■ Singapore

Shell Eco-Marathon celebrates youth efforts for a sustainable future. The Shell Eco-marathon Singapore Carnival 2013 was conducted to celebrate youth innovation and creativity in building a sustainable environment for the future. The event was organized by Shell Companies in Singapore, in partnership with Singapore Environment Council, and aimed to showcase a variety of sustainable solutions conceptualized and developed by youths in Singapore. The highlight of the carnival was the display of six eco-friendly cars designed and built by students from the Institute of Technical Education (ITE), Nanyang Technological University and Ngee Ann Polytechnic. Booths were also set up by the teams to help educate the public about the technology behind their cars and the feasibility of developing similar vehicles for the future.

Singapore Environment Council

Festival of Biodiversity marks 50 Years of greening Singapore. Every year the National Parks Board (NParks) holds the Festival of Biodiversity to celebrate the community's efforts to conserve Singapore's natural heritage. This year the event celebrates 50 years of environmental work in the country and featured the launch of the commemorative book Living in a Garden: The Greening of Singapore. The book showcases Singapore's development into a City in a Garden and introduces many of the fascinating plants and animals found in the country. In addition to the book, Singapore Post Limited released a

special set of four biodegradable commemorative stamps with seeds. The stamps portray Singapore's vibrant urban landscape nestled within a thriving garden. The first local stamp is affixed with the seeds of the *Portulaca grandiflora* (commonly known as moss-rose), which is a small-sized herbaceous creeper that is common in Singapore. NParks also launched the Greening Schools for Biodiversity, which is open to all primary schools, secondary schools and junior colleges. All participating schools will be assisted by experts from the National University of Singapore's Raffles Museum of Biodiversity Research, Nature Society (Singapore), Butterfly Circle and NParks in conducting a biodiversity audit of their school grounds and implementing plans to attract more biodiversity to their school grounds.

NParks

430 attend inaugural Keep Singapore Clean Conference. The Keep Singapore Clean Conference was organized by the Public Hygiene Council (PHC) in support of the Keep Singapore Clean Movement, and supported by the Singapore Kindness Movement, the Keep Singapore Beautiful Movement and the National Environment Agency. The Keep Singapore Clean Movement was launched in September 2012 and has involved close to 15,000 volunteers including students, NGOs, grassroots

leaders and residents. Under this programme, the PHC initiates partnerships between residents, schools, businesses and community groups to improve the cleanliness and hygiene conditions of these community spaces and turn them into role models or "Bright Spots." There are currently 52 Bright Spots and the PHC aims to turn at least 100 community spaces into Bright Spots this year. *NEA*

Underground reservoirs could be Singapore's "fifth tap". Experts said finding underground reservoirs of water could solve Singapore's problem of not having enough space to hold rainwater, and it could also prove to be the country's fifth tap. Singapore's water supply currently depends on four sources - imported water, catchment water, treated recycled water and desalinated water, which are the "four national taps" that support the nation's water demand of some 400 million gallons of water each day. The national water agency PUB aims to study the feasibility of extracting groundwater from the southern and western parts of Singapore. The area under scrutiny is a 200-million-year-old land space called the Jurong Formation, where water is known to pass through. Experts also hope the study will show how water can be sustainably extracted from these aquifers or underground reservoirs. Another possible sources is the Old Aluvium, 100-million-year-old formation in eastern Singapore. Geologists said this formation is made of sand and gravel and has great potential to hold groundwater. *Channel News Asia*

■ Thailand

Sustaining biodiversity in Thailand's municipal areas for climate change adaptation and mitigation. IUCN's Thailand Programme held a meeting between four municipalities; namely Chiang Rai city municipality, Sisaket town municipality, Klang sub-district town municipality in Rayong Province, Thung Song town municipality in Nakhon Si Thammarat Province, and the Bangkok Metropolitan Region to discuss urban biodiversity measures. Experts from the Royal Forestry Department (RFD) and the Biodiversity-Based-Economy Development Office were invited to present as well as to exchange knowledge about urban biodiversity and urban forestry. Key points agreed on at the meeting were "collaboration", "community" and "ownership". Academic collaboration such as expertise from RFD in conducting field surveys and database development can be very helpful for government at local-level. More importantly, communities are key stakeholders in undertaking these activities as local ownership can ensure the success of this programme. To facilitate the exchange of knowledge and experience on urban biodiversity in the Asian region, IUCN and Chiang Rai municipality are hosting the First Urban Biodiversity Regional Seminar: Sustaining Urban Biodiversity for Climate Change Adaptation and Mitigation from 18-20 December 2013 at Chiang Rai municipality. Lessons learned from good practice as well as implementation measures will be exchanged among participating organizations. *IUCN*

Popular island beach closed by oil slick. Ao Phrao was closed and tourists moved away from the popular island beach on Khao Laem Ya-Mu Koh Samet National Park after an oil slick washed ashore and coated the area with gooey muck. The crude oil leaked from an offshore pipeline at a refinery operated by PTT Global Chemical Plc (PTTGC) in Map Ta Phut industrial estate in Rayong province. Navy soldiers and company work gangs have been struggling to contain the oil slick. The slick, which is about one millimeter thick, has affected the entire bay and the beach. The oil that washed up on the island is about one-tenth of the 50,000 liters of crude that leaked into the sea from the PTTGC pipeline feeding its refinery at Map Ta Phut industrial estate in Rayong province. The oil slick was caused by a pipe leak, which was carrying crude being unloaded by an offshore tanker. The Ministry of Natural Resources and Environment said the polluter must bear full responsibility for the damage, but the top priority was to tackle the damage the oil has caused. Samet is one of the most popular destinations for local and foreign tourists. It is about six kilometers off the mainland in Tambon Phae, Rayong province. *Bangkok Post*

Songkhla dolphins facing relocation. The last group of 15 Irrawaddy dolphins in the Songkhla Lake in Songkhla province may have to be relocated to a new habitat if water quality and the environment in the lake do not improve, according to the Department of Marine and Coastal Resources. The dolphins are threatened by fishing gear, water pollution, insufficient food supplies and inbreeding. If these risks are not addressed, the dolphins are expected to disappear from the lake within five years. The department has not yet decided where the dolphins could be relocated, although it suggested a reservoir of the Ratchaprapa dam in Surat Thani province or the Gulf of Thailand as potential sites. If moved, the dolphins would have to undergo an adjustment period to make sure they could survive in their new home. *Bangkok Post*

High demand for 'phayung' threatens protected forests. The Department of National Parks, Wildlife and Plant Conservation (DNP) is doing its best to combat the illegal logging of phayung trees in the Khao Yai-Dong Phayayen Forest Complex, but high demand for the wood has made it impossible to stamp out the activity. The DNP is currently preparing a report on Thailand's efforts to protect the site after the World Heritage Committee sought an explanation for the rise in the logging of phayung (Siamese rosewood) there. The Dong Phayayen-KhaoYai Forest Complex is one of the world's largest habitats for phayung trees. It comprises four national parks - KhaoYai, Thap Lan, Pang Sida, Ta Phraya and the Dong Yai Wildlife Sanctuary. The 6,152-square-kilometer complex spans six Central and northeastern provinces - Saraburi, Nakhon Nayok, Nakhon Ratchasima, Prachin Buri, Sa Kaeo and Buri Ram. The price of Siamese rosewood has soared and felled trees of about a meter in diameter are worth 1.3 million baht. *Bangkok Post*

■ Viet Nam

Viet Nam fights to stop medical rhino horn myth. A long-term public awareness campaign aimed at reducing demand for rhinocerous horn among the community was launched in Viet Nam. More than 580 rhinos have died at the hands of poachers in South Africa this year, the country with the world's largest population of the animal. Many of the horns end up in East Asia, particularly China and Viet Nam. Many people believe that properties of rhino horn cure cancer, reduce fevers, and provide an antidote for hangovers. Others value it as a high-end gift or status symbol. Studies have shown that the horns have no medical properties and are only composed of keratin, the same material that forms hair and nails. Demand for rhino horn in Viet Nam has declined due to Government efforts in raising public awareness and preventing smuggling operations. As a result, the price of each gram of rhino dropped from VND 120 million (US$ 5,700) in 2010 to VND 60 million ($2,800) at present. Viet Nam has worked with South Africa to deal with rhino horn poaching and have signed a memorandum of understanding on increasing co-operation in biodiversity protection and conservation in 2012. The two countries also signed an action plan to implement this memorandum that focuses on fighting against smuggling of rhino products. *Viet Nam News*

New shrew discovered in Viet Nam forest. Researchers have described a previously unknown species of white-toothed shrew in the forests of Viet Nam. The study was published July 2 in the open access journal Zoo Keys. The species, named *Crocidura sapaensis* after Sa Pa District, where it was collected, was discovered after genetic analysis revealed that it was distinct from three closely-related species also found in Viet Nam. The three species of *Crocidura* in Viet Nam are *C. attenuata, C. tanakae* and *C. wuchihensis.* The undescribed fourth species was revealed by molecular analysis of Vietnamese material, which revealed a number of anomalies, indicating the presence of several morphologically similar but molecularly distinct taxa. With more than 180 species found worldwide, *Crocidura* is the largest of any mammal genus. Shrews — which are omnivorous, feeding on seeds, fruit, and invertebrates — are the smallest non-flying mammals in the world. *Zookeys*

Project boosts environment research in Viet Nam. For the past 12 years, the Environment Student Vietnam Project of the Royal Melbourne Institute of Technology (RMIT) has been sending science, engineering and social science students from Melbourne to Viet Nam to work on critical sustainability issues. RMIT is an Australian-based university operating in Viet Nam, with two campuses located in Ho Chi Minh City and in Hanoi. The international research programme enables RMIT University students to gain practical experience while solving environmental challenges in Viet Nam. The latest group investigated water usage habits in Ho Chi Minh City, suggested ways water resources could be made more sustainable, and investigated the effects of urban development on water resources and the environment. Seminars and workshops on the projects are conducted with staff from the Vietnam National University of Ho Chi Minh City at the beginning and end of each project. *RMIT News*

Viet Nam, South Africa target illegal rhino hunters. South Africa and Viet Nam have agreed to exchange the names of registered hunters in a bid to stop rhino poachers who obtain hunting permits under false pretenses. Authorities are targeting hunters who take advantage of laws allowing them to export the rhino horn as a hunting trophy to trade it illegally, mostly on the Asian black market. South Africa, home to more than 20,000 rhinos, or about 90 percent of all rhinos in Africa, lost 668 rhinos to poachers in 2012. Over 270 rhinos have been killed illegally in South Africa since the start of 2013 for their horns. The countries' cooperation plan includes setting up a gene bank and DNA analysis training to track confiscated horns. The agreement covers wildlife crime in general, but rhino poaching is the most pressing issue. *Thanh Nien News*

Dhole
(Cuon alpinus)

The dhole or Asiatic Wild Dog is about the size of a border collie (12-18 kg), but looks quite different. The coat is usually a rusty red color, but varies regionally from sandy yellow to dark grey. Usually it has a black bushy tail and white patches on its chest, paws and belly. Its ears are rounded, and its hooded amber eyes portray an intelligent nature. Among its unusual features is a strange whistle call, which it uses to re-assemble the pack when animals become separated in dense forest. The dhole also has more teeth than most other dogs and has a shorter jaw with one less molar on each side of its lower jaw.

The dhole is found in a wide variety of vegetation types, including primary, secondary and degraded forms of tropical dry and moist deciduous forest; evergreen and semi-evergreen forests; dry thorn forests; grassland–scrub–forest mosaics; and alpine steppe (above 3,000 m). Important factors that may influence habitat selection include the availability of medium to large ungulate prey species, water, presence of other large carnivore species, human population levels, and suitability of breeding sites.

In Southeast Asia, dholes are native to Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Thailand, and Viet Nam. The main prey for the dhole are ungulates, which have also suffered high depletion of their population across the dhole's range. Current distribution is highly fragmented and site-specific information are unfortunately scarce. It is estimated that fewer than 2,500 mature individuals remain in the wild and the declining population trend is expected to continue. Main threats to the species include ongoing habitat loss, depletion of prey base, interspecific competition, persecution and possibly disease transfer from domestic and feral dogs.

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Photo courtesy of John Sevcik

Golden Jackal
(Canis aureus)

The Golden or Asiatic Jackal is a widespread species. It is fairly common throughout its range with high densities observed in areas with abundant food and cover. Due to their tolerance of dry habitats and their omnivorous diet, the Asiatic jackal can live in a wide variety of habitats. They are primarily nocturnal and are opportunistic and omnivorous foragers, even approaching human habitations at night to forage for garbage. The basic social unit is the breeding pair, which is sometimes accompanied by its current litter of pups and/or by offspring from previous litters.

The golden jackal is one of the most widely distributed canid (dog family) species, occurring in many areas of central, eastern, and southern Europe; northern Africa; and parts of Asia, including Sri Lanka, Myanmar, Thailand and parts of Indo-China. Over most its distribution, the golden jackal is fairly common, although it is thought to be declining in many areas due to habitat loss and modification.

Little quantitative information is available on jackal densities, habitat use, and ranging patterns in relation to food availability. Information on dispersal, survival and mortality factors of adults, pups and dispersing individuals is needed. Jackal ecology needs to be studied in forested ecosystems of Southeast Asia where a different set of factors are likely to operate affecting food availability, ranging patterns and survival.

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Red Fox
(Vulpes vulpes)

The red fox has a slender, lean body, a pointed snout and erect, pointed ears. The long, bushy tail hangs downward when the animal is at rest but is held near horizontal when in full flight. Typical fur coloration comprises orange-brown upperparts and somewhat paler underparts. In most subspecies the anterior part of the snout is white, and the neck and upper chest grizzled white. In some regions a minority of foxes are silvery in colour.

The species has a deserved reputation for keen eyesight, sharp hearing and great intelligence. It is agile in its movements with a lively gait, and is reckoned to be a good swimmer. They are mainly nocturnal but are sometimes active well before dusk. Prey items include rats, mice, squirrels, rabbits, reptiles and small birds. Fresh carrion may also be consumed.

The red fox is indisputably the most widespread of all carnivores, and the most adaptable species of wild dog. It occurs in a huge range of habitats in much of the northern hemisphere, doing particularly well in areas where there is a mosaic of different habitats, including areas of farmland. Its range extends from North America across Europe and into Asia, including northern parts of Southeast Asia. Nearly 50 subspecies are formally recognized. In Southeast Asia the Red Fox (subspecies *V. v. hoole* or 'South China Red Fox') occurs in parts of northern Viet Nam.

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Photo courtesy of www.arkive.org

Raccoon Dog
(Nyctereutes procyonoides)

Although this species looks much like the North American raccoon *(Procyon lotor),* the raccoon dog is not closely related to the raccoon, and only distantly related to domestic dogs. The raccoon dog is a small species of canine, native to parts of eastern Asia. As its name suggests, this wild dog has markings that closely resemble those of a raccoon and has also been known to display similar behaviors including the washing of food.

There are five different species of raccoon dog found across eastern Asia and in parts of Europe, all of which have been severely affected by deforestation of their native woodlands. Raccoon dogs are also known to have incredibly dexterous front paws which come in very handy when trying to catch slippery food in the water and when climbing trees.

Raccoon dogs are carnivorous animals meaning that they only hunt and eat other animals in order to survive. As raccoon dogs spend a great deal of time close to water, their diet is primarily made up from frogs and fish along with rodents, small birds, eggs and invertebrates such as insects and spiders.

Habitats of raccoon dogs are typically found near water, and during autumn they are more or less in areas

where fruits and berries are abundant. In urban areas, raccoon dogs inhabit areas with as little as 5 percent forest cover. The raccoon dog is now found across Japan and throughout Europe where it has been introduced and appears to be thriving. Historically however, the raccoon dog's natural range stretched through Japan and across eastern China where the raccoon dog is now extinct in many parts.

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www.aseanbiodiversity.org

The ASEAN Centre for Biodiversity

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

ACB's core strategic goals

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

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

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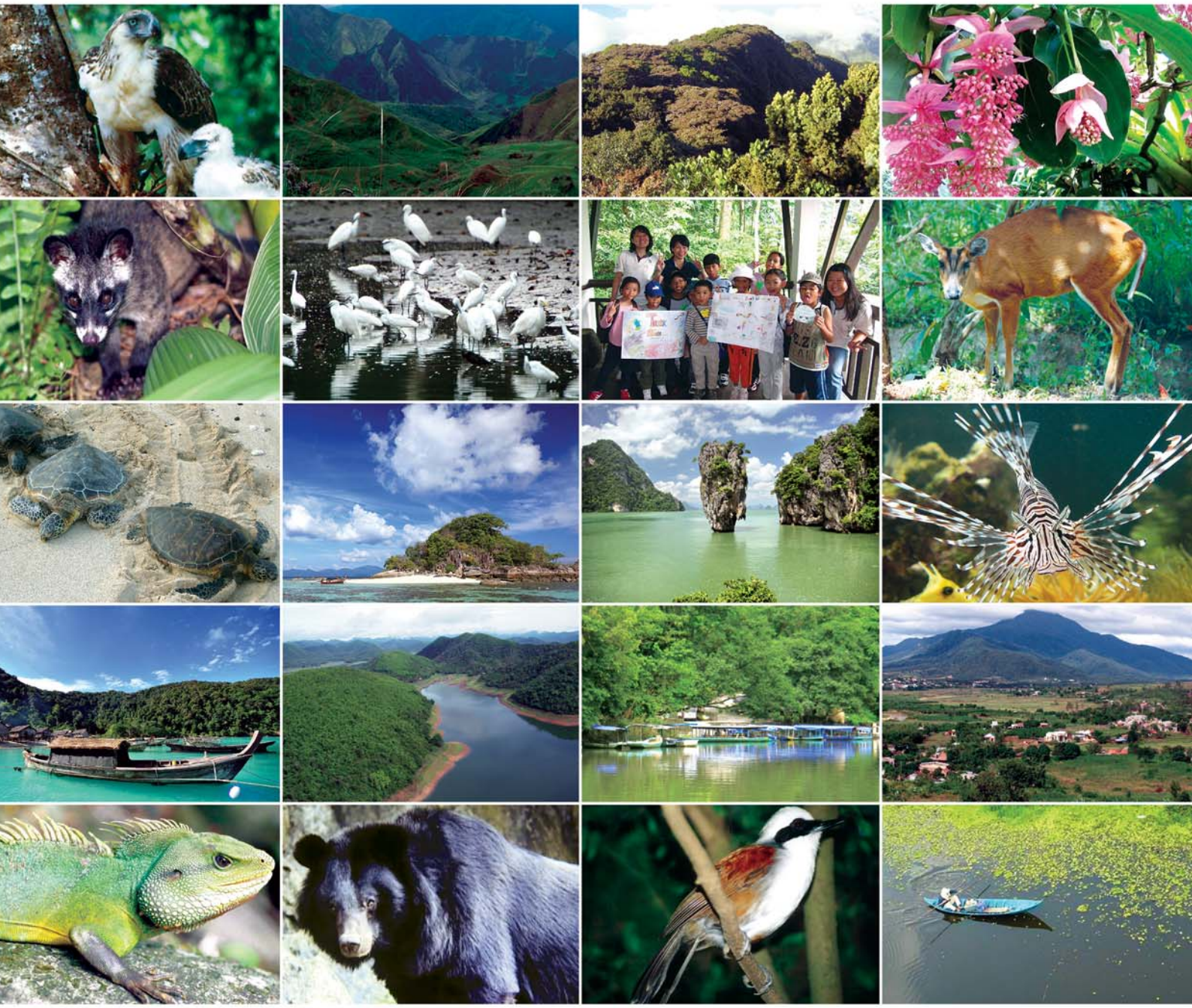

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