Marine and coastal wetlands:

Education network, capacity building, and training

WORKSHOP PROCEEDINGS
Nha Trang, 30 August - 1 September 2006

Marine and coastal wetlands:

Education network, capacity building, and training

WORKSHOP PROCEEDINGS
Nha Trang, 30 August - 1 September 2006

Ha Noi, 2006

Published by: The World Conservation Union, IUCN Viet Nam
Japan International Cooperation Agency, JICA
Ramsar Center Japan, RCJ

Citation: IUCN, MOFi (2006). *Marine and coastal wetlands: education network, capacity building, and training*. Hanoi, Viet Nam, 180 pp.

ISBN-10: 2-8317-0967-9
ISBN-13: 978-2-8317-0967-3

Printed by: Hoang Minh Printing Co., Ltd., Hanoi, Viet Nam.

Available from: IUCN Viet Nam
Villa 44/4 Van Bao Street, Ba Dinh, Hanoi, Viet Nam
Tel: + 8447261575, Fax: + 84 4 7261561
www.iucn.org.vn

Contents

Contents

Abbreviations

BI	Birdlife International
EE	Environmental Education
CBO	Community-Based Organisation
CEPA	Communication, Education, and Public Awareness
COP	Conference of the Parties
CRM	Coastal Resource Management
DANIDA	Danish International Development Cooperation Agency
DENR	Department of Environment and Natural Resouces
GEF	Global Environment Faulity
GO	Governmental Organisation
IUCN	The World Conservation Union
JICA	Japan International Cooperation Agency
MARD	Ministry of Agriculture and Rural Development
MCD	Centre for Marinelife Conservation and Community Development
MERC	Mangrove Ecosystem Research Centre
MERD	Mangrove Ecosystem Research Division
MRC	Mekong River Commission
MWBP	Mekong Wetlands Biodiversity Programme
MOFI	Ministry of Fisheries
MOSTE	Ministry of Science, Technology, and Environment
MPA	Marine Protected Area
NGO	Non-governmental Organisation
NP	National Park
PA	Protected Area
SEMLA	Strengthening Environmental Management and Land Administration in Viet nam
Sida	Swedish International Development Cooperation Agency
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
USD	US dollar
USP	University of the South Pacific
VND	Vietnamese dong
VNU	Viet Nam National University, Hanoi
WANI	Water and Nature Initiative
WEN	Wetlands Expert Network
WHO	World Health Organisation
WWF	World Wide Fund for Nature

Acknowledgements

The IUCN Viet Nam and the authors would like to extend our sincere and profound gratitude to Mr. Chu Tien Vinh and Mr. Truong Kinh for their involvement in hosting and making possible the workshop on “Marine and coastal wetlands: education network, capacity building, and training”.

Particular thanks and recognition to the Ramsar Center Japan (RCJ) and the Swedish International Development Cooperation Agency (Sida) for funding the workshop. We would also like to thank the Keidanren Nature Conservation Fund (KNCF), the Danish International Development Agency (Danida), the Hokkaido River Disaster Prevention and Research Center (HR-DPRC) Foundation, and the Japan International Cooperation Agency (JICA) for their financial support.

Our special thanks go to JICA for their funding contribution in support of the publication of these proceedings.

We also wish to recognise the superb efforts of RCJ, especially Dr. Reiko Nakamura, in helping to organise the workshop, and of the staff of the IUCN Viet Nam Country Office in workshop scheduling and manuscript preparation, namely Ms. Dinh Thi Minh Thu, Mr. Ly Minh Dang, Ms. Tiffany Inglis, Ms. Kathryn Matlack, and Ms. Nguyen Thuy Anh.

Finally, sincere thanks to all Vietnamese and international participants for their valuable contributions, presentations, and perspectives at the workshop.

Preface

The ecosystems, habitats, and species found in Viet Nam's marine and coastal wetlands are valuable assets.

Healthy marine and coastal areas sustain many kinds of wildlife. Rare birds, amphibians, reptiles and fish are sheltered in lagoons and estuaries; mangrove ecosystems stabilise the soil and provide a home for juvenile fish and shellfish; and coral reefs - included in the Ramsar definition of wetlands which includes marine areas up to a depth of 6 metres - have high levels of species diversity and productivity.

Marine and coastal wetlands also support the livelihoods of many human communities, which depend on wetlands services and resources. In addition, coastal wetland habitat often acts as a buffer against storms and protects coastal communities from severe storm damage.

Maintaining the health of marine and coastal ecosystems is therefore critical: for ensuring the welfare of local communities, for conserving biodiversity, and also for maintaining and developing industries such as tourism that contribute significantly to the country's economy.

Viet Nam's development and population growth has occurred at an especially rapid pace along the country's 3,444 kilometer coastline. However, rising levels of pollution and overexploitation of natural resources have accompanied this rapid growth, placing Viet Nam's irreplaceable marine and coastal ecosystems at risk of harm or destruction. In addition, global climate change means these coastal wetland areas will be threatened by more frequent and powerful storms; the recent typhoon Xangsane, the biggest storm to hit Viet Nam in several decades, killed 71 people and caused 629 million USD in damage.

Public awareness and education activities can help control these threats by teaching people why marine and coastal ecosystems are important and how their actions can protect the environment.

The Government of Viet Nam is actively working to support the conservation and sustainable development of marine and coastal wetlands. The Government has issued decrees on conservation and sustainable development of wetlands in Viet Nam, and has also provided considerable budget allocation for supporting the protection and sustainable use of marine resources. The Ministry of Fisheries assisted in the implementation of the Hon Mun Pilot Project in Nha Trang Bay, which successfully instituted a system to protect the natural resources of the area by supporting alternative livelihoods, research, and education efforts in the area.

Education activities could better support the Government's efforts if a system to link together marine and wetland educators were in place. The proposed network would serve to facilitate the regular exchange of information and sharing of experiences between wetland educators in Viet Nam, enhancing the collective capacity of these educators.

This "International workshop on marine and coastal wetlands: education network, capacity building and training" featured wetland practitioners from across the country and region. The workshop promoted the conservation of marine and coastal wetland ecosystems and also discussed the establishment of a network of marine and coastal wetland educators.

Preface

During the workshop, presentations were made on wetland education case studies from Viet Nam and across Asia, on the experiences of existing wetland networks, and on the experiences of organisations involved in wetland education throughout Asia. The majority of the proceedings' papers have been reviewed and edited by the authors after being translated into English. However, mistakes are unavoidable. Feedback from the authors is warmly welcomed.

It is the wish of IUCN and the editor to make these proceedings a useful reference for marine and coastal wetland educators, contributing to greater knowledge and awareness about the important role these ecosystems play.

Bernard O'callaghan
Program Coordinator and
Acting Country Representative

Dr. Chu Tien Vinh
Director
NADAREP/Ministry of Fisheries

Participants

- Bai Tu Long National Park
- Birdlife International
- Education for Nature of Viet Nam (ENV)
- Embassy of Sweden in Viet Nam
- Can Gio Biosphere Reserve
- Can Tho University
- Con Dao National Park
- Centre for Natural Resources and Environmental Studies (CRES)
- Cu Lao Cham National Park
- Department of Fishery (DOFI)
- Department of Natural Resources and Environment (DONRE)
- Flora and Fauna International (FFI)
- Kien Giang Department of Fisheries
- Ho Chi Minh University of Natural Science
- Institute of Aquaculture No. 3
- Institute of Marine Environment and Resources (IMER) - Hai Phong
- Japan International Cooperation Agency (JICA) - Viet Nam
- Khanh Hoa People's Committee
- Marine Protected Area Project
- Marine Life Conservation and Community Development (MCD)
- Mangrove Ecosystem Research Division of Viet nam National University (MERD)
- Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP)
- Ministry of Fisheries (MOFI)
- National Agency of Aquatic Resources Protection (NADAREP)
- Navy Institute
- Nha Trang Bay Marine Protected Area
- Nha Trang People's Committee
- Nha Trang Institute of Oceanography (NIO)
- Nui Chua National Park
- Pan Nature
- Phu Quoc Island

- Ran San Ho
- Research Institute of Marine Fisheries at Hai Phong
- The Royal Netherlands Embassy (RNE) - Viet Nam
- Russia Tropical Center - Coastal Branch, Viet Nam
- Strengthening Environmental Management and Land (SEMLA) Project
- Sub-Department of Aquatic Resources Protection
- University of Fisheries of Nha Trang
- Viet Nam Institute of Fisheries and Economic Planning
- Viet nam Environment Protection Agency (VEPA)
- The World Conservation Union (IUCN)
- World Wide Fund for Nature (WWF)
- Xuan Thuy Ramsar Site

Organisations representing other states

- Bangladesh POUSH
- Forum for Ecosystem Management (FEM)
- Hokkaido River Disaster Prevention Research Center (HRDPRC)
- Indian Environmental Society (IES)
- International Council of Environmental Law (ICEL)
- Japan International Cooperation Agency (JICA)
- Mahidol University
- Meiji Gakuin University
- Ministry of the Environment (MOE) - Japan
- PALLISHREE
- Pusan National University
- Ramsar Center Japan (RCJ)
- Ramsar Center - Korea
- Ramsar COP10 Planning Committee - Gyeongnam
- Ramsar COP11 Planning Committee - Gyeongnam
- Seoul National University
- Suikougiken Corporation
- Tokyo Agriculture University
- Universiti Sains Malaysia (USM)
- Wetlands International - China
- Wetlands International - Japan

Photographs from the workshop

1. Nearly 100 people attended the international workshop.

2. Participants pay close attention during opening speeches.

3. A speech by Dr. Duong Thanh Anh marks the release of the Mekong Region Water Resources Decision-making Handbook.

4. Mr. Chu Manh Trinh leads discussion during the process of establishing Viet Nam's national wetlands education network.

5. Participants toured the waters off Hon Mun Island in glass-bottomed boats, getting a close look at some of the area's 350 species of hard coral.

6. A whale skeleton was one of the exhibits at the National Institute of Oceanography, where participants visited during the field trip to learn more about Viet Nam's marine wildlife and ecosystems.

7. During the field trip, workshop participants visited aquaculture sites in Nha Trang Bay MPA. Aquaculture provides an alternative source of income for many people who reside within the MPA.

8. Dr. Tran Triet with Dr. Truong Kinh, Director of Nha Trang Bay Mane Protected Area.

Section 1

Case studies of wetlands education activities in Viet Nam and Asia

Wetland education in marine protected areas: a case-study of Mu Ko Surin Marine National Park, Thailand

Sansanee Choowaew, Faculty of Environment and Resource Studies
Mahidol University, Thailand

Introduction

Thailand has 3,200 km of coastline extending from the Andaman Sea to the South China Sea and the Gulf of Thailand. Marine and coastal wetlands include coral reefs, seagrass beds, bays, shallow seas, sea-cliffs, mangroves, beaches and swamp forests. These wetlands are home to a wide array of biodiversity. They serve as the basis for subsistence economy of many coastal inhabitants and seamen, and are essential to the socioeconomic development of the country, especially with regard to the tourism industry and education.

The increasing number of Marine Protected Areas in Thailand demonstrates a growing awareness of the need to protect the invaluable seascape and coastal and marine resources. The interest in marine and coastal conservation arose from the realization that human influences devastate the country's natural resources and people's livelihoods.

Marine National Parks in Thailand

There are a total of twenty-one formally legalised Marine National Parks in Thailand (see Table 1), covering an area of 5,810.23 km^2. These Marine National Parks are located in the Andaman Sea (sixteen parks), the South China Sea and the Gulf of Thailand (five parks). Four of the Marine National Parks (Had Chao Mai, Laem Son, Mu Ko Ang Thong, and Ao Phang-Nga) are Ramsar Sites. The Office of Environmental Policy and Planning categorises seven of the sites (Tarutao, Thale Ban, Mu Ko Surin, Sirinath, Mu Ko Similan, Had Nopparatthara - Mu Ko Phi Phi, and Mu Ko Lanta) as wetlands of international importance which therefore have the potential to be designated as Ramsar Sites.

List of Marine National Parks of Thailand *[Source: Marine National Parks Division (2000)]*
*Notes : * = Ramsar Site ; ** = Potential Ramsar Site*

No.	MNP Name	Province	Year of Establishment	Total Area (sqkm)	Marine Area (sqkm)
1	Khao Sam Roi Yot	Prachuab Khiri Khan	1966	98.08	20.88
2	Tarutao **	Satun	1976	1,490.00	1,264.00
3	Thale Ban **	Satun	1980	196.00	2.00
4	Mu Ko Ang Thong *	Surat Thani	1980	102.00	84.00
5	Ao Phang-Nga *	Phang-Nga	1981	400.00	347.00
6	Mu Ko Surin **	Phang-Nga	1981	135.00	102.05
7	Sirinath **	Phuket	1981	90.00	68.00
8	Khao Laem Ya - Mu Ko Samet	Rayong	1981	131.00	123.00
9	Had Chao Mai *	Trang	1981	230.87	137.22
10	Mu Ko Similan **	Phang-Nga	1982	140.00	124.24
11	Mu Ko Chang	Trat	1982	650.00	458.00

No.	MNP Name	Province	Year of Establishment	Total Area (sqkm)	Marine Area (sqkm)
12	Laem Son *	Ranong	1983	315.00	267.00
13	Had Nopparatthara - Mu Ko Phi Phi **	Krabi	1983	387.90	325.96
14	Mu Ko Petra	Trang, Satun	1984	494.38	468.38
15	Khao Lam Pee - Had Thai Mueng	Phang-Nga	1986	72.00	0.00
16	Mu Ko Lanta **	Krabi	1990	134.00	108.96
17	Khao Lak - Lam Ru	Phang-Nga	1991	125.00	0.00
18	Had Vanakorn	Prachuab Khiri Khan	1992	38.00	15.36
19	Tarn Boke Khoranee	Krabi	1998	104.00	0.00
20	Mu Ko Chumphon	Chumphon	1999	317.00	265.55
21	Lam Nam Kraburi	Ranong	1999	160.00	64.00
			TOTAL	**5,810.23**	**4,245.60**

All Marine National Parks in Thailand are administered by the Marine National Parks Division of the National Park, Wildlife and Plant Conservation Department, part of the Ministry of Natural Resources and Environment (MONRE). Following are some important roles and mandates of the Marine National Parks Division:

- Declare areas with high potential for protection as Marine National Parks.
- Manage Marine National Parks in accordance with the National Park Act B.E. 2504 (1961), National Forest Reserve Act B.E. 2507 (1964), Wildlife Reservation and Protection Act B.E. 2535 (1992), Forest Act B.E. 2484 (1941), Fishery Act B.E. 2537 (1994), Harbour Act B.E. 2535 (1992), Environment Act B.E. 2535 (1992) and other relevant laws.
- Continually revise and update Marine National Park management strategies.
- Improve laws and regulations related to National Parks including those governing the protection of coastal resources, beaches and the sea.
- Increase the efficiency of protection activities and law enforcement.
- Establish clear demarcation of Marine National Parks, coral reefs, seagrass, and other habitats.
- Study, survey and research baseline data on natural resources with the intention of developing a plan for sustainable uses in Marine National Parks by coordinating and cooperating with research institutes and universities.
- Provide sustainable recreation, education and research opportunities within the Parks.
- Provide information and other services, including safety, to the public visitors and tourists.

- Establish media relations and develop interpretation programmes for the visitor center and nature and underwater trails; disseminate information to the public, especially children and youth, in order to promote understanding and awareness of the need for protection and conservation of natural resources; and develop and build the capacity of staff.

All Marine National Parks are required to implement nature education activities as part of their routine work. The target groups include school children and youth, visitors, tourists, local inhabitants and the general public.

Mu Ko Surin Marine National Park

Location, Area and Physical Features

Mu Ko Surin Marine National Park is located in the Andaman Sea. It is located approximately sixty km from the coast of Phang-Nga Province in the southern peninsula of Thailand, and about eight km from the Thailand-Myanmar border (9' 21"-30" N; 97' 48"-54" E).

Mu Ko Surin Marine National Park covers an area of 135 km2, 102 km2 (76%) of which is sea. The Park comprises five main islands: Ko Surin Nua, Ko Surin Tai, Ko Ree or Ko Stork, Ko Glang or Ko Pachumba and Ko Khai or Ko Torinla. There are over ten crystal clear bays with transparency of up to 20 meters.

Ecological Features

The Surin Islands are covered with diverse and populated forests. There is an array of vegetation ranging from terrestrial forests, swamp forests, beach forests to mangrove forests. There are at least ninety-one bird species (of which fifty-seven are migratory species), twenty-two mammal species, six reptile species and four sea turtle species.

The surrounding seas are filled with a variety of marine life and numerous types of hard corals, soft corals, sea feathers, starfish, spiny lobster, giant clam and sea anemone. There are also rare marine animals including whale sharks, sea turtles and whales. Out of the world's eight species of giant clams, five were once found in Thailand, though at present only three of these species are observed.

According to a survey released in April 2000 by researchers (Sea Papa Team) at the Faculty of Fishery at Kasetsart University, Mu Ko Surin Marine National Park has the largest, widest, most diverse and best coral reefs in Thailand (http://www.talaythai.com). At 1.2 km wide, the Mu Ko Surin reefs are physically Thailand's biggest. Some estimate the coral reefs are at least 8,000 years old. The reefs are fringing types, like other coral reefs in Thailand. In 1999, El Nino destroyed much of the Ao Suthep coral reef. Other negative influences on the reefs have included tourism, fisheries and changes in the water quality.

Cultural Assets

Thailand's last group of indigenous seamen, or “Morgan sea gypsies”, live in Mu Ko Surin Marine National Park. The Morgan are a nomadic sea people inhabiting islands from India to Indonesia. The name Morgan is derived from their universal sea gypsy language. Sea gypsies maintain a very primitive lifestyle and have great respect for nature and the environment. They rely upon their environment for food, shelter and materials for boats. Although primarily nomads, they avoid traveling during the monsoon season from May to November. During this time, they moor their boats in a sheltered location to form a temporary village comprised of several families. The villages disperse when they start traveling again in December. At present, the Park allocates an area on Ko Surin Tai (the South Surin Island) for the sea gypsies as a permanent settlement. Opposite the Park office, there is a carved wooden sculpture around which the seamen convene annually for three days during the first full moon of the third lunar month to pay respect to their ancestors' spirits. They also celebrate the "Boat-floating Festival" in May to ask for forgiveness and protection from the sea.

Objectives and management schemes of Mu Ko Surin Marine National Park

Established on July 9th, 1981, Mu Ko Surin (Surin Islands) became Thailand's 29th National Park and the country's 6th Marine National Park. Main objectives of Mu Ko Surin Marine National Park are as follows:

- Preserve and conserve natural resources and the environment in order to provide sustainable benefits to society.
- Provide opportunities to the public for education, research and recreation within the Park's capacity.

So far, Mu Ko Surin Marine National Park has achieved a degree of success. Successful management practices include:

- A 5-year management plan
- Resource management including Park zoning, mooring buoy installations and maintenance, patrolling of marine areas and enforcement of fisheries regulations, temporary closure of areas for rehabilitation of the reefs and no commercial fishing within 3 km offshore
- Research and monitoring including long-term monitoring, coral reef mapping, biodiversity research and Reef Check Training
- Tourism, public awareness and education programmes
- Community programmes including economic incentive provision for sea gypsies

Future management plan ideas include: improvement of Visitor Center, public awareness programmes for improving visitors' behavior, enhancing visitors' understanding about visitor fee and capacity building programmes

Nature Education

In addition to swimming, snorkeling, diving, bird watching and hiking, Mu Ko Surin Marine National Park is available to enjoy and study nature and the livelihoods of indigenous peoples. The wetland education services of Mu Ko Surin Marine National Park, nature interpretation systems and facilities, public awareness and nature education programmes are constantly being developed. Some new projects include nature trails, underwater nature trails, indoor and outdoor exhibitions and signboards of different types.

Wetland education in Mu Ko Surin Marine National Park

Visitor center and cacilities

At the Park Headquarters on the north Surin Island (Ko Surin Nua), are the Visitor and Exhibition Centers. Both are fully equipped with basic facilities, including a reception counter, a cashier, a souvenir shop, health care facilities, diving facilities and services, a telephone booth, rest rooms and accommodations. Around the Surin Islands are signboards which provide information about site plans, times of the tides each day, maps and trails. Specially-designed garbage bins are well placed and well maintained, encouraging visitors to be responsible. All garbage is transported to the mainland for appropriate treatment.

Exhibition center

Mu Ko Surin Marine National Park has one of the best Park Exhibition Centers and marine ecotourism media services in Thailand. The Center was built thanks to the joint efforts of the public and private sectors. Mu Ko Surin Marine National Park, the Faculty of Fishery of Kasetsart University, and the Environmental Protection and Tourism Foundation all contributed, with additional help from Advanced Thailand Geographic Magazine, Think Earth, Sea Papa Research Team and Talaythai.com. The Center exhibits a wide range of comprehensive information, photos, maps and models. The information includes a history of the islands, detailed information about Morgan sea gypsies, sea and underwater creatures and sea turtles nursery. There are annual updates of all information and underwater photos. Videos and slide shows are presented on a daily basis. The Center disseminates informative pamphlets on its various activities, maps and nature trails.

Underwation nature trails

Bird watching and hiking trails stretch 2km from Park Headquarters on the north Surin Island to Ao Mai Ngam and is one of the best forest ecology trails in Thailand. The trail is safe and appropriate for all ages. The trail links many diverse ecosystems ranging from evergreen, swamp, mangrove forest and beach. Along the trail, there are many wild animals such as monkeys, squirrels and birds. At the end of the trail lies Had Mai Ngam, a pristine white beach with shallow water perfect for diving. Altogether, there are ten observation stations on this trail:

The First Ultinate Nature Trails in Talay Thai (FUN3T) is the name of the first underwater nature trail in Thailand. This trail was created thanks to cooperation between the government (Mu Ko Surin Marine National Park), academic institutions (Department of Marine Science, Faculty of Fishery, Kasetsart University and Sea Papa Research Team - Talaythai.com) and NGOs (Think Earth).

FUN3T is located at Ao Suthep (Suthep Bay), in the shallow and calm sea of the south Surin Island, fifteen minutes by boat from the Park Headquarters. On the trail, there are 1,200 m long coral reefs. The trail was created to provide environmental education about coral reefs. Visitors snorkel from stop to stop and require no more than average snorkeling skills. It takes about thirty minutes to cover the trail, which consists of ten observation stations. The stations have three different goals:

- Familiarising visitors with sea creatures such as the anemone fish, various forms of coral life, large tabulate coral, soft coral and giant clams
- Helping visitors recognise poisonous sea creatures such as branching fire coral and foliose fire coral
- Teaching visitors about natural factors and processes such as coral head and parrot fish grazing; the effects of tidal waves and low and high tides on coral survival; dead coral; and humans' impact on the coral reef.

The ten observation stations on FUN3T trail are:

- **Station 1**: Anemone Fish. There are twenty-eight species of anemone fish worldwide. Ten of these can be seen in Thailand, and eight are found in Mu Ko Surin Marine National Park. Anemone fish always cohabitate with sea anemones, but exhibit different behaviour. The mother fish is responsible for protecting the family.
- **Station 2**: Large Tabulate Corals. The coral reef ecosystem is a diverse but small habitat. Bottom-dwelling species have different ways of struggling for survival in the reefs. One type of corals expand in size in order to better expose themselves to sunlight. However, they are fragile and can break easily, opening up space for other bottom dwellers to fit into in their own struggles to survive.
- **Station 3**: Giant Clams. These clams, which feed on planktons and green algae, are the largest clams in the world. There are eight species worldwide. At one time, five of these species existed in Thailand; today, only three species remain. Still, Mu Ko Surin is one of the best sites to find giant claims in Thailand.
- **Station 4**: Branching Fire Corals. These corals are actually jellyfish and contain a dangerous and powerful poison.
- **Station 5**: Foliose Fire Corals. These corals are commonly found around Surin Islands and also contain poison. One can often view sea turtles at this station.
- **Station 6**: Massive Corals and Parrot-Fish Grazing. Parrotfish feed primarily on corals. Their parrot-like beaks are designed to scrape the coral.

- **Station 7**: Various Coral Life Forms. There are over 650 coral life forms worldwide. 270 kinds can be found in Thailand, of which over 260 forms exist in Mu Ko Surin Marine National Park. This station displays a variety of these species such as massive corals, branching corals and sub-massive corals.
- **Station 8**: Soft Corals. Unlike most corals, soft coral has a soft body.
- **Station 9**: Natural Dead Corals. Corals often die from natural causes such as wind, waves, tides and predators.
- **Station 10**: Human Impacts on Coral Reefs. Humans activities destroy coral both intentionally and accidentally. Illegal fishing, irresponsible diving, wastewater, garbage that has been dumped into the sea, deteriorating water quality and coral collectors all destroy these vital areas. Fragments of fishing nets cut or torn from a boat can easily get stuck on corals and can cause many problems.

Learning about the culture of Morgan Sea Gypsies

Morgan Sea Gypsies originally traveled throughout the Andaman Sea, from Southern Myanmar through the seas surrounding Ranong, Phang-Nga, Phuket, Krabi, Trang, the Satun Provinces of Thailand and even on to some of the Malaysian and Indonesian islands. The Morgan community on the Surin Islands is the last group of Sea Gypsies in Thailand that still maintains the traditional lifestyle and customs of their ancestors from hundreds of years ago. For example, they still use Zalacca trees to build their boats and dwellings, and they still observe the "Boat floating festival" in May. At present, there are about 160 seamen.

Networking among Marine National Parks

Cooperation among Marine National Parks within Thailand and other countries for nature is still limited. Superintendents manage parks as separate entities. However, there have been some initiatives attempting to link and facilitate the planning and management of these areas on an ecosystem basis.

Joint Management of Protected Areas (JMPA) is a sub-component of the Thai-Danish Programme for Cooperation in Environment (2004-2008). Its aim is to promote participatory approaches to protected area management in Thailand that secure biodiversity conservation while improving the livelihoods of local communities. The immediate objectives are:

- Working towards effective Protected Area management, including holistic ecosystem approaches. Joint management is already operational in a range of protected areas.
- Developing models and systems for Protected Area management including ecosystem approaches and joint management. These should then be replicated through the national Protected Area system to initiate a key strategy for the Department of National Parks, Wildlife and Plant Conservation.
- Achieving institutional and human capacity for effective Protected Area management including ecosystem approaches and joint management.

Activities are implemented in eleven Protected Areas, including six terrestrial National Parks, one Wildlife Sanctuary, and four Marine National Parks (Had Chao Mai, Laem Son, Phi Phi, and Thale Ban). Implementation procedures include: establishment of a Sub-component Steering Committee (SSC) with broad participation from GOs and NGOs to oversee the overall implementation; establishment of a Technical Sub-committee or the Technical Coordination Working Group (TCWG) as a collaborative mechanism and a forum under the SSC for discussing technical issues among stakeholders; establishment of a Protected Areas Innovation Unit (PAIU) in the Department of National Parks, Wildlife and Plant Conservation to lead in implementation. The Department of National Parks, Wildlife and Plant Conservation and a range of NGOs will implement the project. Although JMPA has not yet focused specifically on joint nature education programmes or networking among Marine National Parks, it may be a possible platform to lead the initiative.

At least four Marine National Park Management, Education and Development Centres have been set up for implementing the nature education development programmes at Mu Ko Chang in Trat, Hat Sai Ree in Chumporn, Hat Mai Khao in Phuket, and Had Chao Mai in Trang (e-mail: edumarine@dnp.go.th). Parks and Marine National Park Education Centres cooperate with schoolteachers to provide nature and environmental education to students via the Environmental Learning Mobile Units. Students from school and colleges frequently use the Marine National Parks as "natural" classrooms and outdoor laboratories. The Parks and Marine National Park Education Centres train over 300 students and locals each year. These Centres could serve as platforms for networking among Marine National Parks to jointly implement nature education programmes and activities.

Constraints

Major constraints facing nature education and networking between Marine National Parks include:

- A very limited tradition and lack of experience in networking in Protected Areas management and nature education
- A weak institutional framework and mechanisms to support networking
- A lack of well-trained superintendents and park officials in coastal and marine environmental education
- A lack of technical and professional skills in nature education and interpretation which limits the development of effective nature education programmes

In addition there is a limited budget. At present, the national parks (both marine and terrestrial) have three sources for their budget: government funds which are allocated on the basis of area coverage of each park and management needs; internal park revenue, mainly from entrance fees, visitor services, accommodations, food shops, souvenir shops, and fines; and other sources like donations, private sector and Tourism Authority. Over 85% of the parks' budget comes from the government, and the total revenue is still very small. Moreover, since 1999, according to the 1996 Constitution, the parks have started to transfer

5 % of their revenue to the Tambon Administration Organizations for environmental development projects of communities. Having a limited budget impedes networking activities, although this problem could also increase the need for networking as a way to more effectively use and possibly increase overall revenue.

Conclusion

Marine National Parks in Thailand have a lot to offer in terms of nature education. It is important to document and disseminate accounts of successful practices in Marine National Parks management, conservation and nature education efforts, such as those at Mu Ko Surin Marine National Park, to encourage possible replications in other areas.

Promoting joint nature education and public awareness programmes, trainings, cross visits, exchange visits, media and materials, nature interpretation systems and experience via networking among Marine National Parks would be highly useful for Marine National Parks management in Thailand as well as for other countries. Such actions would also benefit both the users and visitors of Marine Protected Areas at the local, national, and regional levels.

Regional cooperation, as demonstrated by the establishment of the MPA Network, can develop international linkages of great assistance to countries that have little experience in nature education management in Marine Protected Areas. Cooperation is strongly recommended.

References

Coral Cay Conservation. *The Coral Reef Resources of Mu Ko Surin National Park, Thailand*. http://www.coralcay.org

Office of Environmental Policy and Planning (1999). *Wetlands of the South of Thailand*. Ministry of Science, Technology and Environment. Bangkok.

Sethapun, T. (2000). *Marine National Park in Thailand*. http://www.dnp.go.th/parkreserve/e-book/Marine_Park_Th_Tsunami.pdf

Sudara, S. and Yeemin, T. *Demonstration Site Baseline Assessment Report: Mu Koh Surin Marine National Park, Thailand*. UNEP/EAS/ICRAN/WS. 2/5 Annex 4.

Website : http://www.icran.org/sites/doc/MuKohSurinBaselineAssessment.pdf

Website : http://www.forest.go.th/nrco/english/mnpd.htm

Website : http://www.dnp.go.th/National_park.asp

Website : http://www.talaythai.com

Website : http://en.wikipedia.org/wiki/National_parks_(Thailand)

Website : http://www.arcbc.org/arcbcweb/pdf/mpa/02_marine_in_asean.pdf

Website : http://www.geocities.com

Website : http://www.thaiforestbooking.com

Website : http://www.thai-tour.com/eng/phangnga/surin.htm

Wetland conservation and CEPA activities in Japan

Noriko Moriwake, Wildlife Division, Ministry of the Environment, Japan

Introduction

The Ramsar Convention's definition of a wetland is quite broad. The definition includes marshes, rivers, lakes and ponds, tidal flats, seagrass/seaweed beds, mangrove forests, coral reefs and ground water systems, as well as artificial wetlands, such as rice paddies and reservoirs. Under the Ramsar Convention, parties shall designate one or more wetlands within their jurisdiction for inclusion in the *List of Wetlands of International Importance* (Ramsar List). The Ramsar Convention aims to promote wetland conservation by expanding the number and area of Ramsar sites and networking them globally.

Japan's response to Ramsar targets

At the Seventh Meeting of the Parties to the Convention (Ramsar COP7) in 1999, a short-term target was adopted to increase the global number of Ramsar sites to more than 2,000 by COP9 in 2005 - a target that meant almost doubling its number. At the same time, parties were encouraged to designate various types of wetlands as Ramsar sites, paying special attention to underrepresented types such as coral reefs, mangroves, and karst areas. In response to this global target, Japan set its national target to increase the number of Ramsar sites in Japan from 11 to at least 22 by COP9.

Fifty-four candidate sites were selected from "500 important wetlands in Japan" list that had been developed in 2001. The selection took into account that various wetland types and criteria should be used for designating new Ramsar sites by COP9. As a result, 20 new wetlands were designated on 8 November 2005, the first day of COP9, and the total number of Ramsar sites in Japan leaped to 33. The new sites include various types of wetland, such as marshland, lakes and ponds, tidal flats, coral reefs, mangrove forests, and ground water systems, as well as habitats for endangered insects and endemic fish species, and nesting areas of sea turtles. In addition, a regional balance was achieved for distribution of the sites within Japan.

CEPA for conservation and wise use

In fact, these designations are merely a starting point for achieving the conservation and wise use of Ramsar sites. Efforts should be made at each site and also at the national level regarding increased participation of relevant stakeholders, including national and local governments, experts, NGOs, and local communities. Communication, education and public awareness (CEPA) activities can also be powerful tools which promote such activities.

Introduction of wetland education in S. Korea with an emphasis on the Nakdong River Estuary

Ji-Deok Jang, Department of Biology, Pusan National University

Introduction

In Korea, dramatic increases in outdoor education and conservation activities have been observed since 2000, a result of increased awareness of the importance of the nation's wetland ecosystems. Many NGOs specialising in wetland conservation were formed during the late 1990s. These groups initiated local conservation and education activities. Along with the efforts of the central government, the general public and local governments also began to realise the need for wetland conservation. These activities, however, were conducted on a small scale and were not coordinated.

The concerted efforts of all stakeholders are needed to maximise the outcomes of projects in Korea's wetlands in order to implement COP 10. Unlike the proposed roles of NGOs and GOs in wetland education, scientists' roles are not well defined, nor are they recognized. To cope with ever-increasing demands from the various wetland issues (restoration, CEPA, training, etc.), wetland scientists should play a greater role in wetland education and public awareness activities.

For the evaluation of the current status of wetland education for the youth and the public, I reviewed outdoor activities for children, selected case studies on the training of qualified volunteers to be wetland eco-guides, and the ecology curriculum of several universities in Korea. In addition, I discussed the possible roles of wetland scientists such as professional wetland ecologists, limnologists, and hydrologists in bringing about effective CEPA programmes.

The current status of wetland education in Korea

An online search identified 160 outdoor activities on aquatic ecosystems (mainly stream and wetlands) conducted from 2000 to 2006. There was a significant inter-annual variability in the total number of activities, and most programmes were inconsistent due to their fluctuating funds and numbers of qualified instructors. Most activities took place from May to October. Efforts to clean streams, such as garbage collection, comprised 72 percent of their activities, while activities geared toward cleaning coastal wetlands (mudflats) comprised 10 percent and ecological surveys comprised six percent. The programmes largely targeted middle school students ages 13-15, who comprised 51 per cent of participants, while high school students ages 16-18 accounted for 14 per cent of participants. The general public, college students, and elementary school students respectively comprised 12, 7, and 6 per cent of those participating in these activities.

The large proportion of middle school students taking part in the stream cleanup activities may relate to the schools' social service requirement. Currently, almost all middle and high schools in Korea strongly encourage 10-20 hours of extracurricular social service.

Case studies of educational programmemes

Nakdong River estuary

In the case of the Nakdong River estuary in Busan City, citizens have recognised the need for the conservation of the coastal wetlands since 2000, when the Local Agenda 21 Team initiated the Eco-leader programme for the Nakdong River estuary. Since then, several NGOs have been running similar programmes to train volunteers who range from retired teachers to businessmen to housewives. After three years of basic training in the classroom and the field, these participants are currently enrolled in the Eco-expert programme, where they will be taught and guided in the field by professional ecologists and wetland scientists. After a few more years of training, they will be excellent guides in the Eco-park and Eco Centre (Interpretation Centre) in the estuarine wetland.

Members of the Wetland and Birds NGO and the Korean Federation of Environmental Movement have contributed to the educational programmes for both children and the public in the estuary. Most of the educational programmes are fairly new but numbers of participants range from several hundred to more than 1,000 a year. Their educational programmes mainly consist of lectures on plants and animals and bird watching, so organisers want to expand their educational topics to include ecological topics such as the food web, restoration, plant-animal interaction, and migration. Through an evaluation of the programme, education experts should identify the strengths and weaknesses of on-going CEPA activities and share effective methodology. To facilitate effective education, protocols, field guides, and eco-maps written by local NGO experts and scientists are strongly needed. Currently, few educational materials are available for children and the general public in the estuarine wetlands.

Woopo Wetlands

In the Woopo Wetlands (a Ramsar Site), the Woopo Ecology Learning Center was opened in 1999. Since then, over 30,000 visitors have been utilising the facility annually. Popular topics for education include bird watching and the identification of aquatic plants and wetland ecosystems. Despite a shortage of qualified lecturers and teaching materials, participants (mostly children) enjoy their exposure to the various aspects of the largest inland wetland ecosystem.

Wetland science curriculum in universities

Currently, wetland sciences are taught as limnology- or ecology-related subjects- in many four-year institutions in Korea. Out of nearly 100 major four-year institutions involved, only about 20 schools offer ecology and related subjects, such as limnology, aquatic ecology, stream ecology,

phycology, and entomology. In recent years, total numbers of wetland science-, limnology- and ecology-related subjects dropped sharply because of the change in curriculum and shortage of lecturers. In addition, national promotion of biotechnology in Korea is competing with the recruitment of young ecologists and field biologists. Recent launches of national programmes such as the Long-term Ecological Research Programme (2004), the Total Catchment Programme (2003), and the Biodiversity Programme (2005) will provide more research and training opportunities for young scientists. These national programmes, along with CEPA and training programmes for local people, will provide a strong base for the further expansion of conservation activities for the wetland.

Importance of scientists in wetlands education

To cope with problems associated with wetland ecosystems in Korea, the NGO and GO sectors need professional scientists' ecological knowledge and experience to help them with wetlands restoration, CEPA, the training of volunteers, and the organisation of wetlands education for the youth.

Scientists should pay more attention to local wetland issues and challenges and communicate with the public as well as with local NGOs. The development of education programmes for eco-guides and the preparation of appropriate educational materials such as field manuals and eco-guide books for the general public are important steps for CEPA and for publicising the value of Korea's wetlands.

Priority programmes: environmental education activities in the Nha Trang Bay MPA

Nguyen Thi Kim Hoa, Management Board of Nha Trang Bay MPA

Background

The concept of marine protection is very new in Viet nam. The MPA in Nha Trang Bay was Viet nam's first MPA. There is little understanding and knowledge of this concept among the people. For this reason, the Nha Trang Bay MPA and the management board of the Pilot Project for Hon Mun MPA geared their activities towards education and improving the community's awareness.

Strategy for environmental education

Since 2001, a strategy for environmental education (EE) and an action plan were developed and implemented. These activities focussed on:

- Education and awareness-building on several topics
- Adopting appropriate formats to reach different target groups
- Developing a strategy for short- and long-term public relations campaigns and public-relations training

During the implementation of EE activities, the targeted subjects will be divided into three groups:

- **Group 1: Local competent levels (including local authorities and relevant agencies such as the management board of the Nha Trang Bay MPA)**

The People's Committee of Khanh Hoa Province is the highest-level management agency that worked to establish the management board of the Nha Trang Bay MPA and directs the operations of departments and agencies. These include the Department of Fisheries, the Department of Science and Technology, the Department of Tourism and Commerce, the Department of Transport and Communication and the Department of Finance and Pricing. Thus, the support for, and interest in, the environmental education of these departments and is essential to the ultimate success of the programme.

- **Group 2: Local Communities**

Incorporating this group is the top priority in the environmental strategy. This is especially true with regards to those people living and or using those natural resources in the MPA. Children, the future masters of the Nha Trang Bay, will hopefully benefit from public awareness campaigns that first affect families and eventually spread knowledge to the entire community. The urban population is important because of the impact of urbanization and waste dumping into the sea. Business organisations involved in tourism and the service industry also contribute to pollution by leaking oil and generating waste.

- **Group 3: Tourists**

Nha Trang Bay receives 480,000 tourists annually. This number will continue to grow, affecting the socio-economic development of Khanh Hoa Province. This trend will also increase the threat of environmental pollution in the Nha Trang Bay MPA.

Forms of disseminating information

- Mass media: television, radio, website, and bulletin announcements
- Publications: fliers, brochures, CDs, tapes, books, newspapers
- Workshops, seminars, conferences, training courses, meetings of the Protected Area's Management Board
- The information center in Hon Mun: Bich Dam Center for Community Activities
- Extracurricular environmental education programmes in schools
- Events: competitions, camping, artistic performances and games

Approaches to different target groups

Local authorities:

- Develop management rules
- Prepare a plan for management
- Establish the Management Board of the MPA
- Set up the Provincial Steering Committee for marine protection
- Draft regulations for coordination between agencies, departments, sectors and the People's Committee of Nha Trang City during the management of the Nha Trang Bay
- Organise workshops, training courses, seminars and study tours domestically and overseas

Local communities:

- Organise an open competition to design a logo for the MPA
- Proceed with the Programme for Environmental Education in two primary schools and two lower secondary schools in Nha Trang City. Teachers involved in this programme shall be properly trained and equipped with the necessary facilities. During the 2005 - 2006 academic year, 110 pupils were rewarded for their achievement by the Management Board of the Nha Trang Bay. The Management Board of the Hon Mun Pilot Project and the Management Board of the Nha Trang Bay MPA organised a competition among schools to see how well the students understand the idea of an MPA and also organised field trips for the children to visit the Institute of Oceanography and Hon Mun Bay
- Continue activities and meetings with the Protection Committee of Islands and locals for those people living in the MPA
- Artistic performances, camping trips, games and quizzes are used to increase participation. In addition, there are various clubs, films and training courses to improve awareness. The New Zealand Embassy sponsored a project on Vung Ngan Island to

clean up the Nha Trang Bay, and the UK sponsored the Centre for Community Activities in Bich Dam Island, providing books, newspapers, pictures and stories geared towards the local community

Local people and tourists

- Issue fliers, brochures, bulletins, websites and documentary films
- Coordinate exhibitions and activities with other agencies, including the Department of Fisheries
- Initiate a public relations campaign for marine protection. Panels and posters are set up in island clusters, ports and the Cau Da Tourism Ship. In order to get funds, tourists are charged a fee
- Build a tourist center in Hon Mun to increase access to information on biodiversity and the marine protection activities of the Hon Mun Pilot Project and the Management Board of Nha Trang Bay MPA

Improving Nha Trang Bay MPA Management board and staff capacity and awareness

The Management Board of the Nha Trang Bay MPA was established under Decision 2471/2001/QD-UB on July 18, 2001 by the People's Committee of Khanh Hoa Province. There are forty official members; sixteen are permanent staff and twenty-six work on a contractual basis. 80% of the staff members have a university or postgraduate degree. In spite of this, their qualifications in the area of marine protection are minimal. Therefore, it is very important to educate the board on this topic. The agency encouraged and instructed its staff to attend training courses and seminars, both inside and outside the country, organised by groups such as the IUCN, the Ministry of Fisheries, and the National Oceanic and Atmospheric Administration (NOAA).

Future initiatives

Local authorities and relevant agencies

- Develop a programme to build capacity using the coastal consolidated management method. This will be done with assistance from the Ministry of Fisheries, IUCN, NOAA and other organisations
- Share management experiences with other Protected Areas (PAs) in Viet nam and overseas

Local community

- Expand the educational programme to other schools in Nha Trang City

- Share information with other units and associations surrounding the Nha Trang Bay MPA, including the City's Youth Union, youth organizations of various wards next to the MPA, youth branches in universities and colleges of the Nha Trang City
- Increase the number and type of activities available to the local groups in the MPA
- Include hotels, restaurants, souvenir shops in Nha Tran City in the activities
- Provide information and brochures to travel agencies, tourism service agents and diving clubs
- Set up a network of volunteers in Nha Trang City through the Club of Beautiful Nha Trang Bay and other diving clubs

Tourists

- Increase the number of informational panels at the airport, bus and train stations and tourist ports
- Issue brochures, fliers and publications in hotels, tours and tourist ports
- Organize exhibitions on specific topics in coordination with other organizations

Ensure the information is the same as the current leading approach

Difficulties

- Officers' knowledge of environmental education remains limited
- General awareness of people about marine protection remains low
- Geographical impediments to continued dissemination of knowledge (MPA is on a series of islands)

Needs

- More practical support from the Khanh Hoa People's Committee
- Close and effective coordination between relevant agencies and departments in the Province
- Support and cooperation from local authorities both inside and outside the MPA
- Appropriate mechanisms and policies at the macro-level for management of the MPA
- Active participation on behalf of hotels, restaurants, souvenir shops in Nha Tran City
- Release more information and brochures to travel agencies, tourism service agents and diving clubs
- Network of volunteers in Nha Trang City through the Club of Beautiful Nha Trang Bay and other diving clubs

Cham Island Marine Protected Area

Pham Viet Tich, Project Director, Cu Lao Cham MPA Management Board

Background on Cham Island

Located 19 km from Hoi An towards the East Sea, Cham Island consists of 589 family households with a population of about 3,000 people. 80% of households earn their income from fishing.

The Project for Cham Island Marine Protected Area was carried out from October 2003 to September 2006 as part of the Programme for Supporting the Network of Marine Protected Areas designed by the Danish Government in favour of Viet Nam. The main donor is the Danish International Development Cooperation Agency (Danida).

The Cham Island Marine Protected Area was officially established in December 2005 when the People's Committee of Quang Nam Province issued the regulations on the Management of the Cham Island Marine Protected Area, introducing a system of defined functional regions subject to separate legal status. The importance of education and awareness-building activities is addressed by Objective 3 of the Project.

The status of education in Cham Island

Education levels

- About one-third of heads of households have completed lower secondary education
- About 30% of spouses are illiterate
- Only two-thirds of local officials have completed upper secondary education or intermediate levels of education
- There is a small number of young people who have just graduated from university or are pursuing university studies

Education facilities

- There are two primary schools (which host a total of 221 pupils) and one lower secondary school (which has 225 pupils) in Bai Lang Hamlet. Lower secondary pupils must either walk or take a boat to school in Bai Lang, which is 4 km far away. Currently, all school-age children are at school. There is a 2% dropout rate from illness or other reasons at lower secondary schools.
- Most pupils find it difficult to attend lower secondary or upper secondary schools on the mainland (Hoi An) because of poverty, lack of interest in studying, or because they have to stay at home to earn a living with their family.
- Only 35% of households have one or more members who have completed upper secondary education in Hoi An. Of these, 6% have members currently studying in Danang or elsewhere.

The status of marine environmental education

Agencies at the province and town levels, along with the Tan Hiep Commune, have organised various annual training courses to spread information about laws, ordinances, decrees and implementing circulars that are related to the protection and development of aquatic product resources, the environment, and the prevention of floods and storms in coastal districts and towns.

Although the organisation of such activities does occur regularly, Cham Island is located far from the mainland and most participants tend to be local officials or owners of fishing boats. Thus, the capacity to provide public education and information on the role and value of marine biodiversity, coastal wetlands and mangroves remains limited.

Education and awareness-raising activities of the Cham Island MPA project carried out from October 2003 to October 2006

Project objectives

- To train officials from Hoi An town, Tan Hiep commune and the coastal community on Cham Island in order to teach them about protecting the marine environment
- To organise training courses on gender analysis for female officials of the Province, Hoi An town, and the island commune
- To conduct monthly talks for women in Tan Hiep commune with 50% attendance rates informing them about gender issues and the marine environment
- To organise annual performances and beach cleanings on World Biodiversity Day, May 22, and on World Environment Day, June 5, two days associated with EE activities specific to the marine environment

Educational programmes on the marine environment in schools

- To research and compile text books on issues such as biodiversity, marine environment, and mangroves, and to implement related curricula within two years' time for five classes of grade 4 and 5 students (a total of 113 pupils) and for four classes of grade 8 and 9 students (a total of 105 pupils)
- To hold under-the-flag talks for pupils
- To organise painting competitions for art related to the marine environment
- To design and introduce a set of teaching aids for the subject of the marine environment, including pictures, specimens, and simple models
- To organise various excursions for primary and lower secondary teachers to learn and collect experiences

- To set up a club for the Protection of the Cham Island Marine Protected Area (made up of the Farmer's Association, Women's Association, Youth Organisation, Veterans' Association and People's Board of the Hamlets, and others)
- To grant 100 scholarships a year to talented underprivileged pupils for two years. Each pupil will receive a scholarship for VND 300,000

Education and awareness-building activities

- 11 English classes at primary, intermediate and advanced levels
- 2 classes on "Tourist English" for more than 300 inhabitants of Cham Island
- Training on environmental protection and foodstuff safety (179 participants)
- Hosting three training courses on management skills (participatory rural appraisal, circumstantial analysis, gender analysis), and providing the option ot attend other training courses in the country
- Two study tours overseas and 11 excursions in the country
- Publication of calendars, brochures, fliers, leaflets, pictures, posters, T-shirts, caps, setting up advertisement panels and showrooms, organising competitions for paintings of the sea, and developing summary records

Project outcomes

- Improved management capacity and awareness of ways to properly conduct activities related to marine conservation
- Improved community awareness of how to protect biodiversity and the marine environment
- Women and children have access to varied forms of information and regard the protection of the marine environment as an important way to protect their own lives
- The community participates in the development of management plans and regulations and has reached a consensus on zoning of functional regions in the MPA
- The community understands the impact the MPA will have on livelihoods
- The community takes an active role in patrolling and guarding the MPA
- Awareness education influences the participatory development of the MPA management plan

Project challenges

- The coastal community and islands communes maintain low levels of background knowledge

- Socio-economic, cultural, and facility conditions are poor because of the remote location
- Communications and education officials have received no thorough basic training
- Content and characteristics of materials, equipment, and teaching aides is not uniform
- Curriculum covering information about seas, coastal swamps and mangroves has not yet been incorporated into at primary and secondary schools
- The budget for marine education remains limited; the awareness and interest of various levels and sectors have yet to be determined; and task development, coordination, and implementation is not yet consistent

Recommendations

- Continue to implement the programme to improve awareness and management capacity of the leadership at various levels and sectors and to develop regulations to encourage consistent coordination between the sectors
- Accelerate the implementation of a campaign to improve public awareness; further review, adjust and expand the marine educational programme currently adopted in schools to coastal districts and towns and introduce it into the official curriculum of schools, especially in coastal areas
- Implement a programme for livelihood support and the improvement of living conditions of the community in and around the Marine Protected Area
- Improve the study conditions of pupils in the island communes and encourage children to pursue higher education in mainland schools so that they can be learn about land stewardship and return to the island to share this knowledge
- Research the compilation and standardisation of textbooks and teaching aids and train communication officers and teachers
- Expand management and conservation activities of to marine and wetland ecosystems such as swamps and mangroves of the entire region

Con Dao National Park: benefits, challenges, and lessons learned from environmental awareness activities

Vu Van Thuy, Communications and Environmental Education Officer,
The Office of Science and Environmental Education, Con Dao National Park

Introduction

Con Dao National Park was established 31 March, 1993 under Decision 135/TTg of the Prime Minister. The Park highly values communication activities in order to improve general awareness about the value of natural resources and about the corresponding State regulations. Communications and environmental education activities were implemented shortly after the park was established and are usually carried out on an annual basis.

Activities

Due to the sheer variety in the public's knowledge, lifestyle and potential environmental impact, the Park has had to create separate communication strategies that are tailored to specific groups.

Local fishermen

In Con Dao, the number of local fishermen is limited to about 50 households. However, their possible impact on marine natural resources is substantial. Coastal waters are the habitat of various sensitive ecosystems, including coral reefs, seaweed, and mangroves. Because of a lack of access to information, fishermen often violate the rules of the National Park. Therefore, it is essential to provide them with information about the value of natural resources, protected areas of the National Park, and other State regulations in order for them to be aware of, and act more friendly towards, the environment.

There are two ways to improve fishermen awareness. Direct talks with local fishermen during off-season provide information about the importance of the ecosystem, how it factors into their livelihoods, and the rules and regulations for the National Park and the State. Information campaigns on local television programmes, especially segments on the *Environment and peoples' lives show* broadcast regularly by Con Dao Television, can provide natural resource information and information about protection activities and violation penalties.

Fishermen from other localities

These fishermen are very hard to control. Their actions have been severely detrimental to the Con Dao environment. Every year during stormy season, ships and junks from other localities enter the Con Dao sea area for shelter. The Con Dao National Park has contacted the Coast Guard for permission to contact these fishermen. Direct dissemination of information is carried out during the stormy season, when choppy seas mean most ships and junks are anchored at the seaports. With the help of the Coast Guard, one fisherman from each ship/junk is invited to the ship of the National Park. The fisherman is then provided with all necessary information and is asked to sign a document committing to following the rules of the National Park. The disadvantages of this approach are its expense

and the difficulty of repeating the activity annually. For this reason, the Park is trying another approach, using brochures that are distributed by the Coast Guard.

Students

Students are in the process of solidifying their own values. They are the ones who will inherit what we attempt to preserve. For this reason, the Con Dao National Park attaches great importance to them and has created various activities specifically for them.

- Green Clubs support various extra-curricular activities carried out in schools to improve the understanding of the importance of green trees and forests, the sea, and of waste classification and recycling. Excursions have also been organised to help students discover the natural environment. Students respond enthusiastically to discovering mangroves or taking part in the games of waste classification. One game, *Little Turtle*, enables them to understand the threats faced by turtles.
- Additional activities include making naturally-decorated, multi-colored lanterns during the mid-autumn festival and organising fashion shows with the topic of the environment on the National Teachers' Day. These activities are very meaningful and have naturally sent the message to children to protect the environment.

Armed forces units

One of the typical characteristics of the Con Dao National Park is a number of armed forces units - totalling around 2,000 people - most of which are located near or inside the National Park. The National Park holds annual meetings with incoming soldiers in order to improve their awareness of the environment. Information covered includes the value of the natural environment, the rules of the National Park, and State regulations.

Local community

The National Park chooses to educate to this group of people with television and loudspeaker messages. In addition, regular meetings are also held with local people to provide them with information about natural resources, the rules of the National Park and State regulations.

Tourists

Tourism activities are developing rapidly in Con Dao, which, if not controlled properly, could have a negative impact on the environment. Direct instruction is regarded as the most important method for controlling tourist activities. Instruction takes place in the

Representation Room of the National Park where tourists are briefed on the nature and general rules. In the forests, there are two (soon to be three) self-guided trails with various environmental guideposts along the trails that provide interesting information and a message of environmental protection. The Park also is setting up various signs in the tourist sites to remind tourists of environmental protection.

Other activities

In addition to the aforementioned activities, the Park has supported other notable events. For example, this April the Park took advantage of a festival organized in Con Dao by setting up a showroom to display pictures and exhibits about Con Dao flora and fauna. The Park also provided photography services in Con Dao's natural environment (15 photos of tourists and 45 landscape photos were recorded on nearly 200 VCDs with accompanying music). The Park has also coordinated quite well with the district's youth union and student volunteers to conduct activities such as beach cleanings.

Advantages

As compared to other MPAs, the Con Dao National Park gains several advantages from being headquartered far from the mainland. These advantages include:

- Low population density
- A high general level of knowledge on environmental issues
- Leadership that has long been concerned about EE and communications activities
- Communication and environmental education activities were started very early (2000)
- The physical infrastructure, such as loudspeakers, television, and schools, is quite good

Challenges

The information on communication and education activities to use for improving the community's awareness and skills have, thus far, come from a variety of reference materials and short-term training courses. These sources are often less than coherent. To our knowledge, Viet Nam has no specialised programme or textbook focussing on communication and education methodologies for building awareness.

Fishermen from other localities are also one of the main challenges to a healthy park. These fishermen cause many problems for the marine environment but it is very difficult, both logistically and financially, to carry out programmes targeting these people.

Lessons learnt

- To the extent possible, take advantage of any local events and turn them into opportunities to improve environmental awareness
- Use the local broadcasting and television system: study environmental events, articles, and news, and publicise the information for the local community
- Coordinate closely with the local youth organization
- When working with adults, raise as many issues as possible that are closely related to their daily lives and livelihoods
- Work closely with reporters and newsmen because they provide broad access to the community

Conservation education in Xuan Thuy National Park

Luu Cong Hao, Scientific division, Xuan Thuy National Park

Introduction

Xuan Thuy National Park is a wetland area located in the south of the Red River Estuary, in Giao Thuy District, Nam Dinh Province. Its geographical coordinates are: 20011' - 20016' N, 106^{0}29' - 106^{0}37' E. It covers a total area of 7,100 hectares. The area of the buffer zone around the park is 8,000 hectares; the buffer zone contains approximately 3,000 hectares of mangroves and nearly 100 hectares of casuarina forests. Xuan Thuy National Park has a great economic potential, particularly because of its aquatic resources. It is a place where many rare and valuable animals and plants can be found - an area of great biodiversity. In Xuan Thuy National Park, more than 200 species of birds have been discovered, including 150 species of waterfowls. The area has a high density of individuals and is home to up to thirty- or forty- thousand birds. Nine of the area's bird species are listed in the *IUCN Red List of Threatened Species*, including *Platalea minor, Eurynorhynechus pygmatus*, and *Larus saundersi*. For years, Xuan Thuy National Park has been acknowledged by BirdLife International as the best area in the region to be considered as an Important Bird Area (IBA).

In January 1999, the area was recognized by UNESCO as a site under the Ramsar Convention *(The Convention on Wetlands of International Importance, Especially as Waterfowl Habitat)*. At that time, Xuan Thuy National Park became the 50th member site in the world and was the first Ramsar member from Viet Nam. In order to properly protect the area that is now designated as a Ramsar region, in 1995 the Government had decided to establish the Xuan Thuy Wetland Nature Reserve (Xuan Thuy Wetland Nature Reserve). Today, the Nature Reserve has not yet received adequate funding and as a result is characterized by a lack of upkeep, a small Management Board, and a staff of officers who have limited qualifications and capacity. Given the pressures the local communities face to exploit the natural resources of the buffer zone that approach the core zone, it is very difficult to enforce the international commitment made by the government of Viet Nam when it registered the wetland area in the Xuan Thuy Wet Land Nature Reserve to be a member of the Ramsar Convention.

Facing the urgent matters discussed above, the Government (by Decision 01/2003/QD-TTg of 2 January 2003) decided to change Xuan Thuy Wetland Nature Reserve to Xuan Thuy National Park. On this basis, the People's Committee of the Nam Dinh Province issued a Decision to provide for the functions, duties, powers and organizational structure of the Xuan Thuy National Park in order to strengthen its management mechanisms and to help it more effectively work towards its conservation target, gradually developing Xuan Thuy National Park into a standard model of the wetland ecosystem in coastal estuaries of the Red River Delta.

Current status: management and protection in Xuan Thuy National Park

The buffer zone of Xuan Thuy National Park includes five communes and has a total population of more than 45,000 people. The majority of the local people are supported by livelihoods derived from the natural resources of the National Park. Thus, the local community places a great amount of pressure on the Park. During the seasons of catching breeding crabs and breeding oysters, many people visit the National Park each day. The National Park only has 12 officers. They lack judicial and executive powers and thus face difficulties protecting park areas. The ranger unit of the Park only functions as a forest warden in the forestry sector.

In order to protect natural resources, the National Park must gain the cooperation of all stakeholders, people from many different branches, authority levels, and units. For this to happen, it is necessary to educate these people about the basics of natural resources protection. Conservation education urgently needs to become a regular, continuous programme if it is to protect the natural resources in Xuan Thuy National Park.

Conservation education activities in Xuan Thuy National Park

Environmental education targets

Conservation activities ought to target the local community, tourists, officials at all levels, and must also address the needs of farmers, women, young people, students, and other people who go to visit and study in the National Park. A focus will be on people who conduct activities relating to natural resources and the environment of the National Park. Examples of such people are fishermen, freelance exploiters of aquatic resources, and lagoon owners.

To introduce the value of biodiversity of the Xuan Thuy National Park, activities must help the local community to understand their rights and responsibilities in protecting the area's natural and environmental resources.

Forms of conservation education

Regular activities of Xuan Thuy National Park

- With support from the State budget, Xuan Thuy National Park holds a hand-over meeting on a quarterly basis to help people exchange information and learn from management experiences in Xuan Thuy National Park. At these meetings people also develop action plans.
- A system of signboards and posters is set up to convey messages to communes in the buffer zone about conservation in a visually-appealing, lively manner.

- Regulations coordinate the activities of authorities at various levels with those of relevant environmental protection units. These regulations been approved by the Provincial People's Committee.
- Regular coordination with public organizations in various communes of the buffer zone and with the local communication system act to speed up the delivery of messages about environmental issues to the local community.

Conservation education activities supported by international organisations:

- In 1998, a small project for building capacity in the Xuan Thuy Ramsar region was sponsored by the Royal Netherlands Embassy. Project funds were used by the Management Board in coordination with the women's unions of two communes in the buffer zone to provide credit loans to poor women for developing production capacity. So far, the Environmental Credit Fund is still operating well and is greatly appreciated by the women unions and local authorities.
- In 1999-2000, with support from GEF/SGP, the Management Board carried out a project called *Improving awareness of, and support for, the community in the buffer zone of the nature reserve*. Within the framework of the Project, many EE activities were carried out along with several smaller production models. Models related to husbandry and crop cultivation were developed, and experts demonstrated husbandry or cultivation techniques to local communities. These activities have brought about positive outcomes.
- From 2001-2004, a sponsorship was given by the Nature Reserve Fund of Japan (RNCF) to implement a project called *Supporting the construction of a club for conservation of an important bird zone (ving chim)* in Con Lu.
- In 2003, the British Embassy granted a sponsorship to ENV and Xuan Thuy National Park to educate and train lower secondary teachers in buffer zone communes. 6th and 7th grade students participated in the project.
- From 2004-2006, the Center for Marine Protection and Community Development (MCD) coordinated with Xuan Thuy National Park to carry out several projects. Beach cleanup events and field trips to the park for secondary-school students were arranged. Performances on nature and environmental protection were hosted in the Park for women's unions. Sustainable aquaculture in Xuan Giao Commune was promoted, and people in the buffer zone were trained on the basics of community-based ecotourism *(du lich sinh thai cong ding)*.
- The National Park carried out various activities in coordination with volunteers from several universities (including Hanoi National University, the Polytechnic University, and the Forestry University) to implement various awareness campaigns in honour of the World's Environment Day. EE and awareness-raising activities were conducted for students in the region's primary and secondary schools.

Closing points and recommendations

- Environmental activities in Xuan Thuy National Park remain scattered and sporatic, as the Park lacks a comprehensive program. Most activities are carried out with support from other projects.
- A regular budget for EE is still not available.
- EE programme officers are inexperienced.
- Further support from international conservation organisations is required to develop an EE strategy for the National Park and to support various resources for the implementation of this Programme.

Section 2

Experiences of existing
wetlands education networks

The Ramsar Convention on Wetlands: Communication, Education and Public Awareness (CEPA)

Rebecca D'Cruz, Vice Chair, Scientific & Technical Review Panel (STRP)
Convention on Wetlands, Ramsar Convention Bureau

Introduction

There are countless opportunities and benefits that can arise from investing in CEPA. For wetland conservation practitioners, these include:

- Mainstreaming of wetland issues into society and government, via increasing inclusion into the business of sectors other than the environment
- Reducing conflict as a result of community engagement, agreements, and collaborative plans on the sustainable use of resources
- Communities' agreements to invest in restoration and long-term stewardship of wetlands
- A public constituency that speaks for, and helps to set, the agenda for wetland conservation and wise use of natural resources

What is the Ramsar CEPA Programme?

Resolution VII.9 (Conference of the Parties to the Ramsar Convention on Wetlands 7 [COP 7], Costa Rica, 1999) adopted the first Ramsar CEPA programme (Ramsar 1999-2002), for the following reasons:

Recognition of CEPA's importance as a central and cross-cutting element of implementing the Ramsar Convention. CEPA was underlined as an outcome of the World Summit on Sustainable Development and consequently, future Ramsar activities will focus on CEPA to achieve sustainable development and to promote the ecological, social, cultural and economic values of wetlands.

Achievements under the first Ramsar CEPA Programme between 1999 and 2002 include, for example:

- 86 Contracting Parties designated their Government Focal Points for CEPA, and 69 Parties designated their national non-governmental CEPA Focal Points (as called for in Resolution VII.9).
- 68 Contracting Parties had at least 480 wetland education centres, 260 of them linked to Ramsar sites.
- In 18 Contracting Parties, wetland issues were being addressed at all levels in formal education curricula, and a further 58 Contracting Parties were addressing wetland issues at some levels in formal education curricula.
- 26 Contracting Parties had formed national CEPA Task Forces; in particular, Australia, Germany, and Hungary had developed National Wetland CEPA Action Plans (as urged by Resolution VII.9).
- Governments, non-governmental organizations, and local stakeholders in over 70 countries had hosted special events to promote World Wetlands Day on 2 February.
- Since April 2001, a dedicated area of the Convention's Web site has provided CEPA resource materials as well as basic information about the CEPA Programme.

- CEPA e-mail lists in English, French and Spanish were launched in May 2001 to encourage the exchange of wetland CEPA information. Membership is available for all CEPA Focal Points as well as many other interested parties.

At COP9 in Uganda in 2005, the *Convention's Programme on Communication, Education and Public Awareness (CEPA) 2003-2008* was adopted (the full document can be downloaded at: http://www.ramsar.org/key_cepa_programme_e.htm).

This Programme is intended to operate for a six-year period in conjunction with the second Strategic Plan of the Convention adopted at COP8 for the period 2003-2008. The Convention's Strategic Plan 2003-2008 recognises the critical importance of CEPA to pursue its General Objectives, and in particular addresses General Objective 1, which says the Plan aims "to stimulate and assist all Contracting Parties to develop, adopt and use the necessary and appropriate instruments and measures to ensure the wise use of all wetlands within their territories."

In summary, the vision of the Ramsar CEPA Programme is *"People acting for the wise use of wetlands."*

Guiding principles

The following are the guiding principles that underpin the Ramsar CEPA Programme:

Wetlands provide important goods and services that help sustain human life, conserve biological diversity, and combat the impacts of climate change and desertification. Communication, education and public awareness (CEPA) are the tools to place people's social, political, economic and cultural realities within the context of the goods and services provided by wetland ecosystems.

The Ramsar Convention seeks to motivate people to appreciate the values of wetlands so that they become advocates for wetland conservation and wise use and may act to become involved in relevant policy formulation, planning and management.

- The key actors in the implementation of the Ramsar Convention need effective CEPA tools and expertise to engage major stakeholders and to convey appropriate messages in order to mainstream the wise use principle throughout society.
- Wise use issues and concepts need to be communicated effectively to ensure participation of major stakeholders from different sectors and mainstreaming of the issues in sector plans and actions. This communication needs to operate laterally, across and between relevant sectors, and also vertically from stakeholders to governments and back.
- Support for the CEPA Programme should be recognized by Parties to the Convention as an investment which will reduce conflicts over wetland resources, increase the number of advocates, actors and networks involved in the issues, and build an

informed decision-making and public constituency. CEPA mobilises actions directed at achieving the wise use of wetlands. CEPA should form a central part of implementing the Ramsar Convention by each Contracting Party.

This paper reviews the core elements of the Ramsar CEPA Programme 2003-2008 with reference to the objectives of this workshop, and aims to answer two critical questions:

How can the Ramsar CEPA Programme assist wetland educators in Viet Nam?

How can wetland educators in Viet Nam assist the government of Viet Nam and the Ramsar CEPA Programme?

How can the Ramsar CEPA Programme assist wetland educators in Viet Nam?

- A dedicated area on the Ramsar Web Site (www.ramsar.org) provides CEPA resource materials.
- CEPA email lists encourage the exchange of wetland CEPA information between a wide membership.
- Ramsar provides the opportunity to develop links with at least 480 wetland education centres located in 69 countries, 260 of them linked to Ramsar sites, through the Wetland Link International initiative.
- In future, Ramsar will give assistance to develop wetland centres at Ramsar sites as key locations to promote CEPA.
- At the international level, Ramsar works with the emerging CEPA programmes of the Convention on Biological Diversity and the UN Framework Convention on Climate Change to promote shared knowledge of CEPA tools and approaches. These can in turn be made available to wetland educators.

How can wetland educators in Viet Nam assist the government of Viet Nam and the Ramsar CEPA Programme?

The following actions are suggestions for wetland educators:

- Develop pilot projects to evaluate a range of approaches to apply CEPA to promote the wise use of wetlands, in particular to involve those who directly use wetland resources.
- Assist in the establishment of a national Wetland CEPA Task Force to undertake a review of needs, skills, expertise, and options, to set priorities for the implementation of the CEPA programme.
- Assist in the formulation of a national action plan for wetland CEPA and provide a copy of this to the Ramsar Convention Bureau so that it can be made available to other Parties and

interested organizations and individuals. For guidance on this, refer to ramsar.org/outreach_reviewsactionplansl.htm.

- Collaborate globally and nationally to encourage synergy with the CEPA activities under other international conventions and programmes, including the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, and the UNESCO Man and the Biosphere Programme.
- Establish and support national e-groups similar to the Ramsar global e-mail network and link these with the global network.
- Promote and seek to resource the twinning of wetland education centres to encourage the exchange and transfer of information and expertise between centres in developed countries and those in developing countries and countries in transition.
- Review the current national needs and capacities in the areas of wetland CEPA, including the establishment and operations of wetland education centres, and use this to define capacity-building priorities within the national wetland CEPA action plan.
- In collaboration with Ramsar's International Organization Partners *(IUCN, WWF, BirdLife International, Wetlands International & The International Water Management Institute)*, identify sources of expert information and training opportunities in wetland CEPA in order to facilitate the sharing of expertise and knowledge at the local, national, regional and global levels.
- Review formal educational curricula to ensure incorporation of information on the ecosystem services provided by wetlands, promotion of the wise use principle, and recognition of the importance of CEPA in pursuing the objective of wise use.
- Undertake national campaigns, programmes or projects to raise awareness, build community support, and promote stewardship approaches and attitudes supportive of wetland conservation.
- Celebrate World Wetlands Day/Week with appropriate national and local events and promotions and the distribution of resource materials, in order to raise awareness of wetland values and functions.
- Collaborate with the media to inform decision-makers and the broader society about the values and benefits of wetlands.
- Promote appropriate Wetlands of International Importance (Ramsar Sites) as 'demonstration sites' for Ramsar's wise use principle and ensure that they are suitably equipped in terms of capacity, signage, and interpretive materials.
- Seek to establish education centres at Ramsar and other wetland sites to provide focal points for local and national CEPA activities.
- Where wetland education centres exist, review the information presented and ensure that it serves to promote in suitable ways the Ramsar Convention and its wise use principle, and also that the centres are helping to foster communication and, where appropriate, participation, among the local wetland management 'actors' and stakeholders.

- For existing and future wetland education centres, encourage their participation in the Wetland Link International network of WWT, UK, as a mechanism for gaining access to global and national expertise in CEPA.
- Seek to involve suitable places of learning, education and training (museums, zoos, aquaria, botanic gardens and related institutions) in national CEPA efforts; encourage the development of wetland-related interpretative exhibits and programmes at such venues, and also facilitate linkages with wetland-based centres.

Conclusions and recommendation

There is no doubt that CEPA is an important tool to achieve the conservation and wise use of wetlands. To be most effective, CEPA actions must be carried out at the local and national level. Wetland educators, NGOs and community-based organizations (CBO's) have a critical role to play in promoting CEPA at the local and national level.

The proposed establishment of a network of marine and coastal wetland educators in Viet Nam will contribute greatly to achieving the objectives of the Ramsar CEPA Programme and the obligations of Viet Nam as a Contracting Party to the Ramsar Convention, and *inter alia* the conservation and wise use of marine and coastal wetlands and their resources.

Such a network could also provide valuable input to the work of the Ramsar Convention at the international level (including the work of the Scientific and Technical Panel of the Convention) and serve as a model for other Ramsar Contracting Parties in the region and around the world.

References

Ramsar (1999-2002). *Convention's Outreach Programme: Actions to promote communication, education and public awareness to support implementation of the Convention on Wetlands (Ramsar, Iran, 1971).*

Viet Nam MPA conservation network

Chu Manh Trinh, Vice-chairperson, Viet Nam Marine Protected Area conservation network

MPAs: introduction and background

As defined by the World Conservation Union (IUCN), a marine protected area is *any area of the intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment*.

MPAs are set up in order to better protect and maintain sensitive and vulnerable areas of high biodiversity. They also help protect the local community's traditional livelihoods. An MPA is an effective tool for conservation and also supports the fishery sector. In the United States and Australia, where MPAs first began to be established 20 to 30 years ago, MPAs have successfully helped to protect breeding grounds of various fishes; just two to three years after the establishment of MPAs, fish populations in the MPA increased, along with average fish size.

There may be different management strategies for different parts of the same MPA, depending on the level of conservation necessary for the particular region. Absolute prohibition of access to a prescribed area often occurs in core regions of MPAs or in areas that need strong protection, while in other areas certain activities (such as fishing during a particular season or by a certain method) are permitted on a limited basis. Oftentimes activities are permitted in parts of protected areas designated as multi-use areas.

As shown by studies of successful MPAs in other countries, the effective establishment and management of an MPA requires collaboration and cooperation of all stakeholders, including the State, local communities, scientists, NGOs and local people. The participation of community stakeholders in the development of the management plan is key for sharing information and experiences and for helping them understand the financial implications and commitments associated with the future MPA.

MPA networks

An MPA network is a system of separate, but linked, MPAs. MPAs protect different environments through various conservation management methods, but an MPA network can more effectively achieve the conservation of key biodiversity, and can build the management capacity of individual MPAs.

The MPA networks can be based on linkages of different aspects of marine conservation. Specifically, MPA networks can enable the sharing of ecological, social, or management approaches.

- The marine conservation ecological network (Ecological MPA Network) connects MPAs on the basis of geographic region or topographical similarity. MPAs linked on an ecological basis may have similar natural characteristics and may provide different bio-geographical habitats that the same species visits during its life cycle. Networked

MPAs can collectively protect the breeding grounds, feeding grounds, and nursery grounds of the same species even if all of these habitats are not found in the same MPA.

- The marine conservation social network includes member MPAs that seek to protect natural resources using similar management and awareness-building strategies, and that are governed by similar or common political structures at the local, regional, or national level. The Social MPA Network creates opportunities for MPA stakeholders to exchange ideas and experiences, make important connections, develop projects in partnership with one another, and develop long-term administrative and financial partnerships with other institutions and network sectors.
- The marine conservation management network (Management MPA Network) combines the common terms of the ecological and social networks. The management network provides a way for members who share similar priorities to develop consistent action plans and regulatory policies.

The management network makes coordinating management approaches more consistent and helps build the capacity of managers within the entire network.

In 2000, the Ministry of Fishery was assigned to coordinate with the Ministry of Science, Technology and the Environment in taking responsibility for planning and managing the system of MPAs in Viet Nam. A list of 15 proposed MPAs was published and Hon Mun Island in Khanh Hoa Province was the first MPA to be created, carried out within framework of a 4-year project (2001 - 2005) sponsored mainly by the Global Environmental Fund (GEF), the Danish Development Agency (DANIDA) and executed by the local community in cooperation with the World Conservation Union in Viet Nam (IUCN). The second selected area for pilot demonstration of marine conservation in Viet Nam is Cham Island in Quang Nam Province.

The network of 15 MPAs of Viet Nam currently being developed is a type of Management Network. At the moment, an Ecological Network has not yet been developed in Viet Nam.

On the basis of these concepts of conservation networks, the people currently involved with marine conservation activities in Viet Nam want to cooperate and share their experiences, knowledge and information about marine conservation in Viet Nam through a Social Network, the Viet Nam MPA Conservation Network.

Viet Nam MPA Conservation Network

The Viet Nam MPA Conservation Network is a voluntary organisation of Vietnamese and foreign individuals and organizations operating in the marine conservation sector in Viet Nam. The Network functions as an unofficial forum for conservationists, allowing network members to share information and support marine conservation activities in Viet Nam. The Network is a non-governmental, non-profit organization.

Structure

In terms of its structure, the Network consists of members, managers, and a board of coordinators. The management system of the Network is comprised of a chairman and two vice chairmen, selected by the network members. A network secretary is appointed by the chairman to assist the management board with network operations. The MPA network chairman may have a maximum of two terms of office. The donors of the network select the board of coordinators. The network is currently funded by three major donors: the World Wide Fund for Nature (WWF), the World Conservation Union (IUCN) and the Danish Development Agency (Danida). Each of the donors appoints a member to volunteer on the network coordination board. Network members operate on a voluntary basis in accordance with the Network's rules.

Operations

In terms of its operations, the MPA network operates in accordance with Vietnamese law. The network meets at least once a year to assess what has been done during the year and to agree upon the working plan for the next year. The network's financial support for operations comes from the contributions of individuals and donors and from network fundraising activities. The network's annual meeting must be attended by more than 50% of network members before the year's working plan may be decided.

Rights, benefits and procedures

Network members have many rights and benefits. Each member has the right to stand for, nominate, and select various positions of the network management board; to discuss and comment on relevant issues of the network operations; to share and use information about marine conservation; and to study and exchange experiences in MPA management in Viet Nam and overseas.

Network members will share information with other network members through voluntary unstructured sharing or through presentations at workshops, seminars or MPA-related events in the country or overseas. Topics covered include experiences in natural resources and marine biodiversity management; issues, challenges and outcomes of MPAs; matters relating to marine conservation specific to Viet Nam (such as participative conservation or co-management); and setting up and developing the network (which includes advice on securing funds).

Vietnamese and foreign individuals involved in marine conservation activities in Viet Nam who wish to join the network may submit a registration form with the network management. Once an application has been submitted and the management board has been notified and has not responded, membership status is implied.

Current status

On 6th July 2006, in Nui Chua National Park, Ninh Thuan Province, the Viet Nam MPA Conservation Network of Viet Nam was officially established and its Rules of Operations were approved. At the time of its establishment, the Network had 29 voluntary members, including two foreign members. A leadership group of the network was been selected and consists of three people: a chairperson and two vice-chairpersons. The network chairman has appointed a secretary for the network for the term of 2006-2007. The network is chaired by Mr Truong Kinh, Director of the MPA of the Beautiful Bay in Nha Trang, and is co-vice-chaired by Mr Nguyen Huu Hoan, Director of the Nui Chua National Park and Mr Chu Manh Trinh from Cu Lao Cham MPA. The network secretary is Ms Nguyen Thi Kim Hoa of Nha Trang Bay MPA. The network also welcomes the board of coordinators from relevant donors which includes Ms Nguyen Giang Thu, Deputy Director of the Component on the Development of Livelihoods inside and outside MPAs (DANIDA), Ms Bui Thi Thu Hien (IUCN) and Mr. Tran Chinh Khuong (WWF). At the moment, the number of network members has increased to 52, including four foreign members. Since the network's establishment, network operations are maintained at an introductory stage calling for membership. The number of activities of the network has not been substantial. Two training courses on building the capacity of marine conservation in Nha Trang (December 2005) and in Ninh Thuan (July 2006) sponssored by IUCN, the Ministry of Fisheries, NOAA, WWF and other hosts such as the Nha Trang MPA and Nui Chua National Park have been held. Network members who participated in the two training courses practiced what they have learned at the protected areas, National Parks, and agencies that they represent. They have the duty to summarise the outcome of these activities in order to share relevant information with other network members in the next meeting. In December 2006, with the sponsorship of Vietnamese and international donors, the second annual meeting of the network is proposed to take place in Ha Long City. At this meeting a training course on developing marine conservation capacity will be organised. In August 2006, thanks to the support of the US. National Oceanic and Atmospheric Administration (NOAA), two network members including Ms Nguyen Thi Kim Hoa (Hon Mun MPA in Nha Trang) and Mr Le Lam Tuan (from Ha Long Bay) were sent to San Francisco, USA to visit and study oil spills. The two members are preparing their post-study-tour report for presentation at the next annual meeting of the network.

The network asks its members to implement what they learned at the recent training courses in the field. These activities will generate new information and experiences to share with other network members, for the benefit of all.

KODOMO Ramsar: The network-based wetland education activities of the Ramsar Center Japan (RCJ)

Reiko Nakamura, Secretary General, Ramsar Center Japan

Introduction

The Ramsar Center Japan (RCJ) is a non-governmental membership organization based in Tokyo, Japan. Established in May 1990, it currently has 130 individual members: 25 Asian members and 12 member countries from areas outside Japan, including Australia, Bangladesh, China, India, Indonesia, Iran, Korea, Malaysia, Nepal, Philippines, Taiwan and Thailand. Its mission is to promote the wise use of wetlands and foster the mission of the Convention on Wetlands (Ramsar Convention) in Asia and Japan. Through strategic improvements in communication, education and public awareness (CEPA), the RCJ puts its priority on wetlands CEPA in Asia in order to ensure the participation of peoples at all levels in wetlands management.

RCJ activities for adults and children

The RCJ has two main kinds of activities. The first type of activities target adults who are interested in, or engaged with, the conservation and wise use of wetlands. By facilitating various events, such as the Asian Wetland Symposia and regional/local workshops on wetland issues, the RCJ promotes information exchange and in-depth discussion from various relevant sectors. Participants have included national and local governments, NGOs, scientific experts, the private sector, and local and indigenous people engaged in wetlands conservation and management.

The second type of activities focus on education and awareness-raising for children and young adults. The RCJ has organized a series of wetland exchange programmes for children in Asian countries over the past five years. A particular highlight has been an ongoing collaboration with Wetlands International and other NGOs, which, since 2002, has successfully conducted the wetlands exchange programme with children from China, Korea and Japan.

Asian Wetland Symposia

The first big international project of RCJ was the Asian Wetland Symposium (AWS) held in October 1992, in Otsu and Kushiro, Japan. It was the first regional forum on wetlands conservation in Asia. Jointly organized by the Environmental Agency of Japan, the International Lake Environment Committee Foundation (ILEC), several municipal governments and RCJ, more than 1000 people from 26 countries attended and successfully adopted the AWS recommendations.

The second meeting of AWS was held in August 2001, in Penang, Malaysia. It was jointly organised by the Ministry of Science, Technology and the Environment (MOSTE), Malaysia, the School of Biological Sciences, Universiti Sains Malaysia (USM), Wetlands International - Asia Pacific, and by RCJ. The symposium was attended by 350 participants from 37 countries. The group successfully adopted the Penang Statement.

The third meeting of AWS was held in February 2005 in Bhubaneswar, India, and was co-organized by the Chilika Development Authority (CDA), the Department of Forest and Environment, Orissa, the Ministry of Environment and Forests (MOEF), India, the Ministry of the Environment, Japan, Wetlands International and RCJ. It was attended by 400 participants from 32 countries and successfully adopted the Chilika Statement and Tsunami Recommendation.

The respective symposium proceedings and statements were presented to the immediate Ramsar Conference of Contracting Parties (COP) and were recognised as significant contributions to the effective implementation of the Convention in the region. These achievements have significantly contributed to enhancing effective regional cooperation and networking in Asia. They have also led to Resolution IX.19: *The importance of regional wetland symposia for effective implementation of the Ramsar Convention at the Ramsar COP9 in Kampala, Uganda, November 2005.*

Wetland Exchange Programme in Asia for children and teachers

Another CEPA activity of the RCJ has been the Wetland Exchange Programme for Children and Teachers in Asia. This was started as an exchange programme for children from China, Korea and Japan in 2002, and was made possible by financial support from the Japan Fund for Global Environment (JFGE).

The first Wetland Exchange Programme for Japan, Korea and China was held in January 2003 at Yatsuhigata Tidal Flat (Ramsar site), Narashino, Japan. Three children and two educators from China, and three children and three educators from Korea were invited to the Yatsuhigata Ramsar site. Japanese children from Yatsuminami Elementary School hosted them. They participated in a children's meeting on wetland conservation, enjoyed an excursion to the Yatsuhigata Tidal Flat, and jointly edited and published an activity report in Japanese, Chinese and Korean.

The second Wetlands Exchange Programme took place in the Busan and Woopo Wetland (Ramsar site) in South Korea in January 2004. A total of 22 children, teachers and NGO staff from Japan and China were invited to Korea for direct communication and interaction with Korean children and teachers.

The third Wetlands Exchange Programme was held in Dafeng, China in December 2004. The Ramsar Dafeng Nature Reserve is located along the coastal line of the Yellow Sea. It hosts an endangered deer species, the Milu *(Elaphurus davidanus)* which had been once extinct in China but survived in captivity in Europe and was reintroduced to the Nature Reserve in 1986. Since that time, the deer's population has successfully grown from 39 individuals to 500.?11 children and teachers from Korea, another 11 from Japan, and 20 participants from other provinces in China participated in the event. They all met with more than 100 students from the Dafeng Number 4 middle school. On the same day, the Dafeng Middle School Number 4 was denoted as a “Wetland Experimental School” by WI-China,

which focussed on the enhancement of wetland education for students. The outcome of the visit was the adoption of the Dafeng Message on wetland conservation by the children.

The fourth Wetlands Exchange Programme for Japan, Korea and China was held in Zhalong Nature Reserve and Zhalong Middle School, in Zhalong, Heilongjiang, China in July 2005. More than 150 children and teachers from the three countries enjoyed nature walks at the reserve, where they observed red-crowned cranes and monitored the water quality of the Zhalong Nature Reserve. The reserve, designated as a Ramsar site in 1992, is an important habitat for various kinds of cranes. As a result of the programme, the Zhalong Middle School was designated as another wetland experimental school by WI China.

Most recently, the fifth Wetlands Exchange Programme was held in Lanzhou, Gansu Province in China from July 28-30, 2006. The event was hosted by the Waterwheel Garden Primary School, Lanzhou. Lanzhou is the city located on the Huanghe River or Yellow River. The theme of the event was “Conservation of Wetlands, Care for the Huanghe River”, and more than 100 children and teachers participated. The Waterwheel Garden Primary School was subsequently designated as another Wetland Experimental School. After a school meeting, the Japanese and Korean participants visited the Liujiaxia Reservoir.

Wetlands International, China, Wetlands Korea, and the RCJ share a vision to continue collaborative activities in the future, and look forward to designating as many wetland experimental schools as possible in China - and hopefully in Korea and Japan as well - while establishing a network of wetlands schools across the three nations.

The RCJ organized another children and teachers exchange programme around three major lagoons in Japan, Thailand and India from 6-8 February, 2005. Children from around Lake Saroma (Japan) and Lake Songkhula (Thailand) were invited to the Chiliika Lagoon (India) and there were able to interact with students from villages near the Chilika Lagoon. After the exchange, Japanese and Thai students were invited to participate in the last day of the Asian Wetland Symposium 2005 that was taking place in Bhubansewar, India. They were able to deliver their message to an audience of 400.

KODOMO Ramsar

The hot topic of the Wetland Exchange Programme was the KODOMO (or “children”) Ramsar that took place in association with the ninth meeting of the Conference of the Contracting Parties (CPO9) to the Ramsar Convention in Kampala, November 2005. A total of seven teenagers (four boys from Japan, a boy from Korea, a boy from Thailand and a girl from India) were invited to participate in the event by the RCJ. On November 8, 2005, they performed an international exchange exercise with more than 200 Ugandan students at the Rainbow International School in Kampala, Uganda. They had a serious discussion on the theme of “How Children Can Contribute to Wetlands Conservation”, and later successfully adopted the Children's Appeal for COP9. (See Annex)

On the evening of the same day, at the Opening Ceremonies for the Ramsar COP9, 16 child representatives were officially invited to participate in the proceedings by reading the Children's Appeal to an audience of delegates from all around the world. In the Appeal, they recommended the delegates simplify the current information on wetlands so that children can easily understand; work with children to reach out to as many people as possible through awareness activities such as music, dance and drama; include wetlands conservation in the school curriculum; and so on. This marked the first official participation of the younger generation to the Ramsar COP in the Convention's 35-year history.

Through participation in the afore-mentioned exchange programmes, children learned that wetlands were a part of every country. They found out that regardless of origin and location, everybody had basically the same thoughts on wetlands. They also made new friends and noticed that they could communicate and understand each other regardless of differences in language, nationality, culture or lifestyle. They leaned that wetlands in each country have similar problems. They recognized the importance of international cooperation for wetlands conservation. And they hoped to join further exchange programmes to continue their relationships on wetland conservation.

Based on these four years of CEPA activities with children, the RCJ recently launched a new project, *KODOMO Ramsar: Children's Participation in Effective Implementation of the Convention on Wetlands*, with the financial support from the Japan Fund for Global Environment in fiscal year 2006.

The goal of this project is to organise an international children's meeting on wetlands conservation, the so-called the KODOMO Ramsar World Meeting in Korea in 2008, as one of the complementary activities for the Ramsar COP10. In order to meet the goal, we are now working to construct a children's network across 33 Ramsar sites in Japan.

The RCJ is planning to hold the KODOMO Ramsar Sub-regional Meeting at four different locations in Japan in 2006, with the KODOMO Ramsar National Meeting with attendees representing every Ramsar site of Japan in FY2007. It will aim to hold the KODOMO Ramsar World Meeting at COP10 in FY2008 and invite children representing six regional groups (including Asia) under the Ramsar Convention. In order to successfully achieve these goals, any and all collaboration from all sectors is welcome.

ANNEX

CHILDREN'S APPEAL to the 9th Conference of the Parties of the Ramsar Convention

8th November 2005

Good Evening Ladies and Gentlemen.

On behalf of the children of the world, I would like to thank you for this opportunity to participate in this conference. Many conferences like this one are held all over the world, but children never participate. So I thank the organisers of this conference for allowing us to participate. I would like to introduce to you my friends from different parts of the world that will present to you our concerns as young people.

Information about wetlands

When our parents were still young, our grandparents passed on information to them in form of stories and folk tales. The adults of today have made all this information so scientific and academic that it is difficult for us to understand. We only use this information to pass exams but not to make a difference. There is a saying in the Bible - "Train a Child in the ways you want them to behave and when they grow up they will never depart from them". We therefore appeal to you to do the following,

- Please find some simple ways of making the current information easy for us to understand.
- Work with us young people to reach out to as many people as possible through awareness activities such as music, dance and drama.

Tools to manage wetlands

Our grandparents developed different norms and cultures that govern the wise use of Wetland Resources. We are worried that today all these cultures are being destroyed. Today, the guidelines for using wetlands are written in a language we cannot understand well. We appeal to the delegates of the conference and the governments all over the world

- To write the guidelines for using wetlands in ways that young people can understand.
- To support cultural leaders all over the world and empower them to educate us on the conservation of wetlands.

Conservation of wetlands

We have noted with concern that the climate in our home areas has changed as can be seen from the floods we all experience. We are also concerned that the habitats for many beautiful plants and animals continue to disappear at an alarming rate. On the conservation of wetland resources around the world, we appeal to the delegates to do the following;

- Strengthen the laws on the conservation of wetlands and consult young people in the making of these laws.
- Gazette more wetlands as protected areas.
- Re-settle the people living in essential wetlands.
- Include wetland conservation in the school teaching programmes.

Restoration of degraded wetlands

As children, there are important things we have observed that we would like to bring to your attention. There are many importances of wetlands but we see you destroying them. We are now confused on what is right and wrong. On the restoration of degraded wetlands around the world, we ask you to do the following;

- Develop alternative raw materials for the construction industry.
- Establish laws for industries to repair the damage caused to wetlands.
- Work with all partners involved including young people to repair the damage on wetlands.
- Fight poverty to avoid further encroachment.

As you get into your discussions, let what the children have communicated to you be on your minds. Provide opportunities out of this Conference for addressing children's concerns in wetland management. Please remember that Children are also affected by the decisions you make during such meetings. Sometimes much more than adults, since for us we have a longer time to stay. We also believe that however little it may be, we have a contribution to make in the management of wetlands.

Together, we can make the world a better place.

Thank you.

-Children participants in the KODOMO Ramsar

University network for wetland training in the Mekong Region

Tran Triet, University of Natural Sciences, Ho Chi Minh City, Viet Nam,
International Crane Foundation, Wisconsin, USA

Introduction

Wetlands are important ecosystems that support vital ecological functions and provide valuable products and services for human activities. The role of wetlands in the functioning of Earth's ecology has been well documented and widely accepted. However, despite their importance, wetlands worldwide have been subject to misuses and abuses. Large areas of the world's wetlands have been lost, mostly as a result of agricultural development, and many of the remnants are heavily degraded because of the combined effects of pollution, overexploitation, and mismanagement. Conserving wetland resources through the improved understanding of wetland ecology and the application of ecologically sound management is urgently needed.

The Mekong River is one of the great rivers of the world. Wetlands of the lower Mekong basin nourish a population of 55 million people in four countries: Laos PDR, Thailand, Cambodia and Viet Nam. The biodiversity of the Mekong wetlands is of international significance; it includes many unique ecosystems and a wide array of globally threatened species such as giant catfish, the Siamese crocodile, the Sarus crane, the giant ibis, and the Irrawady dolphin. As in many other regions of the developing world, wetland resources of the lower Mekong basin are heavily exploited and wetland biodiversity is under serious threat. Protecting wetlands to safeguard biodiversity and sustain their profits to local communities has become necessary for all four riverine countries. To implement this task, the four countries need a sufficient number of experts and technical staff who are willing and able to work in the field of wetland conservation.

MoU signing ceremony at Mahidol University, Thailand, 22 May 2003 (Photo: S. Choowaew)

Issues in wetland conservation

It has been a challenge for Cambodia, Laos, Thailand and Viet Nam to find enough competent native professionals to work on wetlands, and on natural resources management in general. It is worthwhile to raise awareness and foster interests in wetland conservation among under-graduate and graduate students in the four countries in the hope that those students will get involved in wetland research and conservation practices as they develop their career. There is also a great demand for providing practical training in wetland ecology and management for protected area staff, government officials, and other interested citizens.

Through support from a variety of institutions and aid agencies, many people in the Mekong region have been trained in various facets of wetland conservation over the last 10 years. Even so, little of this capacity can be tapped for actual work on wetlands. Few of those who have received training still work with wetlands; most have moved on to managerial positions or other jobs. The training that they receive is often fragmentary as well. Though useful, courses in wetland delineation, for example, do not develop a strong understanding of wetland ecology that can be used to adapt school examples to applied situations.

The eleven members of the University Network for Wetland Training in the Mekong Region

Realising the pressing demand for high quality training in the fields of wetland ecology and management, and the insufficiency of training capacity, a dialogue was initiated from 2000 - 2002 among colleagues of several major universities in the Mekong region about how to improve the situation. Through discussions, it became clear that educational institutions in Cambodia, It was decided that Laos, Thailand and Viet Nam should invest in building their respective capacities in order to be better able to provide comprehensive and affordable training programs that are tailored to specific regional characteristics. It was also realised that a network of universities was necessary in order to promote regional collaboration. Such a network is essential not only for providing effective regional training, but also for improving understanding and exchanges among researchers and educators of the region.

University network for wetland training

With support from the International Crane Foundation, a workshop was held in November 2002 in Ho Chi Minh City, bringing together representatives from eight universities of the Mekong region, including the Royal University of Agricultural (Cambodia), Royal University of Phnom Penh (Cambodia), National University of Laos, Chulalongkorn University (Thailand), Mahidol University (Thailand), Can Tho University (Viet Nam), Nong Lam University (Viet Nam) and the University of Natural Sciences - Ho Chi Minh City (Viet Nam). The workshop discussed details of network operations and drafted a memorandum of understanding for the establishment of the network.

Sponsored by Mahidol University, on 22 May 2003, top administrators from the universities mentioned previously met in Thailand to sign the memorandum, officially creating the first

First training course, Viet Nam 2003

Second training course, Thailand 2004

Third training course, Lao PDR 2005

Fourth training course, Cambodia 2006

university network in Southeast Asia specialising on wetland training and research. In August 2005, three more universities joined the network: Champasak University (Lao PDR), Mahasarakham University (Thailand) and An Giang University (Viet Nam).

As agreed by the member universities, the network will facilitate the construction and implementation of regional training courses focussing on field biology aspects of wetland ecology and management. The longer-term goal of the network will be to strengthen the capacity of member universities towards establishing complete academic programmes in wetland ecology and conservation. The network will also serve as a mechanism for cooperation among member universities in other areas of education and research, as well as facilitate exchanges between member universities and other wetland institutions around the world.

One of the main activities of the network has been the organisation of regional wetland training courses. After the first training course in Viet Nam in 2003, there have been three other training courses held in Thailand (2004, hosted by Mahidol University), Lao PDR (2005, hosted by the National University of Laos) and Cambodia (2006, hosted by the Royal University of Phnom Penh). These three-week-long training courses were intensive, field-oriented, and taught mainly by educators from within the Mekong region. Trainees were selected out of young lecturers of member universities of the network and from technical staff of protected wetlands in the Mekong region. Main sponsors of these training courses were the John D. & Catherine T. MacArthur Foundation, the International Crane Foundation, the Mekong Wetland Biodiversity and Sustainable Use Programme, and the ASEAN Regional Center for Biodiversity Conservation. The next training course, in 2007, will be held in Viet Nam and hosted by Can Tho University.

Since its establishment, the Mekong University Network has facilitated collaboration between member universities and many institutions and programs from other countries. Exchanges among colleagues of member universities have also increased noticeably.

Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme Wetlands Expert Network

Tran Thu Trang, Officer, Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme

Introduction

Mekong Wetlands Biodiversity Conservation and Sustainable Use Programme (MWBP) is a joint programme of the four governments of the Lower Mekong Basin - Cambodia, Lao PDR, Thailand and Viet Nam - managed by the United Nations Development Programme (UNDP), the World Conservation Union (IUCN) and the Mekong River Commission (MRC), in collaboration with other key stakeholders. With funding from the Global Environment Facility (GEF), the United Nations Development Programme (UNDP), the Royal Netherlands Government, the Mekong River Commission Secretariat (MRCS), the Water and Nature Initiative (WANI) and other donors, the programme tries to address the most critical issues for the conservation and sustainable use of natural resources in the Mekong wetlands.

The programme aims to strengthen the capacity of organisations and people to develop sustainable livelihoods and manage wetland biodiversity resources wisely.

The duration of the programme is five years (2004 - 2009), which is divided into two phases: phase A is from 2004 to the end of 2006, and phase B will be developed upon the results of phase A.

In each of the four programme countries, there is at least one wetland demonstration site. Viet Nam is the only country that has two demonstration sites - Tram Chim National Park in Dong Thap province, and Lang Sen Nature Reserve in Long An province.

MWBP Wetlands Expert Network

Purpose

MWBP Wetlands Expert Network (WEN) has been set up as one of means of achieving the first output (Output 5.01) of the MWBPs 13 main output targets.

With the establishment of MWBP WEN, the programme expects to gather experts in wetlands and wetland-related areas to form a knowledge-based network through which wetlands issues will be discussed, expertise and experiences will be shared, and opportunities for wetlands research can be sought and shared among experts in the network.

Formulation

Following the establishment of MWBP's National Programme Office in April 2005, all contacts established by wetland experts who have frequently worked with VEPA (Nature Conservation Division), IUCN Viet Nam (Water and Wetlands Section), Sub Institute for Forest Inspection and Planning (Sub-FIPI), and the Viet Nam Mekong River Committee (VNMC) were compiled to set up an initial list of 130 experts and 25 organisations involved in wetlands.

With assistance from VEPA and IUCN Viet Nam, a questionnaire (attached) was developed and sent to each individual expert and organisation. Feedback was received from 96 experts and 10 organisations that had agreed to participate in the network.

Operating mechanisms and activities

The first WEN meeting was held in March 2006 in Hanoi with the participation of approximately 50 experts. In this first formal meeting, the draft Network Operating Regulations were presented and comments from participants were invited.

Draft regulations

- The network is divided into three groups based on geography, with one group each for participants from the North, the Centre, and the South. Each group has a leader and all experts are categorised based on expertise in wetlands science, wetlands policy, or wetlands management.
- The network will meet twice a year.
- The MWBP will allocate part of its budget to the operation of this network. However, it is understood that experts will pay a membership fee that will help maintain the minimum operating cost for the network. Fundraising will be considered if more significant activities need be carried out.
- E-mail is the WEN's main channel for disseminating information. The MWBP National Communication and Training Coordinator is responsible for disseminating related information (resourced from MWBP) to the network. Any expert in the network is also expected to share relevant findings with the network.
- The network has recently opened to young officers and researchers working in water and wetlands related issues. MWBP is also maintaining the media network, which encompasses 100 environmental reporters from all over the country.

Activities

Several activities have already taken place.

- The network has been used to share information.
- The MWBP publication has been disseminated.
- WEN management strategy and database of network experts are being developed. This process will be completed by the end of 2006.

ANNEX

MWBP main information sources

MWBP has registered as a member of the following different networks that provide related and suitable information for distribution to the network:

- Environmental News Network (ENN)
- Lancang-Mekong Initiative (rwesa.org): provides recent news and debate articles related to the Mekong region
- MekongInfo: provides news on Mekong-related information, especially publications (MRC focus)
- UNESCO Water Portal: provides international water information
- Ramsar CEPA: has wide distribution and membership, provides news about the latest CEPA activities. Ramsar CEPA is able to post problems, issues, and questions to the networks
- The Wetlands Forum (Ramsar): provides updates about Ramsar activity and uses email to exchange information, lessons, and experiences
- The Communications Initiative (The Drum Beat): profiles global communications initiatives
- Development Communication Network (DCN): provides news and information related to local events

Section 3

Experiences of organisations involved in wetlands education in Viet Nam and Asia

Our effort to help protect nature and the environment

Dang Minh Ha, Education for Nature (ENV), Viet Nam

Introduction

Education for Nature - Viet Nam (ENV) was established in 2000 as Viet Nam's first environmental education-focussed local organization. ENV built upon the success and experience of the community-based Conservation Awareness Program at Cuc Phuong National Park. ENV specialises in training environmental educators, and carries out a variety of educational programmes and initiatives aimed at raising awareness and understanding about the environment and the need to protect nature and wildlife in Viet Nam. ENV is a small group of experienced and highly dedicated young professionals that is committed to making a difference.

Our mission

The mission of ENV is to foster greater understanding about the need to protect Viet Nam's rich natural heritage and the living world. Through ENV's creative and innovative approach to addressing key conservation and environmental issues, ENV aims to influence attitudes and behaviour and to encourage greater public participation in this important and challenging task.

Our work

Although ENV was established in 2000, it built upon the success and experience of Viet Nam's longest-running community-based conservation awareness program at Cuc Phuong National Park. ENV specializes in three core areas: training of environmental educators; working with local stakeholders to design and carry out community-based awareness activities; and combating the illegal trade in wildlife through national public awareness campaigns, trade monitoring and cooperating with government agencies on enforcement of wildlife protection laws.

Through the Environmental Education Family Network, ENV provides ongoing technical support and assistance to environmental educators throughout the country. ENV also produces a range of educational resources such as the popular student magazine *Green Forest*.

ENV activities and programmes:

- Training environmental educators
- Developing and implementing community-based awareness programmes
- Raising awareness and encouraging public participation in combating the illegal trade of wildlife
- Networking and providing technical support to environmental educators in the field
- Producing and distributing the Green Forest student magazine and other education resources

Training for community-based environmental education practitioners

ENV provides EE training for rangers, staff from national parks and protected areas, teachers, youth unions and women's unions.

ENV carried out more than twenty-eight major training courses on EE and communication for teachers, community stakeholder groups and staff from parks and protected areas throughout Viet Nam. ENV's intensive training courses last anywhere from one week to over a month. During a typical ENV training course, participants have the opportunity to gain important knowledge and communications skills through a combination of classroom work and practicums in local schools and villages.

ENV's new National Environmental Education Training Center is located at Tam Dao National Park and includes both training facilities and an active community-based awareness programme.

Community-based EE

ENV works with local partners to carry out community-based EE programmes at parks and protected areas. ENV's awareness programs focus on community stakeholders, such as school children, local residents and park visitors. Activities include organizing nature clubs at schools, adult-focused awareness events in villages, puppet shows and student visits. A separate range of special activities in support of park protection aims at forging links and cooperation between local communities and parks.

Recently, at Tam Dao National Park, ENV started an EE programme based on conservation. A second programme focussing on urban environmental issues was recently introduced into nine Hanoi schools. Meanwhile, ENV continues to provide technical support to the longest running EE programme in Cuc Phuong National Park.

An ENV representative works with staff from Bach Ma and Cuc Phuong National Parks

Combating the illegal trade of wildlife in Viet Nam

ENV is recognized as a leader in NGO efforts to address illegal wildlife trade in Viet Nam. In addition to targeting awareness activities and campaigns on television, public radio, and in newspapers, ENV has worked closely with journalists to increase the coverage and frequency of reporting on these issues. ENV also produced a range of educational materials

including a film, posters, school curriculum and special publications, to encourage the public to help halt the illegal wildlife trade.

Early in 2005, ENV established a Wildlife Crimes Unit (WCU) to monitor and track wildlife crimes and assist authorities in enforcing relevant wildlife protection laws. The WCU operates a national hotline where the public can call to report wildlife crimes. WCU follows cases through to their completion, even assisting with the placement of confiscated wildlife.

Since the wildlife hotline's establishment in 2005 over 260 cases of illegal wildlife trade have been reported to the Vietnamese authorities. Over half of those cases came from reports made by local people's reports.

ENV's environmental education program in Tam Dao has been running for two years and has reached 2,500 students and surrounding community members.

ENV's wildlife trade awareness program collaborates with Voice of Viet Nam (VOV) which reaches ten million people monthly. In addition, the organisation has begun working with renowned journalists, such as My Linh, to publish articles that build awareness about the dangers of wildlife trade.

ENV networking: technical assistance and field support

Through the Environmental Education Family Network, ENV provides resources and technical support to EE programmes to parks and protected areas throughout Viet Nam. In addition to producing a weekly news bulletin for educators, ENV also distributes educational resources and copies of relevant reports and provides ongoing technical inputs in support of field programs.

Green Forest magazine and other educational resources

ENV produces Green Forest, a children's magazine distributed nationally by the Environmental Education Family Network. Two issues of Green Forest are produced each year. Each issue focuses on an environmental topic and includes student contributions from around the country. In addition to Green Forest, ENV produces a range of other educational resources that support awareness programmes and activities, including EE curricula, plays and puppet shows, illustrated stories, films and posters.

Lessons learnt about EE

Formatting the programme

- Define the programme's objectives and activities clearly. Every activity should meet the objective of the education program.
- Conduct research to identify the environmental or conservation problems of the areas.
- Find out which stakeholders directly and indirectly impact the environment in order to determine who needs to be educated or targeted for awareness-building activities.
- Study the local culture.
- Create environmental or conservation messages using local language and simple ideas that are easy for the target audience to understand.
- Choose the education tools and methods appropriate to the target population. Some educators will make a poster or a film before realising that the teaching device is not suited to local conditions or knowledge levels.
- Test education activities before implementing them.

Implementation of education activities

- Choose the right time and location for activities. Avoid busy times of local people (for example, activities hosted during crop harvesting season will likely have low attendance). Choose a location convenient for ENV and for local people.
- Use appropriate equipment familiar to local people. High tech equipment is hard to control and expensive to run and maintain.
- Choose the right counterpart group or organisation. Partner groups can determine the success or failure of the programme. Finding the strongest, most active local organisations to work with. Strong groups might be Youth Unions, Women's Unions, Farmer's Unions, local schools, forest rangers, or people's committees.
- Understand and respect ENV's audience.

Other recommendations

- Stay committed. EE is a long term, continuous activity. It may take several generations to change people's behaviour and attitudes toward the environment.
- Maintain low costs to save funding for longer-term activities.
- Competitions should only be used to evaluate the education activities.
- Monitor and evaluate all activities to find areas that can be improved.
- Educators must be familiar with local culture and peoples.

Capacity building training and environmental education activities of MCD and Trao Reef Marine Reserve Project

Ho Yen Thu, Project Manager,
Centre for Marinelife Conservation and Community Development

Capacity building, training and environmental education by MCD

The Centre for Marinelife Conservation and Community Development (MCD) is a Vietnamese NGO that devotes its work to coastal and marine resource conservation and sustainable community development.

Viet Nam has more than 3200 km of coastline. Most of Viet Nam's population lives near the coast. MCD recognises the living interdependence of coastal communities and aquatic ecosystems that provide jobs, food and ecological services. However, in many parts of Viet Nam's coastal zone these ecosystems are being seriously degraded byhuman activities such as over-fishing, unsustainable aquaculture, domestic and industrial waste discharge, and mass tourism activities. The degradation of these marine ecosystems is threatening the livelihoods of present and future populations living on the coast. The marine and coastal environment needs to be protected to maintain and improve livelihood of coastal communities.

MCD supports community-based initiatives and strives to strengthen the community's capacity through awareness raising activities, education and training. It also achieves results by aiding in the transfer of technology. Its slogan, *Developing informed, empowered communities that sustain health, productive coastal and marine ecosystems*, describes its mission. Awareness-raising, training and education activities related to the marine and coastal environment remain the focus of MCD's operations.

MCD works toward its goals using the following approaches:

- Regular advocacy, awareness-raising, training and education activities in MCD's programmes implemented through projects in different coastal sites
- Cooperation with the media, state management agencies and related organizations to raise awareness and gain wider coverage for communication campaigns
- Participation in local, regional and national forums for sharing information and experiences.

At present, MCD concentrates on implementing two programmes for the Vietnamese coastal zone: the Coastal Wetlands Programme (with the key project site of Giao Xuan Commune in the buffer zone of the Xuan Thuy National Park, Nam Dinh province) and the Coral Reef Program (with the key project site of Trao Reef Marine Reserve, Van Ninh district, Khanh Hoa province). The awareness-raising and EE activities of the two programmes are conducted according to the overall plan of MCD and the specific plan of each programme.

EE in Trao Reef Marine Reserve Project

The Trao Reef Marine Reserve project began in 2001 in Van Hung commune, Van Ninh district, Khanh Hoa Province. It is a project piloting a model of a locally-managed small-

scale marine reserve. Its objective is to build capacity for local communities and authorities to manage coastal coral reef ecosystems and conserve marine and coastal biodiversity through MPAs. The local people of Van Hung commune help manage the marine reserve and work to protect Trao Reef's delicate ecosystem.

In order to achieve the project's objectives, awareness-raising and education activities on the marine and coastal environment, coral reef biodiversity, and coastal resource management are included in the project. We have been implementing the following activities:

- Regular community awareness-raising programmes
- Training courses for local officers and the community
- Coastal clean-up campaigns
- Community Environmental Learning Centres
- Study tours for local and neighbouring communities to learn about, and share, project experiences

All of these activities were conducted with close cooperation with the media (radio, television, press) at all levels (local, provincial, and national). In addition, relevant knowledge institutes and state management agencies were also consulted and actively involved. These activities are briefly described below.

Community awareness-raising programmes

- A communication group is organised which consists of a leader and members, all of whom are from the local community. The group is trained in relevant knowledge of the environment, biodiversity, coral reef, sea-grass, natural resources protection, and communication skills.
- Regular communication campaigns are conducted, popularising basic knowledge on the environment and marine and coastal resources protection for the local community.
- Community dialogues are organised about community-based conservation and management in Trao Reef Marine Reserve.
- The community's participation is mobilised to conduct a survey and assessment of local fisheries resources and to assist in the development of the Trao Reef Marine Reserve regulations.
- The commune radio network is used to promote advocacy and awareness-raising activities.
- Various contests are organised for local adults and children to learn and discuss the marine environment and coral reefs. Songs and poetry contests for pieces on the topic of environment and marine conservation are also organized.
- Local primary schools integrate contents related to the marine environment into extra-curricula activities.

Training courses for local officers and the community

- Training courses teach about participatory surveys and natural resources assessments
- Training courses teach about natural resources monitoring and MPA enforcement
- Workshops are organised on sustainable fisheries and aquaculture
- Training courses are conducted on coral farming

Community environmental learning centre

- Was officially established on 5 June 2006 in Xuan Tu village
- Is meant to be a place which provides information on the environment and biodiversity, enhancing knowledge with EE resources including publications, newspapers, and videos about marine conservation, coral reefs, sea-grass, fish species, the marine environment, and eco-tourism
- Supports awareness-raising and education about Trao Reef Marine Reserve while sharing ideas of ways to address the environmental problems the area is facing
- Is designed as the first place ecotourists should visit for information and sightseeing when they come to Trao Reef

Coastal Clean-up Campaign

- Is an annual activity designed to raise awareness and mobilise the coastal community to protect, clean, beautify and restore the health of the coast.
- Is organised in cooperation with local authorities, government agencies and other organizations. A large part of the coastal community participates, with hundreds and perhaps thousands of local volunteers gathering to collect the rubbish and waste on the coast and near their living areas.
- Received attention in 2006 from all levels of government because of the way communities mobilised to protect the environment. This created a momentum for the activity to be integrated into the environmental protection plan of the localities. IMCD partnered with NADAREP (at the national and provincial levels), the media, and local authorities to support the coastal communities in Khanh Hoa, Quang Nam and Ninh Thuan provinces to implement the "Community Coastal Clean-up" (CCC) campaign in which over a thousant volunteers participated. The campaign became a highlight for raising awareness about the importance of biodiversity, coral reef, and the environment to the life of coastal residents.

Experience exchange activities

- From time to time, study tours are organised for local groups from Van Hung commune to go to Nha Trang Bay MPA and hear the experiences of people there.
- Support is also given to coastal community groups from Quang Nam and Ninh Thuan provinces and from Van Hung commune (Khang Hoa province) to share experiences with locally managed marine reserves and coral farming skills.
- Local residents and officers also make practical information and experiences available to visitors, researchers, students, and pupils.

EE programme publications and materials

- Publications: brochures, posters, reports, books
- Materials: videos, CDs, media and newspaper clippings, photos
- Cultural products, poetry books and song books, drawings

Future activities

MCD's programme of building capacity and conducting EE in the Trao Reef Marine Reserve has utilised a variety of approaches. As the demographics of the local communities change, engagement with these communities will continue, building on today's foundation. MCD also recognises the need to take advantage of emerging technology such as the Internet in order to increase the effectiveness of its community education activities and to widen the scope of its interventions in an integrated coastal zone management framework.

Building capacity and raising awareness among stakeholders in the Chilika Lagoon: blending traditional folklore with environmental education

Durga Prasad Dash, Secretary, PALLISHREE, India

Abstract

Chilika is the second-largest brackish water lagoon in Asia. A Ramsar site that covers approximately 1000 square kilometers, Chilika faces a number of anthropogenic and ecological problems. EE and public-awareness campaigns for the stakeholders of Chilika Lagoon have been implemented by a grassroots-level NGO, PALLISHREE, with the financial support of the Japan Fund for Global Environment and the Toyota Motor Corporation, KNCF, Japan, with the technical support of Ramsar Center Japan-Asia, Japan.

The overall goal of the Project is to build environmental awareness and to educate stakeholders about the Lagoon and especially about biodiversity conservation and use. Under this project, fourteen community-based centres for environmental awareness and education (CEAE) have been established in local schools that serve as learning centres for lagoon stakeholders. These CEAEs act as focal points or nuclei of the entire program. Each CEAE contains a small library and museum, has environmental game materials and an environmental education kit, and is decorated with environmentally-focussed posters. CEAE activities include publishing newsletters and books, preparing and distributing EE awareness kits, supporting the creation of audio visual materials, posters, essays, and paintings, hosting debate competitions, cultural functions, nature camps and wall paintings, exploring nature trails, and hosting boat rallies and events to observe World Wetlands Day. Floating CEAE have also been developed through these centres.

In addition, the CEAEs reach out to stakeholders by organizing the street theater locally known as "*Daskathia*". *Daskathia* is a kind of traditional folklore performance. By entertaining stakeholders while delivering an important message, *Daskathia* has been quite successful in disseminating information about conservation programmes, EE, and current environmental problems and solutions. Creative use of dialogue found in *Daskathia* engages with stakeholders and captures the interest of an audience of all ages and both genders in conservation and sustainable use.

Following project implementation, the following changes were noted:

- The use of small mesh nets in target villages declined.
- Poaching of prawn juveniles declined significantly.
- Small fish, prawns, and crabs caught by fishers were released.
- Stakeholders began to pressure the government to plant vegetation on lagoon embankments.
- Use practices were modified, with attention given to the advice of educators.
- The "Bird Lovers" group was widely promoted as a way to reduce bird poaching.
- Use of chemical fertilizers and pesticides in agricultural fields declined.
- Women in the fishing community were empowered and began to organize meetings on EE and conservation.

Introduction

Designated as a Ramsar site in 1981, Chilika is the second-largest brackish water lagoon in Asia. It is the largest wintering ground for migratory waterfowl in India and is also the habitat of many vulnerable and endangered species listed in the *IUCN Red List of Threatened Species*. The wetland ecosystem of Chilika is also habitat for many species that have a high economic value: the sale of fish, prawns, and crabs provides livelihoods for over one million stakeholders who live in the area around the lagoon.

Chilika has been facing a number of human-related ecological problems. Some of these problems include silt accumulation, degraded water quality, biodiversity loss, a decline in wetland productivity, and poaching of juvenile fish, prawns and crabs. The endangered Irrawaddy dolphin found in the area is threatened, and freshwater resources are at risk because of wasteful use practices

PALLISHREE, a grassroots-level NGO, implemented an Environmental Education and Awareness Project for the stakeholders of Chilika Lagoon with a pilot project that began in 2000. The Project's goal is to promote environmental awareness and education among stakeholders, focusing on biodiversity conservation and wise use. For the Project's first three years, it was supported by the Japan Fund for Global Environment (JFGE) and received technical support from Ramsar Center Japan (RCJ). After the Project's early success, other funding agencies including Toyota Motor Corporation, and KNCF of Japan supported the spread of Project activities to other areas of the lagoon.

Project structure

The main tools of the entire Project are CEAEs.

CEAE were established at schools serving populations of over three thousand people. A room from the school is designated as the Centre. Centres serve as places where stakeholders can learn about the lagoon. 14 trained women from local areas who have gone through orientation programmes and TOT (training of trainers) under the aegis of the programme act as mentors (or facilitators) during coordination activities.

The centres are equipped with (i) a small museum; (ii) a small library; (iii) audiovisual materials; (iv) musical instruments; (v) environmental games; and (vi) simple improvised instruments. Activities of the CEAEs include publishing newsletters and books, preparing and distributing EE awareness kits, supporting the creation of audio visual materials, posters, essays, and paintings, hosting debate competitions, cultural functions, nature camps and wall paintings, exploring nature trails, and hosting boat rallies and events to observe World Wetlands Day. Floating CEAE have also been implemented through these centres.

Based on feedback from village schoolteachers and on suggestions from the International Experts Meeting, CEAE have been developed with the following characteristics:

The learning process at the centre is participatory and activity-based. Students are encouraged to collect specimens for the museum. Environmental painting competitions are held, and music's potential for teaching is harnessed in dramatic and dance performances and during arts and crafts activities. The centre also acts as a place where ideas can be exchanged.

A museum at each centre collects and displays different materials that can teach important information to stakeholders. Skeletons of reptiles, birds, and acquatic animals of Chilika are often displayed, along with models of the lagoon's natural resources or handicrafts made from lagoon resources. Other items that might be found in a CEAE museum include musical instruments, recordings of bird sounds, toys, and audiovisual materials. In the library, visitors can find environmental books, posters, leaflets, and kits.

Facilitators host meetings to teach local women about their rights and about wise use and practices related to the lagoon.

Project activity approach

The Centre has hosted some activities to try to change peoples' attitudes towards the lake. Initial discussions are held to identify stakeholder problems and solutions before PALLISHREE attempts to bring these stakeholders together to conserve Chilika's resources. PALLISHREE takes a three-pronged approach to its actions, using informal, non-formal, and formal methods to educate and provide practical skills to the stakeholders:

- *The non-formal method* utilises trained facilitators who work at the resource centre, an important source of information. Currently, people who are educated and informed about the environment often visit these centres and can provide local people with answers to their questions.
- *The formal method* includes resources provided by PALLISHREE. School textbooks such as The Environment of Chilika Lagoon, Birds of Chilika, Fisheries of Chilika and Plants of Chilika were published in the local Oriya language and distributed in the school.
- *The informal method* is truly participatory, and ensures broad involvement of all members of the community. It is effective because it uses folklore, drama, songs, jokes, and dances that people already know to teach its message. An example of this informal activity is the use of Daskathia, a local performance art and a traditional cultural folk play (folklore). It includes elements of song and dance. Participants wear colourful costumes and hold special sticks while communicating important message through songs, dance, and music. Daskathia often have themes related to the root causes of environmental degradation and the importance of conservation and wise use.

Project activities

Daskathia

Participants in *Daskathia* use a pair of special wooden clapping disks and a cymbal-like musical instrument that makes a rattling sound. *Daskathia* used to be the medium used for singing mythological story-songs. Two people participate: one plays the lead role, and the other plays a supporting role, performing a pantomime art. Colorful dress and painted faces attract the crowd, and the performance is educational while still amusing and exciting.

Daskathia communicates messages about the environment with an activity of high entertainment value. It can be performed in any public place and needs no stage arrangement. The CEAE writes the scripts to include themes related to conservation and sustainable use. It uses these performances to raise public awareness of the lagoon and its resources.

In the past, a series of *Daskathia* that includes child participants has been organized. A special mobile stage can be constructed on the roof of a van or 4-wheeler. Men and women of all ages gather around the vehicle to watch the *Daskathia* in the village. Since there is little other form of entertainment in the village, the audiences are very interested in the programme and participate actively. Song themes are well-understood and create a strong impression on the audience members, who give feedback at the end of the program. Stakeholder participation in conservation activities is increasing steadily, leading organizers to conclude that this tool is one of the best methods of communication. Some potential reasons for the success of *Daskathia* in transmitting information follow. *Daskathia*:

- Use of an already-popular form of entertainment to transmit information
- Focus on local problems and solutions to these problems
- Use of local language, terminology and folk arts
- Requirement of active participation of local performers and directors
- Uslisation of dialogue in a creative way to ensure audience interest in conservation

Newsletters: A local-language newsletter, *Mirror of Chilika*, is published and distributed to area schools, womens' groups, youth leaders, leaders in nature conservation and the government, and other interested parties. Students, teachers, local youth, womens' groups, and area NGO's contribute to these newsletters.

Books: Four books have been published on Chilika and its surroundings that will help lagoon stakeholders understand the area. The books are: *The Environment of Chililka Lagoon, Birds of Chilika, Plants of Chilika, and Fishes of Chilika*.

Education kits: Two different EE and awareness kits have been developed. Educational themes covered by materials in kits include wetlands history, wise wetlands use, the role of wetlands in culture, the concept of WWD, and specific characteristics about the Chilika lagoon and its surrounding areas.

Audio Visual materials: The audiocassette Mo Mana Chadhei (The Bird of My Heart) was prepared in the Oriya language. It includes eight songs with themes related to biodiversity and conservation of Chilika Lagoon. The audiocassettes are distributed among the stakeholders and also are distributed to different parts of Orissa.

Posters: Three posters written in the Oriya language promote the idea of Chilika Lagoon as "our mother and the source of our livelihoods." These posters were distributed to local people, institutions and community centres.

Essay, painting and debate competitions: These competitions were organized for the students of the local schools in the Chilika lagoon area. Winners are awarded prizes and certificates during WWD functions.

Boat Sailing Festival: Every year in November, on the day of the full moon day, the people of Orissa celebrate the boat festival. Boats are worshipped and festivities celebrate the sailors who braved the open seas and brought prosperity to these shores. Over the course of time, the observance of this festival had declined. CEAE successfully revived the tradition in the project area, hoping to promote the cultural aspects of wetlands as a tool to ensure their conservation and management. During the festival, a boat is decorated and worshiped with offerings before a folk play is performed by local youth on the boat and the boat is taken around to visit the island villages.

Nature camps: Children, teachers, and facilitators accompany a team leader to nature campsites around the area. Camping sites include the Regional Science Centre, the Planetarium, Historical Hills, the State Museum, the Zoo and the Botanical Gardens. The camp's purpose is to enhance participants' knowledge about the natural world, especially their understanding of animals, plants, hill ecosystems, historical areas, planets and ecology.

Wall paintings: Wall paintings have played a major role in raising people's awareness of their environment. As powerful communications tools, wall paintings bring peoples' attention to the sensitive issues surrounding Chilika's environment. The focus is on visuals, which are accompanied by small, catchy slogans. These paintings are located at strategic places in island villages.

Nature trail: The objective of the nature trail is to allow local students, stakeholders, tourists and visitors to travel through the lagoon while enjoying a view of the lake, its eco-systems, and the scenery. To help develop these trails, stakeholders plant various plants and participate in some infrastructure development activities.

Boat Rally: Stakeholders, mainly boatmen, organize a boat rally each year on World Wetlands Day. Villagers are encouraged to take part in the "Save Chilika" boat rally, which promotes conservation of bio-diversity and eco-systems and the wise use of lagoon resources.

Observation of World Wetlands Day (WWD): WWD is celebrated each year on the 2nd of February. The celebration is an opportunity to educate the local community about the

importance of biodiversity as well as the values and functions of wetlands. In the past, many people have taken part in the boat rally, holding banners espousing messages of conservation, wise use, ecosystem management, pollution control and good practices.

Floating CEAE: PALLISHREE has introduced an educational innovation in the Chilika Lagoon project area that is designed to educate school students and local communities at large: a floating CEAE. A floating CEAE can take educational materials out to the people where they live, allowing people to closely study weather, water quality and depth, and aquatic plants, sediment, weeds, birds, and fish. These floating CEAEs are located on boats is equipped with all the apparatus and scientific instruments necessary for testing the pH, salinity, plants, soil samples, and animal specimens from Chilika Lagoon. Students go to the lagoon and spend their time studying the flora, fauna, and water characteristics of the lagoon. The floating boat is also used to popularize the idea of wise use of resources around island villages.

Results and closing

With the regular introduction of new activities in the past few years, a dramatic change in the attitude of the people has been noticed. The community today is very receptive to, and supportive of, area NGOs and their activities. The community has initiated activities monitoring reliable collection and dissemination of resources on their own. Following project implementation, the following changes were noted:

- The use of small mesh nets in target villages declined.
- Poaching of prawn juveniles declined significantly.
- Small fish, prawns, and crabs caught by fishers were released.
- Stakeholders began to pressure the government to plant vegetation on lagoon embankments.
- Use practices were modified with attention given to the advice of educators.
- The "Bird Lovers" group was widely promoted as a way to reduce poaching.
- Use of chemical fertilizers and pesticides in agricultural fields declined.
- Women in the fishing community were empowered and began to organize meetings on EE and conservation.

Education on the Ecoboat: man's impacts on Ha Long Bay

The Ecoboat Project, Flora and Fauna International

Introduction

The Ecoboat tries to provide an understanding of tomorrow for the children who will have to live with the consequences of today.

The Ecoboat Project advocates EE at Ha Long Bay World Heritage Site in Quang Ninh Province. It is supported by the Darwin Initiative and is a Fauna and Flora International (FFI) project. Founded in 1903, the FFI is one of the oldest of the environmental organizations.

The Ecoboat takes school children from both the international community and local Vietnamese Ha Long Bay community out on the bay. The students experience first-hand the landscapes, processes and ecosystems of the World Heritage Area and realise the issues facing the local leaders.

The FFI chose Ha Long Bay for an EE programme for a variety of reasons. It's a beautiful place - a stunning, geologically and biologically rich land and seascape, full of opportunities for hands-on encounters with nature. Yet the Bay is also on the edge of an area that's undergoing rapid development. Finding a proper balance between environmental protection and economic development and urbanisation is a challenge.

Issues addressed

Vietnamese leaders and planners are making efforts to address the many complex environmental management problems, including:

- **Consequences of tourism development:** reclamation of land for buildings and golf courses, sediment from development sites, tour boat activities, sewage and other pollution from tour boats, and littering
- **Consequences of infrastructure development:** coastal reclamation for housing, road construction and sediment
- **Consequences of coal mining:** sediment, dust, leachate, waste heaps and coal spillage
- **Consequences of transport activities:** port development and sediment from dredging, risk of oil spills
- **Consequences of aquaculture activities:** loss of mangrove wetlands, use of small fish as feed stocks, pollution from wastes
- **Agriculture:** nutrients, fertilizers and chemicals from the Red River Delta

In 1989, there were approximately 25,000 ha of mangroves in Ha Long Bay. In 2001 there were only 8,946 ha; this indicates an annual loss of 1,330 ha. There has been a rapid decrease in mangrove wetlands with far reaching effects. The immediate area of where mangroves are removed is affected, and so are fish breeding activities and the soil composition

The turbidity of coastal water is extremely high, particularly where the tourist boats dock outside the larger caves. At one location we once lost sight of the Secchi disk at 150mm.

Around the city, Ha Long Bay is only 3m deep, meaning that each passing tourist boat stirs up bottom sediment. There is a channel for larger ships that is maintained by dredging. Suction dredging creates a large volume of disturbed, fine sediment that remains in the water and spreads out from the site.

Coal mining and infrastructure development disturb terrestrial sediment. The recent, large-scale roadwork for the new Bai Chay Bridge and coastal highway contribute significantly to this problem.

Although the nearby coal industry has been creating sediment and dust for over 100 years, it is now taking serious steps to rehabilitate the waste dumps that tower above Hong Gai and Cam Pha. It is an essential industry in the region and employs a large number of people. By managing its waste responsibly, the coal industry will be taking a lead in reducing the impacts on Ha Long Bay.

Floating litter, mostly plastic, is widespread on Ha Long Bay. Plastic first accumulates on the beaches and then moves into the sea on floating "rafts" during high tide.

Recycling for several classes of plastic is now available, but styrofoam remains a major problem. There are no facilities to recycle it; it is usually just burnt. Steps towards a more feasible alternative must be investigated.

The Ecoboat's mission

The Ecoboat voyages allow the children to examine these issues in an environment where the environmental problems are balanced with beauty and tranquility. The students can study unique ecosystems and identify rare and recently discovered plant species. The students visit internal lagoons where the marine life differs from the wider bay outside. These lagoons are particularly beautiful and peaceful.

The contrast between developed and undeveloped caves can be seen as people now have access to a recently discovered, and therefore relatively untouched, cave. It is a great location to view and examine the mechanisms that formed the remarkable landscape of Ha Long Bay and the ongoing processes forming new caves and modifying the limestone islands.

The Ecoboat voyage incorporates periods of physical activity to balance the theoretical aspect. Such activities include beach games with an environmental message and an exploration of some of the more accessible islands. A kayaking trip through a cave into an internal lake teaches both physical coordination and the hazards of floating pollutants.

At the Cua Van Floating Village, students interview fishing families about their unique

lifestyle. In this way the children incorporate the social aspect of Ha Long Bay, allowing them to better understand the importance of aquaculture and its associated risks.

Conclusion

The goal of an Ecoboat voyage is to illustrate that development and conservation are very difficult to balance. There are no simple answers to the dilemmas that officials and business people in Ha Long Bay face. What is happening here in Ha Long Bay, reflects a larger phenomenon occurring throughout Asia and the world in general. This trend will only continue as resources continue diminishing and the population increases. Being careful and observing existing regulations would, however, relieve some of the pressure the ecosystems are under.

The Ecoboat voyage's aim is to stimulate students from international schools throughout the region and from the Vietnamese schools around the Bay to reflect on these complex issues. As they leave us, we hope they are better prepared to lead their communities in managing the challenge of environmental preservation in the midst of development.

World Wide Fund Viet Nam: environmental education for the preservation of marine natural resources in Phu Quoc district

Do Thi Thanh Huyen, Environmental Education Officer, WWF Viet Nam Programme

Introduction of environmental education programme

Since its launch in 1997, the EE programme of the WWF Indochina Programme (now called WWF Viet Nam Programme) has promoted participation in the preservation of biodiversity and the management of natural resources. Recently, EE has become an important and indispensable component of the WWF Viet Nam Programme's preservation efforts.

The purpose of WWF's programme is to enhance the capacity of GOs and NGOs in the implementation of educational programmes and to build awareness and improve training programmes that are aimed at encouraging the change of behaviour of those who may impact the environment.

Approach

The Programme emphasizes joint action and active participation. With this approach, the Programme provides information, fosters a proactive attitude and provides training for natural resource preservation. People who participate in the process will be able to analyse and make responsible decisions about EE. It also encourages them to focus their proactive behaviour on environmental and natural resource preservation.

Influencing change

- If people *do not know or do not understand* about the environment and environment-related issues, provide them with information.
- If people *do know, but are not concerned* about the environment and environment-related issues, concentrate on changing their attitudes.
- If people *do understand and are concerned* about the environment and environment-related issues, but do not know alternative solutions or lack preservation skills, provide them with alternative solutions and skills.
- If people have *alternative solutions and skills*, but face *legal obstacles, economic policies or other obstacles, act as intermediary* between the community beneficiaries and credit programmes in order to remove obstacles.

Action plan

WWF Viet Nam Programme developed and implemented an Action Plan that consists of five components focussing on five different subjects as follows:

- *Community programmes* in nature preservation areas ("nature for the sake of life") aim to enhance knowledge and understanding of nature and to encourage local communities to engage in preservation activities. Many programmes have been conducted in Bach Ma National Garden, Vu Quang district, Song Thanh nature

preservation area, Xuan Main Forestry University (Developing a Community - based Training Programme on EE), and Thua Thien Hue, Quang Nam and Kon Tum provinces.

- *School programmes* (nature class) aim to enhance knowledge and understanding of the environment and to encourage nature preservation activities of pupils. Many programmes have been conducted for primary, lower-secondary and upper-secondary pupils in Cat Tien National Garden's buffer zone, Con Dao, Cat Ba, Vu Quang and Phu Quoc. Popular programmes include clubs, mobile exhibitions and competitions.
- *Public Programmes* aim to enhance knowledge and understanding about the nature of urban communities through communications activities and community education in Viet Nam. To cooperate with Hanoi Zoo to organise programmes such as The Day of World Environment, dramas are played at the Youth Theatre, puppetry shows are created, and animal posters and nature interpretation programmes have been developed and are on display in Ha Noi Zoo.
- *Programmes for administrators* in the sector of policy and industy. The programme aims to enhance knowledge and to transform perspectives on the nature of policy makers and administrators in the industry sector, to encourage the formulation of environmentally -friendly policies and to increase responsibility and cooperation in protecting the environment. Activites include a photo exhibition on nature and biodiversity and the production and screening of two films with the theme of enhancing awareness and protecting the environment.
- *Programmes for tourists* aim to enhance knowledge about nature, to encourage tourists' preservation activities, and to promote ecological tourism. The translation of Interpretation of Biodiversity, a book for environmental educators in tropical countries, has been edited and published. The programme is cooperating with nature preservation areas and tourism companies to design and construct an Interpretation center, nature trails, and exhibits and materias on EE.

Consultation services

The consultation services for organisations and individuals provided by the programme include:

- Planning and developing strategies for EE
- Providing training for trainers
- Providing and developing educational materials and awareness-building materials
- Providing technical assistance for EE implementation
- Supervising and evaluating programmes

Publications

- EE: *a guide to instruct and teach the trainers* was published in 2002 and is available in both Vietnamese and English. It includes five parts: Environmental education, education theories, factors impacting attitude and behaviours, planning and designing an environmental education programme, and modes of presentation and training support activities. The book will provide environmental educators with a set of tools that will help them to design, organise and carry out preservation programmes for both adult and children.
- *Discovering Nature* is a guide for the implementation of EE activities for students. Published in 2003, available in both Vietnamese and English languages. The book will enhance the capacity of lower secondary teachers to design extra-curricular programmes for EE. There are twenty-nine multi-sectoral activities in the book which are designed to increase participation in nature preservation. These materials will provide students with knowledge about the Earth, human impact on the planet, and ways to protect this living planet.
- *Supervising and evaluating EE in communities* is available in Vietnamese and English and was published in September 2002. The book has been developed for measuring the success of, and increasing the effectiveness of, EE programmes in communities.
- *Guiding the Agro-forestry Implementation: Tools for EE in communities* was published in May 2003 and is available in Vietnamese and English. The book provides community developers with a set of tools to help them successfully implement agro-forestry cultivation training programmes for farmers. This document provides community officials with an EE method to combat problems. It also allows people to earn their living without negative side effects. The book consists of three parts that cover nursery garden techniques, agro-forestry technology, and agro-forestry crop plants, respectively. Illustrations help reinforce concepts. The book provides methods to build up agro-forestry systems and introduces ways to help the community living inside and around preservation areas maintain their jobs at the same time as they preserve natural resources.

Other tools for enhancing awareness

- Films

  Gold and Silver: A 6-minute-long film focussing on the importance of the environment and highlighting typical environment-related problems that Viet Nam is facing. The film helps viewers to have a more positive attitude toward the environment.

  Truong Son: Mystery of Nature: An 8-minute-long film about the abundance of natural resources in Truong Son mountains, the area believed to be the place when life originated and an instance of harmonious coexistence between humans and nature for many centuries. The film also reflects the changes that have taken place in the

Truong Son Mountains in recent years because of the unsustainable lifestyles. Today, the area is affected by forest loss, a decline in the number of wild animals present, and water and air pollution. The last part of the film calls for people to change their behaviour in order to live in harmony with nature once again.

Vooc cha va call: A 17-minute-long film about the life of the precious Vooc cha va of Viet Nam. Providing a description of the Vooc cha va's life, the film also reflects on the threats this species faces and calls for people to protect Vooc cha va.

- Posters

  The programme has many posters promoting the preservation of tigers, primates, and biodiversity and the sustainable use of natural resources.

- Short stories

  Story of Bird Family: a short story published in Vietnamese in 1998 telling of the preservation of birds in Cat Tien National Garden

  Story of Forest: a cartoon published in Vietnamese in August 2000 on the topic of the preservation of white-headed langurs, an endemic species of Cat Ba National Garden

  My Son is a Tiger: a cartoon published in Vietnamese in 2003 telling the story of a boy who was lost in the forest and was brought up by a family of tigers

- Dramas

  My Son is a Tiger: played at the Youth Theatre in November 2001

- Puppetry

  Precious Thing of the Green Forest: first played at the anniversary of World Environment Day in 2001 to convey a message to preserve forests and wild animals and not illegally hunt animals

- Exhibits

  An educational exhibit on the trafficking of wild animals opened in early September 2006 to convince students to protect animals

Education programmes on the preservation of marine natural resources in Phu Quoc district and island

These programmes advocate the preservation of marine natural resources, especially Dugong and sea grass, through EE activities in schools. The project hopes to build teachers' capacities to encourage students to implement activities related to conservation. It also aims to build awareness, change students' attitudes towards the preservation of marine natural resources, and create opportunities for students to participate in marine preservation activities.

This will take place during the 2005-2006 academic year.

Communication programme for students

The programme will enhance awareness of pupils in Phu Quoc district and island on the preservation of marine natural resources, especially the Dugong and sea grass habitats. It will evaluate pupils' capacity to help improve the design of future EE programmes. The programme will be 90 to 120 minutes long and will involve educational riddles, games.

Five direct meetings have been conducted with 471 pupils at upper- and lower-secondary school levels. These meetings showed that students are very aware of the importance of preserving marine natural resources, but most do not understand why it is necessary to preserve marine natural resources or how to preserve the resources. At the upper-secondary level, students are more knowledgeable and have ideas concerning the preservation of marine natural resources. Based on these results, a new education programme has been designed and implemented.

Programmes for teacher training and Marine Preservation Clubs

A training session for environmental education at lower-secondary school schools was conducted. After the training course, the teachers lead environment education activities for students and also develop a plan for Marine Preservation Clubs in their schools. Once the plans are approved, the teachers lead the Clubs in their schools. The Phu Quoc District Division of Education cooperates with WWF to monitor and support the implementation of these activities.

Six Marine Preservation Clubs operate in six upper-secondary and lower-secondary schools (Duong dong 1, Duong dong 2, Ghenh Dau, Bai Thom, Ham Ninh, An Thoi). The environmental education programme in Phu Quoc district and island has attained the set objectives and has received supports from Kien Giang Provincial Department of Education and Training, Phu Quoc district division of Education and Training, and management boards and teachers of schools. The students actively supported the programme.

Plan for environmental education related to marine resources

In the future, the WWF Viet Nam programme will continue to conduct educational programmes for the preservation of marine natural resources in Nui Chua National Garden and Con Dao. These programmes will focus on tourists and students. Bird watching in coastal areas will be organised by the WWF in conjunction with the Viet Nam Bird Watching Club and will be incorporated into the programmes as another way to appreciate natural resources.

IUCN Viet Nam's environmental education and awareness-building activities

Bui Thi Thu Hien, Marine and Coastal Resources Programme
IUCN Viet Nam

Introduction

IUCN is a membership organization and is also the world's largest conservation network. Its members include states, government agencies, and NGOs. Thus, it brings together experts, scientists, and both GOs and NGOs in a unique worldwide partnership. This unique structure allows IUCN to bring together representatives from many countries and many different sectors, and enables the Union to facilitate the exchange of ideas in workshops, projects, and other activities. Lessons learnt from education projects, programmes, and methodologies can be shared easily and effectively by such a broad-based organization. In addition, IUCN can learn from its experts and promote the most advanced, cutting-edge environmental education and management training methods in the projects in which it is involved.

Examples of education activities under the Marine and Coastal Programme

IUCN Viet Nam has found that the environmental education activities strongly influence the success of its activities. For this reason, EE and awareness-building activities have been formally integrated into its curriculum. The participation of international organizations such as IUCN Viet Nam acts to raise the levels of environmental awareness in Viet Nam. Projects in which environmental education has already played a key role include:

- The Hon Mun Pilot MPA project (2001-2005)
- Integrated Coastal Management case study in Ha Long Bay, Quang Ninh and Hai Phong province (2002-2008)
- Marine Turtle Conservation (2002-2007)

Hon Mun MPA Pilot Project

The Hon Mun MPA Pilot Project, one of the Marine and Coastal Programme's most successful projects, placed a great deal of importance on ensuring that local stakeholders were not only participants in developing the project's management strategy but were also fully educated about the reasons the area ought to be protected. Education programmes in schools were implemented along with projects that specifically targeted the women of local communities. Members of the community were also trained on topic relating specifically to MPA planning and management issues, building capacity and a knowledge base for the future. One of the reasons environmental education is so important is that it gives people a long-term understanding of the issues of the environment and their specific habitats, making long-term sustainable resource use more likely once the project has ended.

Integrated Coastal Management

Integrated Coastal Management (ICM) brings scientists, managers, and policy-makers together to develop long-term management strategies that accommodate the diverse needs of coastal areas. Specifically, it seeks to amplify the effects of marine biodiversity conservation activities by improving the capacity of coastal area managers to create and enforce regulations. Education, of course, plays a key role in capacity-building activities. MPA managers were trained on the principles of sustainable management. A number of training activities on global imaging systems (GIS) and sustainable tourism were conducted as well, with lessons learnt from other projects disseminated in areas that were just beginning their conservation activities.

Marine turtle conservation

This integrated species-and-habitat conservation project included outreach education programmes targeting local communities and teaching about the life cycles and activities of marine sea turtles. These activities also taught what human activities, such as pollution, egg harvesting, and habitat destruction, placed marine turtles at risk, and also taught about ways to minimise these dangers. An educational resource package, "Saving sea turtles and their habitats," was developed and distributed to children, teaching them basic facts about turtles such as their importance in marine ecosystems and the threats they face. Conservation education activities were implemented in pilot sites on Phu Quoc Island in Kien Giang province. A guidebook introduced in these areas will be evaluated and updated for further use in marine turtle conservation activities.

Conclusion

Although policy change and management regulations are important elements of the process of protecting Viet Nam's environment for sustainable use, these high-level measures must be supported by building the knowledge and capacity of the local people who live closest to the environment. IUCN supports education measures in its projects and also acts to facilitate the exchange of EE and conservation ideas.

Section 4

Wetlands management strategies and recommendations from sites in Viet Nam and Asia

Nha Trang Bay MPA lessons learnt

Truong Kinh, Director,
Management Board of Nha Trang Bay Marine Protected Area

Introduction

The Pilot Project for Hon Mun MPA has been carried out as permitted by the Government of Viet Nam since June 2006 in Nha Trang City, Khanh Hoa province. The project is sponssored by the Global Environment Fund (GEF) through the World Bank, the Danish International Development Agency (Danida), the World Conservation Union (IUCN), and the Vietnamese Government. The project is divided into two phases: an 18-month preparation phase, and a 30-month implementation phase.

Project objectives

The objectives of the Project include:

- Preserving threatened area of globally-key biodiversity that is typical to the region
- Facilitating the improvement of livelihoods of community members in the project site
- Serving as a model for developing other MPAs throughout the country

Project components

The Project is comprised of 4 components:

- Participative planning
- Creating substitutive alternate income
- Capacity building
- Monitoring and evaluation

Outcomes and lessons learnt

Several outcomes and lessons learnt can be shared after four years of project implementation. These include:

- ***Authorities at all levels, including representatives from the Provincial People's Committee, should support the project by fulfilling their commitments***. The Vietnamese Government and the People's Committee of Khanh Hoa province satisfied the commitments that had been signed with donors and international organizations, setting up the Management Board of Nha Trang Bay MPA, the Provincial Steering Committee (which collaborates with various provincial agencies in supporting project activities), and boards of marine protection in island clusters, and also contributing reciprocal capital.
- ***The local community participates actively in managing the MPA.*** The participation of local people is one of the project's characteristics which makes it such an important success story. The provisional regulations for managing the Hon Mun MPA were

promulgated by the People's Committee of Khanh Hoa province. The regulations were drafted by the Project Management Board with the participation of the local community, who were included in discussions and were represented by the comments of functional agencies of the province and Nha Trang City. Monthly, the Management Board of the MPA holds a meeting at cluster level with the local community to learn about their aspirations and hear their proposals on how to carry out marine protection activities in a practical and effective manner.

- ***There is a high level of inter-sectoral coordination.*** During the 4 years of project implementation under the coordination of the province's People's Committee, sectors and local authorities have actively participated in all project activities. They have participated in training courses, given comments on the draft Provisional regulations for managing the Hon Mun MPA and on the management plan, and taken part in patrols within the MPA and in educational programmes on marine resources and the environment in schools, on field trips, or in other settings.
- ***Educational activities for improving awareness are of special importance as marine protection is a new concept to Viet Nam.*** Because of the newness of the cause, the project is especially concerned about raising the awareness level of the communities and parties that are directly involved in the project. Using training courses and public awareness materials that are specialised to reach different target audiences, the awareness levels of all parties have been raised. The education activity that has had the most noteworthy success was an education programme on the marine environment. The programme was carried out in primary and lower secondary schools where a large number of pupils who live in the MPA study. Today, these students know how important the establishment of the MPA was, and they understand how marine resources and the marine environment impact human life their own individual lives. The lives of women in the area have also been improved by gender-related activities carried out within the framework of the project.
- ***Patrol activities are participatory.*** In the past, protection of aquatic resources was the responsibility of the Sub-department of Protection of Aquatic Resources. However, because of a variety of factors patrol activities were not conducted on a regular basis. As soon as the patrol group of the management board of the MPA was set up to include the participation of the local community, patrol activities were carried out more regularly and more effectively. In each island cluster, the local community appoints one or two persons to the patrol group, which operate 24 hours a day. As a result, illegal fishing activities have significantly decreased, and ecosystems have been better protected.
- ***Marine protection activities are combined with resource use activities.*** A harmonious combination of protection and development is one of the keys to successful project implementation. It is necessary to ensure that zoning of the MPA balances the interests of all related parties, especially those of existing resource users, otherwise conflicts may occur. In order to achieve effective balance, zoning activities must

include input from all parties, such as scientists, managers, business leaders and the community.

- ***Alternative livelihoods support local communities.*** As revealed by a socio-economic survey, 79% of the inhabitants of the MPA have fishing-related livelihoods. Some of these fishing activities can have a large impact on the greater marine environment and its resources. For example, catching fish by using explosives or toxic chemicals affect the resources of the MPA and a number of households that use MPA resources but lie outside the MPA. Also, 79% of female inhabitants of the MPA either do housework or are unemployed. The challenge is to create jobs that will increase the income of the community without polluting the environment or damaging marine resources.

  Functional zoning activities have an impact on fishing areas of fishermen. Although people often conduct fishing activities where the resources are centralised, coral reefs need to be protected because they play a key role in supporting fish populations. During the implementation of a programme for creating alternative sources of income for the people it is necessary to collect and analyze data that can reveal which households will be directly affected by those zoning activities. Thus, poor households can be provided with loans to help ensure a successful transition to alternate livelihood activities.

- ***Financial mechanisms must be developed and implemented.*** A sustainable finance strategy was developed at the project implementation stage and was prioritized by local authorities, who were also focussing on the commitments made to the government and donors. The sightseeing fees charged at Nha Trang Bay beginning in early 2006 have been an important source of funds helping to support and maintain activities in the MPA. Local authorities are considering other options to integrate into future sustainable finance strategy. These options include tax exemptions and reductions for households directly affected by functional zoning activities, arranging for service activities to increase income sources, or establishing marine protected funds.

Conclusion

Just four years of implementation of the Pilot Project for Hon Mun MPA, Viet Nam's first MPA, means that there is only a short amount of time to study. Project outcomes are seen only as initial findings, but hopefully they will be replicated in other projects. At present, the Nha Trang Bay MPA is faced with many sizeable challenges and needs further support from international organizations, central agencies and local authorities. At the same time, the management board of Nha Trang Bay MPA will continue to strive to become a model of effective marine protection for Viet Nam and the region.

Sustainable livelihoods in and around marine protected areas (LIMPA)

Nguyen Giang Thu, Vice Manager, MPA component, MOFI/DANIDA project

Introduction

Viet Nam's long coastline and diverse marine and coastal ecosystems provide enormous potential for the development of a strong marine-based economy based especially on marine fisheries and aquaculture and tourism sectors. The fisheries sector is already contributing more than USD 2 billion in export revenue per annum, while about 70% of the rapidly expanding tourism sector is based on coastal areas.

Maintaining a healthy coastal and marine environment is a prerequisite for the sustainable development of these sectors, as marine conservation and economic development are mutually dependent issues in the coastal zone. However, Viet Nam is facing a number of coastal and marine environmental problems which stem principally from the great pressure of human activities; these problems include habitat destruction and degradation, declining marine productivity, loss of biodiversity, and coastal pollution.

These developmental problems create many difficulties and challenges for the Government of Viet Nam, and particularly for the Ministry of Fisheries (MOFI), which recently took on the responsibility for MPAs. The establishment and management of MPAs requires capacity development in MOFI and other relevant ministries, as well as in the provincial authorities of coastal provinces. Thus, donor support, including access to the greater experiences from MPA management in other countries, is much needed by MOFI during the formative years of Viet Nam efforts to develop an MPA Network.

The LMPA component is one of 5 components of the Denmark - Viet Nam Development Cooperation in Environment programme running from 2005-2010.

This component provides support to a thematic area that contributes to one of the priorities of the National Strategy for Environmental Protection: to increase the number of protected areas in Viet Nam, especially Marine Protected Areas (MPAs) and protected wetlands (this is an immediate objective of the National Strategy for Environmental Protection).

Component description

The main aim of this component is to help Viet Nam to further develop its network of marine protected areas (which currently includes 15 sites) based on a strong legal framework at the national level and an effective local management system at the provincial and site levels, in which the sustainable livelihood needs of local communities living in and around MPAs are fully recognised and supported.

All 15 MPA sites in the existing network will be included in the legal, policy, information management, and training and awareness-raising elements of the component. Assisted by the component, MOFI will also provide advisory services to all the provinces with MPA sites, on a demand-driven basis. Two demonstration MPAs, Hon Mun and Cu Lao Cham, will continue to receive direct support to ensure that the management systems developed for these sites remain effective and viable. Cu Lao Cham, and to a lesser extent Hon Mun, will

also receive assistance to help achieve sustainable livelihoods and other improved living conditions for their local communities.

The Development Objective is that valuable habitats and their associated biodiversity in Viet Nam's coastal and marine waters are protected and restored without compromising the livelihood requirements of poor and vulnerable communities. This development objective is supported by three immediate objectives and six outputs.

The immediate objectives are:

- An MPA network that covers the priority areas of Viet Nam's coastal waters is strengthened and effective management systems are in place.
- Vulnerable communities living in and around selected demonstration MPA sites are able to meet their livelihood requirements without having to deplete marine resources or degrade the environment.
- Viet Nam fulfills its commitment to the international effort to develop MPA networks and contributes experiences of addressing the needs of vulnerable communities.

Expected outputs are:

- Output 1: An effective management system for the MPA network developed at national level
- Output 2: Capacity for sound MPA management at national, provincial and site levels achieved through training and institutional development supported by a national MPA Training and Advisory Center
- Output 3: Local communities involved in MPA management through the development of an integrated management system in selected demonstration MPA sites
- Output 4: Marine habitats within selected demonstration MPA sites protected and their natural resources returned to a sustainably producing level
- Output 5: Improved socio-economic security for inhabitants living in and around selected demonstration MPA sites based on sound natural resources management and more diversified income generation
- Output 6: Viet Nam fully engaged in the international effort to establish a global network of MPAs and exchange experiences of reducing the vulnerability of local communities

Outputs 1 and 2 will lead to effective management and capacity development to support the national network of MPAs. At two demonstration MPA sites, Cu Lao Cham (Quang Nam province) and Hon Mun (Khanh Hoa province) outputs 3, 4 and 5 will support integrated management systems at provincial to community levels leading to more effective marine habitat protection and improved socio-economic security for communities living in and around the MPAs. Output 6 will ensure that Viet Nam can both contribute to and benefit from the international effort to develop a global network of MPAs.

Capacity development

The LMPA component will be anchored in the Ministry of Fisheries, Hanoi. The Department of Science and Technology will implement the LMPA component on behalf of MOFI, but with close involvement of the staff of National Directorate of Aquatic Resources Exploitation and Protection (NADAREP). Capacity development for NADAREP will be a priority goal under LMPA component immediate objective 1, and supporting activities will include training for NADAREP staff.

As the implementation of an MPA strategy gets under way, it is likely to raise the demand for a new set of skills from MOFI as well as from the provincial administrations. At the ministry, legal skills with regards to subsidiary legislation within MPA legislation will be required, and at the provincial level there will be demand for better long-term spatial planning. In the first instance it may be considered how MOFI legal staff best may become acquainted with best international practice. In the second case it is important to that the provincial staff tasked with MPA responsibilities are given the opportunity to avail themselves of possible ongoing ICZM training activities, since many of the threats, against as well as opportunities for the success, of MPAs may be identified and controlled at this level.

In the provinces, capacity development in priority MPA sites is a major challenge for the component. The starting point is human resources development to educate provincial staff about the purpose and functions of an MPA. Developing an integrated management approach from provincial to local community level, interpreting the national legal framework for MPA's at provincial level, organising staff working practices, and implementing a strategy to reduce vulnerability of local communities in and around each MPA, are further priority needs that will require considerably more capacity than presently available in the MPA provinces.

Capacity development is urgently required at all levels in the MPA provinces, from the Provincial People's Committee (PPC) level to local communities and fishers. The LMPA component is strongly directed towards capacity development for MPA management and also towards developing considerable experience in marine environmental monitoring. The component will monitor changes in the socio-economic security of vulnerable communities, which can be shared with other components of the programme, and with MONRE.

Management and organisation

The LMPA component will be implemented by MOFI, Hanoi. The National Steering Committee (NSC) for the MPA Network, which has been approved in principle, with a Vice-Minister of MOFI as its chairman, will guide the work of the component. The proposed composition of the NSC will be expanded to include a representative from Ministry of Labour, Invalids and Social Affairs (MOLISA).

The NSC will be supported by an advisory body consisting of ministerial representatives

and experts. (This body will be formed during the MPA project phase by merging the Interministerial Working Group and the Technical Advisory Group into a single MPA Advisory Group.)

MOFI, assisted by the Component Support Office (CSO), will manage the MPA Network and continue to develop the policy and legal framework for MPAs in Viet Nam. The demonstration MPA sites of Hon Mun, Cu Lao Cham and, to a lesser extent Con Dao and Phu Quoc, will continue to receive support. This will be implemented through Provincial Management Offices situated with the Provincial Management Authority/Board for each of the above sites. Each body will send a representative to attend meetings of the NSC as an observer. Within guidelines to be provided by MOFI, the Management Authority/Board will submit proposals for awareness-raising, training, poverty reduction and monitoring activities, based on agreed priorities to achieve the component objectives at these sites.

Appraisal of proposals and supervision of their implementation will be undertaken by MOFI and the component team, supported by the MPA Advisory Group, and short term consultants, as required. The MOFI Component Director will approve those proposals that receive a satisfactory appraisal.

At the province level, each MPA Management Board will be encouraged to adopt an integrated management approach involving cooperation between several key departments, which include the Department of Finance, DONRE, DOST, DARD, FPD, MOLISA, the Department of Tourism and civil organisations. This integrated approach is being piloted in Quang Nam Province (Cu Lao Cham MPA) by the MPA Project, while in Khanh Hoa Province, the Nha Trang Bay MPA Authority has been established as the province's responsible body in charge of Nha Trang Bay MPA.

Marine and coastal wetland management: experiences from the Philippines, Fiji, Solomon Islands and Qatar

Amado S. Tolentino Jr., Ambassador, International Council of Environmental Law

Introduction

The Convention on Wetlands of International Importance defines wetlands as "areas of marsh, fen, peatlands, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, *including areas of marine waters, the depth of which at low tide does not exceed six meters*." Qatar's wetlands include mangroves and salt flats, while wetlands in the Philippines, Fiji and the Solomon Islands include estuaries and deltas, mangroves and inter-tidal mudflats, coastal lagoons, freshwater lakes and marshes, swamp forests, rivers and streams and coral reef systems.

Despite the impact of global warming and the threat of rising sea-levels, these countries' marine and coastal wetlands have been managed sufficiently to maintain their value for the survival and well-being of their respective inhabitants. This paper will examine these experiences to present valuable lessons for those working to achieve effective marine and coastal wetland management.

Collaborative wetlands management in the Philippines

The Phillippines' Department of Environment and Natural Resources (DENR) runs a model project in Lawis through the Coastal Resource Management (CRM) programme. The coastal village *(barangay)* of Lawis is located on Pangangan Island in the province of Bohol. This island falls under the administrative jurisdiction of Calape, a municipality whose inhabitants rely heavily on fishing.

The DENR successfully involves all members of the Calape community in the proper management of its marine resources and in the establishment of five of the eight protected marine areas in Calape. These areas serve as spawning grounds for fish and sanctuaries to rehabilitate the degraded marine resources. A 3.8 km causeway with an adjoining boardwalk was constructed by the island residents themselves that connects Lawis to the Calape mainland. The causeway links residents of the two areas together under the Lawis Farmer's and Fishermen's Association (LAFFA). The causeway was also the area's first venture into eco-tourism.

Before the introduction of CRM, unscrupulous people from other islands engaged in dynamite fishing which led to the degradation of coral reefs and a decline in the fish catch. LAFFA was born out of DENR's efforts to empower local people to manage their own coastal resources. LAFFA/DENR taught participatory coastal resource assessment techniques to the Lawis people's organization, sparking a realisation of the importance of coastal resources in their day-today undertakings.

The DENR-led programme also provided training and capacity-building for enterprise development, coastal law enforcement, resource assessment and protection, mangrove management, establishment of MPAs and eco-tourism. As members of the *Bantay Dagat*, some members of LAFFA became actively involved in their barangay's efforts to protect coastal resources from illegal fishing. *Bantay Dagat* is a collaborative coastal law

enforcement arm of the DENR, Bureau of Fisheries and Aquatic Resources, Philippine Coast Guard, Philippine National Police and the local government units.

CRM also introduced livelihood programmes. Cooperatives were given loans for raising livestock, distributing hogs, supporting seaweed aquaculture, and renting cottages and boardwalks. Their latest venture, lobster aquaculture, has emerged as the most promising endeavour because of the high price of lobsters. Fish harvesting has also increased after the establishment of a 13.5 hectare marine sanctuary in the area.

Pangangan Island is now not only a haven of peace and tranquility for its people and visitors, but also a refuge for fish and a place with sustainable livelihood opportunities for the poor and marginalised fishermen living in the coastal areas.

Fiji: local participation in coral reef restoration

Fiji's effective, innovative coral reef restoration method employs local consultants and has the potential for widespread use. Developed over many years by US marine biologist Dr. Austin Bowden-Kerby, the method is based on the increasingly accepted idea that the best way to save endangered reefs is not necessarily by eliminating human impact, but rather by carefully managing it. This method places special emphasis on working closely with the local people who best know and depend on the reef.

Coral Gardens Initiative

The Coral Gardens Initiative, as the project is formally known, exists in eight villages in the Cuvu and Tuva districts of Fiji. This method goes far beyond simple management. It seeks to actively "cultivate" the reef by removing overabundant predators, such as octipi and the coral-eating Crown of Thorns starfish, while at the same time "planting" missing or low count species that are friendly to the reef, such as the giant clam. These areas are then protected. The initiative promotes active participation of the entire coastal community and successfully draws on their knowledge of the reef by employing consultative methods that endorses participation by all.

The project's success is exemplified by its innovative use of resource maps that create special no-fishing zones, or MPAs. The project utilised the pre-existing tradition of Fijian village chiefs, whereby sacred taboo *(tabu)* no-fishing zones were created within the reef. Although the *tabu* areas are relatively small, if managed properly, they can create a "spill over" effect; fish and shellfish in the protected areas can reproduce and eventually migrate to non-protected areas, restoring the once bountiful harvest.

A distinctive element of the Coral Gardens Initiative is its emphasis on women. This is essential because the in-shore reefs are predominantly women's fishing areas; as a result, it is these women who have the seasonal knowledge about fish. Women also tend to be more willing to follow the no-fishing rules established to restore the reefs.

Another unique feature of the project is the new partnership forged with the private sector. The Shangri-la's Resort managers gave the project over one hundred thousand US dollars. The Shangri-la also helped to fund community workshops and train local fish wardens who are then employed by the resort to help monitor and enforce the no-fishing zones. It also financed the construction of hundreds of "fish-houses," igloo-shaped structures made of cement and stones, which are planted with corals to improve the habitat of reef-dwelling fish.

The Coral Gardens Initiative is ultimately unique in the way it encourages local village people to conduct simple trial-and-error restoration experiments, and in doing so helps them learn first-hand how to work and "train" the coral reef ecosystem to return to its formerly abundant, beautiful and diverse state.

Recently, coral reefs of the South Pacific have received attention as a source of chemicals that research indicates may be cures to cancer, AIDS and drug-resistant bacteria. Those same corals, traditionally part of the Pacific Islanders' environment, are objects of the growing interest of pharmaceutical companies due to their medicinal potential. Such discoveries are a new source of significant economic returns from marine resources.

Bioprospecting

Verata, a small county consisting of eight villages near the Fijian capital of Suva, is known for its bluegreen coastal lagoons and abundance of marine resources. Recently, the residents of Verata joined with the University of South Pacific (USP) to establish a unique bio-prospecting agreement in conjunction with the Scotland-based pharmaceutical research company Strathclyde Institute of Drug Research (SIDR). People received financial benefits in exchange for subjecting their medicinal plants to evaluation. The villagers were responsible for collecting and processing preliminary samples. Instead of simply selling the plant or animal samples to a pharmaceutical company, extracts are prepared at USP and then licensed for evaluation by the Scottish group to other pharmaceutical companies for evaluation. Payments or income to the villages are derived from the licensing of the samples. After one year, the samples may be further licensed by SIDR or returned to Fiji. Since Fiji is a relatively small country and the project participants have close contacts with appropriate government officials, the project is well positioned to influence government policy for prospecting at a national level. Additionally, the practice empowers local communities, giving them the ability to make the necessary decisions to manage their biological diversity. This is especially important in the Pacific where most traditional people have clear tenure rights over their resources.

The Verata model for bioprospecting proved that when local knowledge skills are recognized and respected, local communities can be effective partners in marine conservation. An understanding of traditional management practices is useful as it is generally easier to adopt something familiar than to introduce an entirely new concept. At the same time, the involvement of women and youth should be encouraged, as this can lead to broader participation and therefore a greater chance for sustainable resource management.

Solomon Islands: conservation and sustainable fisheries

In the Solomon Islands, an assisted fishing enterprise demonstrated the value of conservation efforts occurring alongside traditional fishing customs. The Arnavon Islands are home to an extraordinarily diverse group of marine mammals. Important endangered animals such as the hawksbill turtle occupy the area, as do many commercially valuable animals such as sea cucumbers *(beche-de-mer)*, trochus, black and gold lip pearl oysters, giant clams and various reef fish. The local economy traditionally allowed for the harvesting of these organisms on an "open access" basis. However, in the 1980's, shellfish prices went up, leading to overharvesting. One by one, stocks of marine organisms were depleted.

In response, the government immediately set up the Arnavon Islands Community Marine Conservation Area, prohibiting the removal of commercially-important key species. The project calls for the implementation of a management plan in the *tabu* area and also requires the development of sustainable deepwater finfish enterprises. The project goal is to provide communities with alternate food and income sources while simultaneously taking the pressure off the reef species. Six community officers from the village monitor the project. This conservation area marks the first time communities in the Solomon Islands have created a marine sanctuary. The area is the country's first comparatively managed marine conservation area. Today, turtles nest in peace on the small islands of the Arnavon group. Mangroves are growing back naturally and are also being replanted by conservation officers. Even the previously depleted stocks of marine invertebrates are beginning to return to former levels. In addition, there has been a noticeable upsurge in populations of resident birds, especially pigeons that had been heavily hunted in the past.

Qatar: multinational conservation

Qatar is a sovereign and independent Asian state located in the Arabian Gulf. Its 700 kilometers of coastline are characterized by salt flats *(sabkha)*. Within the last decade, vast areas of coast have been built up, endangering fish populations, wildlife habitat, mangrove areas that act as buffer zones, and recreation areas.

Qatar continues to develop at an incredibly fast pace. Because of its small native population, many expatriates from different parts of the world have been recruited to work in Qatar. These expatriates include Indians, Pakistanis, Bangladeshis, Sri Lankans, Indonesians, Filipinos, Thais, Palestinians, and Egyptians. Notably, there are over 35,000 overseas Filipino workers in Qatar alone. Under the auspices of the Philippine Embassy in Doha, the Filipino community was led by students from the Philippine School in Doha on a campaign to plant mangroves and trees in wetlands in municipalities of Al Khor and Al Dakhira.

The Filipino community's mangrove project was the first environmental project to be implemented by an expatriate community in Qatar. The project highlighted the growing environmental concerns that are emerging throughout the country. Qatar-based multinational companies sponssored the project because of its novelty, the lasting benefit it

would provide for the country's coastal environment and its contribution to helping protect the nation's growing population.

This project successfully met its mandate to *enhance knowledge and learning about the benefits of mangroves as wetlands and achieved its purpose, which was to strengthen close family ties and cooperation through mangrove planting*. The project now is in its sixth year and is considered a success, with a 60 percent survival rate of plantings every year. Most important, however, is the growing awareness in Qatar of the wetlands and the increased desire of the community to promote sustainable development in order to protect the diverse community.

Conclusion

Scientists predict an accelerated rise in sea level for the 21st century. Possible implications of a higher sea level include increased periods of flooding for wetlands and shorelines, accelerated retreat or erosion of coastal areas, and intrusion of saltwater into coastal freshwater resources. In response, marine and coastal wetland managers feel an urgency to pursue effective management through education while the benefits of these important natural resources can still be enjoyed. Sustainable development must be pursued in both marine and coastal wetlands. For this purpose, the experiences of the Philippines, Fiji, the Solomon Islands and Qatar must be shared, learned and applied elsewhere.

References:

Biodiversity Conservation Network (1999). *Evaluating Linkages between Business, the Environment and Local Communities: Final Stories from the Field*. Washington, D.C.

In Fiji, a New Approach to the Restoration of Coral Reefs Draws Notice. *ONE COUNTRY Baha'i International Community, Volume 14*.

Kemp, E. (ed) (1993). *The Law of the Mother: Protecting Indigenous People in Protected Areas*. World Wildlife Fund for Nature: San Francisco.

Pena, M. (2005). *Pangangan Island: A Model in Coastal Resource Management*. Philippine Star: Manila (18 September 2005).

Pulea, M. (1985). *Customary Law Relating to the Environment*. Topic Review 21, SPREP: Noumea.

Scott D, and S. Hussain (1993). *Strategic Issues for Wetland Conservation in Asia*. Asian Wetland Bureau: Kuala Lumpur.

Tolentino, A. (2006). *Wetland Cultural Heritage in the Pacific* (unpublished).

Interactive approach to sustainable management of coastal wetland ecosystems in Bangladesh - a case study

Sanowar Hossain, Bangladesh POUSH, President

Introduction

Bangladesh is unique in the nature of relationship that exists between its people and wetlands. An overwhelming majority of the population directly depends on wetland products and services for livelihoods with many communities densely settled in and around wetlands. For centuries the people maintained the relationship through recognition of the wetlands significance and respect for its contribution. Local traditions and customs evolved and eventually governed through undertaking and discharging the role and responsible actions necessary to sustain wetland habitat, functions and assigning attributes.

Those days have given way to a new era of norm, rationality and institution. Wetlands have been reduced and degraded because of population pressures, demand for wetland products by distant markets and the local population for sustenance, non-judicious infrastructure that obstructs or prevents wetlands from maintaining their ecological functions because of the disturbances they create in the hydrological cycle. In addition, government policies and institutions that govern access, control and utilisation of wetlands have weakened traditional customs and rules of wetland governance, leading to poverty and stressed ecosystems.

Wetlands in coastal areas being developed have been affected by natural and human-induced changes. Deforestation, conversion into shrimp farms, settlement pressure, and over exploitation has led to the degradation and destruction of wetlands particularly as these have disrupted breeding, feeding, and habitat sites for flora and fauna species. Traditional management systems have been challenged and overwhelmed by the powerful groups whose actions threaten the existence and functioning of wetlands and equitable distribution of wetland benefits and uses.

Coastal communities comprise a large part of the national population, with many livelihoods directly or indirectly dependent on wetlands. If measures are not taken, over-exploitation of wetlands resources, depletion of the resource base and degradation of biodiversity in the coastal wetlands will result in increased risks and vulnerabilities and shrinking livelihood opportunities and resources to rely upon for the future. On a wider scale, if the yields from coastal wetlands decline, as a result of this trend the livelihood security of the communities will be in jeopardy.

To address the above problems Bangladesh POUSH has been involved in organising and building capacity of local communities for participatory management of coastal wetlands in collaboration with Ramsar Centre Japan and with financial support from the JFGE for a period of three years,

This project, "Community-based Coastal Wetland Management: Building Capacity and Organising Communities," was based on a Community Capacity Development approach, whereby the interventions were aimed at different dimensions through different forms and levels of community participation in wetland management. The project has been building capacity through knowledge sharing and applied training in managing wetland resources.

Approach

The project's overall approach is to initiate processes to enhance the local community's

capacity to address wetland resource conservation and management through a participatory approach.

Primary stakeholders will be hosted in discussions on causes of problems and proposed solutions to problems. By engaging with stakeholders and promoting conservation, the people have learnt about the unique wetland ecosystems and demonstrate through their knowledge that the effects of the programme will remain long after the project's actual activities in the area have ceased.

The programme is being implemented in Badarkhali Union of Chakaria Upazila under Cox's Bazar district in the Southeast coast of Bangladesh.

Targeted primary stakeholders are local people living in the project area, including fishermen, farmers, landowners, entrepreneurs, traders, teachers, students, civil society, the elderly, and social organisations.

Issues in participatory natural resource management in coastal wetlands

- Ecological issues: species exploitation or harvesting, destruction of habitat, existing agri-practices
- Economic: limited income opportunities and lack of community institutions
- Social: lack of awareness, interest and co-operation among local actors and institutions

In accordance with the above key problems, the following activities have taken place:

- To mitigate the ecological exploitation and destruction, the activities will boost the community's capacity to protect habitats and introduce biodiversity-friendly agriculture and farming
- To deal with economic problems, communities need an enhanced capacity to plan and responsibly manage wetlands and livelihoods
- To address the social problems, sustainable use and conservation programmes for wetland resources through participatory management

Direct versus interactive participation for community interventions

Building local capacity is likely to depend more on how support is given than on how much is given. For example, support that creates dependency or that alienates people is likely to be worse than giving none at all. A negative correlation is observed between local organisations' performance and the amount of links with other organisations. On the other hand, strict "autonomy" is not likely to be most productive for local institutional development as some degree of outside involvement can have positive results so long as it does not become "direction" (Sumon 2006). Opportunities and costs for both the direct (currently practised) approach, and interactive approach are outlined below to identify the gaps:

Table of approaches
(source: Sumon M. A., 2006. Local Institutional Development for Natural Resource Management in Bangladesh, Royal Institute of Technology, US-AB, Stockholm, Sweden)

Direct Approach	Interactive Approach
• People are involved in interviews or questionnaire based "extractive" research • None or less opportunity is given to influence the process or to contribute to, or even see the final results • Likely outcome for stakeholders: generates information, but that is all • Asking for views on proposals and amending them to take these views into account • May keep participants informed of the results but ultimately no real share in the decision-making process • Enlisting help in meeting the predetermined objectives of a wider plan/programme • Stakeholders tend to be dependent on external resources and organisations • Likely outcome for stakeholders: can enable implementation of sound intentions, as long as support is available	• Self-mobilisation for catalysing change. • Stakeholders take the initiative to use wetland resources wisely • They may contact external organisations for advice and resources but ultimately they maintain the control • Likely outcome for stakeholders: very strong sense of ownership and independence • Interactive participation for joint analysis and action planning • The stakeholders themselves take control and have a common goal to achieve • Community members influence other groups to initiate change

Major activities

The major activities of the project are as follows:

- To protect and restore the natural resources of coastal ecosystems through active participation of local communities
- To enhance the capacity of local resource users and stakeholders in ecological management of resources which they can largely manage themselves
- To encourage the stakeholders for participatory protection and conservation of natural resources providing recognition/ material support

Methods of intervention

Creating awareness

At the beginning of the project, POUSH started an awareness-raising campaign among stakeholders in the project area to outline the aims and objectives of the project as well as highlight the importance of coastal wetlands and its support services to the people. To raise awareness, POUSH used different multi-media tools such as video, posters, focussed group discussions, community consultation. Through these activities all local stakeholder became aware of, and concerned about, the importance of wetland resources and their conservation. They realised that only local participation in development activities can protect and conserve the wetland.

Through the process of the initial awareness activities, POUSH was able to convince local government representatives (such as the union council chairman and member) and social organisations to contribute voluntary services to the activities of the programme. Local stakeholders such as farmers, fishermen, teachers, traders, and the elderly also shared their knowledge and experience of wetland resource use through focus group discussions.

Over an active period of 30 months, different groups of people have shown interest in protecting and conserving the wetlands. People in the project have clearly understood that communities have their own role to play in managing wetland resources.

Group formation & development

After selecting target group members from the local community, a total of eight groups were formed of fisherman, landowners, teachers, students, farmers, traders, elderly people, and children who collect shrimp fry. Each group consisted of 15 members. After forming, each group developed through meetings and discussions, with members gradually realising the importance of groups and responsibilities to protecting their own interests and also community interests.

Development of training materials

Four training and awareness booklets were developed through consultation with different community group members, trainers and training specialists. The booklets are written in very simple Bangle language with pictures so that the simple literate can understand the subject matter. The names of the booklets with their English names are as follows:

- Natural resource management *(Prakritik Sampad Byabastapana)*
- Coastal wetlands resource management *(Upakulia Jalabhumi Sampad Bayabastapana)*
- Biodiversity conservation: what to do *(Jibabichitra Rakha: Amaderkaronio)*
- Group formation and management *(Dolgathan `O' Byabasthapana)*

A total of 2000 copies (500 for each type of booklet) have been published and distributed among the community group members, local NGOs, CBOs, donor agencies and concerned government agencies. (An English version of the booklets are available in desktop format.) These training materials are also widely used for capacity building of the community people for conservation and sustainable management of wetlands.

Capacity building trainings for group members

Training was conducted to build the capacity for community group members on sustainable coastal wetlands resource management. A total of 46 training courses were conducted for the eight stakeholder groups at community level such as the fisherman, teacher, landowner, pupil, farmer, old person, child who collects shrimp fry, and entrepreneur. Each training course covered theory and practise. The training was participatory and was based on the local coastal ecosystem and experience sharing. Each course was for 15 group members, with a total of group members actively participating and benefiting from the training courses.

The training was conducted in Bangla with a local accent and available communication materials were designed and prepared based on local needs and demands. Trainers facilitated training with expertise in the relevant fields. Below are the major topics for the training.

- Natural resource management
- Biodiversity conservation
- Need and methods of coastal wetlands resources management
- Sustainable use of coastal wetland resources
- Restoration of coastal wetlands resources for livelihood security
- Community's roles and responsibilities in natural resource use and management
- Effects of destructive fishing

Training made the participants aware of the importance of coastal wetlands resources and livelihood security and also made them better at recognising potential uses of natural resources such as fish, mangrove, tree resources, shrimp, salt, and seashells.

Establishment of a child education centre

Eleven education centres were established. This informal Primary Education was for the poorest children of the community. After completion of this courses students were admitted to the government primary school. In the coastal area shrimp fry collection is the livelihood of the area. Each centre has 30 children and visual educational materials such as posters on different environmental messages were used to help the students better understand the environment. Moreover, the importance of fish fry and effects of destructive methods for shrimp fry collection were discussed and demonstrated in addition to basic elementary education. The students were 6 to 14 years old and were taught not to use destructive methods of shrimp fry collection. More children from the project area are interested in becoming students of this education centre, and a locally educated girl has been engaged as teacher.

Establishment of mangrove nursery

A mangrove nursery was established at each Badarkhali project site with the participation of trained community group members who managed to raise 10,000 thousand saplings. Twenty thousand seedlings of Keora *(Sonneratia apetala)* and Bain *(Avicennia officinilis)* were reared in the nursery. The seedlings were grown from seeds. Community group members were involved in maintaining the nursery and the seedlings were used for mangrove restoration in the degraded project area, with the rest distributed among local shrimp farmers for planting on the lower slope of the bank of shrimp farms. During the last planting season group members started selling mangrove saplings to the local shrimp farmers and others through which group earned additional income.

Mangrove plantation site

A total of 50,000 seedlings of Keora *(Sonneratia apetala)* and Bain *(Avicennia officinilis)* were planted for a 2 km mangrove restoration. A trained group member did the restoration on both sides of the Moheshkhali channel near Jomghate. Mangrove saplings have been planted in between commercial shrimp firms. Community group members are involved in looking after the young mangrove saplings once planted. The restoration belts are in the tidal zone, and restoration is ecologically supported by tide and salt torrent grasses that facilitate mangrove success. The shrimp farmers are encouraging and helping group members in maintaining the restoration process.

Local level workshop

A day-long local level workshop was organised on "Community based coastal wetland management" in Cox's Bazar, which is close to the project site.

The workshop attracted different stakeholders, including fishermen, shrimp fry collectors, school teachers, a community leader, local traders, school students, members of organised groups, NGOs, representatives from COB's, local government representatives, project staff and related researchers, an environmentalist, an extension specialist, a UNDP representative, and a representative from RCJ - Tokyo, Japan. A total of 80 participants were present and actively participated in the workshop. After presentation of papers on different issues and topics relating to coastal wetlands, open discussions took place. Participants, mainly local group members, took part in the open discussion and shared their own experiences on natural resources including how wetland resources are being used and exploited, and expressed their views on protecting, managing, and restoring degraded wetlands. Participants of the workshop unanimously concluded that capacity building of community members is needed to ensure their participation in sustainable coastal wetland management.

Regional workshop

A day-long regional workshop on the role of community for sustainable coastal wetland resource management was organised in Cox's Bazar, a coastal district town near the project area.

The main objective of this regional workshop was to share experiences, and knowledge of community-based practises of coastal wetland management. Information was also shared about interactions between NGOs and community wetland resources, the importance of mangrove forests in coastal zones, and the responsibilities of the community and other stakeholders in enhancing sustainable coastal wetland resource management.

The regional workshop attracted different stakeholders such as local fishermen, university students, school teachers, shrimp fry collectors, community leaders from different areas of the coastal zone, representatives of NGOs from the south west coastal zone of Bangladesh, representatives of CBOs, students from Dhaka University, project staff, related researchers from Chittagong University, the local UN representative, a representative from RCJ, Tokyo, Japan, media personnel from Dhaka, and a representative from the Department of Forest Fisheries Govt. of Bangladesh.

A total of 70 participants actively participated in the workshop. Four papers were presented in different sessions of the workshop on different issues, and topics related to coastal wetlands such as coastal wetland management, sustainable use of coastal resources, conservation awareness. Stakeholders participated in the open discussions that followed each presentation. The participants shared their experiences and views on the open discussion. Fishermen also participated in the open discussion and shared their experience

and views on conservation and sustainable use of coastal wetland resources. Students from POUSH school centres also shared their experiences on shrimp fry collection, and how they were collected in an environmentally-friendly way.

International workshop

An international workshop on 'Sustainable coastal wetland resource management through involving local people' was conducted on February 14, 2006 in Dhaka. The workshop was attended by a number of international and national delegates. Experiences and success of the project implementation were shared with the workshop participants. The international participants also shared their success stories from similar kinds of activities. Beneficiaries of the project also participated in the programme. The workshop was followed by a field trip to the project area. The project was greatly appreciated by the participants and other relevant stakeholders.

Brief summary of project results

Positive outcomes of the programme were good practices implemented by the community to prevent juvenile poaching, to increase the mesh size of nets, and to put pressure on environmental development activities of the Government.

- Local people were divided into a number of groups depending on their interests and experiences such as farmers, fishermen, entrepreneurs, teachers, landowners, old people, and students, that have taken part in conservation and wise use of wetlands.
- All the members of the groups have gone through different training programmes for their capacity building to manage the natural resources in an appropriate manner.
- Awareness activities have been widely conducted to disseminate knowledge about the importance and benefits of conserving wetland resources.
- Local government, authorities, NGOs, enterprises and other social organizations have been strongly urged to participate and cooperate in the conservation activities.
- Each group was taught management skills, making resource inventories and resource maps. They were instructed on the identification and prioritisation of various problems; the planning of appropriate projects; the development of resource management plans; and the enforcement and evaluation of the overall management plan.
- All the necessary training materials were developed after conducting reviews with the group members.
- Mangrove model and demo sites for wetland conservation and restoration of mangrove forests were created by the group members.
- Demonstrations of conservation, restoration and enhancement measures were conducted. Pilot demonstrations of mangrove rehabilitation have been established in two suitable locations of the Project Area.

- Environmental Awareness campaigns are conducted in the project area by trained group members to generate mass awareness about the conservation of fragile coastal and marine fisheries.
- Changes of natural resources and household livelihood security due to project interventions are monitored. The monitoring programme will also include socio-economic and biological parameters.

Reflections on project effects

- The local people have realised that they have a good chance to take action themselves, and to participate in the decision-making process by becoming a member of any group that was formed by the project.
- Local people may figure out and implement the measures to solve issues concerning natural resources on their own, and make great progress in achieving the sustainable utilisation of natural resources.
- The community is now well aware of the significance and responsibility of managing and conserving the natural resources.

Recommendations

There is now an excellent basis for the community towards reforestation, ecological restoration, and capacity building of self-sustaining economic livelihoods. Organised and trained local people have been demonstrating the enhancement of their capacity through knowledge sharing and application in managing wetland resources. Through the project activities, people from different walks of life i.e. women, fishermen, poor people, children especially those collecting shrimp, local leaders and civil society have been rewarded through sustainability of natural resources. This holistic passive approach will ultimately lead to the development of a society-based sustainable model of wetland conservation & management. For more information, please contact Sanowar Hossain at bdpoush@bdonline.com.

References

Sumon, M. A. (2006). *Local institutional development (LID) for natural resource management in Bangladesh,* Royal Institute of Technology (KTH), US - AB, Stockholm, Sweden.

Bangladesh POUSH (2005). Annual Report.

Project Completion Report (2006). Community-based Coastal Wetland Management: Building Capacity and Organizing Communities, Bangladesh POUSH, Dhaka.

Otter conservation and management at coastal areas: lessons from otter extinction in Japan

Motokazu Ando, Faculty of Agriculture, Laboratory of Wild Animals, Tokyo University of Agriculture

Chronology toward extinction

Before the 19th century, the Japanese otter Lutra lutra nippon (nomenclature is derived from the Red Data Book of the Environment Ministry) was a common aquatic animal, found throughout Japan, even in Tokyo. The literature record indicates that at one time otters might have also been found at Tsusima Island, although no specimens have been found there. After the Meiji Restoration in the 19th century, when Japan opened the country to the world, the country's otter population began to decline sharply. Japan was not yet an industrialised country, and animal fur, along with silk, was an important foreign trade product sent to Europe and America. Military demand for fur may also have been a factor in the decline of otter populations, but there is no data available to prove this theory.

Fur hunting became a profitable business, and otter fur, in particular, was in high demand because of its quality. Many new trappers travelled from river mouths deep into upper streams. Statistics indicate that the otter population decrease began before the mid-Meiji era (end of 19th century); by 1934, otter statistics were no longer kept in game animal records because the hunted number had become so small. This trend continued until World War II. Although a small number of otters survived the war, by around 1955 they were no longer found in Honshu, Kyushu or Hokkaido. In 1955, high economic growth had not yet begun.

Otters in Shikoku Island survived through the 1950s, but the rapid economic growth of Japan that started around late 1950s finally toppled the island's otter population over the brink. Deterioration of river water quality and intensive use of agro-chemicals resulted in a decline in populations of river fish, the otter's source of food. Otter mortality also increased as the gill net was used more widely at coastal areas. Areas where otters had formerly found shelter along rivers were no longer available after river improvement works. Roads for motor vehicles constructed along rivers and coasts meant many otter deaths as road-kill. This increase in the numbers of roadways also fragmented otter populations. The otter population of northern Shikoku disappeared in the 1960s, and the population of western Shikoku disappeared in the 1970s. The last capture of a living otter was in 1979, at Susaki City on the Pacific side of Shikoku. Footprints and spraints found in the area gradually decreased during the 1980s, and reliable evidence of otter existence became unavailable in the 1990s, when the otter seems to have become extinct.

Lessons learnt from the chronology

Although we lost the Japanese otter, we can learn important lessons from the process. These lessons are as follows:

- ***Hunting pressure was the major cause of otter extinction.*** Environmental issues only dealt otter populations a final blow.
- ***Otter ecology was not properly understood.*** For example, people thought otters lived in rivers, but they survived for the longest in coastal habitat areas. Also,

protected areas set out for the otter were too small, as the otter's need for long home ranges was not widely understood. The establishment of protected areas is one of the most common practices in wildlife conservation. But setting out a protected area for the otter was difficult to do in densely populated countries like Japan and Korea. According to Erlinge (1967, 1968), the straight-line length of a home range of Lutra lutra in southern Sweden is about 15 km for adult males and about 7 km for females with young. The ranges of males are better described as territories. They may overlap the ranges of 1 or more adult females, but they exclude other males. Females also defend their ranges against individuals of the same sex. In the case of L. canadensis in Idaho, seasonal home range length ranged from 8 to 78 km, with males generally having larger ranges than females (Melquist and Hornocker, 1983). Although home range size of the Japanese otter has not been studied, animal patrols were observed to walk around their home ranges and show up at a place every several days (Imaizumi, 1973). Judging from this behavior, small protected areas are not suitable for Japanese otters. Short river systems in Japan and Korea should have been designed to allow river use by otters from river mouth to upstream. At the same time, human use of the river should have made considerations for otter conservation.

- ***There was no information exchange between local governments.*** Although Ehime and Kochi are neighbouring prefectures, otter activity records of Ehime Prefecture were not shared with Kochi Prefecture. This resulted in conservation efforts that were too late to save the otters.

Conservation actions at Ehime and Kochi Prefectures.

	Ehime Pref.	Kochi Pref.
1950s	Campaign begun by local scientist	
1960/63	Survey conducted on animal distribution	
1964	Designated as "Prefectural Animal"	(Prefecture unaware of otter presence)
1970	Few individuals noted	Survey conducted on distribution
1972		
1975	Last capture recorded	Survey by Environment Agency
1990		
Early 1990s		Extinction recorded

- ***Political pressures affected conservation.*** For example, responsibility for captive breeding was assigned to an inexperienced local fishery boss rather than an experienced local zoo.
- ***Conflicts among relevant groups resulted in shortsighted or self-righteous actions.*** Examples of conflicts were: 1) Local NGOs versus local governments; 2) Local researchers versus outside researchers; 3) Amateur photographers versus local otter lovers.
- ***Raised awareness affects the availability of information.*** During the two decades after WWII, the number of otter reportings made by residents increased. Yet this increase did not reflect the size of the otter population, only revealing an increasing public awareness of otters. The fact that the number of otter reportings reached its maximum in 1965, the same year that the Japanese otter was designated as the Special Natural Monument, is no coincidence. Similarly, a decline in otter reportings after 1965 was likely because the decrease in the actual otter population outpaced levels of awareness that were no longer growing very quickly. Although these statistics gave the impression that the otter population was growing, actual otter population had been steadily decreasing, since the first stage.
- ***Conservation efforts were too late.*** In 1965, 25 years before extinction is said to have occurred, capturing small numbers of otters for captive breeding would have still been possible. In 1979, 15 years before extinction and the year that the last otter was captured in the wild, this kind of program was no longer possible. Even when multiple animals were captured, breeding techniques took a long time to develop. In the cases of the Japanese stork and the Japanese serow, more than 20 years were necessary to develop these breeding techniques, and many individuals were lost during time. This teaches that conservation measures should be started when the animal is still common.
- ***Improper research accelerated otter extinction.*** Although surveys of otter field signs had been conducted since 1978, research on conservation measures was not done.
- ***Human factors should have been considered.*** Although the Rias coast was a suitable habitat for the otter, the routes otters used to get there were blocked by coastal road construction and this negatively affected their survival.
- ***Small islands, even when they were located near large cities, could have served as suitable refuge for otters.*** Uninhabited islands provided otters with suitable refuge.

Awareness activities at Susaki City (Japan)

Susaki is a quiet city (population 28,000). In 1974, an otter was caught in Susaki at Shinjo River in the city. This news spread throughout Japan and attracted much attention. By that time, Susaki people had a sense that the otter was a phantom animal, quite near to

extinction (though in actuality populations did still exist elsewhere). This was the first occasion that local people really showed interest in the otter. In 1975 another otter was caught. In 1979, an individual appeared at Shinjo River and stayed there from April until September. On this occasion, TV and newspaper media as well as researchers and amateur cameramen came to photograph the individual. The city was drawn into a sort of otter fever.

Although there were no reliable reports of living otters in the area since then, the people of Susaki City still feels a sense of duty to collect and disseminate information on otters and to promote conservation of otter habitat. With a perspective that a habitat suitable for the otter is also a suitable place for humans, the city has adopted the otter as a symbol of the city and promotes various otter-related projects.

Making the otter a city's symbol

The local people who lived near the Shinjo River organized a group for protecting otters and nature around Shinjo River. Susaki municipal congress also adopted a request urging the Environment Agency to take immediate action for protecting otters. As an administrative response, an Otter Conservation Meeting that included prefectural and municipal officers was organized to discuss protection measures. For example, porous rock embankments instead of concrete walls were used in river disaster recovery work to enrich fish population. Fries of ayu (sweet fish) were released to feed otters. Local awareness was raised by the distribution of pamphlets and the installation of standing boards.

Susaki City Citizen's Charter

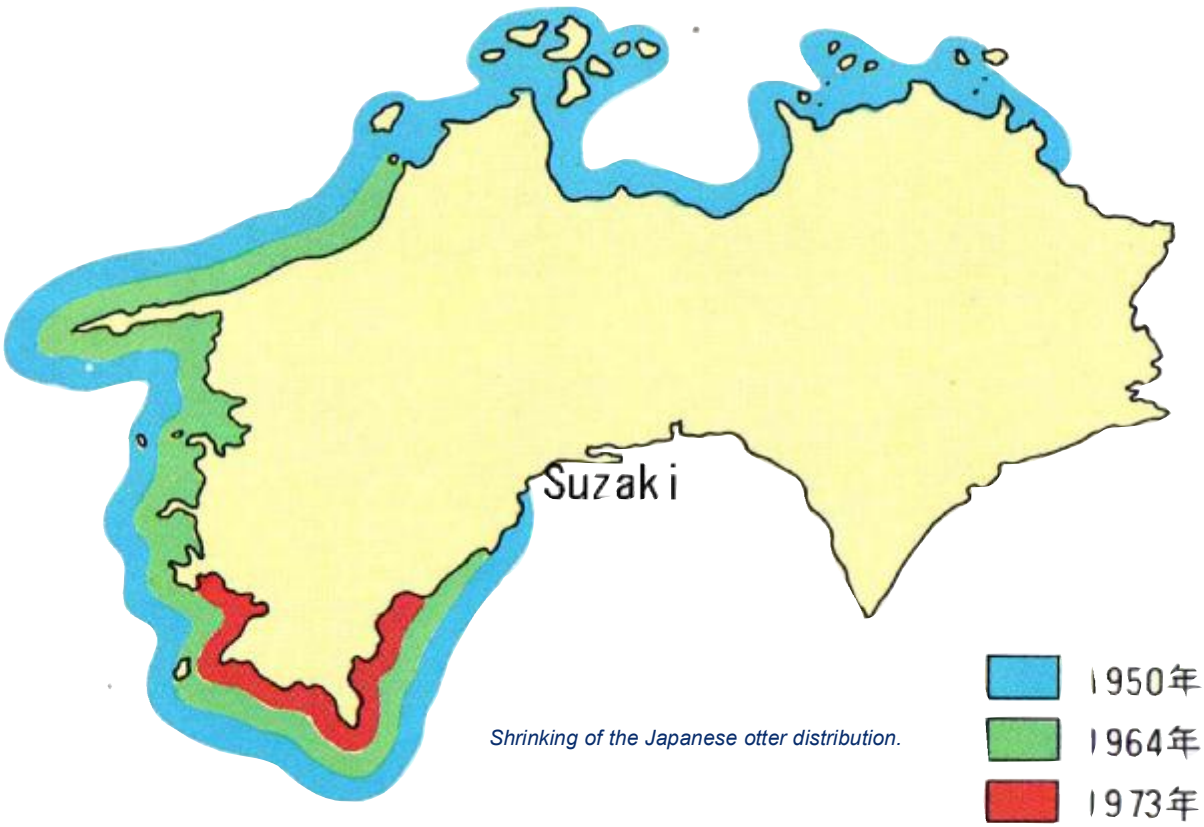
In June 1984, the Susaki City adopted a Citizen's Charter. Believing that a habitat suitable for the otter is also a suitable place for humans, the Charter incorporated and assumed as its own the phrase "Let's maintain our town as otter habitat." After that, the otter became a symbol of the city.

Establishment of the Otter Conservation Fund

In line with the above policy, in April 1993 Susaki City established the Otter Conservation Fund by appropriating an initial 10 million Yen (USD 90,000) from the city budget. Donations and interest has been added to the fund. So far only 1.3 million yen (USD 12,000) has been allocated (used in 1997 to produce an otter textbook) but other allocations are planned.

Otter conservation education targeting a younger generation

A contest was held to choose the otter symbol which the city would use, Illustrated books about otters produced by parents and their children were created, leaflets were distributed,



Shrinking of the Japanese otter distribution.

an otter photo exhibition was held, and an otter forum was convened on two occasions. In "Otter Forum 2000 in Susaki," held on 2nd October 2000, more than 600 high school and junior high school students of the city attended.

International exchange with Korea

The Japan/Korea Otter Symposium held at Kochi in 1995 informed many people about the fact that the otter still survives in Korea; most people in the Kochi prefecture are now aware of this fact. Some even visited otter habitat in Korea. Municipal administrators of Sasaki debated reintroducing the otter, and in August 2000 the 1st Sasaki municipal delegation, headed by the mayor, visited Korea and spoke about the otter. At "Otter Forum in Susaki 2000", Dr. Han Sung-Young and Dr. Han Sang-Hung were invited to the city to give lectures on the otter's status in Korea and to give advice about otter conservation in Susaki. The second and the third delegations, each composed of 10 citizens and students, were sent to Korea in November 2002 and August 2003, respectively.

Efforts of a local zoo

The Noichi Zoological Garden is a local zoo in Kochi Prefecture that was established in 1991. Since its establishment, the zoo has developed breeding programs for endangered otter species and promotes otter awareness to zoo visitors. Although the Japanese otter no longer survives, several other otter species are kept at the zoo to raise the awareness of

local people about "otters" in general; familiarity with these experiences and techniques would be helpful in the unlikely event that a Japanese otter is caught in the wild and brought to the zoo. The Japanese Association of Zoological Gardens and Aquariums has acknowledged the zoo's efforts; the zoo is also responsible for an otter blood-strain registration program that is part of the Association's Species Survival Project. This program was started in 1994 and had registered 5 otter species and 182 individuals by 2000. Frequent physical examinations and medical treatments of these animals have contributed greatly to enhanced understanding of otter blood characteristics and anaesthesiology techniques. Volunteers at the zoo can explain otter morphology and ecology to visitors, using otter models for these educational activities.

Cooperation of TV media in otter survey

Since 1976, the Kochi Prefectural Government has continued to investigate otters, running a habitat survey and studying feeding stations. However, a living Japanese otter has not been filmed since 1979. In response to a proposal from the Japanese otter conservation committee that advised the city's administration, Kochi prefecture and an Environmental Agency in 1994 developed an automatic videotape system near an otter feeding station A video monitoring camera, a temperature sensor and lighting were installed at a feeding station along a small stream near the coast. The video image was transmitted to a relaying station 10 km away, and then transmitted again to Kochi city, 85 km away from the site. The image was monitored and recorded 24 hours a day for over a year.

Wiring costs to connect the camera to the on-site antenna were funded by the budget of the prefecture and the national government, but an additional 30 million yen (USD 250K) was necessary for building transmitting, relaying, amplifying and receiving facilities. Kochi prefecture notified three broadcasting media, NHK-Kochi, RKC and KUTV, of these additional costs. These media companies provided equipment worth a total of 10 million yen free of charge, and rental companies extended their equipment loans by one year. Although these efforts were not successful and no otters were sighted, the involvement of private media companies with the otter awareness program was groundbreaking and attracted much local attention for the otter.

Conflicts between fisheries and the otter

This conflict still has not been resolved. It involves not only the river otter Lutra lutra but also the sea otter *Enhydra lutris*. These species were once widely distributed along the rim of northern Pacific Ocean, from Hokkaido, the Kuril Islands, the Aleutian Islands, and Alaska down to the California coast. After the intensive hunting to support the fur trade during 19th Century, the otter population drastically declined. In 1911, when the Sea Otter Conservation Treaty was adopted, the world population was estimated to be only around a thousand and

were spread out in 11-13 isolated populations. Sea otters were found in Japan until the end of 17th century, along the coast of Hokkaido and east of Cape Erimo, where they formed the south-western tip of otter distribution in the Pacific Ocean. Otters in Japan were wiped out during the hunting boom mentioned above. For this reason, the sea otter has not been mentioned as a Japanese mammal species in most books of Japanese fauna.

However, these sea otters are frequently sighted at Cape Nosappu, the eastern tip of Hokkaido. According to Hattori et al. (2002), the first sighting after World War II took place in 1973 at Kiritappu, in the eastern part of Hokkaido. Before 1994 the sea otter had been seen on the eastern half of Hokkaido. After 1996, sea otter sightings became frequent at Nosappu and neighbouring coasts, and otters were observed on 108 different days prior to December 2002. This trend reflected that otter visits increased and that otters had been staying in the region longer. From 1973 to 2001, seven otter mortalities were reported; six deaths were caused by gill net and one involved a fish net. Coastal harvest of fish, Kombu kelp, and invertebrates such as sea urchins (which are part of a sea otter's diet) sustain key industries in this region. For these reasons, it is not simple to resolve the conflicts between fishing activities and otters. The problem is made more complex by the natural limitations of the otter species, which requires water temperature below 20 degree C and only live in nutrient-rich upwelling areas where they are likely to compete with fishermen.

Conclusion

In closing, it is important to understand that the otter is closely tied to "ecosystem services and human well-being" because of its importance as a wetland ambassador, and its importance to, and impact on, the local culture.

Rapid appraisal of a high-altitude wetland of Nepal[1]

Dr. Bishnu B. Bhandari, President, Forum for Ecosystem Management (FEM)
Nepal and Nepal Wetlands Society[2]

Introduction

The paper is based on review of secondary information and on primary data gathered from two field trips to the Gosainkunda at the time of the Dashahara and Janaipurnima festivals of 2006. The intention of the paper is to provide basic information to the reader about a high altitude wetland of Nepal.

The Gosainkunda: a high altitude wetland

It is estimated that some 6% of land in Nepal can be categorized as wetlands under the Ramsar definition. These wetlands circumscribe all the physiographical zones of Nepal and include the High Himalaya, High Mountain, Mahabharat, Siwalika and Terai areas. The High Himal Zone, the area that lies above 4,000m which is generally characterized by exposed rocks, ice-covered massif, glaciers, glacial lakes, glacial river, snow field and the crest of the Himalayas, provides headwater to the major river systems of Nepal (Koshi, Gandaki, Karnali and Mahakali). Most of the High Himalaya is in a natural state, but many meadows on the slopes of glacial valleys have been overgrazed, causing sod breakage and soil movement. The glaciers of the area are receding, strong indication of global warming or climate change. Compared to other ecological zones, the High Himalaya zone is biologically less rich, but it is culturally significant and provides habitats for several endangered and protected species, including snow leopards, musk deer, and red pandas

Rapid appraisal was carried out on the Gosainkund lake of the Rasuwa District. The lake is 4,380 meters above sea level. Cradled between naked craggy peaks, the Gosainkunda area is believed to have about 108 mythical lakes. In the catchment area of the Gosainkunda there are about 7 lakes. The waters from these lakes, with the exception of water from the Suryakunda lake, drain down to the Gosainkund and then to the Bhairabkunda and the Saraswotikunda.

During the winter season the lake freezes, up to one meter deep. At this time, people walk on the Kunda[3] and offer flowers to the giant rock that lies at the center of the Kunda; it is believed that the rock is the sleeping image of Lord Shiva

Although Dhunche, the headquarters of Rasuwa District, is only 167 km away from Kathmandu, it takes about one day to travel to Dhunche from Kathmandu. To reach the Gosainkunda from Dhunche two days are required because it is important to acclimatize to the high altitude area. Local people can go to the Goainkunda and return to Dhunche in the same day.

Morphometric data suggest that the lake covers about 13 ha of land and has maximum water depth of 26 meters. The trough valley lake contains about 1.5 million cubic meters of water and its transparency is at over 10 meters. PH of the lake is 7.5 (RECHAM Consult et al.; 2005); microphytes are the only organisms that live in the lake. It has a southwest orientation, and its perimeter totals 1503 meters.

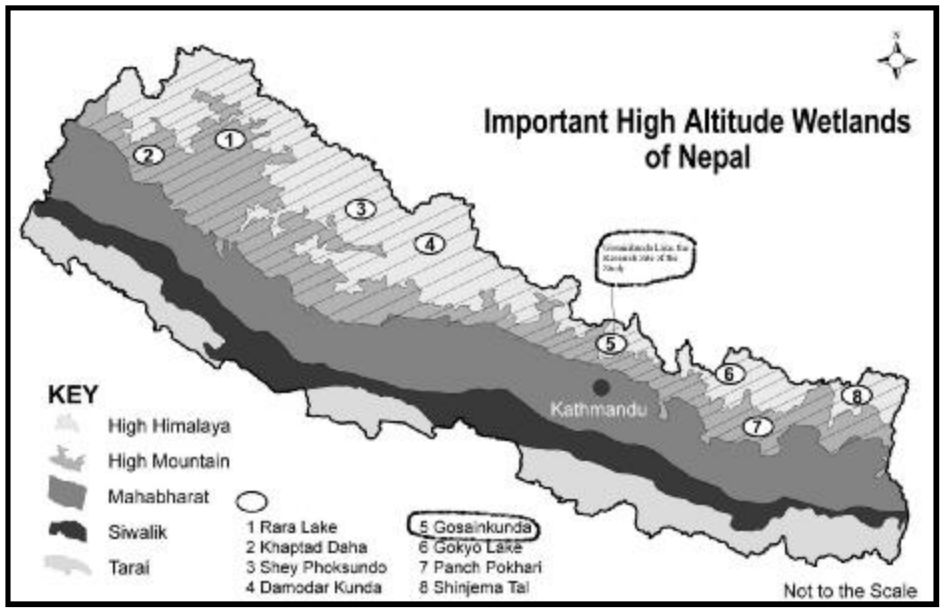
Famous pilgrimage site

The Gosainkunda is believed to be a divine lake, created by Lord Shiva to alleviate the excruciating pain that had been caused when he swallowed *Kalakut Bish*, a fatal poison. For this reason, the lake is one of the most sacred high altitude wetlands of Nepal and is one of the holiest pilgrimage sites. In 2006 alone, some 30,000 pilgrims visited the lake and bathed in its sacred water. Pilgrims usually visit during two times of the year: the first is during the time of *Ganga Dashahara* (the first ten days of *Jestha Purnima*, or "bright moon night period") in June, and the second is during *Janai Purnima* (the last 10 days of *Shrawan Purnima*, or "bright moon night period") in August. Hindus and Buddhists come to the area with the belief that they can earn merit for their eternal life by washing away the year's sins in the Gosainkund. These pilgrims are culturally diverse, representing many of Nepal's different Hindu and Buddhist ethnic groups, and have a variety of traditional rites, rituals, dress, songs, Shaman dances, and foods (Sharma, 1999 and 2005; Poudel, 1995).

During these festivals, many temporary *Tharpus* (makeshift camps) are constructed along the trail from Dhunche to Gosainkunda, catering to the needs of pilgrims; in 2006 alone, some seven dozen Tharpus were constructed. Permanent eco-friendly hotels and lodges also can be found along the trail.

The author met an 84-year-old man making his pilgrimage to the Kunda. Many believe that it is important to visit this place and take a religious dip in the Kunda at least once in lifetime. Those who lack the strength to walk can be carried by a porter, on horseback, in a stretcher, or even on a palanquin.

Shamans (local healers) regard Lord Shiva as their Spiritual Guru, the ultimate source of power. Shamans come every year at the time of *Janai Purnima* to pay homage to their Guru. Each shaman comes with a group of sixty to seventy men and women from different places. The groups chant prayers and religious eulogistic songs and do a dance called *Shey Gombha*. In the *Shey Gombha* dance, men and women separate



Map of Nepal, showing the Gosainkunda and other high altitude wetlands

by gender into two groups, dance in duet, and finish by saying "*Shey Gomba Shek Shek Shek*" and dancing in a circle clapping.

The area's sacred, remote and inaccessible nature provides a good opportunity for the people to support their livelihoods by selling medicinal and aromatic herbs, providing shelter, food, lodging and fuel wood to pilgrims, selling crafts and dairy products from their Chauries, and finding employment in other ways. The Kund also provides fresh drinking water to the people living in Lauri Bina.

Since Lord Shiva himself created the lake by piercing his *Trishul* into the mountain, it is extremely sacred and is revered by the Hindus and Bhuddists of Nepal. Even though the lake is in a remote, difficult-to-reach area of the High Himalaya region of Nepal, people throng there for the *Darshan* (honorific sense of seeing for Hindus and Buddhists) of Lord Shiva in the clean water of the lake. Pilgrims perform rites and rituals upon reaching the area and include taking *Snan* (a holy bath) in the lake, offering *Tarpan* (waters) to gods and ancestors, worshiping the Phallus of Lord Shiva in the temple, the lake (and the marked rock in the center of the lake, in the winter season) and the source of the Trishul Dhara (Sharma, 1999).

Buddhist pilgrims

Buddhists, particularly the Tamangs and Sherpas, attach great importance to purity of the mind *(Shuddha Man)*. In order to attempt to keep their minds as pure as possible, they never bathe or dip in the Kunda, but instead perform the following to purify their mind and body:

- They bring waters in their hands, wash their face, and purify themselves by sprinkling holy water around the head and body.
- They circumambulate the lake, considering it the divine form of Lord Shiva.
- After the circumambulation, they eat food or drinks at the edge of the Kunda. Their practices create little risk of human-caused pollution for the Kunda.

Hindu pilgrims

On the contrary, Hindus and the Buddhist Newars do bathe in, and worship, the Kunda. This certainly pollutes the water of the Kunda. Their other rituals performed in the Kunda are summarized below.

- They take a bath, dipping themselves in the Kunda at least three times; then they offer waters to the Sun God and their ancestors.
- Next, they worship Lord Shiva *(Phallus)* by offering Jal (pure water) and then burning incense *(Dhup)*, lighting oil-immersed cotton wicks *(Dhip)* and offering fruits, sweets or coconuts *(Naibedh)* to God. Finally, they circumambulate the temple. Some pilgrims even float the burning oil cotton wicks on a *Tapari* (leaf plate stitched with bamboo pecks).
- The Brahmans and Chhetries exchange their sacred threads after the religious dip in the Kunda and get a priest to tie sacred thread around their right wrists. Youngsters who have not yet been initiated can wear a new sacred thread here without going through a lengthy ritual.

Shey Gomba Dance in the front yard of the Madadeva Shrine

- Next, the pilgrims go to the Trishul Dhara (the Kunda's water source), which lies above the Kunda on the North. Here, they worship the Trishul (a three pronged iron staff used by Lord Shiva), its three points symbolizes three universal governors: Brahma, Bishnu and Maheswor, under the shelter of a boulder before offering copper made in Trishul to the Trishul Deva. They also light oily wicks in the shrine.
- Finally, the pilgrims go down to the shoreline and circumambulate the Kunda, invoking prayers and shouting loudly "*Jai Shambhu*" (Victory to Lord Shambu). This circumambulation is the end of the rituals performed in the Kunda and it allows them to break their fast of the day.

Historical values

As much as the Gosainkunda is famous for its spiritual values, it is also important from a historical perspective. Evidence supports the claim that Milerappa, a 14th century Tibetan saint, came there for meditation. Most likely he was the one who publicized the faith of Buddhism in the area. Similarly, Malla rulers of medieval Nepal and Shah rulers of modern Nepal both made pilgrimages to the Gosainkunda and tried to set up some trusts for the welfare of all pilgrims and also for saints and hermits carrying Phoolpati and the deity of Gorakhnath, in particular. Also, Amar Sigh Thapa, a national hero, meditated here to rejuvenate his power so that he could fight back with the British to recover the lost land of Nepal. It is said that he was grimly opposed to the inequality of the treaty between India and Nepal, the Sugauli Treaty. He spent his last day at Gosainkunda.

The Sacred Pilgrimage Site: The Gosainkunda

Biological resources

Although the high mountain areas are poor in biological resources, they provide habitat for many endangered and threatened flora and fauna. For example, the dense forest near Chholang Pati, below Lauri Bina, is the habitat of the red panda *(Ailurus fulgens)*, one of the protected species of Nepal. Another protected species, the musk deer *(Moschus moschiferus)*, has also been sighted downstream of the Gosainkunda, near the Sarasotikunda. Of the five species of pica (mouse-hare) recorded in Nepal, researchers have recorded two of these species in the Gosainkunda area; only 23 species of pica have been recorded in the world. Other important mammal species that use the area are the snow leopard *(Panthera uncia)*, the Assamese monkey *(Macaca assamensis)*, the Himalayan thar, the yellow-throated martin, and bats (Karki, 2005). Similarly, 55 species of butterfly (650 species found in Nepal) have been recorded along the trail from Dhunche to the Gosainkunda.

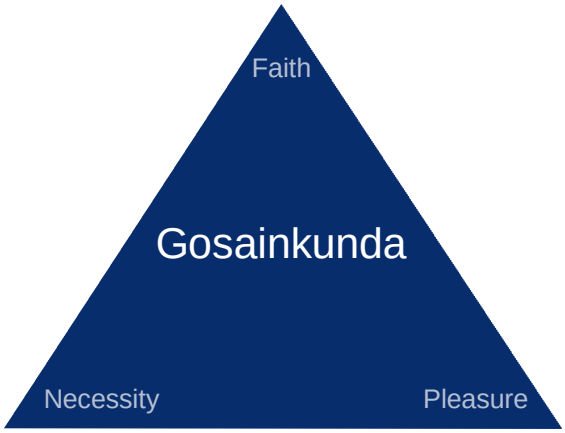
No specific study has been undertaken in the area regarding avifauna, but studies conducted in the Langtang area record some 349 species of birds, five of which are wetland species. The area's globally-threatened bird species include the Greater-spotted eagle and the wood snipe. Little is known about the wood snipe, but it is believed to be at a very vulnerable stage. Although the area is poor in biodiversity, conservation of some key indicator species - such as wood snipe - has potential. Bird-related conservation activities could draw bird ecotourism, especially for people interested in the Ibilbill and the Impheyant Pheasant. Some 110 species of birds have been recorded from the area, according to the former warden of the Langtang National Park.

In terms of floral biodiversity, 400 medicinal plants, 74 edible plants, 28 dye plants and 42 veterinary plants have been identified in the area. Approximately seven of these are endemic plants. Some of the area's plants are listed in the IUCN Red List of Endangered Species. About 7 species of Rhododendron were also recorded in the area. *Rhododendron anthopogan* is a shrub common to the area that is picked by pilgrims to use to worship the Lord Shiva and to use for tea. Some edible mushrooms have also been reported in the area.

Major issues

The author made two trips to the area in this year alone. The first one was made in June, and the second was made in August. The issues and problems encountered during these trips varied in their nature and scope but are nonetheless common problems that factor into the way we should think about conservation and wise use of the Kunda and its resources. Major issues are presented below.

- The area is generally difficult to reach because of its extreme climate andrough terrain and because those that visit risk falling ill from acute mountain sickness (AMS), a lack of oxygen, or heavy breathing.
- Natural resources face intense pressure in the face of the high demand for fuel wood, pastures and other resources by pilgrims, local people, and local livestock.
- The heavy influx of pilgrims during specific times of the year creates extraordinary pressure on lodging and food suppliers. The high numbers of visiors results in accumulation of sewage and garbage, human defecation, and other waste that pollutes the water of the Kunda.
- It is difficult to bring the area's scattered, thin population together to collaborate and engage with each other for common task of conservation.
- The high risk associated with working at altitude, combined with the necessary large time frame and large amount of resources that an in-depth study would require, makes the prospect of undertaking sustainable conservation and development projects or studies in the area quite daunting.



Conclusion: What do we make out of it?

Conservation does not occur in a vacuum. It is a process governed by many factors and external stimuli. It is widely accepted that conservation will take place when there is a stimulus driven by one or more of the following: (1) faith; (2) necessity (basic needs); and (3) pleasure (satisfaction). This is shown in Figure 5.

The drivers shown in Fig. 5 can stimulate the process of conservation of Gosainkunda resources. These drivers can be used to integrate different factors and actors into a plan for the sustainable development of the Kunda. And it is possible for the practitioners to bring these drivers together by facilitating inter-stakeholder dialogue. But this process will only be successful if we integrate the 4C's (explained below).

1. Creativeness = Creative and innovative use of resources
2. Collaboration = Working together with other partners
3. Complementary action = Helping others achieve the goal of wise use
4. Compatibility = Balancing issues related to three E's (Environment, economy and equity).

The four C's are helpful guides for the process of formulation and implementation of any conservation plan or program for sustainable utilization of the Gosainkunda and its valuable resources.

References

Karki, J. B., Siwakoti, M. and Shrestha-Pradhan, N. (2005). *Biodiversity Resources of High Altitude Wetlands of Nepal: Field Studies of the Gosainkunda-Naukunda and Gokyo Wetlands*. High Altitude Wetlands of Nepal: Views and Vision: Proceedings of the National Workshop on High Altitude Wetlands of Nepal (edited by Bishnu B. Bhandari). Kathmandu: Forum for Ecosystem Management. Pp. 67- 86.

Poudyal, B. (1995). *Gosainkund (Neelkanthakunda)* [in Nepali]. Pragya, No. 86, Nepal Royal Academy, pp. 135-137.

RECHAM Consult (Pvt.) Ltd.; HAF Consultancy Services and ERMC (P.) Ltd. (2005). *Final Report on Study including the Preparation of Topographical Map and Bathymetric Map of Gosaikunda and Bhairawkunda in Rasuwa District, Central Development Region of Nepal*. Final Report Submitted to His Majesty's Government, Ministry of Environment, Science and Technology, Department of Hydrology and Meteorology, Babar Mahal, Kathmandu, Nepal.

Sharma, D. R. (1999). *Gosainkunda: Eak Saskritik Adhyayan* [in Nepali]. Contribution to Nepalese Studies, Vol. 26, No. 2, July 1999, pp. 265-280.

Sharma, D. R. (2006). *Holy Water of the Gosainkunda: A Pilgrimmage to High Altitude Wetlands*. High Altitude Wetlands of Nepal: Views and Vision: Proceedings of the National Workshop on High Altitude Wetlands of Nepal (edited by Bishnu B. Bhandari). Kathmandu: Forum for Ecosystem Management. Pp. 111-119.

Endnotes

[1] Paper presented at the International Workshop on Marine and Coastal Wetlands: Educational Network, Capacity Building and Training, Nha Trang, Khanh Hoa Province, Viet Nam, 30th August-1st September 2006. The earlier draft was presented at the First Symposium on The Gosainkunda at Kathmandu, Nepal on the 24th August 2006.

[2] President, Forum for Ecosystem Management and Nepal Wetlands Society Correspondence address: 310/21 Sweta Binayak Marga, Babar Mahal, Kuria Gao, Ward No. 11, Kathmandu, NEPAL. Tel: +977-1-422-7011; E-mail: jureli@simsar.wlink.np

[3] Kunda means a lake in the Nepali language.

Impact of tsunami and initiative taken for the sustainable development of tsunami affected areas in India

Desh Bandhu, President, Indian Environmental Society
Aarti Kaushik, Programme Coordinator, Indian Environmental Society

Introduction

Across India, crises of many kinds have recently caused large-scale human suffering and destroyed infrastructure, crops, and ecosystems. These occurrences seem to be on the rise. Floods, earthquakes, droughts, riots, and industrial accidents are just a few examples of the kinds of disasters that have affected small towns and settlements or districts and entire regions.

The tsunami of December 26, 2004 (26/12) was one of these catastrophic events.

It affected the eastern coast of India and other parts of South and Southeast Asia, wiping out many lives and greatly affecting the lives of those who survived. The tsunami's epicenter was under the ocean at 3.320 N 95.850 E. A large section of India's coastline was damaged. Out of all of the countries affected, India suffered the third-highest losses; states and union territories affected were Tamil Nadu, Kerala, Andhra Pradesh, Pondicherry and Andaman and the Nicobar Islands.

Following the human suffering and material loss of 26/12, many agencies and individuals volunteered to participate in immediate relief measures, reconstruction work, and awareness and EE programmes.

The Indian Environmental Society (IES) and the School of Planning and Architecture (SPA) in New Delhi jointly sponsored awareness-raising and environmental education programmes about sustainable development in tsunami-affected areas. IES and students from SPA together carried out a study with the purpose of developing a long-term plan for sustainable development in tsunami-affected areas. Various awareness-raising and EE programmes supported by Friedrich Ebert Stifung (FES) are carried out in areas where IES and SPA are also working.

Tsunami impact

On 26 December 2004, an earthquake measuring 8.9 on the Richter scale shook the ocean floor near Indonesia. The world's fourth-largest earthquake since 1900, it generated tsunamis that travelled across the entire Indian Ocean within hours. Over 120,000 people lost their lives in this disaster.

In Indonesia, areas near the epicenter of the quake, especially Aceh, were devastated both by the earthquake and by the tsunami. The tsunami also affected Phuket and surrounding areas of Thailand, the city of Penang in Malaysia and areas of Sri Lanka and India. Places as distant as Somalia in Africa were affected.

Out of all countries affected, Indonesia, Thailand, Sri Lanka and India suffered the most damage. In India, parts of coastal Andhra Pradesh, Tamil Nadu, Pondicherry and Kerela were affected. Tamil Nadu had the most area affected, as the entirety of its 1000 km-long coastal belt was affected.

The main earthquake's hypocenter (or location of origin inside the Earth) was at 3.316^0 N, 95.854^0 E (3^{0}19' N 95^{0}51.24' E), some 160 km west of Sumatra, at a depth of 30 km below mean sea level (initially reported as 10 km). The earthquake itself (when considered as separate from the tsunami) was felt across a great distance and was reported in Bangladesh, India, Malaysia, Myanmar, Thailand, Singapore and the Maldives.

What is a tsunami?

The term tsunami takes its origin from the Japanese words for "harbour" (tsu) and "wave" (*nami*). It is a natural phenomenon that consists of a series of waves generated when water in a lake or the sea is rapidly displaced on a massive scale. Earthquakes, landslides, volcanic eruptions and large meteorite impacts all have the potential to generate a tsunami. Tsunami effects can range from unnoticeable changes to utter devastation. Historically, tsunami have been referred to as tidal waves because as they approach land, they take on the
characteristics of a violent onrushing tide rather than the sort of cresting waves that are formed by wind action upon the ocean.

The effects of a tsunami can be mitigated by natural factors such as shoreline tree cover. Some areas in the path of the tsunami on 26/12 were hardly affected because their coastlines were protected by belts of mangroves or coconut palms. In one remarkable instance, the village of Naluvedapathy in India's Tamil Nadu region suffered only minimal damage and few deaths on 24/04 because the wave's impact had been absorbed by a forest of 80,244 trees. The trees had been planted along the shoreline in 2002 in a bid to enter the *Guinness Book of Records*.

Environmentalists have long recommended planting trees in coastal areas to minimize the risk of tsunami damage. While it would take some years for the trees to grow large enough to act as buffers, such barriers would eventually offer a less-expensive and longer-lasting way to protect coastal areas against tsunamis. The current practice of building artificial barriers is costly and damaging.

Tsunami aftermath
(Source: World Health Organization, South East Asia Earthquakes and Tsunami - 13 January 2005)

	Area affected	Damage	Displaced	Relief	Injured	Missing	Deaths
India	2260 km of coastal land affected, penetrating 300 m to 3 km 3.6 M people affected	897 villages, 157,393 dwelling units, 11,827 ha cropped area, and 1.56 USD	646,820	594 relief camps with 377,512 people. 646,820 people evacuated	3,324 in Tamil Nadu only	5,628 (of which 5,542 from A&N Islands	10,151
Indonesia	Aceh: Districts (14 out of 21); 1 M people	172 sub-districts, 1550 villages, and 21,659 houses destroyed	605,849		1,443 hospitalized	10,078	113, 306
Malaysia	NW states of Penang and Kedah		8,000	30,000 in 9 camps	73 in-patient/694 out patint	6	68
Maldives	20 atolls, 33% of population	12,000 people without homes	21663		2214	26	83
Myanmar	10 - 15,000 affected long term 5 - 7,000 directly affected	592 houses of 17 villages destroyed	3,205 homeless/households (638)		43	3	60 - 80
Sri Lanka	Affected families 997,925), houses (103,753)	91,749 fully damaged houses and 25,731 partially house damaged	491,008		15,122		30,725
Somalia	18,000 households. 650 km of coastline, mostly on NW side	1,975 completely damaged houses		Existing IDP camps overburdened	283	5,903	150
Thailand	6 provinces on west Thai coast	6.85 M Bhatt have been provided to assist victims	8,500 evacuated to other islands	47,708 rescue workers mobilized	8,457	3,498	5,309

Impact of tsunami in India

As mentioned before, a large section of India's coastline was hit hard by the tsunami. The following States and Union Territories of India were affected:

- Tamil Nadu
- Andhra Pradesh
- Kerala
- Andaman and Nicobar
- Pondicherry

Factor	Andhra Pradesh	Kerala	Tamil Nadu	Pondicherry	Total
Population Affected]	211,000	2,470,000	890,885	43,000	3,415,000
Area Affected (Sq. Km)	7.9	Unknown	24.87	7.9	40.67
Length of Coast affected	985	250	1000	25	2,260
Extent of Penetration (km)	0.5 - 2.0	1 - 2	1 - 1.5	0.30 - 3.0	-
Height of Tsunami	5	3 - 5	7 - 10	10	-
Village Affected	301	187	362	26	876
Dwelling Units	1557	11,832	91,037	6403	110,829
Cattle Lost	195	Unknown	5467	3445	9,116

With a death toll of 7,793, the state of Tamil Nadu clearly suffered the most loss of life on the mainland. In its Nagapattinam district alone there were 5,525 causalities; entire villages were destroyed.

The death toll in the Kanyakumari district was 808; many of the causalities in this area were pilgrims taking a holy dip in the sea or visitors who had come to see the Vivekananda Rock Memorial.

In the Cuddalore district, 599 perished; in Chennai, the state capital, 206 died. Here, many people taking a Sunday stroll or playing at the Marina beach were swept away, along with residents of fishing villages who were in their coastal homes or out at sea when the tsunami hit. In Kancheepuram district 124 lives were lost.

The official death toll for the Andaman and Nicobar islands was 812. 7,000 people in these areas remain missing and are presumed dead. At least one fifth of the population of the Nicobar Islands died; some small islands had their entire human populations wiped out.

In total, at least 647,556 persons were displaced and moved to emergency shelters. Over 3.6 million people in India were affected by the tsunami. Total tsunami-related financial loss in the country was estimated at over U.S $ 1.8 billion. Over 230,000 homes were damaged in 1,089 affected villages. More than 35,000 head of livestock were lost, nearly 22,000 hectares of crop areas were damaged, and over 83,000 fishing boats were damaged or lost. Roads, jetties, bridges, hospitals, schools, and electricity and water supplies were also severely damaged.

Initiatives taken for development of tsunami-affected Areas.

Tsunami response and aftermath

The following activities occurred in the hours, days, and months after 26/12. Some efforts are continuing today:

- The Government sanctioned the distribution of funds for relief and rehabilitation measures to compensate for tsunami damage.
- The World Health Organization (WHO) provided technical assistance to district authorities to improve monitoring of the quality of drinking water and to educate people about hygiene and waste management. These activities took place in Nagapattinam, Cuddalore and Karaikal with the help of the Gandhi Gram Rural Institute.
- The United Nations Children's Fund (UNICEF) supported interventions related to the water supply, sanitation and hygiene occurred mainly at temporary shelters in three of the three worst affected districts in Tamil Nadu. UNICEF also assisted with the construction of basic sanitary facilities.
- The non-governmental sector in general made significant contributions to tsunami-affected areas. Thousands of volunteers participated in rescue and relief efforts, assisting with the removal of bodies, the clearing of debris, and with cleaning villages where rubbish had been deposited by the tsunami. Volunteers also helped distribute food, water and clothing.

Map of tsunami impact.

- Both the government and the non-governmental sector contributed to rehabilitation activities. Livelihood restoration and improvement activities were conducted as a part of sustainable development Interventions; disaster preparedness packages and other resource materials were developed; and eco-protection programmes for planting and maintaining tree shelterbelts and mangrove forests along the coast were initiated.
- Environmental rehabilitation programmes were developed. Environmental conditions which had to be addressed included debris, deposits of sea-floor sludge, and contaminated well water and housing sites. Awareness programmes for the conservation and protection of the coastal environment were developed.

Eco-restoration & awareness activities: an initiative of IES and SPA

The IES and the SPA are implementing a programme called "Sustainable development of tsunami-affected areas." The programme's goal is to implement an integrated, multi-sectoral programme that leads to sustainable livelihoods and disaster preparedness for tsunami-affected communities of Tamil Nadu, Pondicherry and Andhra Pradesh.

Understanding the characteristics of tsunami and how they release energy is an essential precursor to developing ways to mitigate their effects. Because it is not possible to prevent a tsunami, understanding how to lessen tsunami impact and how to recover quickly from a tsunami are important.

Raising awareness and understanding of natural disasters such as floods, droughts, or tsunami can help minimize the effects of these disasters. IES and the SPA were part of the movement to initiate ecological restoration and environmental awareness activities. Activities of the group included:

Preparation of studies and maps of tsunami-affected areas.

The students of SPA researched potential long-term planning strategies for new coastal settlements, for sustainable development of the coastal stretch of Cuddalore District that had been affected by the tsunami, and for rehabilitation and resettlement of tsunami-affected areas.

The goal of their studies was to understand the nature of the devastation caused by tsunamis. This knowledge would inform the development of site-specific action plans to help areas affected on 26/12 to be better prepared for the future. Major development interventions proposed by the students addressed:

- Livelihood restoration and improvement
- Shelter, water, and sanitation issues
- Disaster-preparedness packages and emergency plans
- Ecological restoration programmes
- Maps depicting effects of the tsunami on different sectors of life and analyzing the tsunamis trajectory as it passed through different areas of India. These maps were useful for investigating several topics in tsunami research.

National seminar on sustainable development of tsunami-affected areas

A two-day seminar on sustainable development of tsunami-affected areas took place in Port Blair, India from April 10 - 11, 2006. The seminar was organized by the Department of Environment and SPA, New Delhi in association with IES and FES.

The objective of the seminar was to educate academics, policy planners, and administrators, raising their awareness of the seminar topic and bringing them together to develop a sound plan for disaster relief and management.

Papers were presented on marine biology, transportation planning, the role of the public in tsunami information systems, the roles of NGOs, the government and the media in disaster preparedness, emergency rescue techniques, early warning systems, and rehabilitiation and resettlement plans.

The following recommendations related to sustainable development in tsunami-affected areas emerged from the seminar:

- **Encourage full community participation.**

  Plans for achieving sustainable conservation and planning must include all stakeholders in the project development stage.

- **Develop sustainable rehabilitation and resettlement plans.**

  If planners fail to take long-term effects of post-tsunami development into account, these development activities may end up increasing the vulnerability of the population to natural disasters. Sustainability of development activities is a critical element of disaster preparedness.

- **Construct new homes in tsunami-affected areas in a culturally-sensitive way.** Builders must take into account the special needs of the specific tribal communities that inhabit the areas.

- **Coordinate the activities of architects and planners.**

  Architects and planners should work in close association on projects in tsunami-affected areas in order to design sewage systems, rainwater harvesting systems, and other elements of shelter infrastructure that address the special needs and vulnerability of these areas.

- **Share information about sustainable development.**

  The sharing of ideas, suggestions, opinions, and information about previous activities related to sustainable development after 26/12 will help planners create the best strategies and approaches to future development activities in tsunami-prone areas.

- **Create Public resource centres.**

  These centers can provide people with information and facts related to natural disasters.

- **Develop awareness publications and resources.**

  These materials can be helpful for disseminating important information about natural disasters.

- **Organize workshops and seminars.**

  Discussions, seminars, and conferences about related issues, can help develop strategies for policy and action programmes in tsunami-affected areas.

- **Develop free medical facilities.**

  Free clinics, medicine, and other forms of health care should be provided to tsunami-affected communities.

Overview on Viet Nam's wetlands after 15 years of implementation of the Ramsar Convention

The Office of Natural Conservation, Department of the Environmental Protection

Current status of Viet Nam wetlands

With a total area of more than 10 million hectares, Viet Nam's wetlands are disbursed throughout most of the country's ecological regions. The people of Viet Nam have long lived in harmony with the wetlands, and have grown attached to the roles it has come to play in the community, in people's lives, and the socio-economic development.

Viet Nam's wetlands were first mapped out in 1989 by Le Dien Duc and the NNK. Their findings indicated 39 typical wetland areas in Viet Nam. The Department of the Environment (now the Department of Environmental Protection) initiated the 'Project for Setting up Scientific Bases for Planning Viet Nam's Wetland Protected Areas', and as a result, through 2001, 68 wetland areas with recognised environmental and biodiversity value have been designated for more and better research surveys. This list of wetland areas serves as a basis for future identification of wetland areas deemed important on both national and international levels.

Viet Nam's wetlands are divided into two main groups: Inland wetlands, and Coastal wetlands.

- Inland wetlands comprise the following types: permanently wet deltas; rivulets; permanent and temporary flowing rivers and streams; fresh water lakes; peat; swamps; salt water lakes; mountainous wetlands; geothermic wetlands; lagoons for aquaculture; and ponds of an area of more than 8 hectares.
- Coastal wetlands comprise of wetlands in estuaries, alluvial lands, wetlands in lagoons and sea waters less than six meters deep during ebb-tides; mangroves and marshes in delta areas, estuaries and alluvial lands; lagoons; coral reefs and seaweed systems, including two important wetland areas in the Red River Delta and the Mekong River Delta.

Preservation of wetlands in Viet Nam

In 1989, Viet Nam became an official member of the Ramsar Convention. Viet Nam is the 50th member country, but more importantly, it is the first member nation from Southeast Asia. The Xuan Thuy Wetland Nature Reserve, now the Xuan Thuy National Park, is the first Ramsar site in Viet Nam. In August 2005, Bau Sau and the seasonal wetlands in Cat Tien National Park became Viet Nam's second Ramsar site.

In Viet Nam, there are currently two wetland-related conservation systems. These are the system of special-use forests under the control of the Ministry of Agriculture and Rural Development (MARD), and the system of marine protected areas under the control of the Ministry of Fisheries. Most of the existing wetland protected areas are special-use forests. Up to March 2004, 126 special-use forests - including 28 National Parks, 59 Nature reserves and landscape conservation areas - were established by the Prime Minister. Out of these forests, four National Parks (including Xuan Thuy, Tram Chim, U Minh Thuong and

Ca Mau Cape) and ten Nature Reserves (including Thanh Phu, Lung Ngoc Hoang, Kien Luong, Bac Lieu, Tien Hai, Vo Doi, Da River Lake, Cam Son, Lak Lake and Nui Coc Lake) are wholly wetlands, with another six national parks (including Ba Be, Bai Tu Long, Cat Tien, Con Dao, Phu Quoc, Lo Go - Sa Mat) and four Nature Reserves (including Binh Chau - Phuoc Buu, EaRal, Trap Kso and Van Long) being partial wetlands.

Viet Nam has four UNESCO-recognised biospheric reserves (i.e. wetlands), including Can Gio Biospheric Reserve of Mangroves, Cat Tien Biospheric Reserve, the Biospheric Reserve in Cat Ba Islands, and the Biospheric Reserve of Costal Wetlands in the Red River Delta.

In 2001, the Ministry of Natural Resources and the Environment (MoNRE) made a proposal to designate 68 wetland areas in Viet Nam with recognised environmental and biodiversity value. These included natural and artificial reservoirs, lagoons, estuaries, bird yards, wet forests, seasonally wet savannahs. Out of those areas, seventeen sites now belong to the system of special-use forests have been approved by the Prime Minister.

Value and function of Viet Nam's wetlands

Viet Nam's wetlands have the following major values:

Economic

Wetlands make an important contribution to the development of agricultural, fishery, forestry, energy, waterway transportation and tourism sectors. Thanks to their permanent currents, large and fertile deltas are created which create healthy, reliable, highly-productive agricultural production areas, which supply the surrounding communities. The export turnover of the fishery sector has also continuously increased, which has created a dynamic for the development of other sectors, including a processing industry for aquatic products. In 2002, coastal fishing activities produced 1,434,800 tonnes, increasing export turnover of the fishery industry to US$ 2 billion (ranking it third nationwide).

The leading feature of this period has been the rapid development of a wetland-based tourism industry. Ha Long Bay, Cat Ba Island, Con Dao and other well-known beaches such as Phan Thiet, Vung Tau, Phong Nha - Ke Bang and the revolutionary base in U Minh Thuong, ecotourism sites such as Xuan Thuy National Park, the Natural Park of Ba Be Lake, and others, are the major sites of attraction to many domestic and foreign tourists.

After 1989, wetland areas also made an important contribution to the socio-economic development of Viet Nam. Viet Nam used to import about one million tonnes of rice per year (during the 1976-1988 period). But thanks to wetlands contributions, the country has not only satisfied its own rice demand but also exported 3.4 million tonnes of rice per year (2003), and has become the second largest rice exporter in the world.

Cultural

Wetlands have important value, not only to local communities, but also to the country as a whole in terms of culture, history, religion and archaeology. Viet Nam wetlands are the original point of the wet-rice-based civilization. Wetlands and their recourses have long been a source of creative inspiration for many writers, poets, painters and musicians in Viet Nam. Many well-known symbols of national significance relate to wetlands: the Lotus, for example, is engraved in pagodas and temples, and praised in songs and dances (It is also the symbol of Viet Nam Airlines). Furthermore, cranes and dragons are two out of four precious creatures that are not only very significant to our lives but also sacred worshipping objects. And water puppetry is a unique form of art performance in Viet Nam. Lastly, wetlands areas also preserve many exhibits from our resistance wars in the past (such as Bach Dang River mouth) and have a close connection to historical heritage sites (Ba Temple in Lan Estuary part of the Red River, the revolutionary base in U Minh Thuong, etc).

Scientific

Fresh water ecosystems contain about 2,611 species of including 1,403 species of algae, 190 species of crustaceans, 147 species of clams and snails, 546 species of fish, 157 species of protozoan, etc. Large inland wetland areas, such as Dong Thap Muoi and U Minh, and the system of rivers and streams have many endemic species of animals and plants. Ecosystems in coastal wetland areas (including mangroves, coral reefs, seaweeds, lagoons, estuaries, etc.) are the habitats of many species of fish, migrant birds, seaweeds, algae, etc. These species have become both typical and unique in terms of their biotopes and their highly valued biodiversity. Estuary wetlands are categorised through their hosting of settled and migrating birds and are where salt marshes, seaweed and algae are distributed. Lagoons in the central part of Viet Nam are the habitats of many species of fish and migratory birds, which, again, are unique in terms of biotope and have highly valued biodiversity.

Functions of Viet Nam wetlands

Viet Nam wetlands have several important functions. These relate to: the charging and discharging underground water; providing a supply of fresh water; sedimentation; precipitation of toxic substances and accumulation of nutrients; regulation of ecology and climate; export of living masses; limitation of floods; blocking of waves and wind; prevention of erosion; and stabilization of coastal lines. A short description of these functions follows.

Charging and discharging of underground water

During the rainy season, when the residual of surface water is high, wetlands function as a reservoir from which water soaks through the entrails of the earth in the dry season. This process takes place continuously and helps to provide an additional volume of water to underground water layers. Additionally, the process of charging and discharging water

continuously between wetland areas and underground water layers acts as a filter that cleans underground water layers. For example, wetland areas beneath indigo forests (U Minh Thuong) play a role of water-keepers, which regulate the moisture and keep the peat layer wet. Moreover, it can limit the aluminiumisation process and provide people and animals with a year round water source.

Sedimentation and precipitation of toxic substances

Wetland areas (particularly lakes, mangroves, alluvial lands, coastal pools and bays) function as deposit tanks where sediments, toxics substances and other waste in general is trapped, thereby purifying water and restricting pollution from the ocean environment.

Accumulation of nutrients

Wetlands retain nutrients (including nitrogen, phosphorous, and micro-elements) which benefits microorganisms, the development of fishery and forestry resources, and limits the phenomenon of eutrophication in wetland areas in the Red River and Mekong River Deltas, and other water areas.

Regulation of microclimate

Wetlands, particularly seaweed, mangroves, and coral reef areas, contribute to the balancing of oxygen and carbon dioxide in the atmosphere. This helps regulate the local climate (including the temperature, humidity, rainfall) and reduces the greenhouse effect.

Flood limitation

Mangroves, natural lakes, and artificial lakes, among others, play roles as reservoirs, holding and regulating rainwater and surface flows. This contributes to reducing the flood flow and limiting floods in surrounding areas such as Hoa Binh Lake, Thac Ba Lake, Tri An Lake, and others.

Biomass production

Wetlands produce biomass and create a food source for various types of aquatic products, livestock, wild animals or cattle. In addition, some of these nutrients come from dead animals that, thanks to the surface flows, decompose at lower levels and enrich the food sources in those areas.

Maintaining biodiversity

Many wetland areas, including those with mangroves, coral reefs, and/or seaweed, serve as appropriate habitats and breeding areas for various species of wild animals and plants. Wetlands maintain abundant sources of gene material, including those of rare and specious species.

Blocking of waves and wind, prevention of erosion and stabilization of coastal lines and limitation of tsunami

Thanks to sea grass and coral reefs, coastal wetland areas can protect beaches against waves, erosion, tides and tsunamis. In addition, they create a favorable environment for alluvium accumulation - in other words, the stabilisation and expansion of alluvial land. Major underground coral reefs help to decrease the wave volume impact on the beach and island edge areas during storms and tsunamis.

Management of Viet Nam's Wetlands

Wetland management at the central level

Prior to 2003, Viet Nam did not have a primary liability agency for the management of wetlands at the central level. Now, the responsibilities have been designated accordingly:

- MARD is responsible for managing wetland areas that are part of the wet rice cultivation areas and national parks, and also is responsible for management of wetland-protected areas that are designated as special-use forests, irrigational works and reservoirs.
- The Ministry of Fishery is responsible for those wetlands concerned with aquaculture and coastal areas.
- MoNRE is responsible for managing river estuaries and acts as the national coordinator of all activities relating to the Ramsar Convention.

There are also other additional sectors being involved in using wetlands including waterway transportation, tourism, hydroelectricity, etc.

In 2003, Government Decree 109/2003/ND-CP, dated 23 September 2003, assigned specific duties to ministries, sectors and localities in conservation and sustainable development of wetlands.

MoNRE

MoNRE is to carry out the State management function in respect of the conservation and sustainable development of wetland areas (Article 5.2). MoNRE's responsibilities consist of the following:

To prepare an overall plan and carry out fundamental surveys, to study and assess the current status of the environment and wetland areas throughout the country; to take lead in conducting surveys, studies and preparation of conservation and sustainable development master plans and submit them to the Prime Minister to set up wetland protected areas of national and international stature that involve more than one sector and are located in the territory of more than one province (Article 9.11).

To develop and submit for promulgation or to promulgate under the scope of its authority, policies and legal normative documents concerning wetland protected areas; to examine and inspect the implementation of legal policies for wetland protection and to acts as the national coordinator in charge of giving instructions for implementation of the Ramsar Convention (Article 15).

A fundamental character of wetland areas in Viet Nam is, for long, they have served as a place of residence of the community from generations to generation, and therefore typical cultivation customs and cultural values have been created. This is the reason why wetland management must be closely linked to community development. A shortcoming, however is, lack of a consistency in planning for wetland development as well as lack of coordination between sectors in general management of wetlands. A smart approach to management and exploitation of wetland requires consistent and comprehensive policies and methods.

MARD and the Ministry of Fisheries

MARD and the Ministry of Fisheries share the following responsibilities:

To organize surveys, study and prepare master plans for conservation and sustainable development of wetland areas that have a specialized nature, a national and international stature, and are located in the territory of more than one province (Articles 9 and 11).

To give instructions and organize the management of specialized wetland protected areas of national and international stature (Article 15).

Wetland management at the provincial level

Viet Nam has 64 provinces under central authority. The provincial people's committee is the highest administrative agency of a province. It acts in addition to other agencies at the department level which are organized vertically from the central level. Thus, wetland management responsibilities at the provincial level are the same as those at the central level, meaning each department or sector shall be responsible for the State management of its own sector, including wetland management in accordance with the law and the assignments of the provincial people's committee. Decree 109/2003/ND-CP provides that:

- People's committees of provinces and cities under central authority shall organize the management of wetland protected areas that do not fall within the management responsibility of ministries and that are located in the territory of their own provinces and cities.
- Departments of natural resources and the environment of provinces and cities under central authority shall take lead in conducting surveys, study and prepare master plan for conservation and sustainable development of important wetland areas in their localities.

At the moment, the understanding of conservation and sustainable development of wetlands at the provincial agencies remains limited, thus propaganda and educational activities need to be improved to enable local people to better understand wetlands.

Viet Nam Wetland management policies

For the past 15 years, the Vietnamese Government has been very interested in the development and completion of its legal system. This includes a great number of legal documents on wetland management, which, among other things, serve as a basis for national administration of the by-laws, and at the same time facilitate international integration.

The legislation on the environmental protection and nature reserve has greatly contributed to the protection of wetlands. Beginning in 1976, Viet Nam has issued more than 500 legal normative documents relating to the environmental protection and nature reserve. Out of those documents, however, there are only about ten documents directly providing for wetlands. In the rest of the documents, the conservation and reasonable exploitation of wetlands is only addressed indirectly - through the protection of certain components of the wetland ecosystem, including water resources or wild animals and plants, etc. Under the (2003) Law on Land, there was not any list of "wetlands" but, in this Law, wetlands are construed as "land for wet rice cultivation", "land for salt production", "land for aquaculture", "land of special-use forests being national parks and wetland nature reserves", "land of rivers, streams, canals and special-use water surface". These documents are referred to in Table 1.

Recently, the State has developed and organised the implementation of a plan of action relating to conservation and development of wetlands, and has drafted several major documents, some of which follow:

- A strategy and master plan for reasonable use and development of the water resources of Viet Nam
- (2003) Strategy for management of the system of Viet Nam nature reserves up to 2010; Decree 109/2003/ND-CP dated 23 September 2003 and Circular 18/2004/TT-BTNMT dated 23 August 2004;
- Decision 04/2004/QD-BTNMT dated 5 April 2004 of the Minister of MoNRE approving a plan of action for conservation and sustainable development of wetland areas for the 2004-2010 period;
- (1995) Plan of action for Viet Nam Biodiversity. A "Plan of action for protecting Viet Nam biodiversity up to 2015 and with orientations up to 2020" is currently being drafted.
- Draft: National plan of action to prevent the environmental degradation of the East Sea and the Thailand Bay up to the year 2015. This plan shall be comprised of various plans of actions of each of the components including mangroves, seaweeds, coral reefs, coastal wetlands, protection of fishery resources and prevention of pollution from the mainland.

Surveys, research, training and development of wetland databases

Before the country's national reunification, the concept of wetlands was not prevalent in Viet

Nam. Research and survey activities at that time only focused on mangroves. In Southern Viet Nam, in 1964, Vu Van Cuong researched the flora and vegetation of the mangroves in the Sai Gon and Vung Tau areas. In 1965, he released a study of the various plant families of Viet Nam mangroves such a Rhizophoraceae, Sonneratiaceae in the Plant Publication of Viet Nam, Laos and Cambodia. Nguyen Van Thon and Lam Binh Loi (1972) also published their research findings in the publication, "Viet Nam Mangroves". There were other studies done by foreign scientists on the impact of toxic chemicals on mangroves, including (1974) Report of the US Academy on the impact of toxic chemicals in Southern Viet Nam by Ross, P. (1975), as published in the document: 'Mangroves in the Southern Viet Nam: The impact of the toxic chemicals used in military affairs'. In the North, during this time, Phan Nguyen Hong also had a study on the flora and coastal forests. In 1970, Hong published his 'Ecology and distribution of coastal vegetational cover in the North of Viet Nam' (MA thesis).

After the national reunification, research activities on mangroves greatly improved in both ends of the country. Many studies in different sectors, including forest survey, survey of the fauna and flora, surveys of geology, geography and climate, and others, were conducted on the subject matter of mangroves and Viet Nam coastal ecosystem. Examples are: 'Ecology of the vegetation in Viet Nam wetlands' (PhD thesis) by Phan Nguyen Hong, 'Research of the Primary productivity of mangroves in Ca Mau' (MA thesis) by Nguyen Hoang Tri, research on Viet Nam mangroves by Phuong Truing Nag - Chua Quang Hien (1987) and other theses relating to the ecosystem of mangroves. There were also four theses within the scope of State-level research works, including a research on the ecosystem of mangroves in Cuu Long River Delta (1981-1990); a research on long term consequences of the chemical war caused to the ecosystem of mangroves and applicable solutions (1982 - 1990) by the Center for Research of Ecosystem of Mangroves led by the Hanoi Teachers' Training College. Research results have been highly valued by the State Committee for Sciences and have subsequently been applied to various localities.

The concept of wetland was little used in Viet Nam until 1990. In 1990, Le Dien Duc delivered a report on an action plan for protection of wetlands in a workshop on sustainable development of the environment held in Hanoi in December 1990. At the same time, the Department of the Environment under the Ministry of Science and Technology (MoSTE) has been publishing many translated documents on wetlands (e.g. Wetland Protection - an IUCN document (1990) or "Wetland protection - an overview of existing problems and required actions" of Patrik J.Dugan translated by Nguyen Khac Kinh).

During 1996 and 1997, a project for "construction of a national strategy for wetland protection for 1996-2000 period" was launched and managed by the Department of the Environment. The Center for Resource and Environmental Research (CRES, under the National University of Hanoi) was the executing agency in coordination with several agencies and scientists. The general report of the project was translated into English by IUCN Viet Nam. Over the next two years 1998 and 1999, a project "Study for improving the community capacity of protection, restoration and management of ecosystems of coastal wetlands" was launched and managed by the National University of Hanoi and successfully completed by CRES. On the basis of the research findings of the 1990's, a scientific

conference on "Management and Sustainable Utilization of natural resources and the environment in coastal wetland areas" was organised by the Research Team on Ecosystem of Mangroves of CRES. It brought together a number of relevant scientists throughout the country, and as a result of this conference, a collection was published in English for exchange with other countries in the world.

Certain international projects for wetlands were also launched in Viet Nam, including a project for the study of wetlands in Cuu Long River delta for two periods (1989 and 1992) which classified and developed a map of wetlands in Cuu Long River Delta, and a project for surveying wetland areas along the coast of Red River Delta (1996).

On 3 May 1999, the Deputy Prime Minister Nguyen Cong Tan signed Decision 116/1999/QD-TTg on the implementation of the project for planning and zoning the restored mangroves in four provinces, including Ca Mau, Bac Lieu, Soc Trang and Tra Vinh, using long-term loans from the World Bank and sponsored by DANIDA (Denmark). The project covers three zones, including strictly protected zones and economic zones with a total area of 44,400 hectares - including 27,053 hectares of the core zone and 17,347 hectares of the transitional zone. However, due to certain uncompleted procedures, there has been a delay in the implementation of this project.

In 1998 and 1999, the Institute of Forestry Survey and Planning completed the project for "Development of the scientific basis for the planning of Viet Nam wetland protected areas" as assigned by MoSTE. As a result, scientific dossiers had been developed for 52 major wetland areas of Viet Nam, and proposals had been made to the Government concerning seven wetland protected areas for approval. On the basis of the project entitled "Scientific Basis for the planning of Marine Protected Areas" carried out in 1998 by the Hai Phong sub-branch of the Oceanography Institute, dossiers had been developed for 16 areas, and scientific and technical facts had been set up for 8 marine protected areas. These are the outstanding results of study and survey activities in respect of Viet Nam wetlands for the recent time.

In terms of surveys of various species of water birds and migrating birds, in 1994, Le Trong Trai and two Danish scientists, Ms Anita Pedersen and Sanne Schnell Nielsen - completed research on species of migrating birds in the Red Rover Delta. Statistics revealed 78 species of water birds, including 37 species of marine birds. Seven of these species are globally endangered, specifically: Platalea minor, Larus saude-rsi, Pelecanus philippensis, Tringa guttifer, Eurynorhynchus semipalmatus and Egretta eulophotes.

Platalea minor is one of the rarest species of migrating birds in Viet Nam. The population of these species in the world at the moment is only about 500 birds. Every year, in early winter, the Platalea minor begins migration to the coastal areas of Viet Nam. The Institute of Survey and Planning has also coordinated with the Birdlife International in monitoring changes to the migratory path of this rare species of birds in Viet Nam. It is possible now to document the winter nesting areas of this species and the number of individual birds that migrate to Viet Nam every year. The bird's habitat in the Cuu Long River Delta have been extensively surveyed by zoologists from the Institute of Forestry Survey and Planning.

Pursuant to the data released in 1996, there are six large bird habitats in the entire Cuu Long River Delta (of which five are located in Ca Mau Province and one is located in Kien Giang Province). As revealed by a survey by Le Dien Duc (1990), there are between 60 and 80 species of birds in the bird habitats of the Cuu Long River Delta, but only 16 species of water birds nesting in these bird yards. Research also shows the number of birds in these bird habitats to be on the decline.

In general, survey activities with regard to species of water birds and migrating birds in Viet Nam have not yet been carried out in a systematic ad regular manner.

Training officers in charge of enforcement and management of Viet Nam wetlands

The term "wetland", first introduced into the popular vocabulary in the early 1990s, has gradually become known in Viet Nam. Wetland is now always mentioned when there are talks about the environment. However, surveys and research and management activities regarding wetlands are only restricted to a small group of scientists and managers. The general public knows little about this diversified but unsustainable ecosystem. The training of wetland scientists and managers is neither regarded as an important task, nor subject to any stable training program. Many of those already trained in the wetland subjects do not continue to work in the field after graduation. Thus, in order to improve wetland management and protection activities, in the near future Viet Nam needs to develop a specific strategy and program for training management and enforcement officers in wetland areas. Furthermore, fundamental knowledge on wetlands also needs to be addressed to in university textbooks and professional secondary schools.

Development of a data bank of wetlands and their fauna

As mentioned earlier, many relatively recent surveys and research projects on wetlands have been conducted throughout the country. At the same time, exploration and planning activities have also been carried out. In addition, there have been the development of Management and Investment Plans for wetland protected areas and protected areas for both wetland and terrestrial forests. Finally, recent statistical works have been started with regard to wetland areas. The difficulty, however, in collecting data and information about wetland areas originates from the involvement of too many agencies in different ministries and sectors in the survey and planning of wetland areas. Thus, although there are quite a lot documents and materials on wetlands, they are dispersed to different coordinators and it is very difficult to collect them to develop a data bank of wetlands to service the activities of surveying, monitoring and management of wetlands nationwide.

Recommendations on the management of Viet Nam's wetlands

The Vietnamese Government has been adopting appropriate policies in order to gradually improve the efficiency of the conservation, utilization and sustainable management of wetlands.

A system of legal documents governing the organizational structure, functions, duties and powers of the central wetland management mechanism has been set up and has become more complete. In particular, after the promulgation of the Law on the Organization of the Government (in 2001), and Decree 91/2002/ND-CP dated 11 November 2002 of the Government (providing for the functions, duties and powers for expanding the function of management of land and water resources and the organization structure of MoNRE), the legal basis for establishment of a system of State management agencies in charge of wetlands has been vastly improved. Decree 109/2003/ND-CP dated 23 September 2003 of the Government has codified the State management of wetlands by assignment of specific responsibilities to ministries and provinces.

More and more organizations and agencies have become involved in the management and conservation of wetlands. Under the instructions of the Government, ministries and ministerial-level agencies, in coordination with MoSTE (now MoST), have completed the initial coordination of all issues relating to wetlands, (e.g., the coordination between MoSTE and MARD and managing wetland protected areas). This, together with the improvement of the management mechanism of natural resources and the environment, and the development of policies for wetland protection, has guaranteed the participation and implementation of international activity relating to wetlands.

The State management mechanism at the local level is organised on the principle of "parallel subordinated" (i.e. subordinated to central specialized agencies and the provincial people's committee), therefore the management of wetlands in certain localities has been proved effective.

Investments from the Government and supports from international organizations for the conservation and development of wetland have increased. The number of domestic projects and international support for wetlands has also increased. However, there are some projects in which the management and efficiency remains limited.

The Vietnamese Government has approved a system of national special-use forests, including wetland areas, as well as a system of marine protected areas. These measures have helped preserve the functions, value and biodiversity of wetlands.

Recommendations on the management of wetlands in Viet Nam

In addition to recent achievements, in order to further improve and promote the efficiency of the wetland management activities, it is necessary to take into account the following recommendations:

Development and implementation of a national strategy for conservation and sustainable development of wetlands

It is necessary to proceed with the development and implementation, in a consistent manner throughout the country, of a national strategy for conservation and sustainable

development of wetlands that meet the national interest and improve the livelihoods of the local communities. At the same time, each of the ecological zones and provinces needs to develop its own specific, highly feasible plan of action.

Improvement of the effectiveness and efficiency of the wetland management institutional system

Institutions, laws and mechanisms for wetland management must be developed consistently at all levels. The National Coordinating Committee for Wetlands needs to be established and operate under direct instruction of a Deputy Prime Minister. The Coordinating Committee shall be an inter-sectoral agency in charge of regulating the coordination between all agencies in charge of wetlands including MoNRE, MARD, the Ministry of Fisheries, the Ministry of Transport and Communications, the Ministry of Culture and Information, the Ministry of Planning and investment, the Ministry of Finance, the Ministry of Justice, the Ministry of Education and Training and other agencies and departments. A consultant experts council shall also be set up to support for operations of the Coordinating Committee. The management unit in charge of wetlands under a relevant agency or department must have specifically assigned duties and powers. It is necessary to improve those agencies and people's committees at district and commune levels to enable them to directly take part in wetland management.

It is necessary to devise policies for capacity improvement of wetland management agencies by way of developing and strengthening the organizational structure, training of officers, and modernizing working facilities and management methods.

- To set up and develop a system of wetland protected areas together with the consideration and assessment of plans of actions of all levels, and to recommend those important wetland protected areas in respect of which, at the moment, neither there is an agency taking charge nor an overall master plan for sustainable use of wetlands is available
- To develop a model of management of wetland protected areas appropriate to the actual conditions of Viet Nam
- To improve professional qualifications, and to strengthen and improve the organizational structure in the wetland protected areas already established

Establishment of measures supporting wetland management

- To train human resources capable of meeting the requirements of the conservation, smart utilization and sustainable development of wetlands
- To inform, educate and provide citizens with information and knowledge about the functions and value of wetlands, abut the skills of conservation and sustainable utilization of wetlands
- To promote encouraging and supporting policies to ensure livelihoods of the local people and to enable them to take part in effectively managing and sustainably using wetlands as required under the Ramsar Convention

- To provide financial support for sustainable utilization activities of wetlands; and to set up a wetland conservation fund. Income sources shall be deducted against agricultural taxes, profits of tourist and ecotourism activities and other wetland-related services
- To speed up scientific research works, surveys and monitoring activities of wetlands throughout the country, in each ecosystem and wetland areas of high value in terms of biodiversity and the environment, particularly in those wetland areas of a national and international significance

Development of measures for managing, preserving and using wetlands

- To develop and issue a system of criteria and table of classification of wetlands
- To set up a management and action mechanism for protecting wetland areas of high value; to organize the implementation of policies and activities relating to conservation and sustainable utilization of wetland areas
- To prepare a plant for re-establishment and restoration of wetland areas and to make available incentives for the protection and improvement of fresh water sources; to devise policies for smart use of wetlands, including aquaculture and other environmentally-friendly models
- To seriously enforce provisions on conservation and sustainable use of wetlands, to take remedies and prosecute for criminal liability with regard to acts of breaches in the sector of wetland conservation, to develop and regularly update a national database and a website on Viet Nam wetland, to study and develop advanced methods of wetland management including ecological approach, co-management, inter-sectoral management or community-based management

Planning for conservation and sustainable use of biodiversities in river estuaries and coastal areas

- To develop a Map of Viet Nam wetland with different scales (including 1:10.000.000 for the whole territory; 1:250.000 for each ecological zone; 1:100.000 for each province and 1:10.000-1:25.000 for each wetland area)
- To prepare an overall master plan for conservation and sustainable development of wetland at the national level (corresponding to the map of wetland at the scale 1:1.000.000) and at the level of each ecological zone as classified under the wetland system.

Development and implementation of regulations on the management of wetland resources

Developing the management regulations plays a decisive and strategic role in the management of aquatic products in wetland areas. These regulations must cover the major issues including regulation of the working relationship between regulatory agencies; and distribution of budget funds for the operations of management of fishery and wetland resources; in order to conduct fishing activities (including catching, aquaculture and research on fishery resources), under the Ordinance on Protection of Fishery resources it is required to obtain an operating license from the provincial department of protection of fishery resources.

References

MoNRE, 1998. A summary report on Viet Nam Wetlands, Hanoi.

MoNRE, 2001. Wetland areas of biodiversity and environmental value of Viet Nam. Hanoi.

MoNRE, 2002. Protection and sustainable development of Viet Nam wetland. Decree 109/2003/ND-CP of the Government dated 23 September 2003 on the protection and sustainable development of wetland areas.

MoNRE, 2003. Protection and sustainable development of Viet Nam wetlands. IUCN, Hanoi.

1998. Law on Water Resources.

The Ramsar Convention, 1971. The Ramsar Convention on wetlands, Iran.

The Department of Environmental Protection, 2001. National Strategy for the environmental protection 2001-2010.

The Department of Environmental Protection, 2002. Project "Assessment of social and cultural aspects of the utilization of wetlands in Viet Nam". Project for development of a National Program for management and protection of Viet Nam wetlands. Pages 44-48, Hanoi, December 2002.

The Department of Environmental Protection, 2005, Overview of the Viet Nam wetland status after 15 years of implementation of the Ramsar Convention. Hanoi, 72 pages.

National University of Hanoi, 2003. Training activities for the purpose of environmental protection and sustainable development in Viet Nam, Summary Book of the Workshop "For the sustainable development of Viet Nam", Hanoi

Le Dien Duc, 1989. Inventory of Viet Nam wetland. The Center for Study of Natural resources and the Environment, National University of Hanoi.

Luu Duc Hai, 2002. Environment educational activities at the National University of Hanoi, a scientific report in the workshop in commemoration of the World Environment Day 5th June 2002.

Biofilm bacteria and conservation

Ishibashi Norihisa, JICA Expert

Introduction

Biofilm bacteria play a number of different important roles in maintaining the natural balance of the coastal environment. Biofilm speeds up decomposition of matter because nearly every type of biofilm consists of bacteria, protozoa, and micro-animals, which decompose organic matter much faster than non-biofilm conditions do. Biofilm also promotes the chemical decomposition of nitrogen because it is formed on the boundary between the oxygenated and non-oxygenated layer. By covering detritus at the floor of the salt pond, tideland and river, biofilm prevents hydrogen sulfate (H2S) from harming the upper water layer. The bacterium is also a decomposer and biological producer for the coastal area.

The contribution of research to conservation

The Marine Research Development Centre (MRDC) - Research Institute for Aquaculture No.3 in Nha Trang, Viet Nam works to educate students and local people on marine aquaculture and coastal conservation. JICA has supported the development of coastal aquaculture of Viet Nam by providing experts who transfer technical abilities and knowledge to support the operation of the centre. JICA hopes to achieve the sustainability of its counterpart organisation and staff, to enhance the productivity of aquaculture, and to conserve the coastal environment, thereby enhancing living conditions of the local community. Specifically, JICA is focussing on improving marine fish larvae production, targeting species such as grouper *(E. Cooides, E malabaricus, Leorpadus)* and sea bass *(Lates calcarifer)*.

To obtain high production levels of fish larvae, it is very important to maintain a healthy and balanced environment. However, research suggests that more studies need to be done on environmental conditions of the boundary between the water and the solid.

Biofilm

During his studies the author discovered a biofilm (white colloid) in the upper the detritus on the floor of a fish larvae culture tank in Japan. When the white colloid thrived the condition of the water in the tank remained healthy and the capacity to produce fish larvae in this environment was high.

Biofilm is found in pipes, on your teeth, and also in natural environments such as wetlands, ponds, rivers, and coastal areas. Biofilm is one life form of micro bacteria which produces an extra-cellular polymeric substance. Bacteria attaches itself to a solid surface and forms a colony. The colony consists of several bacteria group and it is shaped like mushroom with several holes. And the colony bacteria has the stronger resistance for the environment than its bacteria of the plankton life.

Culturing biofilm

Biofilm bacteria is included in the uncultured bacteria group. But it is not difficult to culture a biofilm on the glass floor of an aquarium. Put the slime, the nutrient (artificial food for fish) and mineral into a glass beaker filled with water, then put the beaker carefully into the aquarium water that is supplied with air. After a few days, biofilm bacteria will form a colloid film on the floor of glass beaker at the water-solid boundary. The method of isolating the biofilm bacteria from the slime is very simple: collect some slime and put it into a glass with water, nutrients and a certain amount of minerals. After a few days of sitting still, the biofilm bacteria will move to the surface of water from the slime because there is not enough oxygen available at the bottom of the beaker.

The still method is useful to isolate biofilm bacteria from sand at the beach. It could also isolate the pericla (biofilm) from the sand beach of Nha Trang. Three periclas (biofilms) have been isolated from the tideland at Momoshima in Setonaikai, Japan. The three pedicles formed different patterns from the sea-plant area with mud, the rube- and sand-mixed area, and the sand area.

Research findings

Fifteen biofilm-forming bacteria were isolated from the tideland area and the floor of the aquaculture tank in Japan. It was found that one of these bacteria creates digestive enzymes such as protease, chitins and lipase on the biofilm form . The research group has since collected 200 strains of biofilm bacteria from wetlands and aquaculture tank floors.

The bio-film collected from the floor of an aquaculture tank consists of bacteria with many protozoa, and micro-organisms that decomposes organic matter quickly.

Biofilm bacteria forms a colloid film on the boundary of the oxygenated layer and non-oxygenated layer, demonstrating the nature of biofilm's capabilities to decompose nitrogen in organic substances.

The change in sulfide was observed in the water during the biofilm formation in a small aquarium. And it showed that the sulphide disappeared in the water after the biofilm formed in the aquarium.

Conclusion

We need more studies on environmental biofilm, a natural decomposer that can be affected by water pollution levels, in order to maintain the coastal environment and the sustainable marine aquaculture. It is no doubt that the environmental issue is a multi-sectoral issue. Therefore, stakeholders should have a general consensus toward conservation and sustainable development. The workshop is a useful and appropriate occasion for participants to reach consensus through sharing updated information and knowledge.

DAY 1

SESSION I: INTRODUCTION TO MARINE AND COASTAL WETLAND EDUCATION

8:30 - 8:45 - Introduction - Bernard O'Callaghan, Programme Coordinator and Acting Country Representative, IUCN Viet Nam

8:45 - 9:05 - Nha Trang Bay MPA case study: lessons learnt on MPA management and the role of raising awareness - Dr. Truong Kinh, Director of Nha Trang MPA

9:05 - 9:25 - Support to MPA component MOFI/DANIDA: Training activities - Ms. Nguyen Giang Thu, Vice Manager, MPA Component, MOFI/DANIDA Project

9:25 - 9:45 - KODOMO Ramsar: Network-based wetland education activities of Ramsar Center Japan (RCJ) - Dr. Reiko Nakamura, Secretary-General of Ramsar Center Japan

Coffee break

10:00 - 10:20 - Opening and remarks

Opening remarks, Dr. Ando Motokazu, Director of RCJ

Opening remarks, Dr. Chu Tien Vinh, Director of NADAREP/ Ministry of Fisheries

Opening remarks, Bernard O'Callaghan, Programme Coordinator and Acting Country Representative, IUCN Viet Nam

10:20 - 10:40 - Introduction to the Ramsar Convention in Viet Nam - Mr. Nguyen Xuan Dung, Viet Nam Environmental Protection Agency (VEPA)

SESSION II: INTERNATIONAL EXPERIENCE

10:40 - 11:00 - Ramsar Convention and wetland communications, education and public awareness (CEPA) - Ms. Rebecca D'Cruz, Vice Chairperson, Scientific and Technical Review Panel (STRP), Ramsar Convention

11:00 - 11:20 - Wetland conservation and CEPA activities in Japan - Ms. Noriko Moriwake, Ministry of the Environment, Japan

11:20 - 11:50 - Otter conservation and awareness in coastal management of Korea and Japan - Dr. Ando Motokazu, President of Ramsar Centre Japan and Tokyo University of Agriculture professor

SESSION III: INTERNATIONAL EXPERIENCE, CONTINUED

Group splits into two sub-sessions

Section A: India, Malaysia, Nepal

13:30 - 13:50 - Case study from India - Dr. Durga Prasad Dash, Secretary of PALLISHREE

13:50 - 14:10 - Marine and coastal studies in Panang - Professor Masshor Mansor, Universiti Sains Malaysia

14:10 - 14:30 - Rapid appraisal of the Gosainkund: A high altitude wetland in Nepal - Dr. Bishnu Bhandari, President of Forum for Ecosystem Management (FEM), Nepal

Discussion

Question: What were the area's proposed conservation plans?

Answer *(Dr. Bhandari, FEM)*: Some had wanted to designate the area as a national park. As that would be purely protectionist it would not be a complete solution to the problem.

14:30 - 14:50 - Impact of tsunami and initiative taken for the sustainable development of tsunami-affected areas in India - Dr. Desh Bandhu, Indian Environmental Society

Discussion

Question *(Mr. Manssor, USM)*: How did they deal with huge increase in donations after the tsunami?

Answer *(Dr. Bandhu, IES)*: People in the area planted trees after seeing the results of a study that found that areas with plants had suffered less tsunami damage than had bare areas.

Section B: Fiji, the Philippines, the Solomon Islands, Quatar, Bangladesh, Thailand, and South Korea

13:30 - 13:45 - Experiences from the Philippines, Fiji, Solomon Islands and Qatar - Ambassador Amado S. Tolentino, Jr., International Council of Environmental Law

13:45 - 14:00 - An interactive approach to sustainable management of coastal wetland ecosystems in Bangladesh - Dr. Sanowar Hossain, President, Bangladesh POUSH

Discussion:

Question: How can you sustain the participation of the community long term?

Answer *(Dr. Hossain, BP)*: The group manages its own resources and therefore its own income. Communities plant mangroves that generate funds.

14:00 - 14:15 - Wetland education in Marine Protected Areas: a case study of Mu Ko Surin National Park, Thailand - Dr. Sansanee Chooweaw, Mahidol University, Thailand

14:15 - 14:30 - Introduction of wetland education in Nakdong River Estuary: a case study of South Korea - Mr. Ji Deok Jang, Pusan National University

Discussion:

Question *(Ms. D'Cruz, STRP)*: Is it a legal requirement that MPAs have education programmes in Thailand?

Answer *(Dr. Chooweaw, MU)*: According to the National Park it is an operational requirement rather than a legal requirement.

Question *(Mr. Dung, VEPA)*: Are there comments on how education really contributes to the conservation and protection of wetlands?

Answer *(Mr. Chooweaw, MU)*: The case studies presented from the Philippines, Fiji and the Solomon Islands provide good examples of instances where ecosystem protection came about because of the peoples' changed actions as a result of education. The Sea Gardens were formed by the fishermen to stop the use of dynamite fishing, which protected their livelihoods.

Dr. Hossain (BP): From the EE centre in our project, we've seen that children aged six to ten have a clear understanding of what they are doing. Today they do not engage in destructive fishing methods, and parents are keen to send their children to our school.

Question: How can funding be generated to improve protection at MPAs?

Answer *(Dr. Chooweaw, MU)*: In Thailand, 85% of funding still comes from the government. The remainder comes from the park revenue. Administration costs take about 5% of this revenue. There are a lot of tourists, but the park cannot rely on increasing the number of tourists for raising funds. Currently the park is reviewing the capacity of how many tourists it can take.

Question *(Ms. Thu, MCD)*: Are there mechanisms for the children of Viet Nam to participate in the KODOMO exchange program? Is there any training programme that you can share with Viet Nam so that we can learn from this activity?

Answer *(Prof. Jang, PNU)*: The exchange programme is run by RCJ. However, next year it may expand to the region and include other Asian countries. In 2008 Korea will host the 'Children of Ramsar' meeting.

SESSION IV: MARINE AND COASTAL WETLAND EDUCATION IN VIET NAM

15:05 - 15:25 - ENV environmental education activities in Viet Nam: lessons learnt - Mr. Dang Minh Ha, Vice-director, Education for Nature Viet Nam (ENV)

15:25 - 15:45 - Status of marine education of Cu Lao Cham Marine Protected Area - Mr. Pham Viet Tich, Director, Cu Lao Cham MPA Management Board

Discussion:

Question *(Prof. Mansor, USM*): How can we support people while conserving natural areas?

Answer *(Mr. Trinh, CLC)*: Livelihood improvement for local people involves first asking them what livelihood they want to improve. Livelihoods must come first, but protection is necessary to ensure availability of natural resources.

Question *(Dr. Hossain, BP)*: How will economic development and conservation go together?

Answer *(Dr. Triet,VNU)*: Poor people can benefit from conservation activities. In the Mekong Delta, minority people had been turning wetlands into rice fields until programmes there convinced them to conserve the areas for multi-use instead. When people were provided with skilled training and were taught to make handicrafts from raw materials, they could decrease the amount of rice they needed to harvest. They could sell products that fetched higher prices than their previous goods were sold for, and they could earn a higher marginal profit. If local people see that their earnings will go up as a result of multi-use programmes they can be convinced to sign on, but it is not easy to convince them.

Answer *(Mr. Tuan, CGBR)*: It is useful to take advice from universities and to have management plans that can ease conflicts. Exporting natural resources is a national interest.

Mr. Thanh (IMER): [Discussed Cat Ba area and importance of making it a national park.] Local and national government need to work together. How can we combine conservation and development? You must believe that it is possible, have education and information programmes, and involve local people in development activities.

Question *(Dr. Motokazu, RCJ)*: Can presenters share any difficulties they have faced in projects?

Answer *(Mr. Dinh, BTLNP)*: Although MPA's compensate people for their losses by providing support to development of alternative livelihoods like fish

farming, the number of people negatively affected by the establishment of MPA's is still high. Organisers face difficulties in developing education activities because of the potential negative effects the MPA will have on the livelihoods of park residents. Another difficulty is that people still break laws.

15:45 - 16:05 - Education Eco Boat: Case study in Ha Long Bay - Don Miller, Flora and Fauna International

15:25 - 15:45 - EE experiences from Ho Chi Minh University (Member of the International Crane Foundation) - Dr. Tran Triet, Ho Chi Minh Economics University

15:45 - 16:00 - Education in Nha Trang Bay MPA - Ms. Nguyen Thi Kim Hoa, Head of EE Unit, Nha Trang Bay MPA

DAY 2

SESSION V: CASE STUDIES AND DISCUSSION GROUPS ON EXPERIENCES IN VIET NAM

Session A

8:30 - 9:05 - EE activities of the World Wide Fund for Nature (WWF) - Ms. Do Thi Thu Huyen

Discussion

Question: Has WWF worked with MOFI and other institutions in carrying out environmental education?

Answer *(Ms. Huyen, WWF)*: I'm convinced of the importance of working in cooperation with such institutions. The Marine Conservation Association and WWF cooperate with these institutions whenever possible.

Question: Does WWF conduct any tourist EE activities?

Answer *(Ms. Huyen, WWF)*: The [image] of the dugong was included in the design especially because students show great interest in it. We want to see if the same posters can be used in hotels and we are seeking feedback from hotels before translating posters into English for tourists.

Question: The marine conservation clubs need a certain amount of money to run. After this programme finishes, will there be further funds to carry out the activities?

Answer *(Ms. Huyen, WWF)*: We supported the clubs for three months during the implementation of the programme. If we monitor activities after the pro-

gramme, we generally see that the students and teachers continue to carry out marine conservation and EE.

9:05 - 9:25 - Experiences from education activities on mangrove protection on coastal areas in Viet Nam - Ms. Tran Minh Phuong, Mango Ecosystem Research Division

9:25 - 9:45 - Conservation education in Xuan Thuy National Park - Luu Cong Hao, Xuan Thuy National Park

Discussion:

Question *(Mr. Dung, VEPA)*: Are there any plans to provide education for local managers?

Answer *(Ms. Phuong, MERD)*: We have carried out many activities for managers, hosting workshops and providing them with information related to marine resources.

Ms. Huyen (WWF): In Phu Quoc and other marine areas we haven't had time to carry out such activities. The managers do not have much time. We intend to organise activities such as special events on International Environment Day to pull these managers together to engage in activities. We are not certain they will attend.

Question: Has there been any economic assessment after planting the mangroves?

Mr. Du (BI): There are conflicting views on planting mangroves. We should make sure they do not cause any damage when they are planted.

Dr. Quyen (CRES): We carry out education programs with a focus on local businesses and authorities. We aim to plant mangroves where they used to exist. We do not plant mangroves where they cannot be planted.

Mr. Tuan (CGBR): Sometimes project managers finish the project and stop education. We still do not have adequate EE and communication between all levels of government and communities. We should develop short-term education strategies. In the past two years, these activities have declined.

Ms. Phuong (MERD): After the project has finished EE, can still continue. We can start at the district level and then go down to the community level. We have organised workshops at the local level to deliver information. These workshops should be included in the education strategies of the districts because they will have influence at the community level.

In Nam Binh, Thai Binh Province, we have associations where this information is dispersed. Our organisation has planted more than 10,000 ha of mangroves and 9,000ha in the south.

Mr. Du (BI): The place with the most success in planting mangroves is Thai Thuy District (Thai Binh Province) in the northern parts of Viet Nam. As a result of past programs we now have mangroves in the appropriate places.

Ms. Huyen (WWF): On the topic of the future of education activities, WWF's strategy is to build awareness and capacity. WWF has observed that if communities are adequately informed, they will continue to implement key activities in their region. And once a project finishes, new projects in the area often benefit from the success of the previous project.

Conclusion:

Dr. Ni (CTU): EE is important. The difficulty of EE is in transferring the benefits of knowledge and experience from high levels to lower levels. Education takes time, and it still doesn't always change actions.

Mr. Fabares (MCD): Restoration ecology is a new science. Every country is learning about this topic. It would be very useful to hold a workshop on restoration ecology of mangroves in Viet Nam (e.g., the introduction of fish) and link it to environmental education. The workshop could explore the challenges, benefits, and negative impacts related to mangrove-related restoration ecology. Another issue that needs to be addressed is population genetics, as does the introduction of pathogens. The issue of how to share information among programmes is common to all countries. There seems to be a system in place in Viet Nam where NGOs must register with the government; perhaps we can link with this system to avoid doing extra work.

Dr. Quyen (CRES): I propose that the network or other group we create approaches the government for a budget on environmental education, and that the government advertise this budget or fund it widely to encourage environmental education for communities.

Dr. Vinh (MOFI): MOFI has a project called 131 to collaborate with local people in implementing EE. The legal department of MONRE has highlighted the need to link national-level education programs with local EE activities.

Session B

8:45 - 9:05 - Environmental education and awareness-building: IUCN experience - Ms. Bui Thi Thu Hien, IUCN

9:05 - 9:25 - Ran Trao MPA and the Center for Marine Life and Community Development's (MCD's) EE activities - Ms. Ho Yen Thu, MCD

Discussion:

Question: What are best methods of getting the government's help with enforcement in community-designated MPAs?

Ms. Thu (MCD): Official recognition is really the best way for getting government action. District level support systems and legal officials can be consulted in order to maintain compliance to other regulations.

9:25 - 9:45 - Environmental education activities in Con Dao - Mr. Vu Van Thuy, Department of Scientific and Environmental Education, Con Dao National Park

Discussion:

Question: What is the new logo of national park? Does the programme have financial sustainability?

Answer *(Mr. Thuy, CDNP)*: The logo contains the image of a boat and a fish. In the past the group was called the Green Club and focussed on forest issues. After 2005, the content was changed to include marine areas, wetlands, and species. Financial support comes from authorities of the province.

Question: As communicators are more interesting than educators, how can we be communicators?

Answer *(Mr. Thuy, CDNP)*: If you do communication work you can save money. If you do an event for turtles and invite the media, the image will be dispersed. This is low-cost and it raises awareness. Communication can convey a message but is not as theoretical as plain "education."

9:45 - 10:05 - Marine Fin Fish Culture - Mr. Norihisa Ishibashi, Jica expert at Nha Trang

SESSION 6: INTRODUCTION TO THE NETWORK

10:20 - 10:40 - Mekong Wetlands Biodiversity Programme (MWBP) education network - Ms. Tran Thu Trang, MWBP [Debate on future network's status with regard to government association rules. Experience shared from MWBP network that MWBP needed no permission from the Government.]

10:40 - 11:00 - Viet Nam Marine Protected Area Network - Mr. Chu Manh Trinh, Vice chair-person of MPA network

Discussion:

11:00 - 12:00 - Group discussions in Vietnamese

Lunch

1:30 - 2:15 - Plenary and review of the group discussions

Group 1: Overview

Group 1 presenter: We recognise the importance of the network but also recognise the need for funding that will support the network. There is also the legal status issue. Some of Viet Nam's neighbours have experienced a similar situation. They have been able to develop good relationships with all stakeholders and have successfully established the network. We can either keep the network as a forum, or it can be run by agencies or other organisations.

Many groups have been identified as the target audience. Some groups are specifically involved in wetlands conservation, while others are indirectly involved. Both individuals and organisations should be involved.

Target groups include policy makers, scientific groups, managers of wetland projects, donors, and the general community.

Information and knowledge can be shared. Some specific ideas of topic areas are already established. We agreed upon the main target topics, which will be methods of education and tools for education. Legal framework of network will be established later.

To make the network a success we need funding, a website and email address, a database of shared information, a board or manager, guidelines, and a donor list.

2:15 - 3:00 - Discussion of priorities

Dr. Lanh (VNPPAA): Funding sources and our legal status, especially with MOFI, are two issues. We should appoint a coordinator who has the skills and qualifications needed to manage the network well and who will be good at finding the financial assistance needed.

Group 2: Overview

Group 2 presenter: It is necessary to establish a new network focussed on education. Network should remain a forum, not an organisation. Members

can be individuals, organizations, students, teachers, scientists, enterprises, management agencies, donors, and managers. Workshop priorities are developing community education in public schools and sharing experiences on how to run projects and workshops and train teachers.

We discussed how to run the network. We think participants can get information from a website or via email to save money. We can incorporate education into preexisting projects. A logo and a mailing list of participants are needed. The regular exchange of information is very important and should be maintained. A regular workshop should be held annually or twice a year. We could have our own workshop, or we can organise a smaller workshop within a bigger conference. We need to develop a relationship with international people to build our network and experiences.

Discussion and agreement on priorities:

Dr. Vinh (MOFI): People think a network must be big and must have legal status, but you don't need legal status to have the network run effectively. We can have a managing board, but our name can be flexible. Those who have qualifications need to get involved.

Mr. O'Callaghan (IUCN): Yes, a network doesn't need to be very big and need not be explicitly supported by government. For example: many visitor centres already exist in Viet Nam. It would be a good idea to get everyone together to share ideas about these visitor centres so that new information doesn't need to be generated. A board is not necessarily needed as a group of people from a variety of agencies and organisations (such as universities) can run the network. Funding can get complicated, depending on what agency the money goes through.

Mr. Vinh (MOFI): We should establish a marine and coast wetland education network board comprised of a chairman, vice chairman, and coordinator. We will develop a close relationship with bodies such as the Science and Technology Association that can provide us with technical assistance.

New speaker: We need people who can update information on the website. Can we get a full-time board or secretary?

Answer *(Dr. Vinh, MOFI)*: It is difficult to establish a full-time board or secretary. Who should be included in the education network or programmes? It is good to include many stakeholders.

Who is targeted? This is an important question. First we should focus our attention on managers, then we can continue at the grass root level. Within an MPA some people think education should target children, but I think it

should be the fisherman or women or those that use the wetland resources. Prioritise managers, children are second priority, third is policy-makers.

Question *(Ms. Huyen, WWF)*: Please clarify - is the target group the group that will benefit from the forum itself [i.e., the educators] or the groups who benefit later?

Answer *(Dr. Vinh, MOFI*): The target group is the group or groups who benefit from the network.

Question *(Ms. Huyen, WWF)*: There need to be different approaches to addressing the different needs of target groups and network participants. As there are already many networks, is it good to establish another? Or should we become part of a bigger network so that we can find donors more easily?

Answer *(Dr. Vinh, MOFI)*: No, we are unique because coastal wetlands are the focus of our network. [Discussion on the marine environment, the Ramsar Convention's definition of wetlands that includes coral reefs to 6 metres, and the often differing connotations of the word "marine."}

Mr. Dang (IUCN): We should create a network that performs three functions. It should share materials and methods for wetlands-related education. It should share the content of wetlands-related education curriculum. And it should share messages relevant to educators. A technical advice board will be developed in the future, to provide direction on network activities and focus. It may be too soon to discuss technical content now.

Dr. Vinh (MOFI): We agree now to elect a regulatory committee to develop objectives and a regulation plan. We agree we need money from donors to support regular committee meetings as there is no separate account. [Discussion on when to decide the regulations, with decision to have the committee develop them later.]

Dr. Vinh (MOFI): Organisations interested in joining should designate a representative for us to contact. The regulatory committee will circulate a draft to members.

15:15 - 15:45 - *Launch of IUCN publication "Mekong Region Water Resources Decision-making" - Duong Thanh An, Director of International Department on the Environment (VEPA) and leader in water resource development in Viet Nam*

Champagne served.

16:10 - 16:30 - Discussion and open floor

Dr. Vinh (MOFI): Call for volunteers from Hanoi area to participate in planning meeting.

- Representative from MCD: Yen
- Representative from WWF
- Representatives from IUCN: Mr. Ly Minh Dang nominated as planning meeting representative and Ms. Din Thi Minh Thu nominated as secretary
- Dr Vinh to chair committee

16:45 - Closing

Workshop Findings and Outcomes

FINDINGS

WETLAND MANAGEMENT

- Wetland management strategies should be developed with the participation of all key wetland stakeholders.
- Supporting local livelihoods is a crucial role of wetland management, which should promote the conservation and sustainable use of natural resources in order to support these livelihoods in the future.
- The management of wetland ecosystems should integrate contributions and needs of local people, who are important sources of local knowledge and whose livelihoods are closely linked to natural resources and ecosystem services.
- Before developing a wetlands management programme to improve local livelihoods, local people should first be consulted to assess their areas of need.
- Sustainable wetland management should account for the needs of minority groups, especially women and children.
- Potential sources of funding for wetlands management include park fees, tourist fees and government subsidies.

WETLAND EDUCATION

- Networks and workshops are two effective ways to share education resources and strategies.
- EE programmes must be designed to fit the needs of different target groups, using different activities and approaches to promote wetlands conservation.
- The media is a powerful and inexpensive tool for disseminating information.
- Successful EE programmes share information and teach practical ways to apply new knowledge in everyday life. This builds capacity and ensures that the EE programme will have a lasting impact.

WETLAND CONSERVATION

- Regional and international cooperation, achieved through symposia, networks or international agreements, can enhance the impact of wetlands conservation activities.
- People value wetlands for many different reasons. Wetland conservation strategies should take into account these ecological, economic, cultural, historical, and religious motives in order to have long-term success and to satisfy all stakeholders.
- Healthy wetlands can protect coastal areas from excessive damage in the event of natural disasters.

OUTCOMES

- Workshop participants strongly supported the idea that education is an integral element of sustainable development that can reach various stakeholder groups and can greatly influence community participation and project success.
- Participants found that education for conservation and sustainable use is more effective when it occurs in collaboration with other organisations.
- Vietnamese participants agreed to formally establish a national wetlands education network in order to facilitate effective exchange of information and ideas.
- The education network's planning group members were selected and plans were made for these representatives to convene in Hanoi in 2007 to finalise the network's structure.
- In a separate session held on the second day of the workshop, international participants discussed preparations for the Asian Wetland Symposium, scheduled for early 2008.

Post-Workshop Wrap-Up

The Wetland Education Network Planning Group met on 27 September 2006. Representatives in attendance included:

Mr. Le Thiet Binh, Vice Director, MOFI/NADAREP

Ms. Le Thanh Binh, Head of Nature Conservation Division, VEPA

Mr. Nguyen Xuan Dung, Officer, Nature Conservation Division, VEPA

Mr. Nguyen Cong Quang, Director of CEPA, VEPA

Mr. Hoang Van Thang, Director, CRES

Ms. Tran Minh Phuong, Public Awareness Advisor, MERD/SEMLA Project

Ms. Vu Thi Quyen, Director, ENV

Ms. Ho Yen Thu, Project Manager, MCD

Mr. Trinh Le Nguyen, Director, PanNature

Ms Le Thi Thu Thien, Officer, Viet Nam National Park and Protected Area Association

Ms. Do Thi Thanh Huyen, Environmental Education Officer, WWF

Mr. Nguyen Duc Tu, Wetlands Programme Officer, BI

Mr. Ly Minh Dang, Wetlands and Water Resources Programme Manager, IUCN

Ms. Dinh Thi Minh Thu, Communications Coordinator, IUCN

Ms. Bui Thi Thu Hien, Marine and Coastal Resources Programme Manager, IUCN

Ms. Tiffany Inglis, Programme Assistant, IUCN

Ms. Kathryn Matlack, Programme Assistant, IUCN

The group met to develop Network objectives, regulations, develop a work plan for 2007, and agree upon a semi-permanent committee. Official terms of reference are expected to be available by 2007.

Publishing House No. 823-2006/CXB/4-207/LĐXH, dated 11/12/2006.
Designed by Hoang Minh Printing Co., Ltd., size 21 x 29.7cm, copies 200

IUCN Viet Nam
Villa 44/4 Van Bao Street, Ba Dinh, Hanoi, Viet Nam
Tel: + 8447261575, Fax: + 84 4 7261561
www.iucn.org.vn