

asean BIODIVERSITY

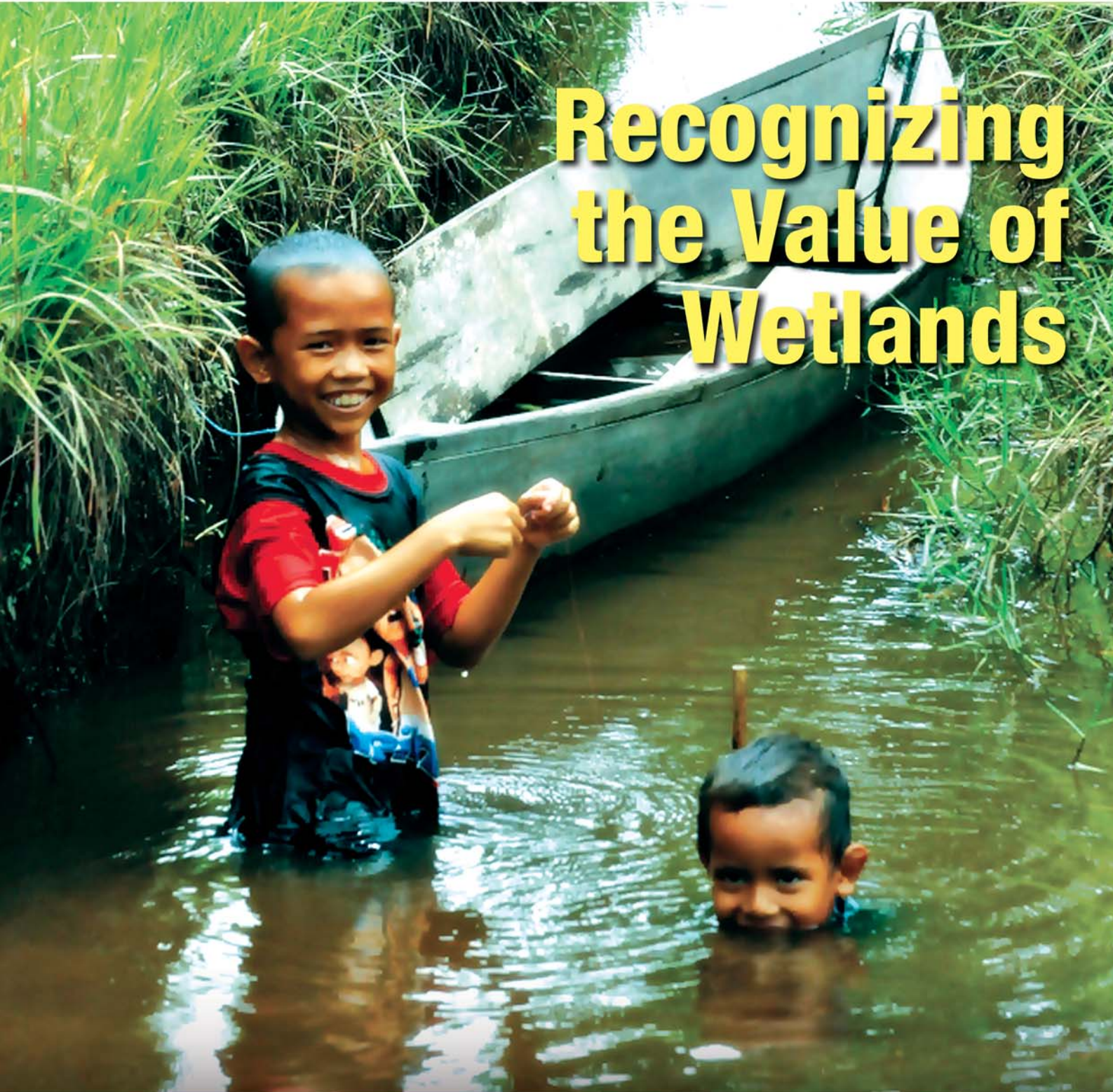


The newsmagazine of the ASEAN Centre for Biodiversity



Volume 12, Number 1 ■ January-April 2013

Recognizing the Value of Wetlands



• Wetlands in the ASEAN region • Peatlands: Status, challenges and actions in Southeast Asia • No water without wetlands • Climate change and mangroves •
Join the ASEAN Peatland Media Awards



**ZOOMING IN ON
BIODIVERSITY
& CLIMATE CHANGE**

You have a shot at
making a difference.
Take that shot and join

ZOOMING IN ON BIODIVERSITY & CLIMATE CHANGE

An ASEAN-wide Photo Contest

- » Open to residents of ASEAN countries
- » Categories: Professional, Amateur, Student
- » Participation is free of charge.
- » Deadline for entries: 31 July 2013
- » Cash prizes await winners.

Download Official Entry Form and Contest Mechanics at
<http://photocontest.aseanbiodiversity.org>

giz



 **ASEAN CENTRE
FOR
BIODIVERSITY**
www.aseanbiodiversity.org

CONTENTS

VOL. 12 • NO. 1 • JANUARY-APRIL 2013



About the cover. Due to an increasing awareness and understanding of wetlands' multiple roles and benefits to humanity, national and global initiatives have been intensified to restore the lost or degraded hydro-biological functions of wetlands. The Ramsar Convention has set the stage for globally recognizing the value of the wetlands ecosystem. (Taken at the Sekonyer River in Kalimantan, Indonesia)
Photo by Wade Martin



SPECIAL REPORTS

- 6** Wetlands in the ASEAN region: Benefits, challenges and conservation initiatives
- 10** Peatlands: Status, challenges and actions in Southeast Asia
- 14** ASEAN Peatlands Management Strategy 2006-2020: Promoting sustainable management of peatlands in Southeast Asia
- 17** Brunei Darussalam Wetlands and peatlands: Status, challenges and actions
- 20** Wetlands of the Philippines
- 22** Wetlands management in Viet Nam
- 25** Constructing a set of indicators for Viet Nam's wetland biodiversity
- 28** Migratory bird conservation requires international cooperation and effort



SPECIAL SECTION

World Wetland Days

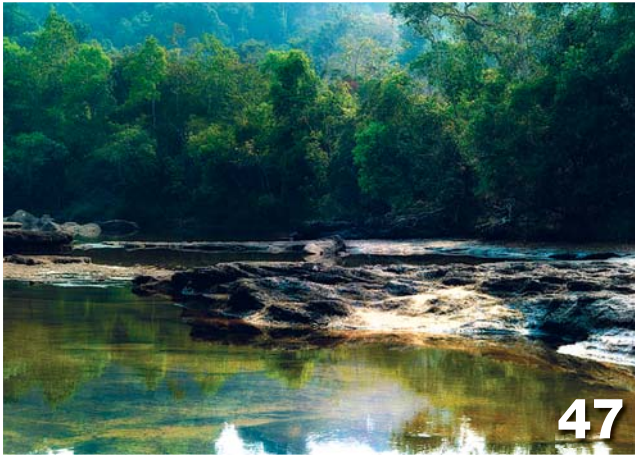
- 31** World Wetland Day: Wetlands and water management
- 31** No water without wetlands

GIZ

- 34** The Economics of Ecosystems and Biodiversity, REDD+ and climate change in mangrove ecosystems of Southeast Asia

ASEAN-WEN

- 39** Operation Cobra strikes to dismantle criminal wildlife trafficking networks
- 39** CITES Secretariat praises ASEAN-WEN and partner enforcement networks ecosystems of Southeast Asia



FEATURES

- 40** *International Women's Day, 8 March*
Caring for the future – An environmental gender agenda
- 42** *World Water Day, 22 March*
World Water Day celebrates water cooperation
- 44** *World Health Day, 7 April*
In mother nature's drugstore
- 46** *Earth Day, 22 April*
Aid the healing on Earth Day, every day

PROFILES

- 47** *Lao PDR*
Phou Khao Khouay National Protected Area
- 51** *Malaysia*
Talang-Satang National Park

BOOKMARKS

- 54** Filipino forester-lawyer to lead ASEAN Centre for Biodiversity

- 54** New ACB head urges ASEAN citizens to join hands for biodiversity conservation
- 55** ACB and BirdLife International (Asia) form conservation partnership
- 55** ACB trains Timor-Leste on biodiversity information management
- 56** Brunei Darussalam holds workshop on crafting a national biodiversity law
- 56** IPBES holds first plenary meeting
- 57** Animation promotes biodiversity conservation
- 57** Protecting ASEAN's mangroves
- 57** Use art for the environment, design a logo for the ASEAN Heritage Parks
- 58** ASEAN planners learn integrating ecosystem services into development planning
- 58** Regional meet calls for action to protect mangroves
- 59** Biodiversity information online resource launched
- 60** Thailand ratifies ACB Establishment Agreement
- 60** Singapore hosts workshop on Global Strategy for Plant Conservation
- 60** ASEAN-Germany cooperation for biodiversity conservation
- 61** ASEAN reviews environmental education plan 2008-2012 and crafts new one
- 61** GIZ holds media training for project staff and partners
- 62** **BIODIVERSITY NEWS SOUTHEAST ASIA**
- 69** **FOCUS**

Publisher

Roberto V. Oliva

Editor-in-Chief

Rolando A. Inciong

Managing Editor

Leslie Ann Jose-Castillo

Head Writer and Researcher

Sahlee Bugna-Barrer

Designer, Graphic and Layout Artist

Nanie S. Gonzales

Circulation Assistant

Angela Rose Crissie A. Metin

Editorial Board

Clarissa C. Arida
 Rolando A. Inciong
 Wilfredo J. Obien
 Roberto V. Oliva
 Monina T. Uriarte
 Sheila G. Vergara

ASEAN Centre for Biodiversity

Headquarters

3/F ERDB Building, Forestry Campus
 University of the Philippines
 Los Baños, Laguna, Philippines

Telephone:

+6349.536-3989; +632.584-4210

Telefax:

+6349.536-2865

E-mail:

contact.us@aseanbiodiversity.org

Website:

www.aseanbiodiversity.org

Disclaimer: Views or opinions expressed herein do not necessarily represent any official views of the Association of Southeast Asian Nations (ASEAN). The authors are responsible for any data or information presented in their articles.

Letters, articles, suggestions and photos are welcome and should be addressed to:

The Editor-in-Chief

ASEAN Biodiversity Magazine
 ASEAN Centre for Biodiversity
 College, Laguna

E-mails:

ravinciong@aseanbiodiversity.org
 lavjose2@aseanbiodiversity.org
 sbbarrer@aseanbiodiversity.org

About the Contributors



Ms. Nesslerine Alzhlawi joined the Ramsar Secretariat as the Assistant Advisor for Asia-Oceania in June 2012. Originally from Syria, Nesslerine holds a Master of Science degree in Aquatic Biology and Resources Management from the University of Exeter, United Kingdom. She has worked in the United Arab Emirates as a conservation officer with the Emirates Wildlife Society – World Wide Fund for Nature (WWF-UAE), leading a project on sustainable fisheries in the Gulf. She has also worked with the United Nations University - Institute for Water, Environment and Health, assisting with research on the impact of large scale land reclamation on coastal ecosystems. Nesslerine speaks English, French and Arabic. Her areas of work include aquatic biology, conservation ecology, and protected area development and management.



Ms. Sing Yun Chin is the Coordinator of Peatland Programme in the Global Environment Center and the Regional Component of the ASEAN Peatland Forests Project (APFP). She has 12 years working experience as a conservation practitioner in Malaysia and ASEAN countries with government departments, private companies, and NGOs/CBOs. Her passion is in wetlands (peatland and mangroves) conservation, protected area planning and management, community-based conservation, and ecotourism. She also enjoys field work. She has wide range of experience and exposure in various conservation fields which provide different perspectives and pragmatic approaches in nature conservation.



Mr. Nguyen Xuan Dung is a government officer and director of administrative office at the Biodiversity Conservation Agency (BCA). He is also the ASEAN Centre for Biodiversity's National Contact Point in Viet Nam. Between 2006 and 2009, he was a government officer in Natural Conservation Division of Viet Nam's Environment Protection Agency (VEPA). A PhD candidate for Environment and Sustainable Development at the Hanoi National University, Dung holds a Master's Degree in Environment from the same university. Among projects he has coordinated are the National Biodiversity Database System funded by the Japan International Cooperation Agency, the project on wetland inventory in Viet Nam, and Removing Barrier Hindering Protected Area Management Effectiveness in Viet Nam funded by GEF.



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 Geocology and Ecosystem Management, with technical expertise and strong interest in both the science-policy and the development-environment interface. Philipp is currently enrolled in a M.Sc. of Environmental Governance, and works as an external consultant and project correspondent for the ACB-GIZ Biodiversity and Climate Change Project.



Ms. Minseon Kim has been the East Asian - Australasian Flyway Partnership (EAAFP) Program Officer since 2009. She is in charge of coordinating Flyway Network Site nomination, developing EAAF Sister Sites and facilitating the sharing of scientific resources and Partnership news among partners and other stakeholders. She has been involved in promoting World Migratory Bird Day, initiated by the Convention on Migratory Species (CMS) and the African-Eurasian Migratory Waterbird Agreement (AEWA), for East Asian Australasian Flyway since 2010, working with the Secretariats of CMS and AEWA. She has overall responsibility for developing the website and publications of the EAAFP. She holds a BSc in Animal Science from Konkuk University, South Korea. Before joining to EAAFP, she worked for Incheon City Government (South Korea) and Australian business enterprise, where she developed her professional experience on communication and coordination.



Mr. Wade Martin works for the U.S. Department of State and is the Director of Governance, Resources, and Performance Management (GRP). As the Director of GRP, he is responsible for overseeing the Department's IT governance, performance, processes, sourcing management, and personnel recruitment for information technology (IT). Prior to coming to Washington, he served at U.S. Embassies in Libreville, Gabon; Vienna, Austria; Tallinn, Estonia, and Jakarta, Indonesia. During his career with the Department of State, which began in 1998, Mr. Martin received numerous Meritorious and Superior Honor awards including the prestigious Thomas Morrison Information Management Award for outstanding and unique contributions in the information management field. Mr. Martin is a graduate of the Marine Corps University's War College and holds a Master of Strategic Studies degree.



Ms. Tô Thuý Nga is an official at the Office of Viet Nam Environment Administration. Prior to this, she worked as officer of the Center for Environmental Training and Communication (CETAC) and an assistant at the World Agroforestry Centre's Viet Nam office. She is a PhD student at Viet Nam National University's Center for Natural Resources and Environmental Studies. Among projects she has handled are the Plan for Removing Environmental Heavily Polluted Enterprises to 2020, Policy framework and legislation development of

environmental services in Viet Nam, and Viet Nam Environment Protection Action Plan to 2020.



Dr. Hoang Thi Thanh Nhan is deputy director of the Biodiversity Conservation Agency / Viet Nam Environment Administration, Ministry of Natural Resources and Environment. Prior to this, she was deputy head of MONRE's Biodiversity Conservation Department. She also served as deputy head of the Biodiversity Conservation Department.



Dr. Faizal Parish has been the Director of the Global Environment Centre since 1998. He is an internationally recognized expert in natural resource management, biodiversity and climate change with focus on mangrove, peatland and river basin assessment and management, with over 30 years international working experience in nearly 20 countries primarily in the Asia Pacific Region. He has actively worked with ASEAN Member States and the ASEAN Secretariat in the development of the ASEAN Peatland Management Strategy and the APFP. He is currently the Co-chair of the Peatland Working Group of the Roundtable on sustainable Palm Oil and a member of the author team of the Intergovernmental Panel on Climate Change developing supplementary Guidelines on peatlands and GHG emissions.



Dr. Filiberto Pollisco, Jr. joined the ASEAN Centre for Biodiversity in 2008 and have since been handling biodiversity concerns as applied in Southeast Asia, such as the Global Taxonomy Initiative, Business and Biodiversity, Biodiversity and Climate Change, urban biodiversity, wetlands and peatlands, agro-biodiversity and ecotourism. He received his PhD in Forestry specializing in Forest Ecology focusing on biodiversity conservation and ecotourism, in year 2000 from the University of the Philippines at Los Banos. He was a programme officer of the Philippine Council for Agriculture and Natural Resources Research and Development of the Department of Science and Technology and handled the national R&D programme for Protected Areas and Wildlife doing programme development, monitoring and evaluation of R&D for 20 years before moving on to become the Assistant Director and Officer-in-Charge of the Agricultural Resources and Management Research Division of the same agency for three years handling sloping land agriculture, solid waste management and conservation / organic agriculture before transferring to the ASEAN Centre for Biodiversity. Since then he has branched out to other biodiversity concerns as stated above.



Mr. Norman Emmanuel Ramirez has extensive experience in the field of training and capacity building. Prior to joining ACB, he worked as Training Specialist at the ASEAN Regional Centre for Biodiversity Conservation (ARCBC). He later became part of the Local Government Finance and Development (LOGOFIND) Project, a project implemented by the Philippines' Department of Finance and funded by the World Bank, where he also served as Training Specialist and was designated as Head of the Training and Capacity Building Unit. Norman is likewise experienced in the areas of project and organizational development and management. He earned his bachelor's degree in Forestry at the University of the Philippines-Los Baños and is currently completing his Master in Management degree at the same university.



Dr. Dicky Simorangkir is currently working as GIZ International Senior Advisor for Biodiversity and Climate Change Project for ASEAN, based in Los Baños in the Philippines. After completing his PhD and working for the University in Germany, he worked for over 20 years for various international organizations, focusing on conservation and sustainable use of natural resources. He worked in many ASEAN countries, Timor Leste, Japan, Germany, Venezuela and the Netherlands.



Dr. Judit Szabo has been recently appointed as the EAAFP Science Officer. In this role, she provides general oversight of scientific aspects of the Secretariat's work, including technical advice on waterbirds and monitoring expertise. As an academic, she worked with bird conservation for the last 15 years, including threatened species monitoring and management and assessing IUCN Red List Status of Australian birds. She has also worked with citizen science data and holds a PhD in Environmental Toxicology and MSc in Theoretical Ecology.



Dr. Lew Young is the Ramsar Secretariat's senior regional advisor for Asia-Oceania. A Hong Kong-born Chinese holding British citizenship, Lew has been Manager of the WWF Hong Kong Mai Po Nature Reserve since 1991, and was actively involved in the listing of the Mai Po Inner Deep Bay Ramsar site in 1995. Since then he has worked closely with the Hong Kong government to develop the management plan and monitoring programme for the site. He has considerable experience in Communication, Education and Public Awareness issues through his work at the Mai Po Marshes Wildlife Education Centre and his involvement in the establishment of Wetland Link International-Asia in 2005, a network that has been promoting greater communication and cooperation among wetland centres across Asia. Lew holds a MSc degree in Ecology from Aberdeen University in Scotland and a Ph.D from Hong Kong University, Department of Zoology, and he joined the Secretariat in 2008.

Wetlands in the ASEAN region: benefits, challenges and conservation initiatives

By Lew Young and Nessrine Alzahawi *

The Convention on Wetlands is an intergovernmental treaty adopted on February 2, 1971 in the Iranian city of Ramsar, on the southern shore of the Caspian Sea. It has come to be known popularly as the “Ramsar Convention”, named after this city where the treaty was first agreed. Born out of a concern over the destruction of wetlands, it is the first of the modern global intergovernmental treaties on the conservation and sustainable use of natural resources.

The Convention entered into force in 1975 and now has 165 contracting Parties. There are 2,101 Ramsar Sites covering over 205,000,000 hectares of surface area around the world. Ramsar Sites form the biggest global network of protected areas for biodiversity. All member countries of the Association of Southeast Asian Nations (ASEAN) are contracting Parties to the Convention, with the exception of Singapore and Brunei. Thus far, there are 39 Ramsar Sites in the ASEAN region with a total surface area of 1,780,480 hectares.

Contracting Parties seek to deliver their commitments to wetland conservation and wise use through “three pillars” of action. These are:

a) working towards the wise use of their wet-

- lands through a wide range of actions including establishing national wetland policies and plans, undertaking inventory and assessment, integrating wetlands into the sustainable development process, and ensuring public participation in wetland management;
- b) designating wetland sites for the List of Wetlands of International Importance (the Ramsar List) as a contribution to the establishment of a global ecological network, and to ensure the effective monitoring and management of those sites included in the List; and
- c) cooperating internationally in their delivery of wetland



Photo by Klaus Stiefel

Table 1. Ramsar Sites in Southeast Asia

	Number of Ramsar Sites	Ramsar Site name
Cambodia	3	<ul style="list-style-type: none"> • Boeng Chhmar and Associated River System and Floodplain • Koh Kapik and Associated Islets • Middle Stretches of the Mekong River north of Stoeng Treng and Floodplain
Indonesia	6	<ul style="list-style-type: none"> • Berbak • Danau Sentarum • Pulau Rambut Wildlife Reserve • Rawa Aopa Watumohai National Park • Sembilang National Park • Wasur National Park
Lao PDR	2	<ul style="list-style-type: none"> • Beung Kiat Ngong Wetlands • Xe Champhone Wetlands
Malaysia	6	<ul style="list-style-type: none"> • Kuching Wetlands National Park • Lower Kinabatangan-Segama Wetland • Pulau Kukup • Sungai Pulai • Tanjung Piai • Tasek Bera
Myanmar	1	<ul style="list-style-type: none"> • Moyingyi Wetland Wildlife Sanctuary
Philippines	5	<ul style="list-style-type: none"> • Agusan Marsh Wildlife Sanctuary • Naujan Lake National Park • Olango Island Wildlife Sanctuary • Puerto Princesa Subterranean River National Park • Tubbataha Reefs National Marine Park
Thailand	11	<ul style="list-style-type: none"> • Bung Khong Long Non-Hunting Area • Don Hoi Lot • Had Chao Mai Marine National Park • Kaper Estuary • Krabi Estuary • Kuan Ki Sian of the Thale Noi Non-Hunting Area • Kut Ting Marshland • Mu Koh Ang Thong Marine National Park • Nong Bong Kai Non-Hunting Area • Pang Nga Bay Marine National Park • Princess Sirindhorn Wildlife Sanctuary
Viet Nam	5	<ul style="list-style-type: none"> • Ba Be • Bau Sau (Crocodile Lake) Wetlands and Seasonal Floodplains • Mui Ca Mau National Park • Tram Chim National Park • Xuan Thuy Natural Wetland Reserve

conservation and wise use, through the management of transboundary water resources, wetlands and shared wetland species, collaboration with other con-

ventions and international organizations, sharing of information and expertise, and increasing the flow of financial resources and relevant technologies to developing coun-

tries and countries in transition.

Under the second of these three pillars, Contracting Parties to the Ramsar Convention commit to designating Ramsar Sites. Designating a wetland as a Ramsar Site has many benefits such as bringing international attention to the site, encouraging and motivating conservation and research, bringing about improved management, and providing an international platform to share experiences and knowledge.

Five major wetland types are generally recognized under the Convention: marine (coastal wetlands including coastal lagoons, seagrass beds, rocky shores, and coral reefs); estuarine (including deltas, tidal marshes, and mangrove swamps); lacustrine (wetlands associated with lakes); riverine (wetlands along rivers and streams); and palustrine (meaning “marshy” - marshes, swamps and bogs). In addition, human-made wetlands such as fish and shrimp ponds, farm ponds, irrigated agricultural land, rice paddies, salt pans, reservoirs, gravel pits, sewage farms and canals are also recognised under the Convention.

The official name of the treaty, The Convention on Wetlands of International Importance especially as Waterfowl Habitat, reflects the original emphasis on the conservation and wise use of wetlands primarily as habitat for waterbirds. Today, however, the Convention has become much more than a treaty to conserve waterfowl habitat, encompassing coral reefs, mangroves, seagrass beds, glaciers, salt flats, and karst systems. Currently, the designation of wetlands as Ramsar Sites takes into

consideration not just the importance of the wetland for waterbirds, but also its importance for fish, indigenous species of fauna and flora, threatened wetland-dependent species, and the rarity or importance of the wetland type for each biogeographic region. Strong emphasis is also placed on the relationship between local people and the wetland, as many sites hold not only values for biodiversity but are sources of livelihood for local communities through the range of ecosystem services they provide, as well as their inherent cultural, religious and aesthetic value. In brief, the Ramsar Convention has broadened its scope of implementation to cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important both for biodiversity conservation and for the well-being of human communities.

The Mekong, which courses through the very heart of inland Southeast Asia, is home to the world’s largest freshwater fisheries, with about 800 different native species. Its rich biodiversity is second only to the Amazon’s. Through fishing, aquaculture and irrigation, it sustains 65 million people. As a whole, the ASEAN region is one of the richest in terms of biodiversity, encompassing the Coral Triangle, the Mekong River Basin, and the forests of Borneo. But what benefits does this richness offer people? How does one measure the real value of wetland ecosystems?

Ecosystem services can be assessed to determine their economic value. Several examples of these analyses have recently been compiled in The Economics of Ecosystems and Biodiversity for Water and Wetlands (Brink et al, 2013;

available online <http://www.teebweb.org/wetlands/>. Coral reefs are the ecosystems with highest monetary value often due to associated high recreation and tourism importance, community benefits (e.g. fishery nursery), as well as their role in protecting from natural hazards (Table 2. *Economic values of wetlands*). Currently, only seven of the 39 Ramsar Sites in the ASEAN region contain coral reefs (Map 1).

Mangroves are also economically valuable. The storm protection and erosion control services performed by the 1,800 hectares of mangroves in Cambodia's Ream National Park were valued at US\$300,000 per year. Moreover, the mangroves provide habitat, nursery and breeding grounds for fish, as well as firewood, medicinal plants and construction materials. All these subsistence goods were valued at almost US\$600,000 per year (Emerton et al. 2002). Another study carried out in Southern Thailand estimates that the value of mangroves is US\$10,821 per hectare for coastal protection against storms, US\$987 per hectare for fish nurseries and US\$ 584 per hectare for collected wood and non-timber forest products (Barbier, 2007). In contrast, the benefits of commercial shrimp farming were estimated at US\$9,632 per hectare with government subsidies contributing about US\$8,412 per hectare. To sum up, shrimp production without subsidies creates benefits of only US\$1,120 per hectare, while the total monetary value of the ecosystem services provided by healthy mangroves reaches US\$12,392 per hectare. In addition, while the benefits of mangroves are provided continuously,

Table 2. Monetary values of services provided by wetlands (Int.\$/ha/year – 2007 values)

Category of wetlands	Service category	No. of estimates	Min value (Int.\$/ha/y)	Max value (Int.\$/ha/y)
Coral reefs	provisioning services	33	6	20,892
	regulating services	17	8	33,640
	habitat services	8	0	56,137
	cultural services	43	0	1,084,809
	Total	101	14	1,195,478
Coastal systems (habitat complexes e.g. shallow seas, rocky shores & estuaries)	provisioning services	19	1	7,549
	regulating services	4	170	30,451
	habitat services	2	77	164
	cultural services	7	0	41,416
	Total	32	248	79,580
Mangroves and tidal marshes	provisioning services	35	44	8,289
	regulating services	26	1,914	135,361
	habitat services	38	27	68,795
	cultural services	13	10	2,904
	Total	112	1,995	215,349
Inland wetlands (floodplains, swamps/marshes and peatlands)	provisioning services	34	2	9,709
	regulating services	30	321	23,018
	habitat services	9	10	3,471
	cultural services	13	648	8,399
	Total	86	981	44,597
Rivers and lakes	provisioning services	5	1,169	5,776
	regulating services	2	305	4,978
	habitat services	0	0	0
	cultural services	5	305	2,733
	Total	12	1,779	13,487



Map 1. Ramsar Sites in ASEAN with coral reefs (4 sites in Thailand, 2 sites in the Philippines and 1 in Indonesia). Despite being in the heart of the coral triangle, only 7 out of the 39 Ramsar Sites in the ASEAN region have coral reefs. Purple areas indicate coral reef distribution, while blue circles indicate Ramsar Sites that include coral reefs.

Source Base map: Global distribution of Coral reefs (V7.0, 2003) 1km raster dataset compiled by the UNEP World Conservation Monitoring Centre (UNEP-WCMC)

shrimp production declines after five years and shrimp farms are abandoned when turning unproductive. Restoring mangroves after these farms are abandoned costs more than the private profits made from shrimp (about US\$ 9,318 per hectare) and have to be borne by the public.

These case studies in the region indicate that it is worthwhile to invest in the wise management of wetlands. Wetlands provide natural infrastructure; maintaining and restoring them in many cases lead to cost savings when compared to manmade infrastructure solutions. Beyond water availability and quality, they are invaluable in supporting climate change mitigation and adaptation,

support health as well as livelihoods, local development and poverty eradication. Without wetlands, the water cycle, carbon cycle and nutrient cycle would be significantly altered, mostly detrimentally.

In addition to the ecosystems services provided by wetlands, many sites in the region hold ancestral, religious, cultural and psychological importance to people; these values cannot be numerically measured or estimated even by the most complex of socio-economic analyses. Yet policies and decisions do not sufficiently take into account these interconnections and interdependencies. Recognizing and strengthening the links of local communities to wetlands can contribute to conservation by involving a wide range of stakeholders. The involvement of local communities is a key factor for successful management and policy, and is embedded in the Ramsar principles and its programme for communication, education, participation and awareness (CEPA). Traditional practices and local knowledge can play an important role in the wise use of wetlands. In many cases, traditionally evolved techniques of ecosystem management are better suited to local conditions than external management approaches.

Action at all levels and by all stakeholders is needed if the opportunities and benefits of working with water and wetlands are to be fully realized and the consequences of continuing wetland loss appreciated and acted upon. Wetlands and water-related ecosystem services need to become an integral part of water management in order to make the transition to a resource-efficient, sustain-

able economy. As wetlands are potentially influenced by all sectoral activities, they should be integrated and mainstreamed in land use, agriculture, fisheries, water, and energy policies. The National Biodiversity Strategies and Actions Plans (NBSAPS) of countries can provide the basis for this cross-sectoral integration.

The Convention on Biological Diversity (CBD) has established Ramsar as its "lead implementation partner" on wetlands; and the two Conventions collaborate through a succession of Joint Work Plans. NBSAPs required under the CBD are meant to identify the priority areas for conservation. Within a country's NBSAP, the number of Ramsar Sites in a country could serve as a target for biodiversity conservation. Wetlands appear in all of the NBSAPs of the ASEAN Member States. However, not all of these national strategies clearly mention Ramsar Sites or wetlands under coastal zone planning or under agricultural, energy, and water policies. The management and wise use of wetlands is a cross-cutting issue, and the commitments of the Contracting Parties entail that the use of all wetlands in the country, even those that are not yet Ramsar Sites, be planned to ensure the long-term integrity and sustainability of any site.

The principles of wise use of the Convention can additionally help towards achieving the Millennium Development Goals (MDG) of poverty alleviation and development, develop a Green Economy, and are in line with the vision of Rio+20 and the vision described in the 'Future We Want'. By implementing the Ramsar Convention, nations can achieve 19 out of the 20 Aichi targets. The

challenge remains in translating these objectives and implementing these principles at the local level, where more efforts are needed to improve communication, collaboration, and to recognize the linkages between wetlands and biodiversity, water availability, and human safety, health and well-being.

Ongoing key challenges in the ASEAN region include the construction of dams, conversion of wetlands for agricultural land, and the introduction of invasive species. Climate change and the increase of frequency and impact of floods are causing annual damages and extensive losses to unprotected shorelines and coastal areas. According to Article 3.2 of the text of the Ramsar Convention, Contracting Parties are required to inform the Ramsar Secretariat '...if the ecological character of any wetland in its territory and included in the List has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference.' Resolutions from recent Conferences of the Parties provide specific guidelines on carrying out assessments on the possible impacts of development in wetland areas. These include: Resolution XI.10 'Wetlands and energy issues', and Resolution X.17 'Environmental Impact Assessment and Strategic Environmental Assessment: updated scientific and technical guidance'.

Specific challenges often seen in Ramsar Sites include the lack of resources and capacity for adequate site management. The authority officially responsible for implementing the Convention in a country, known as the Administrative Au-

thority, is often too far and unaware of what happens on the ground within or near the designated wetlands. Meanwhile, at the local level, site managers do not have sufficient resources or authority to be able to monitor, manage and protect the site from potential threats such as encroachment, development and illegal hunting, fishing, poaching or extraction of resources. Stronger legislation, capacity building at the site level, and systematic monitoring and reporting can help empower local management and ensure the long term sustainability and protection of the site.

With common threats, common interests and overlapping ecosystems, challenges can only be met through regional cooperation. The ASEAN framework, through the ASEAN Centre for Biodiversity, provides a good basis for transboundary cooperation, co-financing, and sharing of information and expertise for improved management. This year is the United Nations' International Year of Water Cooperation, an opportunity to raise awareness of the pressing need to resolve water management issues in a cooperative, integrative and holistic manner. International cooperation is one of the pillars of the Ramsar Convention and the Convention will continue to encourage collaboration and cooperate with regional institutions for the long term and successful conservation of the precious wetlands of the ASEAN Member States. ■

**Low Young is senior regional advisor for Asia-Oceania at the Ramsar Secretariat, while Nessrine Alzhlawi is assistant advisor for Asia-Oceania.*

Peatlands: Status, challenges and actions in Southeast Asia

By Sing Yun Chin and Faizal Parish*

Peatlands are one of the most extensive wetland ecosystems in Southeast Asia, covering about 25 million hectares and representing about 60 percent of the world's tropical peatlands. Naturally, this area was covered in dense tropical forest, underlain by a layer of 2 to 25 meters thick of undecomposed plant material which has accumulated over thousands of years under the waterlogged conditions to form peat or organic soil.

Peatlands are found in all ten ASEAN Member States, but the majority are concentrated in Brunei, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam. The current status and extent of peatland in North Mekong countries is still to be fully determined.

Tropical peatlands in peril

This soil is the most important carbon store

in Southeast Asia, storing twice as much carbon as the biomass of all the forests of the region combined. It also plays a critical role in water resource management acting like a sponge to store water in the wet season then releasing it to the rivers and groundwater in the dry season. It also helps to prevent flooding and salinisation of groundwater in coastal areas. The

biodiversity of these areas is very high with many unique plant, fish and animal species. The diversity of black-water fish species confined to peat swamp forests is very high, including the world's smallest vertebrate – *Paedocypris progenetica* – a miniature fish from Sumatran peat swamp forests. Many timber and non-timber forest products can be harvested from these ecosystems, providing key resources for livelihood of local communities.

However, peatland forests in Southeast Asia have been deforested rapidly in recent years with an approximate annual deforestation rate of 2.2 percent for the period 2000 to 2010 – two to three times higher than for other forest types. An estimated 14 million hectares of peatlands in Southeast Asia have been logged (legally or illegally) and opened up. About 2.4 million hectares are cur-

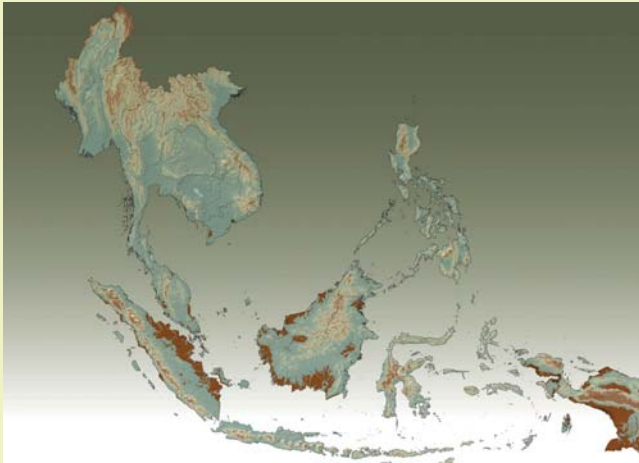
rently cultivated for oil palm, one million hectares are cultivated for pulp and paper, and about one to two million hectares cultivated for other crops. A further three to four million hectares have been severely degraded by fire or has been developed and abandoned for agriculture and the balance is fragmented or partly degraded. Since peatlands are fragile and sensitive ecosystems, many attempts at development have not been successful. Moreover, as a result of drainage and poor land management practices, much of the peatland in the region has been degraded through fire and subsidence.

Drainage lowers the water table, leads to drying of the surface peat layers, and increases decomposition or oxidation that causes subsidence of the peat, as well as making it susceptible to fire. Fire in peatland areas can burn for weeks



Chin Sing Yun/GEC

Layer of peat which is formed by undecomposed plant material



GEC/ASEAN Sec

Peatlands distribution in SEA



Chai Ah Sung

Degraded peatlands due to the drainage canal in Indonesia



Chin Sing Yun/GEC

Burnt peatland due to slash and burn practices by small holders



Chin Sing Yun/GEC

Hazy sky due to the peat fire which impacts the health of the community living nearby

underground and release massive amounts of smoke due to incomplete burning. As a result, massive smoke clouds are generated contributing about 90 percent of the so-called transboundary haze in the ASEAN region that is recognized by the ASEAN Member States as the most serious regional environmental problem. The smoke cloud generated from the peat fire in the 1997-1998 El Nino drought, produced by 2.5 million hectares of peatland fires, covered an area of 10 million square kilometers for several months. This led to massive social, economic and environment impacts in the region with over US\$10 billion in damages and losses without taking into

consideration the adverse effects on climate change and ecosystem services.

Peatlands which are over-drained are continually degraded and subsiding due to the loss of peat layer, as well as at risk from fire. Eventually, these areas may be increasingly affected by floods as most of the base of the peatlands in the region is at or below river and sea level. In Malaysia, over-drainage of peatlands in west Johor in the 1970s has led to subsidence levels of over four meters in some areas which caused extensive flooding and destruction of houses and infrastructure. Recent studies have also indicated that many agriculture areas on peat may be prone to regu-

lar or even permanent flooding after 30 to 50 years of drainage and subsidence. This will have serious implications for communities living in and around these areas.

Challenges in peatland management in Southeast Asia

Controlling and reversing peatland degradation and associated impacts requires an integrated approach to address the root causes which are common across many countries in Southeast Asia. In the past, peatlands have been regarded as “wastelands”. Their key functions and characteristics have not been recognized. Their functions and economic

value still remain poorly studied and understood. The lack of understanding of the critical roles of the region’s peatlands has hindered measures for integrated management.

Peatlands naturally occur in interconnected hydrological units or domes which may each cover between 5,000 to 800,000 hectares. Any development or drainage in one part of the dome will eventually affect other parts of the dome. These hydrological units therefore need to be managed in an integrated manner. Unfortunately, responsibility for peatland management is often fragmented among a wide range of sectoral agencies dealing with land use planning, forestry, ag-



Flooded plantation in the low lying peatland area

Chin Sing Yun/GEC



Community folks working together to block the canal for fire prevention in Riau, Indonesia

Chin Sing Yun/GEC



Chin Sing Yun/GEC

Peatlands support community livelihood. Fish harvesting in the buffer zone of UMTNP of Viet Nam.

riculture, water resources and conservation. This leads to poor planning and creates overlap, conflicts of land use and gaps in jurisdiction between agencies and becomes one of the key factors of unsustainable management of peatlands. Another challenge is how to stimulate cooperation between government agencies at national and local level with the private sector and local communities to work harmoniously to sustainably manage the peatlands.

Drained peatlands are very susceptible to fire as its organic nature makes it a natural combustible material. The situation is worsened by the widespread use of fire for land clear-

ing as fires have become one of the major threats for peatlands. “Zero burning” or “controlled burning” practices are often not implemented due to poor enforcement.

Working Together – An ASEAN Framework for Peatland Management

ASEAN Vision 2020 (adopted 1997) envisions “...a clean and green ASEAN with fully established mechanisms for sustainable development to ensure the protection of the region’s environment, the sustainability of its natural resources and the high quality of life of its people...” and includes addressing environmental degradation and transboundary pollution.

Due to the recurring problems of peatland fires and the associated haze which has blanketed much of five ASEAN Member States – Brunei Darussalam, Indonesia, Malaysia, Singapore and Thailand - ASEAN recognized the need to urgently address this problem. This has resulted in several mechanisms to address the problem of peatland fire and degradation in the region.

The relevant initiatives include the ASEAN Regional Haze Action Plan (1997) and ASEAN Agreement on Transboundary Haze Pollution (2002). Subsequently, the ASEAN Member States adopted the ASEAN Peatland Management Initiative (APMI) in March 2003 and the ASEAN Peatland Man-

agement Strategy (APMS) (2006-2020) in November 2006 to establish a framework for sustainable management and rehabilitation of peatlands in Southeast Asia. The APMS specifies 25 operational objectives and nearly 100 collective actions in 13 focal areas from assessment to integrated management to climate change and financing.

In 2012, the progress in implementing the APMS was reviewed. It was agreed that all ASEAN Member States had made significant progress in the implementation of the APMS, especially related to the knowledge, extent and management of peatlands especially in Brunei, Indonesia, Malaysia, the Philippines, Thailand and Viet Nam. At the same time, Cambodia, Lao PDR and Myanmar are still in the process of identifying and assessing their peatlands and determining values and management issues. To support the implementation of the APMS, Indonesia, Malaysia, Viet Nam, and the Philippines, have finalized; and Thailand and Brunei have initiated National Action Plans on Peatlands (NAP).

The ASEAN Secretariat and selected member states have established the ASEAN Peatland Forest Project (APFP) to support APMS implementation with support from the Global Environment Facility through the International Fund for Agriculture Development. The Global Environment Centre, one of the founding partners of the APMS, has initiated the SEApeat Project with assistance from the European Union to support the APFP and APMS. These initiatives as well as other projects and programmes including the ASEAN Centre for Biodiversity have supported progress in the past

few years to raise awareness and understanding on the role of peatlands, especially in relation to the importance of preventing peatland fires as well as the role of peatlands in regulating global climate change and conserving biodiversity. At the regional level, awareness raising, capacity building and multi-stakeholder engagement to promote integrated management of peatlands through best management practices (BMP) and fire prevention have been the key focus areas to reduce deforestation and degradation of peatland forests in Southeast Asia. Facilitation of stakeholder engagement and promotion of BMP were the key activities at the regional level and in countries such as Indonesia, Malaysia, the Philippines and Viet Nam. In the Mekong countries (Cambodia, Lao PDR, Myanmar), continuing efforts were focused on capacity building such as Training of Trainers training and peat assessment.

The involvement of local governments and communities are vital to ensure the sustainability of the knowledge and skills in peatlands management. Various BMP

and innovative approaches were tested and showcased to the stakeholders and initiated at the sub-national and site level through the peatland projects. These community-based conservation programmes includes the “Friends of Peatland Forests” in Malaysia; the community radio and participatory mapping in Riau, Indonesia; control burning techniques and sustainable agriculture on degraded peatland in Kalimantan, Indonesia; the development of the Information, Education and Communication (IEC) and ecotourism plan in Agusan Marsh, Philippines; and the green contract in U Minh Thoug National Park (UMTNP), Viet Nam. Strong community engagement in peatland management at the local level have stimulated much positive synergy among the stakeholders and improved the governance of the peatland resources in the region. Community involvement in peatlands management has proven to be valuable to the local government through the rehabilitation activities, water management, community radio, community patrol and fire fighting groups. Nevertheless, these will require an extensive time



Chin Sing Yun/GEC
Nepenthes spp. commonly found in the undisturbed peat swamp forest

and effort to build the trust among the stakeholders and such efforts should be continued and scaled up at various countries.

The Roundtable on Sustainable Palm Oil (RSPO) has recently developed and published with support from APFP and SEApeat project - manuals for best management practices for existing cultivation of oil palm on peat and also maintaining and rehabilitating peat swamp forest areas in and around plantations. Good water management is key to reducing the rate of subsidence and water tables need to be maintained at no more than 50cm below the peat surface in plantations

to minimise subsidence and also generate optimum yields. Effective measures to prevent and control peat fires also need to be applied by all existing plantations.

Some challenges remain to implement the APMS including establishment of appropriate finance and incentive mechanisms for sustainable peatland management. Recommendations for strengthening the APMS and its implementation will be considered for approval in October 2013.

Peatland management in Southeast Asia is a complex issue which needs to be resolved in an integrated manner, not only at the regional/national level but also at the sub-national/provincial level. Enhancing governance and development of specific policy directions at national level are crucial ingredients for sustainable peatland management in Southeast Asia. There is no quick solution but it needs serious attention and political will. Regional institutions such as ASEAN can play respective critical roles in supporting regional cooperation to promote sustainable peatland management. Innovative programmes and mechanisms need to be expanded for value-added action. Wise use and sustainable management of peatlands is crucial to enhance the socio-economic well-being of the local and global communities.

For further information about regional efforts in peatland conservation, visit www.aseanpeat.net. ■

Ms. Sing Yun Chin is the Coordinator of Peatland Programme in Global Environment Center and the Regional Component of the ASEAN Peatland Forests Project (APFP), and Dr. Faizal Parish is the Director of Global Environment Centre since 1998.



Stakeholder consultation on peatland conservation in Lao PDR

Chin Sing Yun/GEC

ASEAN Peatlands Management Strategy 2006-2020: Promoting sustainable management of peatlands in Southeast Asia

By Norman Emmanuel Ramirez *

Peatlands are wetland ecosystems that are characterized by the accumulation of organic matter called “peat” which are derived from dead and decaying plant material under high water saturation conditions. Peatlands are one of the most important natural ecosystems in the world which have key values for biodiversity conservation, climate regulation and support for human welfare (CC-GAP, 2005). At the species and genetic level, these unique and complex ecosystems play a special role in maintaining biodiversity as a result of habitat isolation. At the ecosystem level, the value of peatlands lies in its ability to self-organize and adapt to different physical conditions (ACB, 2010).

Peatlands cover more than 400 million hectares in about 180 countries and represent one third of the wetland resource in the world (CC-GAP, 2005). Southeast Asia has more than 25 million hectares of peatland, comprising 60 percent of the global tropical peatland resource. Most of the peatlands in the region can be found in Indonesia, which has over 70 percent of the total peatland cover of Southeast Asia. Other major peatland areas are located in Brunei Darussalam, Malaysia, the Philippines, Thailand, and Viet Nam. Peatlands are usually found in low altitude, sub-coastal areas extending

inland to distances of up to 300 kilometers. The depth of peat varies from 0.5 to more than 10 meters. The significance of peatlands in Southeast Asia has been attributed to socio-economic development and support for the livelihoods of local communities (ASEAN Secretariat, 2007).

Threats to peatland ecosystems

At present, degradation of peatlands in many parts of the world is clearly evident due to human and natural causes. Western Europe has already lost over 90 percent of its original functioning peatlands, while central



Photo by Ahmad Muhsin Mubarak/Malaysia

Mukah, Sarawak, Malaysia

Europe has lost more than 50 percent. In southern and eastern Africa, many peatlands have been converted to agriculture and remaining natural peatlands are under severe threat of conversion and degradation (CC-GAP, 2005).

In Southeast Asia, up to 70 percent of the tropical peat swamp forests have been significantly affected by logging, deforestation, draining, and agriculture. An estimated seven million hectares of peatlands have been cleared and drained for agriculture and forestry in recent years. The oxidation of desiccated topsoil results in 50 to 100 tons of

carbon dioxide released to the atmosphere emission per hectare per year, or approximately 350 to 700 million tons annually.

In these conditions, fires easily spread in drained areas which can last for long periods. Accompanying these fires, large volumes of smoke spread throughout Southeast Asia causing an estimated USD10 billion worth of economic damage and affecting the health of millions of people. Peatland fires also destroy the carbon store built up over thousands of years. In 1997 and 1998, flames engulfed about 2.2 million hectares of peatlands in Indonesia,

contributing 10 to 20 per cent or 1 to 2 billion tons of the world's carbon dioxide emissions (CC-GAP, 2005).

The need for collective action: ASEAN Peatland Management Initiative

In the past, a number of efforts directed at the effective management of peatlands in the ASEAN region have been implemented at national levels. Several joint initiatives following ASEAN cooperation arrangements were undertaken. However, these activities were somewhat limited. Initial efforts concentrated on immediately addressing fire and haze issues, but failed to consider a more sustainable approach specifically for peatlands in the region.

In this respect, the ASEAN Peatland Management Initiative (APMI) was established to provide a framework to promote participation and bring the different actors together in order to widen the knowledge base and opinion; increase understanding of major issues within and between different groups; facilitate exchange of important and critical information on peatland management in the region; and increase coverage in action programmes. The existence of this framework ensures that gaps and priority areas of actions for peatlands conservation within the ASEAN region can be determined (ASEAN Secretariat, 2007). The APMI was developed by the ASEAN Secretariat, with assistance from the Global Environment Centre-Malaysia, and was adopted by the 20th Meeting of the ASOEN-Haze Technical Task Force (HTTF) in the Philippines in Feb 2003 (GEC, 2013).

A sustainable approach: the ASEAN Peatland Management Strategy

The ASEAN Peatland Management Strategy

Focus Areas	Operational Objectives
1. Inventory and Assessment	1.1 Determine the extent and status of peatlands in the ASEAN region (including issues of definition) 1.2 Assess problems and constraints faced in peatland Management 1.3 Monitor and evaluate peatland status and management
2. Research	2.1 Undertake priority research activities
3. Awareness and Capacity Building	3.1 Enhance public awareness on importance of peatlands, its vulnerability to fire and, the threat of haze through implementation of a comprehensive plan 3.2 Build institutional capacity on management of peatlands
4. Information Sharing	4.1 Enhance information management and promote sharing
5. Policies and Legislation	5.1 Develop or strengthen policies and legislation to protect peatlands and reduce peat fire
6. Fire Prevention, Control and Monitoring	6.1 Reduce and minimize occurrence of fire and associated haze
7. Conservation of Peatland Biodiversity	7.1 Promote conservation of peatland biodiversity
8. Integrated Management of Peatlands	8.1 Promote multi-agency involvement in peatland management 8.2 Promote integrated water resources and peatland management using a basin-wide approach and avoiding fragmentation 8.3 Promote integrated forest and peatland management 8.4 Manage agriculture in peatland areas in integrated manner 8.5 Promote integrated community livelihood and peatland management
9. Promotion of Demonstration Site for Peatland	9.1 Promote best management practices
10. Restoration and Rehabilitation	10.1 Develop appropriate techniques for the restoration or rehabilitation of degraded peatlands 10.2 Rehabilitate burnt, drained and degraded peatlands
11. Peatland and Climate Change	11.1 Protect and improve function of peatlands as carbon sequestration and storage 11.2 Support peatland adaptation process to global climate change
12. Regional Cooperation	12.1 Promote exchange of expertise in addressing peatland management issues 12.2 Establishment of 'centres of excellence' in the region for peatland assessment and management 12.3 Contribute to the implementation of other related agreements and regional cooperation mechanisms 12.4 Enhance multi-stakeholder partnerships to support peatland management
13. Financing of the Implementation of Strategy	13.1 Generate financial resources required for the programmes and activities to achieve target of the strategy

Source: ASEAN Peatland Management Strategy

(APMS) was the product of one of the initial actions of the APMI. The APMS provides a framework for all those with responsibilities for and commitments to the sustainable management of peatlands – its wise use, prevention of fires, and its rehabilitation (ACB, 2010). The APMS was endorsed at the 22nd Meeting of the ASOEN-Haze Technical Task Force (HTTF) in Brunei Darussalam in Nov

2005 and the 10th ASEAN Ministerial Meeting on the Environment (AMME) in the Philippines in November 2006 (GEC, 2013).

The APMS has four general objectives: 1) enhancement of awareness and capacity building; 2) addressing transboundary haze pollution and environmental degradation; 3) promotion of the sustainable management of peatlands; and 4) promotion

of regional cooperation. Each general objective is matched by specific operational objectives that are grouped into 13 focal areas. The table above shows these focal areas and the corresponding operational objectives.

Operationalizing the APMS

An accompanying action plan (APMS Action Plan) has been adopted, as well,



Photo by Nagarajan Rengasamy/GEC

Raja Musa Peat Swamp Forest, Selangor, Malaysia

as part of the APMS. This is needed to operationalize the APMS. Specific action points are assigned for each operational objective to be implemented at different levels and time scales. There are two proposed levels of actions: regional and national. Regional actions could be those that enhance or complement national actions through sharing of experiences, information and knowledge; and establishment of regional networks and joint regional approaches.

Action points are also envisioned to be implemented in different time scales: short term (2005-2010), medium term (2005-2015), long term (2005-2020), and continuous, for actions that should be undertaken on a continuing basis. A level of priority is also assigned for each action, i.e. low, medium and high. Assignment of priority for country-level actions will assist ASEAN Member States in prioritizing actions under their respective National Action Plans (ASEAN Secretariat, 2007).

ASEAN Member States are currently preparing their respective National Action Plans (NAPs) for the period of 2006-2020 for country-driven initiatives. The NAPs

must complement and be aligned with the objectives of the APMS and should consider the capacities of national institutions that will implement the NAPs.

Enhancing Peatlands Management through Regional Cooperation

In the ASEAN Member States, there are no policies specifically on peatlands. Different aspects of peatland management are governed by a variety of national and local laws and regulations. Most of the ASEAN Member States have a wide range of agencies or offices that have certain responsibilities related to the management of peatlands. A number of aspects on peatland management are common in the ASEAN region: problems of fire, drainage, livelihood opportunities, sustainability, among others. This scenario, therefore, calls for strengthened coordination and cooperation among concerned stakeholders at the national and regional levels.

The APMS emphasizes the promotion of regional cooperation as one of its general objectives. Currently, two projects are being implemented to support the implementation of regional and national strategies for

sustainable management of peatlands in Southeast Asia and the incorporation of peatland management into policies and plans related to forest and land-related resources. These two complementing projects are the "Rehabilitation and Sustainable Use of Peatland Forests in Southeast Asia (APFP Project)" and "Sustainable Management of Peatland Forest in Southeast Asia (SEApeat Project) (www.peat-portal.net).

As an intergovernmental regional centre of excellence, the ASEAN Centre for Biodiversity (ACB) supports the implementation of the APMS. ACB recognizes the significant role of peatlands, especially in establishing its strong connection between biodiversity conservation and contributing to addressing climate change issues. In 2009, ACB supported the project "Conservation of Peatland Biodiversity in South East Asia (Phase II)" under the ACB Joint Research/Initiatives on Biodiversity Programme. This project was implemented by the Global Environment Centre, a non-profit non-government organization established in 1998 to address key environmental issues.

ACB shall further promote peatlands conservation guided by its mandates to assist the ASEAN Member States in policy formulation, capacity development, awareness-raising, and establishing links with national and international organizations. Establishing strategic partnerships with organizations from the government and private sectors is an important approach to resolve common issues and challenges on peatlands management. ■

**Norman Emmanuel Ramirez is the ASEAN Centre for Biodiversity's capacity development specialist.*

References:

- ASEAN Centre for Biodiversity. 2010. *ASEAN Biodiversity Outlook. Philippines*
- ASEAN Secretariat. 2007. *Strategy and Action Plan for Sustainable Management of Peatlands in ASEAN Member Countries.*
- Coordinating Committee for Global Action on Peatlands (CC-GAP). 2005. *Peatlands: Do you care?*
- The Global Environment Centre-Malaysia website (accessed on 31 March 2013 at www.gec.org.my)
- www.peat-portal.net (accessed on 31 March 2013)

BRUNEI DARUSSALAM

Wetlands and peatlands: Status, challenges and actions

By Mahmud Yussof*

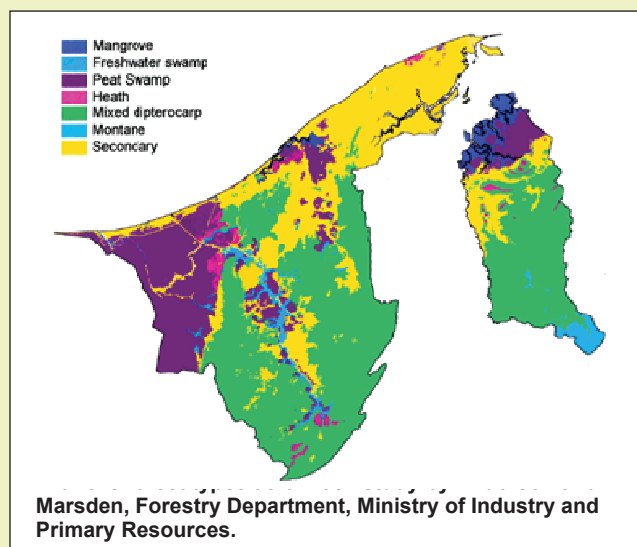
Despite having a small land area of approximately 5,777 square kilometers, Brunei Darussalam hosts a unique biological treasure including forests of different types such as mixed dipterocarp type forest, montane type forest, heath type forest, beach type forest, freshwater type forest, mangrove type forest, and peat swamp type forest.

Mangrove, freshwater, and peat swamp forests have been estimated to have a total area of 26 percent of the total forest cover of the country. Peatland forest itself has dominated 19 percent of the total forest area. Oil-rich Belait District has the highest distribution of peatland in the country and majority of this total forest area is still in good condition. The peatland forest stand displays unique and complex ecosystems in the country mainly comprising of even age stand of *Shorea Albida* (Alan).

On the other hand, mangrove forest is mostly found at the coastal area of the country where the sea water meets the freshwater at the river mouth. At the back of this forest, the freshwater forest is abundant and well established at the riparian, forming a continuous ecological corridor from upstream to downstream of the rivers in Brunei Darussalam.

Having a small land area, the land acquisition is very limited to meet the aggression of economic development activities; hence, sustainable land use man-

agement is compelling. Any improper infrastructural development will give rise to an immediate devastating impact to the overall ecosystems in the country such as unplanned physical development of infrastructural constructions involving the conversion of the said forests. Evidently, man-made drainage in the peatland area will result in a subsequent risk of fires during dry spell and loss of species diversity and peat layer or subsidence effect. Others such as unplanned sand mining, small and sporadic agricultural activities on ad-hoc basis, and human settlement in the peatland



will further pose a threat of forest conversion, resulting in detrimental effects on forest ecosystem services and values. In view of limited area of these peatland areas and their poor natural regeneration, the forest biological ecosystems will be in endangered status. The infrequent fruiting of the *Shorea Albida*, the dominant species of peat swamp forest, and changes in forest micro-climates have significantly contributed to the gradual extinction of peat

swamp forest's unique ecosystems, further speeding up the rate of deterioration of ecological services and erosion of forest genetic in that particular area.

Peatland forests in the country play an important role in carbon sequestration and wetland forests, including the natural water bodies. They are very important for the environment-associated disaster mitigation especially in reducing the occurrence of flash floods during heavy



downpours. Wetlands are the most effective water storage system that can regulate the water level and flow of freshwater into the sea. Sudden flow of freshwater to the sea can spoil the coastal marine ecology especially the tropical rainforest under the shallow sea just near the coast of Brunei Darussalam.

Most of the wetland and peatland areas are under the state land status and therefore, under the control and administration of Land Department, Ministry of Development. However, a few have been gazetted under the Museums Department, Fisheries Department, and Forestry Department to be used and managed sustainably by the respective sector. Hence, legislatively, some of the areas are administered by the department concerned. However, forestry is the major land use of these peatland and wetland areas in which majority are managed for forestry uses mainly for conservation purposes. Even though general forests on the state land are still protected by the Forest Act, Chapter 46 of Brunei Laws, the regulatory provisions for peatland and wetland forests on the state land, are only for harvesting purposes. Any logging activities should be within the department's legal jurisdiction especially on the issuance of logging licenses to the logging companies.

With the new development, under the Brunei Heart of Borneo Initiative, most of these wetland and peatland areas both on forest reserve and state land areas within the designated Brunei HoB initiative should be subject to Brunei HoB's sustainable management regime and guiding principles of sustainable development through the HoB National Council. The Council pro-



vides a negotiating platform and formulates integrated approaches to land use and forest development based on multi-sectoral participation process in accordance with the present and relevant legal and policy framework on environmental protection and stability, wildlife and its habitat protection, and land use management.

The latest report on the National Master Plan 2006-2025 by the Town and Country Planning, Ministry of Development recognizes the designated area for Brunei HoB Initiative and some reserved forest areas for the purpose of protection and conservation. Even though there are remnants of logging activities within these lands, the regulatory provisions stipulated within the forest act have been stepped up by the administrative forest policy introduced in 1989. Environment Impact Assessment (EIA) under Environment Pro-

tection and Management Order 2010 will be introduced for all development projects that involve massive conversion of forests or change in natural ecosystems. Under purview of the Brunei HoB Initiative, a few related research and development activities have been undertaken to develop the database on forest biodiversity that will enhance the conservation values of these areas.

Brunei Darussalam has recently ratified relevant international multilateral agreements on environment protection and has been very responsive to the global agenda on climate change. Such involvement in the international process will increase the relevance of the national strategic efforts on wetland and peatland conservation. Carbon payments from these areas can provide a sustainable source of income to support the country's econom-

ic diversification efforts. The local communities involved will also benefit from the conservation governance as the rich diversity of mammals, birds, orchids, insects and amphibians on these areas will attract a steady inflow of ecotourists and nature enthusiasts. As a result, these activities will provide additional income for the local communities.

In view of their significant socio-economic values, it is important that educational efforts are intensified to raise awareness on the conservation of peatland and wetland forests in relation to environmentally sound land use and climate change policies. Under Brunei HoB Initiative, continuous environmental education and awareness, with focus on community outreach programmes, should be promoted. Preservation of indigenous knowledge should also be one of the strategic thrusts of Brunei HoB Initiative. Actions proposed under the project implementation framework of Brunei HoB Initiative are: develop a communications strategy; develop a community reforestation programme; institutionalize environmental education at all levels of formal education; develop environmental awareness programmes for adults; establish the Brunei HoB biodiversity field course; and document indigenous knowledge.

Brunei HoB Initiative envisions that these important forest types, as part of networks of protected forest within the designated HoB Initiative area, will continue to contribute to the sustainable economic development of Brunei Darussalam. ■

**Mahmud Yussof is CEO of the Heart of Borneo Centre of Brunei Darussalam's Ministry of Industry and Primary Resources.*

AN INITIATIVE BY:



Apfp - SEApeat
ASEAN Peatland Forests Project - Sustainable Management of Peatland Forests in Southeast Asia

ASEAN PEATLAND MEDIA AWARD

Peat for Life

TELL US ABOUT PEATLAND STORIES IN SOUTHEAST ASIA

1ST PRIZE
USD1,000 + CERTIFICATE

2ND PRIZE
USD500 + CERTIFICATE

3RD PRIZE
USD300 + CERTIFICATE

INCLUSIVE OF 3 DAYS,
2 NIGHTS STAY IN THE
FRANGIPANI LANGKAWI
RESORT & SPA



HOW TO ENTER?
VISIT US AT
WWW.ASEANPEAT.NET



© Yusuf Ahmad



© Kuvinn Mallar

AWARD FOR THE MOST OUTSTANDING PRINT MEDIA

An investigative or explanatory feature on peatland related topic.

Eligibility: reports, newspaper, magazines, books or any other paper-based publications.

AWARD FOR THE MOST OUTSTANDING NEW MEDIA

Peatland feature or commentary.

Eligibility: Content is accessible online by public. (e.g. all online portals, blogs, video etc.)

* terms and conditions applied.

CLOSING DATE:
31ST DEC 2013

OPEN TO
INDIVIDUALS / STUDENTS / JOURNALISTS
(MINIMUM 18 YEARS OLD)

Interested in environmental issues and had **writings or coverage (related to peatland) published in any form of media (eg. electronic, print and broadcast)** that are accessible to public from **1ST JAN - 31ST DEC 2013.**

ORGANIZED BY:



Global Environment Centre

SUPPORTED BY:



Enabling poor rural people to overcome poverty



GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET



European Union

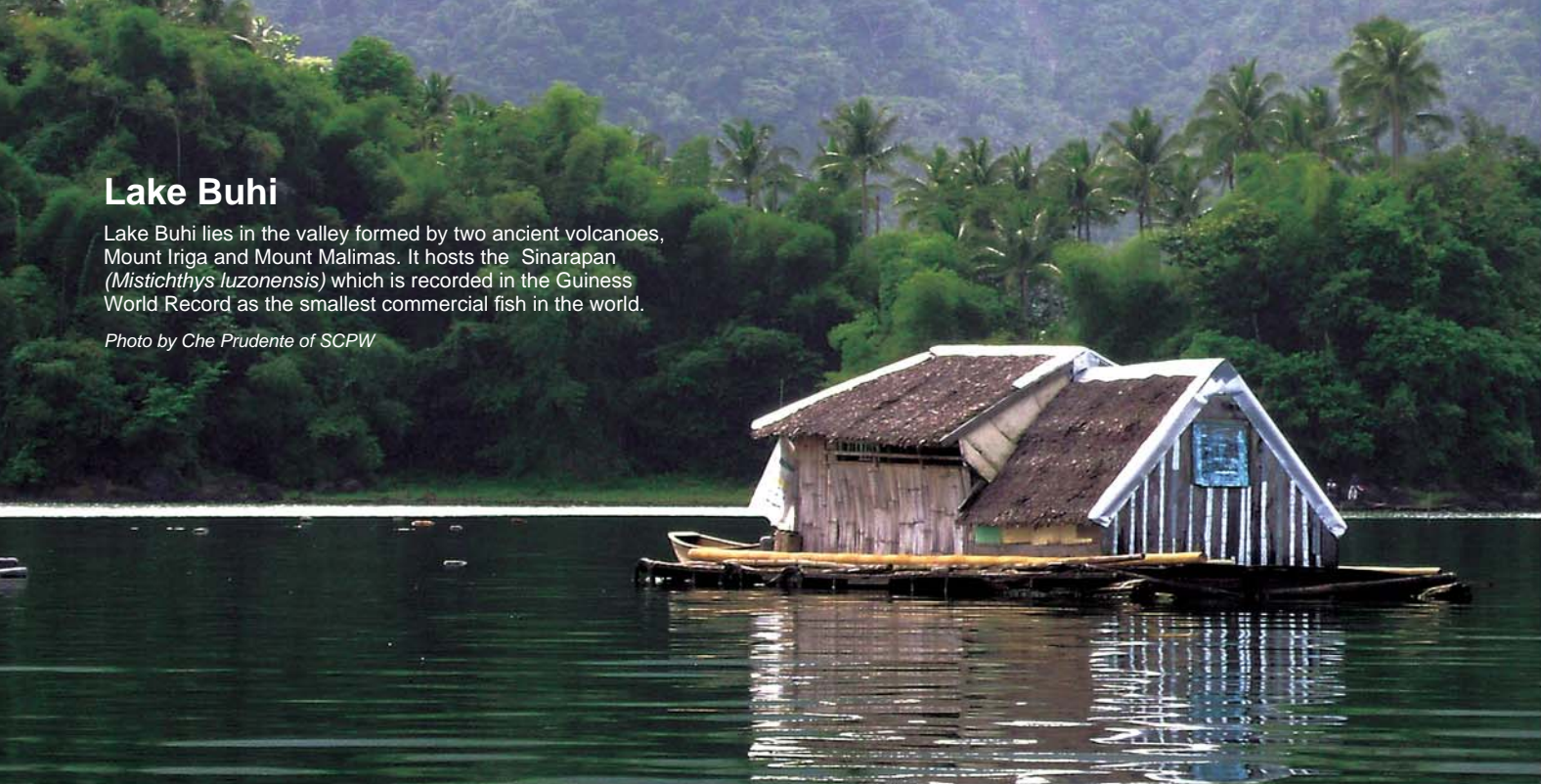


The Frangipani Langkawi
Resort & Spa

Lake Buhi

Lake Buhi lies in the valley formed by two ancient volcanoes, Mount Iriga and Mount Malimas. It hosts the Sinarapan (*Mistichthys luzonensis*) which is recorded in the Guinness World Record as the smallest commercial fish in the world.

Photo by Che Prudente of SCPW



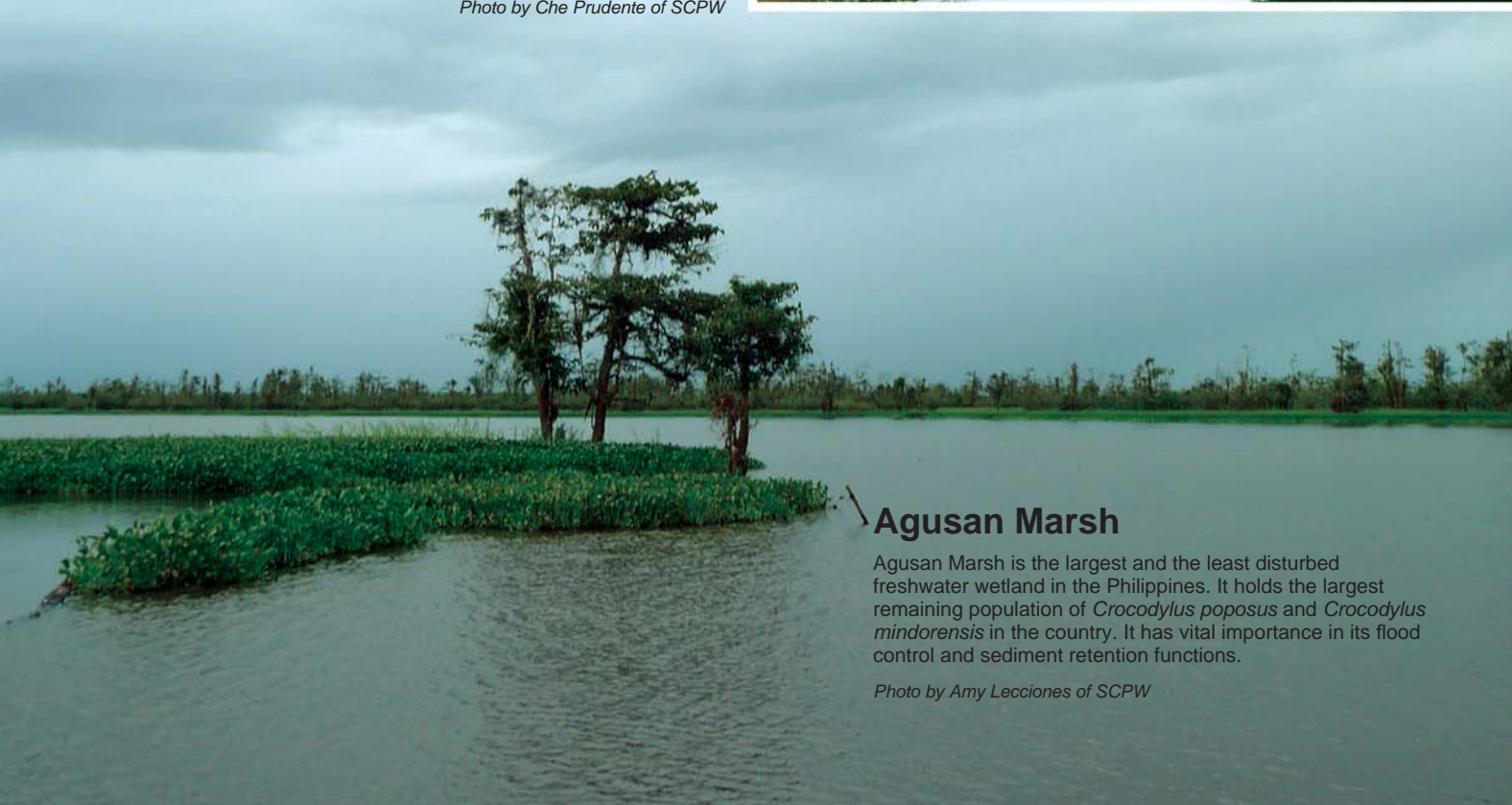
WETLANDS OF THE PHILIPPINES

By the Society for the Conservation of Philippine Wetlands

Bongsanglay Mangroves

Bongsanglay Mangroves in Batuan, Masbate is one of the country's remaining old growth mangrove forests in the Philippines. Its mangrove forest has the rare distinction of having all the three species of the mangrove family Sonneratiaceae – pagatpat, (*Sonneratia alba*), pedada (*S. caseolaris*), and pagatpat-baye (*S. ovata*), which is said to be the rarest of the three *Sonneratia* species.

Photo by Che Prudente of SCPW



Agusan Marsh

Agusan Marsh is the largest and the least disturbed freshwater wetland in the Philippines. It holds the largest remaining population of *Crocodylus poposus* and *Crocodylus mindorensis* in the country. It has vital importance in its flood control and sediment retention functions.

Photo by Amy Lecciones of SCPW

Lake Balanan

Lake Balanan in Siaton, Negros Oriental, is home to close to a hundred dalakit/balete trees. The earthquake in May 1925 caused a massive landslide on both sides of the Balanan and Nasig-id ridges that formed this scenic 24-hectare lake.

Photo by Karen Discaya of SCPW



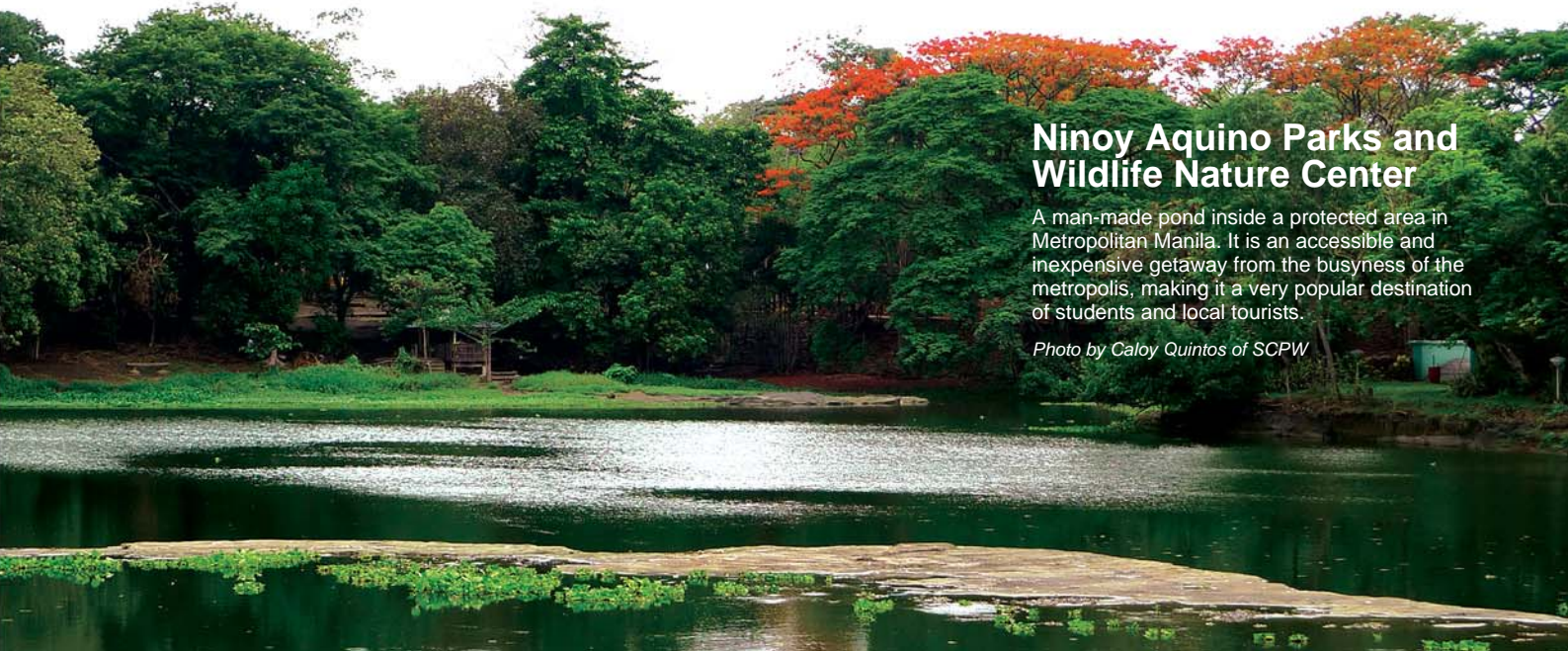
Photo by Karen Discaya of SCPW



Photo by Cynthia Layusa of SCPW

Apo Island

Apo Island in Dauin, Negros Oriental was declared a Protected Landscape and Seascape in 1996. The residents of the island appreciate the importance of establishing the fish sanctuary and understand its role as the breeding ground and nursery for fish, and actively participate in the protection of the island's resources.



Ninoy Aquino Parks and Wildlife Nature Center

A man-made pond inside a protected area in Metropolitan Manila. It is an accessible and inexpensive getaway from the busyness of the metropolis, making it a very popular destination of students and local tourists.

Photo by Caloy Quintos of SCPW



Ba Be National Park in Viet Nam

Wetlands management in Viet Nam

By Nguyen Xuan Dung, Msc and To Thuy Nga, Msc*

There are two groups of wetlands in Viet Nam – inland wetlands and coastal wetlands. The five most important categories of wetlands in Viet Nam include estuarine wetlands of the Red River Delta, the lagoon system in central Viet Nam, wetlands in the Mekong Delta, lakes and reservoirs, and some other unique and important wetland types.

Estuarine wetlands cover 229,762 hectares, occupying 76 percent of the total natural area of the delta. Freshwater wetlands cover 103,373 hectares of the Red River Delta. Wetlands area in the Mekong Delta covers 4.9 million hectares, which includes inland wetlands and coastal wetlands with a depth of less than six meters at low tide (Southern

Sub-FIPI, 2003). Viet Nam has approximately 155,290 hectares of mangrove forests, of which natural mangrove forests cover 32,402 hectares (21 percent) and planted mangrove forests cover 122,892 hectares (79 percent).

According to the Ministry of Natural Resources and Environment or MONRE (2004), Viet Nam has more

than 10 million hectares of wetlands. Over the last 15 years, the natural area of wetlands has been reduced while artificial wetlands have increased. Natural mangrove forests are being converted into aquacultural ponds, tourism facilities, and planted forests. Over the past 20 years, 183,724 hectares of mangrove forests have been lost while aquaculture areas have increased to 1.1 million hectares in 2003. The total area of coastal wetlands in 1982 was 494,000 hectares, and has increased up to 606,792 hectares in 2000 due to an expansion of shrimp ponds (Do Dinh Sam et al., 2005).

Tidal wetlands in estuarine areas of the Mekong Delta have decreased in area from 1,473,889 hect-

ares in 1995 to 1,409,289 hectares in 1999. Data reported by the Southern Institute of Water Resources have shown that more than 50 percent of the total area of the Mekong Delta (approximately two million hectares) is currently affected by salinisation, one of the reasons for this phenomenon is the loss of mangrove forests along the coast.

Services provided by wetlands

Provisioning services: Wetlands bring direct benefits to human, substantially contributing to the national economy, especially to sectors such as agriculture, forestry, and fisheries. They also ensure the food security for the country and maintain

genetic resources for livestock and crops. Moreover, wetlands provide construction materials, fuel, and pharmaceutical materials.

Cultural services: Ecosystems and naturally beautiful landscapes are the origin – many traditions, customs, and practices of Vietnamese people. Since thousand of years ago, the cultural life of Vietnamese people has been close to the nature. For instance, the Lotus – a typical wetland plant – has become a common symbol in the carving works of temples and pagodas, in folk songs, and dances, and has recently become the logo of Viet Nam Airlines. The Demoiselle (or crane) and dragon are two species of animals closely associated with wetland habitats and have been historically classified among four sacred animals in Viet Nam. Vietnamese traditional water puppetry is a unique art with a direct connection to wetlands

Regulating services: The services and functions of ecosystems include climate regulation through carbon storage and rainfall control, groundwater reserve, air and water filtering, waste decomposition in the environment, and mitigation of negative impacts of natural disasters such as landslides and typhoons.

Supporting services: Though not bringing direct benefits to humans, wetlands are essential in the functions of ecosystems, affecting all kinds of other services. Notably, 80 percent of Viet Nam's population is settled within wetlands.

Main pressures on wetlands

Fishing by unsustainable methods: Destructive fishing techniques such as the use of explosives, poisons, and electricity to catch fishes, which are widespread in both inland and coastal regions, pose significant threat to more than 80 percent of Viet Nam's coral reefs.

In the early days of 2010, according to the Sub-Department for Aquatic Resource Exploitation and Protection in Ca Mau province, the electric shock fishing which destroyed fish and shrimp resources on the Western sea went beyond control and became complicated. It is alarming that, in addition to using wherries and scratching, for inshore fishing, electric shock fishing was also used. The fishery protection force discovered a lot of fishing boats with electric shock equipments with capacity of 40 to 100 CV used for exploiting aquatic products.

Land and water conversion without proper scientific basis: According to statistics, the sand area from Ha Tinh to Ninh Thuan provinces is 85,100 hectares. Since 1999, shrimp farming, amenity placer mining, and resort development have destroyed thousands of hectares of sand in the Central Coast. The vast natural tidal areas in the estuary of rivers in the Northern and Southern deltas have also dwindled due to conversion into clam ponds. Tra and basa fish farming with high density in the Mekong Delta is also a cause of potential environmental pollution due to the residue of food for fish with high nutrients without full decomposition.

The construction of dams, reservoirs, roads, and other infrastructure has directly caused the degradation and fragmentation of ecosystems, creating barriers to the migration of species and loss of natural habitats. Dams and reservoirs have huge impacts on the downstream areas which reach even coastal estuaries. Construction of dams-reservoirs has caused loss of natural forests, barriers to the migration paths of fishes, and fragmentation of rivers. The "too-hot" development of small and medium hydropower plants

recently has revealed numerous shortcomings and problems. Many hydropower reservoirs in operation have not followed a proper process in terms of flood discharge scheme and environmental flow maintenance, which caused human and economic damages, and affected downstream ecosystems.

According to statistics, there are about 94 different species belonging to 31 families, including 42 invasive species. Typical 12 invasive plants are developing rapidly such as mimosa trees, para grass, torpedo grass, and water hyacinth. The Ministry of Agriculture and Rural Development or MARD (2009) published a list of 48 alien aquatic animals introduced into Viet Nam through various paths. Among them, 14 species are considered to have adverse impacts on biodiversity in water and traditional aquaculture, and needed to be watched closely in farming facilities and destroyed in natural waters. In Viet Nam, there is no comprehensive assessment of damages and losses caused by invasive alien species. However, some observed evidences and research data show that invasive alien species are threats to biodiversity, human health, society and economy in Viet Nam.

Environmental pollution and climate change: The general environmental quality in Viet Nam has deteriorated. According to the 2010 National Environmental Report, environmental pollution has increased in many aspects. Surface water environment in most urban areas and in many river basins has been polluted with organic matters and typical pollution parameters exceeding their permitted standards many times; the most prominent is pollution



in the basin of Nhue-Day and Dong Nai Rivers. Environmental pollution is a threat to biodiversity, causing death and reducing the number of individuals, indirectly destructing habitats of both terrestrial and underwater wildlife species.

Viet Nam is one of five countries most affected by global climate change. Fragmented ecosystems are certainly more vulnerable to the change and would suffer loss of species at a very high rate. If the sea level increases from 75 centimeters to 1 meter, about 20 to 38 percent of the Mekong Delta and about 11 percent of the Red River Delta would be flooded. Also in the scenario, 78 important natural habitats (27 percent of the total), 46 protected areas (33 percent), 9 biodiversity sites of national and international importance (23 percent), and 23 other important biodiversity sites (21 percent) in Viet Nam would be severely affected.

Wetland management in Viet Nam

System of legal documents on wetlands

Since the early 1960s, Viet Nam has carried out institutional and legislation reforms. It issued a number of laws related to the conservation and sustainable use of biodiversity. Among pieces of legislation that were passed were the Law on Forest Protection and Development in 1991 (amended and supplemented in 2004), the Land Law in 1993 (amended and supplemented in 1998 and 2003), the Environmental Protection Law in 1993 (amended and supplemented in 2005), the Fisheries Law in 2003, and most recently the Biodiversity Law approved by the National Assembly in 2008, which took effect on 1 July 2009.

On 23 September 2003, the Prime Minister issued Decree number 109/2003/ND-CP, which stipulates the mandates and functions of ministries, sectors, and localities on wetland conservation and the sustainable development of wetlands. Other laws include Circular No. 18/2004/TT-BTNMT issued on 23 August 2004 on the conservation and sustainable development of wetlands and Decision No. 04/2004/QD-BTNMT issued by the Minister of MONRE on 5 April 2004 on the approval of the Action Plan on Conservation and Sustainable Development of Wetlands for the 2004-2010 period. The Viet Nam National Biodiversity Strategy and Action Plan to the year 2015 and vision to the year 2020 currently are being drafted.

The Fisheries Law (2003) stipulates two protected area systems including inland water and marine protected areas with three categories: national parks, protected areas for species and habitats, and aquatic resource reserves. The Law on Forest Protection and Development (2004) is a very crucial document for the protection of forest ecosystems, which are the largest in area and rich in biodiversity with many important values to society. The Environmental Protection Law (2005) stipulates that areas and ecosystems of regional and international importance must be inventoried, assessed, and planned for protection.

State management in biodiversity conservation

In Viet Nam, the MONRE and MARD are the two main agencies responsible for state management of biodiversity. The Ministry of Natural Resources and Environment, as the focal point for implementation

of the Biodiversity Law, is continuing to develop a number of guidance documents and the National Biodiversity Action Plan. Other related ministries, sectors, and provincial people's committees will cooperate in implementing this task.

After joining the Ramsar Convention, Viet Nam issued a number of legal documents to demonstrate its compliance to obligations defined by the Convention. In 1989, Viet Nam designated the Xuan Thuy wetland site in Giao Thuy District of Nam Dinh Province to the List of Wetlands of International Importance. Xuan Thuy was the first Ramsar site in Southeast Asia, and the 50th Ramsar site in the world. Currently, there are five Ramsar sites in Viet Nam including: Bau Sau, Cat Tien National Park; Ba Be lake, Ba Be National Park; Tram Chim National Park; and Mui Ca Mau National Park. Viet Nam is in the process of designating more sites to the List, as well as establishing more wetland nature reserves.

Between 2006 and 2011, Viet Nam witnessed a number of significant events particularly important to biodiversity conservation. During this period, the legal framework for biodiversity conservation has been boosted by many important documents, especially the Biodiversity Law. Prime Minister's decision No. 79/2007/QD-TTg approving the "National Biodiversity Action Plan to 2010 and orientations to 2020 for the implementation of the Convention on Biological Diversity and the Cartagena Protocol on Biosafety" is an important legal basis for biodiversity conservation from the central to the local level to be gradually consolidated. The system of all terrestrial, inland water, and marine protected areas

continues to be improved so biodiversity conservation activities can be effectively implemented.

Communication and awareness raising activities on biodiversity for managers at all levels, the public, and students, have been given attention.

With the current status of biodiversity, as well as the opportunities and challenges for biodiversity conservation, special focus will be trained on orientation for biodiversity conservation in the next five years. This includes focusing on improving the system of legal documents for the implementation of the Biodiversity Law including wetland; developing and implementing the National Biodiversity Strategy to 2020 for the implementation of the Convention on Biological Diversity and the Cartagena Protocol on Biosafety; and planning and implementing the master plan for biodiversity for the whole country.

Also included are strengthening and developing the state management agencies in biodiversity conservation; socializing biodiversity conservation; developing financing mechanisms for conservation activities; integrating biodiversity conservation; establishing and managing in a unified way the biodiversity database; and strengthening international cooperation on biodiversity conservation. ■

** Nguyen Xuan Dung is director of Administrative Office at Viet Nam's Biodiversity Conservation Agency (BCA). He is also the ASEAN Centre for Biodiversity's National Contact Point in Viet Nam. To Thuy Nga is an official at the Office of Viet Nam Environment Administration (VEA).*

Constructing a set of indicators for Viet Nam's wetland biodiversity

By Hoang Thi Thanh Nhan*

To assess the status and evolution of wetland biodiversity in Viet Nam, there is a need to set in place a wetland biodiversity monitoring programme. Playing a key role in this process is the identification of indicators of biodiversity monitoring. This paper refers to the results of initial studies for the proposed indicator set of biodiversity monitoring of wetlands in Viet Nam.

Biodiversity indicators, according to the United Nations Environment Programme – World Conservation Monitoring Centre (UNEP-WCMC), utilize quantitative data to measure aspects of biodiversity, ecosystem condition, services, and drivers of change, to help understand how biodiversity is changing over time and space, why it is changing, and

what the consequences of the changes are for ecosystems, their services, and human well-being. They form an essential part of monitoring, assessment, and decision-making, and can often be integrated, to give a rounded view of the status of biodiversity, ecosystems services or regions. These indicators are designed to communicate information quickly and

simply to policy- and decision-makers.

SCBD and wetland biodiversity monitoring indicator set

In order to build the monitoring indicators of biodiversity, the Secretariat of the Convention on Biological Diversity (SCBD) proposed to apply the Pressure - State - Response (PSR) framework because it is compatible with the objectives of biodiversity conservation. So far, the biodiversity convention itself and the member states have been applying this approach in the process of building their monitoring indicator sets.

The SCBD proposed an indicator set of inland wetland biodiversity monitoring consisting of 24 indicators and an indicator set of coastal wetland biodiversity monitoring of 13 indicators.

Ramsar Convention and wetland biodiversity monitoring indicators

To construct wetland monitoring indicators, the Ramsar Convention also identified indicators to assess the status and trends of ecosystems, habitats and species, pressure and threats to biodiversity, and responses to address those pressures. Thus, like the CBD, the Ramsar Convention also applied the PSR framework to construct wetland monitoring indicators. By 2005, the Ninth Meeting of the Conference of the Parties to the CBD (COP 9), adopted a set of wetland monitoring indicators. Eight priority indicators were applied immediately, while five indicators will continue to be built over time. Each indicator had a number of sub-indicators focusing on specific aspects of each indicator.

Research related to biodiversity monitoring indicators in Viet Nam

In 1999, Dr. Nguyen Xuan Huan and Dr. Nguyen Xuan Quynh looked into building a system of parameters and monitoring process on changes in biodiversity for the estuary ecosystem of Bach Dang and Ba Lat under the Environmental Protection Agency. The research initially simply identified indicators of biological diversity and the application of the indicators in the research community.

In 2007, the Environmental Protection Agency worked on developing process, procedures, and parameters for biodiversity monitoring in Viet Nam. The



U Minh Thuong National Park, Viet Nam

Photo by Chin Sing Yun/GEO

agency sought to propose a set of biodiversity monitoring indicators for ecosystems: forests, wetlands (inland) and the coast in Viet Nam, in which the set of inland wetland monitoring indicators included 15 indicators. The set of marine and coastal biodiversity monitoring contained 12 indicators.

In 2010, Hoang Thi Thanh Nhan, et al. studied some parameters and processes for wetland biodiversity monitoring in Viet Nam, proposed wetlands biodiversity monitoring indicators and a wetland monitoring programme for Viet Nam as well as built a biodiversity monitoring programme for Xuan Thuy National Park in Nam Dinh.

In 2010, Tran Dinh Lan, et al. developed indicators of sustainable development of wetland resources in the West of Gulf of Tonkin. The authors came up with a basic set of environmental indicators including 30 indicators and calculated the index of assessing reefs and tidal flats ecosystems along the west coast of the Gulf of Tonkin.

The set of wetland biodiversity monitoring indicators in Viet Nam

Objective: Develop an indicator set to be used for monitoring biodiversity in wetland ecosystems in Viet Nam in accordance with actual conditions and responding to the management of biodiversity in the country.

Principles: From the experiences of building and selecting biodiversity monitoring indicators in general, wetlands have been analyzed in this study. The construction of wetland biodiversity monitoring indicators in Viet Nam country can be summarized as follows:

- Each indicator selected considered the possibilities of direc-

Table 1: Set of wetland biodiversity monitoring indicators proposed to be applied for Viet Nam

Signal	Name of indicators	Centre of indicators
Group of pressure indicators (P)		
P1	Water quality: temperature, DO, turbidity, pH, salinity, NO ₃ , NH ₄ , PO ₄ , SiO ₂ , BOD, COD, <i>E.coli</i> , heavy metals: Pb, Hg, CN, Mn, Fe.	Level of nutrients, metal pollution, biodiversity impacts and aquatic resources
P2	Activities of excessive or illegal exploitation of fisheries resources (number type tools of fisheries exploitation in coastal waters; Quantity and toxicity of chemicals and explosives used fishing reefs; number of electronic tools using to fish).	Indicates the level of excessive exploitation, destruction operators affecting aquatic ecosystems and resources
P3	The number of works affecting the ecosystems (hydropower, irrigation (dams, spillways), roads, bridges, ports, mining of sand, gravel, etc.)	Divided, narrow, habitat disturbance affecting the survival and development of aquatic organisms
P4	The number and impact of invasive species	Impacts on native aquatic species, reducing biodiversity
P5	Population growth and population density in river basin, lakes / coastal	The exploitation level of biological resources increases the influence on the environment
P6	Annual number of tourists	Increase the amount of waste, impact environments and ecosystems of coastal and inland wetland
Group of status indicators (S)		
S1	Diversity of Fish species	Diversity of fish fauna; expression of water ecosystem health
S2	Diversity of waterfowl in migratory season	Diversity of waterfowl fauna; expression of wetland ecosystem health
S3	Area and changes in wetland area (area total, area ratio of habitat, characteristic ecosystem on the total area of the wetland area)	Expression of ecosystems health with the size of organism populations in typical wetland areas
S4	Aquatic plants: species composition and distribution (mangroves, seaweed, seaweed, etc.)	Expression of biodiversity levels
S5	Plankton diversity	Expression level of aquifer biodiversity
S6	Diversity of big size invertebrates has in the bottom	Expression level of bottom biodiversity
S7	The indicator species	Indicators of environmental quality, as the basis for implementation of water environment monitoring
S8	Production of natural fisheries exploitation	Abundance level of resource
S9	Number of rare aquatic species are threatened with extinction; endemic	Development indicators and the degree of reduction of rare aquatic genetic resources
Group of response indicators (R)		
R1	Rate of area of marine conservation, conservation of inland waters in an area of natural waters	Increasing ability of biodiversity conservation
R2	Percentage of costs for biodiversity conservation compared to the total cost of environmental protection	Effective protection of the environment
R3	Number of environmental protection projects; management and sustainable use of natural resources; programs of increasing awareness on biodiversity conservation are done in the area/ year	Impact on habitat protection and biodiversity
R4	Relevant legal documents	Impact on habitat protection and biodiversity

tion about biodiversity levels that directly or indirectly affected ecosystem health and the aquatic organism community;

- For each indicator, the selection criteria was simple, easy to understand, easy to measure, inexpensive, and had appropriate scientific reliability; and
- The set of indicators was built based on the PSR framework.

After conducting further studies and receiving comments from experts in many scientific conferences, a set of wetland biodiversity monitoring indicator was proposed for Viet Nam. The full set includes 19 potential indicators for monitoring wetlands in Viet Nam.

Based on actual conditions, there may be many organizations which have different abilities in the funding and technology required for

wetland biodiversity monitoring. This prevents them from using all 19 indicators. Depending on the type of wetland, one can select appropriate biodiversity monitoring indicators from the list of 19 indicators.

The issues need to be further studied

The set of biodiversity monitoring indicators proposed for wetland ecosystems should be further tested in particular wetland areas. It also needs to be edited and submitted to competent authorities for promulgation. A set of indicators is one of the tools necessary for the conservation and sustainable development of wetlands in Viet Nam. ■

* *Hoang Thi Thanh Nhan is deputy director at the Biodiversity Conservation Agency, Viet Nam Environment Administration, Ministry of Natural Resources and Environment.*

References:

- Ministry of Science, Technology and Environment, 2001. *The valuable wetlands of biodiversity and the environment in Viet Nam*
- Biodiversity Indicators Partnership, 2011. *Guidance for national biodiversity indicator development and use*. UNEP World Conservation Monitoring Centre, Cambridge, UK
- CBD, 1997a. *Recommendations for a core set of indicators of biological diversity*. UNEP/CBD/SBSTTA/3/Inf.13 Montreal, Canada, Secretariat of the Convention on Biological Diversity.
- CBD, 2003. *Monitoring and Indicators: Designing National-level Monitoring Programmes and Indicators*.
- CBD, 2003. *Developing indicators for national-level monitoring of biodiversity*. A draft of the meeting held from 10 to 12 February 2003 in Montreal.
- CRC, 1997. *Biodiversity measuring and monitoring certification training*. Aquatic invertebrates fish and aquatic biodiversity, volume 6.
- Viet Nam Environment Protection Agency, 2007. *Construction normative process of parameters monitoring of biodiversity in Viet Nam*. Final report of task, 170 p.
- Hoang Thi Thanh Nhan, 2010. *Study some parameters, process of monitoring wetland biodiversity of countries*. Report of the results of the subject of Science and Technology, Ministry of Natural Resources and Environment.
- Le Dien Duc, 1989. *Wetland Inventory of Viet Nam*, Center for Resource and Environment Studies, Hanoi National University. Faculty in Hanoi University of Science and Technology.
- Nguyen Huy Yet et al., 2010. *Assess the level of degradation of coastal ecosystems in Viet Nam and propose sustainable management solutions*. Report of the results of science and technology topics, program of KC.09/06-10.
- Scott, D.A.(ed.), 1989. *A Directory of Asian Wetland*, IUCN, Gland Switzerland and Cambridge UK
- UNEP, WCMC, CBD, 2009. *The Ramsar Convention on Wetlands and its indicators of effectiveness*. International Expert Workshop on the 2010 Biodiversity Indicators and Post-2010 Indicator Development.

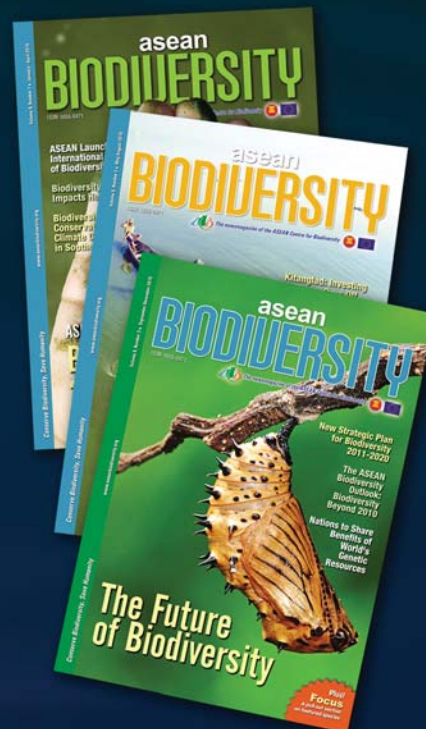
ASEAN Biodiversity magazine online

For in-depth information and news on biodiversity across Southeast Asia, check out the ASEAN Biodiversity Newsmagazine, the international publication of the ASEAN Centre for Biodiversity (ACB)!

ASEAN Biodiversity features special reports on biodiversity-related themes in the ASEAN context, such as climate change, ecotourism, transboundary protected areas, and ASEAN Heritage Parks. Profiles on protected areas provide information on the status of habitats and wildlife, and interesting activities in the parks. The magazine also features ongoing programmes and activities of ACB that assist ASEAN Member States in addressing various biodiversity conservation issues.

ACB welcomes contributions from volunteer writers and photographers who want to help popularize biodiversity. Interested parties may contact Mr. Rolando Inciong, Editor-in-Chief of ASEAN Biodiversity at rainciong@aseanbiodiversity.org, or Ms. Leslie Castillo at lavjose@aseanbiodiversity.org, or call ACB at (+632) 928-3210 and (+632) 929-4147.

For more information visit the ACB website at www.aseanbiodiversity.org.



Migratory bird conservation requires international cooperation and effort

By Judit Szabo and Minseon Kim *

The skies have been dense with waterbirds migrating over Southeast Asia for thousands of years. This phenomenon is threatened to be stopped within a single generation as pieces of evidence point to a looming ecological crisis and the collapse of migratory bird populations.

One of the wonders of the natural world is animal migration. To take advantage of temporally available resources and to escape harsh conditions or lack of food, some animals cover huge distances swimming, walking or flying. Birds are one of the best-known and most spectacular examples. Large soaring birds, such as storks, pelicans and raptors migrate during the day often in large flocks while most shorebirds and passerines travel less conspicuously, in smaller flocks and during the night.

These movements are often evolutionarily predetermined. In long-lived species the same individuals use the same routes to the same non-breeding sites and return to their birth sites year after year. Subsequent generations follow the traditional routes be-

cause these stopover sites have traditionally provided the food, habitat and safety that migratory birds depend on. The major migratory routes around the world are called flyways – these are avian superhighways that get very busy twice a year – southbound during

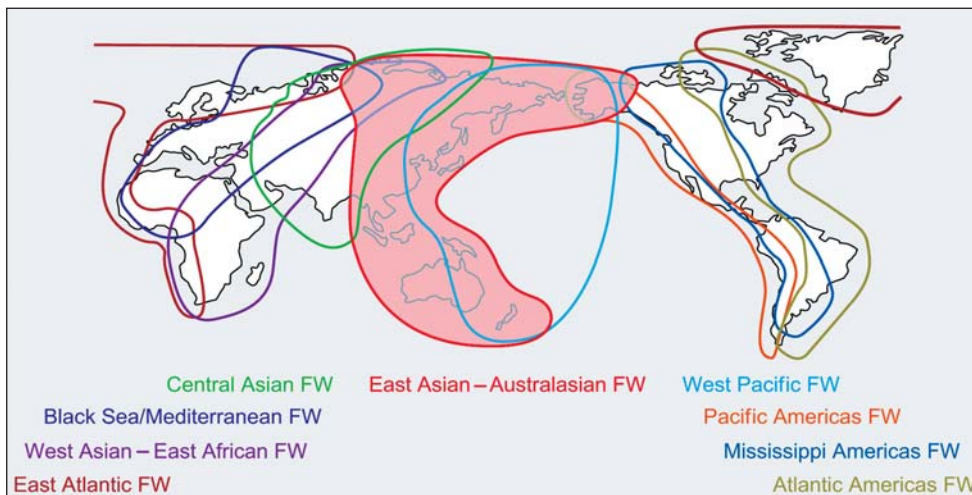
the northern autumn and northbound in the northern spring.

The East Asian-Australasian Flyway (EAAF) is one of the nine global flyways. It connects breeding, staging and stopover areas between the Arctic Circle in Russia and Alaska where most species breed to Australia and New Zealand through East and Southeast Asia. This flyway is indeed very busy – it is used by about 50 million individual birds of over 200 species. The avian passengers are diverse and

of all shapes and sizes from the 25-gram Red-necked Stint to the 15-kilogram Mute Swan and includes shorebirds, storks, ducks and pelicans. It is indeed a superhuman effort from the tiny Stint to complete a 23,000-kilometer round trip every year. However, the 22 Flyway countries are also home to 45 percent of the world's people, many of whom depend upon the wetlands and other habitats along the EAAF for their livelihoods.

Unfortunately, birds and people are often competing to use the same space and resources – and the birds seem to be losing these battles. As an example, intertidal habitats (such as beaches, marshes, mudflats, mangroves and sea-grass beds) in East Asia are being lost at an alarming rate, comparable to the well-publicized loss of tropical rainforests.

In East Asia, intertidal habitats are disappearing at a much higher rate than elsewhere in the world. In fact, during the last 30 years some countries have lost more than half their coastal wetlands. These natural areas have been lost due to industrial, urban, agricultural and infrastructure conversion and expansion. In addition to direct habitat loss, human-caused pollution, loss of water supply, and climate change have affected remaining wetlands



The nine global migratory flyways

that support both migratory and locally-breeding birds. Increased human disturbance and predation by invasive alien species like rats and foxes cause extra mortality, pushing some species closer and closer to extinction.

Migratory waterbirds depend on a chain of highly productive wetlands to rest and feed in order to build up sufficient energy to fuel the next phase of their journey, so with the loss of these habitats and the direct persecution of the birds, it comes as no surprise that this flyway has the highest percentage of declining birds (75 out of 256 populations) and globally threatened species (33). Several migratory species have suffered extensive declines over the last 30 years. At some wintering sites the Far Eastern Curlew declined by about 40 percent and Curlew Sandpiper by nearly 80 percent. We have to act

now to turn around these alarming declines otherwise these birds and their spectacular migration will be lost forever. Local action is needed but is often not enough. Coordinated international cooperation is necessary to address common and shared threats in order to save species, habitats and associated natural heritage.

The East Asian-Australasian Flyway Partnership (EAAFP) was established in 2006 to support international cooperation for the conservation of migratory waterbirds, their habitats and the livelihoods of people that depend on them. The purpose of the EAAFP is to provide a flyway-wide framework to promote dialogue, cooperation and collaboration between a range of stakeholders including all levels of governments, site managers, academic and non-government organisations, private sector and

community groups and local people to conserve migratory waterbirds and their habitats.

The Partnership comprises 29 partners from governmental, intergovernmental, and non-governmental organizations all working for this common goal. The EAAFP has developed and is maintaining the Flyway Site Network, currently consisting of 110 sites that meet criteria for international importance for migratory waterbirds. Designation of a site gives it a higher recognition which hopefully brings better protection, monitoring and management. Additionally, there are currently about a thousand sites recognized as internationally important to migratory waterbirds along the flyway, many of which are located adjacent to human settlement and vulnerable to pressures from rapid social and economic development.

Being part of the Flyway Site Network (FSN) opens up greater opportunities for site managers to communicate and share information for improved site management. By participating in EAAF Site Manager Workshops and participating in EAAF Sister Site arrangements. This will contribute to improved delivery of local and broader-based flyway conservation outcomes.

World Migratory Bird Day is an annual global awareness-raising campaign highlighting the need for protection of migratory birds and their habitats. Together with World Migratory Bird Day Partners, EAAFP encourages national and local governments to promote waterbird awareness-raising and education activities to highlight the plight of waterbirds and their habitats. The survival of migratory birds depends on the availability of well-connected habitat networks along



Terek sandpiper with a legflag representing Queensland state in Australia

Research actions

Color marking helps to understand the migratory routes and strategies of individual species. This understanding can support their better conservation and management. Besides a small metal ring, birds get a flag with a number or flags of a unique combination of colours according to the country where they were captured. There are already over 17,000 sightings of marked birds from throughout the flyway. Terek sandpiper with green flag representing the state of Queensland in Australia. ■

Task Forces

One of the task forces of the EAAFW has been created to conserve the Spoon-billed sandpiper. Breeding in the tundra of the Chukotka and Koryakia regions of Russia, most Spoon-billed sandpipers migrate to spend the winter in Bangladesh and Myanmar while some go to Viet Nam, Thailand and southern China. As the current population estimate is 120 to 220 pairs, this bird is one of the rarest long-distance migrants in the world and is designated Critically Endangered on the IUCN Red List. The causes of its rarity are hunting and trapping at wintering sites and destruction and conversion of tidal mudflats at stopover sites along the Yellow Sea. The Task Force has identified critical sites for the species and worked with local organizations and communities to reduce hunting pressure and raise awareness of the value of these sites. ■



Spoon-billed sandpiper at its Siberian breeding ground



Bako-Buntal Bay has the potential to become an ecotourism/birdwatching hotspot

Flyway Network Sites

Bako-Buntal Bay in Malaysia is the newest Flyway Network Site, mostly inter-tidal mudflats fringed with mangrove forest. This area of about 2,800 hectares supports 20,000 to 25,000 individuals of 32 shorebirds species, among them several globally threatened and

near threatened such as the Nordmann's Greenshank, Asian Dowitcher and Far Eastern Curlew. Additionally, the area supports more than ten percent of the global population of Chinese Egret while the numbers of Red Knot and Great Knot are among the highest for any site in Malaysia. ■

their migration routes. The theme of this year's World Migratory Bird Day "Networking for migratory birds" aims to emphasize both ecological networks, as well as networks between

organizations and individuals and their mutual importance for the long-term conservation of migratory birds. Migratory birds travel huge distances along their migration routes, sometimes

even tens of thousands of kilometers. These connected sites act like 'stepping stones' birds use to migrate and are important for resting, feeding, breeding and wintering. ■

**Dr. Judit Szabo is the Science Officer and Ms. Minseon Kim is the Programme Officer of the EAAFP Secretariat in Incheon, South Korea.*

Biodiversity information at your fingertips!

Check out our website for information materials on biodiversity conservation in ASEAN! The ASEAN Centre for Biodiversity produces a number of public awareness materials on biodiversity in the region, including the quarterly newsmagazine ASEAN Biodiversity, as well as profiles of ASEAN Heritage Parks and endangered species.

Proceedings on workshops organized by ACB focusing on issues such as marine gap analysis, multilateral environmental agreements, and business and biodiversity, among others are already available. The Policy Brief Series focuses on ASEAN actions and recommendations on issues such as community conserved areas, ecotourism, and invasive alien species.

Visitors can access the Biodiversity Information Sharing Service (BISS) to check species lists and protected area network data in ASEAN. Links to biodiversity information in other ASEAN Member States can be accessed here as well.

ACB has also produced videos on ACB and its work in ASEAN, as well as the values and the need to protect our treasured natural resources.

For more information log on to www.aseanbiodiversity.org and chm.aseanbiodiversity.org.



World Wetlands Day: Wetlands and water management

By Braulio Ferreira de Souza Dias, Executive Secretary, CBD

Everybody has an interest in ensuring that water is managed effectively. Water underpins all human and ecosystem needs. In the 21st century though, frequently we do have enough water where and when it is needed, or alternatively we have too much when there is flooding. Moreover, problems with water quality are widespread. The impacts of climate change are affected or are moderated by the presence of water. It is obvious that water security is becoming increasingly urgent for human security and well-being.

Fortunately, there is increasing recognition of the role of natural solutions for achieving this security. As we celebrate World Wetlands Day, we call world attention to how wetlands are natural infrastructure that help us manage water



problems and in doing so provide multiple benefits beyond water itself.

The Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity recognized the importance of water as a cross-cutting subject for the Strategic Plan for Biodiversity (2011– 2020) and the Aichi Biodiversity Targets, particularly not-

ing its paramount importance in achieving Target 14. At the Eleventh Meeting of the Conference of the Parties (COP 11), governments reinforced this recognition and called for a cooperative partnership to promote ecosystem-based solutions for water management by the broadest range of stakeholders. This was seen as a contribution to sustainable development and to the United Nations International Year of Water Cooperation (2013). This year's celebration of International Biodiversity Day on 22 May is devoted to the issue of water and biodiversity.

Managing water is also an important motivation for ecosystem restoration, one of the important Aichi Biodiversity Targets. Sustaining hydrology is a prerequisite for successful restoration.

The opportunity for restoring wetlands to manage water is a good illustration of translating into tangible outcomes the call for concerted action on restoration that was launched in Hyderabad at COP 11.

We are pleased to have contributed to "The Economics of Ecosystems and Biodiversity for Water and Wetlands", launched by the Ramsar Convention Secretariat, which positions wetlands as our most valuable ecosystem type, and primarily because of the benefits they deliver regarding water. The work of the expert group on the role of biodiversity in sustaining the water cycle is another example of demonstrable outcomes of our joint work plan with the Ramsar Convention as the lead implementation partner for wetlands for the CBD. ■

No water without wetlands

By Philipp Gassner *

Are you reading this article over your Sunday morning breakfast? Bon appetit! And are you washing it down with a glass of water? This will fill up the three bathtubs of water, you just drank. Wait, three bathtubs and still thirsty? Clearly, the water in your breakfast was well hidden - virtual, so to say. We drink, in one form or another, nearly four liters of water daily, and use about 150 liters for washing and other purposes. However, the food we consume each day requires at least 2,000 liters to produce, 500 times as much. Your break-



Photo by Kyaw Kyaw Winn

Wetlands are not competitors for water but rather essential components of water infrastructure, providing a clean source and store of freshwater.



Wetlands are among the most biologically productive natural ecosystems.

fast's virtual water footprint: 140 liters for coffee, around 80 liters for toast, 120 liters for eggs, 240 liters for milk, coming, in total, to 1,100 liters or 13,391,400 droplets.

A droplet's journey

Where does this vast amount of water come from? Let us rewind the journey of one of these droplets to find out. If you are in Metro Manila the tap water comes from the Angat reservoir, located north of the city in Bulacan Province. The water embraced in the glass of milk had to cover a longer distance to your table, most likely from New Zealand's pastures. Interestingly enough, around 80 percent of accessibly freshwater used by humans is directed towards agriculture. Our globalized agricultural system means

that much of that water use is not in the country where the product is being consumed. Thus, many countries, in particular the industrialized, are essentially exporting their water use, just as they export carbon emissions. For instance, it has been estimated by the Water Footprint Network that Europe exports 42 percent of its water footprint.

Another leg of the journey in the water cycle back will shed some light on how the water ended up in a large reservoir or a lush green meadow. As you might have guessed the little droplet first evaporated, travelled through the troposphere and returned to earth as rain or snow, feeding rivers or groundwater bodies, which can then be used for agriculture, drinking or sanitation.

Hang on, did we not miss a step here? Almost certainly the droplet would have passed a wetland on its way, the primary resource from which humans derive water. A minor detail? Certainly not, since wetlands take care of water.

Wetlands as water infrastructure

There is a critical link between wetlands and water: without wetlands there will be no water – and without water there will be no wetlands. Undeniably, access to a clean and adequate water supply is critical for human survival, far beyond your breakfast: 41 percent of the world's population lives with severe water stress, a number predicted to rise to two-thirds by 2025. The same time when even the tropical Philippines

are predicted to be facing water shortage, partly due to their population growth. Today providing clean water could save most of the 1.8 million children who die every year from diarrhea.

In contrast to this immediate importance of water, less well understood is that wetlands are fundamental regulators of water regimes. 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. *'Wetlands are not competitors for water but rather essential components of water infrastructure, providing a clean source and store of fresh water'*, says Anada Tiéga, Secretary General of the international Ramsar Convention on Wetlands.



Photo by Harazak

The new insurance company

Beyond being a caretaker of water, wetlands are one of the most biologically productive natural ecosystems, comparable to the glut of coral reefs. Wetlands include marsh, fen, peatland and other areas where water primarily controls the environment - whether natural or artificial, permanent or temporary, salty or brackish. These environments serve as a habitat for myriads of associated plants and animals, including many endangered and threatened species. Likewise, such plant communities, and the surrounding soil, function like a big carbon jar, thus playing a crucial role in moderating global climate. The degradation of peatlands, a common phenomenon in Southeast

Asia, equals alone seven percent of all fossil fuel CO₂ emissions.

To see yet another ecosystem value of wetlands, we can ask some residents of the urban communities, situated on the edge of Vientiane city, Lao PDR. They will happily tattle about the That Luang Marsh providing important resources and agricultural land for their local communities both in the city and in the bordering rural areas. Moreover, their wetland offers substantial flood protection, through the retention of storm runoff generated by the city, and water treatment for domestic, agricultural and industrial wastewater. Every citizen in Southeast Asia's deluge plagued metropolises, be it Manila or most recently Jakarta, would certainly appreciate similarly functional ecosystems around their homes. The goods and services provided by relatively small That Luang Marsh alone are worth just under US\$5 million annually, a number that can be up-scaled many-fold for a megacity.

Compared to the flood damage in the billions, wetlands provide a dirt cheap prophylaxis. Since likely climate change scenarios load the dice in favor of more extreme weather events, it is worthwhile thinking wetlands' protective services as a new generation of insurance policy, provided not by AXA, Sunlife and Co., but Mother Nature herself. As the third most vulnerable country in a warming world, particularly the typhoon tortured Philippines would benefit big time from this 'full coverage climate collision insurance'.

Wetlands warning: Think global, act local

If wetlands play such an important role for the journey of the little water drop-

let and its comrades to our kitchen table, and beyond, why are they still at such stark peril of destruction and degradation? In 2010, a cover story in the scientific top journal Nature drew attention to the nexus between the use and misuse of wetlands and the dire consequences for mankind. In conclusion, the cumulative impacts of dams, pollution, agricultural runoff, the conversion of wetlands and the introduction of exotic species have led to a situation in which some 80 percent of the world's population, next to five billion people, live in areas where river waters are highly threatened.

In response to these threats to one of our most precious life support systems, the Ramsar Convention on Wetlands of International Importance, was born on 2 February 1971. It is part of the international architecture including the UN Millennium Development Goals, the Green Economy initiative or the Aichi Biodiversity Targets, highlighting the importance of water management in an integrated, cooperative and holistic manner.

Forty two years later, in the UN International Year of Water Cooperation, Ramsar has well set the stage for globally recognizing the value of wetlands ecosystem, increasing awareness and understanding of wetlands' multiple roles and benefits to humanity. In the last decades national and global initiatives have been intensified to safeguard and restore the lost or degraded hydro-biological functions of wetlands.

A regional illustration for the protection of the staggering 13,204 square kilometers of Ramsar wetlands in the ASEAN countries is the ASEAN Centre for Biodiversity (ACB). Based in Los Baños, Laguna, Philippines,

the centre coordinates national and regional efforts on wetland conservation and sustainable management of these ecosystems throughout Southeast Asia. Since September 2010, GIZ, the German development cooperation arm, through the Biodiversity and Climate Change Project (BCCP), supports the institutionalization of ACB's core programme on biodiversity and its nexus with climate change.

Zooming back in to our breakfast table: Equally important is engagement at the local level. 'Water is not only the driving force of all nature', as already Leonardo da Vinci puts it, but also of all humans. Every single one of us is utterly dependent on the water wetlands provide us with, rendering wetlands a responsibility of us all.

A company can reduce its environmental impact and monitor its water footprint, as can the individual consumer. We can commit to recycle, reuse and conserve water in our private lives whether it is through rainwater harvesting, water-friendly garden design, cutting water usage in our home or supporting our local wetland.

Your breakfast can be a first step to ease the droplets long and wearing journey, preserving intact wetlands. For instance, by reducing the purchase of products imported from regions with high water scarcity, or with a large water footprint, such as coffee and meat. As the saying goes: Thousands have lived without love, not one without water - and certainly not without the wetlands providing, cleaning and securing it. ■

**Philipp Gassner is an external consultant and project correspondent for the ACB-GIZ Biodiversity and Climate Change Project.*

The Economics of Ecosystems and Biodiversity, REDD+ and climate change in mangrove ecosystems of Southeast Asia

By Filiberto Pollisco, Jr. and Dicky Simorangkir *

This paper was presented at the Workshop on REDD+ and Legal Regimes of Mangroves, Peatlands, and other Wetlands: ASEAN and the World, 15-16 November 2012, Faculty of Law, National University of Singapore.

Ellison, in 2009 during the ASEAN Conference on Biodiversity held in Singapore, reported that mangrove forests in Southeast Asia have one of the highest biodiversity resources in the world occupying an area of 60.9 x 102 square kilometers. The Indo-Malayan Philippine archipelago has 36 to 47 of the 70 known mangrove species occurring in the region. Scientists have identified that Southern New Guinea, including West Papua, is the location of the centre of the Indo-Malayan mangrove biodiver-

sity. She further shared that the region, however, has the highest rates of mangrove loss in the world, losing 628 square kilometers per year in two decades.

She reported that pond culture converted from mangrove intertidal areas cause 50 – 80 percent of mangrove loss in Southeast Asia. Peripheral damages to coastal values from this conversion include discharge of nutrient rich waters that cause eutrophication, associated depletion of natural stocks of fish and crustaceans, and accumulation of toxins in the ponds that cause it to be unusable after a few years leading to abandonment and degradation and forcing the conversion of other mangroves elsewhere. In fact, many scientists identified the leading causes of mangrove loss and degradation as due to human impacts, includ-

ing direct clearing for coastal development, aquaculture, population encroachment, over-exploitation for fuelwood and timber production that has degraded another 26 percent of mangrove forest.

There are three species of mangroves that are of special concern in the ASEAN region – *Bruguiera hainesii*, *Sonneratia griffithii* and *Camptostemon philippinense*. They are listed under the IUCN Red List of Endangered Species, categorized as “critically endangered”, meaning, they have the highest probability of extinction. The first is a very rare species and is only known from a few locations in Indonesia, Malaysia, Thailand, and Myanmar. The second can be found in parts of India and Southeast Asia where the highest mangrove forest loss oc-

curs over the past 60 years. The third one is estimated to have 1200 or fewer individuals remaining.

The medium-sized tree *Heritiera globosa* is an associated species of the mangrove ecosystem and is categorized as “endangered”. It is known to have the most restricted distribution in the region having an area of occurrence of less than 5,000 square kilometers. It is only known in Western Borneo and Indonesia where it is patchily distributed especially in riparian habitats where clearing occurs for timber and oil palm plantations.

It is apparent that mangrove ecosystems are vulnerable to human impacts and have suffered greatly in terms of biodiversity loss. In addition, the ecosystem now becomes vulnerable to climate change, especially



Photo by Ng Kim Tee

sea level rise, in the advent of global warming.

Climate Change and the Mangrove Ecosystem

The complex inter-relation between climate change and mangroves ecosystems can be seen from two different angles. At one hand, mangrove ecosystems have very critical function in combating climate change, while on the other hand they are affected directly and indirectly by climate change.

Mangrove Ecosystem: the first defense line in combating climate change

For many decades, mangroves have never been taken seriously as an important ecosystem in our environment and have been forgotten or ignored in all debates about illegal logging, land use changes, and global warming. Only in recent years mangroves have received more attention as people start to realize its significance to the economy and environment.

Mangroves are also one of nature's best ways for combating global warming because they are so efficient in sequestering carbon. Compared to other forests, such as tropical rainforest, mangroves are more effective and efficient carbon storage, because they develop root biomass very quickly and almost half of the biomass of mangrove forests is below ground (Zabarenko 2011). These and the slowly decomposing thick organic layer in the soil enable mangroves to store carbon up to four times what the tropical rainforests do. Some studies estimated that mangroves are able to sequester up to three to four tons of carbon per hectare per year, which is approximately equivalent to the amount of



Photo courtesy of Green Community

carbon two to three motor vehicles release to the atmosphere each year (Zabarenko 2011). In addition to its function as huge carbon storage, mangroves are also the first defense lines to anticipate sea level rise as they provide immediate protection to coastal communities from storm surges and floods associated with global warming.

With the clearing of mangroves, we will not only lose the important potential for carbon sequestration offered by the mangroves, but also see the release of major quantities of polluting gases from the disturbed mangrove substrate itself. Some studies discovered that the upper layers of mangrove sediments have a high carbon content of over 10 percent and each hectare of mangrove sediment is estimated to contain some 700 tons of carbon per meter depth. Digging up two meters of soil to create shrimp ponds – for example – could result in the potential oxidation of 1,400

tons of carbon per hectare per year. Researchers pointed out that destroyed mangroves will release as much as 10 percent of all emissions worldwide from deforestation although mangroves account for just 0.7 percent of the tropical forest area.

Vast areas of mangroves have been cleared in the last few decades due to coastal development, destructive wood harvest and conversion for aquaculture such as shrimp farms. From once estimated over 32 million hectares 50 years ago there is now only less than half the original mangrove area. Yet, their destruction continues at a very alarming rate. According to recent estimations, the mangrove area decimation is currently around 150,000 hectares per year globally that leads to a loss of 225,000 tons of carbon sequestration potential each year, with an additional release of approximately 11 million tons of carbon from disturbed mangrove soils each year.

The loss of mangroves will therefore damage local economy and the livelihood of coastal communities. It will also leave nearly half of the world's population living in cities and settlements along the coasts 'less protected' from global warming and consequent sea level rise. In many parts of the world where mangrove forests have been cleared, tremendous problems of erosion and siltation have arisen, and terrible losses to human life and property have occurred due to destructive hurricanes, storms and tsunamis. It is expected that millions of coastal residents will have to be evacuated within the next 50 years as sea level continues to rise as a result of global warming caused by excessive CO₂ emissions (Zabarenko 2011).

Impact of Climate Change on Mangrove Ecosystems

There are three levels by which climate change affects the mangrove ecosystem. The first is the tissue/cellular level wherein the physiology of the mangrove plant is affected. Changing environmental conditions such as rising temperature, increased atmospheric carbon dioxide, ultra-violet radiation changes, and precipitation (rainfall) changes all affect the growth and survival of the mangrove plant. Rising temperature combined with low humidity and rainfall would influence the photosynthetic rates thereby reducing the primary productivity of the mangrove plants. Increased atmospheric CO₂ influences the respiration physiology and thereby affects the plant growth and development, which enhances the primary productivity (meaning more plant mass), UV changes damage proteins and nucleotides so that

at enhanced levels would damage plant tissues. More precipitation or rainfall would disrupt the salinity patterns of the ocean thus reducing plant growth. However, local site conditions in combination with other factors and direct human impacts would result to the net response of the mangroves (Ellison, 2009).

The second level is the ecosystem-wide effect. Increased rainfall and sea level rise both affect the growth of the mangrove plants. According to Ellison (2009), increased rainfall would reduce salinity and the extent of mangrove zones can be expected to increase particularly on the landward side where colonization of unvegetated areas would occur. Sea level rise would also have the same effect such that the seaward side would “drown”, reducing the mangrove zone but colonization of the landward side would ensue. She stressed further that the mangrove ecosystem is “one of the most vulnerable ecosystems to be strongly affected by sea level rise caused by climate change”.

The third level is the region-wide effect wherein upper latitudes would have increased (warmer) temperatures paving the way for mangroves to move upward in the upper latitudes. Mangrove distribution is limited to colder temperature where the isotherm level is at 16°C (Ellison 2009). A rise in this temperature would pave the way for the mangroves to occupy latitudes where they were not previously present.

The Economics of Ecosystems and Biodiversity and REDD+

The REDD+ mechanism, as an offshoot of these climate change concerns, focuses on the carbon stock

of the target ecosystem, in this case, the mangrove ecosystem, and not allowing these carbon to be released back into the atmosphere thereby exacerbating global warming. Putting monetary value on these carbon stocks and making these funds available to resource managers can finance his resource management activities and address climate change. Carbon is very much in the biomass of the mangrove plants and, as mentioned previously, much of the carbon stocks are found underground in the root system. However, putting value only on the above-ground standing mangrove trees would under-value the carbon stock of the ecosystem. This also ignores the fact that mangroves are high in biodiversity and linking this biodiversity with the REDD+ mechanism would increase the value of the ecosystem. It would further recognize that there are benefits other than the monetary value of carbon and its sequestration.

On the other hand, in 2007, environment ministers from the governments of the G8+5 countries, meeting in Potsdam, Germany, agreed to “initiate the process of analyzing the global economic benefit of biological diversity, the costs of the loss of biodiversity and the failure to take protective measures versus the costs of effective conservation.” The Economics of Ecosystems and Biodiversity (TEEB) study, which emerged from that decision, has delivered a series of reports addressing the needs of major user groups: national and local decision makers, business and the wider public (TEEB Synthesis Report 2010). The aim of TEEB is to show how economic concepts and tools can help equip

society with the means to incorporate the values of nature into decision making at all levels. The invisibility of biodiversity values has often encouraged inefficient use or even destruction of the natural capital that is the foundation of our economies. Hence, by taking these biodiversity values into account, it would encourage the conservation and sustainable management of these resources.

Another aim of TEEB is to provide a bridge between the multi-disciplinary science of biodiversity and the arena of international and national policy as well as local government and business practices. The scope of TEEB is intentionally broad and it is therefore seen as an inspiration and as an invitation for others to deepen its findings and to develop more context specific recommendations. Ideally, TEEB should act as a catalyst to help accelerate the development of a new economy: one in which the values of natural capital, and the ecosystem services which this capital supplies, are fully reflected in the mainstream of public and private decision-making (TEEB 2010).

The bottom-line objective of TEEB and REDD+ is sustainable resource management. The strategies of both are pretty much the same, that is, putting monetary value on the resource. Whereas REDD+ value the carbon stock of the mangrove and its biodiversity, TEEB values the goods and services which the mangrove ecosystem provides arising from its biodiversity. Hence, according to TEEB, carbon sequestration is just one service the mangrove ecosystem provides.

It is now recognized that there are co-benefits in the REDD+ mechanism other

than carbon sequestration. The ecosystem provides goods and services that are the co-benefits of the mangroves, very much the same as TEEB. The Millennium Ecosystem Assessment defines ecosystem services as the benefits people obtain from the ecosystem. There are four broad categories of ecosystem services:

1. Support services – these are services that are the regular function of the ecosystem, which are energy transfer, nutrient cycling and soil formation. In the case of the mangrove ecosystem, organisms such as fiddler crabs and other crustaceans break down organic matter to their elemental form which the plants could again take up for their nourishment to sustain the ecosystem. Mangroves also serve as catchment of sediments that build up soil for other mangrove-associated plants to come in and enrich the ecosystem further.
2. Provisioning services – these are services that give benefits to the communities, not only human but also biological. The mangrove ecosystem provides edible plants as food, tannin for leather making, wood for shelter and charcoal, and fiber for clothing and ropes. The mangrove ecosystem serves as nursery for juvenile fish and restocks the fish population of nearby coral ecosystems and the seas, for sustainable harvest in the future.
3. Regulating services – the mangrove ecosystem regulates the



Photo by Klaus Stiefel

micro-climate of the area in which they are found. Instead of having high temperature from exposure to bare ground and water, the presence of the mangroves provide shade thereby cooling the immediate atmosphere and area around them. They also regulate the flooding that occurs during high rainfall in the upper elevations and the force of the waves during high winds and typhoons. By trapping the sediments from surface run-offs, they purify the water that goes

into the sea.

4. Cultural services – in some cultural communities, the mangrove ecosystem serve as spiritual inspiration, in most cases, mangroves are utilized for recreation, education, and for aesthetic purposes.

Unfortunately, the negative impacts of mangrove loss are often underestimated or ignored in decision making and development planning processes. According to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

in 2009, the value of ecosystem services lost annually worldwide has been estimated at between USD\$2 and USD\$5 trillion a year, as of 2008. This, from a 1997 estimate of USD\$16-54 trillion of worldwide ecosystem services annually (UNESCAP 2009).

Applying economic thinking to the use of biodiversity and ecosystem services can help clarify two critical points: why prosperity and poverty reduction depend on maintaining the flow of benefits from ecosystems; and why successful environmental protection needs to be grounded in sound economics, including ex-

PLICIT recognition, efficient allocation, and fair distribution of the costs and benefits of conservation and sustainable use of natural resources (TEEB, 2010).

ASEAN TEEB Scoping Study: Case Study on Mangroves

A low-carbon growth strategy (green growth) has emerged as the most feasible development path. The strategy highlights the need for wider accounting and realistic valuation of the natural resources and ecosystem services contribution to human well-being while at the same time address climate change issues (ACB TEEB Scoping Study Report 2012). The conduct of an ASEAN study on The Economics of Ecosystems and Biodiversity is a significant next step for mainstreaming green growth in the development processes of the region. Using the UNEP TEEB study as the foundation, the study builds up sufficient evidence and basis for policy makers and technical officers on the imperatives for proper valuation of ecosystems services as a measure for adapting to climate change impacts.

The objective of the ASEAN TEEB scoping study, as conducted by the ASEAN Centre for Biodiversity (ACB), is to pursue the mainstreaming process of the economics of ecosystems and biodiversity through conduct of assessment and valuation of key ecosystems in Southeast Asia and its services and assist ASEAN Member States to develop green growth economies. The mangrove ecosystem is identified as one of the cases.

This case study examined the value of ecosystem services provided by mangroves. It presents a meta-analysis of the economic valuation literature and ap-



Photo by Klaus Stiefel

plies the estimated value function to assess the value of mangroves in the ASEAN countries. We construct a database containing 130 value estimates, largely for mangroves in Southeast Asia. Values are standardized to US\$ per hectare per year in 2007 prices. The values of mangrove ecosystem services are highly variable across study sites due to, among other factors, the bio-physical characteristics of the site and the socio-economic characteristics of the beneficiaries of ecosystem services. We include explanatory variables in the meta-analysis to account for these influences on estimated mangrove values. A geographic information system (GIS) is used to quantify potentially important spatial variables, including the abundance of mangroves, the population of beneficiaries, and the density of roads in the vicinity of each study site. The meta-analytic value function is used to estimate the change in value of mangrove ecosystem services in Southeast Asia under a baseline scenario of mangrove loss for the period 2000-2050. The baseline scenario is derived from land use changes described by the IMAGE-GLOBIO model (ACB TEEB Scoping Study Report 2012).

The estimated foregone annual benefits in 2050 for the ASEAN region as whole are US\$ 2.2 billion (95 percent prediction interval US\$ 1.6 – 2.8 billion). At a country level, the annual value of foregone mangrove ecosystem services in 2050 follows the pattern of loss of area, with Indonesia expected to suffer the highest losses: US\$ 1.7 billion per year (95 percent prediction interval US\$ 1.2 – 2.2 billion). Malaysia is estimated to suffer the second highest losses in mangrove ecosystem service values: US\$ 279 million per year (95 percent prediction interval of US\$ 228 – 330 million) (ACB TEEB Scoping Study Report 2012).

The values of nature vary according to local biophysical and ecological circumstances and the social, economic and cultural context. Intangible values, which may be reflected in society's willingness to pay to conserve particular species or landscapes, or to protect common resources, must be considered alongside more tangible values like food or timber to provide a complete economic picture. Valuation is seen not as a panacea, but rather as a tool to help recalibrate the faulty economic compass that has led us to decisions that are

prejudicial to both current well-being and that of future generations (TEEB 2010).

Future Directions for Research

The inclusion of spatial variables describing the context of individual mangrove patches is shown to be important in accounting for variation in ecosystem service values. We find evidence that mangrove areas are complements, i.e. that the value of individual mangroves are enhanced when there is a larger extent of other mangrove patches in the surrounding area. This has important implications for mangrove conservation strategies and suggests that the preservation of contiguous areas is preferable to patches that are spatially dispersed. This finding is in contrast to the results of similar meta-analyses for freshwater wetlands (e.g. Brander et al., 2011), which have shown wetland ecosystems to be substitutes.

The fragmentation of mangroves and their surroundings by road infrastructure has a negative effect on the value of mangrove ecosystem services. Increasing the accessibility of mangrove areas appears to degrade the services they provide. This might particularly be the case for the coastal protection and fisheries habitat and nursery services, which are off-site services that do not require access to the mangrove itself. Mangrove conservation efforts should therefore aim to mitigate the impacts of fragmentation by transport infrastructure.

Regarding future research directions, the inclusion of other spatially defined context variables in meta-analyses of ecosystem service values offers a potentially important avenue to further account for variation in values. There is

also a need for collaborative research that combines mangrove ecology and economics to jointly model the provision and value of ecosystem services from mangroves. For the value transfer analysis conducted in this case study, we have modeled the variation in the economic value of ecosystem services but make the assumption that the provision of services is a constant across all mangrove sites (the value of this constant is informed by the level of service provision observed at the study sites reviewed in the meta-analysis).

To a limited extent, spatial variation and non-linearity in ecosystem service provision are implicitly modeled in the meta-analytic value function through the inclusion of the mangrove area, abundance, and road density variables. Explicit ecological modeling of the potential non-linearities in the provision of ecosystem services would, however, be preferable (ACB TEEB Scoping Study Report 2012 cited from Barbier et al., 2008; Koch et al., 2009). The value transfer analysis should therefore be revisited when (modeled) data on the provision of services from mangroves becomes available. Similarly, the estimation of changes in the stock of mangroves over time could be greatly improved by explicitly modeling the specific threats that face this biome, including sea level rise. ■

** Filiberto Pollisco, Jr. is Policy and Programme Development Specialist, ASEAN Centre for Biodiversity, Los Banos, Laguna, Philippines, while Dicky Simorangkir is International Senior Adviser, Biodiversity and Climate Change Project, GIZ-ACB, Los Banos, Laguna, Philippines.*

Operation Cobra strikes to dismantle criminal wildlife trafficking networks

Police, Customs and wildlife officers from Asia, Africa and the United States announced the results of a month-long cross border enforcement operation code-named “COBRA” to dismantle organized wildlife crime syndicates. The first-of-its-kind operation, funded by U.S. Fish and Wildlife Service (USFWS), and supported by FREELAND Foundation and the ASEAN-Wildlife Enforcement Network (ASEAN-WEN), facilitated increased cooperation and real time intelligence exchange between range, transit and consumer countries.

Working collaboratively under the direction of an International Coordination Team (ICT) in Bangkok, the operation ran from 6 January to 5 February 2013 and focused on quality of information and results over quantity of seizures. The operation yielded hundreds of arrests and seizures of wildlife including 42,000 kilograms of red sander wood, 6,500 kilograms of elephant ivory, 1,550 kilograms of shatoosh (rep-

resenting 10,000 Tibetan antelopes killed), 2,600 live snakes, 324 hornbills, 102 pangolins, 800 kilograms of pangolin scales, 22 rhino horns and four rhino horn carvings, 10 tiger and seven leopard trophies, 31 kilograms elephant meat as well as claws and teeth of protected felid animals and plant species.

The operation serves as

a model for international cooperation on wildlife trafficking, specifically targeting the criminal networks that coordinate and provide financial backing for the trade. Operation Cobra was conceived by the China National Interagency CITES Enforcement Coordination Group, and developed in partnership with ASEAN-WEN, Viet Nam,

Indonesia, Thailand, South Asia-WEN, Lusaka Agreement Task Force, South Africa and USFWS, during a Special Investigations Group/DETECT training course held at the Bangkok-based International Law Enforcement Academy in September 2012, supported by USAID ARREST Programme partner FREELAND.



CITES Secretariat praises ASEAN-WEN and partner enforcement networks

March 7, 2013 (Bangkok, Thailand). The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Secretary-General Certificates of Commendation were presented to representatives from the National Inter-Agency CITES Enforcement Collaboration Group (NICECG) of China, the Association of Southeast Asian Nations Wildlife Enforcement Network (ASEAN-WEN) and the Lusaka Agreement Task Force (LATF) for their role in Operation COBRA, a month long cross-continent joint operation to combat illegal wildlife trade. NICECG, ASEAN-WEN and LATF received the award during the first global meeting of wildlife enforcement networks (WENs) on the sidelines of the 16th meeting

of the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES CoP 16). Ten WENs or groups operating within Africa, Asia, Europe, and North and South America, as well as proposed networks for Central Asia, West Asia and the Oceania/Pacific region, met to discuss cooperation on poaching and illicit trade activities. They also exchanged best practices and techniques on combating wildlife and forest crime. Participants expressed support for developing a network of wildlife enforcement networks or groups and recognized the value of the meeting, hosted by the International Consortium on Combating Wildlife Crime (ICWC). ■

Caring for the future – an environmental gender agenda

By Philipp Gassner

Man is tampering with the buttons of the world's climate machine and pushes the global ecosystem ever further to its limits. Or is it men? Let's take a glance at two hot-spots of damage to our natural system: on a clear morning, north of the city of Palembang on Sumatra, Indonesia, Ahmad kisses his wife Lia goodbye, to go logging in a forest, which has declined half over the last years. Likewise worldwide it is largely men, not women, chopping down tropical and boreal forest, thus responsible for 20 percent of world greenhouse gas emissions. Or let us follow Joseph, who just leaves his wife Maricel for a day of fishing on the Philippine Island Malapascua, known to have lost most of its coral reefs already. It is men, again not women, overfishing our ocean, leaving 80 percent of global fishstocks fully or over-exploited.

Now, what can we learn from these? That, as so often, men trigger the gloom and doom in the world?

Gloom and doom wrought by men

Gloom, such as the ever accelerating loss of biological diversity - the combination and interactions of all life forms that have made Earth a uniquely habitable place for humans. A loss, accompanied by plummeting ecosystem services, such as food, medicines, clean water and soil stabilization, worth billions and billions of the global GDP.

Doom like a possibly six degrees warmer world by the end of the century, a world with more droughts,



Photo by Tun Aung

A mother gives her child drinking water amid a parched land. The rapidly changing climate patterns have reduced rainfall in many wetlands in the ASEAN region and elsewhere in the world.

more storms, and more floods, with rising sea levels and less biodiversity. Gloom and doom, which are intrinsically interconnected, through the effects of climate change on biodiversity, as well as changes in biodiversity and ecosystem functioning that affect climate change. Gloom and doom which put half of Southeast Asia's biodiversity at risk, and as much as 88 percent of its coral reefs, to name only one example; which will shock health and livelihoods, especially in the region's less developed nations, increasing poverty and vulnerability.

And for all these, only men are the ones to hold accountable? Let us take this with a grain of salt.

Social roles and the environment

Stereotypes like the ability to multitask or reverse park a car aside, there are indeed some well-defined differences between the social

roles that men and women play, and the power relations in-between. Notably, gender is not based on sex or the biological differences between men and women. Instead, gender is shaped by culture, social relations and natural environments, as Huisinga Norem of the UN Food and Agricultural Organization points out. Gender roles affect economic, political, social and ecological prospects and challenges faced by both men and women, resulting in different labor responsibilities, decision-making processes, and knowledge.

Such difference are also true for natural resource management, climate change and biodiversity conservation. The World Bank summarizes four main variations: especially rural women and men have different roles, responsibilities, and knowledge in managing natural resources.

Ahmad is in charge of timber harvesting, while Lia

collects medicinal plants and picks berries, commodities known as Non-Forest Timber Products. Thus, they both use the forest –in a complementary way.

Moreover access to technology, information and training is mostly targeted to men. Joseph attended a workshop on the impacts of dynamite fishing coral reef ecosystems, while Maricel was too busy cleaning, processing and selling the caught fish. Despite the fact, that the biggest amount of fish is lost post catch, providing a large potential for resource saving practices, as IUCN's Global Senior Gender Adviser Lorena Aguilar highlights.

Gender differences also exist in rights and access to natural resources, including land, trees, water and animals. Likewise, women are still absent from climate change and natural resource-related decision-making processes at all levels. Joseph for instance

takes part in an ecotourism initiative for the island, while Lia has no chance to make her voice heard in Indonesia's climate change negotiations.

Such gender differences point at the scale of the problem and its global environmental and social dimensions. To achieve sustainable development, as stipulated for example in the Millennium Development Goals (MDG), both men and women have to be considered along the way. But we first need to focus on those that are less empowered: women.

Gender and environment: A double-edge relation

Let us have a closer look at the two-way relationship between women and the environment.

Firstly, vulnerability to the consequences of global warming and the destruction of ecosystems varies among gender. Vulnerability is to one part determined by the resources on which individuals depend, and, crucially, the entitlement of individuals to use these resources. In particular in rural areas both women and men are highly dependent on biodiversity resources such as fish or wood, while to a large extent, it is only men owning these resources. Moreover, deforestation, as in Ahmad's and Lia's forest, means that wood – the most widely used solid fuel – is located further away from their village.

In poor communities in most developing countries, women and girls are responsible for collecting firewood, a physically draining task that can take 20 or more hours per week. As a result, Lia now has less time to fulfill her domestic responsibilities, earn money or learn to read. Also her girls are often kept home from school to help gather

fuel, perpetuating their cycle of disempowerment.

As with biodiversity, climate change will exacerbate existing vulnerabilities and create new ones, affecting women more severely than men. This is partly because in many countries they make up the larger share of the agricultural work force and partly because they tend to have access to fewer income-earning opportunities. Further, women often manage households and care for family members, which limits their mobility and increases their vulnerability to sudden weather-related natural disasters.

In addition, the expected increase in temperature-related illnesses and deaths for example from malaria and dengue fever is likely to increase maternal mortality. Maricel is thus more vulnerable to climate change than Joseph, since she was not involved in the island's typhoon preparedness training, she is at a higher health risk during pregnancy and less likely to find new occupation if rising sea levels constrain fishery.

Secondly, women play a different role in biodiversity conservation and climate change mitigation and adaptation. This is mainly due to the fact that women and men have knowledge about different things and different knowledge about the same things. Things like biodiversity, which comes in the form of the wealth of knowledge. Such traditional knowledge is controlled, developed and shared by women. Lia's knowledge on biodiversity, such as wild ancestors of food, medicinal plants and domestic animals is much greater than Ahmad's. She possesses, just like many other women, a large repertoire of "coping strategies" that they have traditionally used to man-

age climate variability. For instance, she is a saver and manager of diverse seeds, more than 600 in her community, increasing her families' resilience in case of droughts, amplified by climate change.

Empowering women to participate as equals in information sharing and generation, education and training, technology or financial assistance, has proved to make resource management and conservation more successful. As men are increasingly drawn to seek remunerated work away from their lands and resources, women's role in the management biological resources is ever more increasing.

The rocky road to empowerment

Despite such priceless contribution by women to save our climate and ecosystems, daunting challenges remain. Michelle Bachelet, Executive Director of UN Women, decries that inequality persists in gender wage gaps and unequal opportunities, in low representation of women in leadership and in continuing violence against women in all its forms. Two out of three illiterate adults are women. Girls are still less likely to be in school than boys. Every 90 seconds of every day, a woman dies in pregnancy.

In a nut shell, women face some of the worst inequities in access to social services, land and other productive assets, which deprives them and the world of the realization of their full potential. *'No enduring solution to the major changes of our day—from climate change to political and economic instability—can be solved without the full empowerment and participation of the world's women'*, underscored Michelle Bachelet at last year's

International Women's Day (IWD).

This 8th of March, International Women's Day's (IWD) 105th anniversary, it is important to keep that in mind, while celebrating the tremendous progress made.

Gaining momentum: the gender agenda

And indeed, appositely to this year's IWD theme, *the Gender Agenda is Gaining Momentum*: during the past century, women have taken many steps forward towards legal rights, access to education or participation in public life – and to being stewards of the global climate and ecosystems.

Success can be seen in every region of the world on every level. Take the shores of the severely overfished Zambian Lake Tanganyika, providing livelihood for ten million people, where a local women's association has turned their backs on fishing and now makes a decent living on rice farming. A story that could inspire Maricel and millions of other fisher folks in the Philippines.

Lia can look at India and Nepal, where recent research proves that community forests with a high proportion of women in key decision-making bodies had significantly improved forest conditions.

For the whole of Southeast Asia, the ASEAN Center for Biodiversity (ACB), based in Los Baños, Laguna, Philippines, coordinates sustainable biodiversity management. Since September 2010, GIZ, the German development cooperation arm, through the Biodiversity and Climate Change Project (BCCP), supports the institutionalization of ACB's core programme on biodiversity and its nexus with climate change, as well as gender.

And also on the international level there is progress on this very link. *“The third MDG is dedicated to promoting gender equality and the empowerment of women. But when we look at the other seven goals, it is clear that none of them are possible without the inclusion of gender considerations”* says Julia Marton-Lefèvre, IUCN Director General. Unlike the UN climate change efforts, the Convention on Biological Diversity acknowledges precisely these gender considerations. The convention adopted a Gender Plan of Action in 2008, stimulating and facilitating efforts to promote gender equality and mainstream a gender perspective from the global to the national level. In the Philippines, for instance, the National Biodiversity Strategy and Action Plan clearly states the importance of gender for the conservation of biodiversity and the equitable sharing of its benefits. Let us hope, that these efforts will empower Maricel who ends a hard day’s wearing work of processing fish, as the sun sets over the coral seamed Island of Malapascua.

And let us use the 8th of March to raise awareness that doom and gloom can only be prevented – a sustainable future can only be reached – by women and men enjoying equality together, as Ms. Bachelet puts it. Only if the vigor of women, like Maricel and Lia, is included, only then the vastness and variety of the environment can be sustained – in the sense of Virginia Woolf: *‘It would be a thousand pities if women wrote like men, or lived like men, or looked like men, for if two sexes are quite inadequate, considering the vastness and variety of the world, how should we manage with one only?’* ■

22 March

World Water Day celebrates water cooperation

This year’s edition of World Water Day, celebrated on 22 March, was organized around the theme of water cooperation and within the framework of the International Year of Water Cooperation. The Day’s celebrations were coordinated by the UN Educational, Scientific and Cultural Organization, in collaboration with the UN Economic Commission for Europe (UNECE) and the UN Department of Economic and Social Affairs, for UN-Water.

The official celebrations were hosted by the Netherlands in The Hague, in conjunction with the High-Level Meeting of the Global Consultation on Water in the Post-2015 Development Agenda, which took place from 21-22 March 2013.

The celebrations included opening keynote speeches by Prince El Hassan bin



Talal of Jordan, Willem-Alexander, Prince of Orange, the Netherlands, and Chair of the UN Secretary General’s Advisory Board on Water and Sanitation (UN-SGAB). Thematic breakout sessions then focused on: water cooperation is key to poverty reduction social equity and gender equity; water cooperation creates economic benefits; water cooperation helps preserve water resources and protect the environment; and water cooperation builds peace. In the afternoon, the High-Level Forum on the Global Thematic Consultation on

Water in the Post-2015 Development Agenda convened to endorse the outcomes of the consultation.

Several other UN events also convened, including the High-Level Interactive Dialogue of the 67th UN General Assembly (UNGA), at UN Headquarters in New York, US, and the commemoration of World Water Day at the UN Economic and Social Commission for Asia and the Pacific headquarters, in Bangkok, Thailand.

A number of UN agencies also issued releases and statements in honor of World Water Day. UNECE highlighted the role of the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) in international water cooperation, particularly in light



of the entry to force of an amendment allowing all UN Member States to accede to the Convention.

The UN Environment Programme (UNEP) launched new public awareness “Pride Campaigns” for watershed and biodiversity protection in Colombia, Ecuador, Mexico and Peru. These campaigns aim to replicate successful pilot projects funded by the Global Environment Facility (GEF), in partnership with UNEP, which encourage downstream water users to contribute to conservation of highland forests. UN-Habitat highlighted successful water and sanitation projects, including sanitation interventions in schools, such as in Bondo Township, Kenya, and Zanzibar, Tanzania, and the Lake Victoria Region Water and Sanitation Initiative.

The International Atomic Energy Agency outlined its technical cooperation project on water resources assessment and management in the Sahel region, which aims to build scientific capacity, provide regional-level analysis, close data gaps and raise public awareness in five transboundary water systems. The UN Children’s Fund called for addressing water, sanitation and hygiene (WASH) linked to child mortality.

The World Bank highlighted water-related climate change impacts such as flooding, droughts and other extreme events, underscoring the importance of cooperation. The GEF noted the US\$1.2 billion in GEF grants had leveraged US\$7.1 billion in co-financing for projects related to freshwater resources. The African Development Bank described the adoption, in 2000, of the Africa Water Vision 2020 as an example of water cooperation and outlined the effect of nega-

tive impact of lack of WASH on women in Africa.

In a number of statements, Heads of UN agencies and others addressed aspects of water cooperation. UN Secretary General Ban Ki-moon stressed “water holds the key to sustainable development” and underscored investment in sanitation as a “down-payment on a sustainable future.” Michel Jarraud, Secretary General, World Meteorological Organization (WMO), and UN-Water Chair, emphasized cooperation in realizing the water outcomes of the UN Conference on Sustainable Development (UNCSD, or Rio+20) and in ensuring water’s place in the post-2015 development agenda.

Irina Bokova, Director-General, UNESCO, highlighted the slogan of the International Year of Water Cooperation, “water, water everywhere, only if we share,” calling for cooperation to achieve the Millennium Development Goals. UN Secretary-General’s Special Representative for Disaster Risk Reduction Margareta Wahlström underscored water management for disaster risk reduction.

Anada Tiéga, Secretary General, Ramsar Convention on Wetlands, highlighted the importance of international cooperation on the protection of wetlands. Bráulio Ferreira de Souza Dias, Executive Secretary, Convention on Biological Diversity, called for cross-sectoral and systematic approaches to water management and biodiversity conservation, particularly regarding the use of natural infrastructure to increase water security.

In addition, the 3rd UN-Water “Water for Life” Best Practices Awards were presented by the UN Office to Support the International

Decade for Action “Water for Life”/UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC) and the World Water Assessment Programme to recipients from Japan and Moldova. The city of Kumamoto, Japan, received the award in the category “best water management practices” for a project managing groundwater recharge through watershed forest protection. The Safe Water and Sanitation for all in the Republic of Moldova won the award for “best participatory, communication, awareness-raising and education practices” for fostering partnerships between stakeholders and local authorities for the

implementation of the human right to water and sanitation. Furthermore, UNESCO designated Maestro Tan Dun as UNESCO Goodwill Ambassador, who performed “Music for Water,” at UNESCO headquarters in Paris, France.

World Water Day was established by the UNGA in 1993, following the recommendation for an international day to celebrate water by the 1992 UN Conference on Environment and Development. World Water Day takes place annually on 22 March, on a theme selected by UN-Water. Previous World Water Day themes include: water and food security; water for cities; water quality. ■

Take time to learn about biodiversity.

Log on to www.aseanbiodiversity.org or chm.aseanbiodiversity.org.

ASEAN CENTRE FOR BIODIVERSITY
2011-2020 United Nations Decade on Biodiversity

World Health Day, 7 April

In mother nature's drugstore

By Philipp Gassner

A little headache from last night's party? Just have a quick Aspirin and you will feel better in no time. The box is empty and the pharmacy closed? No need to worry. A short stroll in the nearby forest will do the trick. Even if you do not see the painkiller pills growing on the tree, be sure they are there: a tiny bit of the bark and leaves of a willow tree, et voilà, your headache should be gone. Already some 400 years BC, the Greek Hippocrates knew about this trick, becoming the father of Aspirin, and by the way, modern medicine. The first records of traditional remedies, such as the oils of cedar, cypress, licorice, myrrh and poppy, date back even further, to 2600 BC, and they are still being used today.

Once you are in nature's own pharmacy, you might as well stay for some more shopping. How about some microbes, such as Penicillin, the almost exclusive source of all antibiotics? Or some Artemisinin from the sweet wormwood plant, the most effective anti-malarial drug used today? The latest thing: Paclitaxel from the Pacific Yew tree, used in treating breast, ovarian, and other cancers. Maybe some venom of the cone snail *C. magus*, called ziconotide, 1000 times more potent than morphine, but not addictive? This shopping list could go on and on.

And the best thing about it, mother nature will not even send a bill for this treasure chest of medicine, unlike every other pharmaceutical companies – even though her profit could be overwhelming. Natural



Photo by Dr. Filiberto Pollisco, Jr.

products have been the source of more than 60 percent of new drugs approved by the U.S. Food and Drug Administration (FDA) over the past three decades, while undiscovered cancer treatments from marine organisms alone could be worth between jaw-dropping US \$563 billion and \$5.69 trillion, according to a recent study. Take the example of the cone snails mentioned earlier whose 140,000 substances show potential in the treatment of Alzheimer's and Parkinson's disease, epilepsy, and heart attacks.

Losing before discovery

So far only 100 of these substances have been characterized, while the very source of these valuable animals is at peril. In Southeast Asia alone, where more than half of the marine cone snail species

live, around 90 percent of coral reefs are threatened. Fifty percent of mangroves have already been destroyed worldwide. This is symptomatic for the global biosphere undergoing dramatic changes. Rates of species loss are occurring at a rate 1000 times faster than before humans walked the earth, putting at least 50 percent of all species alive today at risk of extinction within the next century.

Such onslaught on biodiversity means that we are losing, before discovery which might eventually lead to the bankruptcy of the natural drugstore.

In the mall of biodiversity

Apart from medicine, what else do we need to stay healthy? Let us continue shopping in the mall of biodiversity. Next to the pharmacy, we find the grocery store with food shelves

filled to the top, thanks to biodiversity. Diverse ecosystems play a crucial role in human nutrition, as they ensure the sustainable productivity of soils and provide the genetic resources for all crops, livestock, and marine species harvested for food. Access to sufficient nutritious variety of food is clearly a fundamental determinant of health.

On the way, we also should get some vaccinations against a whole range of infectious diseases. Intact and diverse ecosystems provide an important natural control and thus prevention from the emergence and spread of diseases in animals, plants and humans. These include expensive livestock illnesses, zoonotic outbreaks and global pandemics. In contrast, human impacts on biodiversity, such as deforestation, land-use change

or water management helped the recent infamous outbreaks of SARS, Ebola, avian influenza or malaria.

Some pampering for our social, cultural and spiritual health? No problem, a stop at the park will fix this. Access to greenspace has been associated with improved health outcomes, shorter hospital visits, reduced anti-social behavior, or diseases of affluence such as diabetes or obesity. Next door there is an insurance agency where we can get a low-cost insurance against all kinds of natural disasters threatening our health and well-being: Some mangroves as tsunami protection, a forest to prevent landslide and a wetland to buffer floods. That should do.

Climate change insurance on the cheap

Wait a minute, there is a promotion for a climate change insurance, provided by nature in the form of diverse and thus resilient ecosystems. This comes in handy, since the planet warms gradually, but the effects of extreme weather events – more storms, floods, droughts and heat-waves – will be abrupt and acutely felt, all certainly not good for our health.

Dr. Margaret Chan, Director-General of the World Health Organization points out five major health consequences of climate change. First, rising temperatures and more frequent droughts and floods can compromise food security. Malnutrition, much of it caused by periodic droughts, is already responsible for an estimated 3.5 million deaths each year.

Second, more frequent extreme weather events mean more potential deaths and injuries caused by storms and floods. These are often followed by outbreaks of diseases, such as chol-

era, especially when water and sanitation services are damaged or destroyed.

Third, both scarcities of water, essential for hygiene, and contaminated excess water will increase diarrheal disease, already accounting for about 1.8 million deaths each year.

Fourth, heat waves can directly increase morbidity and mortality, mainly in elderly people with cardiovascular or respiratory disease. The heat wave of 2003 for instance had a terrifying death toll of 70,000 in Europe alone.

Finally, changing temperatures and patterns of rainfall are expected to alter the geographical distribution of insect vectors that spread infectious diseases, like malaria and dengue.

A smart investment for climate change in Southeast Asia

Living in Southeast Asia needs climate insurance since the region will be affected way above average. Decreasing fresh water, rising sea levels, increasing floods and storms, and intensifying risks of hunger and diseases render the Philippines for example the third most-threatened nation by climate change worldwide.

In a nut shell, global warming is likely to compromise all the invaluable health services, we have window-shopped before. Thus, our climate change insurance seems like a smart investment. However, as with any other insurer, the insurance premium will depend on our pre-load. An unhealthy lifestyle such as smoking or drinking will increase the risk for our health and thus the extent of the premium. Accordingly, deforestation, oil spills or CO₂ emissions can and should be set against the value of intact nature. The better we treat our ecosystems, the lower

will be the premium, the safer will be the protection against climate change impacts and the better will be the consequences for our health. It is time for action.

Healthy planet, healthy people

Today's World Health Day celebration, spear-headed by the World Health Organization, marks the anniversary of its First World Health Assembly in 1948. The celebration can be seen as a call for such action. *'While the reality of climate change can no longer be doubted, the magnitude of consequences, and -- most especially for health -- can still be reduced'*, says Dr. Chan. Protecting human health needs to be anchored at the heart of the global climate change and biodiversity agenda.

Act locally, think globally for a better health

This can start at the local level, where traditional knowledge plays an important role, not only for natural medicine but also for sustainable agriculture and food security. Climate change mitigation, happening on the ground, offers many win-win opportunities for enhancing population health. Take the example of the Philippines' Department of Education which is mainstreaming climate change education into its public school curriculum.

Regionally and internationally, consideration of the health impact of climate change can help political leaders move with appropriate urgency, as UN Secretary-General Ban Ki-moon's puts it. *'We must respond with urgent action to stabilize the climate, achieve the Millennium Development Goals, and encourage individual action'*. The project BiodivHealthSEA, for example, focuses on local

impacts and perceptions of global changes in health and biodiversity in South-east Asia.

Another regional initiative is the ASEAN Center for Biodiversity (ACB), based in Los Baños, Laguna, Philippines, and coordinating sustainable biodiversity management. Since September 2010, GIZ, the German development cooperation arm, through the Biodiversity and Climate Change Project (BCCP), supports the institutionalization of ACB's core programme on biodiversity and its nexus with climate change, as well as health.

The project takes the good health as a precious commodity seriously. Following the Economics of Ecosystems and Biodiversity approach (TEEB), i.e. demonstrating the economic and social value of ecosystem services, such as health, raises awareness and informs management and policy decisions. To sum up, we need to make invisible health and insurance services visible - economically tangible.

In comparison, this year wealthy nations will donate more than 13 billion euros to procure food and medicines, to improve sanitation and freshwater access for the world's poorest. As we have seen, other investments may be just as valuable, if not more so, for ensuring health and well-being. There may be no greater strategic investment in health than in the protection of biodiversity and climate.

Health is our most basic human right and one of the most important indicators of sustainable development. Without an intact eco and climate system we may end up paying the hidden price for nature's health services – giving us a much bigger headache than last night's party. ■

22 April

Aid the healing on Earth Day, every day

Ever since it was first marked in 1970, Earth Day has grown to become a global celebration of environmental efforts in 150 countries with the participation of more than one billion people. This year, the Earth Day theme focuses on The Face of Climate Change. This effort aims to collect faces and images of people all over the world who are dealing with the impacts of climate change; to inspire global leaders, governments, environmental organizations, and other stakeholders; and to take further action to address climate change impacts.

Climate change is all around us, and is perhaps the single biggest environmental concern that has roused people to understand that Nature is finally fighting back. For years, Mother Earth has endured decades of abuse through habitat destruction because of deforestation; conversion of forests, wetlands and mountain areas for agricul-

ture, aquaculture, industrial areas and human settlements; pollution of oceans and freshwater bodies from industrial and domestic waste, and sedimentation; unregulated harvesting of trees, plants and wildlife to support the needs of the world's growing population; and degradation of soil through the use of chemical pesticides and fertilizers, among others.

People have enjoyed and used the earth's bounties for centuries, thinking that these resources would never be exhausted. Current events show otherwise. The steady and hastened degradation of forests, oceans, and freshwater ecosystems, have caused numerous environmental issues, foremost of which, is climate change. Variabilities in climate have caused an almost unbearable rise in temperature; increase in extreme weather events, such as increase in frequency and intensity of rain and typhoons, and longer periods of drought;

stronger wave surges that destroy coastal communities; sea level rise that are now affecting low lying cities and nations; and acidification of oceans that affect the survival coral reefs, seagrasses, and other marine life. Climate change has also begun to affect breeding, behavior and migration of wildlife, and has caused changes in crop production cycles.

All these events can now be seen to affect all nations across the globe, both rich and poor countries, but are unfortunately causing the most damage among the poorest of the poor, who do not have the resources to cope with the impacts of climate change. Most countries are becoming overwhelmed, which emphasizes the fact that all hands, from government, to conservation organizations, schools, communities, businesses and other sectors, are needed to combat climate change and other current environmental concerns.

On April 22, people around the world will commemorate Earth Day with conferences, workshops and talks to discuss environmental issues; fun runs and bike rides to emphasize the need for clean air; clean-up activities in coastal areas and riverbanks to show the need to control pollution; and other activities such as exhibits, painting contests, and concerts to raise awareness and inspire the public to contribute to environmental efforts.

This is an opportunity to make Earth Day an everyday event. Contribute daily to the healing of the earth by supporting government and conservation organization initiatives to curb environmental degradation. Bring a bag when you go shopping. Help plant trees. Conserve water and energy. Dispose of waste responsibly. Walk, bike, use public transportation or carpool. Purchase environment-friendly products and patronize environment-friendly establishments. Buy local and preferably organic and free-range products. Bring an insulated mug or water bottle for your beverages.

These are just examples of what ordinary citizens can do to help aid in the healing of the earth. One green act, multiplied daily, and done by billions around the globe, may not cure climate change tomorrow, but it will certainly go a long way to helping the earth, and people, survive. By all means, celebrate Earth Day and mark all the achievements that have been done to help the environment. But be reminded that more needs to be done, and everyone can help by celebrating Earth Day every day. ■



Photo by Zaw Min. Source: ASEAN Biodiversity Outlook.

Burmese children share a feast of vegetables, meat and rice. Biodiversity is a source of food for over 500 million people in the ASEAN region.

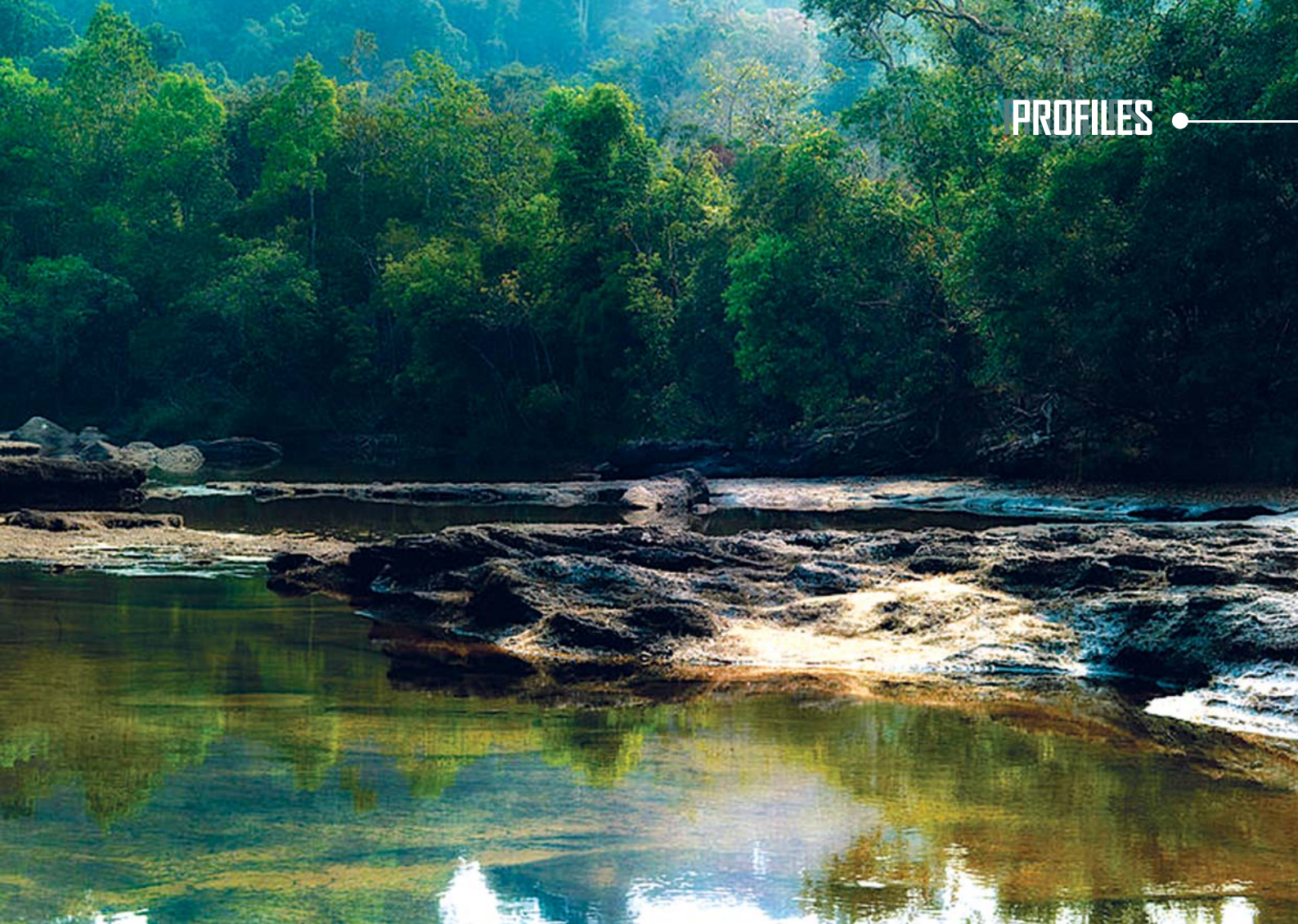


Photo courtesy of Wikimedia Commons

- Lao PDR

Phou Khao Khouay National Protected Area

Phou Khao Khouay, literally translated as the “mountain of the buffalo horn”, is one of Lao PDR’s most beautiful nature reserves. This extensive sandstone mountain range is only 40 kilometers northeast of Vientiane, and was designated a National Protected Area in 1993.



The landscape and ecosystem varies from sheer sandstone cliffs and pristine river gorges to rough mountain slopes. Three large rivers and numerous tributaries empty into the nearby Mekong River. At the centre of the reserve lies the beautiful Ang Nam Leuk reservoir. Another reservoir, Ang Nam Mang 3, located in the very west of the park, has only recently been completed and still shows the scars of construction work.

Covering three provinces, Phou Khao Khouay encompasses about 2,000 square kilometers and stretches over 80 kilometers from west to east, and up to 40 kilometers from north to south. The highest mountain peak is 1,671 meters high.

Habitats and wildlife

The diversity of forest types in the area includes evergreen, mixed deciduous, dry dipterocarp and pine. During the rainy season from May

to October, the reserve comes alive as the forests become green and lush. The waterfalls then reach full flow and vibrantly colored butterflies fill the air. About 50 to 60 percent of all orchids currently found and identified in Lao PDR (nearly 500 of expected +/- 800 species) are also present in Phou Khao Khouay.

Phou Khao Khouay is home to some remarkable wildlife, although most are rarely seen, except for elephants. Some of the larger animals that inhabit the national reserve are the Asian black bear, sun bear, wild dog (jackal and dhole), southern serow, clouded leopard, sambar, mouse deer, Phayre's langur, white-cheeked gibbon, rhesus and pig-tailed macaque, civets and otters.

Two herds of Asian elephant live inside the park. They have formed two groups that apparently do not mingle or interbreed with each other. While one smaller herd is living in the northeastern part (Nam

Mang/Long Xan valley), the other group of about 40 to 50 heads is roaming near Ban Na in the southern periphery of the park.

There are many different bird species in the park, the most remarkable of which is the majestic green peafowl. This once very common bird of the Mekong lowlands is now confined to only five tiny enclaves in southern Lao PDR. Other birds recorded in the park are the blue-breasted quail, Siamese fireback, red-collared woodpecker, coral-billed ground cuckoo, grey-headed lapwing, Jerdon's baza, fish eagle and purple heron. The park is also home to a large number of butterflies and countless other insect species.

Threats

One of the major concerns for park management is the occurrence of human-elephant conflict in the outskirts of the park, particularly in the village of Ban Na. In the mid-

nineties, a considerable part of Ban Na's land became home to an elephant herd of more than 40 heads, victimizing the local farmers by frequently raiding their fields. The movement of the elephant's territory from the upper hills to the lowland was likely caused by their attraction to sugarcane plantations, as well as disturbances due to the construction of a reservoir for power generation several kilometers to the north.

It became difficult for the farmers to plant new crops. The elephants did not move when villagers stopped growing sugarcane, and began to pose a physical and financial threat to local communities. The elephants also destroy a large part of the bamboo while moving through the vegetation, which is a major source of raw materials for local handicrafts.

One of the remedies to reduce human-elephant conflict was the construction of an elephant observation tower, which provided an alternative income for the local communities. While an elephant sighting is not guaranteed, it is highly probable and visitors will have an opportunity to see elephants and other wildlife through the observation tower. This provides an opportunity for villagers to earn from conservation efforts and have a better appreciation of the wildlife that can be found in the park.

Conservation Programme

The Phou Khao Khouay National Protected Area aims to develop tourism as a basis for nature conservation and environmental education. There are many ongoing efforts in community-



based ecotourism in Lao PDR, and these efforts aim to show visitors the magnificent heritage of the country without affecting people's life and their environment.

As part of this endeavor, the Phou Khao Khouay ecotourism project was implemented by the National Tourism Administration of Lao PDR (LNTA), which worked closely with the management of Phou Khao Khouay National Protected Area and the Department of Forestry, which is in charge of the National Protected Areas and their wildlife. The project was supported by the German Development Service (DED) and Embassy of Germany, both in Vientiane; Embassy of Switzerland in Bangkok; and the Canada Fund in Vientiane/Bangkok.

The main goals of the project were to:

- Conserve the nature reserve and its diverse ecosystem and wildlife with the support of sustainable tourism;
- Reduce the exploitation of natural resources by educating local people and creating alternative income opportunities;
- Raise funds for infrastructure, park management, maintenance, and improvement of park facilities;
- Create general public awareness on the importance and benefits of National Protected Areas;
- Provide environmental education and create awareness building for tourists and Lao youth; and
- Create new tourist destinations close to Vientiane.



In 2005, the project was handed over completely to the local communities and is now managed by the villagers of Ban Na and Ban Hatkhai. Some of the achievements of the ecotourism project include the following:

- Improvement of infrastructure;
- Capacity building and training for the Phou Khao Khouay staff, guides and local villagers; and
- Planning and implementation of consumer-oriented activities that coincide with the goals and ideals of nature conservation in Phou Khao Khouay. These activities include trekking, hiking, wildlife watching (elephants), camping, and on-site environmental training.

The villagers of Ban Na and Ban Hatkhai were given extensive education on the benefits and pitfalls of tourism in their village as well as the conservation of Phou Khao Khouay

National Protected Area. Trainings were conducted for villagers to become guides, learn skills in the hospitality trade such as food preparation, and the preparation of their homes as accommodations for tourists.

The LNTA and park administration provide further advice and technical support when needed. Tourism organizations and other companies provide expertise in sales and marketing, and also utilize the services of the villagers of Ban Na and Ban Hatkhai. Private companies that now work with local communities adjacent to the national protected area have pledged to adhere to and honor the principles set during the project development phase, which emphasize villager participation to benefit the community and the environment.

When visitors go to Phou Khao Khouay National Protected Area as well as the villages of Ban Na or Ban Hatkhai, tourism money contributes to the development of

these villages and the creation of new jobs. Part of the income goes to the 'revolving fund', which is a micro-finance scheme where money gained from tourism goes into a 'village account'. Villagers can use this account, following strict rules, to borrow money, which can be used to improve their farm or house, buy seeds, pay hospital bills, or finance the education of their children. The money, of course, has to be paid back in due time and with some interest.

Ecotourism

The heart of Phou Khao Khouay is perfect for outdoor activities such as trekking, canoeing, wildlife watching, picnicking and camping. Its proximity to Vientiane, the capital of Lao PDR, makes it ideal for day trips or multiple day tours.

A major attraction in the park is the Ang Nam Leuk reservoir, a small artificial lake located in the central-northern part of the park. It is surrounded by dense green forest and offers a cool retreat from the heat of Vientiane during the hot season.

Visitors can also experience village life and handicraft production in traditional Lao villages near the nature reserve.

Some of the other attractions in the vicinity of the park include the following:

Ban Na, the Elephant Village

Only an hour-drive from Vientiane, the small and peaceful village of Ban Na on the outside of Phou Khao Khouay offers guided trekking and a great opportunity to watch wild elephants from the safety of an observation tower, which was opened in April 2005. From the tower it

is possible to observe wild elephants at a saltlick, and while they bathe in the nearby stream. Other animals, such as deer, wild pigs and wild dogs, might also be seen or heard at the saltlick. The early morning hours are usually filled with sound of countless birds. Since the wild elephants pose a risk to visitors, the number of visitors is restricted, self-guided tours are not allowed, and visitors are also not allowed to walk back to the village in the dark.

one of the more important pilgrim sites of Lao PDR because of its well-known Buddha footprint. The footprint (phra bat) of the right foot of Buddha lies behind the stupa and points at the nearby Mekong River. Every year in July (with full moon) the temple celebrates a major festival in honor of Buddha.

Mountain Trips at Ban Hatkhai

Ban Hatkhai is a small village just outside Phou Khao Khouay surrounded

as Thailand. This tour can be combined with a trek to Houey Ki Ling, a small stream that leads to a beautiful sandstone plateau.

Swimming and Camping at Tad Leuk

Tad Leuk is the most popular destination in Phou Khao Khouay since it is an ideal spot for swimming and camping, or as a starting point for trekking in the surrounding forests. Tad Leuk is a waterfall within the Nam Leuk, one of the three major rivers of the reserve ('Tad' means waterfall, while 'Nam' means river). The Tad Xang waterfall, another beautiful waterfall that is worth visiting, is a two to three hour-walk upstream from Tad Leuk. Visitors can relax and take a dip at the large pool that surrounds the waterfall.

Facilities inside the park

A Visitor Center with an informative exhibition on the park's flora and fauna, in both Lao and English, can be found in Tad Leuk. There are no guesthouses inside the park. Camping is permitted at Tad Leuk (tents and other equipment can be rented) and the nearest guesthouses are in Thabok or Ban Khonwat in the Long Xan valley. Homestays are available at Ban Na and Ban Hatkhai. Guided trekking tours can be booked at Ban Na and Ban Hat Khai .

How to get there Travel to Ban Na

It is recommended that a trip to the Phou Khao Khouay National Protected Area and Ban Na be booked through a licensed tour company, which will be responsible for the trip including transportation, provision of guides, and collection

of the fees. Nevertheless, those who want to go on their own can take public transportation from the southern bus station in Vientiane Ban Phakhan Km 8. Most of the buses pass Phabath (at the temple) and visitors can disembark here, and walk 1.5 kilometers to the village. Visitors can also opt to hire a vehicle with driver, which can be provided by various tour operators in Vientiane.

Travel to Ban Hatkhai

Visitors can take public transportation from the southern bus station in Vientiane and disembark at Thabok. In the market at Thabok, look for a Songtaew going Long Xan and get off at the junction to Ban Hatkhai. From there it is a two-kilometer walk to the village.

Travel to Tad Leuk

Tad Leuk is relatively easily accessible by car or motorbike from Vientiane via National Road No. 13. Before entering Thabok, turn left to Ban Houay Leuk and this will lead to the checkpoint at the park's border, where visitors pay a minimal entrance fee. From here it is seven kilometers to Tad Leuk.

At Tad Leuk camping is permitted. Camping materials such as tents, mosquito nets, sleeping bags and mattresses can be rented for a small fee. Tad Leuk offers clean toilets and washing facilities. A refreshing bath can be taken in the crystal clear river water. ■

References:

Trekking Central Laos (<http://www.trekkingcentrallaos.com/html/nationalpark.html>)
Ecotourism Laos (<http://www.ecotourismlaos.com/phoukhaokouay/phoukhaokouay.htm>)



Local handicrafts are another attraction in Ban Na. Almost all women and young girls of the village are engaged in basket production. They can split and weave raw bamboo with ease into neat small baskets, which are commonly used for sticky rice. The villagers earn some income from the sale of these baskets.

Visitors may want to trek to the Nam Hi or Tad Lung waterfall, or the more distant Tad Fa, a 40-meter high cliff. Others may be interested in paying a visit to the nearby Wat Phabath,

by mountains, dense forests and bright-green ricefields. The village is an ideal starting point for exciting trekking tours to nearby mountains or waterfalls. Most trips include a rewarding boat trip on the Nam Mang River prior to the trek.

Some attractions in the area include the twin waterfalls of Tad Xay and Pha Xay. More trained visitors can hike up the mountain of Pha Luang, a breathtaking cliff which offers views over Phou Khao Khouay and the Mekong lowland as far



- Malaysia

Talang-Satang National Park

Talang-Satang National Park is located in the Kuching Division of Sarawak. The park comprises the coastline and sea

surrounding four islands of the southwest coast of Sarawak, namely Pulau Talang Besar (Greater Talang Island) and Pulau Talang Kecil (Lesser Talang Island) off Sematan; Pulau Satang Besar (Greater Satang Island); and Pulau Satang Kecil (Lesser Satang Island) off Santubong, near Kuching. These four “Turtle Islands” are responsible for 95 percent of all the turtle landings in Sarawak. Sarawak’s first marine national park, Talang-Satang was established with the primary aim of conserving Sarawak’s marine turtle population.



Gazetted in 1999, the park covers a total area of approximately 19,400 hectares, and covers all lands below the high tide marks on the islands. An area of 4.8 kilometers around the islands forms part of the national park, except for any titled leasehold land on the islands.

Habitats and wildlife

Beautiful shallow reef areas surround all the four islands. The reefs generally consist of several species of hard coral and colonies of soft coral. They provide shelter and resting grounds for sea turtles, and are also important fish breeding areas.

Marine turtles are among the world's longest-lived creatures, with many reaching a lifespan of more than 100 years. They mature slowly, only starting to breed between 30 and 50 years of age, and once they commence breeding, females usually only produce eggs once every four or five years. They do not lay their eggs on just any beach, but migrate back to their beach of birth, sometimes across distances of more than 3,000 kilometers. How they find their way back to that particular beach is one of nature's great unsolved mysteries.

Five marine turtle species are known to nest in Sarawak, with the peak turtle nesting season running from April until September. By far the most important is the Green Turtle (*Chelonia mydas*), which represents 90 percent of all turtle landings. The other species that occasionally land on the islands is the Hawksbill Turtle (*Eretmochelys imbricata*), while the Olive Ridley, Leatherback and Loggerhead Turtles nest primarily on the mainland. All of these species are critically endangered worldwide. The park's Turtle Islands account for 95 percent of all recorded

turtle landings in Sarawak, a clear indicator of the importance of Talang-Satang for marine turtle conservation.

The Talang-Satang National Park also includes the Pulau Tukong Ara-Banun Wildlife Sanctuary, two small islets located close to the Satang Islands. Pulau TokongAra, the larger of the two rocky outcrops, is home to breeding colonies of bridled terns and black-naped terns. Black colored pacific reef egrets are also frequently sighted on the rocks.

Threats

Turtles have survived for over 200 million years, but their population is now severely threatened by their breeding habits and the deterioration of their nesting sites. Beaches around the world are being developed for various purposes, thus disturbing turtle nesting sites and contributing to the decline and possible extinction of marine turtle species.

Other factors that contribute to turtle mortality are deliberate poaching of turtles for meat and tortoise shell; uncontrolled collecting of turtle eggs; entrapment in fishing nets; destruction of feeding grounds such coral reefs or sea grass beds; and ingestion of plastic bags, which some species mistake for jelly fish, part of their natural diet.

Even under perfect conditions, survival rates for turtles are very low. A female turtle may lay as many as 10,000 eggs in her lifetime, but because of nesting losses due to natural land predators and predation by fish once they reach the sea, as few as ten hatchlings will survive to reach maturity.

Conservation Management

Because of the threats to the marine turtles, a conservation programme is under way on Talang-

Satang's three larger islands, and also in Tanjung Datu and Similajau National Parks on the Sarawak mainland. Conservation work dates back to the 1940s when the Sarawak Museum embarked on a long-term research project. Thanks to the Museum's pioneering work, records of landings date back to 1946. Large scale turtle conservation work began in 1951 when over 20,000 eggs were collected and transferred to a natural beach hatchery. In 1953 the first tagging of Green turtles was done.

Today, Sarawak Forestry manages the national park and has set up a number of hatcheries. During the peak turtle nesting season from May to September, park wardens monitor the beaches for turtle landings. Eggs are either removed from nests and placed in guarded hatcheries, or left in place and guarded round the clock by Sarawak Forestry wardens. After 40 to 60 days of incubation, the young hatchlings are released at night to reduce losses from predators. Some hatchlings are tagged with miniaturized radio tracking devices to learn more about their ecology and life cycle. The programme appears to be working well, as the number of landings has stabilized at between 1,500 to 3,000 per year over a 10-year period, after sinking to an all time low of under 1,000 in the early 1980s.

Another reason for increased turtle landings is the successful reef-ball programme. Over 2,000 concrete reef-balls have been placed in the waters of the Talang-Satang National Park. These artificial reef balls provide a ready-made habitat for coral species as well as inter-nesting shelters for turtles. The reef balls' rough and heavy concrete construction can rip fishing

nets to shreds, and therefore prevents encroachment by trawlers. It is difficult to determine exactly what difference they make to actual numbers of landings, but since the introduction of reef-balls the number of dead turtles found in Talang-Satang has decreased dramatically.

The conservation programme has been carefully planned to involve local communities. The traditional rights and practices of the local landowners, villagers, and fishermen are recognized, and Sarawak Forestry works in close cooperation with members of the local community to ensure the sustainable use of resources.

To properly manage the national park, it is subdivided into two areas, namely the Core Area and the Complimentary Area. The Core Area is an area covering a two-kilometer radius from the highest point of each island, as well as 200-meter radius around Pulau Tukong Ara and Pulau Tukong Banun. This Core Area is then subdivided into the Public Appreciation Zone, where visitors are allowed to enter with a permit, and the Conservation/Research Zone, where casual visitors are prohibited. The Complimentary Area covers the two-kilometer radius to the 4.8-kilometer limit surrounding the four islands. These areas are not afforded absolute protection, meaning certain fishing and diving activities are allowed.

Ecotourism

The Talang-Satang National Park was created to promote nature tourism with conservation. Educational and recreational activities that do not have any negative impact on the marine life are encouraged. However, as Talang-Satang is a marine turtle nesting site, most of the park is off limits to casual visitors.



Because of the extreme sensitivity of the habitats, visitors are only allowed within 2.8 kilometers of Pulau Talang Besar, Pulau Talang Kecil, Pulau Satang Kecil or the Ara-Banun Wildlife Sanctuary and only through a special arrangement with Sarawak Forestry. Permission is normally only granted to bona fide researchers, students, conservation organizations, and people participating in the Sea Turtle Volunteer Programme.

Pulau Satang Besar, the largest of the islands, is open to visitors, but conservation takes priority over tourism. Parts of both the island and the surrounding sea are off-limits to visitors, who must remain within the designated area and be accompanied by Sarawak Forestry wardens at all times. Despite these very necessary restrictions, Pulau Satang Besar is a fascinating and beautiful place to visit. The turtle hatchery is the main land-based attraction, where visitors can learn all about the conservation programme.

The Visitors Information Centre is located in the Old Courthouse Complex at the junction of Jalan Tun Abang Haji Openg, Jalan Gambier and Main Bazaar, opposite the Kuching Waterfront.

There is a small, locally operated visitor lodge on Pulau Satang Besar, with limited amenities and accommodation. There is no visitor accommodation elsewhere in Talang-Satang National Park, and overnight stays are not permitted due to the need for conservation of turtle nesting areas. There are no canteens or other visitor facilities, so visitors should bring food and drink with them.

Diving and Snorkelling

The island itself is steep and thickly forested, and unsuitable for trekking. However, a white sand beach stretches across the entire southern side of the island. The surrounding waters are a deep emerald green with coral reefs just a short distance from the shore, which offer good snorkelling possibilities. The sea-bed slopes gradually to a depth of about 12 meters, with some attractive hard coral formations, soft corals, gorgonian sea fans and feather stars, surrounded by their attendant small fish. The colors can be fantastic, but visibility is frequently limited to between three and ten meters, so only serious snorkelers and divers will see the corals at their best. Large pelagic fish are

rare, but Green Turtles can occasionally be seen gliding gracefully through the water.

Scuba diving and snorkelling are confined within the designated zone only. No water recreation activities are allowed outside the zone in the interests of conservation. Scuba divers must be accompanied by an approved dive guide.

The Sea Turtle Volunteer Programme

The Sarawak Sea Turtle Volunteer Programme (SSTVP) is a unique eco-tourism initiative run by Sarawak Forestry. Open from May to September, this conservation-driven programme allows volunteers to actively participate in Sarawak's turtle conservation efforts by spending four days at the Turtle Conservation Station on Pulau Talang-Talang Besar.

Upon arrival on the island, volunteers are briefed on the conservation programme before being allocated tasks or areas of responsibility. Duties include beach patrols to locate turtle arrivals, monitoring turtle nesting activity, tagging and measuring turtles, transferring eggs to the hatchery, releasing hatchlings, data recording and other on-site conservation activities.

The SSTVP offers participants the chance to learn more about turtle conservation and experience unforgettable encounters with marine turtles. Furthermore, participants gain the satisfaction of knowing that they are actually contributing to a valuable conservation project.

How to get there

Pulau Satang Besar is a 30-minute boat ride from Damai Beach, the Sarawak Boat Club Jetty or Telaga Air Jetty. There is no regular boat service and visitors should travel in an organized tour. A number of Kuching-based tour operators run day trips to the island, often in conjunction with other marine-based activities such as dolphin watching or mangrove cruises. ■

References:

Sarawak Forestry Corporation (<http://www.sarawakforestry.com/htm/snp-np-satang.html>)

Sarawak (<http://www.sarawaktourism.com/en/itinerary-detail/itin-detail?catid=1&itinid=39>)

About Talang Satang National Park

Source: Asia Explorers (<http://www.asiaexplorers.com/malaysia/talang-satang-national-park.htm>)

Filipino forester-lawyer to lead ASEAN Centre for Biodiversity

A Filipino forester-lawyer has been chosen by the Association of Southeast Asian Nations (ASEAN) to lead the ASEAN Centre for Biodiversity (ACB). Atty. Roberto V. Oliva, will succeed Executive Director Rodrigo U. Fuentes who passed away in August 2012. The new Executive Director took his oath of office on 23 April at a ceremony held at the ACB Headquarters in Los Banos, Laguna in the Philippines.

A professional forester and lawyer, Oliva specializes in natural resources law and policy, and has over 30 years of professional experience in the areas of forestry, protected areas, environment and natural resources management.

He graduated from the University of the Philippines College of Forestry and Natural Resources (UPCFNR) in 1978 as a government scholar and was a recipient of the Society of Filipino Foresters Award on Leadership. He finished his law degree in 1984, and in 1988, completed a Senior Fellowship at the ASEAN Institute of Forest Management in Kuala Lumpur, Malaysia where he wrote a book entitled "Harmonization of Forest Policies in the ASEAN Region."

Oliva was a professorial lecturer of the UPCFNR where he taught forestry laws, rules and regulations, forest policies and forest administration subjects. He was also a lecturer in the Graduate Programme of the Development Academy of the Philippines handling the legal framework for biodiversity conservation. He continues to teach forestry subjects on various occasions.

He also worked with international organizations such as the United Nations, Asian Development Bank, Japan Bank for International Cooperation, World Bank, Global Environment Facility, the United States Agency for International Development, and private consulting firms mostly as natural resources policy and legal specialist. His contributions to projects with these organizations include the preparation of the Philippine Forestry Master



Plan; drafting of the Forestry Code of the Philippines, formation of Multi-sectoral Forest Protection Committees; conduct of Protected Areas and Biodiversity Studies; preparation of various administrative issuance in the field of natural resources at the Department of Environment and Natural Resources; and participation in the Model Forest Project, Sustainable Coastal Tourism of Asia, and EcoGovernance Project.

From April 2006 to February 2007, Oliva was an international legal consultant/international forestry legal consultant at the Food and Agriculture Organization of the United Nations, where he assisted the government of Kenya in the development of subsidiary legislation for forestry.

Locally, he assisted DENR and local governments in environmental protection and management including the generation of resources for local governments. In 2011, he was team leader in the formulation of the Environment Code of the City of Santa Rosa, Laguna. He was Assistant Secretary at DENR prior to his appointment as ACB Executive Director.

Oliva has received numerous awards in recognition of his achievements, including the Outstanding Citizen of Los Baños, Laguna in 2004; Outstanding Alumnus Award in the field of Forestry Laws and Policies of the UPCFNR and of UPLB, both in 2004; Outstanding Leadership Award as UPCFNR President from 2005 to 2011; and the UPLB Alumni Association Service Award in 2011.

He worked in 2004 with the predecessor organization of ACB, the ASEAN Regional Centre for Biodiversity Conservation (ARCBC), on a study entitled "Legal Personality and Institutionalization of the ARCBC." He was also the legal counsel of ACB from 2008 to 2011.

With Oliva's leadership, the ASEAN Centre for Biodiversity will continue to strengthen biodiversity conservation efforts in the region and develop new directions in the protection of ASEAN's natural heritage.

New ACB head urges ASEAN citizens to join hands for biodiversity conservation

RECOGNIZING the value of collective action, the new leader of the ASEAN Centre for Biodiversity (ACB) called on partner agencies and various sectors of society to work together in protecting biodiversity in the region.

Atty. Roberto V. Oliva formally took oath as the new executive director of the ACB on 23 April at the centre's Headquarters in Los Banos, Laguna in the Philippines.

In his acceptance speech, Oliva said he is up for the challenge of leading ACB in its efforts, but also stressed

the importance of working together to protect the ASEAN region's rich but threatened biodiversity. He underscored that it is crucial to join hands in this effort since man's survival is at stake. "Continue destroying ASEAN biodiversity, and you jeopardize the very existence of ASEAN. Love and care for it, and it will sustain a good life for its 600 million people," he said.

Oliva expressed gratitude to the ASEAN Member States for their technical and in-kind contribution to ACB. He also sought continuous support for the ASEAN Biodiversity Fund and the ratification of the ACB Agreement.

Partner agencies of the ACB graced the oath taking ceremony, and gave their respective messages for Oliva.



Undersecretary Demetrio Ignacio, Jr. of the Philippines' Department of Environment and Natural Resources said ACB faces a number of challenges, but assured full support from the Philippine Government, the ASEAN Senior Officials on the Environment (ASOEN), and the ACB Governing Board. He also encouraged ACB officers and staff to think and act ASEAN, which means respecting cultural and individual differences, thinking about the welfare of all, and deciding based on consensus.

Ignacio, who served as the acting executive director of ACB, administered the oath taking of Oliva.

Meanwhile, Assistant Secretary Teresita Barsana of the Philippines' Department of Foreign Affairs, represented by Director Julius Caesar Flores, reiterated the Department's support in "contributing to the fulfillment of the mandate and work of the Centre and to collective efforts towards the building of the ASEAN Community by 2015."

University of the Philippines Los Banos (UPLB) Chancellor Rex Victor Cruz also welcomed Oliva and mentioned the university's commitment to continue its support to ACB in the coming years. The Centre's headquarters lies in UPLB's sprawling campus.

Oliva is a forester and lawyer who served as the legal counsel of the ACB from 2008-2011 prior to his appointment as executive director. He was also part of the ASEAN Regional Centre for Biodiversity Conservation (ARCBC), the predecessor organization of ACB.

ACB and BirdLife International (Asia) form conservation partnership

THE ASEAN Centre for Biodiversity (ACB) and BirdLife International (Asia) have agreed to form a partnership to strengthen environmental information management capacities of ASEAN Member States, particularly in the identification and delineation of protected areas by improving the quality of available information. Specific areas of cooperation will be on jointly generating knowledge products and tools and delivering on the necessary skills related to enhancing biodiversity conservation in the ASEAN region.

A memorandum of cooperation (MOC) was signed by Mr. Demetrio L. Ignacio Jr., Acting Executive Director of ACB,

and Ms. Cristi Marie C. Nozawa, Regional Director of BirdLife International (Asia), on 9 January 2013 at the ASEAN Centre for Biodiversity Office in Los Banos, Laguna, Philippines.

Director Ignacio said the MOC will encourage the ASEAN Members States to organize their species-related data in support of science-based decision making, particularly in the identification of protected areas.

According to Director Nozawa, the MOC will enable sharing of biodiversity-related information, specifically point and polygon information on Important Bird Areas from BirdLife International, as well as enable ACB to integrate the information from other sources and thus service the protected area site selection needs of ASEAN Member States. The two institutions will cooperate to harmonize the data structures and content between the ASEAN CHM-BISS and BirdLife International's Data Zone.



Acting Executive Director Demetrio L. Ignacio Jr. of the ASEAN Centre for Biodiversity (ACB) and Regional Director Cristi Marie C. Nozawa of BirdLife International (Asia) exchange copies of the MOC they signed to forge a partnership in strengthening environmental information management capacities of ASEAN Member States. Also in photo are (L-R): Wilfredo Obien, Head of ACB Finance and Administration; Rolando Inciong, Head of ACB Communication and Public Affairs; Anabelle Plantilla, Head of Haribon; Clarissa Arida, ACB Director for Programme Development and Implementation.

ACB trains Timor-Leste on biodiversity information management

THREE high level technical staff of the Government of Timor-Leste involved in biodiversity information management underwent a one-week training conducted by the ASEAN Centre for Biodiversity (ACB) at its headquarters in Los Banos, Philippines in January 2013.

The participants were America Machado Fernandes, Clearing-House Mechanism Focal Point for Timor-Leste; Mario Ximenes, Alternate/Assisting Focal Point for Timor-Leste; and Mr. Livio Xavier, UNDP Project Manager. The resource persons were staff of the Biodiversity Information Management of ACB: Director Sheila Vergara, Ms. Lilibeth Cabebe, Ms. Rea Anne Rañada, Mr. Christian Elloran, Mr. Jerome Alano and Ms. Erica Villavelez.

The trainees learned how to manage biodiversity Clearing-House mechanism (CHM) website using Joomla!; update and upload CHM contents; harvest, encode and process species and protected areas (PA) information; organize species and PA information using the Darwin Core



2 (for species) and IUCN-WDPA (for PA) encoding tools; map species and habitats based on available information with the use of new technologies (e.g., global positioning system or GPS); and prepare the draft of Timor-Leste's Fifth National Report to the Convention on Biological Diversity (CBD).

Establishing a CHM website is a requirement for countries that are parties to the CBD. After the training, Timor-Leste will designate a government agency that will officially host and maintain the CHM website as well as facilitate the organization of the CHM stakeholders' network.

Brunei Darussalam holds workshop on crafting a national biodiversity law

AROUND sixty representatives from various government agencies and the private sector involved in legislation and biodiversity conservation in Brunei Darussalam held a workshop on 15 January 2013 to come up with recommendations and guiding principles for the formulation of a national biodiversity law. The workshop was facilitated by the ASEAN Centre for Biodiversity through Dr. Filiberto Pollicco Jr., policy development specialist; Rolando Inciong, head of Communication and Public Affairs; and Ana Maria Tolentino, programme officer. Coordinators were Mahmud Yussof, head of the Heart of Borneo Centre and Biological



Research and Innovation Centre, Ministry of Industry and Primary Resources; and Zaeidi Haji Berudin, Forestry Officer, Biodiversity Research and Innovation Centre.

The findings and recommendation from the workshop were presented to the Minister of Industry and Primary Resources, Yang Berhormat PehinOrang Kaya Seri Utama Dato Seri Setia Hj Yahya Begawan Mudim Dato Paduka Hj Bakar at the closing ceremony of the workshop.

Participants came up with visions on the status of Brunei's biodiversity conservation and economic development over the next 50 years. They envisioned Brunei with sustainably conserved and managed biodiversity; its people well educated on biodiversity and energy conservation; and the country as a global centre of excellence in biodiversity conservation.

Organized by the Ministry of Industry and Primary Resources, the workshop identified and consolidated the roles and responsibilities of relevant agencies in formulating a national goal and key areas for the proposed national biodiversity law. The participants discussed the creation of a national mechanism within the national biodiversity law that will legislatively protect the interests of all stakeholders, ensuring fair and equitable benefit sharing and access to national biodiversity, including genetic resources and its derivatives.

The participants also discussed the establishment of strong and effective legal measures or provisions on the administration of the national biodiversity law, including genetic resources and its derivatives and an institutional structure with the power to oversee implementation, procedures and practices for the sustainable development and wise use of these resources covering agreements and permits, and penalties for non-compliance or any acts that contravene the laws, rules and regulation.

As party to the Convention on Biological Diversity, Brunei Darussalam has an obligation to meet the agreement's three objectives: conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from use of genetic resources. Enacting a national biodiversity law will help Brunei Darussalam meet these objectives and contribute to the realization of the new global biodiversity targets, also known as the Aichi Targets 2020.

IPBES holds first plenary meeting

OVER 500 representatives of member and non-member governments, UN organizations and conventions, intergovernmental organizations, and various stakeholder groups attended the first session of the Plenary of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES-1) held on 21-26 January 2013 in Bonn, Germany. The delegates elected the first IPBES Chair and the members of the Bureau and Multidisciplinary Expert Panel, adopted a budget, and agreed on steps toward the development of an initial IPBES work programme. IPBES was established to focus global attention to biodiversity issues and serve as a central body for generation and dissemination of knowledge on biodiversity. Although similar to the Intergovernmental Panel on Climate Change, IPBES would go further by playing roles beyond conducting assessments. New roles would include capacity building and bringing together different knowledge systems, such as the scientific community and other knowledge holders.

Animation promotes biodiversity conservation

TO creatively educate a wide range of audiences on biodiversity conservation, the ASEAN Centre for Biodiversity (ACB) has produced a 10-minute animated video titled, *Animals and Plants in Danger*. The video focuses on endangered species in the ASEAN Member States and ways on how to save them from extinction. The video enumerates a number of critically endangered species in each ASEAN Member State. It also discusses destructive human activities that contribute to the worsening problem of biodiversity loss. The film ends with a call for action that is conveyed through a “wish list” made by the endangered species as their petition to humans. The production of the video was made possible through the creativity and talents of ACB staff who did the script-writing, voice-overs, animation and video editing. *Animals and Plants in Danger* may be accessed at http://www.aseanbiodiversity.org/index.php?option=com_content&view=article&id=348:animals-and-plants-in-danger&catid=7:acb-videos&Itemid=122. The video may be freely copied and distributed.



Protecting ASEAN’s mangroves

HUMANS have been benefiting from mangroves for thousands of years. They serve as breeding grounds for fishes and protect humans from harsh weather conditions. But irresponsible human activities cause the degradation of mangroves. Promoting regional cooperation in the protection, conservation and sustainable management of mangroves was discussed during a meeting between officials of the Los Banos-based ASEAN Centre for Biodiversity (ACB) and the Indonesian-based Mangrove Ecosystem Conservation and Sustainable Use in the ASEAN Region (MECS Project).

One of the collaborative activities was the Regional Symposium on Mangrove Ecosystem Management in Southeast Asia held on 27 February to 1 March 2013 in Surabaya, Indonesia. Acting ACB Executive Director Demetrio L. Ignacio, Jr. delivered the keynote address. Photo shows Usec Ignacio (in Barong) handing over information materials on ASEAN’s mangroves to Dr. Bedjo Santoso, Director of MECS Project; Director of Forest and Land Rehabilitation and Director General of Watershed Management and Social Forestry, Ministry of Forestry, Indonesia.

Also in photo (l to r): Dr. Berthold Seibert, Project Director of the ACB-GIZ Biodiversity and Climate Change Project (BCCP); Dr. Dicky Simorangkir, Climate Change Expert, BCCP; Rika Novida, National Coordinator, MECS Project;



Willy Obien, Head of Finance and Administration, ACB; Mitsugi Hiroto, Japan International Cooperation Agency; Professor Takahisa Kusano, Chief Advisor, MECS Project; Dr. Santoso; Director Ignacio; Rissa Arida, Director for Programme Development and Implementation, ACB; Dr. Sheila Vergara, Director for Biodiversity Information Management, ACB; Dr. Filiberto Pollisco, Jr., Programme Development Specialist, ACB; and Rolando Inciong, Head of Communication and Public Affairs, ACB.

Use art for the environment, design a logo for the ASEAN Heritage Parks!

National parks, wildlife sanctuaries, and national protected areas are quite com-

mon, but most people are unaware that the Association of Southeast Asian Nations (ASEAN) has the first network of regional protected areas in the world. Known as the ASEAN Heritage Parks (AHPs), these sites are protected areas of high conservation importance which preserve a complete spectrum of representative ecosystems in the ASEAN region. Including natural/national parks, nature reserves, cultural sites and pre-historic sites, AHPs represent the very best of species and ecosystems of ASEAN.

To create greater recognition for the significance of AHPs, set them apart from other protected areas, and promote AHPs as prime nature destinations, the ASEAN Centre for Biodiversity (ACB) is launching an ASEAN Heritage Parks logo design contest. The winning logo will serve as the trademark to identify a specific protected area as an AHP.

ACB is encouraging artists from across the ASEAN region to join the AHP Logo Design Contest. The winner will be awarded during the 4th ASEAN Heritage Parks Conference scheduled on 1-4 October 2013 in Cagayan de Oro City, Philippines.

The logo design mechanics are as follows:

The AHP Logo Contest is open to residents of all ASEAN Member States (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam), most especially to officials and staff of



the 32 ASEAN Heritage Parks, including other protected areas.

The logo must depict the uniqueness of the ASEAN Heritage Parks, which include the following: terrestrial, marine, wetlands/inland water; forests, grasslands, lakes, coastal and marine, mangroves and other ecosystems; richness of biodiversity (flora and fauna); and ecosystem services.

The AHP Logo Contest shall be judged according to the following criteria: Originality (20%), Memorability (20%), Symmetry of Design (20%), Symbolism and Interpretation (20%), and Visual Impact (20%). The decision of the judges is final.

The design of the logo must be original and must be submitted by the actual creator of the logo. Any complaints that may arise due to similarities, likeness or comparison of the design would be the accountability of the participant who will be responsible for its authenticity.

Participants may submit as many entries as they can. Deadline for the submission of entries will be on 31 July 2013.

All entries should be sent via e-mail. Entries should be in high resolution digitized format. The entries should be in .EPS, .TIF, .BMP, .PDF (in 300 dpi,) or other compatible vector formats that can be printed on landscape A3 size paper.

Entries should include at least a one-page description of the logo/entry.

The logo should be clearly readable and retain its readability and reproduction quality when increased or reduced in size.

The logo should look good in full color, single color or black-and-white prints.

All entries must be sent to: The Communication and Public Affairs Office, ASEAN Centre for Biodiversity, Email: arcametin@aseanbiodiversity.org.

Please include the following information in your entry: Name, Address, Phone/mobile number, Age, Organization and Email address.

The winning entry will be presented during the 4th ASEAN Heritage Parks Conference and will serve as the official logo for the ASEAN Heritage Parks.

The winner will receive a certificate and a cash prize of US\$1,000.

All entries shall become properties of the ASEAN Centre for Biodiversity and may be used on official stationery, posters, websites, brochures, advertisements and other information materials.

ASEAN planners learn integrating ecosystem services into development planning

DEVELOPMENT planners from Cambodia, Lao PDR, Myanmar, Thailand and Viet Nam convened from 19 to 22 February 2013 to learn how to integrate ecosystem services into development planning and help conserve and sustainably manage their countries' rich biodiversity resources. Held at the Centara Duangtawan Hotel in Chiang Mai, Thailand, the Training-Workshop on Integrating Ecosystem Services (IES) into Development Planning was organized by the ASEAN Centre for Biodiversity (ACB) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) through the

Biodiversity and Climate Change Project (BCCP) and the European Union-co-financed Enhancing the Economics of Biodiversity and Ecosystem Services in Thailand/South-East Asia Project.

Conducted in cooperation with the Department of National Parks, Wildlife and Plant Conservation and the Highland Research and Development Institute of Thailand, the training-workshop was the second in a series of activities aimed at enhancing capacities of development planners and decision makers in the ASEAN region on managing ecosystems to sustain the flow of ecosystem services that can provide immediate economic benefits, and strengthen the resilience of those systems, especially in the face of climate change.

The training-workshop provided the participants with an overview of "The Economics of Ecosystems and Biodiversity (TEEB)" initiatives and applications including its historical background, objectives and outcomes. The TEEB is a landmark study that assesses the economic impacts associated with losing natural capital. The participants learned how to recognize the linkages between ecosystem services and development; familiarized themselves with TEEB related tools and mechanisms; and contextualized approaches on integrating ecosystem services into development planning for their respective countries

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., 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 the mangroves found on earth, where 36 to 47 species of the world's known 70 mangrove species are present. An estimated 600 million Southeast Asian 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.

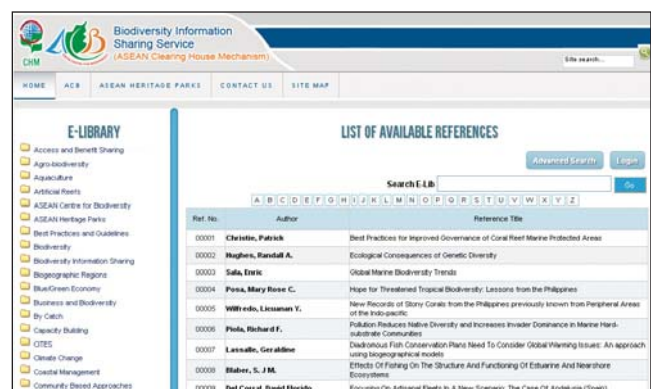
Taking action to mainstream mangrove ecosystem management has become increasingly significant as mangroves contribute to biodiversity conservation by providing feeding and spawning grounds for fish, crabs, shrimp and other marine life. They provide a buffer against the impacts of climate change by serving 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.

Biodiversity information online resource launched

A new on-line resource for biodiversity information, the ACB E-Library, has been launched by the ASEAN Centre for Biodiversity (ACB). The ACB E-library is one of the knowledge management resource services of ACB’s ASEAN Clearing-House Mechanism website which provides a compilation of biodiversity-related references in various thematic areas of the Convention on Biological Diversity. These include cross-cutting concerns on biodiversity such as invasive alien species, climate change, taxonomy, access and benefit sharing of genetic resources, and payment for ecosystem services, among others. Research on species, ecosystems, and assessment studies are also available on the ACB E-Library.

There is something for everyone at the ACB E-Library. Researchers and students can check the status of endangered species and ecosystems protected areas. Policy makers can access materials on governance, law enforcement and gap assessments of protected area networks. Entrepreneurs, non-government organizations and conservation managers can get insights on ecotourism and community-based approaches in natural resource management. Materials on environmental education are also available for academics and environment information officers to help create greater awareness of the need to conserve biodiversity.



Users of this facility can download the reference of their interest in PDF format or may be directed to the source URL if the reference material is restricted to public viewing. The ACB E-library also highlights some of the results of the scoping studies undertaken by ACB particularly on The Economics of Ecosystems and Biodiversity.

For easy access to biodiversity information in the region, check out the resources at the ACB E-Library at http://chm.aseanbiodiversity.org/index.php?option=com_wrapper&view=wrapper&Itemid=214¤t=214.

Thailand ratifies ACB Establishment Agreement

THAILAND has ratified the agreement establishing the ASEAN Centre for Biodiversity (ACB) on 19 February 2013. The instrument of ratification was signed by Surapong Tovichakchaikul, Thailand's Deputy Prime Minister and Minister of Foreign Affairs, making Thailand the seventh ASEAN Member State to ratify the agreement. The ACB Establishment Agreement embodies the commitment of ASEAN Member States in establishing ACB as a regional centre that facilitates cooperation and coordination among ASEAN Member States and with relevant organizations on the conservation and sustainable use of Southeast Asia's rich but highly threatened biodiversity.

Commending Thailand's action, Acting ACB Executive Director Demetrio L. Ignacio, Jr. said the ratification will contribute to the sustainability of ACB in carrying out its primary task as a regional and collaborative institution dealing with the effective management of biodiversity resources, aligning strategic priorities with the environment and natural resources management focus of Thailand and other ASEAN Member States, and linking global initiatives that ensure the sustainable use of biodiversity resources. The ratification, he said, is a very significant contribution to the promotion of unity and collaboration among ASEAN Member States, the realization of the One ASEAN Community 2015 target, and the celebration of the United Nations Decade on Biodiversity (2011-2020).

Singapore hosts workshop on Global Strategy for Plant Conservation

TWENTY-ONE participants from Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Singapore and Viet Nam participated in the regional workshop on *Reflecting the Global Strategy for Plant Conservation (GSPC) in National Biodiversity Strategies and Action Plans (NBSAPs)* held from 4 to 8 March 2013 at the Singapore Botanic Gardens (SBG). The workshop was organized by the Convention on Biological Diversity Secretariat in collaboration with SBG and the National Biodiversity Centre of Singapore, with the Botanic Gardens Conservation International as event facilitator.



The workshop enabled the participants to have a good understanding of how the implementation of the targets of the GSPC contribute to the achievement of the Aichi Biodiversity Targets (Strategic Plan for Biodiversity 2011-2020), so that relevant linkages could be clearly articulated in updated and revised NBSAPs of each participating countries. The workshop identified ways and means to raise awareness of the GSPC at the national level and ensure that plant conservation activities were appropriately reflected in national biodiversity reporting. *NParks News*

ASEAN-Germany cooperation for biodiversity conservation

THE ASEAN Centre for Biodiversity (ACB), and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) welcomed Mrs. Christina Liesegang, an official on regional policy for Asia and South-East Asia of Germany's Federal Ministry of Economic Cooperation and Development (BMZ) at the ACB headquarters in the Philippines on 22 March 2013. Officials of ACB and the German development institution discussed collaboration on conserving the ASEAN regions rich but highly threatened biodiversity. The visit also featured a tour of the Makiling Botanic Gardens.



(From left to right) Dr. Dicky Simorangkir, international expert, GIZ-Biodiversity and Climate Change Project (BCCP); Ms. Claudia Ilting, junior country manager, Philippines and the Pacific, GIZ; Ms. Olga Caday-Asaña, local expert, KfW Development Bank; Dr. Berthold Seibert, project director, GIZ-BCCP; Mrs. Christina Liesegang, desk officer, Division 400 – Regional Policy; Asia and Southeast Asia, General Federal Ministry of Economic Cooperation and Development (BMZ); Mr. Demetrio L. Ignacio Jr, Acting Executive Director, ACB; and Ms. Clarissa Arida, Director, Programme Development and Implementation Unit, ACB.

ASEAN reviews environmental education action plan 2008-2012 and crafts new one

ENVIRONMENTAL education officials and experts from Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand and Viet Nam met in Kuala Lumpur, Malaysia from April 8 to 10 to review the outcomes of the implementation of the ASEAN Environmental Education Action Plan (AEEAP) 2008-2012. Joining the ASEAN Member States are representatives of the ASEAN Secretariat and partner organizations.

Participants formulated a successor plan to the AEEAP 2008-2012 that will continue serving as a guiding document in promoting environmental education and public participation in the ASEAN region. The recommendations for the successor plan were presented at the annual meeting of the ASEAN Working Group on Environmental Education (AWGEE) on April 11 and 12, also in Kuala Lumpur.

The environmental education action plan was implemented from 2008 to 2012 and provided a clear strategic planning network for further development of environmental education in ASEAN while contributing to sustainable environmental management and overall sustainability in the ASEAN Member States.



The action plan supported the vision of ASEAN for a clean and green ASEAN, rich in cultural traditions with citizens who are environmentally literate, imbued with environmental ethic, willing and capable to ensure the sustainable development of the region through environmental education and public participation efforts. The action plan focused on the formal education sector; the non-formal sector; human resource capacity building; and networking, collaboration and communication.

The Kuala Lumpur workshop featured country presentations of good practices on environmental education.

GIZ holds media training for project staff and partners

RECOGNIZING the crucial role that media plays in raising awareness of issues and programmes, GIZ conducted a media training for project staff and partners in Bangkok, Thailand from 18 to 22 March 2013.

Dubbed *How to utilize media to increase outreach*, the five-day workshop oriented participants on how to deal with media, how to write a successful press release, and how to reach media and multipliers using online instruments. Their skills in photography and video were also enhanced.

The workshop was organized for project staff and partners of GIZ in three programmes: the Biodiversity and Climate Change Project in the Philippines, the ASEAN-RESP Programme in Indonesia, and the ASEAN Biocontrol Project in Thailand. The ASEAN Centre for Biodiversity (ACB) was represented by Rolando A. Inciong, head of communication and public affairs;

Corazon de Jesus, Jr., programme development and implementation officer; Jerome S.J. Alano, GIS officer; and Angela Metin, communication and public affairs staff.

"The training helped ACB staff gain a deeper understanding of public relations, its instruments and ways to develop a media strategy. This will certainly enhance our communication, education and public awareness efforts," Mr. Inciong said.



Group photo of the participants in the Media Training held in Bangkok Thailand last March 18-22, 2013. The training course title was *How to utilize media to increase outreach*. (Front row, 3rd person from left – Joachim Voegelé-Trainer/ Communication and media professional from Germany.)

■ Brunei Darussalam

11,000 hectares of land marked for forest restoration. According to the Minister of Industry and Primary Resources, the Forestry Department has identified 11,000 hectares of land for its forest restoration programme in Sungai Liang in Belait District. Fast-growing trees would be planted for harvesting to discourage the logging of primary and pristine rainforest. Efforts are already underway to protect valuable trees such as damar, and that nurseries in Sungai Liang had 300,000 tree saplings ready for replanting. Other strategies employed by the forest department to replenish deforested areas include replanting four trees of the same species for every one logged; development of more timber plantations and strict implementation of logging regulations. There are currently 24 logging companies registered with the Forestry Department, and that quotas were limited to 100,000 cubic meters of wood a year. In terms of conservation, the department is developing plans to conserve peat swamp forests and create more public parks to showcase the country's biodiversity.

The Brunei Times

Up to US\$30.5 million in new funds to support green economies in the Heart of Borneo. The Asian Development Bank (ADB) board formally approved its US\$4.5 million co-funding for the new Sustainable Forest and Biodiversity Management programme in the Heart of Borneo. This funding is part of a programme that was approved by the Global Environment Facility (GEF) Council in November 2012. In addition to the ADB's US\$4.5 million, the GEF will provide US\$2.5 million, the Government of Indonesia US\$0.5 million and WWF US\$2 million. There is also an additional US\$2 million for social development and community empowerment from the Japan Fund for Poverty Alleviation, and up to US\$19.5 million from the Forest Investment Programme (FIP) in Indonesia. These contributions amount to a potential investment of around US\$30.5 million for forest conservation and green growth interventions in the HoB. The

programmes are designed to ensure the sustainable management of forest resources and biodiversity in the Heart of Borneo (HoB) through direct engagement with governments, communities and private sector companies. By reducing pressure on forests and promoting sustainable and equitable forest and land management, the project will help reduce Greenhouse Gas emissions, with potential co-benefits in the form of poverty reduction, improved quality of life for the indigenous peoples and local communities, protection of local peoples' rights, and enhanced conservation of biodiversity and other ecosystem services.

World Wide Fund for Nature

iCube team explores Brunei biodiversity. The 2nd Governing Board Meeting for the International Consortium of Universities for the Study of Biodiversity and the Environment (iCube) visited two sites in Brunei to explore the country's biodiversity. The group, comprising academics from Universiti Brunei Darussalam (UBD) and partner universities, visited Bukit Teraja Forest Reserve in Belait and the White Sands area in Tutong. The activity was a way for iCube to conduct research and impart biodiversity knowledge to the general public, as well as provide hands-on training for UBD undergraduates. Through iCube, students of UBD's Discovery Year programme have been sent overseas to research stations through their link with the University of North Carolina. Students and staff also conducted research at the Galapagos world heritage site and iCube research laboratories at partner universities. Future activities include capacity building and opening up new research avenues to highlight areas that have never been explored such as Mount Pagon and a Teraja expedition. *Brunei Times*

■ Cambodia

Cambodia loses half its seasonal wetlands in ten years. Cambodia lost more than half of its seasonally flooded grasslands in ten years due to industrial agricultural conversion, abandonment of traditional farming, and illegal drainage, putting several



endangered bird species at risk and undermining traditional livelihoods in the region, reports a new study published in the journal *Conservation Biology*. The research is based on aerial photographs, land cover maps, and ground surveys. It found that the grassland area around the Tonle Sap, Southeast Asia's largest freshwater lake, declined from 3,349 square kilometers in 1995 to 1,817 square kilometers by 2005. The paper notes that declining seasonally flooded grasslands across tropical Asia makes the Tonle Sap lake floodplain particularly important. The area is home to 11 "globally-threatened" bird species and supports more than a million local small farmers and fishermen. Between 1995 and 2005, the encroachment of scrubland was the major cause of grassland loss, due to a reduction in traditional, low intensity agricultural practices in the grasslands. Since 2005, intensive rice cultivation by private companies has rapidly become the most serious threat to these grasslands, destroying huge areas at a very alarming rate.

Conservation Biology March 2013.

Crocodile crisis in Cambodia. Fauna & Flora International has launched an emergency public appeal to raise funds to save a critical breeding population of some of the world's last remaining Siamese crocodiles. On 8 February, it was announced that a hydropower dam will be built by the China Guodian



Corporation on the Areng River. The dam will erase the river's resident Critically Endangered Siamese crocodiles – at least five percent of the global breeding population – and force six villages to relocate. For more than a decade, the Cambodian Crocodile Conservation Programme, a joint initiative between FFI and the Cambodian Government's Forestry Administration, has been working with indigenous people to conserve the Critically Endangered Siamese crocodiles. Through the support of this programme, the local communities have successfully protected crocodiles from poaching, habitat degradation and human conflict. The Areng River crocodile population is now stable at 30 to 40 adults and sub-adults. If no action is taken, the entire crocodile population will be lost. The Forestry Administration has asked for FFI's urgent assistance to relocate the crocodiles to a proposed Crocodile Sanctuary in another remote part of the Cardamom Mountains, approximately 70 km away. The Cambodian Crocodile Conservation Programme field personnel will rescue the crocodiles from March through May and must be completed before the rainy season starts in June. *Fauna & Flora International*

Phnom Tamao Zoological Park and Wildlife Rescue Center receives certificate of excellence. Phnom Tamao Zoological Park and Wildlife Rescue Center has recently got a certificate of excellence for the year of 2012 from TripAdvisor, a travel website that assists customers in gathering travel information, posting reviews and opinions of travel-related content and engaging in interactive travel forums. TripAdvisor certified that Phnom Tamao achieved a TripAdvisor rating of 4.5 by its guests and was therefore awarded a certificate of excellence for the year of 2012. Located on an area of 2,285 hectares, about 45 kilometers from the southern part of Phnom Penh capital city, Phnom Tamao Zoological Park and Wildlife Rescue Center was officially opened in 2000. Now it is home to at least 96 of birds, mammals, and reptiles, in a total of around 1,000 animals.

Agence Kampuchea Press

■ Indonesia



Facing extinction, conservationists call emergency summit to save Sumatran rhinos. With the number of Sumatran Rhinoceros now under 200 and declining rapidly, a group of conservationists organized the Sumatran Rhino Crisis Summit to discuss courses of action to save the world's smallest remaining rhino from extinction. The Summit was convened by International Union for Conservation of Nature (IUCN) Species Survival Commission from 31 March to 4 April, 2013 in Singapore. The meeting aimed to produce a plan and funds to prevent the rhino's extinction. The species, which clings to life in parts of peninsular Malaysia, Sumatra, and Malaysian Borneo, is most immediately threatened by its low population density in the wild, poaching for their horns, and habitat loss. Organizers of the event include the Borneo Rhino Alliance, Land Empowerment Animals People, Fauna and Flora International Indonesia, Rhino Foundation of Indonesia, Indonesian Zoo and Aquarium Association, International Rhino Foundation, Leuser International Foundation, Wildlife Conservation Society Indonesia, Taman Safari Indonesia, World Wide Fund for Nature, and SOS Rhino US. *mongabay*

A new owl species from Indonesia is formally described. The RinjaniScops owl (*Otusjolandae*) was discovered by two separate researchers just days apart in September 2003. The "common"



owl is the first endemic bird species recorded on the island of Lombok. The first study of the species, by an international team of scientists, is published in the journal *PLoS One*. George Sangster, from Stockholm University's Department of Zoology in Stockholm, Sweden, was in Lombok to collect sound recordings of the local population of a species of nightjar when he first encountered the species. Coincidentally, researcher Ben King, from the Ornithology Department, American Museum of Natural History in New York, USA, was in Lombok at the same time, recording the same nightjar species even though the researchers had never met. The song they both heard sounded like an owl, but unlike any they had heard in years of field work in Indonesia. The RinjaniScops owls initially looked very similar to the MoluccanScops owl, a species of owl that was reported to occur on Lombok. However, their whistles sounded completely different from the "raven-like croak" of the MoluccanScops Owl. The study underscores that even after 150 years of scientific study there are more birds to be discovered in the Indo-Malayan region and Indonesia is a treasure trove for taxonomists.

BBC Nature News



Study: Endangered monkeys doing better. A study of critically endangered black macaques in an Indonesian nature reserve shows their numbers have stabilized after years of decline. University of Washington researchers working with Indonesian colleagues say the findings from the longest ongoing survey of Sulawesi black macaques provides the first evidence the monkeys may be in better shape following years of decline going back to the 1970s. Since 1977, the group has been conducting conservation-related studies of the

black macaques at the Tangkoko Nature Reserve in North Sulawesi, Indonesia, an area known for its biodiversity that attracts thousands of tourists each year. In North Sulawesi culture, black macaques are considered food for special occasions, similar to the way turkeys are consumed on Thanksgiving in the United States and Canada. An outreach education effort aimed at children who live near the Tangkoko Nature Reserve may be helping to decrease illegal hunting and trapping of the animals. *UPI*

■ Lao PDR

International Finance Corporation provides US\$ 2.4 million as grant to Lao PDR. The International Finance Cooperation (IFC), a member of the World Bank Group, has entered into a partnership with the Ministry of Natural Resources and Environment of Lao PDR to improve laws and regulations as well as their enforcement. The partnership also aims to implement integrated water resources management in the country and ensure that hydropower will be developed and operated in sustainable ways that protect the environment and local people's livelihoods. IFC and the World Bank have been helping Lao PDR revise its water resource law by providing consultation support and technical input to the Ministry of Natural Resources and Environment. This aims to ensure that the new law meet the needs of all water users for many years to come. Under the partnership, IFC will also provide training and technical assistance to the Ministry of Natural Resources and Environment and the relevant people in select river basin to help them better anticipate, evaluate, and manage the water resources in support of sustainable hydropower investments. *Lao News Agency*

Lao-German cooperation to launch solar-powered Environmental Education Bus. Sunlabob Renewable Energy, a Lao PDR-based social enterprise specializing in off-grid renewable energy and clean water access, announced its partnership with Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the

German development agency, and the Government of Lao PDR, to build and deploy an education-focused bus featuring solar power. The bus will be used throughout Lao PDR as a tool to increase knowledge about environmental protection, biodiversity and climate change. The Lao-German cooperation project Promotion of Climate-related Environmental Education (ProCEED), will tour the Environmental Education Bus through rural Lao PDR provinces to conduct education and awareness sessions. The bus, featuring 1.45 kilowatts of roof-mounted solar panels, will include a 32" television inside and a 4.3 meters (diagonal) projection screen on the outside of the bus to be used for displaying educational films and materials during community presentations. Sunlabob is responsible for the supply, design and installation of the renewable energy and electronics aspects of the bus, while GIZ and the Department of Environmental Quality Promotion (DEQP) at the Lao Ministry of Natural Resources and Environment (MoNRE) are leading the development of the education and outreach elements intended to build understanding with the general population, as well as Lao politicians and business leaders. ProCEED's work is guided by the National Strategy on Environmental Education and Awareness (NSEEA), which was endorsed by the Government of Lao PDR in 2004, and sets its regional focus in the provinces of Sayaboury, Houaphan and Khammouane where other Lao-German climate-related and biodiversity-related cooperation activities are implemented.

Sunlabob

Enforcement officers focus on wildlife trade in Lao PDR. Illegal wildlife trade within Lao PDR and across its border with Viet Nam came under focus at a first-ever workshop on wildlife trade for frontline enforcement officers working in border provinces. The workshop, jointly organized by TRAFFIC and Wildlife Conservation Society-Laos Programme, brought together 59 participants to build capacity and tackle the challenge of protecting national parks, strengthening enforcement against illegal wildlife trade within the country

and improving enforcement at the country's entry and exit points. Participants heard that wildlife inspections in Lao PDR in 2011 and 2012 resulted in the confiscation of 1,218 wild animals comprising 39 species, over a tons of wildlife parts and 287 tons of non-timber forest products. They were also informed of cross border smuggling between Lao PDR and Viet Nam in 2012 with seizures including large shipments of pythons, cobras, softshell turtles and pangolins. Other wildlife smuggled from Lao PDR into Viet Nam included Tiger cubs, water monitor lizards, civets, porcupines and a bear cub. TRAFFIC trainers presented the global and regional issues surrounding wildlife trade and guided officers through sessions on identifying commonly traded wildlife species and methods often used by smugglers. *Traffic*

■ Malaysia

Government asked to act fast to patent products from natural resources. The Malaysian Service Providers Confederation (MSPC) said that Malaysia must take quick action to patent products derived from natural resources before foreigners do so. The MSPC stated that useful products derived from nature must be patented immediately, to protect the country's natural heritage and prevent control by foreigners. MSPC urged for the creation of a taskforce involving researchers, professionals and administrators, so the Government could continuously discover new products from biological resources and patent them quickly. They also welcomed the new Access to Biological Resources and Benefit Sharing (ABS) Bill by the Natural Resources and Environment Ministry, which will be tabled this year. The Bill aims to ensure local resources, which are bio-prospected and commercialized, will provide returns to Malaysia. *The Star Online*

Forestry organizations share REDD+ research findings. The Forest Research Institute Malaysia (FRIM) and Forestry and Forest Product Research Institute (FFPRI) Japan successfully conducted a Workshop on REDD+ Research Project in Peninsular Malaysia in

Kuala Lumpur to share, learn and discuss the findings of the FRIM-FFPRI REDD+ research project. The main focus of the FRIM-FFPRI collaborative project, which started in Feb 2011, is to develop forest carbon change monitoring, reporting and verification (MRV) system that can be implemented in REDD+ in Malaysia by combining the country's conditions in relation to international requirements, appropriate available technologies and scientific knowledge. This project, scheduled to end in March, has recently been extended to 2015. Four FRIM researchers and six FFPRI researchers shared their knowledge and findings at the workshop, which attracted 84 participants from various government agencies including state forestry departments, universities and other research institutes. Funded by FFPRI, the workshop was one of the programmes planned by the FRIM-FFPRI REDD+ Research Team to enhance awareness and understanding on REDD+ in terms of its development, implementation and policy as well as technical requirements. The workshop also included group discussions and presentations on Remote Sensing Approach and Issues, Inventory Approach and Issues, and Socio-Economic Aspects and Policy.

Forest Research Institute Malaysia

Rare pygmy elephants 'poisoned' in Borneo. Ten endangered pygmy elephants have been found dead in Gunung Rara Forest Reserve in Sabah, with officials saying they may

have been poisoned. The animals, which had all suffered internal bleeding, were found near each other over the space of three weeks. In one instance, a three-month-old calf was found alongside the body of its mother, apparently trying to wake her. The elephants were all thought to be part of the same family group, and were aged between four and 20. The animals still had their tusks, indicating that they had not been killed by poachers, and none had gunshot wounds. Samples have been sent for testing, but the damage evident in the elephants' digestive systems had led officials to "highly suspect" acute poisoning. Tests will confirm whether they could have been deliberately poisoned. The WWF estimates that there are fewer than 1,500 Borneo pygmy elephants in the wild, most of them in Sabah state. They are the smallest elephant subspecies, with babyish faces, long tails and straight tusks. They are threatened by logging, hunting and increasing contact with humans. *BBC News Asia*

■ Myanmar

Myanmar timber to be exported to EU soon. A delegation is set to arrive from the European Union in Myanmar to assess the timber industry ahead of signing an agreement to export timber to the EU. Exporters have said that they hope timber exports will be possible by June 2013. However, there are several obstacles that will need to be overcome before any agreement is reached. The Ministry

of Environmental Conservation and Forestry (MOECAF) needs to address several outstanding issues in order to meet these international standards. For one, there is no such mechanism in place in the country yet to decipher the source of the timber - whether it originates from natural forest, plantation, or a land concession. Proper monitoring of the timber industry, a working chain of custody, and a certification system need to be put in place once an agreement is reached. Myanmar timber is currently exported to India, China, Thailand and Bangladesh with temporary certificates issued by MOECAF. *Mizzima*



Environmentalists push for Myanmar river conservation commission. Environmentalists have called for the formation of a river conservation commission to cover all Myanmar rivers following the establishment of the Irrawaddy River Conservation Commission by Mandalay Region Legislative Assembly Committee on 6 February. The Irrawaddy River, which flows through the centre of Myanmar and is connected to many other river systems, is considered the country's lifeline and its conservation should be balanced with industries such as mining and hydropower. Forming the Irrawaddy River Conservation Commission will benefit the whole country and should involve scholars, environmentalists and local people. Environmentalists criticized the lack of conservation works for the country's rivers and they pointed out the danger of the rivers drying up due to unmonitored gold, pebble and gravel mining and the extraction of other natural resources. *Mizzima*

President to discuss Inle in Norway. President U Thein Sein is expected to travel to Norway with cooperation on Inle Lake



conservation as one of the major topics for discussion. Norway has made a substantial commitment to efforts to preserve the site, which is a major international tourist attraction. One aspect of Norway's support has been the provision of scholarships for 120 Myanmar students to undertake a master degree at the Asian Institute of Technology in Thailand. Norway expects to hear more about the government's priorities in moving forward conservation plans for the Inle area. *Myanmar Times*

■ Philippines

Telco backs search for 'greenest' schools. Smart Communications Inc. is once again supporting the national search for sustainable and eco-friendly schools, a joint activity of the Department of Environment and Natural Resources through the Environmental Management Bureau, the Department of Education, and the Commission on Higher Education. Smart has been supporting the initiative since 2009 when the search was first launched. The nationwide tilt, done every other year since 2009, recognizes the efforts of various schools to undertake eco-friendly initiatives and is open to all elementary, high school and college levels. The winners will automatically qualify to the Association of Southeast Asian Nations Eco-Schools Programme. Iliran Elementary School of Negros Occidental and the Camarines Sur National High School, winners during the 2011 search, were recipients of the ASEAN Eco-Friendly Schools Award in 2012. Both schools were recognized for their initiatives in integrating environmental protection and preservation in their curriculum, greening activities and overall school management.

Philippine Daily Inquirer

DENR to fund replanting of forests, watersheds in Central Luzon. The Department of Environment and Natural Resources (DENR) has earmarked P357 million to intensify the reforestation of denuded forestlands and watersheds in Central Luzon. The reforestation efforts would help increase the forest cover of Central Luzon as a primary shield against strong typhoons

and flooding, and help boost the National Greening Program (NGP) of President Aquino. About 20,000 hectares of forestlands, watersheds, riverbanks and urban areas are earmarked for reforestation in 2013. Barely two years after the NGP was launched in 2011, more than 12,000 hectares of public lands throughout Central Luzon have been planted with 7.5 million seedlings of forest and fruit trees, mangrove propagules, nipa seedlings and bamboo cultivars. The DENR also aims to rehabilitate until 2022 at least 44,000 hectares of denuded forestlands at the Pantabangan-Carranglan Watershed in Nueva Ecija through the ten-year Forest Management Program supported by the Japan International Cooperation Agency. The NGP is set to rehabilitate 1.5 million hectares of the country's denuded forest areas and aims to help the country reduce poverty, provide food security, conserve biodiversity, and mitigate and adapt to climate change.

BusinessMirror

Filipino government makes climate change a top 2013 priority.

Faced with worsening extreme weather and studies indicating it is likely to be highly vulnerable to the impacts of climate change, the Government of the Philippines intends to implement a series of laws in 2013 aimed at reducing disaster risk, improving clean energy production, and adapting to climate shifts. In 2012, President Benigno Aquino III signed a law creating the one-billion peso (\$24.5 million) Peoples' Survival Fund (PSF), which is expected to receive funding by 2014. The fund aims to implement local climate change action plans to make communities more resilient to climate-induced disasters. This year, a campaign will be launched to involve the private sector on climate change issues including support for the PSF and help improve the capacity of local governments to address climate change. In the 2013 national budget, the government has already set aside 12 billion pesos (\$295 million) for enhancing geohazard maps to include multiple hazards, early warning systems and other infrastructures to improve capacity to reduce risks. Other

programmes being implemented in 2013 include vulnerability assessment of various sectors, especially agriculture; the scaling-up the nation's "eco-town framework" on building sustainable towns; and a youth advocacy campaign called the "Greeneration". The government also is pushing for a land-use bill that would incorporate climate change and disaster risk reduction issues in land use decision making. At the same time, the Department of Environment and Natural Resources is putting together programmes to boost reforestation and improve air quality in both urban and rural areas. For 2013, the target of the National Greening Program is to plant trees on 300,000 hectares, with an aim to boosting its reforestation target to 1.5 million hectares by 2016. Other planned measures including promotion of clean, energy-efficient fuels and strengthening of solid waste management. *AlertNet*

■ Singapore

National Geographic Channel partners with National Environment Agency at first ever Eco-Run. In support of the Youth for the Environment Day in April, National Geographic Channel (NGC) has partnered with the National Environment Agency (NEA) to launch their first ever NGC-NEA Eco-Run to promote recycling efforts and awareness of environmental sustainability through youths. The run is set to take place on 20 April 2013 at the Bishan-Ang Mo Kio Park. Launched in 2011 by NEA, Youth for the Environment Day (YED) is a key platform to engage youths to champion environmental ownership, as well as renew their commitment to care for the environment. The NGC-NEA Eco-Run aims to underscore the objectives of YED, by advocating environmental sustainability through recycling. The event encourages youth participants to chalk up points by collecting recyclable materials such as plastic bottles (PET) and aluminum drink cans. To further highlight the green movement, the event will also integrate environmentally-friendly measures such as the commissioning of eco-friendly running t-shirts made from plastic

bottles, and provide stainless steel water bottles in lieu of conventional plastic or paper cups at race water points. Interested participants who wish to sign up for the inaugural NGC-NEA Eco-Run 2013 can do so by registering their application online at www.yed.sg/ecorun.

National Environment Agency

Singapore Furniture Industries Council and Singapore Environment Council collaborate to raise industry's sustainability standards.

The Singapore Furniture Industries Council (SFIC) and Singapore Environment Council (SEC) signed a Memorandum of Understanding (MOU) to heighten the awareness of environmental sustainability and encourage the adoption of green best practices. The MOU outlines a three-year plan where SFIC and SEC will work together to improve furniture manufacturers' sustainability expertise through various programmes. This includes training seminars and conferences, as well as programmes to help companies undertake the SEC's Singapore Green Labelling Scheme (SGLS), a leading environmental standard and certification mark. The SGLS motivates and empowers manufacturers to adhere to international environmental best practices in their manufacturing process. To date, 11 SFIC members have attained green certifications awarded by both local and international bodies. The SFIC aims to double this number by 2014. The MOU also calls on both organizations to jointly educate consumers on the value of environmentally sustainable products through community outreach programmes, beginning with the School Green Awards (SGA) showcase to be featured during SingaPlural 2013.

Singapore Environment Council

Singapore stops 1.8 tons of illegal ivory from transshipment. The Agri-Food & Veterinary Authority (AVA) and the Singapore Customs worked together to intercept a shipment of about 1.8 tons of illegal raw ivory tusks transiting through Singapore from Africa. The shipment is the second largest ivory seizure

since 2002 and the estimated value of the shipment is about S\$2.5 million. Acting on a tip-off, AVA and Singapore Customs conducted a joint inspection on a shipment that was declared as 'waste paper' on 23 Jan. There they found 1,099 pieces of raw ivory tusks packed in 65 gunny sacks. Under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), all African and Asian elephants are endangered species. International trade in ivory has been banned under the Convention since 1989. The maximum penalty for illegal trade (import, export and re-export) of ivory is a fine of \$50,000 per scheduled specimen (not exceeding an aggregate of \$500,000) and/or imprisonment of up to two years. The same penalties apply to any transshipment of ivory through Singapore without proper CITES permits from the exporting/importing country. *AsiaOne*

■ Thailand

Thai rosewood gets international protection to curb China trade.

Thai rosewood, which fetches exorbitant prices on the international market, was granted protection under Convention on International Trade in Endangered Species (CITES). A 1989 National Logging Ban already prohibits logging of all rosewood and other precious wood species in Thailand. But huge demand and weak law enforcement means Thai rosewood is smuggled into neighboring countries and shipped to end-users, principally China. Member states at the annual summit on CITES voted to list Thai rosewood under Appendix II of the CITES, which regulates trade of threatened species through logging permits and agreed quotas. Rising demand from China's wealthy elite led to a 40 percent increase in traditional rosewood furniture production by Chinese companies in 2010 with prices increasing by 15-40 percent annually, fuelled by speculative investments in "rare wood" products by rich Chinese. Thai rosewood can fetch \$50,000 per cubic meter. The exploitation of rosewood has led to a 66 percent reduction in Thai rosewood trees between 2005 to 2011, according to

the Plant Varieties Protection Division at the Department of Agriculture. *Reuters*



A burden of care over seized exotic wildlife in Thailand.

Over the past two years, officials here have captured more than 46,000 animals from traffickers, vendors and trappers, more than double the 18,000 seized the two previous years. But now the government faces the quandary of what to do with all the creatures it has saved — a sort of Noah's ark of endangered species, except that this ark would most likely sink under the weight of all the elephants, tigers, bears and monkeys. The burden of taking care of seized animals was underlined in October 2012, when 16 malnourished tiger cubs were recovered from the back of a smuggler's truck. Caretakers at the Khao Pratubchang Wildlife Breeding Centre in Ratchaburi Province have been overwhelmed by the 24-hour care and the specialized food and medicine the cubs require. The center houses 45 other tigers, 10 leopards and 13 other small felines known as fishing cats and Asian golden cats, which are slightly bigger than house cats but more fierce. Wildlife centres across the country are already at capacity. A centre near Bangkok houses more than 400 screaming monkeys. One in Chonburi Province has 99 bears, one who has been named Airport because she was rescued from a smuggler's suitcase at an airport. Thai law requires that the animals be kept as evidence until legal proceedings are completed — or for five years if no suspect is arrested. Some of the animals can eventually be released into the wild, including common species of monkeys, snakes and pangolins, which resemble small armadillos and are prized in China for their meat. But the tiger cubs, raised by

humans, face life in captivity. The cubs are likely to live out their life span of more than two decades at the wildlife centre. Feeding the birds and beasts at government centres across the country costs about 1.7 million baht or \$57,000, a month. The Department of National Parks has established a fund to help defray the cost and receives private donations, mainly from celebrities and wealthy Thais. *New York Times*

KaengKrachan for World Heritage list. The cabinet approved a proposal to nominate KaengKrachan Forest Complex for listing as a World Heritage Site, based on the fact the KaengKrachan forest is a centre of biodiversity and is home to more than 720 indigenous animal species. The KaengKrachan Forest Complex is also one of four ASEAN Heritage Parks in Thailand. KaengKrachan is also a major habitat of several endangered species, including a fresh water crocodile found only in this forest complex area. The cabinet also approved a proposal that the name of KaengKrachan Forest Complex be changed to “Thailand Western Forest Complex.” The forest complex covers 482,225 hectares in the eastern part of Tanao Si Mountain Range bordering Myanmar. It consists of five areas, namely KaengKrachan National Park, Mae Nam Phachi Wildlife Sanctuary, KuiBuri National Park, the site linking KaengKrachan National Park to KuiBuri National Park, and the soon-to-be-established ChaloeMPhrakiat Thai Prachan National Park. KaengKrachan National Park, in particular, is a well-known tourism site, located in Phetchaburi and PrachuapKhiri Khan provinces. It is the largest national park in Thailand, rich in fauna and flora. The Thailand Western Forest Complex is in the Indo-Malayan Eco-region under the Tenasserim-South Thailand semi-evergreen rain forests. It is the watershed of four major rivers: Phetchaburi, Phachi, PranBuri, and KuiBuri. The forest complex is 220 kilometers from the ThungYai - HuaiKhaKhaeng Wildlife Sanctuaries, Thailand’s first Natural World Heritage Site designated by UNESCO in December 1991.

Bangkok Post

■ Viet Nam

Pilot project to test range of climate change strategies. A two-year pilot project has provided policy makers in the southern province of Long An with alternative ways to handle climate change and its related threats. Co-funded by the Dutch government, Long An Province, and the International Water Governance Centre, the 385,000 euro (US\$495,000) project “Participation in Climate Adaptation” offered measures to fight floods, saltwater intrusion, drought and water pollution. The pilot area covered the southern coastal districts of Can Duoc, Can Giuoc, ChauThanh, and Tan Tru, where floods from upstream combined with high tides from the East Sea (via the Soai Rap estuary) can lead to severe inundation. This is one of the first projects in Viet Nam to introduce a comprehensive approach for full-scale and meaningful participation by relevant stakeholders at different levels for developing a climate-change-adaptation strategy. The strategy used offers a consensus-based mixture of measures. These include completing and upgrading the dike systems and creating more room for rivers and nature to increase their resilience and the water discharge capacity of the Vam Co River Basin as a whole. It also provides a variety of measures for optimizing water supplies, including rainwater collection, sustainable groundwater exploitation, point-of-use conservation, water-saving technology in irrigation, and sewage and wastewater treatment.

Viet NamNet

Japan exports environment technology to Viet Nam. Japan’s Ministry of Internal Affairs and Communications has announced Viet Nam will be the first destination for the planned export of its cutting edge environmental information technology and social infrastructure. The first step of this new policy, which will take the form of a public-private partnership, is a Japanese pilot project investigating and assessing Vietnamese water and air quality, beginning in March. The NTT DATA Group will conduct the Vietnamese pilot project, endowed



with a government budget worth JPY150 million. The pilot project requires installing data collection equipment across Viet Nam, as well as establishing centres with the capacity to analyze environmental data including water and air quality. With integrated data analysis technology, NTT DATA Group will simultaneously monitor Mekong River water levels and water quality and air quality in Ho Chi Minh City, investigating any links discovered and informing future treatment plans. In the northern industrial zone on the outskirts of Hanoi, NTT DATA Group will also measure temperature, humidity, and power consumption for determining the best approach to improving energy efficiency. *DTI News*

New ‘flying’ frog discovered in Viet Nam. Writing in the *Journal of Herpetology*, Jodi Rowley, an amphibian biologist at the Australian Museum in Sydney, described the discovery of a large green “flying” frog and how she and other researchers “came across a huge green frog, sitting on a log,” not far from the capital, Ho Chi Minh City. She later determined the 3.5-inch creature is a relatively large new type of flying frog, a group known for its ability to “parachute” from tree to tree thanks to special aerodynamic adaptations such as webbed feet. The new species is “one of the most flying frogs of the flying frogs,” Rowley said, “in that it’s got huge hands and feet that are webbed all the way to the toe pad.” The species has largely escaped notice since they spend most of their time high up in the forest canopy. Rowley has named the new species Helen’s flying frog to honor her mother. *UPI*



Photo courtesy of ak.audubon.org

Bar-tailed Godwit (*Limosalapponi camenzbieri*)

The bar-tailed godwit has conspicuous blue-grey legs and a long, dark, slightly upturned bill with a pink base. The breeding and non-breeding plumages of the male bar-tailed godwit change from dull grey-brown in the winter to rich chestnut across the back and breast during the summer breeding season. The neck, breast and sides of the body are finely streaked with black and there is a dark brown and grey streaking on the back and wings. The breast returns to an off-white color once the breeding season is over, while the rest of the plumage becomes duller, with pale fringes to the back and wing feathers.

The female and juvenile bar-tailed godwit have a similar grey-brown plumage, with the juvenile showing slightly more buff coloration. The female is generally larger than the male, with a noticeably longer bill, and has little red-brown coloration during the breeding season. Both the male and female bar-tailed godwit have a distinctive black-and-white barred tail, which gives the species its common name. The coloration on the head of both sexes is broken up by an off-white line above the eyes.

The extreme endurance of the bar-tailed godwit is illustrated in its seasonal migration, where it is known to perform the longest non-stop migration of any land bird. *L. l. baueri* has been known to fly 10,400 kilometers from its breeding grounds in Alaska and eastern Siberia to its wintering grounds in New Zealand in around 175 hours, with an average speed of 63 kilometers per hour. This non-stop flight requires large fat reserves and the ability to shrink the internal organs to reduce weight while in flight. When post-

breeding migration begins, each bar-tailed godwit is around twice its normal body weight.

The bar-tailed godwit breeds between late May and August. The breeding pairs are normally solitary, although sometimes small colonies can form. The female bar-tailed godwit lays one clutch of around four eggs per year, which are incubated for around 20 to 21 days. After the breeding season, the birds move to moulting sites, before migrating to the wintering grounds between October and November.

During the breeding season, the bar-tailed godwit feeds mainly on insects, worms, molluscs and occasionally seeds and berries. The non-breeding diet consists of worms, bivalves and crustaceans, although it occasionally takes the larvae of craneflies, as well as tadpoles and small fish.

The large range of the bar-tailed godwit extends across Europe, Asia, Africa and North America, as well as Australia and New Zealand. *L. l. menzbieri* breeds in northeast Asia, from the Taymyr Peninsular to Far East Siberia, and winters in Australia and Southeast Asia.

References:

ARKive (<http://www.arkive.org/bar-tailed-godwit/limosa-lapponica/#description>)

BirdLife International (2013) Species factsheet: *Limosalapponica*. Downloaded from <http://www.birdlife.org> on 19/03/2013. Recommended citation for factsheets for more than one species: BirdLife International (2013) IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 19/03/2013.



Photo courtesy of www.vogelwarte.ch

Eurasian Spoonbill (*Platalea leucorodia*)

The Eurasian spoonbill is a pure white waterbird with a distinctively spatulate bill. During the breeding season, adults develop a crest of pointed and drooping plumes, as well as patches of yellow on the upper breast and the tip of the bill. The rest of the bill is black, as are the long legs. The sexes are similar in overall appearance but the male is somewhat larger than the female, with a longer bill and longer legs. Juveniles resemble the non-breeding adults, but have pinkish bills and black tips to the wing feathers.

The Eurasian spoonbill inhabits fresh and saltwater marshes, estuaries, deltas, tidal creeks, rivers, lakes, reservoirs and mangrove swamps. It shows a particular preference for shallow wetlands with a mud, clay or fine sand bottom, as well as islands, dense reedbeds, and scattered trees and shrubs for nesting.

The Eurasian spoonbill forages alone or in small groups, wading methodically through shallow water while sweeping its distinctive bill from side to side in search of prey. Small fish, aquatic insects, shrimp and other invertebrates comprise the bulk of its diet, but it will also take algae and fragments of aquatic plants.

Populations in the north of this species' range breed during the spring, while in the tropics the timing of the breeding season coincides with the rains. The nest is a platform of twigs, sticks and other bits of vegetation located on the ground on a small island, or up to five meters above the ground in dense reed, bushes, trees or mangroves. The female usually lays three to four eggs which are incubated for around 24 to 25 days before hatching.

The wide but fragmented breeding range of the Eurasian spoonbill extends from Europe to northwest Africa, the Red Sea, India and China. Wintering areas include the Atlantic coast of Europe, the Mediterranean, sub-Saharan Africa, southwest Asia, India, Sri Lanka, southern China, and Japan.

Except for the Northwest Africa (*P. l. balsaci*) and Red Sea (*P. l. archeri*) populations, which are sedentary, the Eurasian spoonbill is migratory throughout its range. During migration this species generally flies in formation at considerable height and, on long-distance flights, uses sites along the way to stop and recover energy.

The species is threatened by habitat degradation through drainage and pollution, and is especially affected by the disappearance of reed swamps due to agricultural and hydroelectric development. Over-fishing and disturbance have caused population declines, and human exploitation of eggs and nestlings for food has threatened the species in the past. The species is also susceptible to avian influenza so may be threatened by future outbreaks of the virus.

References:

ARKive (<http://www.arkive.org/eurasian-spoonbill/platalea-leucorodia/>)

BirdLife International (2013) Species factsheet: *Platalea leucorodia*. Downloaded from <http://www.birdlife.org> on 19/03/2013.

Recommended citation for factsheets for more than one species: BirdLife International (2013) IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 19/03/2013



Grey-headed Lapwing (*Vanellus cinereus*)

The grey-headed lapwing has a uniform-grey head, neck and upper breast, a black breast-band and contrasting black-and-white pattern on the wings. A juvenile will not have a blackish breastband, while an adult in breeding plumage has a well-defined black breastband and bright orange-yellow bare parts.

The grey-headed lapwing is a common migrant within the East Asian Flyway. It breeds in the boreal spring and summer (April to July) in north-eastern China, Korea and Japan. The mainland populations are considered wholly migratory, with individuals routinely wintering across a large area of Indochina, from Viet Nam in the east to as far west as the Kathmandu Valley in Nepal, north-eastern India and Bangladesh. Those in Japan appear to be less mobile, with at least some individuals remaining to winter in southern Honshu. The species routinely ranges as far south as southern Thailand, with vagrant individuals extending to the Philippines, Peninsular Malaysia, Borneo and Sulawesi.

The grey-headed lapwing is a relatively unknown and under-surveyed species and count data are insufficient. No attempt has ever been made to estimate the size of

the population of a particular country, but count data suggest that most birds are in China and Bangladesh during the non-breeding season. The global population is estimated to number 25,000 to 100,000 individuals, while national population estimates include 100 to 10,000 breeding pairs and 1,000 to 10,000 individuals on migration in China; 50 individuals on migration and 50 wintering individuals in Taiwan; 1,000 individuals on migration in Korea; and 100 to 10,000 breeding pairs, 50 to 1,000 individuals on migration and 50 to 1,000 wintering individuals in Japan.

The population is suspected to be in decline owing to ongoing habitat destruction and degradation.

References:

BirdLife International (2013) Species factsheet: *Vanellus cinereus*. Downloaded from <http://www.birdlife.org> on 19/03/2013. Recommended citation for factsheets for more than one species: BirdLife International (2013) IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 19/03/2013.

Clarke, Rohan H., Karen Davis and Brett Davis. A Grey-headed Lapwing *Vanellus cinereus* at Burren Junction, New South Wales: The First Record for Australia. *Australian Field Ornithology* 2008, 25, 194–197.

Iqbal, Muhammad, AgusNurza and Teuku Muhammad Sanir. *Vanellus cinereus* in Indonesia: Second record after 139 years of Grey-headed Lapwing. Indonesia.



Pied Avocet (*Recurvirostra avosetta*)

The pied avocet gains its common name from the black coloration on its head, which resembles the cap once worn by advocates, a term used for lawyers in certain countries. The rest of the plumage is primarily white, with a black band on the wing, black wing tips and a black striped pattern on the back. One of its most distinctive features is its long, slender, upturned bill.

The species is present all year round in much of its range in Africa and Western Europe. Northern populations migrate south between August and October and return to the breeding grounds between March and May. It breeds from April to August in large colonies, usually of between 10 and 70 pairs. The species migrate in loose flocks, forage in groups of 5 to 30 individuals, and gather to roost in large flocks of several thousand individuals.

They nest in groups, making cup-shaped hollows on mudflats, where they lay a clutch of four eggs. These are incubated by both sexes for about 22 to 27 days. The chicks are led to the water soon after hatching and are cared for by both parents, taking their first flight at about 26 to 28 days old but remaining with the adults well after fledging. They can be aggressive if their nests are threatened. Parents charge at intruders with their heads lowered, and they are able to chase away much bulkier birds. Egg-laying season is year-round, generally peaking from June to October and from March to April.

The species breeds in flat open areas on shallow saline or brackish wetlands with islands, ridges, margins of bare sand, clay or mud, and sparse short vegetation, including inland lakes, pools, coastal lagoons, estuaries, saltpans, saltmarshes, irrigated land and flood-plains in arid areas. The most important characteristics of breeding habitats appear to be water levels, which gradually decline over the summer to

expose additional feeding areas, and high salt concentrations that prevent the development of excessive emergent and shoreline vegetation. Outside of the breeding season, the avocet inhabits coastlines and surrounding muddy areas, such as estuaries, lagoons, sandbanks and mudflats, as well as inland saline lakes. It rarely occurs on inland freshwater lakes and rivers but may forage on agricultural land.

Its diet consists predominantly of aquatic invertebrates 4-15 cm long including aquatic insects, crustaceans, worms, molluscs, small fish, and plant matter. Pied avocets feed by dipping their bill in water, and then sweeping it from side to side. The tip of the bill is highly sensitive to touch, so the bird can catch food even in the turbid water of estuaries and lagoons.

The species is threatened in Europe by the pollution of wetlands with polychlorinated biphenyls, insecticides, selenium, lead and mercury. Important wintering sites are also threatened by infrastructure development, land reclamation, pollution, human disturbance and reduced river flows. The species is susceptible to avian botulism and avian influenza and may be threatened by future outbreaks of these diseases.

References:

ARKive (<http://www.arkive.org/avocet/recurvirostra-avosetta/>)

Biodiversity Explorer (http://www.biodiversityexplorer.org/birds/recurvirostridae/recurvirostra_avosetta.htm)

BirdLife International (2013) Species factsheet: *Recurvirostra avosetta*. Downloaded from <http://www.birdlife.org> on 19/03/2013. Recommended citation for factsheets for more than one species: BirdLife International (2013) IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 19/03/2013.

Oceana (<http://oceana.org/en/explore/marine-wildlife/pied-avocet>)



Help promote the very best of
ASEAN's natural heritage.

LOGO DESIGN CONTEST FOR THE ASEAN HERITAGE PARKS!

- The contest is open to residents of all ASEAN Member States.
- Participation is free of charge.
- A cash prize of US\$1,000 awaits the winner.
- The winning entry will be the official logo of the ASEAN Heritage Parks.
- Entries must be sent to logo.contest@aseanbiodiversity.org.
- Deadline for submission of entries: 31 July 2013

To download the Official Entry Form and the Contest Mechanics, log on to AHPllogodesign.aseanbiodiversity.org.



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.

